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(54) Title: CROSS-NEUTRALIZING SARS-COV2 ANTIBODIES

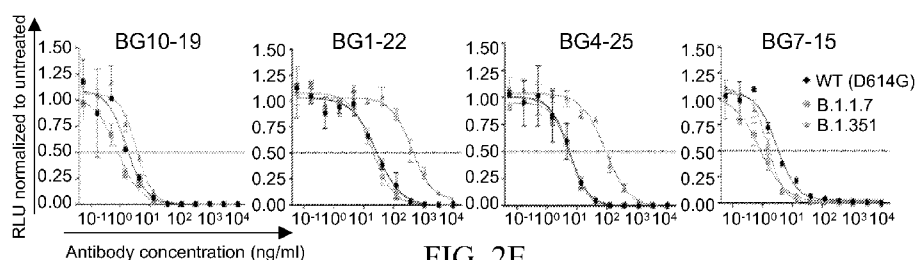


FIG. 2E

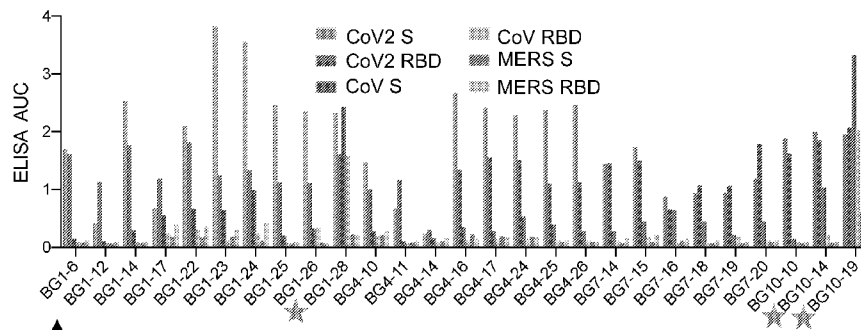


FIG. 2F

(57) Abstract: The present invention provides for cross-neutralizing SARS-CoV2 antibodies. The antibodies can be used to treat SARS-CoV2 and variants thereof.

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CROSS-NEUTRALIZING SARS-COV2 ANTIBODIES

CROSS-REFERENCE TO RELATED APPLICATIONS

[0001] This application claims the benefit of U.S. Provisional Application No. 63/132,695 filed December 31, 2020 and 63/155,220 filed March 1, 2021. The entire contents of the above-identified applications are hereby fully incorporated herein by reference.

STATEMENT REGARDING FEDERALLY SPONSORED RESEARCH

[0002] This invention was made with government support under Grant Nos. DK43351, AI138398 and AI150464 awarded by the National Institutes of Health. The government has certain rights in the invention.

REFERENCE TO AN ELECTRONIC SEQUENCE LISTING

[0003] The contents of the electronic sequence listing (BROD-5305WP_ST25.txt"; Size is 7,287,042 bytes and it was created on December 30, 2021) is herein incorporated by reference in its entirety.

TECHNICAL FIELD

[0004] The subject matter disclosed herein is generally directed to cross-neutralizing SARS-CoV2 antibodies.

BACKGROUND

[0005] SARS-CoV-2 is the third zoonotic betacoronavirus to cause a human outbreak after SARS-CoV in 2002 and Middle East respiratory syndrome coronavirus (MERS-CoV) in 2012 (de Wit et al., 2016). After the SARS-CoV and MERS-CoV outbreaks, limited numbers of neutralizing antibodies were isolated using phage display library techniques (Prabakaran et al., 2006; Sui et al., 2004) and Epstein-Barr virus transformation of B cells from recovered patients (Corti et al., 2015; Traggiai et al., 2004). The ability to characterize specific antibody responses in humans was advanced for pathogens such as human immunodeficiency virus 1 (HIV-1) (Scheid et al., 2009b; Wardemann et al., 2003), malaria (Triller et al., 2017), Zika virus (Robbiani et al., 2017), influenza (Wrammert et al., 2008) and viral hepatitis (Wang et al., 2020a) through the use of single-cell sorting followed by immunoglobulin gene sequencing. Since then, high-throughput single-cell RNA-seq (scRNA-seq) of virus-specific B cells has

allowed simultaneous characterization of the clonal landscape of such cells and their associated transcriptional profiles (Neu et al., 2019). When combined with functional testing and structural characterization of selected monoclonal antibodies, this integrated approach should allow us to learn more about transcriptional pathways involved in the generation of efficient antiviral antibody responses and the roles of different B cell subpopulations (Horns et al., 2020; Mathew et al., 2020; Neu et al., 2019; Waickman et al., 2020).

[0006] Given the recent promising clinical results of therapeutic monoclonal antibodies against Ebola (Mulangu et al., 2019) and HIV-1 (Caskey et al., 2019; Scheid et al., 2016) numerous efforts have been undertaken to develop protective and potentially therapeutic antibodies against SARS-CoV-2 (Baum et al., 2020; Brouwer et al., 2020; Cao et al., 2020b; Chen et al., 2020; Chi et al., 2020; Hurlburt et al., 2020; Ju et al., 2020; Liu et al., 2020; Lv et al., 2020; Pinto et al., 2020b; Robbiani et al., 2020; Rogers et al., 2020; Shi et al., 2020; Wan et al., 2020; Zost et al., 2020). These efforts were aided by structures that have revealed how the SARS-CoV-2 spike binds to its angiotensin-converting enzyme 2 (ACE2) receptor (Yan et al., 2020), specificities of polyclonal antibody responses in COVID-19 convalescent individuals (Barnes et al., 2020b), and commonalities among receptor-binding domain (RBD)-binding monoclonal neutralizing antibodies that prevent infection (Barnes et al., 2020a; Tortorici, 2020; Yuan et al., 2020). Collectively, these structures provide foundations for potential therapeutic benefits by guiding choices of monoclonal antibody pairs for treatment cocktails, while informing structure-based engineering experiments to improve antibody potencies and/or create antibodies resistant to viral mutations. Furthermore, recent mapping of neutralizing SARS-CoV-2 antibodies that target conserved spike epitopes (Lv et al., 2020; Piccoli et al., 2020) has the potential to guide structure-based immunogen design to elicit cross-reactive antibodies against zoonotic coronaviruses with spillover potential.

[0007] Citation or identification of any document in this application is not an admission that such a document is available as prior art to the present invention.

SUMMARY

[0008] In one aspect, the present invention provides for an antibody or antigen binding fragment thereof that binds to the SARS-CoV-2 receptor-binding domain (RBD) and/or SARS-CoV-2 spike trimer comprising: a complementarity-determining region 3 (CDR3) heavy chain and light chain pair that shares at least 90% identity with the heavy chain and/or light chain of

a pair selected from the group consisting of: BG1-1, BG1-3 to BG1-28, BG4-1 to BG4-27, BG7-1 to BG7-7, BG7-9 to BG7-20, and BG10-1 to BG10-19 (SEQ ID NOS: 1-184); or a heavy chain and light chain pair that shares at least 90% identity with the heavy chain and/or light chain of a pair selected from the group consisting of: BG1-1, BG1-3 to BG1-28, BG4-1 to BG4-27, BG7-1 to BG7-7, BG7-9 to BG7-20, and BG10-1 to BG10-19 (SEQ ID NOS: 185-368). In certain embodiments, said antibody or antigen binding fragment is an IgG antibody or antigen binding fragment. In certain embodiments, said antibody or antigen binding fragment is a monoclonal antibody.

[0009] In certain embodiments, said CDR3 heavy chain and light chain pair or heavy chain and light chain pair is selected from the group consisting of: BG1-6, BG1-12, BG1-14, BG1-17, BG1-22, BG1-23, BG1-24, BG1-25, BG1-26, BG1-28, BG4-10, BG4-11, BG4-14, BG4-16, BG4-17, BG4-24, BG4-25, BG4-26, BG7-14, BG7-15, BG7-16, BG7-18, BG7-19, BG7-20, BG10-10, BG10-14, and BG10-19. In certain embodiments, said CDR3 heavy chain and light chain pair or heavy chain and light chain pair is selected from the group consisting of: BG1-22, BG1-24, BG4-25, BG7-15, BG7-20, and BG10-19.

[0010] In certain embodiments, said heavy chain and light chain pair is BG7-15. In certain embodiments, said antibody or antigen binding fragment thereof binds the two “down” / one “up” RBD conformation on the SARS CoV2 spike trimer with no glycan or interprotomer contacts. In certain embodiments, said antibody or antigen binding fragment recognizes an epitope in proximity to RBD residues 439-450. In certain embodiments, said antibody or antigen binding fragment blocks RBD-ACE2 interactions.

[0011] In certain embodiments, said heavy chain and light chain pair is BG7-20. In certain embodiments, said antibody or antigen binding fragment thereof binds a 2d/1u or 1d/2u binding state in the SARS CoV2 spike trimer.

[0012] In certain embodiments, said heavy chain and light chain pair is BG10-19. In certain embodiments, said antibody or antigen binding fragment thereof binds to an all down RBD conformation in the SARS CoV2 spike trimer. In certain embodiments, said antibody or antigen binding fragment recognizes an epitope in proximity to the N343-glycan. In certain embodiments, said antibody or antigen binding fragment light chain makes secondary contacts with an adjacent RBD. In certain embodiments, said antibody or antigen binding fragment heavy chain makes contacts with an epitope in proximity to the N343-glycan and the light chain

contacts adjacent down RBDs and interacts with residues that overlap with the ACE2 receptor binding motif.

[0013] In certain embodiments, said heavy chain and light chain pair is BG1-24. In certain embodiments, said antibody or antigen binding fragment thereof binds both the up/down RBD conformation on the SARS CoV2 spike trimer.

[0014] In certain embodiments, said heavy chain and light chain pair is BG1-22. In certain embodiments, said antibody or antigen binding fragment thereof binds only the up RBD conformation on the SARS CoV2 spike trimer.

[0015] In certain embodiments, said antibody or antigen binding fragment is a VH3-53/3-66 antibody. In certain embodiments, said antibody or antigen binding fragment comprises a CDR3 having a consensus sequence according to Figure 29. In certain embodiments, said heavy chain and light chain pair is BG4-25.

[0016] In another aspect, the present invention provides for an antibody or antigen binding fragment thereof that binds to the SARS, MERS and CoV2 spike trimers outside of the receptor-binding domain (RBD) comprising a complementarity-determining region 3 (CDR3) heavy chain and light chain pair that shares at least 90% identity with the heavy chain and/or light chain of a pair selected from the group consisting of LKA-1-17 (Table 7).

[0017] In certain embodiments, the antibody or antigen binding fragment is modified to enhance stabilization, *in vivo* half-life, neutralizing activity and/or dimerization. In certain embodiments, the antibody or antigen binding fragment is a fusion protein. In certain embodiments, the antibody or antigen binding fragment is fused to another antibody or antibody fragment, Fc domain, antigen binding domain, glutathione S-transferase (GST), and/or serum albumin. In certain embodiments, the antibody or antigen binding fragment comprises amino acid substitutions that increase antibody binding and/or viral neutralization activity.

[0018] In another aspect, the present invention provides for a method of treating a coronavirus infection comprising administering to a subject in need thereof one or more antibodies or antigen binding fragments of any embodiment herein. In certain embodiments, the coronavirus is selected from the group consisting of SARS-CoV-2, SARS and MERS. In certain embodiments, the SARS-CoV-2 is a SARS-CoV-2 variant. In certain embodiments, the SARS-CoV-2 variant is selected from the group consisting of B.1.1.7 and B.1.351. In certain

embodiments, BG10-19 is administered. In certain embodiments, BG10-19 and BG4-25 are administered.

[0019] In another aspect, the present invention provides for a method of identifying neutralizing antibodies from a subject infected with a virus comprising selecting antibodies expressed in B cells further expressing a transcriptional program, wherein the transcriptional program comprises one or more genes selected from the group consisting of: GRAMD1C, TMEM156, PDE4D, NFKBIA, S100A10, TKT, CAPG, CXCR3, CFLAR, HMGA1, MARCKSL1, PIM3, RHOF, MIF, ZFP36L1, NME2, MGAT4A, COCH, HOPX, ITGB2-AS1, BASP1, CD80, PAPSS1, CD70, LYPLAL1, LMNA, and FAS; or TKT, ARHGDIB, CFL1, CNN2, S100A10, HSPA8, HMGA1, PPIA, RAC2, CLIC1, SLC25A5, ARPC1B, SELL, PPP1CA, CAPZB, PPP1R18, CAPG, LDHB, S100A4, VIM, LTB, ANXA2, LCP1, TUBB, ACTG1, GAPDH, ACTB, PFN1, CORO1A, and TMSB10; or CD27, CD80, CD46 and CD86.

[0020] These and other aspects, objects, features, and advantages of the example embodiments will become apparent to those having ordinary skill in the art upon consideration of the following detailed description of example embodiments.

BRIEF DESCRIPTION OF THE DRAWINGS

[0021] An understanding of the features and advantages of the present invention will be obtained by reference to the following detailed description that sets forth illustrative embodiments, in which the principles of the invention may be utilized, and the accompanying drawings of which:

[0022] **FIGS. 1A-1E – SARS-CoV-2 binding B cell populations in 14 recovered subjects;** Representative FACS plots with the gating strategy for sorting of SARS-CoV-2 S (Fig. 1A) and RBD binding (Fig. 1B) B cells. Pre-enriched CD20⁺ cells were gated on live cells based on their appearance in side scatter (SSC) and forward scatter (FSC). Of these, CD19-FITC and SARS-CoV-2 S-APC or SARS-CoV-2 RBD-APC double-positive cells were selected for sorting and sequencing. (Fig. 1C) Bar diagram showing the number of cells for which transcriptional profile and matching VDJ sequences were obtained in each subject against SARS-CoV-2 S (turquoise) and SARS-CoV-2 RBD (yellow). (Fig. 1D) Pie charts showing the total number of B cells sorted from each subject in the center of each pie and expanded B cell clones represented by differently colored pie slices. The white areas in each pie chart represent singlets. (Fig. 1E) Bar diagram showing the fraction (in %) of *VH3-53* and

VH3-66 genes combined among SARS-CoV-2 S trimer (left), RBD binding cells (center) and all cells combined (right) in each donor compared to historic control memory B cells (Rubelt et al., 2012). Red stars indicate fractions with statistically significant difference (P value < 0.005) to historic control memory B cells (Rubelt et al., 2012).

[0023] FIGS. 2A-2G – Antibody neutralization, cross-binding and cross-neutralization. (Fig. 2A) Dot plots showing ELISA binding of all expressed antibodies against SARS-CoV-2 S (y-axis) and RBD (x-axis) (**Table 3**) expressed as area under the curve (AUC) for subjects BG1, BG4, BG7 and BG10, respectively. Red dots represent neutralizers and black dots non-neutralizers in a SARS-CoV-2 pseudovirus assay (**Tables 2 and 3**). Green dots represent negative control antibody mGO53 (Wardemann et al., 2003). Two tailed P values were generated by calculating Spearman correlation coefficient. As in Table 3 high binding was defined as $AUC > 1$, intermediate binding as an AUC 0.25-1 and low binding as an $AUC < 0.25$. (Fig. 2B) Bar diagram showing the IC_{50} values in $\mu g/ml$ (y-axis) against SARS-CoV-2 pseudovirus in red and authentic SARS-CoV-2 virus in black for all antibodies that showed neutralizing activity against SARS-CoV-2 pseudovirus (**Table 2**). Pearson correlation coefficient (r) and P value were calculated comparing results from both assays. (Fig. 2C) Bar diagram showing the ELISA AUC for all antibodies that showed neutralizing activity in a SARS-CoV-2 pseudovirus assay (**Table 2**) against SARS-CoV-2 S (black), SARS-CoV-2 RBD (red), SARS-CoV S (orange), SARS-CoV RBD (magenta), MERS-CoV S (dark grey) and MERS-CoV RBD (light grey). The two antibodies showing cross reactivity, BG1-28 and BG10-19, are indicated with red stars. (Fig. 2D) *In vitro* pseudovirus neutralization assay comparing the potencies of antibodies BG1-28, BG10-19 and S309 against SARS-CoV (Pinto et al., 2020a). Data points represent the average of duplicates, with error bars representing the standard deviation. (Fig. 2E) Normalized relative luminescence values in cell lysates after infection with SARS-CoV-2 pseudoviruses harboring WT-D614G (black), B.1.1.7 (hot pink), or B.1.351 (green) sequences in the presence of indicated antibodies. (Fig. 2F) Bar diagram showing the ELISA AUC for all antibodies that showed neutralizing activity in a SARS-CoV-2 pseudovirus assay (**Table 2**) against SARS-CoV-2 S (red), SARS-CoV-2 RBD (brown), SARS-CoV S (dark blue), SARS-CoV RBD (light blue), MERS-CoV S (dark grey) and MERS-CoV RBD (light grey). The three antibodies showing strong cross reactivity, BG1-28, BG10-14 and BG10-19, are indicated with red stars. (Fig. 2G) *In vitro* pseudovirus neutralization assay comparing the potencies of antibodies BG1-28, BG10-19 and S309 (left

panel) or several SARS-CoV reactive antibodies and CR3022 (right panel) against SARS-CoV. Data points for neutralization assays represent the average of duplicates, with error bars representing the standard deviation.

[0024] FIGS. 3A-3H – Cryo-EM structure of the BG10-19 – S complex illustrates a distinct binding mode. (Fig. 3A) 3.3 Å cryo-EM density for the BG10-19 – S trimer complex revealing three BG10-19 Fabs bound to a closed spike conformation. Side view (left panel) illustrates orientation with respect to the viral membrane (dashed line). Red circle (right panel) highlights quaternary epitope of BG10-19. (Fig. 3B) Close-up view of quaternary epitope highlighted in panel A (red circle) of BG10-19 (blue) involving bridging interactions that span neighboring protomers. (Fig. 3C) BG10-19 CDR loops (cartoon) mapped on the RBD surface. (Fig. 3D) Surface representation of BG10-19 quaternary epitope colored for BG10-19 heavy chain (steel blue) and light chain (light steel blue) interactions. (Fig. 3E) BG10-19 CDRH3 (sticks) buries into a concave pocket formed by core RBD residues near the N343-glycan (teal spheres). (Fig. 3F) BG10-19 CDRH2 (steel blue) interactions with RBD residue (light gray) R346. Potential cation-pi and hydrogen bond interactions are illustrated by dashed black lines. (Fig. 3G) Cryo-EM density map contoured at 5 σ around the N343_{RBD}-glycan (teal sticks), which interfaces with the BG10-19 CDRH3 (steel blue) and CDRL2 (light steel blue) loops. Inset shows schematic of N343_{RBD}-glycan (Blue square: *N*-acetylglucosamine (GlcNAc), Green circle: Mannose (Man), Red triangle: Fucose (Fuc)). (Fig. 3H) SPR experiment to assess whether BG10-19 Fab blocks ACE2 binding on S trimer through inducing the closed prefusion state. SARS-CoV-2 S trimer or RBD (black curves, Fab - S, or Fab - RBD complexes (colored curves) were injected over immobilized ACE2-CH3 (Tada et al., 2020).

[0025] FIGS. 4A-4E – B cell transcriptome analysis. (Fig. 4A) Heatmap displaying the relative expression levels of the top 15 marker genes of the 6 clusters (rows) across cells (columns) (Z-score normalization, row normalized). Marker genes that are known to be differentially expressed in particular B cell developmental stages are indicated (**Table 4** for a full list of marker genes). (Fig. 4B) Uniform Manifold Approximation and Projection (UMAP) plot displaying the cells defined by their single-cell transcriptome measurements. The cells are colored based on their cluster assignments by the Louvain clustering algorithm. (Fig. 4C) Same UMAP plot as in (B) but with cells colored based on their heavy chain isotypes: IGHD in blue, IGHM in yellow, IGHA in red and IGHG in green. (Fig. 4D) Same UMAP plot as in (B) but cells colored based on antibody binding and neutralization: cells with non-tested antibodies in

grey, highly potent SARS-CoV-2 neutralizers ($IC_{50} < 0.1 \text{ mg/ml}$ in pseudovirus neutralization assay as either IgG1 or IgA monomer) in red, low neutralizers ($IC_{50} \geq 0.1 \text{ mg/ml}$) in yellow, non-neutralizing high binders in green and non-neutralizing low binders in blue (Figure 9L, **Tables 2 and 3**). (Fig. 4E) Same UMAP plot as in (B) but cells with antibody CDRH3 shorter than 14 amino acids based on the IMGT definition (Lefranc et al., 2015) and *VH3-53* or *VH3-66* are shown in red and blue respectively. All other sorted and sequenced cells are shown in grey.

[0026] FIGS. 5A-5E – Cryo-EM structure of BG1-22 – S provides insight into the *VH3-53/VH3-66* long CDRH3 antibody binding mode. (Fig. 5A) Cryo-EM density for the BG1-22 – S trimer complex. (Fig. 5B) Left panel: Close-up view of BG1-22 (orange) recognition of RBD epitope (gray surface). Right panels: Overlay of *VH3-53* antibodies BG4-25 (green, this study), COVA2-39 (purple, PDB 7JMP), and C144 (blue, PDB 7K90) with BG1-22 (orange). (Fig. 5C) BG1-22 (orange) and BG4-25 (green) CDR loops mapped on the RBD (gray surface). Disordered residues in the BG1-22 CDRH3 are denoted by a black dashed line. (Fig. 5D) Flattened surface representation of BG1-22 (orange) and BG4-25 (green) with CDRH3 loops highlighted. The CDRH3 of BG1-22 is displaced from the canonical binding pocket along the RBD surface adopted by C102-like antibodies. (Fig. 5E) Surface representation of the BG1-22 RBD epitope (orange). Underlying residues are shown as sticks.

[0027] FIGS. 6A-6G – Cryo-EM structures of BG7-15, BG7-20, and BG1-24 – S trimer complexes. (Fig. 6A) Cryo-EM density for the BG7-15 – S trimer complex. (Fig. 6B) BG7-15 (HC: dark red, LC: salmon) targeting of its RBD (gray surface) epitope. Glycans are depicted as teal spheres. Color coding will be the same throughout the remaining panels. (Fig. 6C) BG7-15 CDR loops mapped on the RBD. (Fig. 6D) Surface representation of BG7-15 epitope. (Fig. 6E) Overlay of BG7-15 (red), REGN-10987 (gold, PDB 6XDG), and hACE2 (green, PDB 6M0J) on the RBD (gray surface). Despite non-overlapping epitopes, BG7-15 and REGN-10987 binding would sterically-hinder hACE2 interactions with the RBD. (Fig. 6F) Top down view of BG7-20 (HC: magenta, LC: pink) bound to S trimer. Inset: cryo-EM density of BG7-20 – S trimer complex. (Fig. 6G) Close-up view of BG1-24 (HC: burnt orange, LC: wheat) bound to RBD. Interactions with the adjacent up RBD and N165_{NTD}-glycan are shown. Inset: cryo-EM density of BG1-24 – S trimer complex.

[0028] FIGS. 7A-7R – Effects of RBD substitutions on monoclonal antibody binding and neutralization. (Fig. 7A) Heat map showing the log fold change in ELISA AUC of

antibody Fabs binding to indicated SARS-CoV-2 RBD mutants relative to wild-type SARS-CoV-2 RBD binding. Mutations that lead to non-binding or decreases >20-fold relative to wild-type are shown as dark red. (Fig. 7B) Surface representation of the SARS-CoV-2 RBD with monoclonal antibody footprints (BG1-22, orange; BG7-15, red; BG1-24, magenta; and BG10-19, blue) shown as dashed lines. Sites of individual RBD substitutions are shown as red spheres. (Figs. 7C-7H) Normalized relative luminescence values in cell lysates after infection with SARS-CoV-2 pseudoviruses harboring wild-type or RBD substitutions in the presence of indicated 6 antibodies. (Fig. 7I) Summary table of IC₅₀ and IC₉₀ values measured for 6 different antibodies against pseudoviruses harboring wild-type or mutant RBDs. (Fig. 7J) Heat map showing the log fold change in ELISA AUC of antibody Fabs binding to indicated SARS-CoV-2 RBD mutants relative to wild-type SARS-CoV-2 RBD binding. Mutations that lead to non-binding or decreases >20-fold relative to wild-type are shown as dark red. (Fig. 7K-7P) Normalized relative luminescence values in cell lysates after infection with SARS-CoV-2 pseudoviruses harboring wild-type or RBD substitutions in the presence of indicated 6 antibodies. (Fig. 7Q) Summary table of IC₅₀, IC₈₀ and IC_{50eff} values measured for 6 different antibodies and antibody combinations against SARS-CoV-2 pseudoviruses. IC_{50eff} values were calculated based on synergistic models previously described (West et al., 2010). (Fig. 7R) Infection of 293T/ACE2cl.22 cells by rVSV/SARS-CoV-2/GFP encoding the indicated spike mutations in the presence of increasing amounts of BG10-19. Infection was quantified by FACS after 16 h, with mean and SD from two technical replicates shown.

[0029] FIGS. 8A-8P – Serum Neutralization against SARS-CoV-2 pseudovirus and B cell repertoire characteristics (related to Figure 1). (Fig. 8A) Serum ID₅₀ titers of all 14 study subjects against SARS-CoV-2 pseudovirus. The blue dots represent subjects that were selected for monoclonal antibody isolation. (Fig. 8B) Correlation between ID₅₀ titers of all 14 study subjects against SARS-CoV-2 pseudovirus and days between COVID-19 diagnosis and blood draw. *P value* was calculated based on the Pearson correlation coefficient (R). (Fig. 8C) Correlation between ID₅₀ titers of all 14 study subjects against SARS-CoV-2 pseudovirus and age of the subjects in years. *P value* was calculated based on the Pearson correlation coefficient (R). (Fig. 8D) Serum ID₅₀ titers of all 14 study subjects against SARS-CoV-2 pseudovirus grouped based on subject gender. *P value* was calculated using an unpaired two-tailed t-test. (Fig. 8E) Pie charts show the total number of B cells sorted from each subject in the center of each pie and differentially expanded pie slices represent the fraction of IgM/IgD⁺ (black), IgG⁺

(white) and IgA⁺ (grey) cells among all sorted cells. (Fig. 8F) Box plots showing absolute numbers of inferred nucleotide mutations per heavy chain V segment for all sorted cells (red bar), S-binding B cells (blue bar), RBD-binding B cells (green bar) and historic control memory B cells (brown bar) (Rubelt et al., 2012). The box limits are at the lower and upper quartiles and the center line indicates the median. (Fig. 8G) Box plots showing absolute numbers of inferred nucleotide mutations per heavy chain V segment for all sorted cells grouped by immunoglobulin isotypes IgD (pink), IgM (purple), IgA (green) and IgG (blue). The box limits are at the lower and upper quartiles, the center line indicates the median, the whiskers indicate 1.5x interquartile range and the dots represent outliers. *P* values were calculated using two tailed t-test and red brackets indicate statistical significance of the difference between samples with **P*≤0.05, ***P*≤0.01, ****P*≤0.001, *****P*≤0.0001 and n/s indicating no statistical significance. *P* values were calculated using a two-tailed t-test. (Fig. 8H) Bar diagram showing the frequency of kappa and lambda light chains among all sorted cells (red), S-binding B cells (blue), RBD-binding B cells (green), historic control memory B cells (brown) (Rubelt et al., 2012). (Fig. 8I) Box plots showing the CDRH3 length in amino acids for all sorted cells (red), S-binding B cells (blue), RBD-binding B cells (green), historic control memory B cells (brown) (Rubelt et al., 2012). (Fig. 8J) Box plots showing the CDRH3 amino acid charges for all sorted cells (red), S-binding B cells (blue), RBD-binding B cells (green), historic control memory B cells (brown) (Rubelt et al., 2012). (Fig. 8K) Box plots showing the CDRH3 amino acid hydrophobicity scores for all sorted cells (red), S-binding B cells (blue), RBD-binding B cells (green), historic control memory B cells (brown) (Rubelt et al., 2012). (Fig. 8L) Box plots showing the CDRH3 length in amino acids for historic control memory B cells (brown) (Rubelt et al., 2012), IgD⁺ SARS CoV2-binding B cells (pink), IgM⁺ SARS CoV2-binding B cells (purple), IgA⁺ SARS CoV2-binding B cells (green), IgG⁺ SARS CoV2-binding B cells (blue). (Fig. 8M) Box plots showing the CDRH3 amino acid charges for historic control memory B cells (brown) (Rubelt et al., 2012), IgD⁺ SARS CoV2-binding B cells (pink), IgM⁺ SARS CoV2-binding B cells (purple), IgA⁺ SARS CoV2-binding B cells (green), IgG⁺ SARS CoV2-binding B cells (blue). CDRH3 amino acid charges were calculated as in (Fig. 8J). (Fig. 8N) Box plots showing the CDRH3 amino acid hydrophobicity scores for historic control memory B cells (brown) (Rubelt et al., 2012), IgD⁺ SARS CoV2-binding B cells (pink), IgM⁺ SARS CoV2-binding B cells (purple), IgA⁺ SARS CoV2-binding B cells (green), IgG⁺ SARS CoV2-binding B cells (blue). Hydrophobicity scores were calculated as in (Fig. 8K). For all box plots

the box limits are at the lower and upper quartiles, the center line indicates the median, the whiskers indicate 1.5x interquartile range and the dots represent outliers. *P* values were calculated using two tailed t-test and red brackets indicate statistical significance of the difference between samples with stars indicating *P* values as in (Fig. 8G). (Fig. 8O) Distribution of clone sizes for each donor stratified by the clone isotype. Clones that contain cells from multiple isotypes are included as a data point in each of the respective groups. Numbers at the top of the violin plots display the percentage of cells from each isotype. Red brackets indicate statistical significance of the difference between isotypes with **P*≤0.05, ***P*≤0.01, ****P*≤0.001, *****P*≤0.0001 and n/s indicating no statistical significance. *P* values were calculated using a two-tailed t-test. (Fig. 8P) Scatterplot displaying the relationship between clone size (number of cells, x-axis) and number of inferred mutations in the heavy chain V segment (y-axis). Each dot represents a cell or a group of cells within a clone with the same heavy chain isotype and number of inferred heavy chain mutations. Clonally related cells with different number of inferred heavy chain mutations are shown with the same color and grouped with violin plots. Pearson correlation coefficients and the p-values of each sub-plot are shown on separately.

[0030] FIGS. 9A-9M – Selection and testing of representative antibodies (related to Figure 2). Venn diagrams summarizing all expanded clones, their immunoglobulin isotypes and selection of representative antibodies for donors BG1 (Fig. 9A), BG4 (Fig. 9B), BG7 (Fig. 9C) and BG10 (Fig. 9D). Colored circles show expanded B cell clones with the diameter of the circle corresponding to the size of the clone except for the largest clone in BG10 with 36 members. The numbers in the circles indicate the number of clonal members for all clones with more than 2 members. Red circles show expanded clones of which one representative antibody was produced and tested and blue circles show expanded clones of which no representative antibodies were tested. Red triangles represent singlets that were produced and tested. (Fig. 9E) Heatmap summarizing the polyreactivity ELISA results for all antibodies produced as IgG1 isolated from BG1, BG4, BG7 and BG10 against double strand DNA (dsDNA), single strand DNA (ssDNA), lipopolysaccharide (LPS), insulin (Ins) and streptavidin-APC (SA-APC) (**Methods**). OD⁴¹⁵ values less than 0.5 at an antibody concentration of 1μg/ml are considered non-reactive and are indicated in white, OD⁴¹⁵ values between 0.5 and 1.9 at an antibody concentration of 1μg/ml are considered moderately reactive and are indicated in orange, and OD⁴¹⁵ values of 2 and above at an antibody concentration of 1μg/ml are considered

strongly reactive and are indicated in red (Tiller et al., 2007). Results for highly-, moderately- and non-polyreactive control antibodies ED38, JB40 and mGO53 are included as indicated (Wardemann et al., 2003). (Fig. 9F) Dot plots summarizing IC₈₀ values from SARS-CoV-2 pseudovirus neutralization assay in µg/ml (y-axis) for all antibodies isolated from subjects BG1, BG4, BG7 and BG10 and produced as IgG1 (**Table 2**). Pink dots represent antibodies isolated from IgG⁺ B cells, bright blue dots represent antibodies isolated from IgA⁺ B cells and black dots show antibodies isolated from IgM⁺ B cells. (Fig. 9G) Bar diagram showing the percent of neutralizing antibodies in a SARS-CoV-2 pseudovirus neutralization assay among antibodies derived from IgM/IgD⁺ B cells (black), IgG⁺ B cells (white) and IgA⁺ B cells (grey) (**Table 2**). (Fig. 9H) Bar diagram showing the IC₈₀ values in µg/ml (y-axis) against SARS-CoV-2 pseudovirus in red and authentic SARS-CoV-2 virus in black for all antibodies that showed neutralizing activity against SARS-CoV-2 pseudovirus (**Table 2**). Pearson correlation coefficient (R) and *P* value were calculated comparing results from both assays. (Fig. 9I) Table summarizing neutralizing activity of antibodies BG10-19, BG1-22, BG4-25 and BG7-15 against SARS-CoV-2 D614G, B.1.1.7 and B.1.351. Shown are IC₅₀ and IC₈₀ values in mg/ml as indicated. (Fig. 9J) Representative image from size exclusion chromatography for purification of IgA dimers for antibody BG1-20 (**Tables 2 and 3**). Y-axis displays absorption at 280nm (mAU) and x-axis displays elution volume (in ml). (Fig. 9K) Representative Criterion™ TGX™ precast gel under non-reducing conditions after Coomassie Blue staining. Ladders with bands at indicated molecular weights are shown on the left and right end of the gel and adjacent to these are the pre-SEC sample and a monomeric IgA as indicated. The 22 lanes in the middle show consecutive elution fractions from SEC covering the multimer, dimer and monomer peaks as indicated and seen in (J). (Fig. 9L) Summary table for IgA neutralization of SARS-CoV-2 pseudovirus. Shown are the IC₅₀ and IC₈₀ values in mg/ml (left two columns) followed by IC₅₀ and IC₈₀ values in nmol and IC₅₀ and IC₈₀ values in nmol corrected for the number of binding sites (Corr.) and the molar neutralization ratio (MNR) as defined by the IC₅₀ of monomeric IgA divided by the IC₅₀ for the dimeric version (Klein and Bjorkman, 2010). G=IgG1, mIgA=monomeric IgA, dIgA=dimeric IgA. (Fig. 9M) Bar graph summarizing the data from (L). Shown are all IgA antibodies which showed some level of neutralization in SARS-CoV-2 pseudovirus neutralization assay in monomeric or dimeric form. Y-axis depicts IC₅₀ (in nmol) corrected for the number of binding sites, x-axis indicates

the different antibodies as indicated. Black bars show neutralization in IgG1 form (IgG), red bars in monomeric IgA (mIgA) and orange bars in dimeric IgA (dIgA) form.

[0031] FIGS. 10A-10J – BG10-19 cryo-EM validation, epitope mapping, and cross-reactive ELISA binding data (related to Figure 3). (Fig. 10A) Representative micrograph and 2D class averages for BG10-19 – S cryo-EM data collection. (Fig. 10B) Gold-standard FSC plot showing an overall resolution of 3.3 Å at FSC=0.143. (Fig. 10C) cryo-EM. (Fig. 10D) Local resolution estimation for the final cryo-EM reconstruction. (Fig. 10E) Structure of ACE2, RBD and BG10-19. (Fig. 10F) Sequence alignment of SARS-CoV-2, SARS-CoV, WIV1-CoV, and SCH014-COV. RBD residues on the primary BG10-19 epitope are shaded blue. Residues contacted on the adjacent RBD are shaded orange. S309 epitope residues are also shown. (Figs. 10G-10J) ELISA binding data for BG10-19, BG1-28, S309 (Pinto et al., 2020a), CR3022 (Tian et al., 2020), and the HIV-1 antibody IOMA (Gristick et al., 2016) against several sarbecoviruses.

[0032] FIGS. 11A-11H – Transcriptional Characteristics (related to Figure 4). (Fig. 11A) Bar diagram showing the percentage of cells from individual donors contributing to all cells within each cluster as indicated. (Fig. 11B) Uniform Manifold Approximation and Projection (UMAP) plot displaying the cells defined by their single-cell transcriptome measurements. The cells are colored based on whether they were isolated with SARS-CoV-2 S trimer (red) or RBD (turquoise) during cell sorting. (Fig. 11C) Same UMAP as in (Fig. 11B), but cells are colored based on their cell cycle phase G1 (red), G2M (green) or S (blue) as predicted by the Seurat cell cycle scoring function (Butler et al., 2018; Stuart et al., 2019). (Fig. 11D) Violin plots displaying the distribution of the expression levels of CD44, CXCR4 and CD38 (log2) within each single-cell transcriptome cluster. (Fig. 11E) Bar plot displaying the percentage of each heavy chain isotype usage within each transcriptome cluster. (Fig. 11F) Box plots displaying the distribution of the number of inferred mutations in the heavy chains within each of the 6 transcriptome clusters. Mean values are displayed above each box. Significance of the difference between the mean values of each cluster with the mean of cluster 1 was calculated using one-tailed t-test. (Fig. 11G) Box plots displaying the distribution of the percentage of donor clonal cells within each transcriptome cluster (i.e. fraction of cells that are part of a B cell clone with 2 or more members across the entire donor). Significance of the difference between the mean values of clusters 3 and 4 with the mean of cluster 1 was calculated with one-tailed t-test. (Fig. 11H) Shannon entropy values calculated based on the

general form of the diversity index proposed by (Hill, 1973), improved by resampling strategies in (Chao et al., 2014; Chao et al., 2015) and implemented in the Alakazam R package (Gupta et al., 2015). Each dot represents the Shannon entropy value of a specific donor among the 14 donors in the specified cluster. Shannon entropy values are reversely related with the clonal expansion within the clusters. Thus, according to the displayed comparisons TC1 contains the smallest clonal expansion. Significance values of pairwise comparisons are computed with two-tailed t-test. For (Fig. 11F), (Fig. 11G) and (Fig. 11H) red brackets indicate statistical significance of the difference between samples. $*P \leq 0.05$, $***P \leq 0.001$, $****P \leq 0.0001$ and n/s indicates no statistical significance.

[0033] FIGS. 12A-12D – TC3 and TC4 characterization (related to Figure 4). (Fig. 12A) Violin plots displaying the distribution of the expression levels of various genes across single-cell transcriptome clusters. The significance of the mean value comparisons between different clusters was calculated using a two-tailed t-test. (Fig. 12B) Box plots displaying the percentage of *VH3-53* or *VH3-66* (with CDRH3 length smaller than 14 aa by IMGT definition (Lefranc et al., 2015)) cells of the 14 donors within each transcriptome cluster. Mean values of cluster 3 and 4 were compared with the mean values of other clusters using a two-tailed t-test. For (Fig. 12A) and (Fig. 12B) red brackets indicate statistical significance of the difference between samples. $*P \leq 0.05$, $***P \leq 0.001$, $****P \leq 0.0001$, and n/s indicates no statistical significance. (Fig. 12C) Scatter plots displaying the relationship between the percent of cells within each donor coming from TC0-5 with the neutralization titer values measured for each donor. Spearman correlation values with corresponding P values are shown on each subplot. Dots are colored based on the donor ID, as indicated. (Fig. 12D) Distribution of the percent of B-cell clones across 6 transcriptome clusters, stratified by neutralizing activity of the tested antibody. Each dot displays the percentage of cells from a specific clone (y-axis) that belongs to the specified transcriptome cluster (x-axis). Numbers on top of each violin plot show the median value of the distribution.

[0034] FIGS. 13A-13H – BG4-25 – RBD structure and BG1-22 – S trimer cryoEM validation (related to Figure 5). (Fig. 13A) X-ray structure overview of BG4-25 (green) in complex with the SARS-CoV-2 RBD (gray surface) and antibody CR3022 (yellow) (Tian et al., 2020). (Fig. 13B) BG4-25 CDR loops mapped on the surface of the RBD. Epitope residues are colored green and the ACE2 footprint shown (orange dotted line). (Fig. 13C) Bar diagram showing the mutation frequency of all inferred mutations that occurred in 10% or more of 93

isolated IgG⁺ *VH3-53/VH3-66* antibodies with CDRH3 less than 14 amino acids (IMGT definition; (Lefranc et al., 2015)) from the collection of 6,113 SARS-CoV-2 binding B cells and a reference group of 13,900 *VH3-53/VH3-66* sequences from a human Ig gene repertoire set (see Methods and (Rubelt et al., 2012)). The frequencies of mutations in the antibodies from the SARS-CoV-2 binding B cells are shown above the dotted line and the frequencies of mutations in the reference group are shown below the dotted line. (Fig. 13D, Fig. 13E) Residue level contacts between BG4-25 (green) and RBD (light gray). Potential H-bonds are shown as dashed lines. (Fig. 13F) Representative micrograph and 2D class averages for BG1-22 – S cryo-EM data collection. (Fig. 13G) Gold-standard FSC plot showing an overall resolution of 3.7 Å at FSC=0.143. (Fig. 13H) Local resolution estimation for the final cryo-EM reconstruction.

[0035] FIGS. 14A-14I – Cryo-EM validation of BG7-15, BG7-20, and BG1-24 – S trimer complexes (related to Figure 6). Representative micrograph (scale bar=100nm) selected from total dataset, 2D class averages, gold-standard FSC plots, and local resolution estimations for (Figs. 14A-14C) BG7-15 – S complex, (Figs. 14D-14F) BG7-20 – S complex, and (Figs. 14G-14I) BG1-24 – S complex.

[0036] FIG. 15 – Schematic and results illustrating sorting of the receptor-binding domain and -trimer specific B cells from 24 individuals with likely SARS-CoV-2 infection.

[0037] FIG. 16 – There is a positive correlation between plasma neutralization titers and the fraction of IgG⁺ B cells in the SARS-CoV-2-specific repertoire in 14 donors, consistent with the finding that most neutralizers stem from IgG⁺ B cells.

[0038] FIG. 17 – Data showing that neutralization does not correlate with mutation levels but correlates with binding to SARS-CoV-2 trimer in ELISA.

[0039] FIG. 18 – Graphs showing that almost all neutralizing antibodies bind to the SARS-CoV-2 receptor-binding domain (RBD).

[0040] FIG. 19 – Graphs showing that almost all neutralizing antibodies bind to the SARS-CoV-2 RBD.

[0041] FIG. 20 – Graph showing that BG10-19 and BG1-28 show equal binding to SARS-CoV-2 and trimer/RBD.

[0042] FIG. 21 – Table showing selected antibodies for structural characterization.

[0043] **FIG. 22** – Shows a 4.0Å cryoEM structure of BG7-20-SARS-CoV-2-S 6P complex. Dataset has preferential orientation issues, which will limit the ability to push the resolution much higher without collecting more data.

[0044] **FIG. 23** – Shows a 4.0Å cryoEM structure of BG7-20-SARS-CoV-2-S 6P complex. Data show two binding states: 2d/1u and 1d/2u bound by Fabs. The data look very similar to previously described C121-S structure (C121 is *VH1-2/VL2-23*).

[0045] **FIG. 24** – Shows a 3.5Å cryoEM structure of BG10-19-SARS-CoV-2-S 6P complex. Shows one main class that is symmetrical.

[0046] **FIG. 25** – Shows a 3.5Å cryoEM structure of BG10-19-SARS-CoV-2-S 6P complex. BG10-19 binds to an all down RBD conformation, with a main epitope focused near the N343-glycan. Interestingly, BG10-19 LC seems to make secondary contacts with adjacent RBD.

[0047] **FIG. 26** – Shows a 3.5Å cryoEM structure of BG10-19-SARS-CoV-2-S 6P complex... bridging RBDs on S trimers. BG10-19 HC makes contacts with primary epitope near N343-glycan, while the LC bridges adjacent down RBDs and interacts with residues that overlap with ACE2 receptor binding motif.

[0048] **FIG. 27** – Shows cryoEM reconstructions of BG1-22 and BG1-24 -S complexes.

[0049] **FIG. 28** – Pie charts showing the total number of B cells sorted from each subject in the center of each pie and expanded B cell clones represented by pie slices. The white areas in each pie chart represent singlets. SARS-CoV-2 surface trimer specific repertoire includes expanded B cell clones.

[0050] **FIG. 29** – Illustrates that SARS-CoV-2 surface trimer-specific repertoire from 14 donors includes heavily expanded class of VH3-53/VH3-66 antibodies. These show a highly conserved sequence.

[0051] **FIG. 30** – UMAP plots showing that SARS-CoV-2 surface trimer-specific repertoire from 14 donors falls into 5 distinct transcriptional clusters.

[0052] **FIG. 31** – Heat map showing that SARS-CoV-2 surface trimer-specific repertoire from 14 donors falls into 5 distinct transcriptional clusters.

[0053] **FIG. 32** – Graphs showing that clusters 3 and 4 have higher levels of B cell activation markers such as CD80, CD40, and CD86.

[0054] **FIG. 33** – Graphs showing that VH3-53/VH3-66 with HC CDR3<14 amino acids are enriched in clusters 3 and 4.

[0055] **FIG. 34** – Pie chart and schematic illustrating the search for SARS/CoV-2/MERS cross-binding antibodies.

[0056] **FIG. 35** – Pie charts showing the total number of B cells sorted from each subject in the center of each pie and expanded B cell clones represented by pie slices. The white areas in each pie chart represent singlets. When used as sorting bait all 6 proteins yield differently expanded B cell clones.

[0057] **FIG. 36** – Pie charts showing that there is considerable clonal overlap between B cells sorted with the 6 different proteins.

[0058] **FIG. 37** – Venn diagrams summarizing all expanded clones and their immunoglobulin isotypes. The majority of expanded clones are IgM⁺ but some expanded clones include class-switched B cells.

[0059] **FIG. 38** – Graph illustrating that sorting with SARS/MERS/CoV-2 trimers selects for antibodies that bind outside of the RBD (see, also, **Table 7**).

[0060] **FIG. 39** – Flow cytometry charts showing a pilot experiment for simultaneous staining with multiple coronavirus trimer single stains.

[0061] The figures herein are for illustrative purposes only and are not necessarily drawn to scale.

DETAILED DESCRIPTION OF THE EXAMPLE EMBODIMENTS

General Definitions

[0062] Unless defined otherwise, technical and scientific terms used herein have the same meaning as commonly understood by one of ordinary skill in the art to which this disclosure pertains. Definitions of common terms and techniques in molecular biology may be found in Molecular Cloning: A Laboratory Manual, 2nd edition (1989) (Sambrook, Fritsch, and Maniatis); Molecular Cloning: A Laboratory Manual, 4th edition (2012) (Green and Sambrook); Current Protocols in Molecular Biology (1987) (F.M. Ausubel et al. eds.); the series Methods in Enzymology (Academic Press, Inc.); PCR 2: A Practical Approach (1995) (M.J. MacPherson, B.D. Hames, and G.R. Taylor eds.); Antibodies, A Laboratory Manual (1988) (Harlow and Lane, eds.); Antibodies A Laboratory Manual, 2nd edition 2013 (E.A. Greenfield ed.); Animal Cell Culture (1987) (R.I. Freshney, ed.); Benjamin Lewin, Genes IX, published by Jones and Bartlet, 2008 (ISBN 0763752223); Kendrew *et al.* (eds.), The Encyclopedia of Molecular Biology, published by Blackwell Science Ltd., 1994 (ISBN

0632021829); Robert A. Meyers (ed.), *Molecular Biology and Biotechnology: a Comprehensive Desk Reference*, published by VCH Publishers, Inc., 1995 (ISBN 9780471185710); Singleton *et al.*, *Dictionary of Microbiology and Molecular Biology* 2nd ed., J. Wiley & Sons (New York, N.Y. 1994), March, *Advanced Organic Chemistry Reactions, Mechanisms and Structure* 4th ed., John Wiley & Sons (New York, N.Y. 1992); and Marten H. Hofker and Jan van Deursen, *Transgenic Mouse Methods and Protocols*, 2nd edition (2011).

[0063] As used herein, the singular forms “a”, “an”, and “the” include both singular and plural referents unless the context clearly dictates otherwise.

[0064] The term “optional” or “optionally” means that the subsequent described event, circumstance or substituent may or may not occur, and that the description includes instances where the event or circumstance occurs and instances where it does not.

[0065] The recitation of numerical ranges by endpoints includes all numbers and fractions subsumed within the respective ranges, as well as the recited endpoints.

[0066] The terms “about” or “approximately” as used herein when referring to a measurable value such as a parameter, an amount, a temporal duration, and the like, are meant to encompass variations of and from the specified value, such as variations of +/-10% or less, +/-5% or less, +/-1% or less, and +/-0.1% or less of and from the specified value, insofar such variations are appropriate to perform in the disclosed invention. It is to be understood that the value to which the modifier “about” or “approximately” refers is itself also specifically, and preferably, disclosed.

[0067] As used herein, a “biological sample” may contain whole cells and/or live cells and/or cell debris. The biological sample may contain (or be derived from) a “bodily fluid”. The present invention encompasses embodiments wherein the bodily fluid is selected from amniotic fluid, aqueous humour, vitreous humour, bile, blood serum, breast milk, cerebrospinal fluid, cerumen (earwax), chyle, chyme, endolymph, perilymph, exudates, feces, female ejaculate, gastric acid, gastric juice, lymph, mucus (including nasal drainage and phlegm), pericardial fluid, peritoneal fluid, pleural fluid, pus, rheum, saliva, sebum (skin oil), semen, sputum, synovial fluid, sweat, tears, urine, vaginal secretion, vomit and mixtures of one or more thereof. Biological samples include cell cultures, bodily fluids, cell cultures from bodily fluids. Bodily fluids may be obtained from a mammal organism, for example by puncture, or other collecting or sampling procedures.

[0068] The terms “subject,” “individual,” and “patient” are used interchangeably herein to refer to a vertebrate, preferably a mammal, more preferably a human. Mammals include, but are not limited to, murines, simians, humans, farm animals, sport animals, and pets. Tissues, cells and their progeny of a biological entity obtained in vivo or cultured in vitro are also encompassed.

[0069] Various embodiments are described hereinafter. It should be noted that the specific embodiments are not intended as an exhaustive description or as a limitation to the broader aspects discussed herein. One aspect described in conjunction with a particular embodiment is not necessarily limited to that embodiment and can be practiced with any other embodiment(s). Reference throughout this specification to “one embodiment,” “an embodiment,” “an example embodiment,” means that a particular feature, structure or characteristic described in connection with the embodiment is included in at least one embodiment of the present invention. Thus, appearances of the phrases “in one embodiment,” “in an embodiment,” or “an example embodiment” in various places throughout this specification are not necessarily all referring to the same embodiment, but may. Furthermore, the particular features, structures or characteristics may be combined in any suitable manner, as would be apparent to a person skilled in the art from this disclosure, in one or more embodiments. Furthermore, while some embodiments described herein include some but not other features included in other embodiments, combinations of features of different embodiments are meant to be within the scope of the invention. For example, in the appended claims, any of the claimed embodiments can be used in any combination.

[0070] All publications, published patent documents, and patent applications cited herein are hereby incorporated by reference to the same extent as though each individual publication, published patent document, or patent application was specifically and individually indicated as being incorporated by reference.

OVERVIEW

[0071] Embodiments disclosed herein provide cross-neutralizing coronavirus antibodies, in particular, cross-neutralizing SARS-CoV2 antibodies capable of neutralizing a broad range of SARS-CoV2 variants (e.g., BG10-19). SARS-CoV2 poses a significant threat worldwide and monoclonal antibodies have been a focus in vaccine and therapeutic design to counteract the threat of SARS-CoV-2. Here, Applicants combined SARS-CoV-2-specific B cell sorting with single-cell VDJ and RNA-seq and structures of monoclonal antibodies to characterize B

cell responses against SARS-CoV-2. Applicants show that the SARS-CoV-2-specific B cell repertoire consists of transcriptionally distinct B cell populations with potentially neutralizing antibodies localized in two clusters that resemble memory and activated B cells. Of 92 isolated antibodies, 27 neutralize SARS-CoV-2 with IC₈₀ values as low as 7ng/ml. Cryo-electron microscopy structures of potentially-neutralizing antibody Fabs complexed with SARS-CoV-2 spike trimers show recognition of various receptor-binding domain (RBD) epitopes, including one antibody (BG10-19) that locks the spike trimer in a completely closed conformation to potentially neutralize SARS-CoV-2, including lineages B.1.1.7 and B.1.351, SARS-CoV and cross-reacts with heterologous RBDs. In certain embodiments, due to the epitopes targeted, the antibodies neutralize variants harboring mutations in the spike protein and RBD domains. Together, the results characterize transcriptional differences among SARS-CoV-2-specific B cells and can inform vaccine and therapeutic development of cross-reactive antibodies, as well as, inform design of immunogens to elicit cross-reactive protection.

THERAPEUTIC ANTIBODIES OR BINDING FRAGMENTS OF AN ANTIBODY

Antibodies

[0072] In certain embodiments, the present invention provides antibodies, antibody fragments, binding fragments of an antibody, or antigen binding fragments capable of binding to an antigen of interest (e.g., the receptor binding domain of SARS-CoV-2 or the spike protein of SARS-CoV-2). Applicants have identified antibodies from B cells that bound to specific bait proteins, i.e., trimers and RBD proteins from SARS-CoV-2, SARS and MERS (see, **Tables 2, 7 and 8**). Table 8 provides a list of all nucleotide sequences identified in isolated B cells from 14 donors. The antibodies are not limited to the nucleotide sequences. The invention also includes antibodies comprising the amino acid sequences encoded for by the nucleotide sequences. One skilled in the art routinely converts nucleotide sequences to amino acid sequences. The disclosed antibodies may be cross-reactive to any coronavirus, thus providing for cross-reactive therapeutic antibodies. In certain embodiments, the antibodies provide epitopes for generating cross-reactive antibodies. In certain embodiments, the antibodies can be administered to treat a coronavirus infection, in particular SARS-CoV-2 and variants thereof. In certain embodiments, the therapeutic antibodies described herein can be used as an initial treatment upon diagnosis or suspicion of a coronavirus infection, in particular a novel coronavirus infection. As used herein, “coronavirus” refers to enveloped viruses with a positive-sense single-stranded RNA genome and a nucleocapsid of helical symmetry that

constitute the subfamily *Orthocoronavirinae*, in the family *Coronaviridae* (see, e.g., Woo PC, Huang Y, Lau SK, Yuen KY. Coronavirus genomics and bioinformatics analysis. *Viruses*. 2010;2(8):1804-1820).

[0073] In certain embodiments, the antibodies disclosed herein are cross-reactive to SARS-CoV-2 variants. As used herein, the term “variant” refers to any virus having one or more mutations as compared to a known virus. A strain is a genetic variant or subtype of a virus. The terms 'strain', 'variant', and 'isolate' may be used interchangeably. In certain embodiments, a variant has developed a “specific group of mutations” that causes the variant to behave differently than that of the strain it originated from.

[0074] While there are many thousands of variants of SARS-CoV-2, (Koyama, Takahiko Koyama; Platt, Daniela; Parida, Laxmi (June 2020). “Variant analysis of SARS-CoV-2 genomes”. *Bulletin of the World Health Organization*. 98: 495–504) there are also much larger groupings called clades. Several different clade nomenclatures for SARS-CoV-2 have been proposed. As of December 2020, GISAID, referring to SARS-CoV-2 as hCoV-19 identified seven clades (O, S, L, V, G, GH, and GR) (Alm E, Broberg EK, Connor T, et al. Geographical and temporal distribution of SARS-CoV-2 clades in the WHO European Region, January to June 2020 [published correction appears in *Euro Surveill*. 2020 Aug;25(33):]. *Euro Surveill*. 2020;25(32):2001410). Also as of December 2020, Nextstrain identified five (19A, 19B, 20A, 20B, and 20C) (Cited in Alm et al. 2020). Guan et al. identified five global clades (G614, S84, V251, I378 and D392) (Guan Q, Sadykov M, Mfarrej S, et al. A genetic barcode of SARS-CoV-2 for monitoring global distribution of different clades during the COVID-19 pandemic. *Int J Infect Dis*. 2020;100:216-223). Rambaut et al. proposed the term “lineage” in a 2020 article in *Nature Microbiology*; as of December 2020, there have been five major lineages (A, B, B.1, B.1.1, and B.1.777) identified (Rambaut, A.; Holmes, E.C.; O’Toole, Á.; et al. “A dynamic nomenclature proposal for SARS-CoV-2 lineages to assist genomic epidemiology”. 5: 1403–1407).

[0075] Genetic variants of SARS-CoV-2 have been emerging and circulating around the world throughout the COVID-19 pandemic (see, e.g., The US Centers for Disease Control and Prevention; www.cdc.gov/coronavirus/2019-ncov/variants/variant-info.html). Exemplary, non-limiting variants applicable to the present disclosure include variants of SARS-CoV-2, particularly those having substitutions of therapeutic concern. **Table A** shows exemplary, non-limiting genetic substitutions in SARS-CoV-2 variants.

Table A.	
Spike Protein Substitution	Common Pango Lineages with Spike Protein Substitutions
L452R	A.2.5, B.1, B.1.429, B.1.427, B.1.617.1, B.1.526.1, B.1.617.2, C.36.3
E484K	B.1.1.318, B.1.1.7, B.1.351, B.1.525, B.1.526, B.1.621, B.1.623, P.1, P.1.1, P.1.2, R.1
K417N, E484K, N501Y	B.1.351, B.1.351.3
K417T, E484K, N501Y	P.1, P.1.1, P.1.2
A67V, del69-70, T95I, del142-144, Y145D, del211, L212I, ins214EPE, G339D, S371L, S373P, S375F, K417N, N440K, G446S, S477N, T478K, E484A, Q493R, G496S, Q498R, N501Y, Y505H, T547K, D614G, H655Y, N679K, P681H, N764K, D796Y, N856K, Q954H, N969K, L981F	B.1.1.529 and BA lineages

Phylogenetic Assignment of Named Global Outbreak (PANGO) Lineages is software tool developed by members of the Rambaut Lab. The associated web application was developed by the Centre for Genomic Pathogen Surveillance in South Cambridgeshire and is intended to implement the dynamic nomenclature of SARS-CoV-2 lineages, known as the PANGO nomenclature. It is available at cov-lineages.org.

[0076] In some embodiments, the SARS-CoV-2 variant is and/or includes: B.1.1.7, also known as Alpha (WHO) or UK variant, having the following spike protein substitutions: 69del, 70del, 144del, (E484K*), (S494P*), N501Y, A570D, D614G, P681H, T716I, S982A, and D1118H (K1191N*); B.1.351, also known as Beta (WHO) or South Africa variant, having the following spike protein substitutions: D80A, D215G, 241del, 242del, 243del, K417N, E484K, N501Y, D614G, and A701V; B.1.427, also known as Epsilon (WHO) or US California variant, having the following spike protein substitutions: L452R, and D614G; B.1.429, also known as Epsilon (WHO) or US California variant, having the following spike protein substitutions: S13I, W152C, L452R, and D614G; B.1.617.2, also known as Delta (WHO) or India variant, having the following spike protein substitutions: T19R, (G142D), 156del, 157del, R158G, L452R, T478K, D614G, P681R, and D950N; P.1, also known as Gamma (WHO) or Japan/Brazil variant, having the following spike protein substitutions: L18F, T20N, P26S, D138Y, R190S, K417T, E484K, N501Y, D614G, H655Y, and T1027I; and B.1.1.529 also known as Omicron (WHO), having the following spike protein substitutions: A67V, del69-70, T95I, del142-144, Y145D, del211, L212I, ins214EPE, G339D, S371L, S373P, S375F, K417N,

N440K, G446S, S477N, T478K, E484A, Q493R, G496S, Q498R, N501Y, Y505H, T547K, D614G, H655Y, N679K, P681H, N764K, D796Y, N856K, Q954H, N969K, L981F, or any combination thereof.

[0077] In some embodiments, the SARS-CoV-2 variant is classified and/or otherwise identified as a Variant of Concern (VOC) by the World Health Organization and/or the U.S. Centers for Disease Control. A VOC is a variant for which there is evidence of an increase in transmissibility, more severe disease (e.g., increased hospitalizations or deaths), significant reduction in neutralization by antibodies generated during previous infection or vaccination, reduced effectiveness of treatments or vaccines, or diagnostic detection failures.

[0078] In some embodiments, the SARS-Cov-2 variant is classified and/or otherwise identified as a Variant of High Consequence (VHC) by the World Health Organization and/or the U.S. Centers for Disease Control. A variant of high consequence has clear evidence that prevention measures or medical countermeasures (MCMs) have significantly reduced effectiveness relative to previously circulating variants.

[0079] In some embodiments, the SARS-Cov-2 variant is classified and/or otherwise identified as a Variant of Interest (VOI) by the World Health Organization and/or the U.S. Centers for Disease Control. A VOI is a variant with specific genetic markers that have been associated with changes to receptor binding, reduced neutralization by antibodies generated against previous infection or vaccination, reduced efficacy of treatments, potential diagnostic impact, or predicted increase in transmissibility or disease severity.

[0080] In some embodiments, the SARS-Cov-2 variant is classified and/or is otherwise identified as a Variant of Note (VON). As used herein, VON refers to both “variants of concern” and “variants of note” as the two phrases are used and defined by Pangolin (cov-lineages.org) and provided in their available “VOC reports” available at cov-lineages.org.

[0081] In some embodiments the SARS-Cov-2 variant is a VOC. In some embodiments, the SARS-CoV-2 variant is or includes an Alpha variant (e.g., Pango lineage B.1.1.7), a Beta variant (e.g., Pango lineage B.1.351, B.1.351.1, B.1.351.2, and/or B.1.351.3), a Delta variant (e.g., Pango lineage B.1.617.2, AY.1, AY.2, AY.3 and/or AY.3.1); a Gamma variant (e.g., Pango lineage P.1, P.1.1, P.1.2, P.1.4, P.1.6, and/or P.1.7), a Omicon variant (B.1.1.529) or any combination thereof.

[0082] In some embodiments the SARS-Cov-2 variant is a VOI. In some embodiments, the SARS-CoV-2 variant is or includes an Eta variant (e.g., Pango lineage B.1.525 (Spike

protein substitutions A67V, 69del, 70del, 144del, E484K, D614G, Q677H, F888L)); an Iota variant (e.g., Pango lineage B.1.526 (Spike protein substitutions L5F, (D80G*), T95I, (Y144*), (F157S*), D253G, (L452R*), (S477N*), E484K, D614G, A701V, (T859N*), (D950H*), (Q957R*))); a Kappa variant (e.g., Pango lineage B.1.617.1 (Spike protein substitutions (T95I), G142D, E154K, L452R, E484Q, D614G, P681R, Q1071H)); Pango lineage variant B.1.617.2 (Spike protein substitutions T19R, G142D, L452R, E484Q, D614G, P681R, D950N)), Lambda (e.g., Pango lineage C.37); or any combination thereof.

[0083] In some embodiments SARS-Cov-2 variant is a VON. In some embodiments, the SARS-Cov-2 variant is or includes Pango lineage variant P.1 (alias, B.1.1.28.1.) as described in Rambaut et al. 2020. Nat. Microbiol. 5:1403-1407) (spike protein substitutions: T20N, P26S, D138Y, R190S, K417T, E484K, N501Y, H655Y, TI027I)); an Alpha variant (e.g., Pango lineage B.1.1.7); a Beta variant (e.g., Pango lineage B.1.351, B.1.351.1, B.1.351.2, and/or B.1.351.3); Pango lineage variant B.1.617.2 (Spike protein substitutions T19R, G142D, L452R, E484Q, D614G, P681R, D950N)); an Eta variant (e.g., Pango lineage B.1.525); Pango lineage variant A.23.1 (as described in Bugembe et al. medRxiv. 2021. doi: doi.org/10.1101/2021.02.08.21251393) (spike protein substitutions: F157L, V367F, Q613H, P681R); or any combination thereof.

[0084] Structures have been determined for SARS-CoV-2 variants and provide a structural framework for describing the impact of individual mutations on immune evasion (see, e.g., McCallum, et al., 2021, Molecular basis of immune evasion by the delta and kappa SARS-CoV-2 variants, bioRxiv 2021.08.11.455956; doi.org/10.1101/2021.08.11.455956). The antibodies described herein can bind to epitopes on the structures of the variants described herein.

[0085] The term “antibody” is used interchangeably with the term “immunoglobulin” herein, and includes intact antibodies, fragments of antibodies, e.g., Fab, F(ab')₂ fragments, and intact antibodies and fragments that have been mutated either in their constant and/or variable region (e.g., mutations to produce chimeric, partially humanized, or fully humanized antibodies, as well as to produce antibodies with a desired trait, e.g., enhanced binding and/or reduced FcR binding). The term “fragment” refers to a part or portion of an antibody or antibody chain comprising fewer amino acid residues than an intact or complete antibody or antibody chain. Fragments can be obtained via chemical or enzymatic treatment of an intact or complete antibody or antibody chain. Fragments can also be obtained by recombinant means.

Exemplary fragments include Fab, Fab', F(ab')₂, Fabc, Fd, dAb, VHH and scFv and/or Fv fragments.

[0086] The term “antigen-binding fragment” refers to a polypeptide fragment of an immunoglobulin or antibody that binds antigen or competes with intact antibody (i.e., with the intact antibody from which they were derived) for antigen binding (i.e., specific binding). As such these antibodies or fragments thereof are included in the scope of the invention, provided that the antibody or fragment binds specifically to a target molecule.

[0087] In certain embodiments, the antibody or antibody fragment is a therapeutic antibody. In certain embodiments, the antibody is a neutralizing antibody. As used herein, “neutralizing antibody” refers to an antibody that is capable of neutralizing a pathogen or reducing infectivity, such as a viral pathogen (e.g., SARS-CoV-2).

[0088] Applicants have identified specific antibodies capable of neutralizing SARS-CoV-2, as well as neutralizing antibodies capable of binding SARS, MERS and CoV2 spike protein (**Table 2**). The antibodies identified specifically bind to the receptor binding domain (RBD) of SARS-CoV-2 spike or a region in the spike protein outside of the RBD. The antibodies neutralize pseudotyped virus expressing the spike protein. The antibodies include “complementarity determining regions” or “CDRs” interspersed among “frame regions” or “FRs”, as defined herein. As used herein CDRs refer to variable regions in an antibody that provide for antigen specificity. In certain embodiments, specific CDRs identified can be used in any antibody framework described further herein. In certain embodiments, one, two, or all three CDRs are used in a framework. In certain embodiments, CDR3 for the light and heavy chains are used in a framework. As used herein, framework can refer to an entire antibody where one or more variable chains or CDR sequences are substituted. It is common for therapeutic antibodies to use a common antibody constant region substituted with the identified variable chains or CDR sequences. In certain embodiments, frame region (FR) refers to the non-CDR regions or constant regions in the antibody.

[0089] In certain embodiments, antibodies prepared according to the present invention are substantially free of non-antibody protein. As used herein, a preparation of antibody protein having less than about 50% of non-antibody protein (also referred to herein as a “contaminating protein”), or of chemical precursors, is considered to be “substantially free.” 40%, 30%, 20%, 10% and more preferably 5% (by dry weight), of non-antibody protein, or of chemical precursors is considered to be substantially free. When the antibody protein or biologically

active portion thereof is recombinantly produced, it is also preferably substantially free of culture medium, i.e., culture medium represents less than about 30%, preferably less than about 20%, more preferably less than about 10%, and most preferably less than about 5% of the volume or mass of the protein preparation.

[0090] In preferred embodiments, the antibodies of the present invention are monoclonal antibodies. As used herein, the term “monoclonal antibody” refers to a single antibody produced by any means, such as recombinant DNA technology. As used herein, the term “monoclonal antibody” also refers to an antibody derived from a clonal population of antibody-producing cells (e.g., B lymphocytes or B cells) which is homogeneous in structure and antigen specificity. The term “polyclonal antibody” refers to a plurality of antibodies originating from different clonal populations of antibody-producing cells which are heterogeneous in their structure and epitope specificity but which recognize a common antigen. Monoclonal and polyclonal antibodies may exist within bodily fluids, as crude preparations, or may be purified, as described herein.

[0091] The term “binding portion” of an antibody (or “antibody portion”) includes one or more complete domains, e.g., a pair of complete domains, as well as fragments of an antibody that retain the ability to specifically bind to a target molecule. It has been shown that the binding function of an antibody can be performed by fragments of a full-length antibody. Binding fragments are produced by recombinant DNA techniques, or by enzymatic or chemical cleavage of intact immunoglobulins. Binding fragments include Fab, Fab', F(ab')₂, Fabc, Fd, dAb, Fv, single chains, VHH, single-chain antibodies, e.g., scFv, and single domain antibodies.

[0092] In certain embodiments, the antibodies described herein are humanized. In certain embodiments, “humanized” forms of non-human antibodies are chimeric antibodies that contain minimal sequence derived from non-human immunoglobulin. For the most part, humanized antibodies are human immunoglobulins (recipient antibody) in which residues from a hypervariable region of the recipient are replaced by residues from a hypervariable region of a non-human species (donor antibody) such as mouse, rat, rabbit or nonhuman primate having the desired specificity, affinity, and capacity. In some instances, FR residues of the human immunoglobulin are replaced by corresponding non-human residues. Furthermore, humanized antibodies may comprise residues that are not found in the recipient antibody or in the donor antibody. These modifications are made to further refine antibody performance. In general, the humanized antibody will comprise substantially all of at least one, and typically two, variable

domains, in which all or substantially all of the hypervariable regions correspond to those of a non-human immunoglobulin and all or substantially all of the FR regions are those of a human immunoglobulin sequence. The humanized antibody optionally also will comprise at least a portion of an immunoglobulin constant region (Fc), typically that of a human immunoglobulin.

[0093] Examples of portions of antibodies or epitope-binding proteins encompassed by the present definition include: (i) the Fab fragment, having VL, CL, VH and CH1 domains; (ii) the Fab' fragment, which is a Fab fragment having one or more cysteine residues at the C-terminus of the CH1 domain; (iii) the Fd fragment having VH and CH1 domains; (iv) the Fd' fragment having VH and CH1 domains and one or more cysteine residues at the C-terminus of the CH1 domain; (v) the Fv fragment having the VL and VH domains of a single arm of an antibody; (vi) the dAb fragment (Ward et al., 341 Nature 544 (1989)) which consists of a VH domain or a VL domain that binds antigen; (vii) isolated CDR regions or isolated CDR regions presented in a functional framework; (viii) F(ab')₂ fragments which are bivalent fragments including two Fab' fragments linked by a disulphide bridge at the hinge region; (ix) single chain antibody molecules (e.g., single chain Fv; scFv) (Bird et al., 242 Science 423 (1988); and Huston et al., 85 PNAS 5879 (1988)); (x) “diabodies” with two antigen binding sites, comprising a heavy chain variable domain (VH) connected to a light chain variable domain (VL) in the same polypeptide chain (see, e.g., EP 404,097; WO 93/11161; Hollinger et al., 90 PNAS 6444 (1993)); (xi) “linear antibodies” comprising a pair of tandem Fd segments (VH-Ch1-VH-Ch1) which, together with complementary light chain polypeptides, form a pair of antigen binding regions (Zapata et al., Protein Eng. 8(10):1057-62 (1995); and U.S. Patent No. 5,641,870).

[0094] In certain embodiments, the antibodies and CDRs of the present invention can be transferred to another antibody type to generate chimeric antibodies. It is intended that the term “antibody type” encompass any Ig class or any Ig subclass (e.g. the IgG1, IgG2, IgG3, and IgG4 subclasses of IgG) obtained from any source (e.g., humans and non-human primates, and in rodents, lagomorphs, caprines, bovines, equines, ovines, etc.).

[0095] The term “Ig class” or “immunoglobulin class”, as used herein, refers to the five classes of immunoglobulin that have been identified in humans and higher mammals, IgG, IgM, IgA, IgD, and IgE. The term “Ig subclass” refers to the two subclasses of IgM (H and L), three subclasses of IgA (IgA1, IgA2, and secretory IgA), and four subclasses of IgG (IgG1, IgG2, IgG3, and IgG4) that have been identified in humans and higher mammals. The

antibodies can exist in monomeric or polymeric form; for example, IgM antibodies exist in pentameric form, and IgA antibodies exist in monomeric, dimeric or multimeric form.

[0096] The term “IgG subclass” refers to the four subclasses of immunoglobulin class IgG - IgG1, IgG2, IgG3, and IgG4 that have been identified in humans and higher mammals by the heavy chains of the immunoglobulins, V1 - γ 4, respectively. The term “single-chain immunoglobulin” or “single-chain antibody” (used interchangeably herein) refers to a protein having a two-polypeptide chain structure consisting of a heavy and a light chain, said chains being stabilized, for example, by interchain peptide linkers, which has the ability to specifically bind antigen. The term “domain” refers to a globular region of a heavy or light chain polypeptide comprising peptide loops (e.g., comprising 3 to 4 peptide loops) stabilized, for example, by β pleated sheet and/or intrachain disulfide bond. Domains are further referred to herein as “constant” or “variable”, based on the relative lack of sequence variation within the domains of various class members in the case of a “constant” domain, or the significant variation within the domains of various class members in the case of a “variable” domain. Antibody or polypeptide “domains” are often referred to interchangeably in the art as antibody or polypeptide “regions”. The “constant” domains of an antibody light chain are referred to interchangeably as “light chain constant regions”, “light chain constant domains”, “CL” regions or “CL” domains. The “constant” domains of an antibody heavy chain are referred to interchangeably as “heavy chain constant regions”, “heavy chain constant domains”, “CH” regions or “CH” domains). The “variable” domains of an antibody light chain are referred to interchangeably as “light chain variable regions”, “light chain variable domains”, “VL” regions or “VL” domains). The “variable” domains of an antibody heavy chain are referred to interchangeably as “heavy chain constant regions”, “heavy chain constant domains”, “VH” regions or “VH” domains).

[0097] The term “region” can also refer to a part or portion of an antibody chain or antibody chain domain (e.g., a part or portion of a heavy or light chain or a part or portion of a constant or variable domain, as defined herein), as well as more discrete parts or portions of said chains or domains. For example, light and heavy chains or light and heavy chain variable domains include “complementarity determining regions” or “CDRs” interspersed among “frame regions” or “FRs”, as defined herein.

[0098] The term “conformation” refers to the tertiary structure of a protein or polypeptide (e.g., an antibody, antibody chain, domain or region thereof). For example, the phrase “light

(or heavy) chain conformation” refers to the tertiary structure of a light (or heavy) chain variable region, and the phrase “antibody conformation” or “antibody fragment conformation” refers to the tertiary structure of an antibody or fragment thereof.

[0099] “Specific binding” of an antibody means that the antibody exhibits appreciable affinity for a particular antigen or epitope and, generally, does not exhibit significant cross reactivity. “Appreciable” binding includes binding with an affinity of at least 25 μM . Antibodies with affinities greater than $1 \times 10^7 \text{ M}^{-1}$ (or a dissociation coefficient of $1 \mu\text{M}$ or less or a dissociation coefficient of 1 nM or less) typically bind with correspondingly greater specificity. Values intermediate of those set forth herein are also intended to be within the scope of the present invention and antibodies of the invention bind with a range of affinities, for example, 100 nM or less, 75 nM or less, 50 nM or less, 25 nM or less, for example 10 nM or less, 5 nM or less, 1 nM or less, or in embodiments 500 pM or less, 100 pM or less, 50 pM or less or 25 pM or less. An antibody that “does not exhibit significant crossreactivity” is one that will not appreciably bind to an entity other than its target (e.g., a different epitope or a different molecule). For example, an antibody that specifically binds to a target molecule will appreciably bind the target molecule but will not significantly react with non-target molecules or peptides. An antibody specific for a particular epitope will, for example, not significantly crossreact with remote epitopes on the same protein or peptide. Specific binding can be determined according to any art-recognized means for determining such binding. Preferably, specific binding is determined according to Scatchard analysis and/or competitive binding assays.

[0100] As used herein, the term “affinity” refers to the strength of the binding of a single antigen-combining site with an antigenic determinant. Affinity depends on the closeness of stereochemical fit between antibody combining sites and antigen determinants, on the size of the area of contact between them, on the distribution of charged and hydrophobic groups, etc. Antibody affinity can be measured by equilibrium dialysis or by the kinetic BIACORE™ method. The dissociation constant, K_d , and the association constant, K_a , are quantitative measures of affinity.

[0101] In certain embodiments, the antibodies described herein or identified according to the methods described herein are blocking antibodies. As used herein, a “blocking” antibody or an antibody “antagonist” is one which inhibits or reduces biological activity of the antigen(s) it binds. In certain embodiments, the blocking antibodies or antagonist antibodies or portions

completely inhibit the biological activity of the antigen(s). For example, the present invention includes antibodies which disrupt receptor/ligand interactions either partially or fully.

Therapeutic Antibody Modifications

[0102] In certain example embodiments, the therapeutic antibodies of the present invention may be modified, such that they acquire advantageous properties for therapeutic use (e.g., stability and specificity), but maintain their biological activity. Therapeutic antibodies may be modified to increase stability or to provide characteristics that improve efficacy of the antibody when administered to a subject *in vivo*. As used herein in reference to therapeutic antibodies, the terms “modified”, “modification” and the like refer to one or more changes that enhance a desired property of the therapeutic antibody. “Modification” includes a covalent chemical modification that does not alter the primary amino acid sequence of the therapeutic antibody itself. Such desired properties include, for example, prolonging the *in vivo* half-life, increasing the stability, reducing the clearance, altering the immunogenicity or allergenicity, or cellular targeting. Changes to a therapeutic antibody that may be carried out include, but are not limited to, conjugation to a carrier protein, conjugation to a ligand, conjugation to another antibody, PEGylation, polysialylation HESylation, recombinant PEG mimetics, Fc fusion, albumin fusion, nanoparticle attachment, nanoparticulate encapsulation, cholesterol fusion, iron fusion, acylation, amidation, glycosylation, side chain oxidation, phosphorylation, biotinylation, the addition of a surface active material, the addition of amino acid mimetics, or the addition of unnatural amino acids. Modified therapeutic antibodies also include analogs. By “analog” is meant a molecule that is not identical, but has analogous functional or structural features. For example, a therapeutic antibody analog retains the biological activity of a corresponding antibody, while having certain biochemical modifications that enhance the analog's function relative to another antibody. Such biochemical modifications could increase the analog's protease resistance, membrane permeability, or half-life, without altering, for example, antigen binding. An analog may include an unnatural amino acid.

[0103] The recitation of a listing of chemical groups in any definition of a variable herein includes definitions of that variable as any single group or combination of listed groups. The recitation of an embodiment for a variable or aspect herein includes that embodiment as any single embodiment or in combination with any other embodiments or portions thereof.

[0104] Modified antibodies (e.g., fusion proteins) may include a spacer or a linker. The terms “spacer” or “linker” as used in reference to a fusion protein refers to a peptide that joins

the proteins comprising a fusion protein. Generally, a spacer has no specific biological activity other than to join or to preserve some minimum distance or other spatial relationship between the proteins. However, in certain embodiments, the constituent amino acids of a spacer may be selected to influence some property of the molecule such as the folding, net charge, or hydrophobicity of the molecule. Suitable linkers for use in an embodiment of the present invention are well known to those of skill in the art and include, but are not limited to, straight or branched-chain carbon linkers, heterocyclic carbon linkers, or peptide linkers. The linker is used to separate two peptides by a distance sufficient to ensure that, in a preferred embodiment, each peptide properly folds. Preferred peptide linker sequences adopt a flexible extended conformation and do not exhibit a propensity for developing an ordered secondary structure. Typical amino acids in flexible protein regions include Gly, Asn and Ser. Virtually any permutation of amino acid sequences containing Gly, Asn and Ser would be expected to satisfy the above criteria for a linker sequence. Other near neutral amino acids, such as Thr and Ala, also may be used in the linker sequence. Still other amino acid sequences that may be used as linkers are disclosed in Maratea et al. (1985), *Gene* 40: 39-46; Murphy et al. (1986) *Proc. Nat'l. Acad. Sci. USA* 83 : 8258-62; U.S. Pat. No. 4,935,233; and U.S. Pat. No. 4,751, 180.

[0105] The clinical effectiveness of protein therapeutics (e.g., antibodies) is often limited by short plasma half-life and susceptibility to protease degradation. Studies of various therapeutic proteins (e.g., filgrastim) have shown that such difficulties may be overcome by various modifications, including conjugating or linking the polypeptide sequence to any of a variety of non-proteinaceous polymers, e.g., polyethylene glycol (PEG), polypropylene glycol, or polyoxyalkylenes (see, for example, typically via a linking moiety covalently bound to both the protein and the nonproteinaceous polymer, e.g., a PEG).

[0106] It is well known that the properties of certain proteins can be modulated by attachment of polyethylene glycol (PEG) polymers, which increases the hydrodynamic volume of the protein and thereby slows its clearance by kidney filtration. (See, e.g., Clark et al., *J. Biol. Chem.* 271: 21969-21977 (1996)). Such PEG- conjugated biomolecules have been shown to possess clinically useful properties, including better physical and thermal stability, protection against susceptibility to enzymatic degradation, increased solubility, longer in vivo circulating half-life and decreased clearance, reduced immunogenicity and antigenicity, and reduced toxicity. Therefore, it is envisioned that certain agents can be PEGylated (e.g., on peptide residues) to provide enhanced therapeutic benefits such as, for example, increased

efficacy by extending half-life *in vivo*. In certain embodiments, PEGylation of the agents may be used to extend the serum half-life of the agents and allow for particular agents to be capable of crossing the blood-brain barrier. Thus, in one embodiment, PEGylating antibodies improve the pharmacokinetics and pharmacodynamics of the antibodies.

[0107] In regards to peptide PEGylation methods, reference is made to Lu et al., Int. J. Pept. Protein Res. 43: 127-38 (1994); Lu et al., Pept. Res. 6: 140-6 (1993); Felix et al., Int. J. Pept. Protein Res. 46: 253-64 (1995); Gaertner et al., Bioconjug. Chem. 7: 38-44 (1996); Tsutsumi et al., Thromb. Haemost. 77: 168-73 (1997); Francis et al., J. Hematol. 68: 1-18 (1998); Roberts et al., J. Pharm. Sci. 87: 1440-45 (1998); and Tan et al., Protein Expr. Purif. 12: 45-52 (1998). Polyethylene glycol or PEG is meant to encompass any of the forms of PEG that have been used to derivatize other proteins, including, but not limited to, mono-(C1-10) alkoxy or aryloxy-polyethylene glycol. Suitable PEG moieties include, for example, 40 kDa methoxy poly(ethylene glycol) propionaldehyde (Dow, Midland, Mich.); 60 kDa methoxy poly(ethylene glycol) propionaldehyde (Dow, Midland, Mich.); 40 kDa methoxy poly(ethylene glycol) maleimido-propionamide (Dow, Midland, Mich.); 31 kDa alpha-methyl-w-(3-oxopropoxy), polyoxyethylene (NOF Corporation, Tokyo); mPEG2-NHS-40k (Nektar); mPEG2-MAL-40k (Nektar), SUNBRIGHT GL2-400MA ((PEG)240kDa) (NOF Corporation, Tokyo), SUNBRIGHT ME-200MA (PEG20kDa) (NOF Corporation, Tokyo). The PEG groups are generally attached to the peptide (e.g., RBD) via acylation or alkylation through a reactive group on the PEG moiety (for example, a maleimide, an aldehyde, amino, thiol, or ester group) to a reactive group on the peptide (for example, an aldehyde, amino, thiol, a maleimide, or ester group).

[0108] The PEG molecule(s) may be covalently attached to any Lys, Cys, or K(CO(CH₂)₂SH) residues at any position in a peptide. In certain embodiments, the antibodies described herein can be PEGylated directly to any amino acid at the N-terminus by way of the N-terminal amino group. A “linker arm” may be added to a peptide to facilitate PEGylation. PEGylation at the thiol side-chain of cysteine has been widely reported (see, e.g., Caliceti & Veronese, Adv. Drug Deliv. Rev. 55: 1261-77 (2003)). If there is no cysteine residue in the peptide, a cysteine residue can be introduced through substitution or by adding a cysteine to the N-terminal amino acid. In certain embodiments, proteins are PEGylated through the side chains of a cysteine residue added to the N-terminal amino acid.

[0109] In exemplary embodiments, the PEG molecule(s) may be covalently attached to an amide group in the C-terminus of a peptide. In certain embodiments, the PEG molecule used in modifying an agent of the present invention is branched while in other embodiments, the PEG molecule may be linear. In particular aspects, the PEG molecule is between 1 kDa and 100 kDa in molecular weight. In further aspects, the PEG molecule is selected from 10, 20, 30, 40, 50, 60, and 80 kDa. In further still aspects, it is selected from 20, 40, or 60 kDa. Where there are two PEG molecules covalently attached to the agent of the present invention, each is 1 to 40 kDa and in particular aspects, they have molecular weights of 20 and 20 kDa, 10 and 30 kDa, 30 and 30 kDa, 20 and 40 kDa, or 40 and 40 kDa. In particular aspects, the antibodies contain mPEG-cysteine. The mPEG in mPEG-cysteine can have various molecular weights. The range of the molecular weight is preferably 5 kDa to 200 kDa, more preferably 5 kDa to 100 kDa, and further preferably 20 kDa to 60 kDa. The mPEG can be linear or branched.

[0110] The present disclosure also contemplates the use of PEG Mimetics. Recombinant PEG mimetics have been developed that retain the attributes of PEG (e.g., enhanced serum half-life) while conferring several additional advantageous properties. By way of example, simple polypeptide chains (comprising, for example, Ala, Glu, Gly, Pro, Ser and Thr) capable of forming an extended conformation similar to PEG can be produced recombinantly already fused to the antibodies (e.g., Amunix' XTEN technology; Mountain View, CA). This obviates the need for an additional conjugation step during the manufacturing process. Moreover, established molecular biology techniques enable control of the side chain composition of the polypeptide chains, allowing optimization of immunogenicity and manufacturing properties.

[0111] Glycosylation can dramatically affect the physical properties of proteins and can also be important in protein stability, secretion, and subcellular localization (see, e.g., Solá and Griebenow, *Glycosylation of Therapeutic Proteins: An Effective Strategy to Optimize Efficacy*. BioDrugs. 2010; 24(1): 9–21). Proper glycosylation can be essential for biological activity. In fact, some genes from eukaryotic organisms, when expressed in bacteria (e.g., *E. coli*) which lack cellular processes for glycosylating proteins, yield proteins that are recovered with little or no activity by virtue of their lack of glycosylation. For purposes of the present disclosure, “glycosylation” is meant to broadly refer to the enzymatic process that attaches glycans to proteins, lipids or other organic molecules. The use of the term “glycosylation” in conjunction with the present disclosure is generally intended to mean adding or deleting one or more carbohydrate moieties (either by removing the underlying glycosylation site or by

deleting the glycosylation by chemical and/or enzymatic means), and/or adding one or more glycosylation sites that may or may not be present in the original sequence.

[0112] Addition of glycosylation sites can be accomplished by altering the amino acid sequence. The alteration to the polypeptide may be made, for example, by the addition of, or substitution by, one or more serine or threonine residues (for O-linked glycosylation sites) or asparagine residues (for N-linked glycosylation sites). The structures of N-linked and O-linked oligosaccharides and the sugar residues found in each type may be different. One type of sugar that is commonly found on both is N-acetylneuraminic acid (hereafter referred to as sialic acid). Sialic acid is usually the terminal residue of both N-linked and O-linked oligosaccharides and, by virtue of its negative charge, may confer acidic properties to the glycoprotein. A particular embodiment of the present disclosure comprises the generation and use of N-glycosylation variants.

[0113] The present disclosure also contemplates the use of polysialylation, the conjugation of peptides and proteins to the naturally occurring, biodegradable α -(2 $\rightarrow$ 8) linked polysialic acid ("PSA") in order to improve their stability and in vivo pharmacokinetics. PSA is a biodegradable, non-toxic natural polymer that is highly hydrophilic, giving it a high apparent molecular weight in the blood which increases its serum half-life. In addition, polysialylation of a range of peptide and protein therapeutics has led to markedly reduced proteolysis, retention of activity in vivo activity, and reduction in immunogenicity and antigenicity (see, e.g., G. Gregoriadis et al., *Int. J. Pharmaceutics* 300(1-2): 125-30). As with modifications with other conjugates (e.g., PEG), various techniques for site-specific polysialylation are available (see, e.g., T. Lindhout et al., *PNAS* 108(18)7397-7402 (2011)).

[0114] Additional suitable components and molecules for conjugation include, for example, thyroglobulin; albumins such as human serum albumin (HAS); tetanus toxoid; Diphtheria toxoid; polyamino acids such as poly(D-lysine:D-glutamic acid); VP6 polypeptides of rotaviruses; influenza virus hemagglutinin, influenza virus nucleoprotein; Keyhole Limpet Hemocyanin (KLH); and hepatitis B virus core protein and surface antigen; or any combination of the foregoing.

[0115] Fusion of albumin to one or more antibodies of the present disclosure can, for example, be achieved by genetic manipulation, such that the DNA coding for HSA, or a fragment thereof, is joined to the DNA coding for the one or more antibodies. Albumin itself may be modified to extend its circulating half-life. Fusion of the modified albumin to one or

more polypeptides can be attained by the genetic manipulation techniques described above or by chemical conjugation; the resulting fusion molecule has a half-life that exceeds that of fusions with non-modified albumin. (See WO2011/051489).

[0116] Several albumin-binding strategies have been developed as alternatives for direct fusion, including albumin binding through a conjugated fatty acid chain (acylation). Because serum albumin is a transport protein for fatty acids, these natural ligands with albumin-binding activity have been used for half-life extension of small protein therapeutics. For example, insulin detemir (LEVEMIR), an approved product for diabetes, comprises a myristyl chain conjugated to a genetically-modified insulin, resulting in a long-acting insulin analog.

[0117] Another type of modification is to conjugate (e.g., link) one or more additional components or molecules at the N- and/or C-terminus of a polypeptide sequence, such as another protein, or a carrier molecule. Thus, an exemplary polypeptide sequence can be provided as a conjugate with another component or molecule. A conjugate modification may result in a polypeptide sequence that retains activity with an additional or complementary function or activity of the second molecule. For example, a polypeptide sequence may be conjugated to a molecule, e.g., to facilitate solubility, storage, in vivo or shelf half-life or stability, reduction in immunogenicity, delayed or controlled release in vivo, etc. Other functions or activities include a conjugate that reduces toxicity relative to an unconjugated polypeptide sequence, a conjugate that targets a type of cell or organ more efficiently than an unconjugated polypeptide sequence, or a drug to further counter the causes or effects associated with a disorder or disease as set forth herein.

[0118] The present disclosure contemplates the use of other modifications, currently known or developed in the future, of the polypeptides to improve one or more properties. One such method for prolonging the circulation half-life, increasing the stability, reducing the clearance, or altering the immunogenicity or allergenicity of a polypeptide of the present disclosure involves modification of the polypeptide sequences by hesylation, which utilizes hydroxyethyl starch derivatives linked to other molecules in order to modify the molecule's characteristics. Various aspects of hesylation are described in, for example, U.S. Patent Appln. Nos. 2007/0134197 and 2006/0258607.

[0119] In particular embodiments, the antibodies include a protecting group covalently joined to the N-terminal amino group. In exemplary embodiments, a protecting group covalently joined to the N-terminal amino group of the proteins reduces the reactivity of the

amino terminus under *in vivo* conditions. Amino protecting groups include —C1-10 alkyl, —C1-10 substituted alkyl, —C2-10 alkenyl, —C2-10 substituted alkenyl, aryl, —C1-6 alkyl aryl, —C(O)—(CH₂)₁₋₆—COOH, —C(O)—C1-6 alkyl, —C(O)-aryl, —C(O)—O—C1-6 alkyl, or —C(O)—O-aryl. In particular embodiments, the amino terminus protecting group is selected from the group consisting of acetyl, propyl, succinyl, benzyl, benzyloxycarbonyl, and t-butyloxycarbonyl. In other embodiments, deamination of the N-terminal amino acid is another modification that may be used for reducing the reactivity of the amino terminus under *in vivo* conditions.

[0120] Chemically modified compositions of the antibodies wherein the antibody is linked to a polymer are also included within the scope of the present invention. The polymer selected is usually modified to have a single reactive group, such as an active ester for acylation or an aldehyde for alkylation, so that the degree of polymerization may be controlled. Included within the scope of polymers is a mixture of polymers. Preferably, for therapeutic use of the end-product preparation, the polymer will be pharmaceutically acceptable. The polymer or mixture thereof may include but is not limited to polyethylene glycol (PEG), monomethoxy-polyethylene glycol, dextran, cellulose, or other carbohydrate-based polymers, poly-(N-vinyl pyrrolidone) polyethylene glycol, propylene glycol homopolymers, a polypropylene oxide/ethylene oxide co-polymer, polyoxyethylated polyols (for example, glycerol), and polyvinyl alcohol.

[0121] In other embodiments, the antibodies are modified by PEGylation, cholesterylation, or palmitoylation. The modification can be to any amino acid residue. In preferred embodiments, the modification is to the N-terminal amino acid of the antibodies, either directly to the N-terminal amino acid or by way coupling to the thiol group of a cysteine residue added to the N-terminus or a linker added to the N-terminus such as trimesoyl tris(3,5-dibromosalicylate) (Ttds). In certain embodiments, the N-terminus of the antibodies comprise a cysteine residue to which a protecting group is coupled to the N-terminal amino group of the cysteine residue and the cysteine thiolate group is derivatized with N-ethylmaleimide, PEG group, cholesterol group, or palmitoyl group. In other embodiments, an acetylated cysteine residue is added to the N-terminus of the agents, and the thiol group of the cysteine is derivatized with N-ethylmaleimide, PEG group, cholesterol group, or palmitoyl group. In certain embodiments, the antibodies of the present invention consist of an amino acid sequence which is bound with a methoxypolyethylene glycol(s) via a linker.

[0122] Substitutions of amino acids may be used to modify an antibody of the present invention. The phrase “substitution of amino acids” as used herein encompasses substitution of amino acids that are the result of both conservative and non-conservative substitutions. Conservative substitutions are the replacement of an amino acid residue by another similar residue in a polypeptide. Typical but not limiting conservative substitutions are the replacements, for one another, among the aliphatic amino acids Ala, Val, Leu and Ile; interchange of Ser and Thr containing hydroxy residues, interchange of the acidic residues Asp and Glu, interchange between the amide-containing residues Asn and Gln, interchange of the basic residues Lys and Arg, interchange of the aromatic residues Phe and Tyr, and interchange of the small-sized amino acids Ala, Ser, Thr, Met, and Gly. Non-conservative substitutions are the replacement, in a polypeptide, of an amino acid residue by another residue which is not biologically similar. For example, the replacement of an amino acid residue with another residue that has a substantially different charge, a substantially different hydrophobicity, or a substantially different spatial configuration.

[0123] In certain embodiments, antibodies of the present invention are modified by affinity maturation. Affinity maturation refers to the introduction of random mutations across the full length of selected CDR or variable chains and screening for increased affinity or neutralization activity. In certain embodiments, phage display or ribosome display is used to produce antibodies with increased affinity for the antigen. The *in vitro* affinity maturation has successfully been used to optimize antibodies, antibody fragments or other peptide molecules like antibody mimetics. Random mutations inside the CDRs are introduced using radiation, chemical mutagens or error-prone PCR. In addition, the genetic diversity can be increased by chain shuffling. Two or three rounds of mutation and selection using display methods like phage display usually results in antibody fragments with affinities in the low nanomolar range (see, e.g., Roskos L.; Klakamp S.; Liang M.; Arends R.; Green L. (2007). Stefan Dübel (ed.). Handbook of Therapeutic Antibodies. Weinheim: Wiley-VCH. pp. 145–169).

[0124] One of skill in the art from this disclosure and the knowledge in the art will appreciate that there are a variety of ways in which to produce such therapeutic antibodies. In general, such therapeutic antibodies may be produced either *in vitro* or *in vivo*. Therapeutic antibodies may be produced *in vitro* as peptides or polypeptides, which may then be formulated into a pharmaceutical composition and administered to a subject. Such *in vitro* production may occur by a variety of methods known to one of skill in the art such as, for example, peptide

synthesis or expression of a peptide/polypeptide from a DNA or RNA molecule in any of a variety of bacterial, eukaryotic, or viral recombinant expression systems, followed by purification of the expressed antibodies (e.g., with protein A or G). Alternatively, antibodies may be produced in vivo by introducing molecules (e.g., DNA, RNA, viral expression systems, and the like) that encode antibodies into a subject, whereupon the encoded therapeutic antibodies are expressed.

[0125] In certain embodiments, the antibodies as defined for the present invention include derivatives that are modified, i.e., by the covalent attachment of any type of molecule to the antibody such that covalent attachment does not prevent the antibody from generating an anti-idiotypic response. For example, but not by way of limitation, the antibody derivatives include antibodies that have been modified, e.g., by glycosylation, acetylation, pegylation, phosphorylation, amidation, derivatization by known protecting/blocking groups, proteolytic cleavage, linkage to a cellular ligand or other protein, etc. Any of numerous chemical modifications may be carried out by known techniques, including, but not limited to specific chemical cleavage, acetylation, formylation, metabolic synthesis of tunicamycin, etc. Additionally, the derivative may contain one or more non-classical amino acids.

Administration of Therapeutic Antibodies

[0126] For therapeutic uses, the antibodies described herein may be administered systemically, for example, formulated in a pharmaceutically-acceptable buffer such as physiological saline. Preferable routes of administration include, for example, subcutaneous, intravenous, interperitoneal, intramuscular, or intradermal injections that provide continuous, sustained levels of the antibody in the patient. Treatment of human patients or other animals will be carried out using a therapeutically effective amount of a therapeutic identified herein in a physiologically-acceptable carrier. Suitable carriers and their formulation are described, for example, in Remington's Pharmaceutical Sciences by E. W. Martin. The amount of the therapeutic agent to be administered varies depending upon the manner of administration, the age and body weight of the patient, and with the clinical symptoms of the neoplasia. Generally, amounts will be in the range of those used for other agents used in the treatment of other diseases associated with neoplasia, although in certain instances lower amounts will be needed because of the increased specificity of the compound. For example, a therapeutic compound is administered at a dosage that is cytotoxic to a neoplastic cell.

[0127] Human dosage amounts can initially be determined by extrapolating from the amount of antibody used in mice, as a skilled artisan recognizes it is routine in the art to modify the dosage for humans compared to animal models. Of course, this dosage amount may be adjusted upward or downward, as is routinely done in such treatment protocols, depending on the results of the initial clinical trials and the needs of a particular patient.

[0128] The therapeutic regimens disclosed herein comprise administration of antibodies of the invention or pharmaceutical compositions thereof to the patient in a single dose or in multiple doses (e.g., 1, 2, 3, 4, 5, 6, 7, 8, 10, 15, 20, or more doses). In one aspect, the therapeutic regimens comprise administration of the antibodies of the invention or pharmaceutical compositions thereof in multiple doses. When administered in multiple doses, the antibodies are administered with a frequency and in an amount sufficient to treat SARS-CoV-2. For example, the frequency of administration ranges from once a day up to about four times a day. In another example, the frequency of administration ranges from about once a week up to about once every six weeks.

[0129] Significant progress has been made in understanding pharmacokinetics (PK), pharmacodynamics (PD), as well as toxicity profiles of therapeutic antibodies in animals and humans, which have been in commercial development for more than three decades (see, e.g., Vugmeyster et al., *Pharmacokinetics and toxicology of therapeutic proteins: Advances and challenges*, *World J Biol Chem.* 2012 Apr 26; 3(4): 73–92). In certain embodiments, therapeutic antibodies are administered by parenteral routes, such as intravenous (IV), subcutaneous (SC) or intramuscular (IM) injection. Molecular size, hydrophilicity, and gastric degradation are the main factors that preclude gastrointestinal (GI) absorption of therapeutic proteins (see, e.g., Keizer, et al., *Clinical pharmacokinetics of therapeutic monoclonal antibodies*. *Clin Pharmacokinet.* 2010 Aug; 49(8):493-507). Pulmonary delivery with aerosol formulations or dry powder inhalers has been used for selected proteins, e.g., exubera (TM) (see, e.g., Scheuch and Siekmeier, *Novel approaches to enhance pulmonary delivery of proteins and peptides*. *J Physiol Pharmacol.* 2007 Nov; 58 Suppl 5(Pt 2):615-25). Intravitreal injections have been used for peptides and proteins that require only local activity (see, e.g., Suresh, et al., *Ocular Delivery of Peptides and Proteins*. In: Van Der Walle C., editor. *Peptide and Protein Delivery*. London: Academic Press; 2011. pp. 87–103). In certain embodiments, SC administration of therapeutic antibodies is often a preferred route. In particular, the

suitability of SC dosing for self-administration translates into significantly reduced treatment costs.

[0130] The pharmaceutical composition may be administered parenterally by injection, infusion or implantation (subcutaneous, intravenous, intramuscular, intraperitoneal, or the like) in dosage forms, formulations, or via suitable delivery devices or implants containing conventional, non-toxic pharmaceutically acceptable carriers and adjuvants. The formulation and preparation of such compositions are well known to those skilled in the art of pharmaceutical formulation. Formulations can be found in Remington: The Science and Practice of Pharmacy, supra.

[0131] As indicated above, the pharmaceutical compositions according to the invention may be in the form suitable for sterile injection. To prepare such a composition, the suitable antibodies are dissolved or suspended in a parenterally acceptable liquid vehicle. Among acceptable vehicles and solvents that may be employed are water, water adjusted to a suitable pH by addition of an appropriate amount of hydrochloric acid, sodium hydroxide or a suitable buffer, 1,3-butanediol, Ringer's solution, and isotonic sodium chloride solution and dextrose solution. The aqueous formulation may also contain one or more preservatives (e.g., methyl, ethyl or n-propyl p-hydroxybenzoate).

Vector Delivery

[0132] The invention also provides a delivery system comprising one or more vectors or one or more polynucleotide molecules, the one or more vectors or polynucleotide molecules comprising one or more polynucleotide molecules encoding an antibody of the present invention.

[0133] In general, and throughout this specification, the term “vector” refers to a nucleic acid molecule capable of transporting another nucleic acid to which it has been linked. Vectors include, but are not limited to, nucleic acid molecules that are single-stranded, double-stranded, or partially double-stranded; nucleic acid molecules that comprise one or more free ends, no free ends (e.g., circular); nucleic acid molecules that comprise DNA, RNA, or both; and other varieties of polynucleotides known in the art. One type of vector is a “plasmid,” which refers to a circular double stranded DNA loop into which additional DNA segments can be inserted, such as by standard molecular cloning techniques. Another type of vector is a viral vector, wherein virally-derived DNA or RNA sequences are present in the vector for packaging into a virus (e.g., retroviruses, replication defective retroviruses, adenoviruses, replication defective

adenoviruses, and adeno-associated viruses). Viral vectors also include polynucleotides carried by a virus for transfection into a host cell. Certain vectors are capable of autonomous replication in a host cell into which they are introduced (e.g., bacterial vectors having a bacterial origin of replication and episomal mammalian vectors). Other vectors (e.g., non-episomal mammalian vectors) are integrated into the genome of a host cell upon introduction into the host cell, and thereby are replicated along with the host genome. Moreover, certain vectors are capable of directing the expression of genes to which they are operatively-linked. Such vectors are referred to herein as “expression vectors.” Vectors for and that result in expression in a eukaryotic cell can be referred to herein as “eukaryotic expression vectors.” Common expression vectors of utility in recombinant DNA techniques are often in the form of plasmids.

Identification of neutralizing antibodies

[0134] Applicants identified specific gene signatures present in B cells that produced neutralizing antibodies (clusters 3 and 4 of Table 4). In certain embodiments, neutralizing antibodies are identified by first enriching for B cells expressing the signature. In certain embodiments, cell sorting using antibodies specific for surface markers in the signatures are used to enrich for the cell types. In certain embodiments, fluorescence-activated cell sorting (FACS) can be used to enrich for the B cells. In certain embodiments, magnetic beads specific for surface markers can be used to enrich for the B cells. In certain embodiments, B cells are enriched from a subject infected with the pathogen (e.g., virus). Antibodies for any pathogen may be identified by enriching for B cells having the disclosed signatures followed by sequencing of the antibody sequences from the enriched cells.

[0135] In certain embodiments, B cells are obtained from a unit of blood collected from a subject using any number of techniques known to the skilled artisan, such as Ficoll separation. In one preferred embodiment, cells from the circulating blood of an individual are obtained by apheresis or leukapheresis. The apheresis product typically contains lymphocytes, including T cells, monocytes, granulocytes, B cells, other nucleated white blood cells, red blood cells, and platelets. In one embodiment, the cells collected by apheresis may be washed to remove the plasma fraction and to place the cells in an appropriate buffer or media for subsequent processing steps. In one embodiment of the invention, the cells are washed with phosphate buffered saline (PBS). B cells can be further isolated by positive or negative selection. A preferred method is cell sorting and/or selection via magnetic immunoadherence or flow

cytometry that uses a cocktail of monoclonal antibodies directed to cell surface markers present on the cells positively or negatively selected. Such separation can be performed using standard methods available in the art. For example, any magnetic separation methodology may be used including a variety of which are commercially available, (e.g., DYNAL® Magnetic Particle Concentrator (DYNAL MPC®)).

[0136] In certain embodiments, the method includes assays capable of validating antibody binding and neutralization activity. In certain embodiments, the validation assay is an immunoassay. Immunoassay methods are based on the reaction of an antibody to its corresponding target or analyte and can detect the analyte in a sample depending on the specific assay format. Immunoassays have been designed for use with a wide range of biological sample matrices. Immunoassay formats have been designed to provide qualitative, semi-quantitative, and quantitative results. Quantitative results may be generated by determining the concentration of analyte detected by an antibody.

[0137] Numerous immunoassay formats have been designed. Exemplary assay formats include enzyme-linked immunosorbent assay (ELISA), radioimmunoassay, fluorescent, chemiluminescence, and fluorescence resonance energy transfer (FRET) or time resolved-FRET (TR-FRET) immunoassays. ELISA or EIA can be quantitative for the detection of an analyte/biomarker. This method relies on attachment of a label to either the analyte or the antibody and the label component includes, either directly or indirectly, an enzyme. ELISA tests may be formatted for direct, indirect, competitive, or sandwich detection of the analyte. Additional techniques include, for example, agglutination, nephelometry, turbidimetry, Western blot, immunoprecipitation, immunocytochemistry, immunohistochemistry, flow cytometry, Luminex assay, and others (see *ImmunoAssay: A Practical Guide*, edited by Brian Law, published by Taylor & Francis, Ltd., 2005 edition).

[0138] Viral neutralizing assays can be used to validate identified antibody frameworks. In certain embodiments, the assay uses live virus. In certain embodiments, the assay uses pseudotyped virus particles (see, e.g., Gentili, 2015). In certain embodiments, the neutralizing assay is performed without live virus (see, e.g., Tan, C.W., Chia, W.N., Qin, X. et al. A SARS-CoV-2 surrogate virus neutralization test based on antibody-mediated blockage of ACE2–spike protein–protein interaction. *Nat Biotechnol* 38, 1073–1078 (2020)).

[0139] Further embodiments are illustrated in the following Examples which are given for illustrative purposes only and are not intended to limit the scope of the invention.

EXAMPLES

Example 1 – B cell genomics and structural studies uncover cross-neutralizing SARS-CoV-2 antibodies

[0140] Applicants used scRNA-Seq to investigate SARS-CoV-2 spike-specific B cell responses in 14 subjects who had recovered from COVID-19. By matching the VDJ sequence and transcriptional profile with neutralization and binding studies from 92 monoclonal antibodies produced from single B cells, Applicants identified two transcriptional clusters that are enriched in B cells that produce binding and neutralizing antibodies. Six of the most potently neutralizing antibodies in the collection derived from B cells in these two transcriptional clusters were structurally characterized. Applicants found that they adopt distinct RBD-binding orientations, including the BG10-19 antibody that reaches between adjacent RBDs on the protomers of a single spike trimer, resulting in a locked spike trimer conformation that cannot bind ACE2. BG10-19 binds adjacent RBDs in a manner distinct from previously-described antibodies that lock the trimer into a closed conformation (Barnes et al., 2020a; Tortorici, 2020). It recognizes SARS-CoV-2, SARS-CoV, and zoonotic RBDs, and demonstrated potent neutralization of SARS-CoV-2, the UK variant B.1.1.7 (Davies et al., 2021), the South African variant B.1.351 (Tegally et al., 2020) as well as the heterologous SARS-CoV pseudotyped viruses. Furthermore, characterization of antibodies belonging to the *VH3-53/VH3-66*-encoded class (Barnes et al., 2020b; Wu et al., 2020a; Yuan et al., 2020) showed common binding modes for antibodies with short (<14 amino acids) and long (>15 amino acids) CDRH3 loops, providing new insights into this recurring class of SARS-CoV-2 neutralizing antibodies.

[0141] *A cohort of recently recovered COVID-19 patients shows serum neutralizing activity.* To understand the development of B cell responses after SARS-CoV-2 infection, Applicants enrolled 14 subjects who had recently recovered from COVID-19. All subjects were diagnosed in March 2020, none required hospitalization, and the time between diagnosis and enrollment of subjects ranged between 31 and 61 days with a median of 51 days (**Table 1**). 12 of 14 subjects were diagnosed with COVID-19 using PCR-based testing at the time of presentation. The remaining two subjects were diagnosed based on serum reactivity to RBD in ELISA, clinical symptoms and history of recent exposure (**Table 1**). All subjects had serum antibodies against RBD in ELISA (**Table 1**).

[0142] To evaluate serum neutralizing activity, Applicants used a pseudotyped virus with SARS-CoV-2 spike (S) protein (Robbiani et al., 2020; Schmidt et al., 2020)(**STAR Methods**). Applicants detected serum neutralization in 11 of 14 (79%) subjects (**Figure 8A, Table 1**). ID₅₀ titers ranged from 51 to 655, and no correlation was seen between serum neutralization and time since diagnosis or age of the subjects (**Figure 8B, C, Table 1**). Although 3 of the top 4 neutralizing sera were obtained from male subjects, there was no statistically significant difference between serum neutralizing activity in female versus male subjects (**Figure 8D, Table 1**). Applicants conclude that serum neutralizing activity was detected in a majority of subjects in this cohort of recently recovered non-hospitalized SARS-CoV-2 patients.

Table 1. Subject Characteristics (related to Figure 1 and Figure 8). Shown are the subject IDs, gender, age at time of diagnosis (in years), result of clinical COVID-19 PCR test result, days between the COVID test and blood draw for this study, clinical symptoms at presentation, serum ID₅₀ and ID₈₀ values in a SARS-CoV-2 pseudovirus assay and results in serum ELISA against SARS-CoV-2 RBD. Subjects highlighted in red font were selected for monoclonal antibody production; n/a= not available.

Subject	Gender	Age	COVID Test Result	Days Between Test and Blood Draw	Symptoms	Serum ID ₅₀	Serum ID ₈₀	RBD ELISA
BG1	M	49	positive	48	fever, malaise, chest tightness, loss of smell	655	112	IgG+/I gM+
BG2	F	37	positive	36	shortness of breath, chest tightness, loss of smell	0	0	IgG+/I gM-
BG4	M	42	positive	50	fever, chills, malaise,	449	99	IgG+/I gM+
BG5	M	40	positive	31	n/a	51	0	IgG+/I gM+
BG6	M	29	not tested	n/a	cough, malaise, chest tightness, diarrhea, loss of smell, headache	72	24	IgG+/I gM-
BG7	M	40	positive	53	loss of smell	155	42	IgG+/I gM+
BG9	F	30	positive	51	n/a	74	0	IgG+/I gM-
BG10	F	58	positive	42	fever, cough, myalgia and fatigue	255	76	IgG+/I gM-
BG13	F	61	not tested	n/a	cough, fever, shortness of breath, rhinitis, nausea/vomiting, diarrhea, loss of smell	77	22	IgG+/I gM+
BG14	F	43	positive	59	fever, nausea	68	0	IgG-/I gM+

BG18	M	57	positive	60	myalgia, chills, fatigue	353	82	IgG+/IgM+
BG19	M	53	positive	61	body aches, fever, fatigue	53	0	IgG+/IgM+
BG20	F	40	positive	51	cough, shortness of breath, fever, diarrhea	0	0	IgG+/IgM+
BG21	F	50	positive	60	cough, rhinitis, chest tightness, diarrhea, sore throat	0	0	IgG+/IgM+

[0143] *SARS-CoV-2 binding B cell repertoires from recovered subjects are enriched for class 1 neutralizing antibodies against RBD.* To characterize the B cell response against the SARS-CoV-2 spike, Applicants sorted a total of 6,113 B cells from 14 subjects that bound to the SARS-CoV-2 receptor binding domain (RBD) or SARS-CoV-2 S trimer (Wrapp et al., 2020) using fluorescence-activated cell sorting (FACS) (**Figures 1A, B**). The frequency of SARS-CoV-2 S- or RBD-binding B cells ranged from 0.05-0.3% of CD19⁺ B cells (**Figures 1A, B**). Applicants profiled sorted cells by 5' directed scRNA-Seq for both mRNA and paired VDJ profiling, recovering matched single-cell VDJ and transcriptome profiles in 129 - 649 cells for SARS-CoV-2 S and 47 - 487 cells for RBD per donor (**Figure 1C**). Applicants identified clonally related B cells of each donor, by accounting for V and J gene similarities as well as sequence similarity between the heavy chain complementarity-determining region (CDRH3) amino acid sequences (Nouri and Kleinstein, 2018). Expanded B cell clones, which Applicants define as the clones with at least 2 clonally related cells in the samples, accounted for 7-45% of sorted B cells in the 14 subjects (**Figure 1D**).

[0144] Applicants tested if the sorted B cell repertoires include cells that have undergone somatic hypermutation and class switch recombination, two steps in the pathway to generate high affinity B cell responses (Victora and Nussenzweig, 2012). Assessing immunoglobulin isotypes, Applicants found that the fractions of IgG⁺, IgM/IgD⁺ and IgA⁺ B cells varied substantially among subjects (9-48%, 48-87% and 3-12% respectively) (**Figure 8E**). When Applicants investigated clonal expansion within each antibody isotype, Applicants found that in 8 of 14 subjects IgM⁺ clones were statistically significantly more expanded than either IgA⁺ clones or IgG⁺ clones or both (**Figure 8O**). Inferring levels of somatic mutations (from RNA, **Methods**), the total number of inferred heavy chain somatic mutations was lower in SARS-CoV-2 S- and RBD-binding B cells than in historic control memory B cells (Rubelt et al., 2012) (**Figure 8F**). IgM⁺ and IgD⁺ SARS-CoV-2 binding B cells showed significantly lower levels of inferred heavy chain somatic mutations compared to IgG⁺ and IgA⁺ B cells (**Figure 8G**).

Lower levels of somatic mutations were especially observed in IgM⁺ B cells with low clonal expansion as 9/14 subjects showed a statistically significant positive correlation between clone size and number of inferred heavy chain mutations in their IgM⁺ repertoire as opposed to IgG⁺ and IgA⁺ cells where this positive correlation was only observed in 4 and 0 subjects respectively (**Figure 8P**).

[0145] Applicants next tested if the sorted B cells were enriched for immunoglobulin genes *VH3-53* and *VH3-66*, as class 1 antibodies that block ACE2 binding to the RBD show a preference for *VH3-53* and *VH3-66* heavy chain genes (Barnes et al., 2020b; Wu et al., 2020a; Yuan et al., 2020). Several class 1 antibodies have been isolated from different subjects, most of which carry CDRH3 regions that are shorter than 14 amino acids (IMGT definition; (Lefranc et al., 2015)) (Barnes et al., 2020b; Wu et al., 2020a; Yuan et al., 2020). Applicants thus compared the frequency of these two VH genes to combined historic control memory B cells from 14 healthy donors (Rubelt et al., 2012). 13 of the 14 recovered donors showed a higher fraction of combined *VH3-53/VH3-66* in B cell repertoires against SARS-CoV-2 S, RBD or both compared to historic memory B cell controls. This difference was statistically significant in 10 of 14 (71%, FDR < 0.1, Two-proportions z-test) subjects (**Figure 1E**) and remained significant in 10 of 14 (71%, FDR < 0.1, Two-proportions z-test) subjects when considering only antibodies with CDRH3 regions shorter than 14 amino acids (not shown). Among other antibody features, the kappa and lambda light chain ratios were comparable to historic controls (**Figure 8H**), whereas CDRH3 length and hydrophobicity were slightly increased and CDRH3 charge was decreased, and these differences existed for both S- and RBD-binding B cells (**Figures 8I-K**) and across Ig isotypes (**Figures 8L-N**). Thus, the B cell repertoire that binds to SARS-CoV-2 S and SARS-CoV-2 RBD in recovered individuals includes class switched IgG⁺ and IgA⁺ affinity matured B cells and is enriched for heavy chain genes that are associated with class 1 neutralizing antibodies. See, also, **Figures 15, 28 and 29**.

[0146] ***SARS-CoV-2 spike binding monoclonal antibodies are directed against RBD and targets outside of the RBD.*** To functionally evaluate selected antibodies, Applicants chose 4 of the 14 subjects with the highest serum neutralization titers (**Figure 8A** and **Table 1**) and produced a total of 92 antibodies from these donors (**Table 2**). The selection of antibodies consisted of 72 representatives from most of the expanded B cell clones in these subjects and 20 singlets (**Figures 9A-D**). All of the selected antibodies selected were expressed as IgG1s in order to allow for direct comparison of binding and neutralization and were initially evaluated

for binding by ELISA. 56 of 92 antibodies (61%) showed strong or intermediate binding to either SARS-CoV-2 S, RBD, or both in ELISA (**Figure 2A** and **Table 3**). 42 of 56 strong or intermediate binders (75%) bound to both SARS-CoV-2 S and RBD, 9 of 56 strong or intermediate binders (16%) only bound to SARS-CoV-2 S, and 5 of 56 (9%) only to RBD (**Figure 2A** and **Table 3**). Applicants conclude that most antibodies isolated from SARS-CoV-2 S- and RBD-binding B cells target either the RBD or epitopes on the spike outside of the RBD.

Table 2A-2B. Selected Antibodies for functional evaluation (related to Figures 2 and 9).

All neutralization results in this table are from antibodies expressed as IgG1. **A.** Shown are isotype, VH gene, CDRH3 amino acid sequence, light chain kappa or lambda light chain use, V kappa/V lambda gene, light chain CDRL3 amino acid sequence, sorting bait used to identify the cell, antibody name, IC₅₀ in µg/ml in SARS-CoV-2 pseudovirus neutralization assay (PV), IC₈₀ in µg/ml in SARS-CoV-2 pseudovirus neutralization assay, IC₅₀ in µg/ml in SARS-CoV-2 authentic virus neutralization assay (LV), IC₈₀ in µg/ml in SARS-CoV-2 authentic virus neutralization assay for antibodies from subject BG1, BG4, BG7 and BG10 as indicated by the antibody names. (SEQ ID NOS: 1-184). **B.** Shown are the heavy chain sequences (HC), kappa light chain (KC) sequences and third lambda light chain (LC) sequences for the indicated antibodies tested (SEQ ID NOS: 185-368).

Table 2A.

ISOT YPE	VH GEN E	CDR3 HEAVY CHAIN	LIG HT CH AIN	VK/V L GENE	CDR3 LIGHT CHAIN	SO RT BA IT	Na me	PV IC5 0 (ug/ ml)	PV IG8 0 (ug/ ml)	LV IC5 0 (ug/ ml)	LV IG8 0 (ug/ ml)
IGH M	IGHV 6-1	CAKQWLANWFDPW	IGK	IGKV 3-20	CQQSESSP YTF	RB D	BG 1-1	>50	>50		
IGH G1	IGHV 1-8	CARGRAGYYDFWSTS SLDNGGMDVW	IGL	IGLV1 -47	CAAWDDDS LSGVVF	RB D	BG 1-3	>50	>50		
IGH M	IGHV 3-23	CVKDVPSMYYIFWSG QGTYW	IGK	IGKV 1-5	CQQYNTYS PITF	RB D	BG 1-4	>50	>50		
IGH M	IGHV 3-23	CAKDLPSRYYDFWSG QGNYW	IGK	IGKV 1-5	CQQYNSYS SITF	RB D	BG 1-5	>50	>50		
IGH G1	IGHV 2-70	CAREMATITGLDYW	IGK	IGKV 1- 39;IG	CQQSYSTP RTF	RB D	BG 1-6	1.1 78	10. 581	0.20 37	0.33 14

				KVID -39							
IGH A1	IGHV 2-70	CARVPPTDYHFDSW	IGK	IGKV 3-20	CQHYGSSP PLTF	2P	BG 1-7	>45	>45		
IGH M	IGHV 1-18	CARDTSGYRNPGYG MDVW	IGK	IGKV 3-11	CQQRSNW PPWTF	2P	BG 1-8	>50	>50		
IGH G1	IGHV 5-51	CATGTFLAVPGDFW	IGL	IGLV6 - 57;IGL V6-57	CQSYDSGR QGVF	RB D	BG 1-9	>25	>25		
IGH M	IGHV 3-48	CARDLQRYGSGSSLG PNYFDYW	IGK	IGKV 1-9	CQQLDTYP RF	RB D	BG 1- 10	>50	>50		
IGH M	IGHV 4-39	CARRAQYYYDSSGY YDAFDIW	IGK	IGKV 3-20	CQQYNSYS TF	RB D	BG 1- 11	>35	>35		
IGH G1	IGHV 3-13	CARDVFRYDSSGRPR YAFDIW	IGK	IGKV 2- 28;IG KV2D -28	CMQALQT PLTF	RB D	BG 1- 12	1.1 51	>50	0.23 38	0.38 66
IGH G1	IGHV 4- 59;IG HV4- 59	CARETRWNWIDSW	IGK	IGKV 4-1	CQQYHNTP WTF	2P	BG 1- 13	>30	>30		
IGH G1	IGHV 3-53	CARDLVDYGMVDVW	IGK	IGKV 1-9	CQQLNSYP PYTF	RB D	BG 1- 14	0.0 20	0.0 72	0.03 716	0.06 751
IGH A1	IGHV 3-43D	CAKDGRRDGYNHAL DNW	IGK	IGKV 1-5	CQQYSSYP TF	RB D	BG 1- 15	>50	>50		
IGH M	IGHV 3- 30;IG HV3- 30-5	CAKGRESTSIGGWFD PW	IGK	IGKV 1-16	CQHYNAY PDHL	2P	BG 1- 16	>37	>37		
IGH M	IGHV 2-70	CARTIVGGTNWYFDL W	IGL	IGLV1 -44	CASWDDS VNGVF	RB D	BG 1- 17	24. 883	>50	5.17 4	15.2 5

IGH M	IGHV 4-39	CARRVMGSGWLDSW	IGL	IGLV2 -14	CSSYTSSST WVF	2P	BG 1- 18	>50	>50		
IGH G1	IGHV 3-9	CAKDMGNGFYYYG LDVW	IGK	IGKV 2D-29	CMQTIHLP RVTF	RB D	BG 1- 19	>30	>30		
IGH A2	IGHV 3- 23;IG HV3- 23D	CAKDAPDVVLVPVY YHYGLEVW	IGK	IGKV 3-20	CQHYGSSR RTF	2P	BG 1- 20	>50	>50		
IGH A1	IGHV 3-30	CARERSGSYYARVEL GYW	IGL	IGLV2 -14	CSSYTSSIT GVF	RB D	BG 1- 21	>25	>25		
IGH G1	IGHV 3- 66;IG HV3- 66	CASSRPPIGQLVPGLD LDWFDPW	IGL	IGLV1 -40	CQSYDSRL SGWVF	RB D	BG 1- 22	0.0 23	0.0 72	0.09 962	0.11 81
IGH A1	IGHV 3-53	CARDSYRGGGIW	IGK	IGKV 1- 33;IG KVID -33	CQQYDNLP QTF	RB D	BG 1- 23	0.0 09	0.0 39	0.02 004	0.02 348
IGH G1	IGHV 1- 69;IG HV1- 69	CARGPYYYDSGGYYL DYW	IGK	IGKV 3-20	CQQYAGSP RTF	RB D	BG 1- 24	0.0 04	0.0 07	0.04 294	0.07 228
IGH G1	IGHV 3-53	CARDMGGDVFDIW	IGK	IGKV 1-9	CQQLNSSP PKLTF	RB D	BG 1- 25	0.0 91	0.5 96	0.12 24	0.14 01
IGH A1	IGHV 4-39	CAAHITVFGIITGNWF DPW	IGL	IGLV1 -40	CQSYASSL SVHVVF	RB D	BG 1- 26	0.3 60	3.9 62	0.23 5	0.31 27
IGH A1	IGHV 3-53	CARESAAAWGWLDP W	IGK	IGKV 1- 39;IG KVID -39	CQQSYSM YTF	RB D	BG 1- 27	>40	>40		

IGH G1	IGHV 3-23	CAKDLGYSGSEIFD YW	IGK	IGKV 1- 39;IG KVID -39	CQQSYSTP VF	RB D	BG 1- 28	10. 398	39. 842	12.7 5	17.5 4
ISOT YPE	VH GEN E	CDR3 HEAVY CHAIN	LIG HT CH AIN	VK/V L GENE	CDR3 LIGHT CHAIN	SO RT BA IT	Na me	PV IC5 0 (ug/ ml)	PV IG8 0 (ug/ ml)	LV IC5 0 (ug/ ml)	LV IG8 0 (ug/ ml)
IGH M	IGHV 3-30- 3	CARARSGSYSAIDY W	IGK	IGKV 1- 33;IG KVID -33	CQQYDYLP LTF	2P	BG 4-1	>50	>50		
IGH M	IGHV 3- 23;IG HV3- 23D	CAKEAYFTAWLHFPF DPW	IGK	IGKV 3-20	CQQYGSSL TF	2P	BG 4-2	>50	>50		
IGH G3	IGHV 3- 30;IG HV3- 30-3	CARDRDDYGDOPYGM DVW	IGL	IGLV3 -27	CYSVADN MGVF	2P	BG 4-3	>50	>50		
IGH G2	IGHV 3-15	CTTGPTVRGVSIVYW	IGL	IGLV7 -46	CLLSYSGA WVF	2P	BG 4-4	>50	>50		
IGH G1	IGHV 1-2	CARSVGYDAFDVW	IGL	IGLV1 -47	CAAWDDS LFVVF	RB D	BG 4-5	>45	>45		
IGH M	IGHV 3-21	CARDLMDYDILTGYW PAGYW	IGK	IGKV 4-1	CQQYFSTP PSTF	RB D	BG 4-6	>50	>50		
IGH M	IGHV 1-2	CARGPPPPAITMIVVT TVWTS	IGK	IGKV 2- 28;IG KV2D -28	CMQALQT PYTF	RB D	BG 4-7	>35	>35		
IGH G1	IGHV 5-10- 1	CARLETTVTTDWFDW W	IGL	IGLV2 -14	CSSYTRGN YVF	RB D	BG 4-8	>50	>50		
IGH G3	IGHV 3-49	CTIGNWHGSGNNIMH DYW	IGK	IGKV 4-1	CHQYYLVP FTF	RB D	BG 4-9	>50	>50		

IGH G1	IGHV 1-2	CARDRWFGKLEGSFD VW	IGL	IGLV2 - 23;IGL V2- 23;IGL V2-23	CCSYATGS SVVF	RB D	BG 4- 10	5.5 3	48. 924	11.4 8	15.5 8
IGH M	IGHV 4-34	CARDTVVVVGAHAF DIW	IGK	IGKV 4-1	CQQYYTTP LTF	RB D	BG 4- 11	11. 335	36. 996	10.7	13.5 5
IGH G1	IGHV 4-39	CARPQVLYYYGSGSY SHWFDPW	IGL	IGLV1 -40	CQSYDSSL SAVWVF	2P	BG 4- 12	>50	>50		
IGH M	IGHV 3-48	CARGSGWYVGFYDW	IGL	IGLV1 -47	CAAWDDS LSALVF	RB D	BG 4- 13	>50	>50		
IGH M	IGHV 1-2	CARVTTPQYDYGDY YYYYGMDVW	IGL	IGLV2 -23	CCSYAGSS TLVF	2P	BG 4- 14	0.8 78	8.9 71	0.25 53	0.35 63
IGH G3	IGHV 4-59	CARDLGQDW	IGK	IGKV 3-20	CQQYGSSP WTF	2P	BG 4- 15	>50	>50		
IGH M	IGHV 4-61	CARDIFGSGSPPSGVA FDYW	IGL	IGLV2 -14	CSSHTSSSS PHVVF	RB D	BG 4- 16	0.8 06	9.3 88	0.13 42	0.17 03
IGH G1	IGHV 3-53	CARESYGMDVW	IGK	IGKV 3-20	CQQYGSSP GTF	2P	BG 4- 17	0.0 24	0.1 02	0.12 76	0.22 02
IGH G1	IGHV 1- 69;IG HV1- 69D	CARVKEWGSYYSDS GSHGKNYFDYW	IGL	IGLV2 -11	CCSYAGTY TVIF	2P	BG 4- 18	>50	>50		
IGH M	IGHV 1-2	CARDGYSSSFIPGPRN YYGMDVW	IGK	IGKV 3-15	CQQFNNW PRGTF	RB D	BG 4- 19	>50	>50		
IGH G1	IGHV 1-18	CARPRGRLITFGGLIV TTLDYYYGMGVW	IGK	IGKV 2- 28;IG KV2D -28	CMQALQT PVTf	2P	BG 4- 20	>50	>50		

IGH G1	IGHV 1-2	CATDKADTSWWEFD PW	IGL	IGLV7 -46	CLLSYSGV VVF	RB D	BG 4- 21	>35	>35		
IGH G1	IGHV 3-53	CARFSKLYQWSFDIW	IGL	IGLV2 -11	CCSYAGTY TPVVF	2P	BG 4- 22	>50	>50		
IGH M	IGHV 3-53	CARGTHYSGSYH W	IGK	IGKV 3-15	CQQYNNW PPGLKITF	RB D	BG 4- 23	>50	>50		
IGH G1	IGHV 3-53	CVRDLDDYGMVDVW	IGK	IGKV 1-9	CQQLNSSP GSLTF	RB D	BG 4- 24	0.0 13	0.0 5	0.02 494	0.04 633
IGH G1	IGHV 3-53	CARDLEVVGAMVDVW	IGK	IGKV 3-20	CQQYGSP MYTF	2P	BG 4- 25	0.0 03	0.0 13	0.04 379	0.07 06
IGH G1	IGHV 3-53	CAREGPHGMDVW	IGK	IGKV 1- 33;IG KV1D -33	CQQYDNLP PTF	RB D	BG 4- 26	0.0 16	0.0 72	0.04 001	0.05 179
IGH G3	IGHV 3-53	CARGPVRGVITHFDY W	IGL	IGLV2 -14	CSSYTSSST SSVF	2P	BG 4- 27	>50	>50		
ISOT YPE	VH GEN E	CDR3 HEAVY CHAIN	LIG HT CH AIN	VK/V L GENE	CDR3 LIGHT CHAIN	SO RT BA IT	Na me	PV IC5 0 (ug/ ml)	PV IG8 0 (ug/ ml)	LV IC5 0 (ug/ ml)	LV IG8 0 (ug/ ml)
IGH D	IGHV 3- 30;IG HV3- 30-5	CVKSSSGWYLRG W	IGK	IGKV 2- 28;IG KV2D -28	CMQALQT PTF	2P	BG 7-1	>50	>50		
IGH M	IGHV 3-53	CAREGRRGQWSWFD PW	IGK	IGKV 3-20	CQQFGSSP LYTF	2P	BG 7-2	>50	>50		
IGH M	IGHV 3-53	CAGSPVRGVITHFDY W	IGL	IGLV2 -14	CSSYTSSST QVF	2P	BG 7-3	>50	>50		
IGH M	IGHV 4-61	CARVDRRYCIITSCYI FDYW	IGK	IGKV 4-1	CQQYYSTP ITF	RB D	BG 7-4	>50	>50		

IGH M	IGHV 3-30- 3	CARGRDGYYYGMDV W	IGK	IGKV 1-9	CQQLNSLF TF	2P	BG 7-5	>50	>50		
IGH M	IGHV 1-2	CARAPPFSSSIGVDY W	IGK	IGKV 1-16	CQQYNSYP LTF	2P	BG 7-6	>50	>50		
IGH M	IGHV 1-2	CAKDHCATTNCFEYL YFGMGVW	IGK	IGKV 2- 28;IG KV2D -28	CMQSLQTR TF	2P	BG 7-7	>50	>50		
IGH M	IGHV 4-4	CARDLTYYGSGNGYTN W	IGK	IGKV 1-5	CQQYNTYF WTF	2P	BG 7-9	>50	>50		
IGH M	IGHV 3-53	CASSPVRGVITQFDY W	IGL	IGLV2 -14	CSSYTSRSP WVF	2P	BG 7- 10	>50	>50		
IGH G1	IGHV 5-51	CARHDGSKVTTNDY W	IGK	IGKV 3-11	CQQRWD PGTF	2P	BG 7- 11	>50	>50		
IGH A1	IGHV 3-30- 3	CARDRSGSYRPGY W	IGK	IGKV 1- 33;IG KVID -33	CQQYGNLP PLTF	2P	BG 7- 12	>50	>50		
IGH M	IGHV 3- 30;IG HV3- 30;IG HV3- 30-5	CAQTGGSYFGPFDYW	IGL	IGLV2 -14	CYSYTTSS TPYVF	2P	BG 7- 13	>50	>50		
IGH G1	IGHV 3-9	CAKDILYGDYVGGFA YW	IGL	IGLV2 -14	CSSYTTSS LVF	RB D	BG 7- 14	0.3 85	19. 178	0.20 84	0.29 81
IGH G1	IGHV 1-18	CAIPYSSVTFDCW	IGK	IGKV 3-20	CQQYGSSR PTF	RB D	BG 7- 15	0.0 16	0.0 92	0.11 39	0.13 45
IGH G1	IGHV 3-53	CARDSQPHYYYGVD VW	IGL	IGLV2 -14	CSSYTKTR TLYVF	RB D	BG 7- 16	3.5 992	21. 792	3.17 2	4.81 7
IGH G1	IGHV 5-51	CAKKKDDRAEAVFD YW	IGL	IGLV1 -44	CATWDDS LNTYVF	RB D	BG 7- 17	>50	>50		

IGH G1	IGHV 3-53	CARGAAMVKELFDY W	IGK	IGKV 4-1	CQQYYSTP LTF	RB D	BG 7- 18	0.0 83	0.2 44	0.11 52	0.16 01
IGH G1	IGHV 3-7	CARVRWLQGGIDYW	IGL	IGLV6 -57	CQSYDSGS WVF	RB D	BG 7- 19	2.7 35	13. 72	1.85 4	3.65 3
IGH G1	IGHV 1-8	CARGGRYCSSTTCYS GVGMDVW	IGL	IGLV1 -40	CQSYDSSL SGWVF	RB D	BG 7- 20	0.0 07	0.0 23	0.05 679	0.09 42
ISOT YPE	VH GEN E	CDR3 HEAVY CHAIN	LIG HT CH AIN	VK/V L GENE	CDR3 LIGHT CHAIN	SO RT BA IT	Na me	PV IC5 0 (ug/ ml)	PV IG8 0 (ug/ ml)	LV IC5 0 (ug/ ml)	LV IG8 0 (ug/ ml)
IGH M	IGHV 3-9	CAKSNSSGLTPFDHW	IGK	IGKV 1- 39;IG KV1D -39	CQQSYSNP FTF	RB D	BG 10- 1	>50	>50		
IGH M	IGHV 4-39	CARRDGSYFDYW	IGL	IGLV3 -1	CQAGDSDT VLF	RB D	BG 10- 2	>50	>50		
IGH G1	IGHV 4-39	CARHVS DGQSIGWLY YFDCW	IGL	IGLV3 -21	CQVWDRS SVF	RB D	BG 10- 3	>50	>50		
IGH A1	IGHV 4-31	CARLAPFGERRVDQY YLMDVW	IGK	IGKV 2D-29	CMQSTQLP WTF	RB D	BG 10- 4	>50	>50		
IGH A1	IGHV 4-4	CARAYYYYYMDVW	IGL	IGLV1 -47	CSAWDDS LRGPVF	RB D	BG 10- 5	>50	>50		
IGH M	IGHV 4-61	CARADRGYCTITDCFI FNYW	IGK	IGKV 4-1	CQQYYSTP LTF	RB D	BG 10- 6	>50	>50		
IGH G1	IGHV 3-13	CTRGAHYDFWRGYY TDDHHYMDVW	IGL	IGLV1 -40	CQSYDSRL SAWVF	RB D	BG 10- 7	>50	>50		
IGH A1	IGHV 3-11	CVRGEGGPHDAFDIW	IGL	IGLV3 -21	CQVWDSS RDLRVF	RB D	BG 10- 8	>50	>50		

IGH M	IGHV 3-7	CVRCGYDDWYFDVW	IGL	IGLV3 -1	CQAWDSS TGVF	2P	BG 10- 9	>50	>50		
IGH G1	IGHV 1-8	CGRGPTTAKSGVEWF DPW	IGL	IGLV1 -40	CQSFDSL SGFYVF	RB D	BG 10- 10	0.0 99	0.3 59	0.03 891	0.05 747
IGH A1	IGHV 3-9	CAKDMGWNVFQGLD VW	IGL	IGLV2 -14	CTSYRSSH LQGVF	RB D	BG 10- 11	>50	>50		
IGH A1	IGHV 1-18	CARSWSAYYNWFDP W	IGK	IGKV 3-20	CQHYGSSP PVTf	2P	BG 10- 12	>50	>50		
IGH M	IGHV 3- 15;IG HV3- 15	CTTDRHVRGTYWGA YYYYGMDVW	IGL	IGLV1 -44	CAAWDDS LNGLYVF	RB D	BG 10- 13	>50	>50		
IGH G1	IGHV 3-74	CARAVRISSGYGLYG DSDYFDYW	IGL	IGLV3 -21	CQVWDSSS DPWVF	2P	BG 10- 14	12. 318	>50	8.68 3	9.54 2
IGH M	IGHV 3-48	CARARGDAFDIW	IGL	IGLV1 -51	CGTWDNS LSVGVF	RB D	BG 10- 15	>50	>50		
IGH G1	IGHV 5-51	CARPLFYCSGGSCLT GYW	IGL	IGLV2 -8	CSSYAGSD NWVF	2P	BG 10- 16	>50	>50		
IGH A1	IGHV 3- 74;IG HV3- 74	CARGRRDGNDLAPD YW	IGL	IGLV3 -10	CYSTDSSD NHRVF	2P	BG 10- 17	>50	>50		
IGH A1	IGHV 3- 30;IG HV3- 30-5	CVKDLGAYASGRLA DW	IGK	IGKV 1- 39;IG KVID -39	CQQSYTTP YTF	RB D	BG 10- 18	>50	>50		
IGH G1	IGHV 5-51	CARTQWGYNYGSHF FYMDVW	IGL	IGLV1 -47	CAAWDAS LSGYVF	RB D	BG 10- 19	0.0 09	0.0 26	0.03 334	0.03 846

Table 2B. Amino acid sequences of the variable regions of the antibodies produced and tested (heavy chain sequences (HC), kappa light chain (KC) sequences and lambda light chain (LC) sequences). (SEQ ID NOS: 185-368).

HCBG1-1	TGVHSQVQLQQSGPGLVKPSQTLSTCAISGDSVSSKNAAWNWIRQSPSRGLEWLGTITYYRSKWYN DYAVSVKGRIANPDTSKNQFSLQLHSVTPEDTAVYYCAKQWLANWFDPWGQGTQVTSSAST
HCBG1-3	TGVHSQVQLVQSGAEVKKPGASVKVSCASGYFTSYDINWVRQATGQGLEWMGWMNPNSGNTG YAQKFQGRVTMTRNTSISTAYMELSSLTSEDATVYYCARGRAGYYDFWSTSSLDNGGMDVWGQGT TVTVSSAST
HCBG1-4	TGVHSEVHLVESGGDLVHPGGSLRLSCVASGFTFTDYAMTWVRQAPGKGLEWVSTISNGGTTNTA DSVKGRFTISRDNNSKNTLYLEMSSLSDEDTAIYYCVKDVPSMYIYFWSGQGTYYWGQGLTVTVSSAST
HCBG1-5	TGVHSEVQLVESGGGLVQPGGSLRLSCAASGFTFSYAMSWVRQAPGKGLEWVSTISNSGGTTNYA DSVKGRFTISRDNNSKNTLFLQMNSLRAEDTAVYYCAKDLPSRYDFWWSGQGNYYWGQGLTVTVSSAS T
HCBG1-6	TGVHSQVTLRESGPALVKPTQTLTLTCTFSGFSLSTSGMCVSWIRQPPGKALEWLARIDWDDDKYY TSLRTRLTISKDTSKNQVVL TMTNMDPVDATYYCAREMATITGLDYWGQGLTVTVSSAST
HCBG1-7	TGVHSQVTLRESGPALVKPTQTLTLTCTFSGFSLSTSGMCVSWIRQPPGKALEWLALIDWDDDKYY TSLKTRLTISKDSSKNEVVL TMTNMDPVDATYYCARVPPTDYHFDWSGQGLTVTVSSAST
HCBG1-8	TGVHSQVQLVQSGAEVKKPGASVKVSCASGYFTSYGISWVRQAPGQGLEWMGWISAYNGNTNY AQKLQGRVTMTDTSTSTAYMELRSLRSDDTAVYYCARDTSGYRNPYGYGMDVWGQGTTVTVSSAS T
HCBG1-9	TGVHSEVQLVQSGAEVKKPGESLKISCKTSGYSFASYWIGWVRQMPGKGLEWMGIIPGDSDTIYTP PFQGGVTISADTSTRASLEWRSRLRASDAIYYCATGTFLAVPGDFWGGQGLTVSVSSAST
HCBG1-10	TGVHSEVQLVESGGGLAQPGGSLRLSCAASGFTFSTYSMNWVRQAPGKGLEWVSFISRSSNTIYYAD SVKGRFTISRDNKNSLYLQMNSLRDEDTAVYYCARDLQRYGSGSSLGPNYFDYWGQGTVVTVSSA ST
HCBG1-11	TGVHSQLHLQESGPGLVKPSETLSLTCTASGSSISSSSYYWGWRQPPGKGLEWIGSVYYSGRTYYNP SLKSRVTISVDTSKNQFSLKLSVTAADTAVYYCARRAQYYDSSGYYDAFDIWGQGTTVTVSSAST
HCBG1-12	TGVHSEVQLVESGGGLVQPGGSLRLSCAASGFTFSTYDMHWVRQATGKGLEWVSAIGTAGDTYYP GSVQGRFTISRDNKNSLYLQMNSLRAGDTAVYYCARDVFRYDSSGRPRYAFDIWGQGTMTVTVSSA ST
HCBG1-13	TGVHSQVQLQESGPGLVKPSETLSLTCTVSGGSMSSDYWSWIRQPPGKGLEWIGYIYYRGSTNLNPS LQSRLTMSVDTSKNQFSLKLSVTAADTAVYYCARETRWNWIDSWGQGTPTVTVSSAST
HCBG1-14	TGVHSEVQLVESGGGLIQPGGSLRLSCAASGLTVNSNYMTWVRQAPGKGLEWVSVIYSGGSTFYAD SVKGRFTISRDNNSKNTLYLQMNSLRAEDTAVYYCARDLVYGMVWGQGTTVTVSSAST
HCBG1-15	TGVHSDVQLVESGGVVQPGGSLRLCAASGFTFDDYAMHWVRQAPGKGLEWVSLITRDGGSTHY ADSVKGRFTISRDNNSKNSLYLQMNSLRLEDATFYCAKDGRRDGYNHALDNWGQGLTVTVSSAST
HCBG1-16	TGVHSQVQLVESGGGVVQPGSLRLSCAASGFSFSSHVMHWVRQAPGKGLEWVAVISYDGSNKFY ADSVKGRFTISRDNSSKNTVFLQMNSLRDEDTAMYYCAKGRESTSIGGWFDWPWGQGLTVTVSSAST
HCBG1-17	TGVHSQVTLRESGPSLVKPTQTLTLTCTFSGFSLSTSGMCVSWIRQPPGKALEWLARIDWDDDKFYST SLKTRLTISKGTSRNQVVL TMTNMGPDVATYYCARTIVGGTNWYFDLWGRGTLTVTVSSAST
HCBG1-18	TGVHSQLQLQESGPGLVKPSETLSLTCTVSGGSSISSSSYYWGWRQPPGKGLEWIGNFYIYGSTNYNP SLKSRVTISVDTSRNQFSLKLSVTAADTAVYYCARRVMGSGWLDWSGQGLTVTVSSAST
HCBG1-19	TGVHSEVQLVESGGGLVQPGGSLRLACAVSGLILDDYALHWVRLAPGKGLEWVSGINWNSGTHYA DSVRGRFTISRDNKNSLYLQMNSLRPEDTALYYCAKDMGNFYIYYGLDVWGQGTSTVTVSSAST
HCBG1-20	TGVHSEVLLLESGGGLVQPGGSLRLSCAASGFPFGSYAMSWVRQAPGKGLEWVSVISGSADTTYA DSVKGRFTISRDNNSKNTLYLQMNSLGAEDTAVYYCAKDAPDVVLVPVYYHYGLEWVGQGTTVTV SSAST
HCBG1-21	TGVHSQVQLVESGGGVVQPGSLRLSCAASGFTFRTYDMHWVRQAPGKGLEWVAVISYDGSIKYFA DSVKDRFTISRDNNSQSTLYLQMNSLRAEDTAVYYCARERSGSYYARVELGYWGQGLTVTVSSAST
HCBG1-22	TGVHSEVQLVESGGGLVQPGGSLRLSCSVSGFTVSSNYMNWVRQAPGKGLEWVSVIYPGGSTFYPD SVKGRFTISRDDSKNTLYLQMNSLRPEDTAAYYCASSRPPIGQLVPLDLDFWDPWGQGLTVIVSSA ST
HCBG1-23	TGVHSEVQLVESGGGLIQPGGSLRLSCAASGLTVSSNYMSWVRQAPGKGLEWVSMYPGGSTYYA DSVKGRFTISRDNNSKNTLYLQMNSLRAEDTAVYYCARDYSYRGGGIWGQGTMTVTVSSAST
HCBG1-24	TGVHSQVQLVQSGAEVKKPGSSVKVSCASGFTFSYAISWVRQAPGQGLEWMGRIISMFGIANNA QKFQGRLTITADTSTSTAYMELSSLRSEDATVYYCARGPYIYDSSGYYLDYWGQGLTVTVSSAST
HCBG1-25	TGVHSEVQLVESGGGLIQPGGSLRLSCAASGFIVSRNYMSWVRQAPGKGLEWVSVIYSGGSTFYADA VKGRFTISRDNNSKNTLYLQMNSLRAEDTAVYYCARDMGDVDFDIWGQGTMTVTVSSAST
HCBG1-26	TGVHSQLQLQESGPGLVKPSETLSLTCTVSGGSIYSSDYWGWRQPPGKGLEWIGSMHYSGSTYHS PSLNSRVITISVDPSTNQLSLRLSSATAADTAVYYCAAHITVFGIITGNWFDWPWGQGLTVTVSSAST

HCBG1-27	TGVHSEVQLVESGGGLIQPGGSLRLSCAASGFNLSGNYMSWVRQAPGQGLEWVSLIYAGGYAYYA DSVKGRFTISRDNNSKNMFYLMNSLRAEDTAIYYCARESAAGWGLDPWGQGTLLTVSSAST
HCBG1-28	TGVHSEVQLVESGGGLVQPGGSQRLSCAASGFTFSSYVINWVRQAPGKGLEWVSAISGSGDITYYAD SVKGRFTMSRDNSKNTLYLQMNLSLRAEDTAVYYCAKDLGYSYGSEIFDYWGQGTLLTVSSAST
HCBG4-1	ATGVHSQVRLVESGGGVVQPGRSLRLSCAVSGFTFSSYAMNWVRQAPGKGLEWVTVISYDGSNKY YADSVKGRFTISRDNNSKNTLYLQMNLSLPPDDTAVYYCARARSGSYSAIDYWGQGTLLTVSSAST
HCBG4-2	ATGVHSEVQLLESGGSLVQPGGSLRLSCAASGFTFSSYAMSWVRQAPGKGLEWVSAISGSGGSTYY ADSVKGRFTISRDNNSKNTLYLQMNLSLRAEDTAVYYCAKEAYFTAWLHFPDPWGQGTLLTVSSAST
HCBG4-3	ATGVHSHVQLVESGGGVVQPGRSLRLSCAASGFTFSSYTMHWVRQAPGKGLEWVAVISKEADISYD GNNKYYADSVKGRFTISRDNNSKNTLYLQNLRLRTEDTAVYYCARDRDDYGPYGMVWGQGTLLTVSSAST
HCBG4-4	ATGVHSEVQLVESGGGLVKPGGSLRLSCAASEFTFSNVWMSWVRQAPGKGLEWVGRIKSKTDGGT TDYAAPVKGRFTISRDDSKNTLYLQMNLSLKTEDTGYYCTTGPTVRGVSYYWGQGTLLTVSSAST
HCBG4-5	ATGVHSQVQLMQSGAEVKKPGASVKVSKASGDSFTDYYVHWVRQAPGQGLEWMGWISPYSGGT NYAPKFRGRVTMTRDTSITTAHMLGRLRSDDTAVYFCARSVGYDAFDVWGPGTMTVSSAST
HCBG4-6	ATGVHSEVQLVESGGGLVKPGGSLRLSCAASGFTFSSYTMNWVRQAPGKGLEWVSSISGAPNYIYY ADSVKGRFTISRDNNAKNSLSLQMNLSLRAEDTAVYYCARDLMDYDILTGYYPAGYWGQGTLLTVSSAST
HCBG4-7	ATGVHSQVQLVQSGAEVKKPGASVKVSKASGYTFTGYIMHWVRQAPGQGLEWMGWINLNSGGT NYAQKFQGRVTMTRDTSISTAYMELSLRLRSDDTAVYYCARGPPPAITMIVVTVVTSWGQGTLLTVSSAST
HCBG4-8	ATGVHSEVQLVQSGAEVKKPGESLRISCKGSGYSFTSYWISWVRQMPGKGLEWMGRIDPSDSYTN SPSFQGHVTISADKSISTAYLQWSSLKASDTAMYYCARLETTVTTDWFDPWGQGTLLTVSSAST
HCBG4-9	ATGVHSEVQLVESGGGLAQPGRSLRLSCRCSGFRFGDYAVNWVRQFPKGPEWIGFIRKTFGAATQ YAAVKGRFTISRDDSQSVAYLQMNRLITDDTAVYYCTIGNWHGSGNNIMHDYWGQGTLLTVSSAST
HCBG4-10	ATGVHSQVQLVQSGAEVKKPGASVKVSKASGYIFTGYIHWVRQAPGQGLEWMGWINPISGGTN YAAQKFQGRVTATRDTSITTAAYMELTSLTSDDTAVFYCARDRWFGKLEGSFDVWGQGTMTVSSAST
HCBG4-11	ATGVHSQVQLQQWGAGLLKPSETLSLTCVYDESFSYYWTWIRQPPGKGLEWIGEINHSGSTNYN PSLKSRTISVDTSKNQFSLRLSSVTAADTAVYYCARDTVVVVGAHAFDIWGQGTMTVSSAST
HCBG4-12	ATGVHSQLQLQESGPGLVKPSSETLSLTCIVSGGSISSSSYYWGWRQPPGKGLEWIGTIYNSGSTHYNP SLRSRTISVDTSKSHFSLKLSSVTAADTAVYYCARPQVLYYGSYSYSHWFDPWGQGTLLTVSSAST
HCBG4-13	ATGVHSEVQLVESGGGLVQPGGSLRLSCAASGFTFSSYEMNWVRQAPGKGLEWVSYISSSGSTIYYA DSVKGRFTISRDNNAKNSLYLQVNSLRAEDTAVYYCARGSGWYVGFYWGQGTLLTVSSAST
HCBG4-14	ATGVHSQVQLVQSGAEVKKPGASVKVSKASGYTFTGYIHWVRQAPGQGLEWMGWINPNSGGT NYAAQKFQGRVTMTRDTSISTAYMELSLRLRSDDTAVYFCARVTTIPQYDYGDIYGGMDVWGQGT TVTVSSAST
HCBG4-15	ATGVHSQVQLQESGPGLVKPSSETLSLTCVSGGSISSYYWSWIRQPPGKGLDWIGYIYSGSTNYNPS LKSRTISVDTSKNQFSLKLSSVTAADTAVYYCARDLGQDWGQGTLLTVSSAST
HCBG4-16	ATGVHSQVQLQESGPGLVKPSQTLSTCTVSGGSISSGSSYWSWIRQAPGKGLEWIGRIYTSGSTNYN PSLKSRTISVDTSKNQFSLKLSSVTAADTAVYYCARDIFGSGSPSGVAFDYWGQGTLLTVSSAST
HCBG4-17	ATGVHSEVQLVESGGGLIQPGGFLRLSCAASGLTVSSNYMNWVRQAPGKGLEWVSVIYSGGSTYYA DSVKGRFTISRDNNSKNTLYLQMNLSLRAEDTAVYYCARESYGMDVWGQGTLLTVSSAST
HCBG4-18	ATGVHSQVQLVQSGAEVKKPGSSVKVSKASGFTFSNYAVSWVRQAPGQGLEWMGGIISIFATANY AAQKFQGRVTITADESTSTAYMELSSLRSEDATVYYCARVKEWGSYSDSGSHGKNYFDYWGQGTLLTVSSAST
HCBG4-19	ATGVHSQVQLVQSGAEVKKPGASVKVSKASGYTFTGYSMHWVRQAPGQGLEWMGWINPNSGGT NYAAQKFQGRVTMTRDTSISTTYMELSLRLRSDDTAVYYCARDGYSSSIFIPGRNYYGMDVWGQGT TVTVSSAST
HCBG4-20	ATGVHSQVHLVQSGAEVKKPGASVKVSKASGYTFTSYGINWVRQAPGQGLEWMGWISAYNGNT NYAAQKLQGRVTMTTDTSTSTAYMELSLRLRSDDTAVYYCARPRGRLITFGGLIVTTLDYGGMDVW GQGTLLTVTVSSAST
HCBG4-21	ATGVHSQVQLVQSGPEVKKPGASVRVSKTSGHTFTDYWIQWVRQAPGQGLEWMGWIELSTGGTN YAPKFQGRVAMSSDTSIRTAYMDLWSLTSDDTALYYCATDKADTSWWEFDPWGQGTLLTVSSAST
HCBG4-22	ATGVHSEVQLVESGGGLVQPGASLRLSCAASGFTVSSNYMSWVRQAPGKGLEWVSVIYSGGSTYY ADSVKGRFTISRHNSENTLYLQMNLSLRAEDTAVYYCARFSKLYQWSFDIWGQGTMTVTVSSAST
HCBG4-23	ATGVHSEVQLVESGGGLVQPGGSLRLSCAASGFTVSSNYMSWVRQAPGKGLEWVSVIYSGGSTYYA DSVKGRFTISRHNNSKNTLYLQMNLSLRAEDTAVYYCARGTHYSGSYHHWGQGTLLTVSSAST
HCBG4-24	ATGVHSEVQLVESGGGLIQPGGSLRLSCAASGLTVSSNYMNWVRQAPGKGLEWVSVIYSGGSTFYA DSVKGRFTISRDNNSKNTLYLQMNLSLRAEDTAVYYCVRDLDYGGMDVWGQGTLLTVTVSSAST
HCBG4-25	ATGVHSEVQLVESGGGLIQPGGSLRLSCAASGITVVRNYMTWVRQAPGKGLEWVSVIYSGGTYYA DSVKGRFTISRDNNSKNTMYLQMNLSLRAEDTAIYYCARDLEVVGAMDVWGQGTLLTVTVSSAST

HCBG4-26	ATGVHSEVQLVESGGGLIQPGGSLRLSCAASGVIVSSNYMSWVRQAPGKGLEWVSVIYSGGSTYYA DSVKGRFTISRDKSKNTLYLQMNSLRAEDTAVYYCAREGPHGMDVWGQGTITVTVSSAST
HCBG4-27	ATGVHSEVQLVESGGGLVQPGGSLRLSCAASGFTILSNYMSWVRQAPGKGLEWVSVIYSGGSTYYA DSVKGRFTISRHNKNTLFLQMNSLRVEDTAVYYCARGPVRGVITHFDYWGQGTITVTVSSAST
HCBG7-1	ATGVHSQVQLVESGGGVVPRGSLRLSCAASGFTFSTYGMHWVRQAPGKGLEWVAIISYDGNKYY YTDSVKGRFTISRDNKSNMYYLQMNSLRAEDTAVYYCVKSSSGWYLRGLGYWGRGTLTVTVSSAST
HCBG7-2	ATGVHSEVQLVESGGGLIQAGGSLRLSCTASGFSVSGNYMNWVRQAPGQGLEWVSVIYTDDTTYYP DSVKGRFTISRDNKNTLYLQMNSLRAEDTAVYYCAREGRRGQWSWFDPWGQGTITVTVSSAST
HCBG7-3	ATGVHSEVQLVESGGGLIQPGGSLRLSCTASTFTVSSNYMSWVRQAPGKGLEWVSVIYTGGSTYYA DSVKGRFTISRDNKNTLYLQVNSLRAEDTAVYYCAGSPVRGVITHFDYWGQGTITVTVSSAST
HCBG7-4	ATGVHSQVQLQESGPGLVKPSETLSLTCIVSGGSVSSSYYSWVRQPPGKGLEWIGYVDYSGSTNY NPSLKSRTMSVDTSKNQFSLRLSSVTAADTAMYYCARVDRRYCIITSCYIFDYWGQGTITVTVSSAS T
HCBG7-5	ATGVHSQVQLVESGGGVVQPRSLRLSCAASGFTFSSYAMNHWVRQAPGKGLEWVAVISYDGGNKYY YADSVKGRFTISRDNKNTLYLQMNSLRAEDTAVYYCARGRDGYYYGMDVWGQGTITVTVSSAST
HCBG7-6	ATGVHSQVQLVQSGAEVKKPGASVKVSCASGYTFTGYSIHWVRQAPGQGLEWMGWNPYTGDT YVQKFQGCVTMTTRDTSISTAYMELSLRSDDTAVYYCARAPPFSSSSIGVDYWGQGTITVTVSSAST
HCBG7-7	ATGVHSQVQLVQSGAEVKKPGASVKVSCASGYSFSDYYLQWVRQAPGQGLEWMGWNPYSGGT HYAQKFQGRVTMTTRDTSISTAYMELSSLRSDDTAVYYCAKDHCAATTNCFEYLYFGMGVWGQGTITV TVSSAST
HCBG7-9	ATGVHSQVQLQESGPKQVKPSETLSLCTVSGASMSSYYWFWLRQAPGKGLEWIGRIYSGGSTNYN PSFKSRVTMSVDTSKNQFFLELSSVTAADTAVYYCARDLTYGSGNGYTNWGQGTITVTVSSAST
HCBG7-10	ATGVHSEVQLVESGGGLIHPGGSLRLSCAASGFTVTSNYMSWVRQAPGKGLEWVSVIYSGGSTYYA DSVKGRFTISRDNKNTLYLQMNSLRAEDTAVYYCASSPVRGVITQFDYWGQGTITVTVSSAST
HCBG7-11	ATGVHSEVQLVQSGAEVKKPGESLKISCKGSGYFTFTNYWIAWVRQMPGKGLEWMGAIPYDSDTR YSPSFQGVQVTSADKSISTAYLQWSSLKASDTAMFYCARHDSKVTNDYWGQGTITVTVSSAST
HCBG7-12	ATGVHSQVQLVESGGGVVQPRSLRLSCAASGFTFSIYAMHWVRQAPGKGLEWVAVISYDGSNKYY YADSVKGRFTISRDNKNTLYLQMNSLRVEDTAVYYCARDRSGSYRPGYWGQGTITVTVSSAST
HCBG7-13	ATGVHSQVQLVESGGGVVQPRSLRLSCAASGFTFSSYGMHWVRQAPGKGLEWVAVISYDGNKYY YADSVKGRFTISRDNKNTLYLQMNSLRPEDTAVYYCAQTGGSYFGPDFYWGQGTITVTVSSAST
HCBG7-14	ATGVHSEVQLVESGGGLVQPGSLRLSCAASGFTFEDYAMHWVRQTPGKGLEWVSGISWNGGIIGY ADSVKGRFTISRDNKNTLYLQMRSLRAEDTALYYCAKDILYGDYVGGFAYWGQGTITVTVSSAST
HCBG7-15	ATGVHSQVQLVQSGAEVKKPGASVKVSCASGYTFTSYAISWVRQAPGQGLEWMGWVSAYNNGT NYAQKLQGRVTMTTDTSTNTAYMELSLRSDDTAIYYCAIPYSSVTFDCWGQGTITVTVSSAST
HCBG7-16	ATGVHSEVQLVESGGGLVQPGGSLRLSCVASGFTVTNNFMNWRQAPGMGLEWVAVVYPGGGSDY SDSVKGRFTISRDNKNTVYLQMNSLRSEDTAIYYCARDSQPHYYYGVVDVWGQGTATVTVSSAST
HCBG7-17	ATGVHSEVQLVQSGAEVKKPGESLKISCKVSGYRFTSYWIGWVRQMPGKGLEWMGMIYLSDDSR VGPSFRGQVTSADKSISTAYLQWSSLKTSDSAVYYCAKKKDDRAEAVFDYWGQGTITVTVSSAST
HCBG7-18	ATGVHSEVQLMESGGGLIQPGGSLRLSCAASGFIVSSNYMSWVRQAPGKGLEWVSVIYSGGGTDYA DSVKGRFTISRDNKNTLFLQMNSLRAEDTAVYYCARGAAMVKELFDYWGQGTQVTVSSAST
HCBG7-19	ATGVHSEVQLVESGGGLVQPGGSLRLSCAASGFTFSTYWMWVRQAPGKGLEWVANIKEDGSEK YYVDSVKGRVTISRDNKNTLYLQMNSLRVEDTAVYYCARVRLQGGIDYWGQGTITVTVSSAST
HCBG7-20	ATGVHSQVQLVQSGAEVKKAGASVKVSCASGYTFTSYDINWVRQASGQGLEWMGWMNPISGNT GYAQKFQGRVTMTNTSITTAYMELSSLRSEDTAIYFCARGGRYCSSTTCYSGVGMDVWGQGTITV TVPSAST
HCBG10-1	ATGVHSEVQLVESGGGLVQPRSLRLSCAASGFTFDEYAMHWVRQAPGKGLEWVSGISWSSVSIAY ADSVKGRFTISRDKAKNSLYLQMNSLRAEDTALYYCAKSNSGLTPFDHWGQGLLTVTVSSAST
HCBG10-2	ATGVHSQLQLQESGPGLVKPSETLSLCTVSGGSISGSSYQWGWVRQPPGKGLAWIAGIHYSGSTYY NPSLKSRTVTSVETSKNQFSLRLYSVTATDTSLYYCARRDGSYFDYWGQGTALTVTVSSAST
HCBG10-3	ATGVHSQLQLQESGPGLVKPSETLSLCTVSGDSMSSRSYYWGWVRQPPGKGLEWIGIYYSGDTYY DPSLKSRTVTSVDTSKIQFTLNLSSVTAADTAVYYCARHVSQGQSIGWLYYFDCWGQGTITVTVSSAS T
HCBG10-4	ATGVHSQVQLQESGPQFVKPSQTLSTCTVSGGSLSSGGYYWTWIRQHPGKGLEWIGYISSSGSTFYN PSLKSRTISIDTSENQFSLKVSSVTAADTAVYYCARLAPFGERRVDQYYLMDVWGQGTITVTVSSAST
HCBG10-5	ATGVHSQVQLQESGPGLVRPSGTLSTCGVSGGSISSNNWWSWVRQPPGKGLEWIGIHYSGGTNY NPSLKSRTVTSISLDRSTNQFSLRLTSVTAADTAVYYCARAYYYYMDVWAEGTTVTVASAST
HCBG10-6	ATGVHSQVQLQESGPGLVKPSETLSLCTVSGGISSTSYYSWVRQPPGKGLEWIGIYYSGNTNY NPSLKSRTVMSVDTSKNQFSLKLSSVTAADTAVYYCARADRGYCTITDCIFNYWGQGTITVTVSSAS T
HCBG10-7	ATGVHSEVQLVESGGGLVQPGESLRLSCTASAFSVNTYDMYWVRQPTGKGLEWVSTIRVTGDTYYYP DSVKGRFTISRRESATNSLYLQMNSLRAGDTAIYYCTRGAHYDFWRGYYTDDHHYMDVWGKGTITV VSSAST

HCBG10-8	ATGVHVSQMELVESGGGLVKPGGSLRLSCASSGFSLDYYMTWIRQAPGKGLEWVSYISRS DGKTFY ADSVKGRFTLSTDDGKSLYLQMNLSRAEDTAVYYCVRGEGGPHDAFDIWGQGTMTVTVSSAST
HCBG10-9	ATGVHSEVQLVESGGGLVQPGGSLRLSCAASGFTFRNYWMSWVRQAPGKGLEWVANIKQD GSEKY YVDSVKGRFTISRDN AKNSLYLQMNLSRAEDTAVYYCVRCGYDDWYFDVWGRGTLTVTVSSAST
HCBG10-10	ATGVHVSQVQLVQSGAEVKKPGASVKVSCASGYIFTNYDINWVRQATGQGLEWMGWMNPNSGNA GYAQKFQGRVTMTNRNTSITTAYMELSSLRSED TAVYYCGRGPTTAKSGVEWFDWPWGQGT LTVTVSSA ST
HCBG10-11	ATGVHSEVQLEESGGGLVQPGRSLRLSCVASGFSFDDYAVHWVRQAPGKGLEWVSGINWNSDSTD YADSV EGRFTISRDN AKKS VYLQMRSLRAEDSALYYCAKDMGWNV FQGLDVWGQGT TTVTVSSAST
HCBG10-12	ATGVHVSQVQLVQSGAEVKKPGASVKVSCMASGFSFTSFVISWVRQAPGQGLEWMGWISAYNGNTD Y AQKFQGRVTMTTDTSTSTAYMELRSLRSDDTAIYYCARSWSAYYNWFDWPWGQGT LTVTVSSAST
HCBG10-13	ATGVHSEVQLVESGGDLVKPGGSLRLSCTVSRFTFKNAWMSWVRQAPGKGLEWVGRIKSKADGGT TDYAAPVRTRFTISRDDSKNTLYLQMNLSLTSED TAVYYCTDRHVRGTYWGAYYYYGMDVWGQG TTTVTVSSAST
HCBG10-14	ATGVHSEVQLVESGGGLVQPGGSLRLSCAASGFTFSSYWMHWVRQAPGKGLVWVSRINNDGSSTS YADSVKGRFTISRDN AKNTLYLQMNLSRAEDTAVYYCARAVRISSGYGLYGDSDFDYWGQGT LTV TVSSAST
HCBG10-15	ATGVHSEVQLVESGGGSVQPGGSLRLSCAASGFTFSPYSMTWVRQAPGKGLEWVSYISSSSTIHYA ESVKGRFTISRDNARDSLYLQMNLSLKDEDTAVYYCARARGDAFDIWGQGTMTVTVSSAST
HCBG10-16	ATGVHSEVQLVQSGAEVKKPGESLRISCKGFYGYFPSYWIWVRQMPGKGLEWMGIYPGDSGTRY SPSFRGQVTISADRSISTAYLQWSSLKASDTAIYYCARPLFYCSGGSCLTGYWGQGT LTVTVSSAST
HCBG10-17	ATGVHSEVQLVESGGGLVQPGGSLRLSCAASGFTFSSYCMHWVRQAPGKGLVWVSRISKSDSGTTY ADSVQGRFTISRDN AKNALFLQMNLSRAEDTAVYYCARGRRDGNLAPDYWGQGT LTVTVSSAST
HCBG10-18	ATGVHVSQVQLVESGGGVVQPGRSLRLSCAASGFPFIISGMHWVRQAPGKGLEWVAVLSFDGSNEY ADSVKGRFTISRDN SKNTLYLQIDSLGPEDTAVYYCVKDLGAYASGRLADWGQGT LTVTVSSAST
HCBG10-19	ATGVHSEVQLVQSGAEVKKPGESLKISCKSGSYFTSYWIGWVRQMPGKGLEWMGVITYPGDSDTRY SPSFQGGQVTISADKSISTAYLQWSSLKASDTAMYYCARTQWGYNYGSHFFYMDVWGKGTTTVTVSS AST
KCBG1-1	TGVHSEIVLTQSPGTLSPGEGTTLSCRASQSVSSSYLAWYQQKPGQAPRLLIYGASGRATGIPDRFS GSGSGTDFTLISRLEPEDFAVYYCQQSESSPYTFGQGT KLEIKRT
KCBG1-4	TGVHSDIQMTQSPSTMSASVGDRVTITCRASQSNLWYQQKPGKAPNLLIYKASSLESQVPSRFS GSGSGTEFTLTISLQPDDEFATYYCQQYNTYSPITFGQGT RLEIKRT
KCBG1-5	TGVHSDIQMTQSPSTLSASVGDRVTITCRASQNNISRLAWYQQKSGKAPKPLIYKASSLESQVPSRFS GGGSGTEFTLTISLQPDDEFATYYCQQYNSYSITFGQGT RLEIKRT
KCBG1-6	TGVHSDIQMTQSPSSLASVGDRVTITCRASQNNIRRYLNWYQQKPGNAPKLLIYAASSLQSGVPSRFS GSGSGTDFTLTISLQPDDEFATYSCQQSYSTPRTFGQGT KVEIKRT
KCBG1-7	TGVHSEIVLTQSPGTLSPGERAALSCRASLPISARYLAWYQQKPGQTPRLLIYGASSRATGIPDRFS GSGSGTDFTLISR LDPEDFAVYYCQHYGSSPPLTFGGGT KVEIKRT
KCBG1-8	TGVHSEIVLTQSPATLSLSPGERATLSCRASQSVSSYLAWYQQKPGQAPRLLIYDASNRATGIPARFSG SGSGTEFTLTISLQPEDFAVYYCQQRSNWPPWTFGQGT KVEIKRT
KCBG1-10	TGVHSDIQLTQSPSFLASVGDRVTITCRASQGISSYLAWYQQKPGKAPKLLIYAASLQSGVPSRFSG SGSGTEFTLTISLQPEDFAVYYCQQLDTPRFGGGT KVDIQT
KCBG1-11	TGVHSEIVLTQSPGTLSPGERATLSCRASQSVNSRFLAWYQQKPGQAPRLLIYAASSRATGIPDRFS GSGSGTDFTLTISLQPDDEFATYYCQQYNSYSTFGQGT KVEIKRT
KCBG1-12	TGVHGDIVMTQSPSLPVTGPGEASISCRSSQSLLHSNGYNYLDWYLQKPGQSPQLLIYLSNRRASGV PDRFSGSGSGTDFTLKISRVEAEDVGYYCMQALQTPLTFGPGTKVDIKRT
KCBG1-13	TGVHSDIVMTQSPDSLAVSLGERATISCKSSQSVSYTSNNKSYLAWYQQKAGQPPKLLIYWASTRES GV PDRFSGSGSGTDFSLTISLQAEDEVAVYYCQQYHNTPTWTFGQGT KVEIKRT
KCBG1-14	TGVHSDIQLTQSPSFLASVGDRVTITCRASQGISSYLAWYQQKPGKAPKLLIYAASLQSGVPSRFSG SGSGTEFTLTISR LQPEDFAVYYCQQLNSYPPYTFGQGT KLEIKRT
KCBG1-15	TGVHSDIQMTQSPSTLSASVGDRVTITCRASQSISSWLAWYQQKPGKAPKLLINRASSLESQVPSRFSG SGSGTEFTLTISLQPDDEFATYYCQQYSSYPTFGQGT KVEIKRT
KCBG1-16	TGVHSDIQMTQSPSSLASVGDRVTITCRASQIGNYLAWFQQKPGKAPKSLIYVASSLQSGVPSKFS GSGSGTDFILSISSLQPEDFAVYYCQHYNAYPITFGQGT RLEIKRTV
KCBG1-19	TGVHGDVVLTQTPLSLSVTPGQPASISCKSNQSLHSDGKTYLYWYFQRPQPPQLLIYEVSNPFSGV PYRFSGSGSGTDFTLKISRVEAEDVGYYCMQTIHLPRVTFGQGT RLDIKRT
KCBG1-20	TGVHSEIVLTQSPGTLSPGERATLSCRASQSVTGNFLSWYQQKPGQAPRLLIYGASSRATGIPDRFS GSGSGTDFTLISRLEPEDFAVYYCQHYGSSRRTFGQGT KVEIKRT
KCBG1-23	TGVHSDIQMTQSPSSLASVGDRVTITCQASQDISNYLNWYQQKPGKAPKLLIYDASNLQIGVPSRFS GSGSGTDFTFITISLQPEDATYYCQQYDNLPTFGGGT KVEIKRT
KCBG1-24	TGVHSEIVLTQSPGTLSPGERATLSCRASQSVGSGYLAWYQQRPGQAPRLLIYGASSRATGIPDRFS GSGSGTDFTLISRLEPEDFAVYYCQQYAGSPRTFGQGT RLEIKRT

KCBG1-25	TGVHSDIQLTQSPSFLSASVGDRVTITCRASQGISSYLAWYQQKPGKAPKLLIYAASLTQSGVPSRFS SGSGTEFTLTISLQPEDFATYYCQQLNSSPKLTFGGGKVEIKRT
KCBG1-27	TGVHSDIQLTQSPSSLSASVGDRVTITCRASQSMSTYLNWYQQKAEKAPKLLIYAASLTQSGVPSRFS SGSGTDFTLTISLQPEDFATYYCQQSYPYTFGGGKLEVKRT
KCBG1-28	TGVHSDIQLTQSPSSLSASVGDRVTITCRASQISGYLNWYQHKAGKAPKLLIYAASLTQSGVPSRFS SGSGTDFTLTISLQPEDFATYYCQQSYSTPVFGGKLEIKRT
KCBG4-1	TGVHSDIQLTQSPSSLSASVGDRVTITCRASQDISNYLNWYQQKPGKAPKLLIYDASNLETGVPSRFS SGSGTDFTLTISLQPEDATYYCQQYDYLPLTFGGGKVEIKRT
KCBG4-2	TGVHSEIVLTQSPGTLSPGERATLSCRASQSVSSSYFAWYQQRPQGAPRLLIYGASSRATGIPDRFS SGSGTDFTLTISRLEPEDFAVYYCQQYGSSLTFGGGKVEIKRT
KCBG4-6	TGVHSDIVMTQSPDSLAVSLGERATINCKSSQSVLYSSNNKNYLAWYQQKPGQPPKLLIYWASTRES GVPDRFSGSGSGTDFTLTISRSLQAEDVAVYYCQQYFSTPPSTFGGGKVEIKRT
KCBG4-7	TGVHSDIVMTQSPSLPVPTEGPASISCRSSQSLLSHNGYNYLDWYLQKPGQSPQLLIYLGSNRASGV PDRFSGSGSGTDFTLKISRVEAEDVGYYCMQALQTPYTFGGGKLEIKRT
KCBG4-9	TGVHSDIVLTQSPDSLGVSLGERATINCRATETVLYSPHNRYLNWYQQKAGQPPKLLFYWATTREN GVPDRFSATGSATDFLTIVNSLQAEDVAVYYCHQYYLVPTFGPGTRVDIKRT
KCBG4-11	TGVHSDIVMTQSPDSLAVSLGERATINCKSSQSVLYSSNNKNYLWYQQKPGQPPKLLIYWASTRES GVPDRFSGSGSGTDFTLTISLQAEDVAVYYCQQYTTPLTFGGGKVEIKRT
KCBG4-15	TGVHSEIVLTQSPGTLSPGERATLSCRASQSVSTIYLAWYQQKPGQAPRLLIYAASSRATGIPDRFS SGSGTDFTLTISRLEPEDFAVYYCQQYGSSPWTFGGKVEIKRT
KCBG4-17	TGVHSEIVLTQSPGTLSPGERATLSCRASQSISSYLAWYQQKLGQAPRLLMYGASSRATGIPDRFS SGSGSDFTLTISRLEPEDFAVYFCQQYGSSPFTFGGKVEIKRT
KCBG4-19	TGVHSEIVMTQSPAALSVSPGERATLSCRASQSVTSNLAWYQQKPGQAPRLLIYGASTRATGIPARFS SGSGTEFTLTISLQSEDFAVYYCQFNWPRGTFGGKVEIKRT
KCBG4-20	TGVHSDIVMTQSPSLPVPTEGPASISCRSSQSLLSHNGYNYLDWYLQKPGQSPQLLIYLGSDRAFGV PDRFSGSGSGTDFTLKISRVEAEDVGYYCMQALQTPVTFGGGKVEIKRT
KCBG4-23	TGVHSEIVMTQSPATLSVSPGERATLSCRASQSVSSNLAWYQQKPGQAPRLLIYGASTRATGIPARFS SGSGTEFTLTISLQSEDFAVYYCQQYNNWPPGLKITFGGKTRLEIKRT
KCBG4-24	TGVHSDIQLTQSPAFLSASVGDRVTITCRASQGISSYLAWYQQRPKGAPKLLIYAASLTQSGVPSRFS SGSGTEFTLTISLQPEDFATYYCQQLNSSPSLTFGGGKVEIKRT
KCBG4-25	TGVHSEIVLTQSPGTLSPGERATLSCRASQSVSSYLAWYQQKPGQAPRLLIYGASSRATGIPDRFS SGSGTDFTLTISRLEPEDFAVYYCQQYGSPMYTFGGKLEIKRT
KCBG4-26	TGVHSDIQLTQSPSSLSASVGDRVTITCRASQDISNYLNWYQQKPGKAPKLLIFDASNSETGVPSRFS SGSGTDFTLTISLQPEDATYYCQQYDNLPTFGGKLEIKRT
KCBG7-1	ATGVHSDIVMTQSPSLPVPTEGPASISCRSSQSLLSHNGYNYLDWYLQKPGQSPQLLIYLGSNRASG VPDRFSGSGSGTDFTLKISRVEADDVGYYCMQALQTPTFGGGKVEIKRT
KCBG7-2	ATGVHSEIVLTQSPGTLSPGERATLSCRASQSVSSYLAWYQQKPGQAPSLIYGASHRATGIPDRF SGSGTDFTLTISRLEPEDFAVYYCQQFGSSPLYTFGGGKLEIKRT
KCBG7-4	ATGVHSDIVMTQSPDSLAVSLGERATINCKSSLSVLYSSNNKNYLAWYQQKPGQPPKLLIYWASTRE SGVPDRFSGSGSGTDFTLTISGLQAEDVAVYYCQQYSTPITFGGKTRLEIKRT
KCBG7-5	ATGVHSDIQLTQSPSFLSASVGDRVTITCRASQGINSYLAWYQQKPGKAPKLLIYAASLTQSGVPSRFS SGSGTEFTLTISLQPEDFATYYCQQLNSLFTFGPGTKVDIKRT
KCBG7-6	ATGVHSDIQLTQSPSSLSASVGDRVTITCRASQAISNYLAWFQQKPGKAPKSLIYAASLTQSGVPSKF SGSGTDFTLTISLQPEDFATYYCQQYNSYPLTFGGGKVEIKRT
KCBG7-7	ATGVHSDIVVTQSPSLPVPAPGEPASISCRSSQSLLSHNGYNYLDWYLQKPGQSPQLLIYLGSNRASG VPDRFSGSGSGTDFTLKISRVEAEDVGYYCMQSLQTRTFGGGKVEIKRT
KCBG7-9	ATGVHSDIQLTQSPSTLSASVGDRVTITCRASQISRWLAWYQQTPGKAPKLLIYKASSLESVPSRF SGSGTEFTLTISLQPDFAVYYCQQYNTYFWTFGGGKVEIKRT
KCBG7-11	ATGVHSEIVLTQSPATLSLSPGERATLSCRASQSVPTYLAWYQQKPGQAPRLLIYDASNRTGVPARF SGSGTDFTLTISLEPEDFAVYYCQQRDWPFTFGGKLEIKRT
KCBG7-12	ATGVHSDIQLTQSPSSLSASVGDRVTITCRASQDISNYLNWYQQKPGKAPKLLIYDASNLETGVPSRF SGSGTDFTLTISLQPEDATYYCQQYGNLPLTFGGGKTRLEIKRT
KCBG7-15	ATGVHSEIVLTQSPGTLSPGERATLSCRASQSVSGTFLAWYQQKPGQAPRLLISGASSRATGIPDRF SGSGTDFTLTISRLEPEDFAVYYCQQYGSSRPTFGGKLEIKRT
KCBG7-18	ATGVHSDIVMTQSPDSLAVSLGERATINCKSSQSVLYSSNNKNYLAWYQQKPGQPPKLLIYWASTRE SGVPDRFSGSGSGTDFTLTITSLQAEDVAVYYCQQYSTPLTFGGGKVDIKRT
KCBG10-1	ATGVHSDIQLTQSPSSLSASVGDRVTITCRASHSISDYLWYQQKPGKAPKLLIYAASLTQSGVPSRF SGSGTDFTLTISLQPKDFATYYCQQSYSNPFTFGPGTKVDIKRT
KCBG10-4	ATGVHSDIVMTQTPSLSVTPGQASFSRSESLLYSDGKTYLHWYLRKPGQPPQLLIYEVSKRFSG VPDRFSGSGSGTDFTLKISRVEAEDVGYYCMQSTQLPWTFGGKVEIQRT
KCBG10-6	ATGVHSDIVMTQSPDSLAVSLGDRATINCKSSQNLLFSSNNKNYLAWYQQKPGQPPKLLIYWASTRE SGVPDRFSGSGSGTDFTLTITSLQAEDVAVYYCQQYSTPLTFGGGKVEIKRT

KCBG10-12	ATGVHSEIVLTQSPGTLSPGERATLSCRASQSVSSIYLAWYQQKPGQAPRLLIYGASSRATGIPDRF SGSGSGTDFLTISRLEPEDFAVYYCQHYGSSPPVTFGQGTKLEIKRT
KCBG10-18	ATGVHSDIQMTQTPSSLSASVGDVRSITCRASQNIHFTLIWYLQRPQKAPNFLIYAASSLQSGVPSRFS GSGSETDFLTITSLQPEDFGTYCQQSYTTPYTFGQGTKLEIKRT
LCBG1-3	TGSWAQSFLTQPPSASGTPGQRTVITSCSGSSSNIGSNYVYVYQQLPGTAPKLLIYRNNQRPSGVPDRF SGSKSGTSASLAISGLRSEDEADYYCAAWDDSLSGVVFVGGGTKLTVLGQPKAAPSVTLPFP
LCBG1-9	TGSWANFMLTQPHSVSDSPGRVTITISCTRSSGDIASSYVQWYQORPGSVPTTVIHENSERPSGVPDRF SGSIDTSSNSASLTISGLQTEDEAVYYCQSYDSGRQGVFVGGGTKLTVLGQPKAAPSVTLPFP
LCBG1-17	TGSWAQSFLTQSPSASGTPGQRTVITSCSGSSSNIGGNTVNWYQQLPGTAPKLLIYSNNQRPSGVPDRF SGSKSGTSASLAISGLQSEDEADYYCASWDDSVNGVFVGGGTKLTVLGQPKAAPSVTLPFP
LCBG1-18	TGSWAQSALTQPASVSGSPGQSITISCTGTSSDVGGYNYVSWYQHPGKAPKVMYDVRNRPSGVSN RFGSGKSGNTASLTISGLQAEDEADYYCSSYTSSSTWVFGGGLTKLTVLGQPKAAPSVTLPFP
LCBG1-21	TGSWAQSALTQPASVSGSPGQSITISCTGTSSDVGGYNYVSWYQHPGKAPKLMYEVSNRPSGVSN RFGSGKSGNTASLTISGLQAEDEADYYCSSYTSSITGVFGGGLTKLTVLGQPKAAPSVTLPFP
LCBG1-22	TGSWAQSFLTQPPSVSGAPGQRTVITSCGTSSSNIGAGYVHWYQHPGTAPKLLIYGNSNRPSGVPD RFGSGKSGTSASLAITGLQAEDEADYYCQSYDSRLSGWVFGGGLTKLTVLGQPKAAPSVTLPFP
LCBG1-26	TGSWAQSFLTQPPSVSGAPGQRTVITSCGTSSSNIGAGYDVHWYQQLPGTAPKLLIYGNNNRPSGVPD RFGSGKSGTSASLAITGLQAEDEADYYCQSYASSLSVHVVFVGGGTKLTVLGQPKAAPSVTLPFP
LCBG4-3	TGSVTSFELTQPSSSVSPGQTVTITCSGDLVLEKKYVRWFQQRPGQAPILVIYKTERPSRIPERFSGSS SGTTVSLIITGAQVEDEADYYCYSVADNMGVFVGGGTKLTVLGQPKAAPSVTLPFP
LCBG4-4	TGSNSQAVVTQEPSTVSPGGTVTLTCGSTTGAVTSGHYPYWFQKPGQAPRTLIYDTNNKHSWTPA RFGSGLLGGKAALTLGAQPEDEAEYCYLLSYSGAWVFVGGGTKLTVLGQPKAAPSVTLPFP
LCBG4-5	TGSWAQSFLTQPPSASGTPGQRTVITSCSGSSSNILNNYVYVYQQLPGTAPKLLIYRNNQRPSGVPDR FSGKSGTSASLAISGLRSEDEADYYCAAWDDSLFVVFVGGGTKLTVLGQPKAAPSVTLPFP
LCBG4-8	TGSWAQSALTQPASVSGSPGQSITISCTGTSSDVGGYNYVSWYQHPGKAPKLMYDVSNRPSGVSN RFGSGKSGNTASLTISGLQAEDEADYYCSSYTRGNYVFGTGKTVTLGQPKANPTVTLFP
LCBG4-10	TGSWAQSALTQPASVSGSPGQSITISCTGTSSDVGGYNLVSQYQHPKAPKLMYAAANKRPSGVSN RFGSGKSGNTASLTISGLQAEDEAHYYCCSYATGSSVVFVGGGTKLTVLGQPKAAPSVTLPFP
LCBG4-12	TGSWAQSFLTQPPSVSGAPGQRTVITSCGTSSNIGAGYDVHWYQQLPGTAPKLLIYANSNRPSGVPDR FSGKSGTSASLAITGLQAEDEADYYCQSYDSSLASVWVFGTGKTVTLRQPKANPTVTLFP
LCBG4-13	TGSWAQSFLTQPPSASGTPGQRTVITSCSGSNSNIGSNYVYVYQQLPGTAPKLLIYRNNQRPSGVPDRF SGKSGTSASLAISGLRSEDEADYYCAAWDDSLALVFVGGGTKLTVLGQPKAAPSVTLPFP
LCBG4-14	TGSWAQSALTQPASVSGSPGQSITISCTGTSSDVGSYNLVSQYQHHPGKAPKLMYEVSKRPSGVSNR FSGKSGNTASLTISGLQAEDETDYCCSYAGSTYTPVVFVGGGTKLTVLGQPKAAPSVTLPFP
LCBG4-16	TGSWAQSALTQPASVSGSPGQSITISCTGTSSDVGGYNYVSWYQHPGKAPKIMYDVSNRPSGVSN RFGSGKSGNTASLTISGLQAEDEADYYCSSHTSSSPHVVFVGGGTKLTVLGQPKAAPSVTLPFP
LCBG4-18	TGSWAQSALTQPRSVSGSPGQSVTISCTGTSSDVGGYNYVSWYQHPGKAPKLMYDVSQRPSGVP DRFSGKSGNTASLTISGLQAEDEADYYCCSYAGTYTVIFVGGGTKLTVLGQPKAAPSVTLPFP
LCBG4-21	TGSNSQAVVTQEPSTVSPGGTVTLTCGSSGTGTVTSYHYAYWFQKPGQVPRVLIYDTSKPSWTPA RFGSGLLDGKAALTLGAQPEDEADYYCYLLSYSGVVFVGGGTKLTVLGQPRSAPSVTLPFP
LCBG4-22	TGSWAQSALTQPRSVSGSPGQSVTISCTGTSSDVGGYNYVSWYQHPGNAPKLMIFDVSKRPSGVPD RFGSGKSGNTASLTISGLQAEDEADYYCCSYTSSSTLVFGTGKTVTLGQPKANPTVTLFP
LCBG4-27	TGSWAQSALTQPASVSGSPGQSITISCTGTSSDVGGYDFVSWYQHPGKAPKLMYDDINRPSGVSNR FSGKSGNTASLTISGLQAEDEADYYCSSYTSSSTSVFVGGGTKLTVLGQPKAAPSVTLPFP
LCBG7-3	ATGSWAQSALTQPASVSGSPGQSITISCTGTSSDVGGYNYVSWYQHPGKAPKLMYDVSNRPSGV NRFGSGKSGNTASLTISGLQAEDEADYYCSSYTSSSTQVFVGGGTKLTVLGQPKAAPSVTLPFP
LCBG7-10	ATGSWAQSALTQPASVSGSPGQSITISCTGTSSDVGGYNYVSWYQHPGKAPKLMYDVSNRPSGV NRFGSGKSGNTASLTISGLQAEDEADYYCSSYTSRSPWVFVGGGTKLTVLGQPKAAPSVTLPFP
LCBG7-13	ATGSWAQSALTQPASVSGSPGQSITISCTGTSSDVGGYNYVSWYQHPGKAPKLMYEVSNRPSGV SRFGSGKSGNTASLTISGLQAEDEADYYCYSYTTSSSTPYVFGTGKTVTLGQPKANPTVTLFP
LCBG7-14	ATGSWAQSALTQPASVSGSPGQSITISCTGTSSDVGGYNYVSWYQHPGKAPKLMYDVSNRPSGV NRFGSGKSGNTASLTISGLQAEDEADYYCSSYTSSSTLVFGTGKTVTLGQPKANPTVTLFP
LCBG7-16	ATGSWAQSALTQPASVSGSPGQSITISCTGTSTDVGGYHYVSWHQHPGAPKLMYEVSNRPSGVSH RFGSGKSGNTASLTISGLQAEDEADYYCSSYTKRTRLVYVFGTGTMVTLGQPKANPTVTLFP
LCBG7-17	ATGSWAQSFLTQPPSASGTPGQRTVITSCSGSSSNIGGNTVTWYRQLPGTAPKLLISTNNQRPSGVPDR FSGKSGTSASLAISGLQSEDEADYYCATWDDSLNTYVFGTGKTVTLGQPKANPTVTLFP
LCBG7-19	ATGSWANFMLTQPRSVSESPGKTVTISCTRTSGSIANYVQWYQORPGSSPTTVIYEDSQRPSPVPDRF SGSIDSSNSASLTISGLKTEDEADYYCQSYDSGSWVFVGGGTKLTVLGQPKAAPSVTLPFP
LCBG7-20	ATGSWAQSFLTQPPSVSGAPGQRTVITSCGTSSSNIGAGYDVHWYHQLPGTAPKFLIYGNSNRPSGV DRFSGKSGTSASLAITRLQAEDEADYYCQSYDSSLSGWVFGGGLTKLTVLGQPKAAPSVTLPFP
LCBG10-2	ATGSVTSYELTQPPSVSVSPGQATITCSGDKLGDQFVSWYRQRPQSPVVVYQDIKRPSPGIPERFSG SNSGNRATLTIRGTQALDEADYYCQAGSDTVLFGGGLTKLTVLGQPKAAPSVTLPFP

LCBG10-3	ATGSVTSYVLTQPPSVSVAPGQTARISCGGDKIGSKNVHWYQQKPGQAPVLVYDDSDRPSGIPERFSGSNSGNTATLTITRVEARDEADYYCQVWDRSSVFGTGKVSVLGQPKANPTVTFLFPPS
LCBG10-5	ATGSWAQSLLTQPPSASGTPGQRTVITSCSGSSNIGSNSVCWYQQLPGTAPKLLIYRSNQRPSGVPDRFSGSKSGTSASLAISGLWSEDEADYYCSAWDDSLRGPVFGGGTKLTVLGQPKAAPSVTFLFPPS
LCBG10-7	ATGSWAQSVLTQPPSVSGAPGQRTVITSCGTSNIGAGYDVHWYQQLPGTAPKLLIYANTNRPSGVPDRFSGSKSGTSASLAISGLQAEDEADYFCQSYDSRLSAWVFGGGTKLTVLGQPKAAPSVTFLFPPS
LCBG10-8	ATGSVTSYVLTQPPSVSVAPGQTARISCGGNNIESKTVHWYQQKPGQAPILVYDDNDRPSGIPERFSGSNSGNTATLSISRAEAGDEADYYCQVWDRSSRLRVFGGGTKLSVLGQPKAAPSVTFLFPPS
LCBG10-9	ATGSVTSYELTQPPSVSVSPGQTASITCSVDKLGKNYVCWYQQKPGQSPVLVIYQDSKRPSGIPERFSGSNSGNTATLTISGTQAMDEADYYCQAWDSSSTGVFGGGTKLTVLGQPKAAPSVTFLFPPS
LCBG10-10	ATGSWAQSVLTQPPSVSGAPGQRTVITSCGSSSDIGAGYNVHWYQQLPGTAPKLLIYGNNNRPSGVPDRFSGSKSGASASLAISGLQAEDEADYYCQSFSSLSGFYVFGTGKVTVLGQPKANPTVTFLFPPS
LCBG10-11	ATGSWAQSALTQPASVSGSPGQSITISCTGTSDVGGYNYVSWYQQHPGKAPKLMIFEVSNRPSGVSDFSGSKSGNTASLTISGLQAEDEADYYCTSYRSSLQGVFGTGKVTVLGQPKANPTVTFLFPPS
LCBG10-13	ATGSWAQSVLTQPPSASGTPGQRTVITSCGSSNIGSNTVNWYQQLPGTAPKLLIYTNNQRPSGVPDRFSGSKSGTSASLAISGLQSEDEADYYCAAWDDSLNGLYVFGTGKVTVLGQPKANPTVTFLFPPS
LCBG10-14	ATGSVTSYVLTQPPSVSVAPGQTARITCGGNNIGSKSVHWYQQKPGQAPVLVYDDSDRPSGIPERFSGSNSGNTATLTISRVEAGDEADYYCQVWDRSSDPWVFGGGTKVTVLGQPKAAPSVTFLFPPS
LCBG10-15	ATGSWAQSVLTQPPSVSAAPGQKVTISCSGSSNIGNYSWYHQLPGTAPKLLIYDNNKRPSGIPDRFSGSKSGTSATLGITGLQTGDEADYYCGTWDNSLSVG VFGGGTKLTVLGQPKAAPSVTFLFPPS
LCBG10-16	ATGSWAQSALTQPPSASGSPGQSITISCTGTSSDIGAYNYVSWYQQHPDKAPKLMIEVNNRPSGVSDFSGSKSGNTASLTVSGLQAEDEADYYCSSYAGSDNWVFGGGTKLAVLGQPKAAPSVTFLFPPS
LCBG10-17	ATGSVTSYALTQPPSVSVSPGQTARITCSGDALPRRYAYWYQQKSGQAPVLVIYEDTKRPSGIPERFSGSSSGTMA TLTISGAQVEDEADYYCYSTDSSDNHRVFGGGTKLTVLGQPKAAPSVTFLFPPS
LCBG10-19	ATGSWAQSVLTQPPSASGTPGQRTVITSCGSSNIGSDHVVYWYQQLPGTAPKLFYRNNQRPSGVPDRFSGSKSGTSASLAISGLRSEDEADYYCAAWDASLSGYVFGTGKVTVLGQPKANPTVTFLFPPS

[0147] ***Antibodies isolated from SARS-CoV-2 S- and RBD-binding B cells are typically non-polyreactive.*** Polyreactivity is a feature of antibodies that is selected against in several checkpoints throughout B cell development (Wardemann et al., 2003), but can be generated during affinity maturation (Tiller et al., 2007). Antibody responses to HIV-1 envelope trimer, for example, display elevated levels of polyreactivity, which was suggested to be a means to increase antibody avidity in the setting of a low density of envelope spikes on the HIV surface (Mouquet et al., 2010) and to allow for better binding to divergent HIV-1 envelope strains (Prigent et al., 2018). At the same time, polyreactivity negatively affects the half-life and therefore clinical utility of monoclonal antibodies when considered for clinical use in humans (Horwitz et al., 2013; Shingai et al., 2014).

[0148] To assess if antibodies isolated from SARS-CoV-2 S- and RBD-binding B cells have an increased frequency of polyreactivity, Applicants tested all 92 isolated antibodies for binding to dsDNA, insulin, bacterial lipopolysaccharide (LPS) and streptavidin-APC by ELISA (Wardemann et al., 2003). Applicants included streptavidin-APC as an antigen to additionally assess any potential off-target binding of B cells to the reagent used to stain the baits used in cell sorting (**Methods**). 11 of 92 (12%) of all antibodies and 6 of 56 (11%) intermediate or strong binders to SARS-CoV-2 S or RBD showed reactivity against two or more of the four polyyreactivity antigens in ELISA (**Figure 9E** and **Table 3**), significantly less

than polyreactivity frequencies detected in healthy memory B cells (22.7%, (Tiller et al., 2007)) or HIV-specific B cells (75% (Mouquet et al., 2010)). In addition, Applicants tested all 92 antibodies in an ELISA assay developed to screen for off-target antibody binding against baculovirus lysate in the presence of bovine serum albumin (BSA) (Hotzel et al., 2012) (**Methods**). None of the antibodies were found to be reactive against baculovirus lysate in this assay (**Table 3**). Applicants conclude that most antibodies isolated from SARS-CoV-2 S-and RBD-binding B cells are not polyreactive when expressed as IgG1 and that intermediate or strong binding to the SARS-CoV-2 surface trimer does not require polyreactivity.

Table 3. Antibody Binding to SARS-CoV-2 S trimer and RBD (related to Figures 2, 4 and Figure 9). Heat map summarizing the area under the curve (AUC) values from ELISAs testing for binding to SARS-CoV-2, SARS-CoV and MERS RBD and S trimer respectively. Shown are also antibody polyreactivity as defined by binding to at least two of the four antigens ssDNA, dsDNA, LPS or insulin (**Methods**), antibody reactivity in a baculovirus lysate assay (**Methods**), SARS-CoV-2 neutralizer status, transcriptional cluster and isotype of the cell of origin and the number of clonal members for antibodies from BG1, BG4, BG7 and BG10. Red fields indicate high binding in ELISA (AUC>1), orange fields intermediate binding (AUC 0.25-1) and white fields low or non-detectable binding (AUC<0.25). (P) indicates polyreactive antibodies, (NP) indicates non-polyreactive antibodies, (X) indicates presence and (0) absence of neutralizing activity in SARS-CoV-2 pseudovirus assay. When neutralizing activity was detected, the neutralizing form of the antibody (IgG (G), monomeric IgA (mIgA) or dimeric IgA (dIgA)) is indicated (**Figure 9L, Table 2**). mGO53= negative control antibody (Wardemann et al., 2003), 3B12= positive control antibody for MERS-CoV S and MERS-CoV RBD (Tang et al., 2014), S227.14= positive control antibody for SARS CoV S and SARS CoV RBD (Rockx et al., 2008), NIH45-46 (Scheid et al., 2011) and 45-46m2 (Diskin et al., 2013) are positive control antibodies and 3BNC117 (Scheid et al., 2011) a negative control antibody for the baculovirus lysate assay (**Methods**), (NP) indicates non-polyreactive antibodies, (X) indicates presence and (0) absence of neutralizing activity in SARS-CoV-2 pseudovirus assay (**Table 2**). mGO53= negative control antibody (Wardemann et al., 2003).

NAME	CoV2 RBD	CoV2 S protein	Polyreactive	Neutralizer	Cluster
BG1-1	0.2306	0.1683	NP	0	0
BG1-3	0.1085	0.4142	NP	0	0
BG1-4	0.09808	0.07113	NP	0	0

BG1-5	0.1339	0.09371	P	0	0
BG1-6	1.605	1.703	NP	X	4
BG1-7	0.1199	0.1041	NP	0	0
BG1-8	0.1062	0.1259	NP	0	1
BG1-9	0.1386	0.2711	NP	0	3
BG1-10	0.5986	0.4609	NP	0	0
BG1-11	0.09154	0.243	NP	0	2
BG1-12	1.14	0.4093	NP	X	0
BG1-13	0.1184	1.926	NP	0	0
BG1-14	1.764	2.528	NP	X	3
BG1-15	0.428	0.5295	NP	0	0
BG1-16	0.0791	0.07073	NP	0	0
BG1-17	1.189	0.6855	NP	X	4
BG1-18	0.1998	0.2341	NP	0	2
BG1-19	1.82	1.494	NP	0	0
BG1-20	0.1045	0.1175	NP	0	4
BG1-21	0.115	0.1403	NP	0	2
BG1-22	1.821	2.098	NP	X	4
BG1-23	1.239	3.823	NP	X	4
BG1-24	1.337	3.552	P	X	3
BG1-25	1.121	2.459	NP	X	3
BG1-26	1.111	2.351	NP	X	5
BG1-27	0.1297	0.1093	NP	0	0
BG1-28	1.608	2.307	NP	X	3
BG4-1	0.08149	0.1071	NP	0	4
BG4-2	0.1105	0.1767	NP	0	2
BG4-3	0.09051	2.136	NP	0	4
BG4-4	1.118	0.2065	NP	0	3
BG4-5	0.3876	2.071	NP	0	0
BG4-6	0.091	0.1027	NP	0	0
BG4-7	0.0649	0.07399	NP	0	0
BG4-8	0.3854	1.112	NP	0	3
BG4-9	0.1876	0.1046	P	0	3
BG4-10	0.9985	1.468	P	X	0
BG4-11	1.168	0.6657	NP	X	0
BG4-12	0.1679	1.802	NP	0	3
BG4-13	0.1943	0.2423	NP	0	0
BG4-14	0.297	0.2366	P	X	3
BG4-15	0.1117	1.065	NP	0	3
BG4-16	1.345	2.671	NP	X	0
BG4-17	1.552	2.411	NP	X	4

BG4-18	0.1086	0.6447	P	0	0
BG4-19	0.135	0.3743	NP	0	0
BG4-20	0.1203	0.5239	NP	0	3
BG4-21	0.9825	0.8651	NP	0	0
BG4-22	0.1602	0.1694	NP	0	4
BG4-23	0.3522	1.091	P	0	1
BG4-24	1.509	2.278	NP	X	3
BG4-25	1.098	2.371	NP	X	3
BG4-26	1.117	2.461	NP	X	3
BG4-27	0.3318	1.492	P	0	0
BG7-1	0.12	0.09325	P	0	5
BG7-2	0.09841	0.07828	NP	0	0
BG7-3	0.1109	0.08913	NP	0	0
BG7-4	0.1105	0.1022	NP	0	1
BG7-5	0.1038	0.0967	NP	0	5
BG7-6	0.1151	0.1035	NP	0	0
BG7-7	0.121	0.1036	NP	0	0
BG7-9	0.1373	0.1007	NP	0	0
BG7-10	0.1167	0.09618	NP	0	0
BG7-11	0.15	0.09496	NP	0	0
BG7-12	0.1008	0.07711	NP	0	3
BG7-13	0.1243	0.08768	NP	0	4
BG7-14	1.456	1.448	NP	X	4
BG7-15	1.5	1.729	NP	X	4
BG7-16	0.6532	0.8796	NP	X	0
BG7-17	0.1121	0.09246	NP	0	0
BG7-18	1.074	0.9296	NP	X	3
BG7-19	1.068	0.9416	NP	X	4
BG7-20	1.781	1.193	NP	X	3
BG10-1	0.5949	0.442	NP	0	0
BG10-2	0.4778	0.2259	NP	0	0
BG10-3	0.392	0.9065	NP	0	0
BG10-4	0.3232	0.7478	NP	0	0
BG10-5	0.145	0.1012	NP	0	0
BG10-6	0.2115	0.1351	NP	0	2
BG10-7	0.1886	0.2337	P	0	0
BG10-8	0.5463	0.6417	NP	0	0
BG10-9	0.1612	0.1371	NP	0	0
BG10-10	1.615	1.88	NP	X	3
BG10-11	0.7585	1.076	NP	0	0
BG10-12	0.4233	0.2134	NP	0	0

BG10-13	0.6331	0.372	P	0	5
BG10-14	1.856	1.996	NP	X	0
BG10-15	0.1985	0.1317	NP	0	2
BG10-16	0.2639	0.5506	NP	0	0
BG10-17	0.2756	0.1554	NP	0	0
BG10-18	0.5641	0.8515	NP	0	0
BG10-19	2.075	1.956	NP	X	4
BG10-1	0.5949	0.442	NP	0	0
MGO53	0.1114	0.1206	NP	n/a	n/a

NAME	CoV2 RBD	CoV2 S	CoV RBD	CoV S	MERS RBD	MERS S	Polyreactive	BV Lysate	Neutralizer	Cluster	IsoType	# Mem.
BG1-1	0.231	0.188	0.094	0.084	0.127	0.128	NP	0	0	0	IGHM	5
BG1-3	0.109	0.414	0.090	0.091	0.220	0.162	NP	0	0	0	IGHG1	3
BG1-4	0.088	0.071	0.088	0.081	0.183	0.138	NP	0	0	0	IGHM	3
BG1-5	0.134	0.094	0.244	0.163	0.477	0.183	P	0	0	0	IGHM	3
BG1-6	1.005	1.703	0.108	0.142	0.128	0.079	NP	0	X (G)	4	IGHG1	2
BG1-7	0.120	0.104	0.108	0.086	0.194	0.151	NP	0	0	0	IGHA1	2
BG1-8	0.106	0.126	0.132	0.099	0.270	0.182	NP	0	0	1	IGHM	2
BG1-9	0.139	0.271	0.137	0.092	0.292	0.158	NP	0	0	3	IGHG1	2
BG1-10	0.509	0.461	0.182	0.104	0.379	0.186	NP	0	0	0	IGHM	2
BG1-11	0.092	0.243	0.107	0.100	0.215	0.151	NP	0	0	2	IGHM	2
BG1-12	1.140	0.409	0.086	0.109	0.096	0.087	NP	0	X (G)	0	IGHG1	2
BG1-13	0.118	1.935	0.154	0.586	0.281	1.546	NP	0	0	0	IGHG1	2
BG1-14	1.764	2.528	0.092	0.292	0.101	0.075	NP	0	X (G)	3	IGHG1	2
BG1-15	0.428	0.530	0.101	0.084	0.177	0.127	NP	0	X (mA, dA)	0	IGHA1	2
BG1-16	0.079	0.071	0.066	0.072	0.106	0.103	NP	0	0	0	IGHM	2
BG1-17	1.189	0.686	0.242	0.581	0.387	0.185	NP	0	X (G)	4	IGHM	2
BG1-18	0.200	0.234	0.125	0.090	0.278	0.140	NP	0	0	2	IGHM	2
BG1-19	1.830	1.494	0.137	0.099	0.302	0.241	NP	0	0	0	IGHG1	1
BG1-20	0.105	0.118	0.093	0.087	0.266	0.472	NP	0	0	4	IGHA2	1
BG1-21	0.115	0.140	0.085	0.073	0.165	0.117	NP	0	0	2	IGHA1	1
BG1-22	1.621	2.098	0.300	0.889	0.364	0.174	NP	0	X (G)	4	IGHG1	1
BG1-23	1.239	3.523	0.119	0.638	0.297	0.182	NP	0	X (G, mA, dA)	4	IGHA1	1
BG1-24	1.337	3.552	0.249	0.986	0.417	0.117	P	0	X (G)	3	IGHG1	4
BG1-25	1.121	2.455	0.089	0.205	0.087	0.070	NP	0	X (G)	3	IGHG1	1
BG1-26	1.111	2.351	0.339	0.319	0.086	0.084	NP	0	X (G, mA, dA)	5	IGHA1	2
BG1-27	0.130	0.109	0.158	0.098	0.279	0.222	NP	0	X (mA, dA)	0	IGHA1	1
BG1-28	1.638	2.307	1.577	2.435	0.222	0.227	NP	0	X (G)	3	IGHG1	2

NAME	CoV2 RBD	CoV2 S	CoV RBD	CoV S	MERS RBD	MERS S	Polyreactive	BV Lysate	Neutralizer	Cluster	Isotype	# Mem.
BG4-1	0.081	0.107	0.138	0.078	0.213	0.149	NP	0	0	4	IGHM	11
BG4-2	0.111	0.177	0.159	0.098	0.287	0.195	NP	0	0	2	IGHM	4
BG4-3	0.091	0.134	0.127	0.127	0.234	0.184	NP	0	0	4	IGHG3	3
BG4-4	0.118	0.207	0.178	0.114	0.246	0.198	NP	0	0	3	IGHG2	3
BG4-5	0.305	0.371	0.152	0.089	0.238	0.208	NP	0	0	0	IGHG1	3
BG4-6	0.091	0.103	0.115	0.072	0.180	0.188	NP	0	0	0	IGHM	3
BG4-7	0.065	0.074	0.084	0.060	0.083	0.118	NP	0	0	0	IGHM	3
BG4-8	0.385	0.112	0.105	0.073	0.186	0.157	NP	0	0	3	IGHG1	3
BG4-9	0.188	0.105	0.157	0.080	0.573	0.209	P	0	0	3	IGHG3	2
BG4-10	0.979	0.458	0.197	0.274	0.280	0.207	P	0	X (G)	0	IGHG1	2
BG4-11	0.118	0.868	0.072	0.102	0.110	0.075	NP	0	X (G)	0	IGHM	2
BG4-12	0.168	0.902	0.132	0.110	0.281	0.227	NP	0	0	3	IGHG1	2
BG4-13	0.184	0.342	0.151	0.081	0.320	0.178	NP	0	0	0	IGHM	2
BG4-14	0.287	0.237	0.105	0.159	0.182	0.108	P	0	X (G)	3	IGHM	2
BG4-15	0.112	0.955	0.084	0.228	0.178	0.212	NP	0	0	3	IGHG3	2
BG4-16	0.345	0.371	0.110	0.352	0.142	0.222	NP	0	X (G)	0	IGHM	2
BG4-17	0.552	0.411	0.140	0.275	0.172	0.192	NP	0	X (G)	4	IGHG1	2
BG4-18	0.109	0.845	0.144	0.247	0.832	0.583	P	0	0	0	IGHG1	2
BG4-19	0.135	0.374	0.136	0.094	0.235	0.201	NP	0	0	0	IGHM	2
BG4-20	0.120	0.524	0.173	0.165	0.465	0.472	NP	0	0	3	IGHG1	2
BG4-21	0.983	0.885	0.093	0.080	0.197	0.184	NP	0	0	0	IGHG1	2
BG4-22	0.160	0.169	0.161	0.105	0.248	0.184	NP	0	0	4	IGHG1	1
BG4-23	0.352	0.901	0.095	0.282	0.182	0.730	P	0	0	1	IGHM	1
BG4-24	0.809	0.278	0.152	0.532	0.167	0.186	NP	0	X (G)	3	IGHG1	1
BG4-25	0.508	0.371	0.115	0.392	0.117	0.096	NP	0	X (G)	3	IGHG1	1
BG4-26	0.117	0.431	0.112	0.284	0.102	0.090	NP	0	X (G)	3	IGHG1	1
BG4-27	0.322	0.432	0.284	0.305	0.874	0.522	P	0	0	0	IGHG3	1

NAME	CoV2 RBD	CoV2 S	CoV RBD	CoV S	MERS RBD	MERS S	Polyreactive	BV Lysate	Neutralizer	Cluster	Isoctype	# Mem.
BG7-1	0.120	0.093	0.115	0.103	0.389	0.885	P	0	0	5	IGHD	12
BG7-2	0.098	0.078	0.078	0.078	0.124	0.167	NP	0	0	0	IGHM	9
BG7-3	0.111	0.089	0.103	0.093	0.252	0.453	NP	0	0	0	IGHM	9
BG7-4	0.111	0.102	0.095	0.087	0.161	0.262	NP	0	0	1	IGHM	8
BG7-5	0.104	0.097	0.092	0.080	0.149	0.161	NP	0	0	5	IGHM	5
BG7-6	0.115	0.104	0.106	0.085	0.223	0.197	NP	0	0	0	IGHM	3
BG7-7	0.121	0.104	0.098	0.084	0.198	0.283	NP	0	0	0	IGHM	3
BG7-8	0.137	0.101	0.105	0.082	0.141	0.195	NP	0	0	0	IGHM	2
BG7-10	0.117	0.096	0.102	0.116	0.415	0.490	NP	0	0	0	IGHM	2
BG7-11	0.150	0.095	0.085	0.086	0.118	0.143	NP	0	0	0	IGHG1	2
BG7-12	0.101	0.077	0.082	0.078	0.122	0.194	NP	0	0	3	IGHA1	2
BG7-13	0.124	0.088	0.082	0.093	0.218	0.421	NP	0	0	4	IGHM	2
BG7-14	1.456	1.448	0.118	0.281	0.164	0.065	NP	0	X (G)	4	IGHG1	1
BG7-15	1.500	1.729	0.170	0.444	0.225	0.091	NP	0	X (G)	4	IGHG1	1
BG7-16	0.653	0.880	0.084	0.647	0.143	0.118	NP	0	X (G)	0	IGHG1	1
BG7-17	0.112	0.092	0.077	0.080	0.129	0.175	NP	0	0	0	IGHG1	1
BG7-18	1.074	0.930	0.075	0.447	0.115	0.065	NP	0	X (G)	3	IGHG1	1
BG7-19	1.068	0.942	0.181	0.212	0.092	0.064	NP	0	X (G)	4	IGHG1	1
BG7-20	1.781	1.193	0.118	0.449	0.127	0.094	NP	0	X (G)	3	IGHG1	1

NAME	CoV2 RBD	CoV2 S	CoV RBD	CoV S	MERS RBD	MERS S	Polyreactive	BV Lysate	Neutralizer	Cluster	Isotype	# Mem.
BG10-1	0.595	0.442	0.148	0.073	0.268	0.196	NP	0	0	0	IGHM	36
BG10-2	0.478	0.226	0.203	0.089	0.276	0.184	NP	0	0	0	IGHM	15
BG10-3	0.392	0.907	0.085	0.087	0.137	0.153	NP	0	0	0	IGHG1	8
BG10-4	0.323	0.748	0.093	0.068	0.136	0.150	NP	0	X (mA, dA)	0	IGHA1	9
BG10-5	0.145	0.101	0.097	0.067	0.165	0.140	NP	0	X (dA)	0	IGHA1	8
BG10-6	0.212	0.135	0.123	0.072	0.178	0.159	NP	0	0	2	IGHM	6
BG10-7	0.189	0.234	0.098	0.077	0.229	0.173	P	0	0	0	IGHG1	6
BG10-8	0.546	0.642	0.105	0.068	0.130	0.141	NP	0	X (mA, dA)	0	IGHA1	5
BG10-9	0.161	0.137	0.158	0.084	0.265	0.207	NP	0	0	0	IGHM	5
BG10-10	1.819	1.890	0.092	0.152	0.089	0.068	NP	0	X (G)	3	IGHG1	4
BG10-11	0.759	1.076	0.072	0.073	0.106	0.124	NP	0	X (mA, dA)	0	IGHA1	3
BG10-12	0.423	0.213	0.149	0.143	0.268	0.372	NP	0	0	0	IGHA1	2
BG10-13	0.633	0.372	0.221	0.105	0.518	0.851	P	0	0	5	IGHM	2
BG10-14	1.856	1.996	0.208	1.930	0.098	0.083	NP	0	X (G)	0	IGHG1	2
BG10-15	0.199	0.132	0.087	0.064	0.129	0.130	NP	0	0	2	IGHM	2
BG10-16	0.264	0.551	0.090	0.101	0.182	0.313	NP	0	0	0	IGHG1	2
BG10-17	0.276	0.155	0.094	0.066	0.130	0.133	NP	0	0	0	IGHA1	2
BG10-18	0.584	0.852	0.138	0.118	0.389	0.851	NP	0	0	0	IGHA1	2
BG10-19	2.075	1.956	3.037	3.323	0.146	0.613	NP	0	X (G)	4	IGHG1	2
mGO53	0.111	0.121	0.100	0.072	0.197	0.179	NP	n/a	n/a	n/a		
3B12	n/a	n/a	0.119	0.979	2.181	2.325	n/a	n/a	n/a	n/a		
S327.14	n/a	n/a	2.338	3.379	0.455	1.354	n/a	n/a	n/a	n/a		
NIH45-46	n/a	n/a	n/a	n/a	n/a	n/a	n/a	X	n/a	n/a		
45-46m2	n/a	n/a	n/a	n/a	n/a	n/a	n/a	X	n/a	n/a		
3BNC117	n/a	n/a	n/a	n/a	n/a	n/a	n/a	0	n/a	n/a		

[0149] *Neutralizing antibodies against SARS-CoV-2 mostly arise from IgG⁺ B cells and target the RBD.* Applicants next screened all 92 antibodies for neutralizing activity in the pseudotyped virus neutralization assay used on the serum samples (Robbiani et al., 2020; Schmidt et al., 2020) (above and **Methods**). 27 of 92 antibodies (29%) showed neutralizing activity when tested up to a concentration of at least 25 µg/ml, and neutralizing antibodies were identified from all 4 selected subjects (**Figure 9F** and **Table 2**). IC₅₀ values ranged from 3ng/ml to 25µg/ml with a median of 99ng/ml (**Figure 9F** and **Table 2**). Neutralizers showed at least intermediate binding in ELISA to both SARS-CoV-2 S trimer and RBD, with the exception of one antibody, BG4-14, a weak neutralizer with binding by ELISA only to RBD (**Tables 2** and **3**).

[0150] Neutralizing activity was detected for 21 of 42 antibodies (50%) selected from IgG⁺ cells compared with 4 of 35 (11%) from IgM⁺/D⁺ cells and 2 of 15 (13%) from IgA⁺ cells ($\chi^2=15.9$, P value 0.0004) (**Figure 9G** and **Table 2**). To evaluate if these 27 neutralizers were similarly potent against authentic SARS-CoV-2 virus compared with pseudovirus, Applicants tested their activities in a neutralization assay against authentic SARS-CoV-2 and found the results between both SARS-CoV-2 neutralization assays to be comparable (correlation coefficient (r) for comparison between IC₅₀ values 0.701, P value <0.0001) (**Figure 2B**, **Figure 9H** and **Table 2**). Applicants conclude that neutralizing antibodies targeting the RBD of SARS-CoV-2 were present in all four selected subjects, mostly arise from IgG⁺ B cells, and are active against both a pseudotyped virus and against authentic SARS-CoV-2. See, also, **Figures 17-20**.

[0151] *Select antibodies retain potent neutralizing activity against circulating variants B.1.1.7 and B.1.351.* Several circulating variants of SARS-CoV-2, including B.1.1.7 and B.1.351 (Tegally et al., 2020) show decreased sensitivity to some SARS-CoV-2 monoclonal antibodies, polyclonal sera from recovered COVID-19 patients (Wibmer et al., 2021) and sera from individuals who have received SARS-CoV-2 mRNA vaccines (Wang et al., 2021) (Wu et al., 2021) (Liu et al., 2021). To test if the antibodies described herein retain neutralizing activity against B.1.1.7 and B.1.351 Applicants produced pseudotyped SARS-CoV-2 viruses carrying the reported spike mutations in these variants ((Davies et al., 2021) (Tegally et al., 2020) and **Methods**) and tested antibodies BG10-19, BG1-22, BG4-25 and BG7-15 in a pseudovirus neutralization assay (**Figures 2E** and **9I**). All three antibodies neutralized B.1.1.7 with similar potency as WT (D614G) and both BG10-19 and BG7-15 retained neutralization

potency against B.1.351 whereas both BG1-22 and BG4-25 showed a 15-fold increase in IC₅₀ values against this variant respectively (**Figures 2E and 9I**). Applicants conclude that BG10-19 and BG7-15 retain potent neutralizing activity against the recently identified circulating variants B.1.1.7 and B.1.351.

[0152] *Antibody BG10-19 potently neutralizes both SARS-CoV-2 and SARS-CoV.* Antibodies that target conserved epitopes among different betacoronaviruses are the subject of intense investigation given their potential utility in future coronavirus outbreaks. A small set of antibodies that were isolated from SARS-CoV-infected individuals have been shown to cross-react with SARS-CoV-2 (Pinto et al., 2020a) and vice versa (Robbiani et al., 2020).

[0153] To evaluate potential cross-reactivity of the antibodies to other coronaviruses, Applicants tested all 92 neutralizing antibodies for binding to SARS-CoV and MERS-CoV spike (S) protein and RBD in ELISA (**Figure 2C, 2F and Table 3**). Two SARS-CoV-2 non-neutralizing antibodies showed strong cross binding to MERS (BG4-23 and BG1-13), one of which (BG4-23) also showed strong cross binding to SARS-CoV (**Table 3**). Three SARS-CoV-2 neutralizers (BG1-28, BG10-14, BG10-19) showed strong cross-binding to SARS-CoV (**Table 3**), and BG10-19 also showed weak binding to MERS S (**Figure 2C**). Applicants next tested if any of the SARS-CoV-2 neutralizers that cross-bind SARS-CoV also show neutralizing activity against SARS-CoV using a pseudovirus neutralization assay. BG10-19 neutralized SARS-CoV potently with an IC₅₀ value of 3ng/ml compared with 20ng/ml for antibody S309, a cross neutralizing antibody that was originally isolated from a SARS-CoV patient (**Figure 2D, 2G**) (Pinto et al., 2020a). BG10-19 also neutralized SARS-CoV-2 more potently than S309 with an IC₅₀ of 9ng/ml compared to 79ng/ml (**Table 2** and (Pinto et al., 2020a)). BG1-28 and BG10-14 did not neutralize SARS-CoV and neither did a selection of SARS-CoV-2 neutralizers that showed intermediate cross binding to SARS-CoV in ELISA (**Figure 2D, 2G and Table 3**).

[0154] *IgA dimerization increases neutralization of SARS-CoV-2.* Secreted IgA and IgM antibodies can, if expressed with J chain, multimerize and therefore increase overall antibody avidity depending on the density and accessibility of the antigen binding sites (Klein and Bjorkman, 2010). Consistent with this, some IgA dimers of SARS-CoV-2 neutralizing antibodies show increased neutralizing potency when compared to their monomeric versions (Wang et al., 2020b). To test the effect of dimerization on neutralizing activity in our antibodies Applicants expressed and purified 13/15 antibodies which were derived from IgA⁺ B cells

(**Tables 2 and 3**) as IgA monomers and dimers (**Figure 9J, K**) and tested them for neutralization of SARS-CoV-2 in a pseudotyped neutralization assay. Both antibodies that showed neutralizing activity against SARS-CoV-2 when expressed as IgG1 (BG1-23 and BG1-26, **Tables 2 and 3**) showed similar neutralization potency when expressed as IgA monomers. In dimeric form, their neutralizing activity increased with molar neutralization ratios (MNRs) (Klein and Bjorkman, 2010) of 6 and 8 respectively suggesting an added avidity effect through dimerization (**Figures 9L, M**). 6 of the remaining 11 antibodies that had not shown any neutralizing activity when expressed as IgG1 neutralized SARS-CoV-2 either weakly only as dimeric IgA (BG10-5) or both as IgA monomer and dimer with IC50 values ranging from 26ng/ml (dimeric BG10-8) to 6.5ug/ml (dimeric BG1-15) (**Figures 9L, M**). MNRs >2 were observed for weakly neutralizing IgA dimer BG1-27 (MNR=3) and potently neutralizing IgA dimer BG10-8 (MNR=10.86) suggesting that in these cases dimerization leads to increased overall avidity of the antibody (Klein and Bjorkman, 2010) (**Figures 9L, M**). Applicants conclude that expression as IgA can increase the neutralizing activity of some SARS-CoV-2 antibodies against SARS-CoV-2 pseudovirus and that in some cases dimerization can further increase potency by increasing overall antibody avidity.

[0155] *A cryo-electron microscopy structure of a complex between the SARS-CoV-2 S trimer and the Fab fragment of cross-neutralizing antibody BG10-19.* To understand the mechanism of potent BG10-19-mediated neutralization of both SARS-CoV-2 and SARS-CoV, Applicants determined a 3.3 Å single-particle cryo-electron microscopy (cryo-EM) structure of a complex between a soluble, stabilized SARS-CoV-2 S (Hsieh et al., 2020) and the BG10-19 Fab (**Figure 3, Figure 10 and Table 5**).

[0156] The BG10-19 – S structure revealed S trimers adopting a closed conformation bound to three BG10-19 Fab fragments (**Figures 3A and 10A-C**). BG10-19 recognizes a quaternary epitope comprising distinct regions from all three protomers, including interactions that bridge two neighboring RBDs and the N165_{NTD}-glycan (**Figure 3B**). Specifically, BG10-19 uses five of its six complementarity-determining region (CDR) loops to interact with a proteoglycan epitope focused atop the RBD α1 (residues 338-347) and α2 (residues 364-374) helices, with additional contacts with residues 436-450 (**Figure 3C-G**). The CDRH2 and CDRH3 loops mediate the majority of RBD contacts (~760 Å² of ~1090 Å² total paratope buried surface area (BSA)), establishing extensive hydrogen bonding and van der Waals interactions with RBD residues (**Figure 3E, G**). The N343_{RBD}-glycan (modeled as a complex-

type pentasaccharide) at the base of the $\alpha 1$ helix interfaces with both CDRH3 and CDRL2 loops, including contacts with the core fucose moiety in a manner similar to the cross-reactive SARS-CoV monoclonal antibody S309 (**Figure 3F**) (Pinto et al., 2020a). The CDRH2 and CDRH3 loops mediate the majority of RBD contacts ($\sim 760 \text{ \AA}^2$ of $\sim 1090 \text{ \AA}^2$ total paratope buried surface area (BSA)), establishing extensive hydrogen bonding and van der Waals interactions with RBD residues (**Figure 3E,F**). Collectively, interactions mediated by CDRH1-3 and CDRL2 loops establish the primary epitope recognized by BG10-19, which does not overlap with the ACE2 receptor-binding motif (RBM) (**Figure 10**) and accounts for 87% of BSA on the S trimer ($\sim 925 \text{ \AA}^2$ of peptide BSA and $\sim 220 \text{ \AA}^2$ glycan BSA).

[0157] However, unlike the binding mode of S309, BG10-19 adopts a pose that positions the light chain CDRL1 loop and FWR3 atop the neighboring “down” RBD to lock the S trimer into a closed conformation (**Figure 3A-D and Figure 10C**). This binding orientation is distinct from previously-described neutralizing antibodies that utilize interactions of long CDRH3s to mediate bridging interactions to stabilize the S trimer in a closed, prefusion conformation state (Barnes et al., 2020a; Tortorici, 2020). Additional BG10-19 interactions on the neighboring RBD involve residues 490-498 (**Figure 3D**), which overlap with the ACE2 RBM and contribute $\sim 150 \text{ \AA}^2$ BSA to the total quaternary epitope. Such interactions prevent sampling of the “up” RBD conformation to expose the ACE2 RBM, thus blocking the SARS-CoV-2 S 6P trimer binding to immobilized sACE2-CH3 (Tada et al., 2020) in SPR experiments (**Figure 3H**). These data suggest that BG10-19 utilizes a neutralization mechanism that inhibits exposure of the ACE2 RBM.

[0158] Furthermore, sequence conservation at the BG10-19 epitope explains the potent cross-neutralizing activity against SARS-CoV (**Figure 2D, G**). The primary binding site for BG10-19 comprises 23 of 29 residues strictly or conservatively substituted between SARS-CoV-2 and SARS-CoV RBDs (**Figure 10E**). Given the highly conserved nature of the BG10-19 epitope, Applicants further characterized the potential of BG10-19 to cross-react with heterologous sarbecoviruses. Bat coronavirus strains WIV1-CoV and SCH014-CoV belong to the clade 1 family of sarbecoviruses and are ACE2-tropic (Li et al., 2003). When Applicants assessed BG10-19 cross-reactivity to these viruses, Applicants observed the binding to WIV1-CoV RBD at the same levels as SARS-CoV-2 and SARS-CoV, but no neutralizing activity (**Figure 10G-J**). The lack of neutralizing activity against WIV1-CoV was surprising, given its 95% amino acid sequence identity with SARS-CoV (Cohen et al., 2020; Pinto et al., 2020a).

Interestingly, key sequence differences occur at RBD positions 346, 439, 440, and 445, and mutations at these positions have been shown to provide immune escape against class 3 anti-SARS-CoV-2 neutralizing antibodies and polyclonal sera (Thomson et al., 2020; Weisblum et al., 2020). For example, substitutions at RBD residue R346 have the potential to disrupt cation- π and hydrogen bond interactions at the antibody-antigen interface (**Figures 3E, F and 10D**). Overall, the findings suggest that the SARS-CoV-2 trimer-specific antibody response includes rare antibodies such as BG10-19 with highly potent cross-neutralizing activity against SARS-CoV. See, also, **Figures 24-26**.

[0159] SARS-CoV-2 S- and RBD-binding B cell repertoires include different B cell populations. To characterize the transcriptional properties SARS-CoV2 and RBD-binding B cells, Applicants performed scRNA-seq paired with VDJ sequencing of B cell populations sorted from the 14 convalescent subjects. These B cells were selected based on expression of CD20, CD19 and SARS-CoV-2 S or RBD binding alone without selection for other surface markers or immunoglobulin isotype expression (**Methods** and above). Applicants profiled 6,113 sorted B cells, revealing 6 distinct transcriptional cell clusters (TCs) (**Figures 4A, B**) that had representation from all donors, though with enrichment of some donors in specific clusters. (**Figure 11A** and see below). These clusters were neither dependent on binding to SARS-CoV-2 S or RBD (**Figure 11B**) nor on cell cycle phase (**Figure 11C**). As expected, CD44 and CXCR4 were abundantly expressed throughout all TCs, consistent with their frequent expression among mature B cells (**Figure 11D**) (Kremmidoitis and Zola, 1995; Nagasawa et al., 1996; Nie et al., 2004). CD38 expression levels were low throughout all clusters, in keeping with a low frequency of antibody-secreting cells which was expected as B cells were selected based on binding of surface immunoglobulin to SARS-CoV-2 S or RBD (Ellebedy et al., 2016) (**Figure 11D**). The cell clusters were distinguished by increased expression of specific marker genes (**Figure 4A**), such as genes associated with different B cell populations, including naïve and memory B cells, consistent with isotype, mutation status and clonal expansion features of these cells. Specifically, the TC1 marker genes *FCER2* (CD23) and *TCL1A* are known to be highly expressed in mature naïve B cells (**Figure 4A, Table 4**) (Horns et al., 2020), consistent with an enrichment in TC1 of IgD⁺ and IgM⁺ B cells (36% and 63% of cells, respectively, **Figure 11E**) with low levels of inferred somatic mutations (**Figure 11F**) and minimal clonal expansion (**Figure 11G, H**). In TC3 and TC4, CD27 and CD80, both expressed in memory B cells (Moroney et al., 2020; Zuccarino-Catania et al., 2014)

were highly expressed (**Figure 12A**), and the majority of cells in these clusters were IgG1⁺ (53% and 73% of cells, respectively, **Figure 11E**), somatically mutated (**Figure 11F**) and more clonally expanded than cells in TC1 (**Figure 11G, H**). Cells in TC3 and TC4 are also highly expressed CXCR3, a chemokine receptor found on some class switched B cells that is believed to facilitate migration to sites of inflammation (Moroney et al., 2020; Muehlinghaus et al., 2005) and CD70, which is upregulated on stimulated B cells where its interaction with CD27 on effector T cells plays an important role in antiviral T cell responses (Izawa et al., 2017; van Gisbergen et al., 2011) (**Figure 4A** and **Figure 12A**).

[0160] In the weeks following vaccination or infection with influenza or infection with Ebola, antigen specific B cells can present as antibody secreting cells, memory B cells or “activated B cells” (ABCs), which wane after several weeks and show relatively higher expression levels of CD52, TLR10, CD19 and CD20 (Ellebedy et al., 2016). To test if either TC3 or TC4 include ABCs, Applicants examined the distribution of expression levels in each cell cluster of CD52, TLR10, CD19 and CD20 and 10 other genes that are expressed at higher levels in ABCs compared to memory B cells (**Figure 12A**) (Ellebedy et al., 2016). All 14 genes were significantly higher expressed (one-tailed t-test, FDR < 0.01) in TC4 than in TC3 (**Figure 12A**). Thus, SARS-CoV-2 S- and RBD-binding B cell repertoires in recently recovered subjects include ABCs (TC4) and memory B cells (TC3) that are both mostly IgG1⁺, show expansion of B cell clones and somatic hypermutation. Applicants also detected IgD⁺ and IgM⁺ mature naïve B cells (TC1) with low levels of somatic hypermutation, minimal clonal expansion and high expression of CD23 and TCLA1.

Table 4. Transcriptome cluster marker genes (related to Figure 4 and Figure 11). For each of the 6 transcriptome clusters the top 30 genes that are differentially upregulated are displayed. Genes are included only if their minimum log fold change is greater than 0.25 with a false discovery rate (FDR) < 0.05. Columns show the gene name, transcriptome cluster, average log fold change (avg_logFC) and BH adjusted P values (p_val_adj) respectively.

gene	cluster	avg_logFC	p_val_adj
EMP3	0	0.742674	7.4E-231
CIB1	0	0.704189	5.3E-174
LITAF	0	0.696586	1.1E-144
LGALS1	0	0.648787	6.46E-87
RHOB	0	0.591643	1.06E-85
COTL1	0	0.586451	4.6E-187

SRGN	0	0.570442	3.11E-24
PSAP	0	0.528844	6.22E-96
YWHAH	0	0.52012	1.77E-44
TNFRSF1B	0	0.51046	6.22E-57
ITM2C	0	0.509568	1.57E-77
IFITM2	0	0.450464	9.91E-88
FCRLA	0	0.444861	1.77E-91
SYK	0	0.436202	1.16E-85
THEMIS2	0	0.40288	1.43E-83
VOPP1	0	0.401409	6.67E-78
CNFN	0	0.387881	2.94E-19
S100A6	0	0.38559	1.87E-38
CBLB	0	0.384918	1.32E-81
RGS2	0	0.381306	1.48E-47
GPR183	0	0.380305	2.76E-66
NEAT1	0	0.379959	4.52E-59
KLK1	0	0.373715	5.25E-20
LY6E	0	0.368067	7.06E-75
MAP1LC3B	0	0.363525	4.22E-38
CLECL1	0	0.359972	4.62E-21
ARL4C	0	0.359298	8.06E-19
FCGR2B	0	0.359257	1.82E-75
ENC1	0	0.357722	2.84E-59
MYADM	1	1.243403	2.3E-225
TCL1A	1	1.225935	3.7E-199
IGLL5	1	1.046009	2.42E-69
TUBA1A	1	1.03559	2.7E-164
BACH2	1	0.901778	1E-144
CXCR4	1	0.864938	8.9E-189
FCER2	1	0.827531	8.04E-86
CA5B	1	0.783617	9.16E-76
FOS	1	0.762213	1.7E-99
YBX3	1	0.73925	4.63E-44
TAGAP	1	0.705204	4.6E-109
TSC22D3	1	0.700201	2.2E-176
TXNIP	1	0.684033	5.7E-154
IQGAP1	1	0.68283	8.19E-82
ITM2B	1	0.682475	1.7E-113
IL4R	1	0.673833	1.02E-36
CFAP20	1	0.669236	6.18E-48
PIK3IP1	1	0.666655	5.62E-36
APLP2	1	0.602008	3.22E-48
DUSP1	1	0.601203	6.7E-111
ARL4A	1	0.57224	7.76E-46
FOXP1	1	0.559891	1.4E-105
SNX9	1	0.550919	2.06E-56
FAM129C	1	0.54711	2.8E-55
KLF3	1	0.541581	2.6E-32

SNX29	1	0.530698	5.2E-35
JUN	1	0.514755	7.63E-56
TMEM123	1	0.510121	3.92E-29
H1FX	1	0.507778	1.98E-11
LINC00926	1	0.495411	2.6E-63
LINC01857	2	0.89658	6.2E-141
LY9	2	0.805187	1.06E-55
ZNF331	2	0.793354	1.3E-112
NR4A2	2	0.716041	8.47E-46
ZFP36	2	0.683502	8.91E-92
JUNB	2	0.621796	5.86E-87
CXCR4	2	0.61256	3.1E-119
H3F3B	2	0.5396	4.45E-84
RGS2	2	0.48302	2.18E-31
SELENOK	2	0.449154	1.37E-49
CD83	2	0.437254	1.85E-45
SAT1	2	0.429319	2.81E-36
BTG1	2	0.421039	6.36E-76
EZR	2	0.415967	7.78E-86
IDI1	2	0.411112	1.24E-23
HSPA5	2	0.401979	3.29E-29
FTH1	2	0.397222	1.3E-58
C7orf50	2	0.388294	6.36E-20
ZFP36L2	2	0.376236	1.65E-23
ATP6V0C	2	0.36337	3.38E-34
PTP4A1	2	0.356091	4.39E-16
GPR183	2	0.350688	1.52E-24
SELENOM	2	0.347283	1.93E-07
RPS3	2	0.334121	3.2E-182
PDCD4	2	0.333819	2.22E-18
PDE4B	2	0.328615	8.84E-26
DDIT4	2	0.328236	5.39E-06
RPL3	2	0.325632	8.5E-151
ZFAS1	2	0.322384	3.31E-41
SNX9	2	0.322189	2.42E-32
PDE4D	3	0.617391	1.4E-74
GRAMD1C	3	0.5433	7.13E-80
TMEM156	3	0.48219	2.27E-75
NFKBIA	3	0.404666	4.09E-61
CXCR3	3	0.390844	1.47E-37
CFLAR	3	0.346347	7.76E-37
PIM3	3	0.331141	5.81E-32
TKT	3	0.328569	3.22E-51
CD70	3	0.315321	1.15E-18
RHOF	3	0.312104	2.01E-29
MGAT4A	3	0.304847	1.51E-26
HOPX	3	0.298667	3.67E-23
CAPG	3	0.296711	1.13E-45

MARCKSL1	3	0.295157	1.35E-35
S100A10	3	0.289821	7.32E-59
CD80	3	0.285129	1.57E-19
ZFP36L1	3	0.28247	3.44E-27
COCH	3	0.280678	1.25E-25
HMGA1	3	0.279839	9.8E-37
FAS	3	0.27515	2.3E-11
BASP1	3	0.27404	6.05E-23
PAPSS1	3	0.261811	1.77E-19
ITGB2-AS1	3	0.258236	4.33E-23
LYPLAL1	3	0.258037	1.67E-18
NME2	3	0.256528	7.04E-27
MIF	3	0.253228	2.95E-27
LMNA	3	0.252637	6.57E-15
ACTG1	4	2.187489	0
GAPDH	4	1.415694	0
S100A10	4	1.383357	7.2E-274
ACTB	4	1.243456	0
TKT	4	1.199748	2E-301
PFN1	4	1.193543	0
CORO1A	4	1.132533	0
HSPA8	4	1.082111	3.2E-263
S100A4	4	1.056015	3.6E-181
HMGA1	4	1.043888	1.8E-253
CNN2	4	1.042658	3.6E-276
SELL	4	1.018083	5.4E-218
TMSB10	4	0.991662	0
ARPC1B	4	0.991293	4.7E-219
CLIC1	4	0.952471	6.8E-232
RAC2	4	0.938414	1.2E-246
ARHGDIB	4	0.90303	1.3E-289
SLC25A5	4	0.889603	6.1E-229
VIM	4	0.859558	7.6E-175
PPP1R18	4	0.84057	1.9E-201
PPP1CA	4	0.833401	4E-215
CAPZB	4	0.814333	3.8E-206
ANXA2	4	0.803902	2.7E-162
CAPG	4	0.793994	6.6E-194
CFL1	4	0.778148	1.4E-279
LDHB	4	0.752417	7.2E-191
LTB	4	0.736497	1.6E-162
TUBB	4	0.725367	1E-110
PPIA	4	0.721525	1.9E-250
LCP1	4	0.719491	1.6E-135
PTPRC	5	1.302366	3.5E-69
MALAT1	5	1.155559	9.5E-118
TMEM123	5	1.08055	0.000249
B4GALT1	5	1.077235	3.42E-24

NFKBID	5	1.057845	7.32E-09
CEMIP2	5	1.021713	2.23E-06
LINC00926	5	1.016311	7.84E-33
VPS13C	5	1.015257	0.003396
MTRNR2L12	5	1.012071	7.3E-48
SMCHD1	5	1.00159	2.43E-26
NSF	5	0.997369	1.08E-09
BACH1	5	0.983251	1.45E-12
PARP14	5	0.975469	3.07E-05
EML4	5	0.971648	1.41E-31
CD69	5	0.967358	0.000444
CASP8	5	0.954006	1.86E-11
BTG2	5	0.953929	3.32E-09
NCOA3	5	0.949408	7.56E-17
SF1	5	0.949164	4.3E-55
REL	5	0.941262	1.26E-27
MS4A1	5	0.940841	1.15E-49
AKAP13	5	0.936896	3.65E-06
TMEM131L	5	0.931662	0.000402
PRDM2	5	0.921625	7.83E-18
PNN	5	0.918618	6.3E-23
STK4	5	0.914263	1.76E-21
PELI1	5	0.90293	0.000183
SRSF4	5	0.899508	2.23E-07

Table 5. Cryo-EM data collection and refinement statistics (related to Figures 3, 5, 6 and Figures 10, 13, and 14).

	BG10-19 Fab SARS-CoV-2 S 6P	BG1-22 Fab SARS-CoV-2 S 6P	BG7-15 Fab SARS-CoV-2 S 6P	BG7-20 Fab SARS-CoV-2 S 6P	BG1-24 Fab SARS-CoV-2 S 6P
PDB	XXXX	XXXX	XXXX	XXXX	XXXX
EMD	xxxx	xxxx	xxxx	xxxx	xxxx
Data collection conditions					
Microscope	Talos Arctica	Talos Arctica	Talos Arctica	Talos Arctica	Talos Arctica
Camera	Gatan K3 Summit	Gatan K3 Summit	Gatan K3 Summit	Gatan K3 Summit	Gatan K3 Summit
Magnification	45,000x	45,000x	45,000x	45,000x	45,000x
Voltage (kV)	200	200	200	200	200
Recording mode	counting	counting	counting	counting	counting
Dose rate (e ⁻ /pixel/s)	13.5	13.3	13.8	13.8	13.3
Electron dose (e ⁻ /Å ²)	60	60	60	60	60
Defocus range (μm)	0.7 – 2.0	0.7 – 2.0	0.7 – 2.0	0.7 – 2.0	0.7 – 2.0
Pixel size (Å)	0.8689	0.8689	0.8689	0.8689	0.8689
Micrographs collected	3,807	3,386	3,065	3,717	2,609
Micrographs used	2,860	2,720	2,464	2,830	2,060
Total extracted particles	856,326	756,649	791,968	809,834	556,346
Refined particles	162,522	188,436	209,924	230,863	105,245
Particles in final refinement	101,085	71,104	130,297	135,666	84,059
Symmetry imposed	C3	C3	C1	C1	C1
Nominal Resolution (Å)					
FSC 0.5 (unmasked/masked)	7.5/3.7	7.6/4.1	7.8/4.0	8.0/4.3	8.3/4.5
FSC 0.143 (unmasked/masked)	4.4/3.3	5.9/3.7	5.2/3.7	6.7/3.8	6.7/4.0
Refinement and Validation					
Initial model used	7K43	7K4N	6XKL	6XKL	6XKL
Number of atoms					
Protein	28,466	27,798	25,662	25,238	28,871
Ligand	715	873	837	675	779
MapCC (global/local)	0.81/0.79	0.80/0.75	0.74/0.73	0.79/0.76	0.86/0.81
Map sharpening B-factor	55.7	75.3	80.7	92.4	79.1
R.m.s. deviations					
Bond lengths (Å)	0.002	0.005	0.01	0.015	0.001
Bond angles (°)	0.6	0.89	0.92	0.73	0.9
MolProbity score	2.37	2.26	2.46	2.19	2.14
Clashscore (all atom)	19.7	14.8	18.1	19.24	15.2
Poor rotamers (%)	1.3	1.1	2.4	0.32	0
Ramachandran plot					
Favored (%)	94	89.9	93.7	96.63	92.9
Allowed (%)	5.6	10.1	6.3	3.24	6.5
Disallowed (%)	0.4	0	0	0.13	0.6

[0161] Memory B cells and activated B cells are enriched for cells that generate binding and neutralizing antibodies. To test if antibodies with high levels of binding to or neutralization of SARS-CoV-2 were preferentially isolated from B cells in certain TCs, Applicants identified the clusters from which the 92 antibodies Applicants produced and tested are derived. Given that antibodies were selected for production and testing only based on representation of expanded clones (72/92) or randomly selected mostly IgG⁺ or IgA⁺ singlets (20/92) all transcriptional clusters are not equally represented among the 92 antibodies (**Table 3**). However, 20 of 33 (60%) neutralizers, 14 of 15 (94%) potent neutralizers (IC₅₀ ≤ 0.1 μg/ml) and 5 of 10 (50%) non-neutralizing high binders were derived from cells in TCs 3 and 4 (**Figure 4D and 9L, Tables 2 and 3**), whereas 36 of 49 (73%) of the low binders belonged to TCs 0 and 2 (**Figure 4D and Table 3**). The majority of neutralizers from TCs 3 and 4 were derived from singlets or small clones and did not have clonal members in other TCs among the cells

Applicants sampled (**Figure 12D**, **Table 3**). Applicants further tested the clusters for enrichment in class 1 neutralizers (*VH3-53/VH3-66* antibodies with short CDRH3 regions (Barnes et al., 2020a) and see above). *VH3-53/VH3-66* antibodies were overall significantly enriched in TC3 and TC4 compared to TCs 1, 2 and 5 (**Figures 4E** and **12B**, two-tailed t-test, $P \leq 0.0001$), and all (8/9) *VH3-53/VH3-66* neutralizing antibodies with CDRH3 regions shorter than 14 amino acids according to IMGT definition (Lefranc et al., 2015) were derived from B cells that belonged to either TC3 or TC4 (**Tables 2** and **3**). Note that the difference between TC3 and TC0 did not reach statistical significance. Applicants conclude that both strongly binding and neutralizing antibodies against SARS-CoV-2 are frequently isolated from cells with a transcriptional profile consistent with memory B cells and ABCs.

[0162] *Frequency of SARS-CoV-2 S- and RBD-binding ABCs and memory B cells correlates with serum neutralizing activity.* While memory B cells and antibody secreting plasma cells are two separate B cell compartments that are regulated differently (Leyendeckers et al., 1999), memory B cells and plasma cells can originate from the same germinal center reaction, memory B cells can become antibody secreting plasma cells upon antigen binding and stimulation (Victora and Nussenzweig, 2012) and antibodies derived from memory B cells against HIV have been detected in serum from matched patients using mass spectrometry (Scheid et al., 2009a). Whether the frequency of memory B cells among SARS-CoV-2 S- and RBD-binding B cells correlates with plasma neutralizing activity in recently recovered subjects is not known. To test this, Applicants measured if the frequency of cells from any TC among SARS-CoV-2 S- and RBD-binding B cells correlated with serum neutralization in the 14 study subjects and found that the frequency of only TC3 and TC4 cells correlated positively with serum neutralization against SARS-CoV-2 in a pseudovirus assay (Pearson's $r = 0.64$ and 0.66 , $P = 0.013$ and 0.011 , respectively) (**Figure 12C**) and this correlation was not significantly affected by correcting for time since COVID-19 diagnosis (Pearson's $r = 0.69$ and 0.76 , $P = 0.017$ and 0.007 , respectively). Applicants conclude that expansion of both SARS-CoV-2 binding memory B cells and ABCs correlate with serum neutralization titers against SARS-CoV-2 in convalescent COVID-19 patients.

[0163] *VH3-53/VH3-66 antibodies with long CDRH3s can adapt class 1 antibody structural poses.* Given the enrichment of *VH3-53/VH3-66*-encoded antibodies in TC3 and TC4 that correlated with strong binding and potent neutralization of SARS-CoV-2, Applicants selected two antibodies which were coded by cells in these clusters with distinct CDRH3

lengths for structural characterization of their Fab fragments complexed with SARS-CoV-2 RBD or stabilized S trimer. Applicants solved a 3.0 Å crystal structure of Fabs from BG4-25 (*VH3-53*-encoded with 12 aa CDRH3, $IC_{80} = 13$ ng/ml) and the SARS-CoV antibody CR3022 (Tian et al., 2020) in complex with SARS-CoV-2 RBD (**Figure 13A** and **Table 6**). Consistent with the binding mode of class 1 neutralizing antibodies (Barnes et al., 2020b; Yuan et al., 2020), BG4-25 recognizes a RBD epitope that overlaps with >90% of residues in the ACE2 RBM (**Figure 13B**), which is only fully accessible with “up” RBD conformations. Two V-gene encoded regions in class 1 neutralizing antibodies prominently contribute to epitope recognition; the ³¹SNY³³ CDRH1 and ⁵³SGGS⁵⁶ CDRH2 sequence motifs, which take part in extensive hydrogen bond interactions at the RBD interface (Yuan et al., 2020; Tan et al., 2021; Wu et al., 2020b). Analysis of inferred somatic mutations in 93 *VH3-53/VH3-66* antibodies coded in the collection of SARS-CoV-2 binding B cells with CDRH3 less than 14 amino acids (IMGT definition; (Lefranc et al., 2015) revealed frequent inferred mutations in these motifs, including S31R and S56T in the antibody heavy chain positions 31 and 56, respectively, which are observed in BG4-25 (**Figure 13C-E**). *VH3-53/VH3-66*-encoded antibodies from SARS-CoV-2 binding B cells with short CDRH3s were also enriched for inferred mutations Y58F, F27L, and T28I, with the latter two mutations reported to increase neutralization potency in this class of antibodies (Hurlburt et al., 2020). Despite lacking these specific mutations, BG4-25 shows exceptional neutralizing activity, which is potentially explained by the F27I and S31R CDRH1 loop mutations that provide increased van der Waals interactions along the antibody-RBD interface (**Figure 13D, E**).

[0164] In addition to the recurrent, class 1 neutralizing antibodies defined by *VH3-53/VH3-66*-encoded gene segments and short CDRH3s (e.g., BG4-25), a subset of *VH3-53/VH3-66*-encoded neutralizing antibodies have been described with CDRH3 lengths >15 amino acids which would seemingly be incompatible with the binding mode of the recurring class 1 antibodies. A 3.7 Å cryo-EM structure of BG1-22 (*VH3-53*-encoded with 21 aa CDRH3, $IC_{80} = 72$ ng/ml, **Table 2**) Fab complexed with stabilized S trimers revealed binding of BG1-22 to “up” RBD conformations (**Figures 5A** and **13F-H**). Surprisingly, the binding orientation of BG1-22 was consistent with class 1 antibody binding modes (**Figure 5B**), which contrasts with previously-characterized *VH3-53/VH3-66* – long CDRH3 antibodies (Barnes et al., 2020a) (Wu et al., 2020a). To accommodate this binding mode, the 21-residue long CDRH3 of BG1-22 flips outward towards RBD residue Q493 resulting in a slight rotation of the antibody light

chain relative to the canonical class 1 RBD-binding antibodies (**Figure 5C-E**). The displaced CDRH3 conformation makes few sidechain interactions with the RBD, such that 6 residues of the CDRH3 loop are disordered (**Figure 5C, D**).

[0165] Although unliganded Fab structures often exhibit a disordered CDRH3 (e.g., 1RZI, 1RZF), it is unusual for an antibody bound to an antigen to exhibit a disordered CDRH3. From an examination of 731 antibody-antigen structures with resolutions of 3.5 Å or better in the Structural Antibody Database (SABDab; (Dunbar et al., 2014)), Applicants found only 6 with missing residue numbers between heavy chain residues 95 to 107, implying a disordered CDRH3 (PDB Codes 3LH2, 4JDT, 7JWB, 5ANM, 4M8Q, 3LHP). None of these complexes involved conventional antibody-antigen pairs; instead, they were germline forms of antibodies, the epitope was presented in a scaffold, or only the VH domain was involved in binding. This suggests that the orientation adopted by BG1-22 is not one that promotes CDRH3-mediated interactions with the antigen, as is classically observed in antibody-antigen structures, but instead simply accommodates the longer CDRH3 length by displacing much of the loop to outside the antibody-antigen interface. Taken together, these results provide further insight into the recurring *VH3-53/VH3-66* neutralizing antibody class and suggests that longer CDRH3s, while infrequent, are not a restriction to V-gene mediated interactions at the RBD interface for *VH3-53/VH3-66* antibodies. See, also, **Figures 16, 27, 29 and 30-33**.

Table 6. X-ray crystallographic data collection and refinement statistics (related to Figures 5 and 13).

BG4-25 - SARS2-RBD (12-2, SSRL)	
PDB ID	
Data collection^a	
Space group	P2 ₁ 2 ₁ 2 ₁
Unit cell (Å)	56.0, 104.3, 268.8
α, β, γ (°)	90, 90, 90
Wavelength (Å)	1.0
Resolution (Å)	38.8-3.0 (3.16-3.0)
Unique Reflections	31,903 (4079)
Completeness (%)	97.9 (88.1)
Redundancy	6.1 (4.2)
CC _{1/2} (%)	97.2 (25.9)
$\langle I/\sigma I \rangle$	4.0 (0.7)
Mosaicity (°)	0.23
R _{merge} (%)	27.1 (135.8)
R _{pim} (%)	12.5 (88.6)
Wilson B-factor	60.9
Refinement and Validation	
Resolution (Å)	38.8 - 3.0
Number of atoms	
Protein	8,183
Ligand	0
Waters	0
R _{work} /R _{free} (%)	22.8/27.6
R.m.s. deviations	
Bond lengths (Å)	0.01
Bond angles (°)	1.6
MolProbity score	1.89
Clashscore (all atom)	18.9
Poor rotamers (%)	0.9
Ramachandran plot	
Favored (%)	86.4
Allowed (%)	11.1
Disallowed (%)	0.7
Average B-factor (Å)	80.5

^aNumbers in parentheses correspond to the highest resolution shell

[0166] *Structural characterization of neutralizing antibodies with distinct epitope recognition and mutational escape patterns.* To further understand the specificity of RBD-targeting, Applicants determined cryo-EM structures of Fab-S complexes for three additional potentially neutralizing antibodies: BG7-15 (*VH1-18*-encoded, 11 aa CDRH3, IC₈₀ = 92 ng/ml),

BG7-20 (*VH1-8*-encoded, 20 aa CDRH3, $IC_{80} = 23$ ng/ml) and BG1-24 (*VH1-69*-encoded, 16 aa CDRH3, $IC_{80} = 7$ ng/ml), to resolutions of 3.7, 4.0, and 3.9 Å, respectively (**Figures 6 and 14, Table 5**). In all cases, Fabs were bound to either up or down RBD conformations, demonstrating recognition of antibody epitopes in either state. Analysis of the BG7-15 – S structure revealed an antibody epitope focused on RBD residues 439-451, mainly mediated by contacts with CDRH3 and CDRL3 loops, which is non-overlapping with the ACE2 RBM (**Figure 6B-D**). Overlay of BG7-15 and REGN-10987 (Hansen et al., 2020) showed a shared antibody footprint that binds outside the ACE2 RBM but would sterically hinder ACE2 receptor binding to RBD (**Figure 3H and Figure 6E**) while allowing binding of class 1 neutralizing antibodies (*e.g.*, BG4-25, C102, REGN-10933).

[0167] Cryo-EM structures of BG7-20 – S and BG1-24 – S complexes revealed RBD-targeting similar to human neutralizing antibodies that belong to the class 2 binding mode (Barnes et al., 2020a). This class of SARS-CoV-2 neutralizing antibodies is defined by potent neutralizers capable of recognizing up and down RBD conformations, an epitope that overlaps with the ACE2 RBM, has secondary interactions with neighboring “up” RBDs, and has the potential for intra-protomer avidity effects. Despite preferred VH gene usages yet to be established for class 2 antibodies (BG7-20 and BG1-24 are *VH1-8* and *VH1-69*, respectively), BG7-20 and BG1-24 show a similar epitope focused along the RBD ridge that overlaps with residues involved in ACE2 binding and includes contacts with E484, F486, and Q493. The binding pose of BG1-24 promotes stabilization of the N165_{NTD} glycan, adding to the observation that class 2 antibodies can involve interprotomer glycan contacts (Cao et al., 2020a). Interestingly, the N-glycan interaction is mediated by a hydrophobic Met-Phe sequence at the tip of CDRH2, a common feature of *VH1-69* antibodies (Chen et al., 2019). This feature has been attributed to facilitating broad neutralization by antibodies against influenza and Hepatitis C (Guthmiller et al., 2020) (Chen et al., 2019) and likely explains BG1-24’s polyreactivity (**Figure 9E and Table 3**).

[0168] With the use of monoclonal antibodies as therapeutic options for SARS-CoV-2 infection, understanding possible RBD mutations selected under monoclonal antibody pressure and the frequency of SARS-CoV-2 isolates harboring RBD mutations that confer immune escape is critical. While deep mutational scanning and *in vitro* selection experiments have facilitated the choice of therapeutic antibody cocktails, these experiments have also illustrated that single-point mutations are sufficient for viral escape (Greaney et al., 2020; Weisblum et

al., 2020). Indeed, reports of the SARS-CoV-2 spike variant N439K, which now accounts for 3-4% of global isolates, could potentially limit the use of REGN-10987 as a therapy in SARS-CoV-2 infection (Barnes et al., 2020b).

[0169] To assess the effects of RBD substitutions, Applicants assayed ELISA binding and SARS-CoV-2 pseudovirus neutralization for 6 of the 7 antibodies reported in this study against a panel of RBD point mutations by ELISA (**Figure 7A-P**). Decreased binding and neutralization potency was observed for most antibodies when RBD substitutions occurred within the antibody epitope and were consistent with RBD substitutions known to decrease binding of antibodies in the same class (**Figure 7C-Q**) (Barnes et al., 2020a; Greaney et al., 2020). Notable exceptions included BG7-15, which showed neutralizing activity against the RBD N439K mutant that confers escape against REGN-10987, and BG4-25, which neutralized the class 1 escape variant A475V (**Figure 7M, N**). In general, decreased binding affinity correlated with RBD mutations that conferred viral escape in pseudotyped viral neutralization assays and were consistent with the observation that RBD mutations that affect antibodies from one class do not affect antibodies in a different RBD-targeting class (**Figure 7C-H and K-P**). Given that several potentially neutralizing antibodies were non-competitive, Applicants assessed antibody cocktails for synergistic neutralization effects ($IC_{50_{eff}} > 1$) against SARS-CoV-2 pseudovirus using a previously described synergistic model (West et al., 2010). Results suggest that only the BG10-19 + BG4-25 antibody combination demonstrated synergistic neutralizing activity (**Figure 7Q**) with other pairs showing no synergistic effects, consistent with published results for similarly classed antibody pairs (Hansen et al., 2020).

[0170] Finally, given the broad binding and neutralization activity of BG10-19 against a panel of SARS-CoV-2 RBD substitutions (**Figure 7J, K**), Applicants utilized a rVSV/SARS-CoV-2 chimeric virus to determine spike variants that escape neutralization BG10-19 ((Weisblum et al., 2020) **Methods**). Initial attempts at selection experiments for BG10-19 showed no viral escape variants, consistent with observations for potentially neutralizing convalescent plasma, antibody cocktails, and some monoclonal antibodies (Weisblum et al., 2020). However, after several passages, plaque purified viruses harboring the G339R and L441P mutations showed partial escape from BG10-19 (**Figure 7R**). Thus, Applicants conclude that BG10-19's SARS-CoV-2/SARS-CoV cross neutralization and ability to tolerate single RBD mutations within its epitope makes it an attractive therapeutic candidate as

Applicants observe increasing point mutations among different SARS-CoV-2 isolates (**Figure 10D**). See, also, **Figures 22, 23 and 27**.

[0171] Discussion. Antibodies play an indispensable role in antiviral immune responses both through their ability to neutralize viruses via interactions with their Fabs (Corti and Lanzavecchia, 2013) and by engaging other components of the immune system through interactions with their Fc regions (Bournazos et al., 2020). Characteristic features of different viruses influence the dynamics of how antiviral B cell and antibody responses are generated. HIV-1, for example, constrains efficient antibody responses through narrow structural pathways to broad neutralization (Scheid et al., 2011) and by causing B cell exhaustion (Moir et al., 2008).

[0172] In this study, Applicants show from a comprehensive in-depth analysis of SARS-CoV-2 binding B cells from convalescent individuals 4-8 weeks post SARS-CoV-2 infection that the repertoire of SARS-CoV-2 binding B cells includes clonally expanded memory B cells and ABCs, as well as mature naïve B cells that are mostly observed as singlets, IgM⁺ or IgD⁺ and non-mutated. Interestingly, Applicants found clonal cells to be present in TC0, which is enriched in IgM⁺ B cells with inferred somatic mutations and low expression of CD27. Despite showing clonal expansion and somatic mutations, antibodies produced from this cluster were mostly low binding and non-neutralizing. An important point to consider in this context is that the comparatively low affinity of these antibodies could potentially be overcome *in vivo* if expressed as pentamers in the presence of J chain, similar to the observation of increased neutralization of some IgA antibodies when expressed as dimers. Applicants speculate that this cluster might contain cells from an early extrafollicular B cell response as also observed in influenza infection (Lam and Baumgarth, 2019). On the other hand, high binding and potent neutralizing activity were mostly detected in antibodies isolated from ABCs and memory B cells that shared transcriptional phenotypes across different individuals.

[0173] Immunologic correlates for protection from SARS-CoV-2 after vaccination or prior exposure are not yet defined, but studies of other respiratory viruses suggest that serum neutralization could play an important role in protective immunity against SARS-CoV-2 (Kulkarni et al., 2018; Verschoor et al., 2015). Consistent with other SARS-CoV-2 studies, Applicants did not detect any intra-donor correlation between serum neutralization and the potency of monoclonal antibodies (Robbiani et al., 2020), but Applicants found a strong correlation between serum neutralization and the relative size of the ABC and memory B cell

populations. This underscores the close relationship between high affinity memory B cell responses and serum antibody activity in SARS-CoV-2. It is important to investigate if a similar correlation exists in individuals who have been vaccinated against SARS-CoV-2 in an effort to delineate different responses to SARS-CoV-2 vaccines. Given its limited size, entry into the memory B cell compartment is tightly regulated by selection for high affinity of the immunoglobulin receptor (Victora and Nussenzweig, 2012). If neutralizing activity can also be selected for in the germinal center reaction is not known. Applicants did not find that to be the case, as both non-neutralizing high binders and neutralizers were found in TC3 and TC4 which are consistent with post germinal center B cells. This highlights the importance of integrating antibody structural and functional information in antiviral vaccine design, as neutralization cannot be independently selected for in the immune response (Chen et al., 2018).

[0174] The structural analysis revealed new insights into commonalities and differences among RBD-specific monoclonal antibodies. For example, in common with potently neutralizing antibodies C144 (Barnes et al., 2020a) and S2M11 (Tortorici, 2020), BG10-19 bridges between adjacent RBDs to lock the S trimer into a closed, prefusion conformation. However, in contrast to most previously described antibodies, BG10-19 recognizes a conserved epitope within the RBD core that is accessible in up/down RBD conformations on the spike trimer of both SARS-CoV-2 and SARS-CoV (unlike the conserved, cryptic CR3022 epitope only accessible on up RBD conformations), which may allow design of immunogens that elicit cross-reactive protection against future emerging coronaviruses. BG10-19's unique binding/neutralization properties and resistance to all RBD mutations identified in circulating isolates with a frequency >0.01%, including those found within the B.1.1.7 and B.1.351 lineages, make this an ideal therapeutic candidate in the arsenal against SARS-CoV-2.

[0175] Additionally, high-resolution structures of *VH3-53/VH3-66*-class antibodies provided further understanding of the rules that govern potent neutralization and viral escape from this recurring antibody class and showed that CDRH3 length may not be a limitation to VH gene segment-mediated interactions at the RBD interface. Collectively, these structures and insights into the cellular processes behind the induction of potent, cross-reactive, neutralizing antibodies will not only aid in the battle to control the current COVID-19 pandemic through the use of safe and effective antibody treatments but will also provide additional criteria for the evaluation of humoral immune responses elicited from candidate vaccines against emerging zoonotic viruses with pandemic potential.

Example 2 – SARS/COV2/MERS cross binding antibodies

[0176] Applicants also identified antibodies that bind to SARS, COV2 and MERS (**Figures 34-39 and Table 7**). Applicants used Hash tags for cells specific to MERS, SARS and COV2 and sequenced the antibodies together (**Figure 34**). When used as sorting bait all 6 proteins yielded differently expanded B cell clones (**Figure 35**). There was considerable clonal overlap between B cells sorted with the 6 different proteins (**Figure 36**). The majority of expanded clones were IgM+, but some expanded clones include class switched B cells (**Figure 37**). Sorting with SARS/MERS/COV2 trimers selects for antibodies that bind outside of the RBD region of the spike protein (**Figure 38**). Thus, the antibodies may be specific to non-mutated virus as most mutations occur in the RBD domain. Thus, the antibodies may be used for identifying immunogenic epitopes outside of the RBD domain. **Figure 39** shows staining with multiple coronavirus trimers for use in simultaneous staining.

Table 7. SARS/MERS/CoV2 Antibodies (SEQ ID NOS: 369-446).

Isotype	VH Gene	Heavy Chain	CDR3 Heavy Chain	Light Chain	VK/VL Gene		CDR3 Light Chain	Virus	Name
IGHG1	IGHV 4-59	IGHJ6	CARHWRDCSGGV CQASQYSSMDVW	IGL	IGLVI-40	IGLJ2,IGLJ3,IGLJ3	CQSYDGSL SESAVF	MERS 2P	LKA1
IGHG1	IGHV 4-59	IGHJ6	CARHWRDCTGGV CRASQYSSMDVW	IGL	IGLVI-40	IGLJ2,IGLJ3,IGLJ3	CHSYDGSL SESAVF	SARS 2P	LKA2
IGHA2	IGHV 4-59	IGHJ6	CARHWRDCSGGV CRASQYSSMDVW	IGL	IGLVI-40	IGLJ2,IGLJ3,IGLJ3	CQSYDGSL SESAVF	SARS 2P	
IGHA2	IGHV 4-59	IGHJ6	CARHWRDCSGGV CRASQYSSMDVW	IGL	IGLVI-40	IGLJ2,IGLJ3,IGLJ3	CQSYDGSL SESAVF	SARS 2P	
IGHA1	IGHV 4-59	IGHJ6	CARHWRDCNRGV CRASQYSSMDVW	IGL	IGLVI-40	IGLJ2,IGLJ3,IGLJ3	CHSYDGT SESAVF	SARS 2P	
IGHG1	IGHV 4-59	IGHJ6	CARHWRECSGGVC RASQYSSMDVW	IGL	IGLVI-40	IGLJ2,IGLJ3,IGLJ3	CQSYDGSL SESAVF	SARS 2P	
IGHG1	IGHV 4-59	IGHJ6	CARHWRDCNCGV CRASQYSSMDVW	IGL	IGLVI-40	IGLJ2,IGLJ3,IGLJ3	CQSYDGSL SESAVF	SARS 2P	
IGHG1	IGHV 4-59	IGHJ6	CARHWRECSGGVC RTSQYSSMDVW	IGL	IGLVI-40	IGLJ2,IGLJ3,IGLJ3	CQSYDGSL SESAVF	SARS 2P	
IGHG1	IGHV 4-59	IGHJ6	CARHWRDCSGGV CRASQYSAMDVW	IGL	IGLVI-40	IGLJ3	CHSYDGSL SESAVF	COVID 2P	LKA3

IGHA1	IGHV 3-30	IGHJ3	CAHVRPLTGYHVG HDPFDIW	IGL	IGLVI- 51	IGLJ2,IG LJ3,IGLJ 3	CGTWDTS LSIGVF	MER S 2P	LKA4
IGHA1	IGHV 3-30	IGHJ3	CAHVRPLTGYHVG HDPFDIW	IGL	IGLVI- 51	IGLJ2,IG LJ3,IGLJ 3	CGTWDTS LRIGVF	MER S 2P	
IGHA1	IGHV 3-30	IGHJ3	CAHVRPLTGYHVG HDPFDIW	IGL	IGLVI- 51	IGLJ3	CGTWDTS LSIGVF	SARS 2P	LKA5
IGHA1	IGHV 3-30	IGHJ3	CAHVRPLTGYHVG HDPFDIW	IGL	IGLVI- 51	IGLJ2,IG LJ3,IGLJ 3	CGTWDTS LSAGVF	SARS 2P	
IGHA1	IGHV 3-30	IGHJ3	CAHVRPLTGYHVG RDPFDIW	IGL	IGLVI- 51	IGLJ2,IG LJ3,IGLJ 3	CGTWDTS LSAGVF	SARS 2P	
IGHA1	IGHV 3-30	IGHJ3	CAHVRPLTGYHVG RDPFDVW	IGL	IGLV3-1	IGLJ2,IG LJ3	CQAWNN NNVF	SARS 2P	
IGHA1	IGHV 4-59	IGHJ4	CARGFDYW	IGK	IGKV3- 20	IGKJ1	CQQYGNS PWTF	MER S 2P	LKA6
IGHGI	IGHV 4-59	IGHJ4	CARGFDYW	IGK	IGKV3- 20	IGKJ1	CLQYGS GWTF	SARS 2P	LKA7
IGHGI	IGHV 4-59	IGHJ4	CARGFDYW	IGK	IGKV3- 20	IGKJ1	CQQYGSS PWTF	SARS 2P	
IGHG3	IGHV 4-59	IGHJ4	CARGFDYW	IGK	IGKV3- 20	IGKJ1	CQQYGSS PWTF	SARS 2P	
IGHGI	IGHV 4-59	IGHJ4	CARGFDYW	IGK	IGKV3- 20	IGKJ1	CHQYGSS PWTF	SARS 2P	
IGHGI	IGHV 4-59	IGHJ3	CARRIYGGDGFDI W	IGL	IGKV3- 21	IGLJ1	CQVWHG TGDQYVF	SARS 2P	LKA8
IGHGI	IGHV 4-59	IGHJ3	CARRIYGGDGFDI W	IGL	IGKV3- 21	IGLJ1	CQVWPGS SDHYVF	SARS 2P	
IGHGI	IGHV 4-59	IGHJ3	CARRIYGGDGFDI W	IGL	IGKV3- 21	IGLJ1	CQVWHG TSDHYVF	SARS 2P	
IGHA1	IGHV 3-30	IGHJ6	CARSRGGSYYYGM DVW	IGK	IGKV1- 39	IGKJ2,I GKJ2	CQQSYSTL ETF	SARS 2P	LKA9
IGHGI	IGHV 3-30	IGHJ6	CARSRGGSYYYGM DVW	IGK	IGKV1-5	IGKJ1	CQHYNFS PTWTF	SARS 2P	
IGHGI	IGHV 3-30	IGHJ6	CARAAGGGYYYG MDVW	IGL	IGLV2- 23	IGLJ1	CCSYAGGY VF	SARS 2P	LKA10
IGHGI	IGHV 3-30	IGHJ6	CARAAGGNYYYG MDVW	IGK	IGKV1- 39	IGKJ4	CQQSYGS PLTF	SARS 2P	
IGHA1	IGHV 4-59	IGHJ3	CARSVAALTWELN KLAFDVW	IGK	IGKV3- 20	IGKJ1	CQQYGSP TWTF	COVI D 2P	LKA11
IGHA1	IGHV 4-59	IGHJ3	CARSVAALTWELN KLAFDVW	IGK	IGKV3- 20	IGKJ1	CQQYGSP TWTF	COVI D RBD	

IGHA1	IGHV 1-69	IGHJ4	CAQTPYDSSGYR SYW	IGK	IGKV3- 11	IGKJ4	CQQRNTN WPPRLTF	MER S 2P	LKA12
IGHA1	IGHV 1-69	IGHJ4	CAETTPYDSSGYR SYW	IGK	IGKV3- 11	IGKJ4	CQQRNTN WPPRLTF	SARS 2P	LKA13
IGHG1	IGHV S-51	IGHJ4	CARWEAGGTSPLD YW	IGK	IGKVI-5	IGKJ2	CQRYNSYS QNTF	SARS 2P	LKA14
IGHG1	IGHV S-51	IGHJ4	CARWEAGGTSPLD SW	IGK	IGKVI-5	IGKJ2,I GKJ2	CQQYSSYS QITF	SARS 2P	
IGHA1	IGHV 3-66	IGHJ4	CARGYGDYFDYW	IGK	IGKV3- 20	IGKJ2,I GKJ2,IG KJ2	CQHFGSS PLF	SARS 2P	LKA15
IGHG1	IGHV 3-66	IGHJ4	CARAYGDYFDYW	IGK	IGKV3- 20	IGKJ2,I GKJ2	CQQYRTF	SARS 2P	
IGHG3	IGHV S-51	IGHJ5	CARHPKGYGLRLP NWFDPW	IGL	IGLV2- 14	IGLJ1	CSSYTSST FF	SARS 2P	LKA16
IGHG3	IGHV S-51	IGHJ5	CARHPKGYGLRLP NWFDPW	IGL	IGLV2- 14	IGLJ1	CSSYTSST FF	SARS 2P	
IGHG1	IGHV 3-23	IGHJ4	CAKDLPYRCSGGS CFGYFDYW	IGL	IGLVI- 44	IGLJ2,IG LJ3	CSAWDDS LNGVVF	SARS 2P	LKA17
IGHM	IGHV 3-23	IGHJ4	CAKDLPYRCSGGS CFGYFDYW	IGL	IGLVI- 44	IGLJ2,IG LJ3	CAAWDDS LNGVVF	SARS 2P	

Example 3 – Methods

[0177] *Experimental model and subject details.* All work with human samples was performed in accordance with approved Institutional Review Board protocols (IRB) which were reviewed by the IRB at Brigham and Women's Hospital, Boston. Subjects who had recovered from COVID-19 (**Table 1**) were recruited through a patient cohort that has been created in collaboration between The Broad Institute of MIT and Harvard, Cambridge (MA, USA) and Brigham and Women's Hospital, Boston (MA, USA) under IRB protocol 2020P000849, "Biorepository for Samples from those at increased risk for or infected with SARS-CoV-2". Blood draws were performed at Brigham and Women's Hospital.

[0178] *Serum RBD Enzyme-linked immunosorbent assay (ELISA).* Serum ELISAs against SARS-CoV-2 RBD were performed in a protocol modified from (Roy et al., 2020). MaxiSorp 384-well microplates (Sigma) were coated with 50 µl/well of 2,500 ng/ml of SARS-CoV-2 RBD in coating buffer (1 packet BupH carbonate-bicarbonate (ThermoFisher) in 500 ml of Milli-Q H2O) overnight at 4°C. Plates were then washed 3 times with 100 µl/well of wash buffer (0.05% Tween-20, 400 mM NaCl, and 50 mM Tris-HCl [pH 8.0] in Milli-Q H2O) using a BioTek 406 plate washer. Plates were blocked by adding 100 µl/well of blocking buffer (1%

BSA, 140 mM NaCl, and 50 mM Tris-HCl (pH 8.0)) for 30 min at room temperature. Plates were then washed as described above. 50 μ l of 1:100 diluted serum samples in dilution buffer (1% BSA, 0.05% Tween-20, 140 mM NaCl, and 50 mM Tris-HCl (pH 8.0)) were added to the wells and incubated for 30 min at 37 °C. Plates were then washed 7 times as described above. 50 μ l/well of 1:25,000 diluted detection antibody solution (HRP-anti human IgG and IgM, Bethyl Laboratory #A80-104P, A80-100P) was added to the wells and incubated for 30 min at room temperature. Plates were then washed 7 times as described above. 40 μ l/well of Pierce TMB peroxidase substrate (ThermoFisher) was then added to the wells and incubated at room temperature for 3 min (IgG) or 5 min (IgM). The reaction was then stopped by adding 40 μ l/well of stop solution (0.5M H₂SO₄ in Milli-Q H₂O) to each well. The OD was read after 15 min at 450 nm and 570 nm on a BioTek Synergy HT. For control antibodies CR3022 (Tian et al., 2020) IgG1 and IgM (Absolute Antibody #Ab01680-10.0, Ab01680-15.0) dilution curves, the antibodies were diluted to a concentration of 1 μ g/ml in dilution buffer and duplicate 12 two-fold serial dilution curves were generated. One known positive and two known negative samples were included on each plate as controls.

[0179] Serum ELISA analysis. A standard curve based on absorbances from the monoclonal antibody CR3022 (Tian et al., 2020) dilution series included with each plate was used to estimate antibody abundance in test samples and allow for comparison of results across batches. Estimated antibody abundance in test samples was compared to the background signal from a cohort of pre-pandemic serum samples that served as negative controls. Serum samples with antibody abundance greater than 3 standard deviations (SD) above the mean of the pre-pandemic serum samples were considered to be positive and samples with antibody abundance less than 3 SD above the mean of the pre-pandemic serum samples were considered negative.

[0180] SARS-CoV-2 and SARS-CoV pseudovirus neutralization assay. Neutralizing activity against SARS-CoV-2 pseudovirus was measured using a single-round infection assay in human ACE2-expressing target cells. Convalescent patient serum samples were tested against pseudotyped virus particles produced in 293T/17 cells (American Type Culture Collection) by co-transfection of plasmids encoding codon-optimized S (containing D at position 614) with a partially deleted cytoplasmic tail (provided by Dr. Dan Barouch, Beth Israel Deaconess Medical Center), and the HIV-1 backbone vector SG3 Δ Env (NIH AIDS Reagent Program). This pseudovirus strain was used for infecting TZM.bl/ACE2 target cells which encode an integrated luciferase reporter gene under control of an HIV-1 LTR.

Subsequently, a second pseudovirus assay platform was implemented and used for testing neutralizing activity of purified monoclonal antibodies. This assay platform utilized pseudovirus produced in 293T/17 cells by co-transfection of plasmids encoding codon-optimized SARS-CoV-2 full-length S (containing G at position 614), packaging plasmid pCMV Δ R8.2 expressing HIV-1 gag and pol, and luciferase reporter plasmid pHR' CMV-Luc. Plasmids were kindly provided by Dr. Barney Graham (NIH, Vaccine Research Center). This pseudovirus strain was used for infecting 293/ACE2 target cells. The 293T and TZM.bl cell lines stably overexpressing the human ACE2 cell surface receptor protein were kindly provided by Drs. Michael Farzan and Huihui Ma (The Scripps Research Institute). For neutralization assays, serial dilutions of patient serum samples (primary 1:20 with 3-fold dilution series) or antibodies (up to 50 μ g/ml with 5-fold dilution series) were performed in duplicate followed by addition of pseudovirus. Plates were incubated for 1 hour at 37°C followed by addition of 293T/ACE2 or TZM.bl/ACE2 target cells (1×10^4 /well). Wells containing cells + pseudovirus (without sample) or cells alone acted as positive and negative infection controls, respectively. Assays were harvested on either day 2 (TZM.bl/ACE2 target cells) or day 3 (293/ACE2 target cells) using Promega Bright-Glo luciferase reagent and luminescence detected with a Perkin-Elmer Victor luminometer. Titers were determined as the serum dilution or antibody concentration that inhibited 50% or 80% virus infection (serum ID₅₀/ID₈₀ or antibody IC₅₀/IC₈₀ titers, respectively).

[0181] Similarly, neutralizing activity of monoclonal antibodies against SARS-CoV pseudovirus as well as SARS-CoV-2 variants B.1.1.7 and B.1.351 was determined using HIV-based lentiviral particles pseudotyped with either SARS-CoV S lacking the C-terminal 21 amino acids of the cytoplasmic tail or SARS-CoV-2 S (containing G at position 614) carrying the reported spike mutations in B.1.1.7 and B.1.351 (Tegally et al., 2020) (Davies et al., 2021). Pseudotyped particles were generated and neutralization assays were performed as previously described (Crawford et al., 2020a) (Crawford et al., 2020b). Briefly, the genes encoding the respective spike proteins were co-transfected with Env-deficient HIV backbone to create pseudotyped lentiviral particles. For neutralization assays, 4- or 5-fold serially diluted purified IgG was incubated with SARS-CoV pseudotyped virus for 1 hour at 37°C. The virus/antibody mixture was added to 293TACE2 target cells and incubated for 48 hours at 37°C, then cells were lysed and luciferase activity was measured using Britelite Plus (Perkin Elmer). Relative luminescence units (RLUs) were normalized to values derived from cells infected with

pseudotyped virus in the absence of antibody. Data were fit to a 5- parameter nonlinear regression in AntibodyDatabase (West et al., 2013).

[0182] *Blood sample processing.* 60-80 ml of blood from each donor were processed using Ficoll Paque Plus (GE Healthcare) in order to isolate peripheral blood mononuclear cells (PBMCs) according to the manufacturer's instructions. After PBMC isolation Applicants immediately proceeded with isolation of CD20⁺ B cells using magnetic cell separation (MACS). In brief, cells were resuspended in MACS buffer (phosphate buffered saline (PBS) pH 7.2, 0.5% bovine serum albumin (BSA) and 2 mM EDTA) and stained with mouse anti-human CD20 IgG1 antibody coupled to magnetic beads (Miltenyi Biotec, #130-091-104). After washing and resuspending in MACS buffer cells were added to LS columns (Miltenyi Biotec) placed on a magnetic stand and the columns washed 3 times with 3 ml MACS buffer before removing the columns from the magnet and elution of cells according to the manufacturer's instructions. Cells were then washed and resuspended in Cell Staining Buffer (Biolegend, #420201).

[0183] *Cell staining and sorting.* CD20 enriched cells were stained with DNA-barcoded TotalSeq C antibodies (Biolegend) according to the manufacturer's instructions. In brief, cells underwent Fc receptor blocking with Human TruStain FcX™ Fc (Biolegend) for 10 minutes at 4°C, after which cells were washed and resuspended in Cell Staining Buffer (Biolegend, #420201). Cells from different subjects were then stained with different TotalSeq C antibodies (Biolegend): 1 (TotalSeq™-C0251 anti-human Hashtag 1 Antibody), 2 (TotalSeq™-C0252 anti-human Hashtag 2 Antibody), 3 (TotalSeq™-C0253 anti-human Hashtag 3 Antibody), 4 (TotalSeq™-C0254 anti-human Hashtag 4 Antibody), 6 (TotalSeq™-C0256 anti-human Hashtag 6 Antibody), 7 (TotalSeq™-C0257 anti-human Hashtag 7 Antibody), 8 (TotalSeq™-C0258 anti-human Hashtag 8 Antibody), 10 (TotalSeq™-C0260 anti-human Hashtag 10 Antibody). After staining with hashing antibodies, cells were washed 3 times in Cell Staining Buffer (Biolegend, #420201) and then up to 7 separate samples were combined for staining of antigen binding B cells. For this, the combined samples were stained with either 1µg/ml biotinylated SARS-CoV-2 spike trimer or 1µg/ml biotinylated SARS-CoV-2 RBD (See below for protein expression; biotinylation was performed using avitag technology (Avidity) following the manufacturer's instructions). Cells were simultaneously stained with FITC mouse anti-human CD19 antibody (BD, 340864) and incubated for 20 minutes at 4°C before they were washed and resuspended in PBS with 5% fetal bovine serum (FBS). Cells were then

stained with streptavidin-coupled APC (Biolegend #405207) for 5 minutes at 4°C and washed and resuspended in PBS with 5% FBS. Antigen binding B cells were then sorted using a Sony MA900 cell sorter by gating on live cells in the forward scatter and side scatter (Figure 1A and 1B) and on CD19-FITC and SARS-CoV-2 S-APC or RBD-APC double-positive cells. After sorting, cells were washed and counted using a hemocytometer and microscopy, before resuspending up to 10,000 cells in a volume of 32µl for 5' single cell RNA-Seq (see below).

[0184] 5' *scRNA-seq* library generation. Cells were separated into droplet emulsions using the Chromium Next GEM Single-cell 5' Solution (v1.1) and the 10x Chromium Controller. 5,000-10,000 cells were loaded per channel of the Chromium Next GEM single-cell 5' (v1.1) Chip G. Following lysis of cells, barcoded mRNA reverse transcription, and cDNA amplification, a 0.6X SPRI cleanup was performed and the supernatant was set aside for Feature Barcoding library construction as instructed by the Chromium NextGEM single-cell V(D)J v1.1 protocol. A final elution of 45µL was saved for further construction of libraries. Using the saved supernatant of the 0.6X cDNA cleanup, Feature Barcoding libraries were completed according to the 5' Next GEM (v1.1) Feature Barcoding library construction methods provided by 10x Genomics. Gene expression and V(D)J libraries were created according to manufacturer's instruction (10x Genomics), which includes enzymatic fragmentation, adaptor ligation, and sample index barcoding steps. The V(D)J libraries were created from the original cDNA after it was enriched for human B cells, following the Chromium NextGEM single-cell V(D)J v1.1 protocol.

[0185] *scRNA-seq* library sequencing. Gene expression, feature barcoding libraries, and BCR enriched V(D)J libraries were sequenced on a Nextseq500 (Illumina) using a high output 150 cycle flowcell, with the read configuration Read 1: 28 cycles, Read 2: 96 cycles, Index read 1: 8 cycles or sequenced on a HiSeq X (Illumina), using a 150 cycle flowcell with the read configuration: Read 1: 28 cycles, Read 2: 96 cycles, Index read 1: 8 cycles. Feature Barcoding libraries were spiked into the gene expression libraries (at 10-20% of the sample pool) prior to sequencing. All BCR enriched V(D)J libraries were pooled together and sequenced on a NextSeq500 (Illumina) using the same parameters as previously mentioned.

[0186] *Antibody production.* Antibody VDJ heavy chain and VJ light chain sequences of selected antibodies were produced as minigenes and cloned into IgG1 heavy chain, IgA1 heavy chain, IgA2 heavy chain, kappa light chain or lambda light chain expression vectors as previously described (Wardemann et al., 2003) (Wang et al., 2020b). After cloning into

expression vectors, matching antibody heavy chain and light chain plasmids were co-transfected into Expi293F cells following the manufacturer's instructions. In brief, heavy chain plasmid DNA and light chain plasmid DNA were diluted in 1.5ml Opti-Plex Complexation Buffer (Invitrogen) before mixing with 80 μ l ExpiFectamine 293 Reagent (Invitrogen) diluted in 1.4ml Opti-Plex Complexation Buffer (Invitrogen). For dimeric IgA production equal amounts of heavy chain plasmid DNA, light chain plasmid DNA and J chain plasmid DNA were used in the transfection. Mixture was incubated for 15 minutes at room temperature before adding to 25ml of Expi293F cells at a density of 3.0×10^6 viable cells/ml and incubation in a shaker incubator according to the manufacturer's instructions. ExpiFectamine 293 Transfection Enhancer 1 and 2 (150 μ l and 1.5 ml, respectively) were added 18 hours post-transfection. Antibody containing supernatants were harvested after 7 days by centrifugation of cells at 3,000g for 20 minutes and transfer of supernatants into 50ml falcon tubes (Fisher Scientific). Prior to size exclusion chromatography (see below) IgA dimers were purified from transfection supernatants using peptide M coupled agarose beads (Invivogen) according to the manufacturer's instructions.

[0187] *IgA dimer purification through size exclusion chromatography.* A pre-packed HiLoad™ 16/600 Superdex™ 200pg (Cytiva, #28-9893-35) column on the Cytiva “ÄKTA pure Chromatography System” was equilibrated with PBS. After equilibration of the column with PBS each IgA preparation was applied onto the column and the column was run at a flow rate of 1.25ml/min. The total column volume was 120ml. Fractions were collected in a volume of 1.5ml per fraction. Peaks consistent with IgA multimers, IgA dimers and IgA monomers were detected at 0.3-0.4, 0.4-0.5 and 0.5-0.6 column volumes respectively (**Figure 9J**). Fractions spanning all three peaks were collected and evaluated individually by running Criterion™ TGX™ precast gels (Biorad 5671095) under non-reducing conditions with a Precision Plus Protein™ Kaleidoscope™ Prestained Protein Standard (Biorad #1610375) (**Figure 9K**).

[0188] *Antibody ELISA testing.* Antibody concentrations were determined measuring absorbance at 280nm using Nanodrop 2000c (Thermo Scientific) or IgG specific ELISA as previously described (Tiller et al., 2008). Antibody reactivities to SARS-CoV-2 S, SARS-CoV-2 RBD, SARS-CoV S, SARS-CoV RBD, MERS-CoV S and MERS-CoV RBD were determined using the same protocol with the following modifications: Antigens were coated on Corning™ Costar™ Brand 96-Well EIA/RIA Plates at a concentration of 5 μ g/ml. Antibody

binding was then assessed at starting concentrations of 1µg/ml, 1.1µg/ml and 1.2µg/ml for IgG, monomeric IgA and dimeric IgA respectively in order to achieve equal Fab molar concentrations. 3 consecutive 1/4 dilutions were performed. Positive control antibodies used in these assays included antibodies BG10-19 for SARS-CoV-2 S and SARS-CoV-2 RBD (see above), 3B12 (Absolute Antibody # Ab01673-10.0) for MERS-CoV S and MERS-CoV RBD (Tang et al., 2014) and S227.14 (Absolute Antibody Ab00263-10.0) for SARS CoV S and SARS CoV RBD (Rockx et al., 2008). Antigen specific ELISA results are expressed as AUC using Graphpad PRISM software. Polyreactivity ELISAs were performed as previously described (Tiller et al., 2008) with the following modification: In addition to the antigens ssDNA, dsDNA, LPS and insulin (Tiller et al., 2008), streptavidin-coupled APC (Biolegend #405207) was used as a fifth antigen in order to assess potential off target binding against this reagent used for cell sorting (see above). As described previously (Tiller et al., 2008), polyreactivity is defined as reactivity to 2 or more antigens among the antigens single stranded DNA, double stranded DNA, lipopolysaccharide (LPS) or insulin. As previously described, antibodies ED38, JB40 and mGO53 (Wardemann et al., 2003) were used as strongly polyreactive, intermediately polyreactive and non-polyreactive control antibodies respectively. In ELISA assays including IgG, IgA monomers and IgA dimers, HRP-conjugated goat anti-human kappa and lambda chain antibodies (Biorad #STAR127P and #STAR129P) were used as secondary antibodies at a 1/5000 dilution.

[0189] Off-target antibody binding to baculovirus (BV) particles generated in Sf9 insect cells was tested as previously described (Hotzel et al., 2012). A solution of 1% baculovirus in 100mM sodium bicarbonate buffer pH 9.6 was adsorbed to a 384-well ELISA plate (Nunc Maxisorp) using a Tecan Freedom Evo2 liquid handling robot and the plate was incubated overnight at 4°C. Following blocking with 0.5% BSA in PBS, 1µg/ml of IgG was added to the blocked assay. Plates were incubated for 3 hours at room temperature. Antibody binding was detected using an HRP-conjugated anti-Human IgG (H&L) secondary antibody (Genscript). ELISA was developed using SuperSignal ELISA Femto Maximum Sensitivity Substrate (Thermo Scientific). Anti-HIV antibodies NIH45-46 (Scheid et al., 2011) and 45-46m2 (Diskin et al., 2013) were used as positive controls and antibody 3BNC117 (Scheid et al., 2011) was used as negative control. Measurements were performed in quadruplicate and OD values within 1.5-fold the negative control were considered to be negative.

[0190] *Neutralization activity of antibodies against authentic SARS-CoV-2.* Vero E6-TMPRSS2 were seeded at 10,000 per well the day prior to infection in CellCarrier-384 ultra microplate (Perkin Elmer). Monoclonal antibody samples were tested in 4-fold 9-point dilution spots starting at a highest concentration of 100 $\mu\text{g/mL}$. Serial diluted antibodies were mixed separately with diluted SARS-CoV-2 virus and incubated at 37 °C with 5% CO_2 for 1 hour. Antibody-virus complexes were added to the cells in triplicate. Plates were incubated at 37 °C with 5% CO_2 for 48 hours. After that, plates were fixed and inactivated using 4% paraformaldehyde in PBS for 2 hours at room temperature. Plates were then washed and incubated with diluted anti-SARS-CoV/SARS-CoV-2 nucleoprotein mouse antibody (Sino) for 1.5 hours at room temperature. Plates were subsequently incubated with Alexa488-conjugated goat anti-mouse (JacksonImmuno) for 45 mins at room temperature, followed by nuclear staining with Hoechst 33342 (ThermoFisher). The fluorescence images were recorded and analyzed using Opera Phenix™ High Content Screening System. The half-maximal inhibitory concentrations (IC_{50}) were determined using four parameters logistic regression (GraphPad Prism 8.0).

[0191] *Protein expression and purification.* Expression and purification of SARS-CoV-2 6P stabilized S trimers (Hsieh et al., 2020) and constructs encoding the sarbecovirus RBDs were conducted as previously described (Cohen et al., 2020). Briefly, constructs were purified from supernatants of transiently transfected Expi293F cells (Gibco) by Ni^{2+} -NTA affinity and size exclusion chromatography (SEC). Peak fractions were identified by SDS-PAGE, pooled, and stored at 4°C. IgGs were expressed, purified, and stored as described (Barnes et al., 2020b). Fabs were generated by papain digestion using crystallized papain (Sigma-Aldrich) in 50 mM sodium phosphate, 2 mM EDTA, 10 mM L-cysteine, pH 7.4 for 30-60 min at 37°C at a 1:100 enzyme:IgG ratio. To remove undigested IgGs and Fc fragments, digested products were applied to a 1-mL HiTrap MabSelect SuRe column (GE Healthcare Life Sciences) and the flow-through containing cleaved Fabs was collected. Fabs were further purified by SEC using a Superdex 200 Increase 10/300 column (GE Healthcare Life Sciences) in TBS before concentrating and storage at 4°C.

[0192] *Cryo-EM sample preparation.* Purified Fab and S 6P trimer were incubated at a 1.1:1 molar ratio per protomer on ice for 30 minutes prior to deposition on a freshly glow-discharged 300 mesh, 1.2/1.3 UltraAuFoil grid. Immediately before 3 μL of complex was applied to the grid, fluorinated octyl-malotiside was added to the Fab-S complex to a final detergent

concentration of 0.02% w/v, resulting in a final complex concentration of 3 mg/ml. Samples were vitrified in 100% liquid ethane using a Mark IV Vitrobot after blotting for 3 s with Whatman No. 1 filter paper at 22°C and 100% humidity.

[0193] *Cryo-EM data collection and processing.* Data collection and processing followed a similar workflow to what has been previously described in detail (Barnes et al., 2020a). Briefly, micrographs were collected on a Talos Arctica transmission electron microscope (Thermo Fisher) operating at 200 kV for all Fab-S complexes. Data were collected using SerialEM automated data collection software (Mastronarde, 2005) and movies were recorded with K3 camera (Gatan). Data collections parameters are summarized in **Table 5**. For all data sets, cryo-EM movies were patch motion corrected for beam-induced motion including dose-weighting within cryoSPARC v2.15 (Punjani et al., 2017) after binning super resolution movies. The non-dose-weighted images were used to estimate CTF parameters using cryoSPARC implementation of the Patch CTF job. Processing for all datasets was carried out in a similar fashion. Briefly, an initial set of particles was picked based on templates from 2D classification of blob picked particles on a small sub-set of images. This set was pared down through several rounds of 3D classification. An ab initio job on a small good subset of these particles revealed distinct states and junk particles. Full set of particles was heterogeneously refined against distinct states, as well as a junk class acting as a trap for bad particles. Particles from each were separately refined using non-uniform refinement in C1 symmetry. Particles from distinct states were re-extracted without binning and were further refined separately in several rounds of 3D classification. Particles were subdivided into groups based on beam-tilt, refined separately for CTF parameters and aberration correction. For all states, a soft mask (3-pixel extension, 6-pixel soft edge) was generated for the S1 subunits and Fab variable domains. The resolution at the Fab interface was modestly improved, with overall reported resolutions reported based on gold standard FSC calculations.

[0194] *Cryo-EM Structure Modeling and Refinement.* Coordinates for initial complexes were generated by docking individual chains from reference structures into cryo-EM density using UCSF Chimera (Goddard et al., 2018) (see **Table 5** for PDB coordinates). Models were then refined into cryo-EM maps rigid body and real space refinement with morphing in Phenix (Terwilliger et al., 2018). Sequence-updated models were built manually in Coot (Emsley et al., 2010) and then refined using iterative rounds of real-space refinement in Phenix and Coot. Glycans were modeled at potential *N*-linked glycosylation sites (PNGSs) in Coot using

‘blurred’ maps processed with a variety of B-factors generated in cryoSPARC v2.15. Validation of model coordinates was performed using MolProbity (Chen et al., 2010) (**Table 5**).

[0195] BG4-25-RBD X-ray crystallography experiments. Crystallization trials for a stoichiometric complex of BG4-25 – SARS-CoV2 RBD – CR3022 were carried out at room temperature using the sitting drop vapor diffusion method by mixing equal volumes of the Fab-RBD complex and reservoir using a TTP LabTech Mosquito robot and commercially-available screens (Hampton Research). Crystals were obtained in 0.05 M Citric acid, 0.05 M BIS-TRIS propane pH 5.0 and 16% polyethylene glycol 3350 and quickly cryo-protected in a solution matching the reservoir + 20% glycerol. X-ray diffraction data were collected for Fab-RBD complex at the Stanford Synchrotron Radiation Lightsource (SSRL) beamline 12-2 on a Pilatus 6M pixel detector (Dectris). Data from a single crystal were indexed and integrated in XDS (Kabsch, 2010) and merged using AIMLESS in *CCP4* (Winn et al., 2011) (**Table 6**). The Fab-RBD complex structure was determined by molecular replacement in PHASER (McCoy et al., 2007) using Fab and RBD coordinates from individual components of PDB 6XC3 (CC12.1 Fab – CR3022 Fab – SARS-CoV2 RBD) as search models after trimming heavy chain and light chain CDR loops for CC12.1 Fab. Coordinates were refined using rigid body and B-group refinement in Phenix (Adams et al., 2010) followed by cycles of manual building in Coot (Emsley et al., 2010) (**Table 6**).

[0196] Structural Analyses. CDR lengths and Kabot numbering were calculated based on IMGT definitions (Lefranc et al., 2015). Structure figures were made with UCSF ChimeraX. Local resolution maps were calculated using cryoSPARC v 2.15. Buried surface areas were calculated using PDBePISA (Krissinel and Henrick, 2007) and a 1.4 Å probe. Potential hydrogen bonds were assigned as interactions that were <4.0Å and with A-D-H angle >90°. Potential van der Waals interactions between atoms were assigned as interactions that were <4.0Å. Hydrogen bond and van der Waals interaction assignments are tentative due to resolution limitations.

[0197] Surface Plasmon Resonance (SPR) binding experiments. SPR experiments were performed using a Biacore T200 instrument (GE Healthcare). ACE2 microbody (Tada et al., 2020) was immobilized on a CM5 chip by primary amine chemistry at pH 4.5 to a final response level of ~1000 resonance units (RUs). Fabs were complexed with 100 nM SARS2 S 6P or SARS2 RBD at a 10:1 molar ratio and incubated for a minimum of 1 hour. Antigen or

Fab-antigen complex was injected over immobilized ACE2 microbody surface at a flow rate of 30 $\mu\text{L}/\text{min}$ for a contact time of 300 seconds. Sensorgrams were buffer corrected using an injection of 0.01 M HEPES pH 7.4, 0.15 M NaCl, 3 mM EDTA, 0.005% v/v surfactant P20 buffer.

[0198] SARS-CoV-2 mutant RBD and sarbecovirus RBD ELISA binding assay. Binding of Fabs to SARS-CoV-2 RBDs containing single mutations or to sarbecovirus RBDs was evaluated by ELISA. RBD antigens (mutant or wild-type) were adsorbed to 384-well Nunc MaxiSorp plates (Sigma) at a concentration of 2 $\mu\text{g}/\text{mL}$ overnight. Plates were blocked with 3% BSA in TBS-T (TBS with 0.05% Tween20) for 1 h at room temperature, then 5-fold serial dilutions starting at 10 $\mu\text{g}/\text{mL}$ of Fab were added. Plates were washed with TBS-T and bound Fab was detected using an HRP-conjugated secondary Ab (Genscript) and SuperSignal ELISA Femto Substrate (Thermo Scientific). AUC for each Fab-antigen pair was calculated using Graphpad PRISM software. Fold decrease in AUC was calculated relative to SARS-CoV2 RBD AUC for the same Fab. Data shown are representative of two independent experiments.

[0199] SARS-CoV-2 mutant pseudotyped reporter virus and mutant pseudotyped virus neutralization assay. SARS-CoV-2 pseudotyped particles were generated as previously described (Robbiani et al., 2020; Schmidt et al., 2020). Briefly, 293T cells were transfected with pNL4-3 Env-nanoluc and pSARS-CoV-2-S Δ 19. For generation of RBD-mutant pseudoviruses, pSARS-CoV-2-S Δ 19 carrying indicated spike mutations was used instead. Particles were harvested 48 hpt, filtered and stored at -80°C .

[0200] Fourfold serially diluted monoclonal antibodies were incubated with SARS-CoV-2 pseudotyped virus for 1 h at 37°C . The mixture was subsequently incubated with HT1080_{ACE2} cl14 cells (Schmidt et al., 2020) for 48 h after which cells were washed with PBS and lysed with Luciferase Cell Culture Lysis 5 $\times$ reagent (Promega). Nanoluc Luciferase activity in lysates was measured using the Nano-Glo Luciferase Assay System (Promega) with the Glomax Navigator (Promega). The obtained relative luminescence units were normalized to those derived from cells infected with SARS-CoV-2 pseudotyped virus in the absence of monoclonal antibodies. The half-maximal and 90% inhibitory concentrations (IC₅₀ and IC₉₀) were determined using four-parameter nonlinear regression (least squares regression method without weighting; constraints: top=1, bottom=0) (GraphPad Prism).

[0201] Antibody resistance selection experiments. 293T/ACE2.cl22 (Schmidt et al., 2020) were cultured in Dulbecco's Modified Eagle Medium (DMEM) supplemented with 10% fetal

bovine serum (FBS) at 37°C and 5% CO₂. Cells have been tested negative for contamination with mycoplasma. rVSV/SARS-CoV-2/GFP chimeric virus stocks were generated by infecting 293T/ACE2.cl22 cells. Supernatant was harvested 1 day post infection (dpi), cleared from cellular debris, aliquoted and stored at -80 °C. Two plaque purified variants designated rVSV/SARS-CoV-2/GFP_{1D7} and rVSV/SARS-CoV-2/GFP_{2E1} that encode F157S/R685M (1D7) and D215G/R683G (2E1) substitutions were used in these studies (Schmidt et al., 2020). For BG10-19 selection experiments, the virus was passaged multiple times in the presence of 1µg/ml or 5µg/ml antibody. At passage 4, virus was allowed to replicate in the presence of antibodies until all the cells were infected then harvested. The virus was then passaged in the presence of antibodies for a fifth and final time before supernatant was harvested for further analysis. To isolate individual mutants, the supernatants of passage 5 were serially diluted and individual viral foci were isolated by limiting dilution in 96-well plates.

[0202] For the identification of putative antibody resistance mutations, RNA was isolated from aliquots of supernatant containing selected viral populations and isolates using NucleoSpin 96 Virus Core Kit (Macherey-Nagel). The purified RNA was subjected to reverse transcription using SuperScript VILO cDNA Synthesis Kit (Thermo Fisher Scientific). The cDNA was amplified using KOD Xtreme Hot Start DNA Polymerase (Millipore Sigma) and primers flanking the entire S-encoding sequence. The PCR products were purified and sequenced using Sanger-sequencing.

[0203] To measure neutralizing activity, 40 µg/ml antibody was five-fold serially diluted in 96-well plates over 7 dilutions. Thereafter, approximately 5×10^4 infectious units of rVSV/SARS-CoV-2/GFP WT or mutant isolates were mixed with BG10-19 at a 1:1 ratio and incubated for 1 hr at 37°C in a 96-well plate. The mixture was then added to 293T/ACE2.cl22 target cells plated at 1×10^4 cells/well in 100 µl medium in 96-well plates the previous day. Thus, the final starting dilution was 10 µg/ml. Cells were then cultured for 16 hr, then harvested for flow cytometry.

[0204] *scRNA-seq analysis.* mRNA and VDJ sequence reads were mapped to the reference human genome GRCh38-3.0.0 with the cloud-based Cumulus workflows (Li et al., 2020), using the CellRanger 3.0.2 software pipeline. Cells with both high-quality VDJ sequence and transcriptome information were kept for the downstream analysis by filtering out the cells which had less than 300 detected genes or which had poor quality VDJ contig information defined by i) being non-productive by 10x standards, ii) having more than four productive VDJ

contigs, iii) having less than three filtered UMIs. For the transcriptome analysis, batch effects were removed with the ComBat algorithm (Johnson et al., 2007) implemented in SVA R Package version 3.38.0.. For the transcriptome mRNA count normalization, dimensionality reduction, clustering, cell cycle scoring, cluster marker genes detection and differential gene expression analysis steps Seurat R package (Butler et al., 2018) (Stuart et al., 2019) was employed. For the normalization step gene expression counts for each cell were divided by the total counts for that cell and multiplied by 1e6, which was then log-transformed using log1p. Dimensionality reduction was done by PCA with selecting 50 first principal components.

[0205] For clustering of the cells into transcriptome clusters, first the k-nearest neighbor (kNN) graph of the cells was constructed. Second, this kNN graph was used to generate the shared nearest neighbor (sNN) graph by calculating Jaccard index between every cell and its *k* nearest neighbors. Third, the leiden algorithm (Traag et al., 2019) was used to find the clusters of the cells based on the generated sNN graph.

[0206] Cell cycle scoring was done by calculating the module scores of the cell cycle genes defined in (Tirosh et al., 2016). Positive cluster marker genes and differentially expressed genes were detected with a log-fold change threshold of 0.25, where only the genes that were detected in a minimum fraction of 20% in either of the six transcriptome populations were considered. Expression levels of immunoglobulin genes were discarded during the clustering and differential gene expression analysis steps.

[0207] *Antibody Repertoire Analysis.* 10x V(D)J contig assembly algorithm takes many forms of noise specific to scRNA-seq data into account while generating the assembled V(D)J sequences (support.10xgenomics.com/single-cell-vdj/software/pipelines/latest/algorithms/assembly). Nevertheless, only the cells with high-quality V(D)J contig sequences were selected and V(D)J gene annotations were assigned by using IGBLAST (version 1.14.0) software with the Change-O R package (Gupta et al., 2015). Donor specific B cell clones were identified by the Change-O R package (Gupta et al., 2015), where the appropriate threshold for trimming the hierarchical clustering into B cell clones was found by inspecting the bimodal distribution of the distance between each sequence in the data and its nearest-neighbor.

[0208] Mutation inference based on the scRNA-seq VDJ sequences of the donor and the control cells (Rubelt et al., 2012) was performed by the Shazam R Package (Yaari et al., 2012)

where the region definition parameter was set to be “IMGT_V_BY_SEGMENTS” which provides no subdivisions and treats the entire V segment as a single region.

[0209] CDRH3 length was defined based on IMGT definition (Lefranc et al., 2015) with the addition of two conserved amino acid residues that were added to assist in clonal analysis (Nouri and Kleinstein, 2018). This addition was corrected for all analyses involving specific CDRH3 length, such as selection of *VH3-53/3-66* antibodies with CDRH3 shorter than 14 amino acid length.

[0210] CDRH3 amino acid charges were calculated by the Alakazam R package (Gupta et al., 2015) using the method of Moore (Moore, 1985) excluding the N-terminus and C-terminus charges, and normalizing by the number of informative positions.

[0211] Hydrophobicity scores were calculated with the Alakazam R package using the method of Kyte and Doolittle (Kyte and Doolittle, 1982).

[0212] Shannon entropy values were calculated using Alakazam R package. For each donor the transcriptome cluster specific Hill diversity index, proposed in (Hill, 1973), improved by (Chao et al., 2014; Chao et al., 2015) was calculated by setting the diversity order equal to 1 with Alakazam R package. For each run the number of bootstrap realizations is set to be 400, and the minimum number of observations to sample is set to be 10.

[0213] ***Mutational analysis of VH3-53/3-66 antibodies.*** Inferred somatic mutations in the V gene segment of *VH3-53/VH3-66* antibodies were counted for the IgG⁺ antibodies with CDRH3 lengths less than 14 amino acids from SARS-CoV-2 binding B cells across 14 subjects, listing only those sites where the frequency was >10% in either the IgG⁺ set or in the repertoire comparison. The repertoire comparison set of human *VH3-53/VH3-66* sequences was taken from the sequence read archive of (Rubelt et al., 2012).

[0214] **Table 8A-8B.** The Table lists the nucleotide sequence (SEQ ID NOS: 447-12672), the bait that was used to sort the respective cell and the sequence name. The sequence name includes the donor (e.g., BG1, BG10) and whether the sequence is a light chain or heavy chain (e.g., LC, HC). The nucleotide sequences can be converted to amino acid sequence by one skilled in the art. **8A.** Full list of nucleotide sequences for heavy and light chains identified in B cells bound to bait proteins from the 14 donors. **8B.** For patients BG1, BG4, BG7 and BG10 there is an additional column that shows the antibody names for the antibodies produced from the nucleotide sequences in that line.

Table 8A.

SEQ ID NO	BAIT	SEQUENCE NAME	SEQ ID NO	BAIT	SEQUENCE NAME	SEQ ID NO	BAIT	SEQUENCE NAME
447	RBD	BG1NUC-HC1	4523	2P	BG7NUC-LC42	8598	2P	BG14NUC-HC126
448	2P	BG1NUC-HC2	4524	2P	BG7NUC-LC43	8599	2P	BG14NUC-HC127
449	RBD	BG1NUC-HC3	4525	2P	BG7NUC-LC44	8600	RBD	BG14NUC-HC128
450	2P	BG1NUC-HC4	4526	2P	BG7NUC-LC45	8601	RBD	BG14NUC-HC129
451	RBD	BG1NUC-HC5	4527	2P	BG7NUC-LC46	8602	RBD	BG14NUC-HC130
452	2P	BG1NUC-HC6	4528	2P	BG7NUC-LC47	8603	2P	BG14NUC-HC131
453	RBD	BG1NUC-HC7	4529	2P	BG7NUC-LC48	8604	2P	BG14NUC-HC132
454	RBD	BG1NUC-HC8	4530	2P	BG7NUC-LC49	8605	RBD	BG14NUC-HC133
455	RBD	BG1NUC-HC9	4531	2P	BG7NUC-LC50	8606	RBD	BG14NUC-HC134
456	RBD	BG1NUC-HC10	4532	2P	BG7NUC-LC51	8607	RBD	BG14NUC-HC135
457	RBD	BG1NUC-HC11	4533	2P	BG7NUC-LC52	8608	RBD	BG14NUC-HC136
458	2P	BG1NUC-HC12	4534	2P	BG7NUC-LC53	8609	RBD	BG14NUC-HC137
459	RBD	BG1NUC-HC13	4535	2P	BG7NUC-LC54	8610	RBD	BG14NUC-HC138
460	RBD	BG1NUC-HC14	4536	2P	BG7NUC-LC55	8611	RBD	BG14NUC-HC139
461	RBD	BG1NUC-HC15	4537	2P	BG7NUC-LC56	8612	RBD	BG14NUC-HC140
462	RBD	BG1NUC-HC16	4538	2P	BG7NUC-LC57	8613	2P	BG14NUC-HC141
463	RBD	BG1NUC-HC17	4539	2P	BG7NUC-LC58	8614	2P	BG14NUC-HC142
464	2P	BG1NUC-HC18	4540	2P	BG7NUC-LC59	8615	RBD	BG14NUC-HC143
465	2P	BG1NUC-HC19	4541	2P	BG7NUC-LC60	8616	2P	BG14NUC-HC144
466	RBD	BG1NUC-HC20	4542	RBD	BG7NUC-LC61	8617	2P	BG14NUC-HC145
467	2P	BG1NUC-HC21	4543	2P	BG7NUC-LC62	8618	2P	BG14NUC-HC146
468	2P	BG1NUC-HC22	4544	2P	BG7NUC-LC63	8619	RBD	BG14NUC-HC147
469	2P	BG1NUC-HC23	4545	RBD	BG7NUC-LC64	8620	RBD	BG14NUC-HC148
470	2P	BG1NUC-HC24	4546	RBD	BG7NUC-LC65	8621	2P	BG14NUC-HC149
471	RBD	BG1NUC-HC25	4547	RBD	BG7NUC-LC66	8622	2P	BG14NUC-HC150
472	2P	BG1NUC-HC26	4548	RBD	BG7NUC-LC67	8623	2P	BG14NUC-HC151
473	RBD	BG1NUC-HC27	4549	RBD	BG7NUC-LC68	8624	2P	BG14NUC-HC152
474	2P	BG1NUC-HC28	4550	2P	BG7NUC-LC69	8625	2P	BG14NUC-HC153
475	RBD	BG1NUC-HC29	4551	2P	BG7NUC-LC70	8626	RBD	BG14NUC-HC154
476	2P	BG1NUC-HC30	4552	2P	BG7NUC-LC71	8627	2P	BG14NUC-HC155
477	RBD	BG1NUC-HC31	4553	2P	BG7NUC-LC72	8628	2P	BG14NUC-HC156
478	RBD	BG1NUC-HC32	4554	2P	BG7NUC-LC73	8629	RBD	BG14NUC-HC157
479	2P	BG1NUC-HC33	4555	2P	BG7NUC-LC74	8630	2P	BG14NUC-HC158
480	2P	BG1NUC-HC34	4556	2P	BG7NUC-LC75	8631	2P	BG14NUC-HC159
481	RBD	BG1NUC-HC35	4557	2P	BG7NUC-LC76	8632	2P	BG14NUC-HC160
482	2P	BG1NUC-HC36	4558	2P	BG7NUC-LC77	8633	2P	BG14NUC-HC161
483	RBD	BG1NUC-HC37	4559	2P	BG7NUC-LC78	8634	2P	BG14NUC-HC162
484	RBD	BG1NUC-HC38	4560	2P	BG7NUC-LC79	8635	RBD	BG14NUC-HC163
485	2P	BG1NUC-HC39	4561	2P	BG7NUC-LC80	8636	RBD	BG14NUC-HC164
486	RBD	BG1NUC-HC40	4562	2P	BG7NUC-LC81	8637	RBD	BG14NUC-HC165
487	RBD	BG1NUC-HC41	4563	2P	BG7NUC-LC82	8638	2P	BG14NUC-HC166
488	2P	BG1NUC-HC42	4564	2P	BG7NUC-LC83	8639	2P	BG14NUC-HC167
489	2P	BG1NUC-HC43	4565	2P	BG7NUC-LC84	8640	2P	BG14NUC-HC168
490	RBD	BG1NUC-HC44	4566	2P	BG7NUC-LC85	8641	2P	BG14NUC-HC169
491	RBD	BG1NUC-HC45	4567	2P	BG7NUC-LC86	8642	RBD	BG14NUC-HC170
492	RBD	BG1NUC-HC46	4568	2P	BG7NUC-LC87	8643	2P	BG14NUC-HC171
493	2P	BG1NUC-HC47	4569	2P	BG7NUC-LC88	8644	RBD	BG14NUC-HC172
494	RBD	BG1NUC-HC48	4570	2P	BG7NUC-LC89	8645	2P	BG14NUC-HC173
495	RBD	BG1NUC-HC49	4571	2P	BG7NUC-LC90	8646	2P	BG14NUC-HC174
496	RBD	BG1NUC-HC50	4572	2P	BG7NUC-LC91	8647	2P	BG14NUC-HC175
497	2P	BG1NUC-HC51	4573	2P	BG7NUC-LC92	8648	RBD	BG14NUC-HC176
498	2P	BG1NUC-HC52	4574	2P	BG7NUC-LC93	8649	2P	BG14NUC-HC177
499	RBD	BG1NUC-HC53	4575	2P	BG7NUC-LC94	8650	RBD	BG14NUC-HC178
500	2P	BG1NUC-HC54	4576	2P	BG7NUC-LC95	8651	2P	BG14NUC-HC179
501	2P	BG1NUC-HC55	4577	2P	BG7NUC-LC96	8652	2P	BG14NUC-HC180
502	RBD	BG1NUC-HC56	4578	2P	BG7NUC-LC97	8653	2P	BG14NUC-HC181
503	2P	BG1NUC-HC57	4579	2P	BG7NUC-LC98	8654	2P	BG14NUC-HC182
504	2P	BG1NUC-HC58	4580	2P	BG7NUC-LC99	8655	2P	BG14NUC-HC183
505	2P	BG1NUC-HC59	4581	2P	BG7NUC-LC100	8656	RBD	BG14NUC-HC184
506	RBD	BG1NUC-HC60	4582	2P	BG7NUC-LC101	8657	2P	BG14NUC-HC185
507	RBD	BG1NUC-HC61	4583	2P	BG7NUC-LC102	8658	2P	BG14NUC-HC186
508	RBD	BG1NUC-HC62	4584	2P	BG7NUC-LC103	8659	2P	BG14NUC-HC187
509	2P	BG1NUC-HC63	4585	2P	BG7NUC-LC104	8660	RBD	BG14NUC-HC188
510	2P	BG1NUC-HC64	4586	2P	BG7NUC-LC105	8661	2P	BG14NUC-HC189
511	2P	BG1NUC-HC65	4587	2P	BG7NUC-LC106	8662	2P	BG14NUC-HC190
512	2P	BG1NUC-HC66	4588	2P	BG7NUC-LC107	8663	2P	BG14NUC-HC191
513	RBD	BG1NUC-HC67	4589	2P	BG7NUC-LC108	8664	RBD	BG14NUC-HC192
514	RBD	BG1NUC-HC68	4590	2P	BG7NUC-LC109	8665	RBD	BG14NUC-HC193
515	2P	BG1NUC-HC69	4591	2P	BG7NUC-LC110	8666	RBD	BG14NUC-HC194
516	2P	BG1NUC-HC70	4592	2P	BG7NUC-LC111	8667	RBD	BG14NUC-HC195
517	2P	BG1NUC-HC71	4593	2P	BG7NUC-LC112	8668	RBD	BG14NUC-HC196
518	RBD	BG1NUC-HC72	4594	2P	BG7NUC-LC113	8669	2P	BG14NUC-HC197
519	RBD	BG1NUC-HC73	4595	2P	BG7NUC-LC114	8670	2P	BG14NUC-HC198
520	RBD	BG1NUC-HC74	4596	2P	BG7NUC-LC115	8671	2P	BG14NUC-HC199

521	2P	BG1NUC-HC75	4597	2P	BG7NUC-LC116	8672	2P	BG14NUC-HC200
522	RBD	BG1NUC-HC76	4598	2P	BG7NUC-LC117	8673	RBD	BG14NUC-HC201
523	2P	BG1NUC-HC77	4599	2P	BG7NUC-LC118	8674	RBD	BG14NUC-HC202
524	2P	BG1NUC-HC78	4600	2P	BG7NUC-LC119	8675	2P	BG14NUC-HC203
525	2P	BG1NUC-HC79	4601	2P	BG7NUC-LC120	8676	2P	BG14NUC-HC204
526	RBD	BG1NUC-HC80	4602	2P	BG7NUC-LC121	8677	2P	BG14NUC-HC205
527	RBD	BG1NUC-HC81	4603	2P	BG7NUC-LC122	8678	2P	BG14NUC-HC206
528	2P	BG1NUC-HC82	4604	2P	BG7NUC-LC123	8679	2P	BG14NUC-HC207
529	RBD	BG1NUC-HC83	4605	2P	BG7NUC-LC124	8680	2P	BG14NUC-HC208
530	2P	BG1NUC-HC84	4606	2P	BG7NUC-LC125	8681	2P	BG14NUC-HC209
531	2P	BG1NUC-HC85	4607	2P	BG7NUC-LC126	8682	2P	BG14NUC-HC210
532	2P	BG1NUC-HC86	4608	2P	BG7NUC-LC127	8683	2P	BG14NUC-HC211
533	RBD	BG1NUC-HC87	4609	2P	BG7NUC-LC128	8684	RBD	BG14NUC-HC212
534	2P	BG1NUC-HC88	4610	2P	BG7NUC-LC129	8685	2P	BG14NUC-HC213
535	RBD	BG1NUC-HC89	4611	2P	BG7NUC-LC130	8686	2P	BG14NUC-HC214
536	RBD	BG1NUC-HC90	4612	2P	BG7NUC-LC131	8687	RBD	BG14NUC-HC215
537	RBD	BG1NUC-HC91	4613	2P	BG7NUC-LC132	8688	RBD	BG14NUC-HC216
538	RBD	BG1NUC-HC92	4614	2P	BG7NUC-LC133	8689	2P	BG14NUC-HC217
539	RBD	BG1NUC-HC93	4615	2P	BG7NUC-LC134	8690	2P	BG14NUC-HC218
540	RBD	BG1NUC-HC94	4616	2P	BG7NUC-LC135	8691	2P	BG14NUC-HC219
541	RBD	BG1NUC-HC95	4617	2P	BG7NUC-LC136	8692	RBD	BG14NUC-HC220
542	RBD	BG1NUC-HC96	4618	2P	BG7NUC-LC137	8693	2P	BG14NUC-HC221
543	2P	BG1NUC-HC97	4619	2P	BG7NUC-LC138	8694	2P	BG14NUC-HC222
544	2P	BG1NUC-HC98	4620	2P	BG7NUC-LC139	8695	2P	BG14NUC-HC223
545	2P	BG1NUC-HC99	4621	2P	BG7NUC-LC140	8696	RBD	BG14NUC-HC224
546	RBD	BG1NUC-HC100	4622	2P	BG7NUC-LC141	8697	2P	BG14NUC-HC225
547	2P	BG1NUC-HC101	4623	2P	BG7NUC-LC142	8698	RBD	BG14NUC-HC226
548	RBD	BG1NUC-HC102	4624	2P	BG7NUC-LC143	8699	2P	BG14NUC-HC227
549	2P	BG1NUC-HC103	4625	2P	BG7NUC-LC144	8700	2P	BG14NUC-HC228
550	2P	BG1NUC-HC104	4626	2P	BG7NUC-LC145	8701	RBD	BG14NUC-HC229
551	2P	BG1NUC-HC105	4627	2P	BG7NUC-LC146	8702	RBD	BG14NUC-HC230
552	2P	BG1NUC-HC106	4628	2P	BG7NUC-LC147	8703	2P	BG14NUC-HC231
553	RBD	BG1NUC-HC107	4629	2P	BG7NUC-LC148	8704	RBD	BG14NUC-HC232
554	RBD	BG1NUC-HC108	4630	2P	BG7NUC-LC149	8705	2P	BG14NUC-HC233
555	2P	BG1NUC-HC109	4631	2P	BG7NUC-LC150	8706	2P	BG14NUC-HC234
556	2P	BG1NUC-HC110	4632	2P	BG7NUC-LC151	8707	2P	BG14NUC-HC235
557	2P	BG1NUC-HC111	4633	2P	BG7NUC-LC152	8708	2P	BG14NUC-HC236
558	2P	BG1NUC-HC112	4634	2P	BG7NUC-LC153	8709	2P	BG14NUC-HC237
559	2P	BG1NUC-HC113	4635	2P	BG7NUC-LC154	8710	2P	BG14NUC-HC238
560	RBD	BG1NUC-HC114	4636	2P	BG7NUC-LC155	8711	2P	BG14NUC-HC239
561	RBD	BG1NUC-HC115	4637	2P	BG7NUC-LC156	8712	2P	BG14NUC-HC240
562	RBD	BG1NUC-HC116	4638	2P	BG7NUC-LC157	8713	2P	BG14NUC-HC241
563	RBD	BG1NUC-HC117	4639	2P	BG7NUC-LC158	8714	2P	BG14NUC-HC242
564	2P	BG1NUC-HC118	4640	2P	BG7NUC-LC159	8715	2P	BG14NUC-HC243
565	2P	BG1NUC-HC119	4641	2P	BG7NUC-LC160	8716	2P	BG14NUC-HC244
566	RBD	BG1NUC-HC120	4642	2P	BG7NUC-LC161	8717	2P	BG14NUC-HC245
567	2P	BG1NUC-HC121	4643	2P	BG7NUC-LC162	8718	2P	BG14NUC-HC246
568	2P	BG1NUC-HC122	4644	2P	BG7NUC-LC163	8719	2P	BG14NUC-HC247
569	2P	BG1NUC-HC123	4645	2P	BG7NUC-LC164	8720	2P	BG14NUC-HC248
570	RBD	BG1NUC-HC124	4646	2P	BG7NUC-LC165	8721	2P	BG14NUC-HC249
571	RBD	BG1NUC-HC125	4647	2P	BG7NUC-LC166	8722	RBD	BG14NUC-HC250
572	RBD	BG1NUC-HC126	4648	2P	BG7NUC-LC167	8723	2P	BG14NUC-HC251
573	RBD	BG1NUC-HC127	4649	2P	BG7NUC-LC168	8724	RBD	BG14NUC-HC252
574	RBD	BG1NUC-HC128	4650	2P	BG7NUC-LC169	8725	RBD	BG14NUC-HC253
575	RBD	BG1NUC-HC129	4651	2P	BG7NUC-LC170	8726	RBD	BG14NUC-HC254
576	RBD	BG1NUC-HC130	4652	2P	BG7NUC-LC171	8727	RBD	BG14NUC-HC255
577	RBD	BG1NUC-HC131	4653	2P	BG7NUC-LC172	8728	2P	BG14NUC-HC256
578	RBD	BG1NUC-HC132	4654	2P	BG7NUC-LC173	8729	RBD	BG14NUC-HC257
579	RBD	BG1NUC-HC133	4655	2P	BG7NUC-LC174	8730	2P	BG14NUC-HC258
580	2P	BG1NUC-HC134	4656	2P	BG7NUC-LC175	8731	2P	BG14NUC-HC259
581	2P	BG1NUC-HC135	4657	2P	BG7NUC-LC176	8732	RBD	BG14NUC-HC260
582	RBD	BG1NUC-HC136	4658	2P	BG7NUC-LC177	8733	RBD	BG14NUC-HC261
583	RBD	BG1NUC-HC137	4659	2P	BG7NUC-LC178	8734	RBD	BG14NUC-HC262
584	RBD	BG1NUC-HC138	4660	2P	BG7NUC-LC179	8735	2P	BG14NUC-HC263
585	RBD	BG1NUC-HC139	4661	2P	BG7NUC-LC180	8736	2P	BG14NUC-HC264
586	2P	BG1NUC-HC140	4662	2P	BG7NUC-LC181	8737	2P	BG14NUC-HC265
587	2P	BG1NUC-HC141	4663	2P	BG7NUC-LC182	8738	2P	BG14NUC-HC266
588	2P	BG1NUC-HC142	4664	2P	BG7NUC-LC183	8739	RBD	BG14NUC-HC267
589	2P	BG1NUC-HC143	4665	2P	BG7NUC-LC184	8740	2P	BG14NUC-HC268
590	2P	BG1NUC-HC144	4666	2P	BG7NUC-LC185	8741	RBD	BG14NUC-HC269
591	2P	BG1NUC-HC145	4667	2P	BG7NUC-LC186	8742	RBD	BG14NUC-HC270
592	2P	BG1NUC-HC146	4668	2P	BG7NUC-LC187	8743	2P	BG14NUC-HC271
593	2P	BG1NUC-HC147	4669	2P	BG7NUC-LC188	8744	RBD	BG14NUC-HC272
594	2P	BG1NUC-HC148	4670	2P	BG7NUC-LC189	8745	RBD	BG14NUC-HC273
595	2P	BG1NUC-HC149	4671	2P	BG7NUC-LC190	8746	RBD	BG14NUC-HC274
596	RBD	BG1NUC-HC150	4672	2P	BG7NUC-LC191	8747	RBD	BG14NUC-HC275
597	2P	BG1NUC-HC151	4673	2P	BG7NUC-LC192	8748	RBD	BG14NUC-HC276
598	RBD	BG1NUC-HC152	4674	2P	BG7NUC-LC193	8749	2P	BG14NUC-HC277
599	RBD	BG1NUC-HC153	4675	2P	BG7NUC-LC194	8750	RBD	BG14NUC-HC278

600	2P	BG1NUC-HC154	4676	2P	BG7NUC-LC195	8751	2P	BG14NUC-HC279
601	2P	BG1NUC-HC155	4677	2P	BG7NUC-LC196	8752	2P	BG14NUC-HC280
602	RBD	BG1NUC-HC156	4678	2P	BG7NUC-LC197	8753	RBD	BG14NUC-HC281
603	2P	BG1NUC-HC157	4679	2P	BG7NUC-LC198	8754	RBD	BG14NUC-HC282
604	2P	BG1NUC-HC158	4680	2P	BG7NUC-LC199	8755	2P	BG14NUC-HC283
605	2P	BG1NUC-HC159	4681	2P	BG7NUC-LC200	8756	RBD	BG14NUC-HC284
606	2P	BG1NUC-HC160	4682	2P	BG7NUC-LC201	8757	RBD	BG14NUC-HC285
607	RBD	BG1NUC-HC161	4683	2P	BG7NUC-LC202	8758	2P	BG14NUC-HC286
608	2P	BG1NUC-HC162	4684	2P	BG7NUC-LC203	8759	RBD	BG14NUC-HC287
609	RBD	BG1NUC-HC163	4685	2P	BG7NUC-LC204	8760	RBD	BG14NUC-HC288
610	RBD	BG1NUC-HC164	4686	2P	BG7NUC-LC205	8761	2P	BG14NUC-HC289
611	RBD	BG1NUC-HC165	4687	2P	BG7NUC-LC206	8762	RBD	BG14NUC-HC290
612	RBD	BG1NUC-HC166	4688	2P	BG7NUC-LC207	8763	2P	BG14NUC-HC291
613	2P	BG1NUC-HC167	4689	2P	BG7NUC-LC208	8764	2P	BG14NUC-HC292
614	RBD	BG1NUC-HC168	4690	2P	BG7NUC-LC209	8765	2P	BG14NUC-HC293
615	RBD	BG1NUC-HC169	4691	2P	BG7NUC-LC210	8766	2P	BG14NUC-HC294
616	2P	BG1NUC-HC170	4692	2P	BG7NUC-LC211	8767	2P	BG14NUC-HC295
617	2P	BG1NUC-HC171	4693	2P	BG7NUC-LC212	8768	2P	BG14NUC-HC296
618	2P	BG1NUC-HC172	4694	2P	BG7NUC-LC213	8769	2P	BG14NUC-HC297
619	RBD	BG1NUC-HC173	4695	2P	BG7NUC-LC214	8770	2P	BG14NUC-HC298
620	RBD	BG1NUC-HC174	4696	2P	BG7NUC-LC215	8771	RBD	BG14NUC-HC299
621	RBD	BG1NUC-HC175	4697	2P	BG7NUC-LC216	8772	RBD	BG14NUC-HC300
622	2P	BG1NUC-HC176	4698	2P	BG7NUC-LC217	8773	RBD	BG14NUC-HC301
623	RBD	BG1NUC-HC177	4699	2P	BG7NUC-LC218	8774	2P	BG14NUC-HC302
624	RBD	BG1NUC-HC178	4700	2P	BG7NUC-LC219	8775	RBD	BG14NUC-HC303
625	2P	BG1NUC-HC179	4701	2P	BG7NUC-LC220	8776	2P	BG14NUC-HC304
626	RBD	BG1NUC-HC180	4702	2P	BG7NUC-LC221	8777	RBD	BG14NUC-HC305
627	RBD	BG1NUC-HC181	4703	2P	BG7NUC-LC222	8778	RBD	BG14NUC-HC306
628	RBD	BG1NUC-HC182	4704	2P	BG7NUC-LC223	8779	2P	BG14NUC-HC307
629	RBD	BG1NUC-HC183	4705	2P	BG7NUC-LC224	8780	2P	BG14NUC-HC308
630	2P	BG1NUC-HC184	4706	2P	BG7NUC-LC225	8781	2P	BG14NUC-HC309
631	RBD	BG1NUC-HC185	4707	2P	BG7NUC-LC226	8782	2P	BG14NUC-HC310
632	RBD	BG1NUC-HC186	4708	2P	BG7NUC-LC227	8783	2P	BG14NUC-HC311
633	RBD	BG1NUC-HC187	4709	2P	BG7NUC-LC228	8784	2P	BG14NUC-HC312
634	RBD	BG1NUC-HC188	4710	2P	BG7NUC-LC229	8785	RBD	BG14NUC-HC313
635	2P	BG1NUC-HC189	4711	2P	BG7NUC-LC230	8786	2P	BG14NUC-HC314
636	RBD	BG1NUC-HC190	4712	2P	BG7NUC-LC231	8787	2P	BG14NUC-HC315
637	2P	BG1NUC-HC191	4713	2P	BG7NUC-LC232	8788	2P	BG14NUC-HC316
638	2P	BG1NUC-HC192	4714	2P	BG7NUC-LC233	8789	RBD	BG14NUC-HC317
639	2P	BG1NUC-HC193	4715	2P	BG7NUC-LC234	8790	RBD	BG14NUC-HC318
640	2P	BG1NUC-HC194	4716	2P	BG7NUC-LC235	8791	RBD	BG14NUC-HC319
641	2P	BG1NUC-HC195	4717	2P	BG7NUC-LC236	8792	RBD	BG14NUC-HC320
642	2P	BG1NUC-HC196	4718	2P	BG7NUC-LC237	8793	2P	BG14NUC-HC321
643	2P	BG1NUC-HC197	4719	2P	BG7NUC-LC238	8794	RBD	BG14NUC-HC322
644	2P	BG1NUC-HC198	4720	2P	BG7NUC-LC239	8795	RBD	BG14NUC-HC323
645	2P	BG1NUC-HC199	4721	2P	BG7NUC-LC240	8796	RBD	BG14NUC-HC324
646	RBD	BG1NUC-HC200	4722	2P	BG7NUC-LC241	8797	2P	BG14NUC-HC325
647	RBD	BG1NUC-HC201	4723	2P	BG7NUC-LC242	8798	2P	BG14NUC-HC326
648	RBD	BG1NUC-HC202	4724	2P	BG7NUC-LC243	8799	2P	BG14NUC-HC327
649	2P	BG1NUC-HC203	4725	2P	BG7NUC-LC244	8800	RBD	BG14NUC-HC328
650	2P	BG1NUC-HC204	4726	2P	BG7NUC-LC245	8801	RBD	BG14NUC-HC329
651	2P	BG1NUC-HC205	4727	2P	BG7NUC-LC246	8802	RBD	BG14NUC-HC330
652	RBD	BG1NUC-HC206	4728	2P	BG7NUC-LC247	8803	2P	BG14NUC-HC331
653	2P	BG1NUC-HC207	4729	2P	BG7NUC-LC248	8804	RBD	BG14NUC-HC332
654	2P	BG1NUC-HC208	4730	2P	BG7NUC-LC249	8805	RBD	BG14NUC-HC333
655	2P	BG1NUC-HC209	4731	2P	BG7NUC-LC250	8806	RBD	BG14NUC-HC334
656	RBD	BG1NUC-HC210	4732	2P	BG7NUC-LC251	8807	2P	BG14NUC-HC335
657	RBD	BG1NUC-HC211	4733	2P	BG7NUC-LC252	8808	2P	BG14NUC-HC336
658	2P	BG1NUC-HC212	4734	2P	BG7NUC-LC253	8809	2P	BG14NUC-HC337
659	2P	BG1NUC-HC213	4735	RBD	BG7NUC-LC254	8810	2P	BG14NUC-HC338
660	2P	BG1NUC-HC214	4736	RBD	BG7NUC-LC255	8811	RBD	BG14NUC-HC339
661	2P	BG1NUC-HC215	4737	RBD	BG7NUC-LC256	8812	2P	BG14NUC-HC340
662	RBD	BG1NUC-HC216	4738	RBD	BG7NUC-LC257	8813	RBD	BG14NUC-HC341
663	2P	BG1NUC-HC217	4739	RBD	BG7NUC-LC258	8814	RBD	BG14NUC-HC342
664	2P	BG1NUC-HC218	4740	RBD	BG7NUC-LC259	8815	2P	BG14NUC-HC343
665	RBD	BG1NUC-HC219	4741	RBD	BG7NUC-LC260	8816	2P	BG14NUC-HC344
666	2P	BG1NUC-HC220	4742	RBD	BG7NUC-LC261	8817	RBD	BG14NUC-HC345
667	2P	BG1NUC-HC221	4743	RBD	BG7NUC-LC262	8818	RBD	BG14NUC-HC346
668	2P	BG1NUC-HC222	4744	RBD	BG7NUC-LC263	8819	RBD	BG14NUC-HC347
669	2P	BG1NUC-HC223	4745	RBD	BG7NUC-LC264	8820	RBD	BG14NUC-HC348
670	RBD	BG1NUC-HC224	4746	RBD	BG7NUC-LC265	8821	2P	BG14NUC-HC349
671	RBD	BG1NUC-HC225	4747	RBD	BG7NUC-LC266	8822	2P	BG14NUC-HC350
672	2P	BG1NUC-HC226	4748	RBD	BG7NUC-LC267	8823	2P	BG14NUC-HC351
673	2P	BG1NUC-HC227	4749	RBD	BG7NUC-LC268	8824	RBD	BG14NUC-HC352
674	2P	BG1NUC-HC228	4750	RBD	BG7NUC-LC269	8825	RBD	BG14NUC-HC353
675	RBD	BG1NUC-HC229	4751	RBD	BG7NUC-LC270	8826	RBD	BG14NUC-HC354
676	RBD	BG1NUC-HC230	4752	RBD	BG7NUC-LC271	8827	2P	BG14NUC-HC355
677	RBD	BG1NUC-HC231	4753	RBD	BG7NUC-LC272	8828	2P	BG14NUC-HC356
678	2P	BG1NUC-HC232	4754	RBD	BG7NUC-LC273	8829	2P	BG14NUC-HC357

679	RBD	BG1NUC-HC233	4755	RBD	BG7NUC-LC274	8830	2P	BG14NUC-HC358
680	RBD	BG1NUC-HC234	4756	RBD	BG7NUC-LC275	8831	2P	BG14NUC-HC359
681	2P	BG1NUC-HC235	4757	RBD	BG7NUC-LC276	8832	2P	BG14NUC-HC360
682	2P	BG1NUC-HC236	4758	RBD	BG7NUC-LC277	8833	2P	BG14NUC-HC361
683	2P	BG1NUC-HC237	4759	RBD	BG7NUC-LC278	8834	2P	BG14NUC-HC362
684	2P	BG1NUC-HC238	4760	RBD	BG7NUC-LC279	8835	RBD	BG14NUC-HC363
685	RBD	BG1NUC-HC239	4761	RBD	BG7NUC-LC280	8836	RBD	BG14NUC-HC364
686	RBD	BG1NUC-HC240	4762	RBD	BG7NUC-LC281	8837	2P	BG14NUC-HC365
687	2P	BG1NUC-HC241	4763	RBD	BG7NUC-LC282	8838	2P	BG14NUC-HC366
688	2P	BG1NUC-HC242	4764	RBD	BG7NUC-LC283	8839	2P	BG14NUC-HC367
689	2P	BG1NUC-HC243	4765	RBD	BG7NUC-LC284	8840	2P	BG14NUC-HC368
690	RBD	BG1NUC-HC244	4766	RBD	BG7NUC-LC285	8841	2P	BG14NUC-HC369
691	RBD	BG1NUC-HC245	4767	RBD	BG7NUC-LC286	8842	RBD	BG14NUC-HC370
692	RBD	BG1NUC-HC246	4768	RBD	BG7NUC-LC287	8843	2P	BG14NUC-HC371
693	2P	BG1NUC-HC247	4769	RBD	BG7NUC-LC288	8844	2P	BG14NUC-HC372
694	2P	BG1NUC-HC248	4770	RBD	BG7NUC-LC289	8845	RBD	BG14NUC-HC373
695	2P	BG1NUC-HC249	4771	RBD	BG7NUC-LC290	8846	2P	BG14NUC-HC374
696	RBD	BG1NUC-HC250	4772	RBD	BG7NUC-LC291	8847	2P	BG14NUC-HC375
697	RBD	BG1NUC-HC251	4773	RBD	BG7NUC-LC292	8848	RBD	BG14NUC-HC376
698	2P	BG1NUC-HC252	4774	RBD	BG7NUC-LC293	8849	RBD	BG14NUC-HC377
699	RBD	BG1NUC-HC253	4775	RBD	BG7NUC-LC294	8850	RBD	BG14NUC-HC378
700	RBD	BG1NUC-HC254	4776	RBD	BG7NUC-LC295	8851	2P	BG14NUC-HC379
701	RBD	BG1NUC-HC255	4777	RBD	BG7NUC-LC296	8852	RBD	BG14NUC-HC380
702	2P	BG1NUC-HC256	4778	RBD	BG7NUC-LC297	8853	2P	BG14NUC-HC381
703	2P	BG1NUC-HC257	4779	RBD	BG7NUC-LC298	8854	RBD	BG14NUC-HC382
704	2P	BG1NUC-HC258	4780	RBD	BG7NUC-LC299	8855	RBD	BG14NUC-HC383
705	2P	BG1NUC-HC259	4781	RBD	BG7NUC-LC300	8856	RBD	BG14NUC-HC384
706	RBD	BG1NUC-HC260	4782	RBD	BG7NUC-LC301	8857	RBD	BG14NUC-HC385
707	RBD	BG1NUC-HC261	4783	RBD	BG7NUC-LC302	8858	RBD	BG14NUC-HC386
708	2P	BG1NUC-HC262	4784	RBD	BG7NUC-LC303	8859	2P	BG14NUC-HC387
709	2P	BG1NUC-HC263	4785	RBD	BG7NUC-LC304	8860	2P	BG14NUC-HC388
710	2P	BG1NUC-HC264	4786	RBD	BG7NUC-LC305	8861	2P	BG14NUC-HC389
711	RBD	BG1NUC-HC265	4787	RBD	BG7NUC-LC306	8862	2P	BG14NUC-HC390
712	2P	BG1NUC-HC266	4788	RBD	BG7NUC-LC307	8863	RBD	BG14NUC-HC391
713	2P	BG1NUC-HC267	4789	RBD	BG7NUC-LC308	8864	2P	BG14NUC-HC392
714	2P	BG1NUC-HC268	4790	RBD	BG7NUC-LC309	8865	2P	BG14NUC-HC393
715	RBD	BG1NUC-HC269	4791	RBD	BG7NUC-LC310	8866	2P	BG14NUC-HC394
716	RBD	BG1NUC-HC270	4792	RBD	BG7NUC-LC311	8867	2P	BG14NUC-HC395
717	RBD	BG1NUC-HC271	4793	RBD	BG7NUC-LC312	8868	2P	BG14NUC-HC396
718	RBD	BG1NUC-HC272	4794	RBD	BG7NUC-LC313	8869	2P	BG14NUC-HC397
719	RBD	BG1NUC-HC273	4795	RBD	BG7NUC-LC314	8870	2P	BG14NUC-HC398
720	2P	BG1NUC-HC274	4796	RBD	BG7NUC-LC315	8871	2P	BG14NUC-HC399
721	2P	BG1NUC-HC275	4797	RBD	BG7NUC-LC316	8872	RBD	BG14NUC-HC400
722	2P	BG1NUC-HC276	4798	RBD	BG7NUC-LC317	8873	2P	BG14NUC-HC401
723	RBD	BG1NUC-HC277	4799	RBD	BG7NUC-LC318	8874	2P	BG14NUC-HC402
724	2P	BG1NUC-HC278	4800	RBD	BG7NUC-LC319	8875	2P	BG14NUC-HC403
725	2P	BG1NUC-HC279	4801	RBD	BG7NUC-LC320	8876	2P	BG14NUC-HC404
726	2P	BG1NUC-HC280	4802	RBD	BG7NUC-LC321	8877	2P	BG14NUC-HC405
727	2P	BG1NUC-HC281	4803	RBD	BG7NUC-LC322	8878	RBD	BG14NUC-HC406
728	2P	BG1NUC-HC282	4804	RBD	BG7NUC-LC323	8879	2P	BG14NUC-HC407
729	2P	BG1NUC-HC283	4805	RBD	BG7NUC-LC324	8880	2P	BG14NUC-HC408
730	RBD	BG1NUC-HC284	4806	RBD	BG7NUC-LC325	8881	RBD	BG14NUC-HC409
731	2P	BG1NUC-HC285	4807	RBD	BG7NUC-LC326	8882	RBD	BG14NUC-HC410
732	2P	BG1NUC-HC286	4808	RBD	BG7NUC-LC327	8883	2P	BG14NUC-HC411
733	2P	BG1NUC-HC287	4809	RBD	BG7NUC-LC328	8884	2P	BG14NUC-HC412
734	2P	BG1NUC-HC288	4810	RBD	BG7NUC-LC329	8885	2P	BG14NUC-HC413
735	2P	BG1NUC-HC289	4811	RBD	BG7NUC-LC330	8886	2P	BG14NUC-HC414
736	2P	BG1NUC-HC290	4812	RBD	BG7NUC-LC331	8887	2P	BG14NUC-HC415
737	2P	BG1NUC-HC291	4813	RBD	BG7NUC-LC332	8888	RBD	BG14NUC-HC416
738	RBD	BG1NUC-HC292	4814	RBD	BG7NUC-LC333	8889	2P	BG14NUC-HC417
739	RBD	BG1NUC-HC293	4815	RBD	BG7NUC-LC334	8890	2P	BG14NUC-HC418
740	RBD	BG1NUC-HC294	4816	RBD	BG7NUC-LC335	8891	RBD	BG14NUC-HC419
741	RBD	BG1NUC-HC295	4817	RBD	BG7NUC-LC336	8892	RBD	BG14NUC-HC420
742	RBD	BG1NUC-HC296	4818	RBD	BG7NUC-LC337	8893	2P	BG14NUC-HC421
743	RBD	BG1NUC-HC297	4819	RBD	BG7NUC-LC338	8894	2P	BG14NUC-HC422
744	2P	BG1NUC-HC298	4820	RBD	BG7NUC-LC339	8895	2P	BG14NUC-HC423
745	2P	BG1NUC-HC299	4821	RBD	BG7NUC-LC340	8896	RBD	BG14NUC-HC424
746	RBD	BG1NUC-HC300	4822	RBD	BG7NUC-LC341	8897	2P	BG14NUC-HC425
747	RBD	BG1NUC-HC301	4823	RBD	BG7NUC-LC342	8898	2P	BG14NUC-HC426
748	RBD	BG1NUC-HC302	4824	RBD	BG7NUC-LC343	8899	RBD	BG14NUC-HC427
749	RBD	BG1NUC-HC303	4825	RBD	BG7NUC-LC344	8900	RBD	BG14NUC-HC428
750	RBD	BG1NUC-HC304	4826	RBD	BG7NUC-LC345	8901	2P	BG14NUC-HC429
751	2P	BG1NUC-HC305	4827	RBD	BG7NUC-LC346	8902	RBD	BG14NUC-HC430
752	RBD	BG1NUC-HC306	4828	RBD	BG7NUC-LC347	8903	2P	BG14NUC-HC431
753	RBD	BG1NUC-HC307	4829	RBD	BG7NUC-LC348	8904	RBD	BG14NUC-HC432
754	2P	BG1NUC-HC308	4830	RBD	BG7NUC-LC349	8905	2P	BG14NUC-HC433
755	RBD	BG1NUC-LC1	4831	RBD	BG7NUC-LC350	8906	RBD	BG14NUC-HC434
756	2P	BG1NUC-LC2	4832	RBD	BG7NUC-LC351	8907	RBD	BG14NUC-HC435
757	RBD	BG1NUC-LC3	4833	RBD	BG7NUC-LC352	8908	2P	BG14NUC-HC436

758	2P	BG1NUC-LC4	4834	RBD	BG7NUC-LC353	8909	RBD	BG14NUC-HC437
759	RBD	BG1NUC-LC5	4835	RBD	BG7NUC-LC354	8910	RBD	BG14NUC-HC438
760	2P	BG1NUC-LC6	4836	RBD	BG7NUC-LC355	8911	RBD	BG14NUC-HC439
761	RBD	BG1NUC-LC7	4837	RBD	BG7NUC-LC356	8912	RBD	BG14NUC-HC440
762	RBD	BG1NUC-LC8	4838	RBD	BG7NUC-LC357	8913	2P	BG14NUC-HC441
763	RBD	BG1NUC-LC9	4839	RBD	BG7NUC-LC358	8914	2P	BG14NUC-HC442
764	RBD	BG1NUC-LC10	4840	RBD	BG7NUC-LC359	8915	RBD	BG14NUC-HC443
765	RBD	BG1NUC-LC11	4841	RBD	BG7NUC-LC360	8916	RBD	BG14NUC-HC444
766	2P	BG1NUC-LC12	4842	RBD	BG7NUC-LC361	8917	2P	BG14NUC-HC445
767	RBD	BG1NUC-LC13	4843	RBD	BG7NUC-LC362	8918	RBD	BG14NUC-HC446
768	RBD	BG1NUC-LC14	4844	RBD	BG7NUC-LC363	8919	2P	BG14NUC-HC447
769	RBD	BG1NUC-LC15	4845	RBD	BG7NUC-LC364	8920	2P	BG14NUC-HC448
770	RBD	BG1NUC-LC16	4846	RBD	BG7NUC-LC365	8921	2P	BG14NUC-HC449
771	RBD	BG1NUC-LC17	4847	RBD	BG7NUC-LC366	8922	RBD	BG14NUC-HC450
772	2P	BG1NUC-LC18	4848	RBD	BG7NUC-LC367	8923	RBD	BG14NUC-HC451
773	2P	BG1NUC-LC19	4849	RBD	BG7NUC-LC368	8924	RBD	BG14NUC-HC452
774	RBD	BG1NUC-LC20	4850	RBD	BG7NUC-LC369	8925	RBD	BG14NUC-HC453
775	2P	BG1NUC-LC21	4851	RBD	BG7NUC-LC370	8926	2P	BG14NUC-HC454
776	2P	BG1NUC-LC22	4852	RBD	BG7NUC-LC371	8927	RBD	BG14NUC-HC455
777	2P	BG1NUC-LC23	4853	RBD	BG7NUC-LC372	8928	RBD	BG14NUC-HC456
778	2P	BG1NUC-LC24	4854	RBD	BG7NUC-LC373	8929	RBD	BG14NUC-HC457
779	RBD	BG1NUC-LC25	4855	RBD	BG7NUC-LC374	8930	2P	BG14NUC-HC458
780	2P	BG1NUC-LC26	4856	RBD	BG7NUC-LC375	8931	2P	BG14NUC-HC459
781	RBD	BG1NUC-LC27	4857	RBD	BG7NUC-LC376	8932	RBD	BG14NUC-HC460
782	2P	BG1NUC-LC28	4858	RBD	BG7NUC-LC377	8933	2P	BG14NUC-HC461
783	RBD	BG1NUC-LC29	4859	RBD	BG7NUC-LC378	8934	RBD	BG14NUC-HC462
784	2P	BG1NUC-LC30	4860	RBD	BG7NUC-LC379	8935	2P	BG14NUC-HC463
785	RBD	BG1NUC-LC31	4861	RBD	BG7NUC-LC380	8936	RBD	BG14NUC-HC464
786	RBD	BG1NUC-LC32	4862	RBD	BG7NUC-LC381	8937	RBD	BG14NUC-HC465
787	2P	BG1NUC-LC33	4863	RBD	BG7NUC-LC382	8938	RBD	BG14NUC-HC466
788	2P	BG1NUC-LC34	4864	RBD	BG7NUC-LC383	8939	RBD	BG14NUC-HC467
789	RBD	BG1NUC-LC35	4865	RBD	BG7NUC-LC384	8940	2P	BG14NUC-HC468
790	2P	BG1NUC-LC36	4866	RBD	BG7NUC-LC385	8941	2P	BG14NUC-HC469
791	RBD	BG1NUC-LC37	4867	RBD	BG7NUC-LC386	8942	RBD	BG14NUC-HC470
792	RBD	BG1NUC-LC38	4868	RBD	BG7NUC-LC387	8943	2P	BG14NUC-HC471
793	2P	BG1NUC-LC39	4869	RBD	BG7NUC-LC388	8944	2P	BG14NUC-HC472
794	RBD	BG1NUC-LC40	4870	RBD	BG7NUC-LC389	8945	RBD	BG14NUC-HC473
795	RBD	BG1NUC-LC41	4871	RBD	BG7NUC-LC390	8946	2P	BG14NUC-HC474
796	2P	BG1NUC-LC42	4872	RBD	BG7NUC-LC391	8947	RBD	BG14NUC-HC475
797	2P	BG1NUC-LC43	4873	RBD	BG7NUC-LC392	8948	RBD	BG14NUC-HC476
798	RBD	BG1NUC-LC44	4874	RBD	BG7NUC-LC393	8949	2P	BG14NUC-HC477
799	RBD	BG1NUC-LC45	4875	RBD	BG7NUC-LC394	8950	2P	BG14NUC-HC478
800	RBD	BG1NUC-LC46	4876	RBD	BG7NUC-LC395	8951	RBD	BG14NUC-HC479
801	2P	BG1NUC-LC47	4877	RBD	BG7NUC-LC396	8952	RBD	BG14NUC-HC480
802	RBD	BG1NUC-LC48	4878	RBD	BG7NUC-LC397	8953	RBD	BG14NUC-HC481
803	RBD	BG1NUC-LC49	4879	2P	BG9NUC-HC1	8954	2P	BG14NUC-HC482
804	RBD	BG1NUC-LC50	4880	2P	BG9NUC-HC2	8955	2P	BG14NUC-HC483
805	2P	BG1NUC-LC51	4881	2P	BG9NUC-HC3	8956	2P	BG14NUC-HC484
806	2P	BG1NUC-LC52	4882	2P	BG9NUC-HC4	8957	2P	BG14NUC-HC485
807	RBD	BG1NUC-LC53	4883	2P	BG9NUC-HC5	8958	2P	BG14NUC-HC486
808	2P	BG1NUC-LC54	4884	2P	BG9NUC-HC6	8959	2P	BG14NUC-HC487
809	2P	BG1NUC-LC55	4885	2P	BG9NUC-HC7	8960	2P	BG14NUC-HC488
810	RBD	BG1NUC-LC56	4886	RBD	BG9NUC-HC8	8961	RBD	BG14NUC-HC489
811	2P	BG1NUC-LC57	4887	RBD	BG9NUC-HC9	8962	2P	BG14NUC-HC490
812	2P	BG1NUC-LC58	4888	RBD	BG9NUC-HC10	8963	RBD	BG14NUC-HC491
813	2P	BG1NUC-LC59	4889	2P	BG9NUC-HC11	8964	RBD	BG14NUC-HC492
814	RBD	BG1NUC-LC60	4890	RBD	BG9NUC-HC12	8965	2P	BG14NUC-HC493
815	RBD	BG1NUC-LC61	4891	RBD	BG9NUC-HC13	8966	2P	BG14NUC-HC494
816	RBD	BG1NUC-LC62	4892	RBD	BG9NUC-HC14	8967	2P	BG14NUC-HC495
817	2P	BG1NUC-LC63	4893	RBD	BG9NUC-HC15	8968	RBD	BG14NUC-HC496
818	2P	BG1NUC-LC64	4894	2P	BG9NUC-HC16	8969	RBD	BG14NUC-HC497
819	2P	BG1NUC-LC65	4895	2P	BG9NUC-HC17	8970	2P	BG14NUC-HC498
820	2P	BG1NUC-LC66	4896	2P	BG9NUC-HC18	8971	RBD	BG14NUC-HC499
821	RBD	BG1NUC-LC67	4897	2P	BG9NUC-HC19	8972	RBD	BG14NUC-HC500
822	RBD	BG1NUC-LC68	4898	2P	BG9NUC-HC20	8973	RBD	BG14NUC-HC501
823	2P	BG1NUC-LC69	4899	2P	BG9NUC-HC21	8974	RBD	BG14NUC-HC502
824	2P	BG1NUC-LC70	4900	2P	BG9NUC-HC22	8975	RBD	BG14NUC-HC503
825	2P	BG1NUC-LC71	4901	RBD	BG9NUC-HC23	8976	RBD	BG14NUC-HC504
826	RBD	BG1NUC-LC72	4902	2P	BG9NUC-HC24	8977	2P	BG14NUC-HC505
827	RBD	BG1NUC-LC73	4903	RBD	BG9NUC-HC25	8978	2P	BG14NUC-HC506
828	RBD	BG1NUC-LC74	4904	RBD	BG9NUC-HC26	8979	2P	BG14NUC-HC507
829	2P	BG1NUC-LC75	4905	RBD	BG9NUC-HC27	8980	RBD	BG14NUC-HC508
830	RBD	BG1NUC-LC76	4906	RBD	BG9NUC-HC28	8981	RBD	BG14NUC-HC509
831	2P	BG1NUC-LC77	4907	2P	BG9NUC-HC29	8982	RBD	BG14NUC-HC510
832	2P	BG1NUC-LC78	4908	2P	BG9NUC-HC30	8983	RBD	BG14NUC-HC511
833	2P	BG1NUC-LC79	4909	RBD	BG9NUC-HC31	8984	2P	BG14NUC-HC512
834	RBD	BG1NUC-LC80	4910	2P	BG9NUC-HC32	8985	RBD	BG14NUC-HC513
835	RBD	BG1NUC-LC81	4911	RBD	BG9NUC-HC33	8986	2P	BG14NUC-HC514
836	2P	BG1NUC-LC82	4912	RBD	BG9NUC-HC34	8987	2P	BG14NUC-HC515

837	RBD	BG1NUC-LC83	4913	RBD	BG9NUC-HC35	8988	RBD	BG14NUC-HC516
838	2P	BG1NUC-LC84	4914	RBD	BG9NUC-HC36	8989	2P	BG14NUC-HC517
839	2P	BG1NUC-LC85	4915	2P	BG9NUC-HC37	8990	RBD	BG14NUC-HC518
840	2P	BG1NUC-LC86	4916	2P	BG9NUC-HC38	8991	2P	BG14NUC-HC519
841	RBD	BG1NUC-LC87	4917	2P	BG9NUC-HC39	8992	RBD	BG14NUC-HC520
842	2P	BG1NUC-LC88	4918	RBD	BG9NUC-HC40	8993	RBD	BG14NUC-HC521
843	RBD	BG1NUC-LC89	4919	2P	BG9NUC-HC41	8994	RBD	BG14NUC-HC522
844	RBD	BG1NUC-LC90	4920	2P	BG9NUC-HC42	8995	2P	BG14NUC-HC523
845	RBD	BG1NUC-LC91	4921	RBD	BG9NUC-HC43	8996	RBD	BG14NUC-HC524
846	RBD	BG1NUC-LC92	4922	2P	BG9NUC-HC44	8997	2P	BG14NUC-HC525
847	RBD	BG1NUC-LC93	4923	2P	BG9NUC-HC45	8998	2P	BG14NUC-HC526
848	RBD	BG1NUC-LC94	4924	RBD	BG9NUC-HC46	8999	2P	BG14NUC-HC527
849	RBD	BG1NUC-LC95	4925	2P	BG9NUC-HC47	9000	2P	BG14NUC-HC528
850	RBD	BG1NUC-LC96	4926	2P	BG9NUC-HC48	9001	2P	BG14NUC-HC529
851	2P	BG1NUC-LC97	4927	RBD	BG9NUC-HC49	9002	2P	BG14NUC-HC530
852	2P	BG1NUC-LC98	4928	2P	BG9NUC-HC50	9003	RBD	BG14NUC-HC531
853	2P	BG1NUC-LC99	4929	2P	BG9NUC-HC51	9004	RBD	BG14NUC-HC532
854	RBD	BG1NUC-LC100	4930	RBD	BG9NUC-HC52	9005	RBD	BG14NUC-HC533
855	2P	BG1NUC-LC101	4931	2P	BG9NUC-HC53	9006	2P	BG14NUC-HC534
856	RBD	BG1NUC-LC102	4932	RBD	BG9NUC-HC54	9007	2P	BG14NUC-HC535
857	2P	BG1NUC-LC103	4933	RBD	BG9NUC-HC55	9008	RBD	BG14NUC-LC1
858	2P	BG1NUC-LC104	4934	2P	BG9NUC-HC56	9009	RBD	BG14NUC-LC2
859	2P	BG1NUC-LC105	4935	2P	BG9NUC-HC57	9010	RBD	BG14NUC-LC3
860	2P	BG1NUC-LC106	4936	RBD	BG9NUC-HC58	9011	RBD	BG14NUC-LC4
861	RBD	BG1NUC-LC107	4937	RBD	BG9NUC-HC59	9012	RBD	BG14NUC-LC5
862	RBD	BG1NUC-LC108	4938	RBD	BG9NUC-HC60	9013	RBD	BG14NUC-LC6
863	2P	BG1NUC-LC109	4939	2P	BG9NUC-HC61	9014	RBD	BG14NUC-LC7
864	2P	BG1NUC-LC110	4940	2P	BG9NUC-HC62	9015	RBD	BG14NUC-LC8
865	2P	BG1NUC-LC111	4941	RBD	BG9NUC-HC63	9016	RBD	BG14NUC-LC9
866	2P	BG1NUC-LC112	4942	2P	BG9NUC-HC64	9017	RBD	BG14NUC-LC10
867	2P	BG1NUC-LC113	4943	2P	BG9NUC-HC65	9018	RBD	BG14NUC-LC11
868	RBD	BG1NUC-LC114	4944	2P	BG9NUC-HC66	9019	RBD	BG14NUC-LC12
869	RBD	BG1NUC-LC115	4945	2P	BG9NUC-HC67	9020	RBD	BG14NUC-LC13
870	RBD	BG1NUC-LC116	4946	2P	BG9NUC-HC68	9021	RBD	BG14NUC-LC14
871	RBD	BG1NUC-LC117	4947	RBD	BG9NUC-HC69	9022	RBD	BG14NUC-LC15
872	2P	BG1NUC-LC118	4948	2P	BG9NUC-HC70	9023	RBD	BG14NUC-LC16
873	2P	BG1NUC-LC119	4949	2P	BG9NUC-HC71	9024	RBD	BG14NUC-LC17
874	RBD	BG1NUC-LC120	4950	RBD	BG9NUC-HC72	9025	RBD	BG14NUC-LC18
875	2P	BG1NUC-LC121	4951	2P	BG9NUC-HC73	9026	RBD	BG14NUC-LC19
876	2P	BG1NUC-LC122	4952	2P	BG9NUC-HC74	9027	RBD	BG14NUC-LC20
877	2P	BG1NUC-LC123	4953	2P	BG9NUC-HC75	9028	RBD	BG14NUC-LC21
878	RBD	BG1NUC-LC124	4954	RBD	BG9NUC-HC76	9029	RBD	BG14NUC-LC22
879	RBD	BG1NUC-LC125	4955	RBD	BG9NUC-HC77	9030	RBD	BG14NUC-LC23
880	RBD	BG1NUC-LC126	4956	RBD	BG9NUC-HC78	9031	RBD	BG14NUC-LC24
881	RBD	BG1NUC-LC127	4957	2P	BG9NUC-HC79	9032	RBD	BG14NUC-LC25
882	RBD	BG1NUC-LC128	4958	2P	BG9NUC-HC80	9033	2P	BG14NUC-LC26
883	RBD	BG1NUC-LC129	4959	2P	BG9NUC-HC81	9034	2P	BG14NUC-LC27
884	RBD	BG1NUC-LC130	4960	2P	BG9NUC-HC82	9035	2P	BG14NUC-LC28
885	RBD	BG1NUC-LC131	4961	RBD	BG9NUC-HC83	9036	2P	BG14NUC-LC29
886	RBD	BG1NUC-LC132	4962	RBD	BG9NUC-HC84	9037	2P	BG14NUC-LC30
887	RBD	BG1NUC-LC133	4963	RBD	BG9NUC-HC85	9038	2P	BG14NUC-LC31
888	2P	BG1NUC-LC134	4964	RBD	BG9NUC-HC86	9039	2P	BG14NUC-LC32
889	2P	BG1NUC-LC135	4965	2P	BG9NUC-HC87	9040	2P	BG14NUC-LC33
890	RBD	BG1NUC-LC136	4966	2P	BG9NUC-HC88	9041	2P	BG14NUC-LC34
891	RBD	BG1NUC-LC137	4967	2P	BG9NUC-HC89	9042	2P	BG14NUC-LC35
892	RBD	BG1NUC-LC138	4968	2P	BG9NUC-HC90	9043	2P	BG14NUC-LC36
893	RBD	BG1NUC-LC139	4969	2P	BG9NUC-HC91	9044	2P	BG14NUC-LC37
894	2P	BG1NUC-LC140	4970	RBD	BG9NUC-HC92	9045	2P	BG14NUC-LC38
895	2P	BG1NUC-LC141	4971	2P	BG9NUC-HC93	9046	2P	BG14NUC-LC39
896	2P	BG1NUC-LC142	4972	2P	BG9NUC-HC94	9047	2P	BG14NUC-LC40
897	2P	BG1NUC-LC143	4973	RBD	BG9NUC-HC95	9048	2P	BG14NUC-LC41
898	2P	BG1NUC-LC144	4974	2P	BG9NUC-HC96	9049	2P	BG14NUC-LC42
899	2P	BG1NUC-LC145	4975	2P	BG9NUC-HC97	9050	2P	BG14NUC-LC43
900	2P	BG1NUC-LC146	4976	2P	BG9NUC-HC98	9051	2P	BG14NUC-LC44
901	2P	BG1NUC-LC147	4977	2P	BG9NUC-HC99	9052	2P	BG14NUC-LC45
902	2P	BG1NUC-LC148	4978	RBD	BG9NUC-HC100	9053	2P	BG14NUC-LC46
903	2P	BG1NUC-LC149	4979	RBD	BG9NUC-HC101	9054	2P	BG14NUC-LC47
904	RBD	BG1NUC-LC150	4980	RBD	BG9NUC-HC102	9055	2P	BG14NUC-LC48
905	2P	BG1NUC-LC151	4981	2P	BG9NUC-HC103	9056	2P	BG14NUC-LC49
906	RBD	BG1NUC-LC152	4982	RBD	BG9NUC-HC104	9057	RBD	BG14NUC-LC50
907	RBD	BG1NUC-LC153	4983	2P	BG9NUC-HC105	9058	RBD	BG14NUC-LC51
908	2P	BG1NUC-LC154	4984	2P	BG9NUC-HC106	9059	RBD	BG14NUC-LC52
909	2P	BG1NUC-LC155	4985	RBD	BG9NUC-HC107	9060	RBD	BG14NUC-LC53
910	RBD	BG1NUC-LC156	4986	RBD	BG9NUC-HC108	9061	RBD	BG14NUC-LC54
911	2P	BG1NUC-LC157	4987	RBD	BG9NUC-HC109	9062	RBD	BG14NUC-LC55
912	2P	BG1NUC-LC158	4988	2P	BG9NUC-HC110	9063	RBD	BG14NUC-LC56
913	2P	BG1NUC-LC159	4989	2P	BG9NUC-HC111	9064	RBD	BG14NUC-LC57
914	2P	BG1NUC-LC160	4990	2P	BG9NUC-HC112	9065	RBD	BG14NUC-LC58
915	RBD	BG1NUC-LC161	4991	RBD	BG9NUC-HC113	9066	2P	BG14NUC-LC59

916	2P	BG1NUC-LC162	4992	2P	BG9NUC-HC114	9067	2P	BG14NUC-LC60
917	RBD	BG1NUC-LC163	4993	2P	BG9NUC-HC115	9068	2P	BG14NUC-LC61
918	RBD	BG1NUC-LC164	4994	RBD	BG9NUC-HC116	9069	2P	BG14NUC-LC62
919	RBD	BG1NUC-LC165	4995	RBD	BG9NUC-HC117	9070	2P	BG14NUC-LC63
920	RBD	BG1NUC-LC166	4996	RBD	BG9NUC-HC118	9071	2P	BG14NUC-LC64
921	2P	BG1NUC-LC167	4997	2P	BG9NUC-HC119	9072	2P	BG14NUC-LC65
922	RBD	BG1NUC-LC168	4998	2P	BG9NUC-HC120	9073	RBD	BG14NUC-LC66
923	RBD	BG1NUC-LC169	4999	RBD	BG9NUC-HC121	9074	RBD	BG14NUC-LC67
924	2P	BG1NUC-LC170	5000	RBD	BG9NUC-HC122	9075	RBD	BG14NUC-LC68
925	2P	BG1NUC-LC171	5001	2P	BG9NUC-HC123	9076	RBD	BG14NUC-LC69
926	2P	BG1NUC-LC172	5002	2P	BG9NUC-HC124	9077	RBD	BG14NUC-LC70
927	RBD	BG1NUC-LC173	5003	2P	BG9NUC-HC125	9078	2P	BG14NUC-LC71
928	RBD	BG1NUC-LC174	5004	2P	BG9NUC-HC126	9079	2P	BG14NUC-LC72
929	RBD	BG1NUC-LC175	5005	RBD	BG9NUC-HC127	9080	RBD	BG14NUC-LC73
930	2P	BG1NUC-LC176	5006	2P	BG9NUC-HC128	9081	RBD	BG14NUC-LC74
931	RBD	BG1NUC-LC177	5007	RBD	BG9NUC-HC129	9082	RBD	BG14NUC-LC75
932	RBD	BG1NUC-LC178	5008	RBD	BG9NUC-HC130	9083	2P	BG14NUC-LC76
933	2P	BG1NUC-LC179	5009	RBD	BG9NUC-HC131	9084	RBD	BG14NUC-LC77
934	RBD	BG1NUC-LC180	5010	RBD	BG9NUC-HC132	9085	RBD	BG14NUC-LC78
935	RBD	BG1NUC-LC181	5011	2P	BG9NUC-HC133	9086	RBD	BG14NUC-LC79
936	RBD	BG1NUC-LC182	5012	RBD	BG9NUC-HC134	9087	RBD	BG14NUC-LC80
937	RBD	BG1NUC-LC183	5013	2P	BG9NUC-HC135	9088	RBD	BG14NUC-LC81
938	2P	BG1NUC-LC184	5014	RBD	BG9NUC-HC136	9089	RBD	BG14NUC-LC82
939	RBD	BG1NUC-LC185	5015	2P	BG9NUC-HC137	9090	RBD	BG14NUC-LC83
940	RBD	BG1NUC-LC186	5016	RBD	BG9NUC-HC138	9091	RBD	BG14NUC-LC84
941	RBD	BG1NUC-LC187	5017	2P	BG9NUC-HC139	9092	RBD	BG14NUC-LC85
942	RBD	BG1NUC-LC188	5018	2P	BG9NUC-HC140	9093	2P	BG14NUC-LC86
943	2P	BG1NUC-LC189	5019	2P	BG9NUC-HC141	9094	2P	BG14NUC-LC87
944	RBD	BG1NUC-LC190	5020	2P	BG9NUC-HC142	9095	2P	BG14NUC-LC88
945	2P	BG1NUC-LC191	5021	2P	BG9NUC-HC143	9096	2P	BG14NUC-LC89
946	2P	BG1NUC-LC192	5022	2P	BG9NUC-HC144	9097	RBD	BG14NUC-LC90
947	2P	BG1NUC-LC193	5023	2P	BG9NUC-HC145	9098	RBD	BG14NUC-LC91
948	2P	BG1NUC-LC194	5024	2P	BG9NUC-HC146	9099	RBD	BG14NUC-LC92
949	2P	BG1NUC-LC195	5025	RBD	BG9NUC-HC147	9100	2P	BG14NUC-LC93
950	2P	BG1NUC-LC196	5026	RBD	BG9NUC-HC148	9101	2P	BG14NUC-LC94
951	2P	BG1NUC-LC197	5027	RBD	BG9NUC-HC149	9102	2P	BG14NUC-LC95
952	2P	BG1NUC-LC198	5028	RBD	BG9NUC-HC150	9103	RBD	BG14NUC-LC96
953	2P	BG1NUC-LC199	5029	2P	BG9NUC-HC151	9104	RBD	BG14NUC-LC97
954	RBD	BG1NUC-LC200	5030	2P	BG9NUC-HC152	9105	RBD	BG14NUC-LC98
955	RBD	BG1NUC-LC201	5031	RBD	BG9NUC-HC153	9106	2P	BG14NUC-LC99
956	RBD	BG1NUC-LC202	5032	2P	BG9NUC-HC154	9107	RBD	BG14NUC-LC100
957	2P	BG1NUC-LC203	5033	2P	BG9NUC-HC155	9108	RBD	BG14NUC-LC101
958	2P	BG1NUC-LC204	5034	2P	BG9NUC-HC156	9109	RBD	BG14NUC-LC102
959	2P	BG1NUC-LC205	5035	2P	BG9NUC-HC157	9110	2P	BG14NUC-LC103
960	RBD	BG1NUC-LC206	5036	RBD	BG9NUC-HC158	9111	RBD	BG14NUC-LC104
961	2P	BG1NUC-LC207	5037	2P	BG9NUC-HC159	9112	RBD	BG14NUC-LC105
962	2P	BG1NUC-LC208	5038	2P	BG9NUC-HC160	9113	RBD	BG14NUC-LC106
963	2P	BG1NUC-LC209	5039	2P	BG9NUC-HC161	9114	RBD	BG14NUC-LC107
964	RBD	BG1NUC-LC210	5040	RBD	BG9NUC-HC162	9115	RBD	BG14NUC-LC108
965	RBD	BG1NUC-LC211	5041	2P	BG9NUC-HC163	9116	2P	BG14NUC-LC109
966	2P	BG1NUC-LC212	5042	2P	BG9NUC-HC164	9117	2P	BG14NUC-LC110
967	2P	BG1NUC-LC213	5043	RBD	BG9NUC-HC165	9118	RBD	BG14NUC-LC111
968	2P	BG1NUC-LC214	5044	2P	BG9NUC-HC166	9119	RBD	BG14NUC-LC112
969	2P	BG1NUC-LC215	5045	RBD	BG9NUC-HC167	9120	2P	BG14NUC-LC113
970	RBD	BG1NUC-LC216	5046	RBD	BG9NUC-HC168	9121	2P	BG14NUC-LC114
971	2P	BG1NUC-LC217	5047	RBD	BG9NUC-HC169	9122	2P	BG14NUC-LC115
972	2P	BG1NUC-LC218	5048	RBD	BG9NUC-HC170	9123	RBD	BG14NUC-LC116
973	RBD	BG1NUC-LC219	5049	RBD	BG9NUC-HC171	9124	RBD	BG14NUC-LC117
974	2P	BG1NUC-LC220	5050	2P	BG9NUC-HC172	9125	RBD	BG14NUC-LC118
975	2P	BG1NUC-LC221	5051	RBD	BG9NUC-HC173	9126	RBD	BG14NUC-LC119
976	2P	BG1NUC-LC222	5052	2P	BG9NUC-HC174	9127	RBD	BG14NUC-LC120
977	2P	BG1NUC-LC223	5053	RBD	BG9NUC-HC175	9128	2P	BG14NUC-LC121
978	RBD	BG1NUC-LC224	5054	RBD	BG9NUC-HC176	9129	2P	BG14NUC-LC122
979	RBD	BG1NUC-LC225	5055	2P	BG9NUC-HC177	9130	RBD	BG14NUC-LC123
980	2P	BG1NUC-LC226	5056	RBD	BG9NUC-HC178	9131	RBD	BG14NUC-LC124
981	2P	BG1NUC-LC227	5057	2P	BG9NUC-HC179	9132	RBD	BG14NUC-LC125
982	2P	BG1NUC-LC228	5058	2P	BG9NUC-HC180	9133	2P	BG14NUC-LC126
983	RBD	BG1NUC-LC229	5059	2P	BG9NUC-HC181	9134	2P	BG14NUC-LC127
984	RBD	BG1NUC-LC230	5060	RBD	BG9NUC-HC182	9135	RBD	BG14NUC-LC128
985	RBD	BG1NUC-LC231	5061	2P	BG9NUC-HC183	9136	RBD	BG14NUC-LC129
986	2P	BG1NUC-LC232	5062	RBD	BG9NUC-HC184	9137	RBD	BG14NUC-LC130
987	RBD	BG1NUC-LC233	5063	2P	BG9NUC-HC185	9138	2P	BG14NUC-LC131
988	RBD	BG1NUC-LC234	5064	RBD	BG9NUC-HC186	9139	2P	BG14NUC-LC132
989	2P	BG1NUC-LC235	5065	2P	BG9NUC-HC187	9140	RBD	BG14NUC-LC133
990	2P	BG1NUC-LC236	5066	2P	BG9NUC-HC188	9141	RBD	BG14NUC-LC134
991	2P	BG1NUC-LC237	5067	2P	BG9NUC-HC189	9142	RBD	BG14NUC-LC135
992	2P	BG1NUC-LC238	5068	2P	BG9NUC-HC190	9143	RBD	BG14NUC-LC136
993	RBD	BG1NUC-LC239	5069	2P	BG9NUC-HC191	9144	RBD	BG14NUC-LC137
994	RBD	BG1NUC-LC240	5070	RBD	BG9NUC-HC192	9145	RBD	BG14NUC-LC138

995	2P	BG1NUC-LC241	5071	2P	BG9NUC-HC193	9146	RBD	BG14NUC-LC139
996	2P	BG1NUC-LC242	5072	2P	BG9NUC-HC194	9147	RBD	BG14NUC-LC140
997	2P	BG1NUC-LC243	5073	RBD	BG9NUC-HC195	9148	2P	BG14NUC-LC141
998	RBD	BG1NUC-LC244	5074	RBD	BG9NUC-HC196	9149	2P	BG14NUC-LC142
999	RBD	BG1NUC-LC245	5075	2P	BG9NUC-HC197	9150	RBD	BG14NUC-LC143
1000	RBD	BG1NUC-LC246	5076	RBD	BG9NUC-HC198	9151	2P	BG14NUC-LC144
1001	2P	BG1NUC-LC247	5077	2P	BG9NUC-HC199	9152	2P	BG14NUC-LC145
1002	2P	BG1NUC-LC248	5078	2P	BG9NUC-HC200	9153	2P	BG14NUC-LC146
1003	2P	BG1NUC-LC249	5079	RBD	BG9NUC-HC201	9154	RBD	BG14NUC-LC147
1004	RBD	BG1NUC-LC250	5080	2P	BG9NUC-HC202	9155	RBD	BG14NUC-LC148
1005	RBD	BG1NUC-LC251	5081	2P	BG9NUC-HC203	9156	2P	BG14NUC-LC149
1006	2P	BG1NUC-LC252	5082	2P	BG9NUC-HC204	9157	2P	BG14NUC-LC150
1007	RBD	BG1NUC-LC253	5083	2P	BG9NUC-HC205	9158	2P	BG14NUC-LC151
1008	RBD	BG1NUC-LC254	5084	RBD	BG9NUC-HC206	9159	2P	BG14NUC-LC152
1009	RBD	BG1NUC-LC255	5085	RBD	BG9NUC-HC207	9160	2P	BG14NUC-LC153
1010	2P	BG1NUC-LC256	5086	2P	BG9NUC-HC208	9161	RBD	BG14NUC-LC154
1011	2P	BG1NUC-LC257	5087	RBD	BG9NUC-HC209	9162	2P	BG14NUC-LC155
1012	2P	BG1NUC-LC258	5088	RBD	BG9NUC-HC210	9163	2P	BG14NUC-LC156
1013	2P	BG1NUC-LC259	5089	2P	BG9NUC-HC211	9164	RBD	BG14NUC-LC157
1014	RBD	BG1NUC-LC260	5090	RBD	BG9NUC-HC212	9165	2P	BG14NUC-LC158
1015	RBD	BG1NUC-LC261	5091	RBD	BG9NUC-HC213	9166	2P	BG14NUC-LC159
1016	2P	BG1NUC-LC262	5092	2P	BG9NUC-HC214	9167	2P	BG14NUC-LC160
1017	2P	BG1NUC-LC263	5093	2P	BG9NUC-HC215	9168	2P	BG14NUC-LC161
1018	2P	BG1NUC-LC264	5094	RBD	BG9NUC-HC216	9169	2P	BG14NUC-LC162
1019	RBD	BG1NUC-LC265	5095	2P	BG9NUC-HC217	9170	RBD	BG14NUC-LC163
1020	2P	BG1NUC-LC266	5096	2P	BG9NUC-HC218	9171	RBD	BG14NUC-LC164
1021	2P	BG1NUC-LC267	5097	RBD	BG9NUC-HC219	9172	RBD	BG14NUC-LC165
1022	2P	BG1NUC-LC268	5098	RBD	BG9NUC-HC220	9173	2P	BG14NUC-LC166
1023	RBD	BG1NUC-LC269	5099	2P	BG9NUC-HC221	9174	2P	BG14NUC-LC167
1024	RBD	BG1NUC-LC270	5100	RBD	BG9NUC-HC222	9175	2P	BG14NUC-LC168
1025	RBD	BG1NUC-LC271	5101	2P	BG9NUC-HC223	9176	2P	BG14NUC-LC169
1026	RBD	BG1NUC-LC272	5102	2P	BG9NUC-HC224	9177	RBD	BG14NUC-LC170
1027	RBD	BG1NUC-LC273	5103	RBD	BG9NUC-HC225	9178	2P	BG14NUC-LC171
1028	2P	BG1NUC-LC274	5104	2P	BG9NUC-HC226	9179	RBD	BG14NUC-LC172
1029	2P	BG1NUC-LC275	5105	RBD	BG9NUC-HC227	9180	2P	BG14NUC-LC173
1030	2P	BG1NUC-LC276	5106	RBD	BG9NUC-HC228	9181	2P	BG14NUC-LC174
1031	RBD	BG1NUC-LC277	5107	2P	BG9NUC-HC229	9182	2P	BG14NUC-LC175
1032	2P	BG1NUC-LC278	5108	2P	BG9NUC-HC230	9183	RBD	BG14NUC-LC176
1033	2P	BG1NUC-LC279	5109	2P	BG9NUC-HC231	9184	2P	BG14NUC-LC177
1034	2P	BG1NUC-LC280	5110	RBD	BG9NUC-HC232	9185	RBD	BG14NUC-LC178
1035	2P	BG1NUC-LC281	5111	RBD	BG9NUC-HC233	9186	2P	BG14NUC-LC179
1036	2P	BG1NUC-LC282	5112	RBD	BG9NUC-HC234	9187	2P	BG14NUC-LC180
1037	2P	BG1NUC-LC283	5113	2P	BG9NUC-LC1	9188	2P	BG14NUC-LC181
1038	RBD	BG1NUC-LC284	5114	2P	BG9NUC-LC2	9189	2P	BG14NUC-LC182
1039	2P	BG1NUC-LC285	5115	2P	BG9NUC-LC3	9190	2P	BG14NUC-LC183
1040	2P	BG1NUC-LC286	5116	2P	BG9NUC-LC4	9191	RBD	BG14NUC-LC184
1041	2P	BG1NUC-LC287	5117	2P	BG9NUC-LC5	9192	2P	BG14NUC-LC185
1042	2P	BG1NUC-LC288	5118	2P	BG9NUC-LC6	9193	2P	BG14NUC-LC186
1043	2P	BG1NUC-LC289	5119	2P	BG9NUC-LC7	9194	2P	BG14NUC-LC187
1044	2P	BG1NUC-LC290	5120	RBD	BG9NUC-LC8	9195	RBD	BG14NUC-LC188
1045	2P	BG1NUC-LC291	5121	RBD	BG9NUC-LC9	9196	2P	BG14NUC-LC189
1046	RBD	BG1NUC-LC292	5122	RBD	BG9NUC-LC10	9197	2P	BG14NUC-LC190
1047	RBD	BG1NUC-LC293	5123	2P	BG9NUC-LC11	9198	2P	BG14NUC-LC191
1048	RBD	BG1NUC-LC294	5124	RBD	BG9NUC-LC12	9199	RBD	BG14NUC-LC192
1049	RBD	BG1NUC-LC295	5125	RBD	BG9NUC-LC13	9200	RBD	BG14NUC-LC193
1050	RBD	BG1NUC-LC296	5126	RBD	BG9NUC-LC14	9201	RBD	BG14NUC-LC194
1051	RBD	BG1NUC-LC297	5127	RBD	BG9NUC-LC15	9202	RBD	BG14NUC-LC195
1052	2P	BG1NUC-LC298	5128	2P	BG9NUC-LC16	9203	RBD	BG14NUC-LC196
1053	2P	BG1NUC-LC299	5129	2P	BG9NUC-LC17	9204	2P	BG14NUC-LC197
1054	RBD	BG1NUC-LC300	5130	2P	BG9NUC-LC18	9205	2P	BG14NUC-LC198
1055	RBD	BG1NUC-LC301	5131	2P	BG9NUC-LC19	9206	2P	BG14NUC-LC199
1056	RBD	BG1NUC-LC302	5132	2P	BG9NUC-LC20	9207	2P	BG14NUC-LC200
1057	RBD	BG1NUC-LC303	5133	2P	BG9NUC-LC21	9208	RBD	BG14NUC-LC201
1058	RBD	BG1NUC-LC304	5134	2P	BG9NUC-LC22	9209	RBD	BG14NUC-LC202
1059	2P	BG1NUC-LC305	5135	RBD	BG9NUC-LC23	9210	2P	BG14NUC-LC203
1060	RBD	BG1NUC-LC306	5136	2P	BG9NUC-LC24	9211	2P	BG14NUC-LC204
1061	RBD	BG1NUC-LC307	5137	RBD	BG9NUC-LC25	9212	2P	BG14NUC-LC205
1062	2P	BG1NUC-LC308	5138	RBD	BG9NUC-LC26	9213	2P	BG14NUC-LC206
1063	RBD	BG2NUC-HC1	5139	RBD	BG9NUC-LC27	9214	2P	BG14NUC-LC207
1064	RBD	BG2NUC-HC2	5140	RBD	BG9NUC-LC28	9215	2P	BG14NUC-LC208
1065	2P	BG2NUC-HC3	5141	2P	BG9NUC-LC29	9216	2P	BG14NUC-LC209
1066	RBD	BG2NUC-HC4	5142	2P	BG9NUC-LC30	9217	2P	BG14NUC-LC210
1067	RBD	BG2NUC-HC5	5143	RBD	BG9NUC-LC31	9218	2P	BG14NUC-LC211
1068	RBD	BG2NUC-HC6	5144	2P	BG9NUC-LC32	9219	RBD	BG14NUC-LC212
1069	RBD	BG2NUC-HC7	5145	RBD	BG9NUC-LC33	9220	2P	BG14NUC-LC213
1070	RBD	BG2NUC-HC8	5146	RBD	BG9NUC-LC34	9221	2P	BG14NUC-LC214
1071	2P	BG2NUC-HC9	5147	RBD	BG9NUC-LC35	9222	RBD	BG14NUC-LC215
1072	RBD	BG2NUC-HC10	5148	RBD	BG9NUC-LC36	9223	RBD	BG14NUC-LC216
1073	2P	BG2NUC-HC11	5149	2P	BG9NUC-LC37	9224	2P	BG14NUC-LC217

1074	RBD	BG2NUC-HC12	5150	2P	BG9NUC-LC38	9225	2P	BG14NUC-LC218
1075	RBD	BG2NUC-HC13	5151	2P	BG9NUC-LC39	9226	2P	BG14NUC-LC219
1076	RBD	BG2NUC-HC14	5152	RBD	BG9NUC-LC40	9227	RBD	BG14NUC-LC220
1077	RBD	BG2NUC-HC15	5153	2P	BG9NUC-LC41	9228	2P	BG14NUC-LC221
1078	RBD	BG2NUC-HC16	5154	2P	BG9NUC-LC42	9229	2P	BG14NUC-LC222
1079	RBD	BG2NUC-HC17	5155	RBD	BG9NUC-LC43	9230	2P	BG14NUC-LC223
1080	RBD	BG2NUC-HC18	5156	2P	BG9NUC-LC44	9231	RBD	BG14NUC-LC224
1081	RBD	BG2NUC-HC19	5157	2P	BG9NUC-LC45	9232	2P	BG14NUC-LC225
1082	RBD	BG2NUC-HC20	5158	RBD	BG9NUC-LC46	9233	RBD	BG14NUC-LC226
1083	RBD	BG2NUC-HC21	5159	2P	BG9NUC-LC47	9234	2P	BG14NUC-LC227
1084	2P	BG2NUC-HC22	5160	2P	BG9NUC-LC48	9235	2P	BG14NUC-LC228
1085	RBD	BG2NUC-HC23	5161	RBD	BG9NUC-LC49	9236	RBD	BG14NUC-LC229
1086	RBD	BG2NUC-HC24	5162	2P	BG9NUC-LC50	9237	RBD	BG14NUC-LC230
1087	RBD	BG2NUC-HC25	5163	2P	BG9NUC-LC51	9238	2P	BG14NUC-LC231
1088	RBD	BG2NUC-HC26	5164	RBD	BG9NUC-LC52	9239	RBD	BG14NUC-LC232
1089	RBD	BG2NUC-HC27	5165	2P	BG9NUC-LC53	9240	2P	BG14NUC-LC233
1090	RBD	BG2NUC-HC28	5166	RBD	BG9NUC-LC54	9241	2P	BG14NUC-LC234
1091	RBD	BG2NUC-HC29	5167	RBD	BG9NUC-LC55	9242	2P	BG14NUC-LC235
1092	2P	BG2NUC-HC30	5168	2P	BG9NUC-LC56	9243	2P	BG14NUC-LC236
1093	RBD	BG2NUC-HC31	5169	2P	BG9NUC-LC57	9244	2P	BG14NUC-LC237
1094	RBD	BG2NUC-HC32	5170	RBD	BG9NUC-LC58	9245	2P	BG14NUC-LC238
1095	RBD	BG2NUC-HC33	5171	RBD	BG9NUC-LC59	9246	2P	BG14NUC-LC239
1096	RBD	BG2NUC-HC34	5172	RBD	BG9NUC-LC60	9247	2P	BG14NUC-LC240
1097	2P	BG2NUC-HC35	5173	2P	BG9NUC-LC61	9248	2P	BG14NUC-LC241
1098	RBD	BG2NUC-HC36	5174	2P	BG9NUC-LC62	9249	2P	BG14NUC-LC242
1099	2P	BG2NUC-HC37	5175	RBD	BG9NUC-LC63	9250	2P	BG14NUC-LC243
1100	RBD	BG2NUC-HC38	5176	2P	BG9NUC-LC64	9251	2P	BG14NUC-LC244
1101	RBD	BG2NUC-HC39	5177	2P	BG9NUC-LC65	9252	2P	BG14NUC-LC245
1102	RBD	BG2NUC-HC40	5178	2P	BG9NUC-LC66	9253	2P	BG14NUC-LC246
1103	RBD	BG2NUC-HC41	5179	2P	BG9NUC-LC67	9254	2P	BG14NUC-LC247
1104	RBD	BG2NUC-HC42	5180	2P	BG9NUC-LC68	9255	2P	BG14NUC-LC248
1105	RBD	BG2NUC-HC43	5181	RBD	BG9NUC-LC69	9256	2P	BG14NUC-LC249
1106	RBD	BG2NUC-HC44	5182	2P	BG9NUC-LC70	9257	RBD	BG14NUC-LC250
1107	RBD	BG2NUC-HC45	5183	2P	BG9NUC-LC71	9258	2P	BG14NUC-LC251
1108	RBD	BG2NUC-HC46	5184	RBD	BG9NUC-LC72	9259	RBD	BG14NUC-LC252
1109	2P	BG2NUC-HC47	5185	2P	BG9NUC-LC73	9260	RBD	BG14NUC-LC253
1110	2P	BG2NUC-HC48	5186	2P	BG9NUC-LC74	9261	RBD	BG14NUC-LC254
1111	RBD	BG2NUC-HC49	5187	2P	BG9NUC-LC75	9262	RBD	BG14NUC-LC255
1112	RBD	BG2NUC-HC50	5188	RBD	BG9NUC-LC76	9263	2P	BG14NUC-LC256
1113	2P	BG2NUC-HC51	5189	RBD	BG9NUC-LC77	9264	RBD	BG14NUC-LC257
1114	RBD	BG2NUC-HC52	5190	RBD	BG9NUC-LC78	9265	2P	BG14NUC-LC258
1115	RBD	BG2NUC-HC53	5191	2P	BG9NUC-LC79	9266	2P	BG14NUC-LC259
1116	2P	BG2NUC-HC54	5192	2P	BG9NUC-LC80	9267	RBD	BG14NUC-LC260
1117	RBD	BG2NUC-HC55	5193	2P	BG9NUC-LC81	9268	RBD	BG14NUC-LC261
1118	RBD	BG2NUC-HC56	5194	2P	BG9NUC-LC82	9269	RBD	BG14NUC-LC262
1119	2P	BG2NUC-HC57	5195	RBD	BG9NUC-LC83	9270	2P	BG14NUC-LC263
1120	RBD	BG2NUC-HC58	5196	RBD	BG9NUC-LC84	9271	2P	BG14NUC-LC264
1121	2P	BG2NUC-HC59	5197	RBD	BG9NUC-LC85	9272	2P	BG14NUC-LC265
1122	RBD	BG2NUC-HC60	5198	RBD	BG9NUC-LC86	9273	2P	BG14NUC-LC266
1123	RBD	BG2NUC-HC61	5199	2P	BG9NUC-LC87	9274	RBD	BG14NUC-LC267
1124	2P	BG2NUC-HC62	5200	2P	BG9NUC-LC88	9275	2P	BG14NUC-LC268
1125	2P	BG2NUC-HC63	5201	2P	BG9NUC-LC89	9276	RBD	BG14NUC-LC269
1126	2P	BG2NUC-HC64	5202	2P	BG9NUC-LC90	9277	RBD	BG14NUC-LC270
1127	2P	BG2NUC-HC65	5203	2P	BG9NUC-LC91	9278	2P	BG14NUC-LC271
1128	2P	BG2NUC-HC66	5204	RBD	BG9NUC-LC92	9279	RBD	BG14NUC-LC272
1129	2P	BG2NUC-HC67	5205	2P	BG9NUC-LC93	9280	RBD	BG14NUC-LC273
1130	2P	BG2NUC-HC68	5206	2P	BG9NUC-LC94	9281	RBD	BG14NUC-LC274
1131	2P	BG2NUC-HC69	5207	RBD	BG9NUC-LC95	9282	RBD	BG14NUC-LC275
1132	2P	BG2NUC-HC70	5208	2P	BG9NUC-LC96	9283	RBD	BG14NUC-LC276
1133	RBD	BG2NUC-HC71	5209	2P	BG9NUC-LC97	9284	2P	BG14NUC-LC277
1134	RBD	BG2NUC-HC72	5210	2P	BG9NUC-LC98	9285	RBD	BG14NUC-LC278
1135	RBD	BG2NUC-HC73	5211	2P	BG9NUC-LC99	9286	2P	BG14NUC-LC279
1136	2P	BG2NUC-HC74	5212	RBD	BG9NUC-LC100	9287	2P	BG14NUC-LC280
1137	RBD	BG2NUC-HC75	5213	RBD	BG9NUC-LC101	9288	RBD	BG14NUC-LC281
1138	RBD	BG2NUC-HC76	5214	RBD	BG9NUC-LC102	9289	RBD	BG14NUC-LC282
1139	2P	BG2NUC-HC77	5215	2P	BG9NUC-LC103	9290	2P	BG14NUC-LC283
1140	2P	BG2NUC-HC78	5216	RBD	BG9NUC-LC104	9291	RBD	BG14NUC-LC284
1141	RBD	BG2NUC-HC79	5217	2P	BG9NUC-LC105	9292	RBD	BG14NUC-LC285
1142	2P	BG2NUC-HC80	5218	2P	BG9NUC-LC106	9293	2P	BG14NUC-LC286
1143	RBD	BG2NUC-HC81	5219	RBD	BG9NUC-LC107	9294	RBD	BG14NUC-LC287
1144	2P	BG2NUC-HC82	5220	RBD	BG9NUC-LC108	9295	RBD	BG14NUC-LC288
1145	2P	BG2NUC-HC83	5221	RBD	BG9NUC-LC109	9296	2P	BG14NUC-LC289
1146	RBD	BG2NUC-HC84	5222	2P	BG9NUC-LC110	9297	RBD	BG14NUC-LC290
1147	RBD	BG2NUC-HC85	5223	2P	BG9NUC-LC111	9298	2P	BG14NUC-LC291
1148	2P	BG2NUC-HC86	5224	2P	BG9NUC-LC112	9299	2P	BG14NUC-LC292
1149	RBD	BG2NUC-HC87	5225	RBD	BG9NUC-LC113	9300	2P	BG14NUC-LC293
1150	2P	BG2NUC-HC88	5226	2P	BG9NUC-LC114	9301	2P	BG14NUC-LC294
1151	RBD	BG2NUC-HC89	5227	2P	BG9NUC-LC115	9302	2P	BG14NUC-LC295
1152	RBD	BG2NUC-HC90	5228	RBD	BG9NUC-LC116	9303	2P	BG14NUC-LC296

1153	2P	BG2NUC-HC91	5229	RBD	BG9NUC-LC117	9304	2P	BG14NUC-LC297
1154	2P	BG2NUC-HC92	5230	RBD	BG9NUC-LC118	9305	2P	BG14NUC-LC298
1155	2P	BG2NUC-HC93	5231	2P	BG9NUC-LC119	9306	RBD	BG14NUC-LC299
1156	2P	BG2NUC-HC94	5232	2P	BG9NUC-LC120	9307	RBD	BG14NUC-LC300
1157	2P	BG2NUC-HC95	5233	RBD	BG9NUC-LC121	9308	RBD	BG14NUC-LC301
1158	2P	BG2NUC-HC96	5234	RBD	BG9NUC-LC122	9309	2P	BG14NUC-LC302
1159	RBD	BG2NUC-HC97	5235	2P	BG9NUC-LC123	9310	RBD	BG14NUC-LC303
1160	2P	BG2NUC-HC98	5236	2P	BG9NUC-LC124	9311	2P	BG14NUC-LC304
1161	2P	BG2NUC-HC99	5237	2P	BG9NUC-LC125	9312	RBD	BG14NUC-LC305
1162	RBD	BG2NUC-HC100	5238	2P	BG9NUC-LC126	9313	RBD	BG14NUC-LC306
1163	RBD	BG2NUC-HC101	5239	RBD	BG9NUC-LC127	9314	2P	BG14NUC-LC307
1164	RBD	BG2NUC-HC102	5240	2P	BG9NUC-LC128	9315	2P	BG14NUC-LC308
1165	RBD	BG2NUC-HC103	5241	RBD	BG9NUC-LC129	9316	2P	BG14NUC-LC309
1166	RBD	BG2NUC-HC104	5242	RBD	BG9NUC-LC130	9317	2P	BG14NUC-LC310
1167	2P	BG2NUC-HC105	5243	RBD	BG9NUC-LC131	9318	2P	BG14NUC-LC311
1168	RBD	BG2NUC-HC106	5244	RBD	BG9NUC-LC132	9319	2P	BG14NUC-LC312
1169	RBD	BG2NUC-HC107	5245	2P	BG9NUC-LC133	9320	RBD	BG14NUC-LC313
1170	RBD	BG2NUC-HC108	5246	RBD	BG9NUC-LC134	9321	2P	BG14NUC-LC314
1171	2P	BG2NUC-HC109	5247	2P	BG9NUC-LC135	9322	2P	BG14NUC-LC315
1172	RBD	BG2NUC-HC110	5248	RBD	BG9NUC-LC136	9323	2P	BG14NUC-LC316
1173	RBD	BG2NUC-HC111	5249	2P	BG9NUC-LC137	9324	RBD	BG14NUC-LC317
1174	RBD	BG2NUC-HC112	5250	RBD	BG9NUC-LC138	9325	RBD	BG14NUC-LC318
1175	2P	BG2NUC-HC113	5251	2P	BG9NUC-LC139	9326	RBD	BG14NUC-LC319
1176	2P	BG2NUC-HC114	5252	2P	BG9NUC-LC140	9327	RBD	BG14NUC-LC320
1177	RBD	BG2NUC-HC115	5253	2P	BG9NUC-LC141	9328	2P	BG14NUC-LC321
1178	RBD	BG2NUC-HC116	5254	2P	BG9NUC-LC142	9329	RBD	BG14NUC-LC322
1179	2P	BG2NUC-HC117	5255	2P	BG9NUC-LC143	9330	RBD	BG14NUC-LC323
1180	2P	BG2NUC-HC118	5256	2P	BG9NUC-LC144	9331	RBD	BG14NUC-LC324
1181	2P	BG2NUC-HC119	5257	2P	BG9NUC-LC145	9332	2P	BG14NUC-LC325
1182	2P	BG2NUC-HC120	5258	2P	BG9NUC-LC146	9333	2P	BG14NUC-LC326
1183	RBD	BG2NUC-HC121	5259	RBD	BG9NUC-LC147	9334	2P	BG14NUC-LC327
1184	RBD	BG2NUC-HC122	5260	RBD	BG9NUC-LC148	9335	RBD	BG14NUC-LC328
1185	2P	BG2NUC-HC123	5261	RBD	BG9NUC-LC149	9336	RBD	BG14NUC-LC329
1186	2P	BG2NUC-HC124	5262	RBD	BG9NUC-LC150	9337	RBD	BG14NUC-LC330
1187	RBD	BG2NUC-HC125	5263	2P	BG9NUC-LC151	9338	2P	BG14NUC-LC331
1188	RBD	BG2NUC-HC126	5264	2P	BG9NUC-LC152	9339	RBD	BG14NUC-LC332
1189	2P	BG2NUC-HC127	5265	RBD	BG9NUC-LC153	9340	RBD	BG14NUC-LC333
1190	2P	BG2NUC-HC128	5266	2P	BG9NUC-LC154	9341	RBD	BG14NUC-LC334
1191	2P	BG2NUC-HC129	5267	2P	BG9NUC-LC155	9342	2P	BG14NUC-LC335
1192	2P	BG2NUC-HC130	5268	2P	BG9NUC-LC156	9343	2P	BG14NUC-LC336
1193	2P	BG2NUC-HC131	5269	2P	BG9NUC-LC157	9344	2P	BG14NUC-LC337
1194	2P	BG2NUC-HC132	5270	RBD	BG9NUC-LC158	9345	2P	BG14NUC-LC338
1195	2P	BG2NUC-HC133	5271	2P	BG9NUC-LC159	9346	RBD	BG14NUC-LC339
1196	2P	BG2NUC-HC134	5272	2P	BG9NUC-LC160	9347	2P	BG14NUC-LC340
1197	RBD	BG2NUC-HC135	5273	2P	BG9NUC-LC161	9348	RBD	BG14NUC-LC341
1198	RBD	BG2NUC-HC136	5274	RBD	BG9NUC-LC162	9349	RBD	BG14NUC-LC342
1199	RBD	BG2NUC-HC137	5275	2P	BG9NUC-LC163	9350	2P	BG14NUC-LC343
1200	2P	BG2NUC-HC138	5276	2P	BG9NUC-LC164	9351	2P	BG14NUC-LC344
1201	2P	BG2NUC-HC139	5277	RBD	BG9NUC-LC165	9352	RBD	BG14NUC-LC345
1202	2P	BG2NUC-HC140	5278	2P	BG9NUC-LC166	9353	RBD	BG14NUC-LC346
1203	2P	BG2NUC-HC141	5279	RBD	BG9NUC-LC167	9354	RBD	BG14NUC-LC347
1204	2P	BG2NUC-HC142	5280	RBD	BG9NUC-LC168	9355	RBD	BG14NUC-LC348
1205	2P	BG2NUC-HC143	5281	RBD	BG9NUC-LC169	9356	2P	BG14NUC-LC349
1206	2P	BG2NUC-HC144	5282	RBD	BG9NUC-LC170	9357	2P	BG14NUC-LC350
1207	RBD	BG2NUC-HC145	5283	RBD	BG9NUC-LC171	9358	2P	BG14NUC-LC351
1208	RBD	BG2NUC-HC146	5284	2P	BG9NUC-LC172	9359	RBD	BG14NUC-LC352
1209	2P	BG2NUC-HC147	5285	RBD	BG9NUC-LC173	9360	RBD	BG14NUC-LC353
1210	RBD	BG2NUC-HC148	5286	2P	BG9NUC-LC174	9361	RBD	BG14NUC-LC354
1211	2P	BG2NUC-HC149	5287	RBD	BG9NUC-LC175	9362	2P	BG14NUC-LC355
1212	2P	BG2NUC-HC150	5288	RBD	BG9NUC-LC176	9363	2P	BG14NUC-LC356
1213	2P	BG2NUC-HC151	5289	2P	BG9NUC-LC177	9364	2P	BG14NUC-LC357
1214	2P	BG2NUC-HC152	5290	RBD	BG9NUC-LC178	9365	2P	BG14NUC-LC358
1215	2P	BG2NUC-HC153	5291	2P	BG9NUC-LC179	9366	2P	BG14NUC-LC359
1216	2P	BG2NUC-HC154	5292	2P	BG9NUC-LC180	9367	2P	BG14NUC-LC360
1217	2P	BG2NUC-HC155	5293	2P	BG9NUC-LC181	9368	2P	BG14NUC-LC361
1218	2P	BG2NUC-HC156	5294	RBD	BG9NUC-LC182	9369	2P	BG14NUC-LC362
1219	RBD	BG2NUC-HC157	5295	2P	BG9NUC-LC183	9370	RBD	BG14NUC-LC363
1220	2P	BG2NUC-HC158	5296	RBD	BG9NUC-LC184	9371	RBD	BG14NUC-LC364
1221	2P	BG2NUC-HC159	5297	2P	BG9NUC-LC185	9372	2P	BG14NUC-LC365
1222	RBD	BG2NUC-HC160	5298	RBD	BG9NUC-LC186	9373	2P	BG14NUC-LC366
1223	2P	BG2NUC-HC161	5299	2P	BG9NUC-LC187	9374	2P	BG14NUC-LC367
1224	2P	BG2NUC-HC162	5300	2P	BG9NUC-LC188	9375	2P	BG14NUC-LC368
1225	RBD	BG2NUC-HC163	5301	2P	BG9NUC-LC189	9376	2P	BG14NUC-LC369
1226	2P	BG2NUC-HC164	5302	2P	BG9NUC-LC190	9377	RBD	BG14NUC-LC370
1227	RBD	BG2NUC-HC165	5303	2P	BG9NUC-LC191	9378	2P	BG14NUC-LC371
1228	RBD	BG2NUC-HC166	5304	RBD	BG9NUC-LC192	9379	2P	BG14NUC-LC372
1229	2P	BG2NUC-HC167	5305	2P	BG9NUC-LC193	9380	RBD	BG14NUC-LC373
1230	2P	BG2NUC-HC168	5306	2P	BG9NUC-LC194	9381	2P	BG14NUC-LC374
1231	2P	BG2NUC-HC169	5307	RBD	BG9NUC-LC195	9382	2P	BG14NUC-LC375

1232	2P	BG2NUC-HC170	5308	RBD	BG9NUC-LC196	9383	RBD	BG14NUC-LC376
1233	RBD	BG2NUC-HC171	5309	2P	BG9NUC-LC197	9384	RBD	BG14NUC-LC377
1234	2P	BG2NUC-HC172	5310	RBD	BG9NUC-LC198	9385	RBD	BG14NUC-LC378
1235	2P	BG2NUC-HC173	5311	2P	BG9NUC-LC199	9386	2P	BG14NUC-LC379
1236	2P	BG2NUC-HC174	5312	2P	BG9NUC-LC200	9387	RBD	BG14NUC-LC380
1237	RBD	BG2NUC-HC175	5313	RBD	BG9NUC-LC201	9388	2P	BG14NUC-LC381
1238	2P	BG2NUC-HC176	5314	2P	BG9NUC-LC202	9389	RBD	BG14NUC-LC382
1239	RBD	BG2NUC-HC177	5315	2P	BG9NUC-LC203	9390	RBD	BG14NUC-LC383
1240	RBD	BG2NUC-HC178	5316	2P	BG9NUC-LC204	9391	RBD	BG14NUC-LC384
1241	RBD	BG2NUC-HC179	5317	2P	BG9NUC-LC205	9392	RBD	BG14NUC-LC385
1242	2P	BG2NUC-HC180	5318	RBD	BG9NUC-LC206	9393	RBD	BG14NUC-LC386
1243	RBD	BG2NUC-HC181	5319	RBD	BG9NUC-LC207	9394	2P	BG14NUC-LC387
1244	RBD	BG2NUC-HC182	5320	2P	BG9NUC-LC208	9395	2P	BG14NUC-LC388
1245	2P	BG2NUC-HC183	5321	RBD	BG9NUC-LC209	9396	2P	BG14NUC-LC389
1246	2P	BG2NUC-HC184	5322	RBD	BG9NUC-LC210	9397	2P	BG14NUC-LC390
1247	RBD	BG2NUC-HC185	5323	2P	BG9NUC-LC211	9398	RBD	BG14NUC-LC391
1248	2P	BG2NUC-HC186	5324	RBD	BG9NUC-LC212	9399	2P	BG14NUC-LC392
1249	RBD	BG2NUC-HC187	5325	RBD	BG9NUC-LC213	9400	2P	BG14NUC-LC393
1250	2P	BG2NUC-HC188	5326	2P	BG9NUC-LC214	9401	2P	BG14NUC-LC394
1251	2P	BG2NUC-HC189	5327	2P	BG9NUC-LC215	9402	2P	BG14NUC-LC395
1252	2P	BG2NUC-HC190	5328	RBD	BG9NUC-LC216	9403	2P	BG14NUC-LC396
1253	2P	BG2NUC-HC191	5329	2P	BG9NUC-LC217	9404	2P	BG14NUC-LC397
1254	RBD	BG2NUC-HC192	5330	2P	BG9NUC-LC218	9405	2P	BG14NUC-LC398
1255	2P	BG2NUC-HC193	5331	RBD	BG9NUC-LC219	9406	2P	BG14NUC-LC399
1256	RBD	BG2NUC-HC194	5332	RBD	BG9NUC-LC220	9407	RBD	BG14NUC-LC400
1257	2P	BG2NUC-HC195	5333	2P	BG9NUC-LC221	9408	2P	BG14NUC-LC401
1258	2P	BG2NUC-HC196	5334	RBD	BG9NUC-LC222	9409	2P	BG14NUC-LC402
1259	RBD	BG2NUC-HC197	5335	2P	BG9NUC-LC223	9410	2P	BG14NUC-LC403
1260	RBD	BG2NUC-HC198	5336	2P	BG9NUC-LC224	9411	2P	BG14NUC-LC404
1261	2P	BG2NUC-HC199	5337	RBD	BG9NUC-LC225	9412	2P	BG14NUC-LC405
1262	2P	BG2NUC-HC200	5338	2P	BG9NUC-LC226	9413	RBD	BG14NUC-LC406
1263	RBD	BG2NUC-HC201	5339	RBD	BG9NUC-LC227	9414	2P	BG14NUC-LC407
1264	2P	BG2NUC-HC202	5340	RBD	BG9NUC-LC228	9415	2P	BG14NUC-LC408
1265	RBD	BG2NUC-HC203	5341	2P	BG9NUC-LC229	9416	RBD	BG14NUC-LC409
1266	2P	BG2NUC-HC204	5342	2P	BG9NUC-LC230	9417	RBD	BG14NUC-LC410
1267	RBD	BG2NUC-HC205	5343	2P	BG9NUC-LC231	9418	2P	BG14NUC-LC411
1268	2P	BG2NUC-HC206	5344	RBD	BG9NUC-LC232	9419	2P	BG14NUC-LC412
1269	RBD	BG2NUC-HC207	5345	RBD	BG9NUC-LC233	9420	2P	BG14NUC-LC413
1270	2P	BG2NUC-HC208	5346	RBD	BG9NUC-LC234	9421	2P	BG14NUC-LC414
1271	2P	BG2NUC-HC209	5347	RBD	BG10NUC-HC1	9422	2P	BG14NUC-LC415
1272	2P	BG2NUC-HC210	5348	RBD	BG10NUC-HC2	9423	RBD	BG14NUC-LC416
1273	RBD	BG2NUC-HC211	5349	RBD	BG10NUC-HC3	9424	2P	BG14NUC-LC417
1274	2P	BG2NUC-HC212	5350	RBD	BG10NUC-HC4	9425	2P	BG14NUC-LC418
1275	RBD	BG2NUC-HC213	5351	RBD	BG10NUC-HC5	9426	RBD	BG14NUC-LC419
1276	2P	BG2NUC-HC214	5352	RBD	BG10NUC-HC6	9427	RBD	BG14NUC-LC420
1277	RBD	BG2NUC-HC215	5353	RBD	BG10NUC-HC7	9428	2P	BG14NUC-LC421
1278	2P	BG2NUC-HC216	5354	RBD	BG10NUC-HC8	9429	2P	BG14NUC-LC422
1279	RBD	BG2NUC-HC217	5355	RBD	BG10NUC-HC9	9430	2P	BG14NUC-LC423
1280	RBD	BG2NUC-HC218	5356	RBD	BG10NUC-HC10	9431	RBD	BG14NUC-LC424
1281	RBD	BG2NUC-HC219	5357	RBD	BG10NUC-HC11	9432	2P	BG14NUC-LC425
1282	2P	BG2NUC-HC220	5358	RBD	BG10NUC-HC12	9433	2P	BG14NUC-LC426
1283	RBD	BG2NUC-HC221	5359	RBD	BG10NUC-HC13	9434	RBD	BG14NUC-LC427
1284	RBD	BG2NUC-HC222	5360	RBD	BG10NUC-HC14	9435	RBD	BG14NUC-LC428
1285	RBD	BG2NUC-HC223	5361	RBD	BG10NUC-HC15	9436	2P	BG14NUC-LC429
1286	2P	BG2NUC-HC224	5362	RBD	BG10NUC-HC16	9437	RBD	BG14NUC-LC430
1287	RBD	BG2NUC-HC225	5363	RBD	BG10NUC-HC17	9438	2P	BG14NUC-LC431
1288	2P	BG2NUC-HC226	5364	RBD	BG10NUC-HC18	9439	RBD	BG14NUC-LC432
1289	2P	BG2NUC-HC227	5365	RBD	BG10NUC-HC19	9440	2P	BG14NUC-LC433
1290	2P	BG2NUC-HC228	5366	RBD	BG10NUC-HC20	9441	RBD	BG14NUC-LC434
1291	RBD	BG2NUC-HC229	5367	RBD	BG10NUC-HC21	9442	RBD	BG14NUC-LC435
1292	2P	BG2NUC-HC230	5368	RBD	BG10NUC-HC22	9443	2P	BG14NUC-LC436
1293	RBD	BG2NUC-HC231	5369	RBD	BG10NUC-HC23	9444	RBD	BG14NUC-LC437
1294	2P	BG2NUC-HC232	5370	RBD	BG10NUC-HC24	9445	RBD	BG14NUC-LC438
1295	2P	BG2NUC-HC233	5371	RBD	BG10NUC-HC25	9446	RBD	BG14NUC-LC439
1296	2P	BG2NUC-HC234	5372	RBD	BG10NUC-HC26	9447	RBD	BG14NUC-LC440
1297	RBD	BG2NUC-HC235	5373	RBD	BG10NUC-HC27	9448	2P	BG14NUC-LC441
1298	RBD	BG2NUC-HC236	5374	2P	BG10NUC-HC28	9449	2P	BG14NUC-LC442
1299	2P	BG2NUC-HC237	5375	2P	BG10NUC-HC29	9450	RBD	BG14NUC-LC443
1300	RBD	BG2NUC-HC238	5376	2P	BG10NUC-HC30	9451	RBD	BG14NUC-LC444
1301	2P	BG2NUC-HC239	5377	2P	BG10NUC-HC31	9452	2P	BG14NUC-LC445
1302	2P	BG2NUC-HC240	5378	2P	BG10NUC-HC32	9453	RBD	BG14NUC-LC446
1303	2P	BG2NUC-HC241	5379	2P	BG10NUC-HC33	9454	2P	BG14NUC-LC447
1304	RBD	BG2NUC-HC242	5380	2P	BG10NUC-HC34	9455	2P	BG14NUC-LC448
1305	2P	BG2NUC-HC243	5381	2P	BG10NUC-HC35	9456	2P	BG14NUC-LC449
1306	RBD	BG2NUC-HC244	5382	2P	BG10NUC-HC36	9457	RBD	BG14NUC-LC450
1307	RBD	BG2NUC-HC245	5383	RBD	BG10NUC-HC37	9458	RBD	BG14NUC-LC451
1308	2P	BG2NUC-HC246	5384	RBD	BG10NUC-HC38	9459	RBD	BG14NUC-LC452
1309	RBD	BG2NUC-HC247	5385	RBD	BG10NUC-HC39	9460	RBD	BG14NUC-LC453
1310	RBD	BG2NUC-HC248	5386	RBD	BG10NUC-HC40	9461	2P	BG14NUC-LC454

1311	2P	BG2NUC-HC249	5387	RBD	BG10NUC-HC41	9462	RBD	BG14NUC-LC455
1312	2P	BG2NUC-HC250	5388	RBD	BG10NUC-HC42	9463	RBD	BG14NUC-LC456
1313	2P	BG2NUC-HC251	5389	RBD	BG10NUC-HC43	9464	RBD	BG14NUC-LC457
1314	RBD	BG2NUC-HC252	5390	RBD	BG10NUC-HC44	9465	2P	BG14NUC-LC458
1315	2P	BG2NUC-HC253	5391	RBD	BG10NUC-HC45	9466	2P	BG14NUC-LC459
1316	RBD	BG2NUC-HC254	5392	RBD	BG10NUC-HC46	9467	RBD	BG14NUC-LC460
1317	2P	BG2NUC-HC255	5393	RBD	BG10NUC-HC47	9468	2P	BG14NUC-LC461
1318	RBD	BG2NUC-HC256	5394	RBD	BG10NUC-HC48	9469	RBD	BG14NUC-LC462
1319	2P	BG2NUC-HC257	5395	RBD	BG10NUC-HC49	9470	2P	BG14NUC-LC463
1320	2P	BG2NUC-HC258	5396	RBD	BG10NUC-HC50	9471	RBD	BG14NUC-LC464
1321	2P	BG2NUC-HC259	5397	RBD	BG10NUC-HC51	9472	RBD	BG14NUC-LC465
1322	2P	BG2NUC-HC260	5398	RBD	BG10NUC-HC52	9473	RBD	BG14NUC-LC466
1323	2P	BG2NUC-HC261	5399	RBD	BG10NUC-HC53	9474	RBD	BG14NUC-LC467
1324	RBD	BG2NUC-HC262	5400	RBD	BG10NUC-HC54	9475	2P	BG14NUC-LC468
1325	2P	BG2NUC-HC263	5401	2P	BG10NUC-HC55	9476	2P	BG14NUC-LC469
1326	RBD	BG2NUC-HC264	5402	RBD	BG10NUC-HC56	9477	RBD	BG14NUC-LC470
1327	2P	BG2NUC-HC265	5403	RBD	BG10NUC-HC57	9478	2P	BG14NUC-LC471
1328	2P	BG2NUC-HC266	5404	2P	BG10NUC-HC58	9479	2P	BG14NUC-LC472
1329	2P	BG2NUC-HC267	5405	RBD	BG10NUC-HC59	9480	RBD	BG14NUC-LC473
1330	2P	BG2NUC-HC268	5406	RBD	BG10NUC-HC60	9481	2P	BG14NUC-LC474
1331	RBD	BG2NUC-HC269	5407	RBD	BG10NUC-HC61	9482	RBD	BG14NUC-LC475
1332	2P	BG2NUC-HC270	5408	RBD	BG10NUC-HC62	9483	RBD	BG14NUC-LC476
1333	2P	BG2NUC-HC271	5409	RBD	BG10NUC-HC63	9484	2P	BG14NUC-LC477
1334	2P	BG2NUC-HC272	5410	RBD	BG10NUC-HC64	9485	2P	BG14NUC-LC478
1335	2P	BG2NUC-HC273	5411	RBD	BG10NUC-HC65	9486	RBD	BG14NUC-LC479
1336	2P	BG2NUC-HC274	5412	RBD	BG10NUC-HC66	9487	RBD	BG14NUC-LC480
1337	2P	BG2NUC-HC275	5413	2P	BG10NUC-HC67	9488	RBD	BG14NUC-LC481
1338	2P	BG2NUC-HC276	5414	2P	BG10NUC-HC68	9489	2P	BG14NUC-LC482
1339	2P	BG2NUC-HC277	5415	2P	BG10NUC-HC69	9490	2P	BG14NUC-LC483
1340	2P	BG2NUC-HC278	5416	RBD	BG10NUC-HC70	9491	2P	BG14NUC-LC484
1341	2P	BG2NUC-HC279	5417	RBD	BG10NUC-HC71	9492	2P	BG14NUC-LC485
1342	RBD	BG2NUC-HC280	5418	RBD	BG10NUC-HC72	9493	2P	BG14NUC-LC486
1343	RBD	BG2NUC-HC281	5419	RBD	BG10NUC-HC73	9494	2P	BG14NUC-LC487
1344	RBD	BG2NUC-HC282	5420	2P	BG10NUC-HC74	9495	2P	BG14NUC-LC488
1345	2P	BG2NUC-HC283	5421	2P	BG10NUC-HC75	9496	RBD	BG14NUC-LC489
1346	2P	BG2NUC-HC284	5422	2P	BG10NUC-HC76	9497	2P	BG14NUC-LC490
1347	2P	BG2NUC-HC285	5423	2P	BG10NUC-HC77	9498	RBD	BG14NUC-LC491
1348	2P	BG2NUC-HC286	5424	RBD	BG10NUC-HC78	9499	RBD	BG14NUC-LC492
1349	RBD	BG2NUC-HC287	5425	RBD	BG10NUC-HC79	9500	2P	BG14NUC-LC493
1350	2P	BG2NUC-HC288	5426	RBD	BG10NUC-HC80	9501	2P	BG14NUC-LC494
1351	2P	BG2NUC-HC289	5427	RBD	BG10NUC-HC81	9502	2P	BG14NUC-LC495
1352	RBD	BG2NUC-HC290	5428	2P	BG10NUC-HC82	9503	RBD	BG14NUC-LC496
1353	2P	BG2NUC-HC291	5429	RBD	BG10NUC-HC83	9504	RBD	BG14NUC-LC497
1354	2P	BG2NUC-HC292	5430	RBD	BG10NUC-HC84	9505	2P	BG14NUC-LC498
1355	2P	BG2NUC-HC293	5431	RBD	BG10NUC-HC85	9506	RBD	BG14NUC-LC499
1356	2P	BG2NUC-HC294	5432	RBD	BG10NUC-HC86	9507	RBD	BG14NUC-LC500
1357	RBD	BG2NUC-HC295	5433	RBD	BG10NUC-HC87	9508	RBD	BG14NUC-LC501
1358	2P	BG2NUC-HC296	5434	2P	BG10NUC-HC88	9509	RBD	BG14NUC-LC502
1359	2P	BG2NUC-HC297	5435	2P	BG10NUC-HC89	9510	RBD	BG14NUC-LC503
1360	RBD	BG2NUC-HC298	5436	RBD	BG10NUC-HC90	9511	RBD	BG14NUC-LC504
1361	2P	BG2NUC-HC299	5437	RBD	BG10NUC-HC91	9512	2P	BG14NUC-LC505
1362	2P	BG2NUC-HC300	5438	2P	BG10NUC-HC92	9513	2P	BG14NUC-LC506
1363	2P	BG2NUC-HC301	5439	RBD	BG10NUC-HC93	9514	2P	BG14NUC-LC507
1364	2P	BG2NUC-HC302	5440	RBD	BG10NUC-HC94	9515	RBD	BG14NUC-LC508
1365	2P	BG2NUC-HC303	5441	2P	BG10NUC-HC95	9516	RBD	BG14NUC-LC509
1366	2P	BG2NUC-HC304	5442	2P	BG10NUC-HC96	9517	RBD	BG14NUC-LC510
1367	RBD	BG2NUC-HC305	5443	2P	BG10NUC-HC97	9518	RBD	BG14NUC-LC511
1368	2P	BG2NUC-HC306	5444	2P	BG10NUC-HC98	9519	2P	BG14NUC-LC512
1369	2P	BG2NUC-HC307	5445	2P	BG10NUC-HC99	9520	RBD	BG14NUC-LC513
1370	2P	BG2NUC-HC308	5446	RBD	BG10NUC-HC100	9521	2P	BG14NUC-LC514
1371	2P	BG2NUC-HC309	5447	RBD	BG10NUC-HC101	9522	2P	BG14NUC-LC515
1372	RBD	BG2NUC-HC310	5448	2P	BG10NUC-HC102	9523	RBD	BG14NUC-LC516
1373	RBD	BG2NUC-HC311	5449	2P	BG10NUC-HC103	9524	2P	BG14NUC-LC517
1374	RBD	BG2NUC-HC312	5450	RBD	BG10NUC-HC104	9525	RBD	BG14NUC-LC518
1375	RBD	BG2NUC-HC313	5451	2P	BG10NUC-HC105	9526	2P	BG14NUC-LC519
1376	RBD	BG2NUC-HC314	5452	2P	BG10NUC-HC106	9527	RBD	BG14NUC-LC520
1377	RBD	BG2NUC-HC315	5453	2P	BG10NUC-HC107	9528	RBD	BG14NUC-LC521
1378	2P	BG2NUC-HC316	5454	2P	BG10NUC-HC108	9529	RBD	BG14NUC-LC522
1379	RBD	BG2NUC-HC317	5455	2P	BG10NUC-HC109	9530	2P	BG14NUC-LC523
1380	2P	BG2NUC-HC318	5456	2P	BG10NUC-HC110	9531	RBD	BG14NUC-LC524
1381	2P	BG2NUC-HC319	5457	RBD	BG10NUC-HC111	9532	2P	BG14NUC-LC525
1382	2P	BG2NUC-HC320	5458	2P	BG10NUC-HC112	9533	2P	BG14NUC-LC526
1383	2P	BG2NUC-HC321	5459	2P	BG10NUC-HC113	9534	2P	BG14NUC-LC527
1384	RBD	BG2NUC-HC322	5460	2P	BG10NUC-HC114	9535	2P	BG14NUC-LC528
1385	RBD	BG2NUC-HC323	5461	RBD	BG10NUC-HC115	9536	2P	BG14NUC-LC529
1386	RBD	BG2NUC-HC324	5462	2P	BG10NUC-HC116	9537	2P	BG14NUC-LC530
1387	RBD	BG2NUC-HC325	5463	2P	BG10NUC-HC117	9538	RBD	BG14NUC-LC531
1388	RBD	BG2NUC-HC326	5464	2P	BG10NUC-HC118	9539	RBD	BG14NUC-LC532
1389	2P	BG2NUC-HC327	5465	2P	BG10NUC-HC119	9540	RBD	BG14NUC-LC533

1390	2P	BG2NUC-HC328	5466	2P	BG10NUC-HC120	9541	2P	BG14NUC-LC534
1391	2P	BG2NUC-HC329	5467	2P	BG10NUC-HC121	9542	2P	BG14NUC-LC535
1392	2P	BG2NUC-HC330	5468	2P	BG10NUC-HC122	9543	2P	BG18NUC-HC1
1393	2P	BG2NUC-HC331	5469	2P	BG10NUC-HC123	9544	2P	BG18NUC-HC2
1394	2P	BG2NUC-HC332	5470	2P	BG10NUC-HC124	9545	RBD	BG18NUC-HC3
1395	2P	BG2NUC-HC333	5471	2P	BG10NUC-HC125	9546	2P	BG18NUC-HC4
1396	RBD	BG2NUC-HC334	5472	2P	BG10NUC-HC126	9547	2P	BG18NUC-HC5
1397	2P	BG2NUC-HC335	5473	RBD	BG10NUC-HC127	9548	RBD	BG18NUC-HC6
1398	2P	BG2NUC-HC336	5474	RBD	BG10NUC-HC128	9549	2P	BG18NUC-HC7
1399	RBD	BG2NUC-HC337	5475	RBD	BG10NUC-HC129	9550	2P	BG18NUC-HC8
1400	2P	BG2NUC-HC338	5476	2P	BG10NUC-HC130	9551	RBD	BG18NUC-HC9
1401	2P	BG2NUC-HC339	5477	2P	BG10NUC-HC131	9552	2P	BG18NUC-HC10
1402	2P	BG2NUC-HC340	5478	2P	BG10NUC-HC132	9553	2P	BG18NUC-HC11
1403	2P	BG2NUC-HC341	5479	2P	BG10NUC-HC133	9554	2P	BG18NUC-HC12
1404	2P	BG2NUC-HC342	5480	2P	BG10NUC-HC134	9555	2P	BG18NUC-HC13
1405	2P	BG2NUC-HC343	5481	2P	BG10NUC-HC135	9556	2P	BG18NUC-HC14
1406	2P	BG2NUC-HC344	5482	2P	BG10NUC-HC136	9557	2P	BG18NUC-HC15
1407	RBD	BG2NUC-HC345	5483	2P	BG10NUC-HC137	9558	2P	BG18NUC-HC16
1408	2P	BG2NUC-HC346	5484	RBD	BG10NUC-HC138	9559	RBD	BG18NUC-HC17
1409	2P	BG2NUC-HC347	5485	2P	BG10NUC-HC139	9560	2P	BG18NUC-HC18
1410	2P	BG2NUC-HC348	5486	2P	BG10NUC-HC140	9561	2P	BG18NUC-HC19
1411	RBD	BG2NUC-HC349	5487	RBD	BG10NUC-HC141	9562	RBD	BG18NUC-HC20
1412	RBD	BG2NUC-HC350	5488	RBD	BG10NUC-HC142	9563	2P	BG18NUC-HC21
1413	2P	BG2NUC-HC351	5489	2P	BG10NUC-HC143	9564	RBD	BG18NUC-HC22
1414	RBD	BG2NUC-HC352	5490	2P	BG10NUC-HC144	9565	2P	BG18NUC-HC23
1415	RBD	BG2NUC-HC353	5491	2P	BG10NUC-HC145	9566	2P	BG18NUC-HC24
1416	2P	BG2NUC-HC354	5492	2P	BG10NUC-HC146	9567	2P	BG18NUC-HC25
1417	2P	BG2NUC-HC355	5493	2P	BG10NUC-HC147	9568	2P	BG18NUC-HC26
1418	2P	BG2NUC-HC356	5494	2P	BG10NUC-HC148	9569	2P	BG18NUC-HC27
1419	2P	BG2NUC-HC357	5495	2P	BG10NUC-HC149	9570	2P	BG18NUC-HC28
1420	2P	BG2NUC-HC358	5496	2P	BG10NUC-HC150	9571	2P	BG18NUC-HC29
1421	2P	BG2NUC-HC359	5497	RBD	BG10NUC-HC151	9572	2P	BG18NUC-HC30
1422	2P	BG2NUC-HC360	5498	RBD	BG10NUC-HC152	9573	RBD	BG18NUC-HC31
1423	2P	BG2NUC-HC361	5499	RBD	BG10NUC-HC153	9574	RBD	BG18NUC-HC32
1424	2P	BG2NUC-HC362	5500	RBD	BG10NUC-HC154	9575	RBD	BG18NUC-HC33
1425	2P	BG2NUC-HC363	5501	2P	BG10NUC-HC155	9576	2P	BG18NUC-HC34
1426	RBD	BG2NUC-HC364	5502	2P	BG10NUC-HC156	9577	2P	BG18NUC-HC35
1427	2P	BG2NUC-HC365	5503	2P	BG10NUC-HC157	9578	2P	BG18NUC-HC36
1428	2P	BG2NUC-HC366	5504	RBD	BG10NUC-HC158	9579	2P	BG18NUC-HC37
1429	2P	BG2NUC-HC367	5505	2P	BG10NUC-HC159	9580	2P	BG18NUC-HC38
1430	RBD	BG2NUC-HC368	5506	RBD	BG10NUC-HC160	9581	2P	BG18NUC-HC39
1431	2P	BG2NUC-HC369	5507	2P	BG10NUC-HC161	9582	2P	BG18NUC-HC40
1432	2P	BG2NUC-HC370	5508	RBD	BG10NUC-HC162	9583	RBD	BG18NUC-HC41
1433	2P	BG2NUC-HC371	5509	RBD	BG10NUC-HC163	9584	RBD	BG18NUC-HC42
1434	2P	BG2NUC-HC372	5510	RBD	BG10NUC-HC164	9585	2P	BG18NUC-HC43
1435	2P	BG2NUC-HC373	5511	2P	BG10NUC-HC165	9586	2P	BG18NUC-HC44
1436	2P	BG2NUC-HC374	5512	2P	BG10NUC-HC166	9587	2P	BG18NUC-HC45
1437	2P	BG2NUC-HC375	5513	2P	BG10NUC-HC167	9588	RBD	BG18NUC-HC46
1438	2P	BG2NUC-HC376	5514	RBD	BG10NUC-HC168	9589	2P	BG18NUC-HC47
1439	2P	BG2NUC-HC377	5515	RBD	BG10NUC-HC169	9590	2P	BG18NUC-HC48
1440	2P	BG2NUC-HC378	5516	RBD	BG10NUC-HC170	9591	2P	BG18NUC-HC49
1441	2P	BG2NUC-HC379	5517	2P	BG10NUC-HC171	9592	2P	BG18NUC-HC50
1442	2P	BG2NUC-HC380	5518	2P	BG10NUC-HC172	9593	2P	BG18NUC-HC51
1443	RBD	BG2NUC-LC1	5519	2P	BG10NUC-HC173	9594	2P	BG18NUC-HC52
1444	RBD	BG2NUC-LC2	5520	2P	BG10NUC-HC174	9595	2P	BG18NUC-HC53
1445	2P	BG2NUC-LC3	5521	2P	BG10NUC-HC175	9596	RBD	BG18NUC-HC54
1446	RBD	BG2NUC-LC4	5522	2P	BG10NUC-HC176	9597	2P	BG18NUC-HC55
1447	RBD	BG2NUC-LC5	5523	RBD	BG10NUC-HC177	9598	2P	BG18NUC-HC56
1448	RBD	BG2NUC-LC6	5524	2P	BG10NUC-HC178	9599	2P	BG18NUC-HC57
1449	RBD	BG2NUC-LC7	5525	RBD	BG10NUC-HC179	9600	2P	BG18NUC-HC58
1450	RBD	BG2NUC-LC8	5526	2P	BG10NUC-HC180	9601	RBD	BG18NUC-HC59
1451	2P	BG2NUC-LC9	5527	2P	BG10NUC-HC181	9602	2P	BG18NUC-HC60
1452	RBD	BG2NUC-LC10	5528	RBD	BG10NUC-HC182	9603	2P	BG18NUC-HC61
1453	2P	BG2NUC-LC11	5529	2P	BG10NUC-HC183	9604	2P	BG18NUC-HC62
1454	RBD	BG2NUC-LC12	5530	2P	BG10NUC-HC184	9605	RBD	BG18NUC-HC63
1455	RBD	BG2NUC-LC13	5531	2P	BG10NUC-HC185	9606	RBD	BG18NUC-HC64
1456	RBD	BG2NUC-LC14	5532	2P	BG10NUC-HC186	9607	2P	BG18NUC-HC65
1457	RBD	BG2NUC-LC15	5533	2P	BG10NUC-HC187	9608	2P	BG18NUC-HC66
1458	RBD	BG2NUC-LC16	5534	2P	BG10NUC-HC188	9609	2P	BG18NUC-HC67
1459	RBD	BG2NUC-LC17	5535	2P	BG10NUC-HC189	9610	2P	BG18NUC-HC68
1460	RBD	BG2NUC-LC18	5536	2P	BG10NUC-HC190	9611	RBD	BG18NUC-HC69
1461	RBD	BG2NUC-LC19	5537	2P	BG10NUC-HC191	9612	2P	BG18NUC-HC70
1462	RBD	BG2NUC-LC20	5538	RBD	BG10NUC-HC192	9613	RBD	BG18NUC-HC71
1463	RBD	BG2NUC-LC21	5539	2P	BG10NUC-HC193	9614	2P	BG18NUC-HC72
1464	2P	BG2NUC-LC22	5540	RBD	BG10NUC-HC194	9615	2P	BG18NUC-HC73
1465	RBD	BG2NUC-LC23	5541	2P	BG10NUC-HC195	9616	2P	BG18NUC-HC74
1466	RBD	BG2NUC-LC24	5542	RBD	BG10NUC-HC196	9617	2P	BG18NUC-HC75
1467	RBD	BG2NUC-LC25	5543	2P	BG10NUC-HC197	9618	2P	BG18NUC-HC76
1468	RBD	BG2NUC-LC26	5544	2P	BG10NUC-HC198	9619	RBD	BG18NUC-HC77

1469	RBD	BG2NUC-LC27	5545	RBD	BG10NUC-HC199	9620	RBD	BG18NUC-HC78
1470	RBD	BG2NUC-LC28	5546	2P	BG10NUC-HC200	9621	2P	BG18NUC-HC79
1471	RBD	BG2NUC-LC29	5547	RBD	BG10NUC-HC201	9622	2P	BG18NUC-HC80
1472	2P	BG2NUC-LC30	5548	2P	BG10NUC-HC202	9623	2P	BG18NUC-HC81
1473	RBD	BG2NUC-LC31	5549	RBD	BG10NUC-HC203	9624	2P	BG18NUC-HC82
1474	RBD	BG2NUC-LC32	5550	2P	BG10NUC-HC204	9625	2P	BG18NUC-HC83
1475	RBD	BG2NUC-LC33	5551	RBD	BG10NUC-HC205	9626	2P	BG18NUC-HC84
1476	RBD	BG2NUC-LC34	5552	2P	BG10NUC-HC206	9627	2P	BG18NUC-HC85
1477	2P	BG2NUC-LC35	5553	RBD	BG10NUC-HC207	9628	2P	BG18NUC-HC86
1478	RBD	BG2NUC-LC36	5554	RBD	BG10NUC-HC208	9629	2P	BG18NUC-HC87
1479	2P	BG2NUC-LC37	5555	2P	BG10NUC-HC209	9630	2P	BG18NUC-HC88
1480	RBD	BG2NUC-LC38	5556	2P	BG10NUC-HC210	9631	2P	BG18NUC-HC89
1481	RBD	BG2NUC-LC39	5557	2P	BG10NUC-HC211	9632	2P	BG18NUC-HC90
1482	RBD	BG2NUC-LC40	5558	2P	BG10NUC-HC212	9633	RBD	BG18NUC-HC91
1483	RBD	BG2NUC-LC41	5559	2P	BG10NUC-HC213	9634	RBD	BG18NUC-HC92
1484	RBD	BG2NUC-LC42	5560	2P	BG10NUC-HC214	9635	2P	BG18NUC-HC93
1485	RBD	BG2NUC-LC43	5561	2P	BG10NUC-HC215	9636	2P	BG18NUC-HC94
1486	RBD	BG2NUC-LC44	5562	2P	BG10NUC-HC216	9637	2P	BG18NUC-HC95
1487	RBD	BG2NUC-LC45	5563	2P	BG10NUC-HC217	9638	RBD	BG18NUC-HC96
1488	RBD	BG2NUC-LC46	5564	RBD	BG10NUC-HC218	9639	2P	BG18NUC-HC97
1489	2P	BG2NUC-LC47	5565	2P	BG10NUC-HC219	9640	2P	BG18NUC-HC98
1490	2P	BG2NUC-LC48	5566	2P	BG10NUC-HC220	9641	2P	BG18NUC-HC99
1491	RBD	BG2NUC-LC49	5567	2P	BG10NUC-HC221	9642	2P	BG18NUC-HC100
1492	RBD	BG2NUC-LC50	5568	2P	BG10NUC-HC222	9643	RBD	BG18NUC-HC101
1493	2P	BG2NUC-LC51	5569	RBD	BG10NUC-HC223	9644	2P	BG18NUC-HC102
1494	RBD	BG2NUC-LC52	5570	RBD	BG10NUC-HC224	9645	RBD	BG18NUC-HC103
1495	RBD	BG2NUC-LC53	5571	RBD	BG10NUC-HC225	9646	RBD	BG18NUC-HC104
1496	2P	BG2NUC-LC54	5572	2P	BG10NUC-HC226	9647	2P	BG18NUC-HC105
1497	RBD	BG2NUC-LC55	5573	2P	BG10NUC-HC227	9648	RBD	BG18NUC-HC106
1498	RBD	BG2NUC-LC56	5574	2P	BG10NUC-HC228	9649	RBD	BG18NUC-HC107
1499	2P	BG2NUC-LC57	5575	2P	BG10NUC-HC229	9650	2P	BG18NUC-HC108
1500	RBD	BG2NUC-LC58	5576	2P	BG10NUC-HC230	9651	2P	BG18NUC-HC109
1501	2P	BG2NUC-LC59	5577	2P	BG10NUC-HC231	9652	RBD	BG18NUC-HC110
1502	RBD	BG2NUC-LC60	5578	RBD	BG10NUC-HC232	9653	2P	BG18NUC-HC111
1503	RBD	BG2NUC-LC61	5579	RBD	BG10NUC-HC233	9654	2P	BG18NUC-HC112
1504	2P	BG2NUC-LC62	5580	RBD	BG10NUC-HC234	9655	2P	BG18NUC-HC113
1505	2P	BG2NUC-LC63	5581	RBD	BG10NUC-HC235	9656	2P	BG18NUC-HC114
1506	2P	BG2NUC-LC64	5582	2P	BG10NUC-HC236	9657	2P	BG18NUC-HC115
1507	2P	BG2NUC-LC65	5583	RBD	BG10NUC-HC237	9658	RBD	BG18NUC-HC116
1508	2P	BG2NUC-LC66	5584	RBD	BG10NUC-HC238	9659	2P	BG18NUC-HC117
1509	2P	BG2NUC-LC67	5585	2P	BG10NUC-HC239	9660	2P	BG18NUC-HC118
1510	2P	BG2NUC-LC68	5586	2P	BG10NUC-HC240	9661	2P	BG18NUC-HC119
1511	2P	BG2NUC-LC69	5587	2P	BG10NUC-HC241	9662	2P	BG18NUC-HC120
1512	2P	BG2NUC-LC70	5588	2P	BG10NUC-HC242	9663	2P	BG18NUC-HC121
1513	RBD	BG2NUC-LC71	5589	RBD	BG10NUC-HC243	9664	2P	BG18NUC-HC122
1514	RBD	BG2NUC-LC72	5590	2P	BG10NUC-HC244	9665	2P	BG18NUC-HC123
1515	RBD	BG2NUC-LC73	5591	RBD	BG10NUC-HC245	9666	2P	BG18NUC-HC124
1516	2P	BG2NUC-LC74	5592	2P	BG10NUC-HC246	9667	2P	BG18NUC-HC125
1517	RBD	BG2NUC-LC75	5593	2P	BG10NUC-HC247	9668	2P	BG18NUC-HC126
1518	RBD	BG2NUC-LC76	5594	2P	BG10NUC-HC248	9669	2P	BG18NUC-HC127
1519	2P	BG2NUC-LC77	5595	2P	BG10NUC-HC249	9670	2P	BG18NUC-HC128
1520	2P	BG2NUC-LC78	5596	2P	BG10NUC-HC250	9671	2P	BG18NUC-HC129
1521	RBD	BG2NUC-LC79	5597	2P	BG10NUC-HC251	9672	2P	BG18NUC-HC130
1522	2P	BG2NUC-LC80	5598	2P	BG10NUC-HC252	9673	2P	BG18NUC-HC131
1523	RBD	BG2NUC-LC81	5599	2P	BG10NUC-HC253	9674	RBD	BG18NUC-HC132
1524	2P	BG2NUC-LC82	5600	2P	BG10NUC-HC254	9675	2P	BG18NUC-HC133
1525	2P	BG2NUC-LC83	5601	2P	BG10NUC-HC255	9676	RBD	BG18NUC-HC134
1526	RBD	BG2NUC-LC84	5602	2P	BG10NUC-HC256	9677	2P	BG18NUC-HC135
1527	RBD	BG2NUC-LC85	5603	2P	BG10NUC-HC257	9678	2P	BG18NUC-HC136
1528	2P	BG2NUC-LC86	5604	2P	BG10NUC-HC258	9679	RBD	BG18NUC-HC137
1529	RBD	BG2NUC-LC87	5605	RBD	BG10NUC-HC259	9680	2P	BG18NUC-HC138
1530	2P	BG2NUC-LC88	5606	RBD	BG10NUC-HC260	9681	RBD	BG18NUC-HC139
1531	RBD	BG2NUC-LC89	5607	2P	BG10NUC-HC261	9682	RBD	BG18NUC-HC140
1532	RBD	BG2NUC-LC90	5608	RBD	BG10NUC-HC262	9683	RBD	BG18NUC-HC141
1533	2P	BG2NUC-LC91	5609	2P	BG10NUC-HC263	9684	2P	BG18NUC-HC142
1534	2P	BG2NUC-LC92	5610	2P	BG10NUC-HC264	9685	2P	BG18NUC-HC143
1535	2P	BG2NUC-LC93	5611	RBD	BG10NUC-HC265	9686	2P	BG18NUC-HC144
1536	2P	BG2NUC-LC94	5612	RBD	BG10NUC-HC266	9687	2P	BG18NUC-HC145
1537	2P	BG2NUC-LC95	5613	RBD	BG10NUC-HC267	9688	2P	BG18NUC-HC146
1538	2P	BG2NUC-LC96	5614	RBD	BG10NUC-HC268	9689	2P	BG18NUC-HC147
1539	RBD	BG2NUC-LC97	5615	2P	BG10NUC-HC269	9690	2P	BG18NUC-HC148
1540	2P	BG2NUC-LC98	5616	2P	BG10NUC-HC270	9691	2P	BG18NUC-HC149
1541	2P	BG2NUC-LC99	5617	RBD	BG10NUC-HC271	9692	2P	BG18NUC-HC150
1542	RBD	BG2NUC-LC100	5618	2P	BG10NUC-HC272	9693	2P	BG18NUC-HC151
1543	RBD	BG2NUC-LC101	5619	2P	BG10NUC-HC273	9694	2P	BG18NUC-HC152
1544	RBD	BG2NUC-LC102	5620	RBD	BG10NUC-HC274	9695	2P	BG18NUC-HC153
1545	RBD	BG2NUC-LC103	5621	2P	BG10NUC-HC275	9696	2P	BG18NUC-HC154
1546	RBD	BG2NUC-LC104	5622	RBD	BG10NUC-HC276	9697	RBD	BG18NUC-HC155
1547	2P	BG2NUC-LC105	5623	RBD	BG10NUC-HC277	9698	2P	BG18NUC-HC156

1548	RBD	BG2NUC-LC106	5624	RBD	BG10NUC-HC278	9699	2P	BG18NUC-HC157
1549	RBD	BG2NUC-LC107	5625	2P	BG10NUC-HC279	9700	2P	BG18NUC-HC158
1550	RBD	BG2NUC-LC108	5626	2P	BG10NUC-HC280	9701	2P	BG18NUC-HC159
1551	2P	BG2NUC-LC109	5627	2P	BG10NUC-HC281	9702	2P	BG18NUC-HC160
1552	RBD	BG2NUC-LC110	5628	2P	BG10NUC-HC282	9703	2P	BG18NUC-HC161
1553	RBD	BG2NUC-LC111	5629	2P	BG10NUC-HC283	9704	2P	BG18NUC-HC162
1554	RBD	BG2NUC-LC112	5630	2P	BG10NUC-HC284	9705	RBD	BG18NUC-HC163
1555	2P	BG2NUC-LC113	5631	2P	BG10NUC-HC285	9706	2P	BG18NUC-HC164
1556	2P	BG2NUC-LC114	5632	2P	BG10NUC-HC286	9707	RBD	BG18NUC-HC165
1557	RBD	BG2NUC-LC115	5633	RBD	BG10NUC-HC287	9708	RBD	BG18NUC-HC166
1558	RBD	BG2NUC-LC116	5634	RBD	BG10NUC-HC288	9709	2P	BG18NUC-HC167
1559	2P	BG2NUC-LC117	5635	RBD	BG10NUC-HC289	9710	2P	BG18NUC-HC168
1560	2P	BG2NUC-LC118	5636	2P	BG10NUC-HC290	9711	RBD	BG18NUC-HC169
1561	2P	BG2NUC-LC119	5637	2P	BG10NUC-HC291	9712	2P	BG18NUC-HC170
1562	2P	BG2NUC-LC120	5638	RBD	BG10NUC-HC292	9713	2P	BG18NUC-HC171
1563	RBD	BG2NUC-LC121	5639	2P	BG10NUC-HC293	9714	2P	BG18NUC-HC172
1564	RBD	BG2NUC-LC122	5640	RBD	BG10NUC-HC294	9715	2P	BG18NUC-HC173
1565	2P	BG2NUC-LC123	5641	RBD	BG10NUC-HC295	9716	2P	BG18NUC-HC174
1566	2P	BG2NUC-LC124	5642	RBD	BG10NUC-HC296	9717	2P	BG18NUC-HC175
1567	RBD	BG2NUC-LC125	5643	RBD	BG10NUC-HC297	9718	2P	BG18NUC-HC176
1568	RBD	BG2NUC-LC126	5644	2P	BG10NUC-HC298	9719	2P	BG18NUC-HC177
1569	2P	BG2NUC-LC127	5645	RBD	BG10NUC-HC299	9720	2P	BG18NUC-HC178
1570	2P	BG2NUC-LC128	5646	RBD	BG10NUC-HC300	9721	2P	BG18NUC-HC179
1571	2P	BG2NUC-LC129	5647	RBD	BG10NUC-HC301	9722	RBD	BG18NUC-HC180
1572	2P	BG2NUC-LC130	5648	RBD	BG10NUC-HC302	9723	RBD	BG18NUC-HC181
1573	2P	BG2NUC-LC131	5649	RBD	BG10NUC-HC303	9724	2P	BG18NUC-HC182
1574	2P	BG2NUC-LC132	5650	RBD	BG10NUC-HC304	9725	2P	BG18NUC-HC183
1575	2P	BG2NUC-LC133	5651	2P	BG10NUC-HC305	9726	2P	BG18NUC-HC184
1576	2P	BG2NUC-LC134	5652	RBD	BG10NUC-HC306	9727	2P	BG18NUC-HC185
1577	RBD	BG2NUC-LC135	5653	RBD	BG10NUC-HC307	9728	RBD	BG18NUC-HC186
1578	RBD	BG2NUC-LC136	5654	2P	BG10NUC-HC308	9729	2P	BG18NUC-HC187
1579	RBD	BG2NUC-LC137	5655	2P	BG10NUC-HC309	9730	2P	BG18NUC-HC188
1580	2P	BG2NUC-LC138	5656	RBD	BG10NUC-HC310	9731	2P	BG18NUC-HC189
1581	2P	BG2NUC-LC139	5657	2P	BG10NUC-HC311	9732	2P	BG18NUC-HC190
1582	2P	BG2NUC-LC140	5658	2P	BG10NUC-HC312	9733	2P	BG18NUC-HC191
1583	2P	BG2NUC-LC141	5659	2P	BG10NUC-HC313	9734	2P	BG18NUC-HC192
1584	2P	BG2NUC-LC142	5660	2P	BG10NUC-HC314	9735	RBD	BG18NUC-HC193
1585	2P	BG2NUC-LC143	5661	2P	BG10NUC-HC315	9736	2P	BG18NUC-HC194
1586	2P	BG2NUC-LC144	5662	2P	BG10NUC-HC316	9737	2P	BG18NUC-HC195
1587	RBD	BG2NUC-LC145	5663	2P	BG10NUC-HC317	9738	RBD	BG18NUC-HC196
1588	RBD	BG2NUC-LC146	5664	RBD	BG10NUC-HC318	9739	RBD	BG18NUC-HC197
1589	2P	BG2NUC-LC147	5665	2P	BG10NUC-HC319	9740	RBD	BG18NUC-HC198
1590	RBD	BG2NUC-LC148	5666	2P	BG10NUC-HC320	9741	RBD	BG18NUC-HC199
1591	2P	BG2NUC-LC149	5667	2P	BG10NUC-HC321	9742	2P	BG18NUC-HC200
1592	2P	BG2NUC-LC150	5668	2P	BG10NUC-HC322	9743	RBD	BG18NUC-HC201
1593	2P	BG2NUC-LC151	5669	2P	BG10NUC-HC323	9744	2P	BG18NUC-HC202
1594	2P	BG2NUC-LC152	5670	RBD	BG10NUC-HC324	9745	RBD	BG18NUC-HC203
1595	2P	BG2NUC-LC153	5671	RBD	BG10NUC-HC325	9746	2P	BG18NUC-HC204
1596	2P	BG2NUC-LC154	5672	2P	BG10NUC-HC326	9747	RBD	BG18NUC-HC205
1597	2P	BG2NUC-LC155	5673	2P	BG10NUC-HC327	9748	2P	BG18NUC-HC206
1598	2P	BG2NUC-LC156	5674	2P	BG10NUC-HC328	9749	2P	BG18NUC-HC207
1599	RBD	BG2NUC-LC157	5675	2P	BG10NUC-HC329	9750	2P	BG18NUC-HC208
1600	2P	BG2NUC-LC158	5676	RBD	BG10NUC-HC330	9751	2P	BG18NUC-HC209
1601	2P	BG2NUC-LC159	5677	2P	BG10NUC-HC331	9752	2P	BG18NUC-HC210
1602	RBD	BG2NUC-LC160	5678	RBD	BG10NUC-HC332	9753	2P	BG18NUC-HC211
1603	2P	BG2NUC-LC161	5679	RBD	BG10NUC-HC333	9754	RBD	BG18NUC-HC212
1604	2P	BG2NUC-LC162	5680	RBD	BG10NUC-HC334	9755	2P	BG18NUC-HC213
1605	RBD	BG2NUC-LC163	5681	2P	BG10NUC-HC335	9756	RBD	BG18NUC-HC214
1606	2P	BG2NUC-LC164	5682	2P	BG10NUC-HC336	9757	RBD	BG18NUC-HC215
1607	RBD	BG2NUC-LC165	5683	2P	BG10NUC-HC337	9758	RBD	BG18NUC-HC216
1608	RBD	BG2NUC-LC166	5684	RBD	BG10NUC-HC338	9759	RBD	BG18NUC-HC217
1609	2P	BG2NUC-LC167	5685	2P	BG10NUC-HC339	9760	2P	BG18NUC-HC218
1610	2P	BG2NUC-LC168	5686	2P	BG10NUC-HC340	9761	RBD	BG18NUC-HC219
1611	2P	BG2NUC-LC169	5687	2P	BG10NUC-HC341	9762	2P	BG18NUC-HC220
1612	2P	BG2NUC-LC170	5688	2P	BG10NUC-HC342	9763	2P	BG18NUC-HC221
1613	RBD	BG2NUC-LC171	5689	RBD	BG10NUC-HC343	9764	2P	BG18NUC-HC222
1614	2P	BG2NUC-LC172	5690	2P	BG10NUC-HC344	9765	2P	BG18NUC-HC223
1615	2P	BG2NUC-LC173	5691	RBD	BG10NUC-HC345	9766	RBD	BG18NUC-HC224
1616	2P	BG2NUC-LC174	5692	2P	BG10NUC-HC346	9767	RBD	BG18NUC-HC225
1617	RBD	BG2NUC-LC175	5693	2P	BG10NUC-HC347	9768	2P	BG18NUC-HC226
1618	2P	BG2NUC-LC176	5694	2P	BG10NUC-HC348	9769	2P	BG18NUC-HC227
1619	RBD	BG2NUC-LC177	5695	2P	BG10NUC-HC349	9770	2P	BG18NUC-HC228
1620	RBD	BG2NUC-LC178	5696	2P	BG10NUC-HC350	9771	2P	BG18NUC-HC229
1621	RBD	BG2NUC-LC179	5697	2P	BG10NUC-HC351	9772	RBD	BG18NUC-HC230
1622	2P	BG2NUC-LC180	5698	RBD	BG10NUC-HC352	9773	2P	BG18NUC-HC231
1623	RBD	BG2NUC-LC181	5699	2P	BG10NUC-HC353	9774	RBD	BG18NUC-HC232
1624	RBD	BG2NUC-LC182	5700	2P	BG10NUC-HC354	9775	2P	BG18NUC-HC233
1625	2P	BG2NUC-LC183	5701	2P	BG10NUC-HC355	9776	2P	BG18NUC-HC234
1626	2P	BG2NUC-LC184	5702	RBD	BG10NUC-HC356	9777	2P	BG18NUC-HC235

1627	RBD	BG2NUC-LC185	5703	RBD	BG10NUC-HC357	9778	2P	BG18NUC-HC236
1628	2P	BG2NUC-LC186	5704	2P	BG10NUC-HC358	9779	2P	BG18NUC-HC237
1629	RBD	BG2NUC-LC187	5705	RBD	BG10NUC-HC359	9780	RBD	BG18NUC-HC238
1630	2P	BG2NUC-LC188	5706	RBD	BG10NUC-HC360	9781	RBD	BG18NUC-HC239
1631	2P	BG2NUC-LC189	5707	2P	BG10NUC-HC361	9782	RBD	BG18NUC-HC240
1632	2P	BG2NUC-LC190	5708	2P	BG10NUC-HC362	9783	2P	BG18NUC-HC241
1633	2P	BG2NUC-LC191	5709	2P	BG10NUC-HC363	9784	RBD	BG18NUC-HC242
1634	RBD	BG2NUC-LC192	5710	RBD	BG10NUC-HC364	9785	2P	BG18NUC-HC243
1635	2P	BG2NUC-LC193	5711	2P	BG10NUC-HC365	9786	2P	BG18NUC-HC244
1636	RBD	BG2NUC-LC194	5712	2P	BG10NUC-HC366	9787	2P	BG18NUC-HC245
1637	2P	BG2NUC-LC195	5713	RBD	BG10NUC-HC367	9788	2P	BG18NUC-HC246
1638	2P	BG2NUC-LC196	5714	RBD	BG10NUC-HC368	9789	2P	BG18NUC-HC247
1639	RBD	BG2NUC-LC197	5715	2P	BG10NUC-HC369	9790	2P	BG18NUC-HC248
1640	RBD	BG2NUC-LC198	5716	2P	BG10NUC-HC370	9791	2P	BG18NUC-HC249
1641	2P	BG2NUC-LC199	5717	2P	BG10NUC-HC371	9792	2P	BG18NUC-HC250
1642	2P	BG2NUC-LC200	5718	RBD	BG10NUC-HC372	9793	2P	BG18NUC-HC251
1643	RBD	BG2NUC-LC201	5719	RBD	BG10NUC-HC373	9794	RBD	BG18NUC-HC252
1644	2P	BG2NUC-LC202	5720	RBD	BG10NUC-HC374	9795	2P	BG18NUC-HC253
1645	RBD	BG2NUC-LC203	5721	2P	BG10NUC-HC375	9796	RBD	BG18NUC-HC254
1646	2P	BG2NUC-LC204	5722	2P	BG10NUC-HC376	9797	RBD	BG18NUC-HC255
1647	RBD	BG2NUC-LC205	5723	2P	BG10NUC-HC377	9798	2P	BG18NUC-HC256
1648	2P	BG2NUC-LC206	5724	2P	BG10NUC-HC378	9799	2P	BG18NUC-HC257
1649	RBD	BG2NUC-LC207	5725	2P	BG10NUC-HC379	9800	2P	BG18NUC-HC258
1650	2P	BG2NUC-LC208	5726	2P	BG10NUC-HC380	9801	RBD	BG18NUC-HC259
1651	2P	BG2NUC-LC209	5727	2P	BG10NUC-HC381	9802	2P	BG18NUC-HC260
1652	2P	BG2NUC-LC210	5728	RBD	BG10NUC-HC382	9803	RBD	BG18NUC-HC261
1653	RBD	BG2NUC-LC211	5729	RBD	BG10NUC-HC383	9804	2P	BG18NUC-HC262
1654	2P	BG2NUC-LC212	5730	RBD	BG10NUC-HC384	9805	RBD	BG18NUC-HC263
1655	RBD	BG2NUC-LC213	5731	RBD	BG10NUC-HC385	9806	2P	BG18NUC-HC264
1656	2P	BG2NUC-LC214	5732	RBD	BG10NUC-HC386	9807	2P	BG18NUC-HC265
1657	RBD	BG2NUC-LC215	5733	2P	BG10NUC-HC387	9808	2P	BG18NUC-HC266
1658	2P	BG2NUC-LC216	5734	2P	BG10NUC-HC388	9809	RBD	BG18NUC-HC267
1659	RBD	BG2NUC-LC217	5735	RBD	BG10NUC-HC389	9810	2P	BG18NUC-HC268
1660	RBD	BG2NUC-LC218	5736	2P	BG10NUC-HC390	9811	2P	BG18NUC-HC269
1661	RBD	BG2NUC-LC219	5737	2P	BG10NUC-HC391	9812	2P	BG18NUC-HC270
1662	2P	BG2NUC-LC220	5738	2P	BG10NUC-HC392	9813	2P	BG18NUC-HC271
1663	RBD	BG2NUC-LC221	5739	2P	BG10NUC-HC393	9814	2P	BG18NUC-HC272
1664	RBD	BG2NUC-LC222	5740	2P	BG10NUC-HC394	9815	2P	BG18NUC-HC273
1665	RBD	BG2NUC-LC223	5741	2P	BG10NUC-HC395	9816	2P	BG18NUC-HC274
1666	2P	BG2NUC-LC224	5742	2P	BG10NUC-HC396	9817	2P	BG18NUC-HC275
1667	RBD	BG2NUC-LC225	5743	RBD	BG10NUC-HC397	9818	2P	BG18NUC-HC276
1668	2P	BG2NUC-LC226	5744	2P	BG10NUC-HC398	9819	2P	BG18NUC-HC277
1669	2P	BG2NUC-LC227	5745	2P	BG10NUC-HC399	9820	2P	BG18NUC-HC278
1670	2P	BG2NUC-LC228	5746	RBD	BG10NUC-HC400	9821	RBD	BG18NUC-HC279
1671	RBD	BG2NUC-LC229	5747	2P	BG10NUC-HC401	9822	2P	BG18NUC-HC280
1672	2P	BG2NUC-LC230	5748	2P	BG10NUC-HC402	9823	2P	BG18NUC-HC281
1673	RBD	BG2NUC-LC231	5749	2P	BG10NUC-HC403	9824	RBD	BG18NUC-HC282
1674	2P	BG2NUC-LC232	5750	RBD	BG10NUC-HC404	9825	2P	BG18NUC-HC283
1675	2P	BG2NUC-LC233	5751	RBD	BG10NUC-HC405	9826	RBD	BG18NUC-HC284
1676	2P	BG2NUC-LC234	5752	2P	BG10NUC-HC406	9827	2P	BG18NUC-HC285
1677	RBD	BG2NUC-LC235	5753	2P	BG10NUC-HC407	9828	RBD	BG18NUC-HC286
1678	RBD	BG2NUC-LC236	5754	2P	BG10NUC-HC408	9829	RBD	BG18NUC-HC287
1679	2P	BG2NUC-LC237	5755	2P	BG10NUC-HC409	9830	2P	BG18NUC-HC288
1680	RBD	BG2NUC-LC238	5756	RBD	BG10NUC-HC410	9831	2P	BG18NUC-HC289
1681	2P	BG2NUC-LC239	5757	2P	BG10NUC-HC411	9832	2P	BG18NUC-HC290
1682	2P	BG2NUC-LC240	5758	2P	BG10NUC-HC412	9833	RBD	BG18NUC-HC291
1683	2P	BG2NUC-LC241	5759	2P	BG10NUC-HC413	9834	RBD	BG18NUC-HC292
1684	RBD	BG2NUC-LC242	5760	RBD	BG10NUC-HC414	9835	RBD	BG18NUC-HC293
1685	2P	BG2NUC-LC243	5761	2P	BG10NUC-HC415	9836	2P	BG18NUC-HC294
1686	RBD	BG2NUC-LC244	5762	RBD	BG10NUC-HC416	9837	2P	BG18NUC-HC295
1687	RBD	BG2NUC-LC245	5763	2P	BG10NUC-HC417	9838	2P	BG18NUC-HC296
1688	2P	BG2NUC-LC246	5764	RBD	BG10NUC-HC418	9839	2P	BG18NUC-HC297
1689	RBD	BG2NUC-LC247	5765	RBD	BG10NUC-HC419	9840	2P	BG18NUC-HC298
1690	RBD	BG2NUC-LC248	5766	RBD	BG10NUC-HC420	9841	RBD	BG18NUC-HC299
1691	2P	BG2NUC-LC249	5767	2P	BG10NUC-HC421	9842	2P	BG18NUC-HC300
1692	2P	BG2NUC-LC250	5768	RBD	BG10NUC-HC422	9843	2P	BG18NUC-HC301
1693	2P	BG2NUC-LC251	5769	RBD	BG10NUC-HC423	9844	2P	BG18NUC-HC302
1694	RBD	BG2NUC-LC252	5770	RBD	BG10NUC-HC424	9845	2P	BG18NUC-HC303
1695	2P	BG2NUC-LC253	5771	RBD	BG10NUC-HC425	9846	2P	BG18NUC-HC304
1696	RBD	BG2NUC-LC254	5772	2P	BG10NUC-HC426	9847	2P	BG18NUC-HC305
1697	2P	BG2NUC-LC255	5773	RBD	BG10NUC-HC427	9848	2P	BG18NUC-HC306
1698	RBD	BG2NUC-LC256	5774	RBD	BG10NUC-LC1	9849	2P	BG18NUC-HC307
1699	2P	BG2NUC-LC257	5775	RBD	BG10NUC-LC2	9850	2P	BG18NUC-HC308
1700	2P	BG2NUC-LC258	5776	RBD	BG10NUC-LC3	9851	RBD	BG18NUC-HC309
1701	2P	BG2NUC-LC259	5777	RBD	BG10NUC-LC4	9852	2P	BG18NUC-HC310
1702	2P	BG2NUC-LC260	5778	RBD	BG10NUC-LC5	9853	RBD	BG18NUC-HC311
1703	2P	BG2NUC-LC261	5779	RBD	BG10NUC-LC6	9854	2P	BG18NUC-HC312
1704	RBD	BG2NUC-LC262	5780	RBD	BG10NUC-LC7	9855	2P	BG18NUC-HC313
1705	2P	BG2NUC-LC263	5781	RBD	BG10NUC-LC8	9856	2P	BG18NUC-HC314

1706	RBD	BG2NUC-LC264	5782	RBD	BG10NUC-LC9	9857	RBD	BG18NUC-HC315
1707	2P	BG2NUC-LC265	5783	RBD	BG10NUC-LC10	9858	2P	BG18NUC-HC316
1708	2P	BG2NUC-LC266	5784	RBD	BG10NUC-LC11	9859	2P	BG18NUC-HC317
1709	2P	BG2NUC-LC267	5785	RBD	BG10NUC-LC12	9860	2P	BG18NUC-HC318
1710	2P	BG2NUC-LC268	5786	RBD	BG10NUC-LC13	9861	2P	BG18NUC-HC319
1711	RBD	BG2NUC-LC269	5787	RBD	BG10NUC-LC14	9862	2P	BG18NUC-HC320
1712	2P	BG2NUC-LC270	5788	RBD	BG10NUC-LC15	9863	2P	BG18NUC-HC321
1713	2P	BG2NUC-LC271	5789	RBD	BG10NUC-LC16	9864	RBD	BG18NUC-HC322
1714	2P	BG2NUC-LC272	5790	RBD	BG10NUC-LC17	9865	RBD	BG18NUC-HC323
1715	2P	BG2NUC-LC273	5791	RBD	BG10NUC-LC18	9866	RBD	BG18NUC-HC324
1716	2P	BG2NUC-LC274	5792	RBD	BG10NUC-LC19	9867	RBD	BG18NUC-HC325
1717	2P	BG2NUC-LC275	5793	RBD	BG10NUC-LC20	9868	2P	BG18NUC-HC326
1718	2P	BG2NUC-LC276	5794	RBD	BG10NUC-LC21	9869	2P	BG18NUC-HC327
1719	2P	BG2NUC-LC277	5795	RBD	BG10NUC-LC22	9870	RBD	BG18NUC-HC328
1720	2P	BG2NUC-LC278	5796	RBD	BG10NUC-LC23	9871	2P	BG18NUC-HC329
1721	2P	BG2NUC-LC279	5797	RBD	BG10NUC-LC24	9872	2P	BG18NUC-HC330
1722	RBD	BG2NUC-LC280	5798	RBD	BG10NUC-LC25	9873	2P	BG18NUC-HC331
1723	RBD	BG2NUC-LC281	5799	RBD	BG10NUC-LC26	9874	2P	BG18NUC-HC332
1724	RBD	BG2NUC-LC282	5800	RBD	BG10NUC-LC27	9875	2P	BG18NUC-HC333
1725	2P	BG2NUC-LC283	5801	2P	BG10NUC-LC28	9876	RBD	BG18NUC-HC334
1726	2P	BG2NUC-LC284	5802	2P	BG10NUC-LC29	9877	2P	BG18NUC-HC335
1727	2P	BG2NUC-LC285	5803	2P	BG10NUC-LC30	9878	RBD	BG18NUC-HC336
1728	2P	BG2NUC-LC286	5804	2P	BG10NUC-LC31	9879	RBD	BG18NUC-HC337
1729	RBD	BG2NUC-LC287	5805	2P	BG10NUC-LC32	9880	2P	BG18NUC-HC338
1730	2P	BG2NUC-LC288	5806	2P	BG10NUC-LC33	9881	2P	BG18NUC-HC339
1731	2P	BG2NUC-LC289	5807	2P	BG10NUC-LC34	9882	2P	BG18NUC-HC340
1732	RBD	BG2NUC-LC290	5808	2P	BG10NUC-LC35	9883	RBD	BG18NUC-HC341
1733	2P	BG2NUC-LC291	5809	2P	BG10NUC-LC36	9884	2P	BG18NUC-HC342
1734	2P	BG2NUC-LC292	5810	RBD	BG10NUC-LC37	9885	RBD	BG18NUC-HC343
1735	2P	BG2NUC-LC293	5811	RBD	BG10NUC-LC38	9886	2P	BG18NUC-HC344
1736	2P	BG2NUC-LC294	5812	RBD	BG10NUC-LC39	9887	2P	BG18NUC-HC345
1737	RBD	BG2NUC-LC295	5813	RBD	BG10NUC-LC40	9888	2P	BG18NUC-HC346
1738	2P	BG2NUC-LC296	5814	RBD	BG10NUC-LC41	9889	2P	BG18NUC-HC347
1739	2P	BG2NUC-LC297	5815	RBD	BG10NUC-LC42	9890	2P	BG18NUC-HC348
1740	RBD	BG2NUC-LC298	5816	RBD	BG10NUC-LC43	9891	2P	BG18NUC-HC349
1741	2P	BG2NUC-LC299	5817	RBD	BG10NUC-LC44	9892	2P	BG18NUC-HC350
1742	2P	BG2NUC-LC300	5818	RBD	BG10NUC-LC45	9893	RBD	BG18NUC-HC351
1743	2P	BG2NUC-LC301	5819	RBD	BG10NUC-LC46	9894	2P	BG18NUC-HC352
1744	2P	BG2NUC-LC302	5820	RBD	BG10NUC-LC47	9895	2P	BG18NUC-HC353
1745	2P	BG2NUC-LC303	5821	RBD	BG10NUC-LC48	9896	2P	BG18NUC-HC354
1746	2P	BG2NUC-LC304	5822	RBD	BG10NUC-LC49	9897	2P	BG18NUC-HC355
1747	RBD	BG2NUC-LC305	5823	RBD	BG10NUC-LC50	9898	2P	BG18NUC-HC356
1748	2P	BG2NUC-LC306	5824	RBD	BG10NUC-LC51	9899	2P	BG18NUC-HC357
1749	2P	BG2NUC-LC307	5825	RBD	BG10NUC-LC52	9900	RBD	BG18NUC-HC358
1750	2P	BG2NUC-LC308	5826	RBD	BG10NUC-LC53	9901	2P	BG18NUC-HC359
1751	2P	BG2NUC-LC309	5827	RBD	BG10NUC-LC54	9902	2P	BG18NUC-HC360
1752	RBD	BG2NUC-LC310	5828	2P	BG10NUC-LC55	9903	2P	BG18NUC-HC361
1753	RBD	BG2NUC-LC311	5829	RBD	BG10NUC-LC56	9904	2P	BG18NUC-HC362
1754	RBD	BG2NUC-LC312	5830	RBD	BG10NUC-LC57	9905	2P	BG18NUC-HC363
1755	RBD	BG2NUC-LC313	5831	2P	BG10NUC-LC58	9906	RBD	BG18NUC-HC364
1756	RBD	BG2NUC-LC314	5832	RBD	BG10NUC-LC59	9907	RBD	BG18NUC-HC365
1757	RBD	BG2NUC-LC315	5833	RBD	BG10NUC-LC60	9908	2P	BG18NUC-HC366
1758	2P	BG2NUC-LC316	5834	RBD	BG10NUC-LC61	9909	2P	BG18NUC-HC367
1759	RBD	BG2NUC-LC317	5835	RBD	BG10NUC-LC62	9910	2P	BG18NUC-HC368
1760	2P	BG2NUC-LC318	5836	RBD	BG10NUC-LC63	9911	2P	BG18NUC-HC369
1761	2P	BG2NUC-LC319	5837	RBD	BG10NUC-LC64	9912	2P	BG18NUC-HC370
1762	2P	BG2NUC-LC320	5838	RBD	BG10NUC-LC65	9913	2P	BG18NUC-HC371
1763	2P	BG2NUC-LC321	5839	RBD	BG10NUC-LC66	9914	2P	BG18NUC-HC372
1764	RBD	BG2NUC-LC322	5840	2P	BG10NUC-LC67	9915	RBD	BG18NUC-HC373
1765	RBD	BG2NUC-LC323	5841	2P	BG10NUC-LC68	9916	RBD	BG18NUC-HC374
1766	RBD	BG2NUC-LC324	5842	2P	BG10NUC-LC69	9917	RBD	BG18NUC-HC375
1767	RBD	BG2NUC-LC325	5843	RBD	BG10NUC-LC70	9918	RBD	BG18NUC-HC376
1768	RBD	BG2NUC-LC326	5844	RBD	BG10NUC-LC71	9919	RBD	BG18NUC-HC377
1769	2P	BG2NUC-LC327	5845	RBD	BG10NUC-LC72	9920	2P	BG18NUC-HC378
1770	2P	BG2NUC-LC328	5846	RBD	BG10NUC-LC73	9921	2P	BG18NUC-HC379
1771	2P	BG2NUC-LC329	5847	2P	BG10NUC-LC74	9922	2P	BG18NUC-HC380
1772	2P	BG2NUC-LC330	5848	2P	BG10NUC-LC75	9923	RBD	BG18NUC-HC381
1773	2P	BG2NUC-LC331	5849	2P	BG10NUC-LC76	9924	RBD	BG18NUC-HC382
1774	2P	BG2NUC-LC332	5850	2P	BG10NUC-LC77	9925	2P	BG18NUC-HC383
1775	2P	BG2NUC-LC333	5851	RBD	BG10NUC-LC78	9926	RBD	BG18NUC-HC384
1776	RBD	BG2NUC-LC334	5852	RBD	BG10NUC-LC79	9927	2P	BG18NUC-HC385
1777	2P	BG2NUC-LC335	5853	RBD	BG10NUC-LC80	9928	2P	BG18NUC-HC386
1778	2P	BG2NUC-LC336	5854	RBD	BG10NUC-LC81	9929	2P	BG18NUC-HC387
1779	RBD	BG2NUC-LC337	5855	2P	BG10NUC-LC82	9930	2P	BG18NUC-HC388
1780	2P	BG2NUC-LC338	5856	RBD	BG10NUC-LC83	9931	RBD	BG18NUC-HC389
1781	2P	BG2NUC-LC339	5857	RBD	BG10NUC-LC84	9932	2P	BG18NUC-HC390
1782	2P	BG2NUC-LC340	5858	RBD	BG10NUC-LC85	9933	RBD	BG18NUC-HC391
1783	2P	BG2NUC-LC341	5859	RBD	BG10NUC-LC86	9934	2P	BG18NUC-HC392
1784	2P	BG2NUC-LC342	5860	RBD	BG10NUC-LC87	9935	2P	BG18NUC-HC393

1785	2P	BG2NUC-LC343	5861	2P	BG10NUC-LC88	9936	2P	BG18NUC-HC394
1786	2P	BG2NUC-LC344	5862	2P	BG10NUC-LC89	9937	2P	BG18NUC-HC395
1787	RBD	BG2NUC-LC345	5863	RBD	BG10NUC-LC90	9938	2P	BG18NUC-HC396
1788	2P	BG2NUC-LC346	5864	RBD	BG10NUC-LC91	9939	2P	BG18NUC-HC397
1789	2P	BG2NUC-LC347	5865	2P	BG10NUC-LC92	9940	2P	BG18NUC-HC398
1790	2P	BG2NUC-LC348	5866	RBD	BG10NUC-LC93	9941	2P	BG18NUC-HC399
1791	RBD	BG2NUC-LC349	5867	RBD	BG10NUC-LC94	9942	2P	BG18NUC-HC400
1792	RBD	BG2NUC-LC350	5868	2P	BG10NUC-LC95	9943	2P	BG18NUC-HC401
1793	2P	BG2NUC-LC351	5869	2P	BG10NUC-LC96	9944	2P	BG18NUC-HC402
1794	RBD	BG2NUC-LC352	5870	2P	BG10NUC-LC97	9945	2P	BG18NUC-HC403
1795	RBD	BG2NUC-LC353	5871	2P	BG10NUC-LC98	9946	2P	BG18NUC-HC404
1796	2P	BG2NUC-LC354	5872	2P	BG10NUC-LC99	9947	RBD	BG18NUC-HC405
1797	2P	BG2NUC-LC355	5873	RBD	BG10NUC-LC100	9948	2P	BG18NUC-HC406
1798	2P	BG2NUC-LC356	5874	RBD	BG10NUC-LC101	9949	RBD	BG18NUC-HC407
1799	2P	BG2NUC-LC357	5875	2P	BG10NUC-LC102	9950	RBD	BG18NUC-HC408
1800	2P	BG2NUC-LC358	5876	2P	BG10NUC-LC103	9951	RBD	BG18NUC-HC409
1801	2P	BG2NUC-LC359	5877	RBD	BG10NUC-LC104	9952	2P	BG18NUC-HC410
1802	2P	BG2NUC-LC360	5878	2P	BG10NUC-LC105	9953	2P	BG18NUC-HC411
1803	2P	BG2NUC-LC361	5879	2P	BG10NUC-LC106	9954	2P	BG18NUC-HC412
1804	2P	BG2NUC-LC362	5880	2P	BG10NUC-LC107	9955	RBD	BG18NUC-HC413
1805	2P	BG2NUC-LC363	5881	2P	BG10NUC-LC108	9956	RBD	BG18NUC-HC414
1806	RBD	BG2NUC-LC364	5882	2P	BG10NUC-LC109	9957	2P	BG18NUC-HC415
1807	2P	BG2NUC-LC365	5883	2P	BG10NUC-LC110	9958	RBD	BG18NUC-HC416
1808	2P	BG2NUC-LC366	5884	RBD	BG10NUC-LC111	9959	2P	BG18NUC-HC417
1809	2P	BG2NUC-LC367	5885	2P	BG10NUC-LC112	9960	2P	BG18NUC-HC418
1810	RBD	BG2NUC-LC368	5886	2P	BG10NUC-LC113	9961	2P	BG18NUC-HC419
1811	2P	BG2NUC-LC369	5887	2P	BG10NUC-LC114	9962	RBD	BG18NUC-HC420
1812	2P	BG2NUC-LC370	5888	RBD	BG10NUC-LC115	9963	2P	BG18NUC-HC421
1813	2P	BG2NUC-LC371	5889	2P	BG10NUC-LC116	9964	2P	BG18NUC-HC422
1814	2P	BG2NUC-LC372	5890	2P	BG10NUC-LC117	9965	2P	BG18NUC-HC423
1815	2P	BG2NUC-LC373	5891	2P	BG10NUC-LC118	9966	RBD	BG18NUC-HC424
1816	2P	BG2NUC-LC374	5892	2P	BG10NUC-LC119	9967	2P	BG18NUC-HC425
1817	2P	BG2NUC-LC375	5893	2P	BG10NUC-LC120	9968	2P	BG18NUC-HC426
1818	2P	BG2NUC-LC376	5894	2P	BG10NUC-LC121	9969	2P	BG18NUC-HC427
1819	2P	BG2NUC-LC377	5895	2P	BG10NUC-LC122	9970	RBD	BG18NUC-HC428
1820	2P	BG2NUC-LC378	5896	2P	BG10NUC-LC123	9971	2P	BG18NUC-HC429
1821	2P	BG2NUC-LC379	5897	2P	BG10NUC-LC124	9972	2P	BG18NUC-HC430
1822	2P	BG2NUC-LC380	5898	2P	BG10NUC-LC125	9973	RBD	BG18NUC-HC431
1823	2P	BG4NUC-HC1	5899	2P	BG10NUC-LC126	9974	2P	BG18NUC-HC432
1824	2P	BG4NUC-HC2	5900	RBD	BG10NUC-LC127	9975	2P	BG18NUC-HC433
1825	2P	BG4NUC-HC3	5901	RBD	BG10NUC-LC128	9976	RBD	BG18NUC-HC434
1826	2P	BG4NUC-HC4	5902	RBD	BG10NUC-LC129	9977	RBD	BG18NUC-HC435
1827	2P	BG4NUC-HC5	5903	2P	BG10NUC-LC130	9978	2P	BG18NUC-HC436
1828	2P	BG4NUC-HC6	5904	2P	BG10NUC-LC131	9979	2P	BG18NUC-HC437
1829	2P	BG4NUC-HC7	5905	2P	BG10NUC-LC132	9980	2P	BG18NUC-HC438
1830	2P	BG4NUC-HC8	5906	2P	BG10NUC-LC133	9981	2P	BG18NUC-HC439
1831	2P	BG4NUC-HC9	5907	2P	BG10NUC-LC134	9982	2P	BG18NUC-HC440
1832	2P	BG4NUC-HC10	5908	2P	BG10NUC-LC135	9983	2P	BG18NUC-HC441
1833	2P	BG4NUC-HC11	5909	2P	BG10NUC-LC136	9984	2P	BG18NUC-HC442
1834	2P	BG4NUC-HC12	5910	2P	BG10NUC-LC137	9985	2P	BG18NUC-HC443
1835	2P	BG4NUC-HC13	5911	RBD	BG10NUC-LC138	9986	2P	BG18NUC-HC444
1836	2P	BG4NUC-HC14	5912	2P	BG10NUC-LC139	9987	2P	BG18NUC-HC445
1837	RBD	BG4NUC-HC15	5913	2P	BG10NUC-LC140	9988	RBD	BG18NUC-HC446
1838	2P	BG4NUC-HC16	5914	RBD	BG10NUC-LC141	9989	2P	BG18NUC-HC447
1839	2P	BG4NUC-HC17	5915	RBD	BG10NUC-LC142	9990	2P	BG18NUC-HC448
1840	2P	BG4NUC-HC18	5916	2P	BG10NUC-LC143	9991	2P	BG18NUC-HC449
1841	RBD	BG4NUC-HC19	5917	2P	BG10NUC-LC144	9992	2P	BG18NUC-HC450
1842	2P	BG4NUC-HC20	5918	2P	BG10NUC-LC145	9993	2P	BG18NUC-HC451
1843	2P	BG4NUC-HC21	5919	2P	BG10NUC-LC146	9994	2P	BG18NUC-HC452
1844	RBD	BG4NUC-HC22	5920	2P	BG10NUC-LC147	9995	2P	BG18NUC-HC453
1845	RBD	BG4NUC-HC23	5921	2P	BG10NUC-LC148	9996	2P	BG18NUC-HC454
1846	2P	BG4NUC-HC24	5922	2P	BG10NUC-LC149	9997	2P	BG18NUC-HC455
1847	RBD	BG4NUC-HC25	5923	2P	BG10NUC-LC150	9998	2P	BG18NUC-HC456
1848	RBD	BG4NUC-HC26	5924	RBD	BG10NUC-LC151	9999	2P	BG18NUC-HC457
1849	RBD	BG4NUC-HC27	5925	RBD	BG10NUC-LC152	10000	2P	BG18NUC-HC458
1850	RBD	BG4NUC-HC28	5926	RBD	BG10NUC-LC153	10001	2P	BG18NUC-HC459
1851	RBD	BG4NUC-HC29	5927	RBD	BG10NUC-LC154	10002	2P	BG18NUC-HC460
1852	RBD	BG4NUC-HC30	5928	2P	BG10NUC-LC155	10003	2P	BG18NUC-HC461
1853	RBD	BG4NUC-HC31	5929	2P	BG10NUC-LC156	10004	RBD	BG18NUC-HC462
1854	RBD	BG4NUC-HC32	5930	2P	BG10NUC-LC157	10005	RBD	BG18NUC-HC463
1855	RBD	BG4NUC-HC33	5931	RBD	BG10NUC-LC158	10006	2P	BG18NUC-HC464
1856	RBD	BG4NUC-HC34	5932	2P	BG10NUC-LC159	10007	2P	BG18NUC-HC465
1857	2P	BG4NUC-HC35	5933	RBD	BG10NUC-LC160	10008	2P	BG18NUC-HC466
1858	RBD	BG4NUC-HC36	5934	2P	BG10NUC-LC161	10009	2P	BG18NUC-HC467
1859	RBD	BG4NUC-HC37	5935	RBD	BG10NUC-LC162	10010	RBD	BG18NUC-HC468
1860	RBD	BG4NUC-HC38	5936	RBD	BG10NUC-LC163	10011	RBD	BG18NUC-HC469
1861	2P	BG4NUC-HC39	5937	RBD	BG10NUC-LC164	10012	RBD	BG18NUC-HC470
1862	2P	BG4NUC-HC40	5938	2P	BG10NUC-LC165	10013	2P	BG18NUC-HC471
1863	2P	BG4NUC-HC41	5939	2P	BG10NUC-LC166	10014	2P	BG18NUC-HC472

1864	RBD	BG4NUC-HC42	5940	2P	BG10NUC-LC167	10015	2P	BG18NUC-HC473
1865	2P	BG4NUC-HC43	5941	RBD	BG10NUC-LC168	10016	2P	BG18NUC-HC474
1866	2P	BG4NUC-HC44	5942	RBD	BG10NUC-LC169	10017	RBD	BG18NUC-HC475
1867	RBD	BG4NUC-HC45	5943	RBD	BG10NUC-LC170	10018	2P	BG18NUC-HC476
1868	2P	BG4NUC-HC46	5944	2P	BG10NUC-LC171	10019	RBD	BG18NUC-HC477
1869	2P	BG4NUC-HC47	5945	2P	BG10NUC-LC172	10020	RBD	BG18NUC-HC478
1870	RBD	BG4NUC-HC48	5946	2P	BG10NUC-LC173	10021	RBD	BG18NUC-HC479
1871	RBD	BG4NUC-HC49	5947	2P	BG10NUC-LC174	10022	RBD	BG18NUC-HC480
1872	2P	BG4NUC-HC50	5948	2P	BG10NUC-LC175	10023	2P	BG18NUC-HC481
1873	RBD	BG4NUC-HC51	5949	2P	BG10NUC-LC176	10024	RBD	BG18NUC-HC482
1874	2P	BG4NUC-HC52	5950	RBD	BG10NUC-LC177	10025	2P	BG18NUC-HC483
1875	2P	BG4NUC-HC53	5951	2P	BG10NUC-LC178	10026	2P	BG18NUC-HC484
1876	RBD	BG4NUC-HC54	5952	RBD	BG10NUC-LC179	10027	2P	BG18NUC-HC485
1877	2P	BG4NUC-HC55	5953	2P	BG10NUC-LC180	10028	2P	BG18NUC-HC486
1878	2P	BG4NUC-HC56	5954	2P	BG10NUC-LC181	10029	2P	BG18NUC-HC487
1879	2P	BG4NUC-HC57	5955	RBD	BG10NUC-LC182	10030	2P	BG18NUC-HC488
1880	RBD	BG4NUC-HC58	5956	2P	BG10NUC-LC183	10031	2P	BG18NUC-HC489
1881	RBD	BG4NUC-HC59	5957	2P	BG10NUC-LC184	10032	2P	BG18NUC-HC490
1882	2P	BG4NUC-HC60	5958	2P	BG10NUC-LC185	10033	2P	BG18NUC-HC491
1883	2P	BG4NUC-HC61	5959	2P	BG10NUC-LC186	10034	RBD	BG18NUC-HC492
1884	2P	BG4NUC-HC62	5960	2P	BG10NUC-LC187	10035	2P	BG18NUC-HC493
1885	RBD	BG4NUC-HC63	5961	2P	BG10NUC-LC188	10036	2P	BG18NUC-HC494
1886	RBD	BG4NUC-HC64	5962	2P	BG10NUC-LC189	10037	2P	BG18NUC-HC495
1887	RBD	BG4NUC-HC65	5963	2P	BG10NUC-LC190	10038	2P	BG18NUC-HC496
1888	2P	BG4NUC-HC66	5964	2P	BG10NUC-LC191	10039	RBD	BG18NUC-HC497
1889	2P	BG4NUC-HC67	5965	RBD	BG10NUC-LC192	10040	2P	BG18NUC-HC498
1890	2P	BG4NUC-HC68	5966	2P	BG10NUC-LC193	10041	2P	BG18NUC-HC499
1891	RBD	BG4NUC-HC69	5967	RBD	BG10NUC-LC194	10042	2P	BG18NUC-HC500
1892	2P	BG4NUC-HC70	5968	2P	BG10NUC-LC195	10043	2P	BG18NUC-HC501
1893	RBD	BG4NUC-HC71	5969	RBD	BG10NUC-LC196	10044	RBD	BG18NUC-HC502
1894	2P	BG4NUC-HC72	5970	2P	BG10NUC-LC197	10045	2P	BG18NUC-HC503
1895	RBD	BG4NUC-HC73	5971	2P	BG10NUC-LC198	10046	2P	BG18NUC-HC504
1896	2P	BG4NUC-HC74	5972	RBD	BG10NUC-LC199	10047	2P	BG18NUC-HC505
1897	RBD	BG4NUC-HC75	5973	2P	BG10NUC-LC200	10048	RBD	BG18NUC-HC506
1898	2P	BG4NUC-HC76	5974	RBD	BG10NUC-LC201	10049	2P	BG18NUC-HC507
1899	2P	BG4NUC-HC77	5975	2P	BG10NUC-LC202	10050	2P	BG18NUC-HC508
1900	2P	BG4NUC-HC78	5976	RBD	BG10NUC-LC203	10051	2P	BG18NUC-HC509
1901	2P	BG4NUC-HC79	5977	2P	BG10NUC-LC204	10052	2P	BG18NUC-HC510
1902	RBD	BG4NUC-HC80	5978	RBD	BG10NUC-LC205	10053	2P	BG18NUC-HC511
1903	RBD	BG4NUC-HC81	5979	2P	BG10NUC-LC206	10054	2P	BG18NUC-HC512
1904	RBD	BG4NUC-HC82	5980	RBD	BG10NUC-LC207	10055	2P	BG18NUC-HC513
1905	RBD	BG4NUC-HC83	5981	RBD	BG10NUC-LC208	10056	2P	BG18NUC-HC514
1906	2P	BG4NUC-HC84	5982	2P	BG10NUC-LC209	10057	2P	BG18NUC-HC515
1907	2P	BG4NUC-HC85	5983	2P	BG10NUC-LC210	10058	RBD	BG18NUC-HC516
1908	2P	BG4NUC-HC86	5984	2P	BG10NUC-LC211	10059	2P	BG18NUC-HC517
1909	2P	BG4NUC-HC87	5985	2P	BG10NUC-LC212	10060	2P	BG18NUC-HC518
1910	2P	BG4NUC-HC88	5986	2P	BG10NUC-LC213	10061	2P	BG18NUC-HC519
1911	RBD	BG4NUC-HC89	5987	2P	BG10NUC-LC214	10062	2P	BG18NUC-HC520
1912	RBD	BG4NUC-HC90	5988	2P	BG10NUC-LC215	10063	2P	BG18NUC-HC521
1913	2P	BG4NUC-HC91	5989	2P	BG10NUC-LC216	10064	RBD	BG18NUC-HC522
1914	2P	BG4NUC-HC92	5990	2P	BG10NUC-LC217	10065	2P	BG18NUC-HC523
1915	2P	BG4NUC-HC93	5991	RBD	BG10NUC-LC218	10066	2P	BG18NUC-HC524
1916	RBD	BG4NUC-HC94	5992	2P	BG10NUC-LC219	10067	2P	BG18NUC-HC525
1917	2P	BG4NUC-HC95	5993	2P	BG10NUC-LC220	10068	RBD	BG18NUC-HC526
1918	RBD	BG4NUC-HC96	5994	2P	BG10NUC-LC221	10069	RBD	BG18NUC-HC527
1919	RBD	BG4NUC-HC97	5995	2P	BG10NUC-LC222	10070	2P	BG18NUC-HC528
1920	RBD	BG4NUC-HC98	5996	RBD	BG10NUC-LC223	10071	2P	BG18NUC-HC529
1921	2P	BG4NUC-HC99	5997	RBD	BG10NUC-LC224	10072	2P	BG18NUC-HC530
1922	2P	BG4NUC-HC100	5998	RBD	BG10NUC-LC225	10073	2P	BG18NUC-HC531
1923	2P	BG4NUC-HC101	5999	2P	BG10NUC-LC226	10074	2P	BG18NUC-HC532
1924	RBD	BG4NUC-HC102	6000	2P	BG10NUC-LC227	10075	RBD	BG18NUC-HC533
1925	2P	BG4NUC-HC103	6001	2P	BG10NUC-LC228	10076	2P	BG18NUC-HC534
1926	2P	BG4NUC-HC104	6002	2P	BG10NUC-LC229	10077	2P	BG18NUC-HC535
1927	2P	BG4NUC-HC105	6003	2P	BG10NUC-LC230	10078	2P	BG18NUC-HC536
1928	2P	BG4NUC-HC106	6004	2P	BG10NUC-LC231	10079	2P	BG18NUC-HC537
1929	2P	BG4NUC-HC107	6005	RBD	BG10NUC-LC232	10080	RBD	BG18NUC-HC538
1930	2P	BG4NUC-HC108	6006	RBD	BG10NUC-LC233	10081	RBD	BG18NUC-HC539
1931	2P	BG4NUC-HC109	6007	RBD	BG10NUC-LC234	10082	2P	BG18NUC-HC540
1932	2P	BG4NUC-HC110	6008	RBD	BG10NUC-LC235	10083	RBD	BG18NUC-HC541
1933	2P	BG4NUC-HC111	6009	2P	BG10NUC-LC236	10084	RBD	BG18NUC-HC542
1934	2P	BG4NUC-HC112	6010	RBD	BG10NUC-LC237	10085	RBD	BG18NUC-HC543
1935	RBD	BG4NUC-HC113	6011	RBD	BG10NUC-LC238	10086	RBD	BG18NUC-HC544
1936	RBD	BG4NUC-HC114	6012	2P	BG10NUC-LC239	10087	RBD	BG18NUC-HC545
1937	RBD	BG4NUC-HC115	6013	2P	BG10NUC-LC240	10088	RBD	BG18NUC-HC546
1938	2P	BG4NUC-HC116	6014	2P	BG10NUC-LC241	10089	2P	BG18NUC-HC547
1939	RBD	BG4NUC-HC117	6015	2P	BG10NUC-LC242	10090	RBD	BG18NUC-HC548
1940	2P	BG4NUC-HC118	6016	RBD	BG10NUC-LC243	10091	RBD	BG18NUC-HC549
1941	2P	BG4NUC-HC119	6017	2P	BG10NUC-LC244	10092	2P	BG18NUC-HC550
1942	2P	BG4NUC-HC120	6018	RBD	BG10NUC-LC245	10093	2P	BG18NUC-HC551

1943	RBD	BG4NUC-HC121	6019	2P	BG10NUC-LC246	10094	2P	BG18NUC-HC552
1944	2P	BG4NUC-HC122	6020	2P	BG10NUC-LC247	10095	2P	BG18NUC-HC553
1945	RBD	BG4NUC-HC123	6021	2P	BG10NUC-LC248	10096	2P	BG18NUC-HC554
1946	2P	BG4NUC-HC124	6022	2P	BG10NUC-LC249	10097	2P	BG18NUC-HC555
1947	RBD	BG4NUC-HC125	6023	2P	BG10NUC-LC250	10098	RBD	BG18NUC-HC556
1948	RBD	BG4NUC-HC126	6024	2P	BG10NUC-LC251	10099	2P	BG18NUC-HC557
1949	2P	BG4NUC-HC127	6025	2P	BG10NUC-LC252	10100	RBD	BG18NUC-HC558
1950	RBD	BG4NUC-HC128	6026	2P	BG10NUC-LC253	10101	2P	BG18NUC-HC559
1951	RBD	BG4NUC-HC129	6027	2P	BG10NUC-LC254	10102	2P	BG18NUC-HC560
1952	2P	BG4NUC-HC130	6028	2P	BG10NUC-LC255	10103	2P	BG18NUC-HC561
1953	2P	BG4NUC-HC131	6029	2P	BG10NUC-LC256	10104	2P	BG18NUC-HC562
1954	2P	BG4NUC-HC132	6030	2P	BG10NUC-LC257	10105	RBD	BG18NUC-HC563
1955	2P	BG4NUC-HC133	6031	2P	BG10NUC-LC258	10106	2P	BG18NUC-HC564
1956	RBD	BG4NUC-HC134	6032	RBD	BG10NUC-LC259	10107	2P	BG18NUC-HC565
1957	2P	BG4NUC-HC135	6033	RBD	BG10NUC-LC260	10108	2P	BG18NUC-HC566
1958	2P	BG4NUC-HC136	6034	2P	BG10NUC-LC261	10109	2P	BG18NUC-HC567
1959	2P	BG4NUC-HC137	6035	RBD	BG10NUC-LC262	10110	2P	BG18NUC-HC568
1960	2P	BG4NUC-HC138	6036	2P	BG10NUC-LC263	10111	2P	BG18NUC-HC569
1961	2P	BG4NUC-HC139	6037	2P	BG10NUC-LC264	10112	2P	BG18NUC-HC570
1962	2P	BG4NUC-HC140	6038	RBD	BG10NUC-LC265	10113	2P	BG18NUC-HC571
1963	2P	BG4NUC-HC141	6039	RBD	BG10NUC-LC266	10114	2P	BG18NUC-HC572
1964	2P	BG4NUC-HC142	6040	RBD	BG10NUC-LC267	10115	2P	BG18NUC-HC573
1965	2P	BG4NUC-HC143	6041	RBD	BG10NUC-LC268	10116	RBD	BG18NUC-HC574
1966	RBD	BG4NUC-HC144	6042	2P	BG10NUC-LC269	10117	RBD	BG18NUC-HC575
1967	2P	BG4NUC-HC145	6043	2P	BG10NUC-LC270	10118	2P	BG18NUC-HC576
1968	2P	BG4NUC-HC146	6044	RBD	BG10NUC-LC271	10119	RBD	BG18NUC-HC577
1969	2P	BG4NUC-HC147	6045	2P	BG10NUC-LC272	10120	2P	BG18NUC-HC578
1970	2P	BG4NUC-HC148	6046	2P	BG10NUC-LC273	10121	2P	BG18NUC-HC579
1971	2P	BG4NUC-HC149	6047	RBD	BG10NUC-LC274	10122	2P	BG18NUC-HC580
1972	2P	BG4NUC-HC150	6048	2P	BG10NUC-LC275	10123	2P	BG18NUC-HC581
1973	2P	BG4NUC-HC151	6049	RBD	BG10NUC-LC276	10124	2P	BG18NUC-HC582
1974	2P	BG4NUC-HC152	6050	RBD	BG10NUC-LC277	10125	2P	BG18NUC-HC583
1975	2P	BG4NUC-HC153	6051	RBD	BG10NUC-LC278	10126	2P	BG18NUC-HC584
1976	2P	BG4NUC-HC154	6052	2P	BG10NUC-LC279	10127	2P	BG18NUC-HC585
1977	2P	BG4NUC-HC155	6053	2P	BG10NUC-LC280	10128	RBD	BG18NUC-HC586
1978	RBD	BG4NUC-HC156	6054	2P	BG10NUC-LC281	10129	2P	BG18NUC-HC587
1979	2P	BG4NUC-HC157	6055	2P	BG10NUC-LC282	10130	2P	BG18NUC-HC588
1980	RBD	BG4NUC-HC158	6056	2P	BG10NUC-LC283	10131	2P	BG18NUC-HC589
1981	2P	BG4NUC-HC159	6057	2P	BG10NUC-LC284	10132	2P	BG18NUC-HC590
1982	RBD	BG4NUC-HC160	6058	2P	BG10NUC-LC285	10133	2P	BG18NUC-HC591
1983	RBD	BG4NUC-HC161	6059	2P	BG10NUC-LC286	10134	2P	BG18NUC-HC592
1984	RBD	BG4NUC-HC162	6060	RBD	BG10NUC-LC287	10135	2P	BG18NUC-HC593
1985	2P	BG4NUC-HC163	6061	RBD	BG10NUC-LC288	10136	2P	BG18NUC-HC594
1986	RBD	BG4NUC-HC164	6062	RBD	BG10NUC-LC289	10137	2P	BG18NUC-HC595
1987	RBD	BG4NUC-HC165	6063	2P	BG10NUC-LC290	10138	RBD	BG18NUC-HC596
1988	RBD	BG4NUC-HC166	6064	2P	BG10NUC-LC291	10139	2P	BG18NUC-HC597
1989	RBD	BG4NUC-HC167	6065	RBD	BG10NUC-LC292	10140	RBD	BG18NUC-HC598
1990	2P	BG4NUC-HC168	6066	2P	BG10NUC-LC293	10141	RBD	BG18NUC-HC599
1991	2P	BG4NUC-HC169	6067	RBD	BG10NUC-LC294	10142	RBD	BG18NUC-HC600
1992	2P	BG4NUC-HC170	6068	RBD	BG10NUC-LC295	10143	2P	BG18NUC-HC601
1993	RBD	BG4NUC-HC171	6069	RBD	BG10NUC-LC296	10144	2P	BG18NUC-HC602
1994	2P	BG4NUC-HC172	6070	RBD	BG10NUC-LC297	10145	2P	BG18NUC-HC603
1995	2P	BG4NUC-HC173	6071	2P	BG10NUC-LC298	10146	2P	BG18NUC-HC604
1996	RBD	BG4NUC-HC174	6072	RBD	BG10NUC-LC299	10147	2P	BG18NUC-HC605
1997	2P	BG4NUC-HC175	6073	RBD	BG10NUC-LC300	10148	RBD	BG18NUC-HC606
1998	RBD	BG4NUC-HC176	6074	RBD	BG10NUC-LC301	10149	RBD	BG18NUC-HC607
1999	2P	BG4NUC-HC177	6075	RBD	BG10NUC-LC302	10150	2P	BG18NUC-HC608
2000	2P	BG4NUC-HC178	6076	RBD	BG10NUC-LC303	10151	RBD	BG18NUC-HC609
2001	2P	BG4NUC-HC179	6077	RBD	BG10NUC-LC304	10152	2P	BG18NUC-HC610
2002	RBD	BG4NUC-HC180	6078	2P	BG10NUC-LC305	10153	2P	BG18NUC-HC611
2003	2P	BG4NUC-HC181	6079	RBD	BG10NUC-LC306	10154	2P	BG18NUC-HC612
2004	RBD	BG4NUC-HC182	6080	RBD	BG10NUC-LC307	10155	2P	BG18NUC-HC613
2005	2P	BG4NUC-HC183	6081	2P	BG10NUC-LC308	10156	RBD	BG18NUC-HC614
2006	2P	BG4NUC-HC184	6082	2P	BG10NUC-LC309	10157	2P	BG18NUC-HC615
2007	2P	BG4NUC-HC185	6083	RBD	BG10NUC-LC310	10158	RBD	BG18NUC-HC616
2008	2P	BG4NUC-HC186	6084	2P	BG10NUC-LC311	10159	2P	BG18NUC-HC617
2009	2P	BG4NUC-HC187	6085	2P	BG10NUC-LC312	10160	2P	BG18NUC-HC618
2010	2P	BG4NUC-HC188	6086	2P	BG10NUC-LC313	10161	2P	BG18NUC-HC619
2011	2P	BG4NUC-HC189	6087	2P	BG10NUC-LC314	10162	RBD	BG18NUC-HC620
2012	2P	BG4NUC-HC190	6088	2P	BG10NUC-LC315	10163	2P	BG18NUC-HC621
2013	2P	BG4NUC-HC191	6089	2P	BG10NUC-LC316	10164	2P	BG18NUC-HC622
2014	2P	BG4NUC-HC192	6090	2P	BG10NUC-LC317	10165	2P	BG18NUC-HC623
2015	RBD	BG4NUC-HC193	6091	RBD	BG10NUC-LC318	10166	2P	BG18NUC-HC624
2016	2P	BG4NUC-HC194	6092	2P	BG10NUC-LC319	10167	2P	BG18NUC-HC625
2017	RBD	BG4NUC-HC195	6093	2P	BG10NUC-LC320	10168	RBD	BG18NUC-HC626
2018	RBD	BG4NUC-HC196	6094	2P	BG10NUC-LC321	10169	2P	BG18NUC-HC627
2019	RBD	BG4NUC-HC197	6095	2P	BG10NUC-LC322	10170	RBD	BG18NUC-HC628
2020	2P	BG4NUC-HC198	6096	2P	BG10NUC-LC323	10171	2P	BG18NUC-HC629
2021	2P	BG4NUC-HC199	6097	RBD	BG10NUC-LC324	10172	2P	BG18NUC-HC630

2022	2P	BG4NUC-HC200	6098	RBD	BG10NUC-LC325	10173	RBD	BG18NUC-HC631
2023	2P	BG4NUC-HC201	6099	2P	BG10NUC-LC326	10174	RBD	BG18NUC-HC632
2024	2P	BG4NUC-HC202	6100	2P	BG10NUC-LC327	10175	2P	BG18NUC-HC633
2025	2P	BG4NUC-HC203	6101	2P	BG10NUC-LC328	10176	2P	BG18NUC-HC634
2026	2P	BG4NUC-HC204	6102	2P	BG10NUC-LC329	10177	2P	BG18NUC-HC635
2027	2P	BG4NUC-HC205	6103	RBD	BG10NUC-LC330	10178	2P	BG18NUC-HC636
2028	2P	BG4NUC-HC206	6104	2P	BG10NUC-LC331	10179	2P	BG18NUC-HC637
2029	2P	BG4NUC-HC207	6105	RBD	BG10NUC-LC332	10180	2P	BG18NUC-HC638
2030	2P	BG4NUC-HC208	6106	RBD	BG10NUC-LC333	10181	RBD	BG18NUC-HC639
2031	2P	BG4NUC-HC209	6107	RBD	BG10NUC-LC334	10182	2P	BG18NUC-HC640
2032	RBD	BG4NUC-HC210	6108	2P	BG10NUC-LC335	10183	RBD	BG18NUC-HC641
2033	RBD	BG4NUC-HC211	6109	2P	BG10NUC-LC336	10184	2P	BG18NUC-HC642
2034	RBD	BG4NUC-HC212	6110	2P	BG10NUC-LC337	10185	2P	BG18NUC-HC643
2035	2P	BG4NUC-HC213	6111	RBD	BG10NUC-LC338	10186	2P	BG18NUC-HC644
2036	2P	BG4NUC-HC214	6112	2P	BG10NUC-LC339	10187	2P	BG18NUC-HC645
2037	2P	BG4NUC-HC215	6113	2P	BG10NUC-LC340	10188	2P	BG18NUC-HC646
2038	2P	BG4NUC-HC216	6114	2P	BG10NUC-LC341	10189	2P	BG18NUC-HC647
2039	RBD	BG4NUC-HC217	6115	2P	BG10NUC-LC342	10190	RBD	BG18NUC-HC648
2040	2P	BG4NUC-HC218	6116	RBD	BG10NUC-LC343	10191	2P	BG18NUC-HC649
2041	RBD	BG4NUC-HC219	6117	2P	BG10NUC-LC344	10192	2P	BG18NUC-HC650
2042	RBD	BG4NUC-HC220	6118	RBD	BG10NUC-LC345	10193	2P	BG18NUC-HC651
2043	2P	BG4NUC-HC221	6119	2P	BG10NUC-LC346	10194	RBD	BG18NUC-HC652
2044	RBD	BG4NUC-HC222	6120	2P	BG10NUC-LC347	10195	2P	BG18NUC-HC653
2045	RBD	BG4NUC-HC223	6121	2P	BG10NUC-LC348	10196	RBD	BG18NUC-HC654
2046	2P	BG4NUC-HC224	6122	2P	BG10NUC-LC349	10197	2P	BG18NUC-HC655
2047	RBD	BG4NUC-HC225	6123	2P	BG10NUC-LC350	10198	2P	BG18NUC-HC656
2048	RBD	BG4NUC-HC226	6124	2P	BG10NUC-LC351	10199	2P	BG18NUC-HC657
2049	2P	BG4NUC-HC227	6125	RBD	BG10NUC-LC352	10200	RBD	BG18NUC-HC658
2050	RBD	BG4NUC-HC228	6126	2P	BG10NUC-LC353	10201	2P	BG18NUC-HC659
2051	2P	BG4NUC-HC229	6127	2P	BG10NUC-LC354	10202	2P	BG18NUC-HC660
2052	2P	BG4NUC-HC230	6128	2P	BG10NUC-LC355	10203	2P	BG18NUC-HC661
2053	RBD	BG4NUC-HC231	6129	RBD	BG10NUC-LC356	10204	2P	BG18NUC-HC662
2054	2P	BG4NUC-HC232	6130	RBD	BG10NUC-LC357	10205	RBD	BG18NUC-HC663
2055	2P	BG4NUC-HC233	6131	2P	BG10NUC-LC358	10206	RBD	BG18NUC-HC664
2056	2P	BG4NUC-HC234	6132	RBD	BG10NUC-LC359	10207	RBD	BG18NUC-HC665
2057	RBD	BG4NUC-HC235	6133	RBD	BG10NUC-LC360	10208	RBD	BG18NUC-HC666
2058	RBD	BG4NUC-HC236	6134	2P	BG10NUC-LC361	10209	RBD	BG18NUC-HC667
2059	2P	BG4NUC-HC237	6135	2P	BG10NUC-LC362	10210	RBD	BG18NUC-HC668
2060	2P	BG4NUC-HC238	6136	2P	BG10NUC-LC363	10211	RBD	BG18NUC-HC669
2061	2P	BG4NUC-HC239	6137	RBD	BG10NUC-LC364	10212	RBD	BG18NUC-HC670
2062	2P	BG4NUC-HC240	6138	2P	BG10NUC-LC365	10213	2P	BG18NUC-HC671
2063	2P	BG4NUC-HC241	6139	2P	BG10NUC-LC366	10214	2P	BG18NUC-HC672
2064	2P	BG4NUC-HC242	6140	RBD	BG10NUC-LC367	10215	2P	BG18NUC-HC673
2065	2P	BG4NUC-HC243	6141	RBD	BG10NUC-LC368	10216	RBD	BG18NUC-HC674
2066	2P	BG4NUC-HC244	6142	2P	BG10NUC-LC369	10217	2P	BG18NUC-HC675
2067	2P	BG4NUC-HC245	6143	2P	BG10NUC-LC370	10218	2P	BG18NUC-HC676
2068	2P	BG4NUC-HC246	6144	2P	BG10NUC-LC371	10219	2P	BG18NUC-HC677
2069	RBD	BG4NUC-HC247	6145	RBD	BG10NUC-LC372	10220	RBD	BG18NUC-HC678
2070	RBD	BG4NUC-HC248	6146	RBD	BG10NUC-LC373	10221	2P	BG18NUC-HC679
2071	RBD	BG4NUC-HC249	6147	RBD	BG10NUC-LC374	10222	2P	BG18NUC-HC680
2072	RBD	BG4NUC-HC250	6148	2P	BG10NUC-LC375	10223	2P	BG18NUC-HC681
2073	2P	BG4NUC-HC251	6149	2P	BG10NUC-LC376	10224	RBD	BG18NUC-HC682
2074	2P	BG4NUC-HC252	6150	2P	BG10NUC-LC377	10225	2P	BG18NUC-HC683
2075	2P	BG4NUC-HC253	6151	2P	BG10NUC-LC378	10226	2P	BG18NUC-HC684
2076	RBD	BG4NUC-HC254	6152	2P	BG10NUC-LC379	10227	RBD	BG18NUC-HC685
2077	2P	BG4NUC-HC255	6153	2P	BG10NUC-LC380	10228	2P	BG18NUC-HC686
2078	RBD	BG4NUC-HC256	6154	2P	BG10NUC-LC381	10229	2P	BG18NUC-HC687
2079	RBD	BG4NUC-HC257	6155	RBD	BG10NUC-LC382	10230	2P	BG18NUC-HC688
2080	RBD	BG4NUC-HC258	6156	RBD	BG10NUC-LC383	10231	2P	BG18NUC-HC689
2081	2P	BG4NUC-HC259	6157	RBD	BG10NUC-LC384	10232	2P	BG18NUC-HC690
2082	RBD	BG4NUC-HC260	6158	RBD	BG10NUC-LC385	10233	RBD	BG18NUC-HC691
2083	2P	BG4NUC-HC261	6159	RBD	BG10NUC-LC386	10234	RBD	BG18NUC-HC692
2084	RBD	BG4NUC-HC262	6160	2P	BG10NUC-LC387	10235	RBD	BG18NUC-HC693
2085	RBD	BG4NUC-HC263	6161	2P	BG10NUC-LC388	10236	2P	BG18NUC-HC694
2086	RBD	BG4NUC-HC264	6162	RBD	BG10NUC-LC389	10237	RBD	BG18NUC-HC695
2087	2P	BG4NUC-HC265	6163	2P	BG10NUC-LC390	10238	2P	BG18NUC-HC696
2088	RBD	BG4NUC-HC266	6164	2P	BG10NUC-LC391	10239	2P	BG18NUC-HC697
2089	2P	BG4NUC-HC267	6165	2P	BG10NUC-LC392	10240	2P	BG18NUC-HC698
2090	2P	BG4NUC-HC268	6166	2P	BG10NUC-LC393	10241	2P	BG18NUC-HC699
2091	RBD	BG4NUC-HC269	6167	2P	BG10NUC-LC394	10242	2P	BG18NUC-HC700
2092	RBD	BG4NUC-HC270	6168	2P	BG10NUC-LC395	10243	2P	BG18NUC-HC701
2093	RBD	BG4NUC-HC271	6169	2P	BG10NUC-LC396	10244	2P	BG18NUC-HC702
2094	2P	BG4NUC-HC272	6170	RBD	BG10NUC-LC397	10245	2P	BG18NUC-HC703
2095	RBD	BG4NUC-HC273	6171	2P	BG10NUC-LC398	10246	2P	BG18NUC-HC704
2096	2P	BG4NUC-HC274	6172	2P	BG10NUC-LC399	10247	2P	BG18NUC-HC705
2097	2P	BG4NUC-HC275	6173	RBD	BG10NUC-LC400	10248	2P	BG18NUC-HC706
2098	RBD	BG4NUC-HC276	6174	2P	BG10NUC-LC401	10249	RBD	BG18NUC-HC707
2099	RBD	BG4NUC-HC277	6175	2P	BG10NUC-LC402	10250	2P	BG18NUC-HC708
2100	RBD	BG4NUC-HC278	6176	2P	BG10NUC-LC403	10251	2P	BG18NUC-HC709

2101	2P	BG4NUC-HC279	6177	RBD	BG10NUC-LC404	10252	2P	BG18NUC-HC710
2102	RBD	BG4NUC-HC280	6178	RBD	BG10NUC-LC405	10253	RBD	BG18NUC-HC711
2103	RBD	BG4NUC-HC281	6179	2P	BG10NUC-LC406	10254	2P	BG18NUC-HC712
2104	2P	BG4NUC-HC282	6180	2P	BG10NUC-LC407	10255	RBD	BG18NUC-HC713
2105	2P	BG4NUC-HC283	6181	2P	BG10NUC-LC408	10256	RBD	BG18NUC-HC714
2106	2P	BG4NUC-HC284	6182	2P	BG10NUC-LC409	10257	RBD	BG18NUC-HC715
2107	RBD	BG4NUC-HC285	6183	RBD	BG10NUC-LC410	10258	RBD	BG18NUC-HC716
2108	2P	BG4NUC-HC286	6184	2P	BG10NUC-LC411	10259	RBD	BG18NUC-HC717
2109	2P	BG4NUC-HC287	6185	2P	BG10NUC-LC412	10260	2P	BG18NUC-HC718
2110	RBD	BG4NUC-HC288	6186	2P	BG10NUC-LC413	10261	2P	BG18NUC-HC719
2111	2P	BG4NUC-HC289	6187	RBD	BG10NUC-LC414	10262	RBD	BG18NUC-HC720
2112	2P	BG4NUC-HC290	6188	2P	BG10NUC-LC415	10263	RBD	BG18NUC-HC721
2113	RBD	BG4NUC-HC291	6189	RBD	BG10NUC-LC416	10264	RBD	BG18NUC-HC722
2114	2P	BG4NUC-HC292	6190	2P	BG10NUC-LC417	10265	2P	BG18NUC-HC723
2115	RBD	BG4NUC-HC293	6191	RBD	BG10NUC-LC418	10266	RBD	BG18NUC-HC724
2116	2P	BG4NUC-HC294	6192	RBD	BG10NUC-LC419	10267	2P	BG18NUC-HC725
2117	RBD	BG4NUC-HC295	6193	RBD	BG10NUC-LC420	10268	2P	BG18NUC-HC726
2118	2P	BG4NUC-HC296	6194	2P	BG10NUC-LC421	10269	2P	BG18NUC-HC727
2119	RBD	BG4NUC-HC297	6195	RBD	BG10NUC-LC422	10270	2P	BG18NUC-HC728
2120	2P	BG4NUC-HC298	6196	RBD	BG10NUC-LC423	10271	2P	BG18NUC-HC729
2121	2P	BG4NUC-HC299	6197	RBD	BG10NUC-LC424	10272	2P	BG18NUC-HC730
2122	2P	BG4NUC-HC300	6198	RBD	BG10NUC-LC425	10273	RBD	BG18NUC-HC731
2123	2P	BG4NUC-HC301	6199	2P	BG10NUC-LC426	10274	RBD	BG18NUC-HC732
2124	2P	BG4NUC-HC302	6200	RBD	BG10NUC-LC427	10275	2P	BG18NUC-HC733
2125	2P	BG4NUC-HC303	6201	RBD	BG13NUC-HC1	10276	RBD	BG18NUC-HC734
2126	2P	BG4NUC-HC304	6202	RBD	BG13NUC-HC2	10277	2P	BG18NUC-HC735
2127	2P	BG4NUC-HC305	6203	RBD	BG13NUC-HC3	10278	2P	BG18NUC-HC736
2128	RBD	BG4NUC-HC306	6204	RBD	BG13NUC-HC4	10279	2P	BG18NUC-HC737
2129	2P	BG4NUC-HC307	6205	RBD	BG13NUC-HC5	10280	2P	BG18NUC-HC738
2130	2P	BG4NUC-HC308	6206	RBD	BG13NUC-HC6	10281	RBD	BG18NUC-HC739
2131	2P	BG4NUC-HC309	6207	RBD	BG13NUC-HC7	10282	2P	BG18NUC-HC740
2132	2P	BG4NUC-HC310	6208	RBD	BG13NUC-HC8	10283	2P	BG18NUC-HC741
2133	RBD	BG4NUC-HC311	6209	RBD	BG13NUC-HC9	10284	2P	BG18NUC-HC742
2134	2P	BG4NUC-HC312	6210	RBD	BG13NUC-HC10	10285	2P	BG18NUC-HC743
2135	2P	BG4NUC-HC313	6211	RBD	BG13NUC-HC11	10286	RBD	BG18NUC-HC744
2136	2P	BG4NUC-HC314	6212	2P	BG13NUC-HC12	10287	2P	BG18NUC-HC745
2137	2P	BG4NUC-HC315	6213	2P	BG13NUC-HC13	10288	RBD	BG18NUC-HC746
2138	2P	BG4NUC-HC316	6214	2P	BG13NUC-HC14	10289	RBD	BG18NUC-HC747
2139	RBD	BG4NUC-HC317	6215	2P	BG13NUC-HC15	10290	RBD	BG18NUC-HC748
2140	RBD	BG4NUC-HC318	6216	2P	BG13NUC-HC16	10291	2P	BG18NUC-HC749
2141	2P	BG4NUC-HC319	6217	2P	BG13NUC-HC17	10292	2P	BG18NUC-HC750
2142	2P	BG4NUC-HC320	6218	2P	BG13NUC-HC18	10293	2P	BG18NUC-HC751
2143	2P	BG4NUC-HC321	6219	2P	BG13NUC-HC19	10294	2P	BG18NUC-LC1
2144	RBD	BG4NUC-HC322	6220	RBD	BG13NUC-HC20	10295	2P	BG18NUC-LC2
2145	2P	BG4NUC-HC323	6221	RBD	BG13NUC-HC21	10296	RBD	BG18NUC-LC3
2146	RBD	BG4NUC-HC324	6222	RBD	BG13NUC-HC22	10297	2P	BG18NUC-LC4
2147	2P	BG4NUC-HC325	6223	RBD	BG13NUC-HC23	10298	2P	BG18NUC-LC5
2148	RBD	BG4NUC-HC326	6224	RBD	BG13NUC-HC24	10299	RBD	BG18NUC-LC6
2149	RBD	BG4NUC-HC327	6225	RBD	BG13NUC-HC25	10300	2P	BG18NUC-LC7
2150	RBD	BG4NUC-HC328	6226	RBD	BG13NUC-HC26	10301	2P	BG18NUC-LC8
2151	2P	BG4NUC-HC329	6227	2P	BG13NUC-HC27	10302	RBD	BG18NUC-LC9
2152	2P	BG4NUC-HC330	6228	2P	BG13NUC-HC28	10303	2P	BG18NUC-LC10
2153	RBD	BG4NUC-HC331	6229	2P	BG13NUC-HC29	10304	2P	BG18NUC-LC11
2154	2P	BG4NUC-HC332	6230	2P	BG13NUC-HC30	10305	2P	BG18NUC-LC12
2155	2P	BG4NUC-HC333	6231	2P	BG13NUC-HC31	10306	2P	BG18NUC-LC13
2156	2P	BG4NUC-HC334	6232	2P	BG13NUC-HC32	10307	2P	BG18NUC-LC14
2157	2P	BG4NUC-HC335	6233	2P	BG13NUC-HC33	10308	2P	BG18NUC-LC15
2158	RBD	BG4NUC-HC336	6234	2P	BG13NUC-HC34	10309	2P	BG18NUC-LC16
2159	2P	BG4NUC-HC337	6235	RBD	BG13NUC-HC35	10310	RBD	BG18NUC-LC17
2160	RBD	BG4NUC-HC338	6236	RBD	BG13NUC-HC36	10311	2P	BG18NUC-LC18
2161	2P	BG4NUC-HC339	6237	RBD	BG13NUC-HC37	10312	2P	BG18NUC-LC19
2162	RBD	BG4NUC-HC340	6238	RBD	BG13NUC-HC38	10313	RBD	BG18NUC-LC20
2163	2P	BG4NUC-HC341	6239	RBD	BG13NUC-HC39	10314	2P	BG18NUC-LC21
2164	RBD	BG4NUC-HC342	6240	RBD	BG13NUC-HC40	10315	RBD	BG18NUC-LC22
2165	RBD	BG4NUC-HC343	6241	RBD	BG13NUC-HC41	10316	2P	BG18NUC-LC23
2166	RBD	BG4NUC-HC344	6242	2P	BG13NUC-HC42	10317	2P	BG18NUC-LC24
2167	2P	BG4NUC-HC345	6243	2P	BG13NUC-HC43	10318	2P	BG18NUC-LC25
2168	RBD	BG4NUC-HC346	6244	2P	BG13NUC-HC44	10319	2P	BG18NUC-LC26
2169	2P	BG4NUC-HC347	6245	2P	BG13NUC-HC45	10320	2P	BG18NUC-LC27
2170	RBD	BG4NUC-HC348	6246	2P	BG13NUC-HC46	10321	2P	BG18NUC-LC28
2171	2P	BG4NUC-HC349	6247	RBD	BG13NUC-HC47	10322	2P	BG18NUC-LC29
2172	2P	BG4NUC-HC350	6248	RBD	BG13NUC-HC48	10323	2P	BG18NUC-LC30
2173	2P	BG4NUC-HC351	6249	RBD	BG13NUC-HC49	10324	RBD	BG18NUC-LC31
2174	2P	BG4NUC-HC352	6250	RBD	BG13NUC-HC50	10325	RBD	BG18NUC-LC32
2175	RBD	BG4NUC-HC353	6251	RBD	BG13NUC-HC51	10326	RBD	BG18NUC-LC33
2176	RBD	BG4NUC-HC354	6252	RBD	BG13NUC-HC52	10327	2P	BG18NUC-LC34
2177	RBD	BG4NUC-HC355	6253	RBD	BG13NUC-HC53	10328	2P	BG18NUC-LC35
2178	2P	BG4NUC-HC356	6254	RBD	BG13NUC-HC54	10329	2P	BG18NUC-LC36
2179	2P	BG4NUC-HC357	6255	RBD	BG13NUC-HC55	10330	2P	BG18NUC-LC37

2180	RBD	BG4NUC-HC358	6256	RBD	BG13NUC-HC56	10331	2P	BG18NUC-LC38
2181	RBD	BG4NUC-HC359	6257	2P	BG13NUC-HC57	10332	2P	BG18NUC-LC39
2182	RBD	BG4NUC-HC360	6258	2P	BG13NUC-HC58	10333	2P	BG18NUC-LC40
2183	RBD	BG4NUC-HC361	6259	RBD	BG13NUC-HC59	10334	RBD	BG18NUC-LC41
2184	RBD	BG4NUC-HC362	6260	RBD	BG13NUC-HC60	10335	RBD	BG18NUC-LC42
2185	2P	BG4NUC-HC363	6261	RBD	BG13NUC-HC61	10336	2P	BG18NUC-LC43
2186	2P	BG4NUC-HC364	6262	RBD	BG13NUC-HC62	10337	2P	BG18NUC-LC44
2187	RBD	BG4NUC-HC365	6263	RBD	BG13NUC-HC63	10338	2P	BG18NUC-LC45
2188	2P	BG4NUC-HC366	6264	RBD	BG13NUC-HC64	10339	RBD	BG18NUC-LC46
2189	2P	BG4NUC-HC367	6265	RBD	BG13NUC-HC65	10340	2P	BG18NUC-LC47
2190	2P	BG4NUC-HC368	6266	RBD	BG13NUC-HC66	10341	2P	BG18NUC-LC48
2191	2P	BG4NUC-HC369	6267	2P	BG13NUC-HC67	10342	2P	BG18NUC-LC49
2192	2P	BG4NUC-HC370	6268	2P	BG13NUC-HC68	10343	2P	BG18NUC-LC50
2193	2P	BG4NUC-HC371	6269	RBD	BG13NUC-HC69	10344	2P	BG18NUC-LC51
2194	2P	BG4NUC-HC372	6270	RBD	BG13NUC-HC70	10345	2P	BG18NUC-LC52
2195	2P	BG4NUC-HC373	6271	RBD	BG13NUC-HC71	10346	2P	BG18NUC-LC53
2196	2P	BG4NUC-HC374	6272	RBD	BG13NUC-HC72	10347	RBD	BG18NUC-LC54
2197	RBD	BG4NUC-HC375	6273	RBD	BG13NUC-HC73	10348	2P	BG18NUC-LC55
2198	2P	BG4NUC-HC376	6274	2P	BG13NUC-HC74	10349	2P	BG18NUC-LC56
2199	2P	BG4NUC-HC377	6275	2P	BG13NUC-HC75	10350	2P	BG18NUC-LC57
2200	2P	BG4NUC-HC378	6276	2P	BG13NUC-HC76	10351	2P	BG18NUC-LC58
2201	RBD	BG4NUC-HC379	6277	2P	BG13NUC-HC77	10352	RBD	BG18NUC-LC59
2202	2P	BG4NUC-HC380	6278	2P	BG13NUC-HC78	10353	2P	BG18NUC-LC60
2203	2P	BG4NUC-HC381	6279	RBD	BG13NUC-HC79	10354	2P	BG18NUC-LC61
2204	2P	BG4NUC-HC382	6280	RBD	BG13NUC-HC80	10355	2P	BG18NUC-LC62
2205	2P	BG4NUC-HC383	6281	RBD	BG13NUC-HC81	10356	RBD	BG18NUC-LC63
2206	2P	BG4NUC-HC384	6282	RBD	BG13NUC-HC82	10357	RBD	BG18NUC-LC64
2207	2P	BG4NUC-HC385	6283	RBD	BG13NUC-HC83	10358	2P	BG18NUC-LC65
2208	RBD	BG4NUC-HC386	6284	2P	BG13NUC-HC84	10359	2P	BG18NUC-LC66
2209	RBD	BG4NUC-HC387	6285	2P	BG13NUC-HC85	10360	2P	BG18NUC-LC67
2210	2P	BG4NUC-HC388	6286	2P	BG13NUC-HC86	10361	2P	BG18NUC-LC68
2211	2P	BG4NUC-HC389	6287	RBD	BG13NUC-HC87	10362	RBD	BG18NUC-LC69
2212	2P	BG4NUC-HC390	6288	RBD	BG13NUC-HC88	10363	2P	BG18NUC-LC70
2213	2P	BG4NUC-HC391	6289	RBD	BG13NUC-HC89	10364	RBD	BG18NUC-LC71
2214	2P	BG4NUC-HC392	6290	RBD	BG13NUC-HC90	10365	2P	BG18NUC-LC72
2215	2P	BG4NUC-HC393	6291	RBD	BG13NUC-HC91	10366	2P	BG18NUC-LC73
2216	RBD	BG4NUC-HC394	6292	2P	BG13NUC-HC92	10367	2P	BG18NUC-LC74
2217	2P	BG4NUC-HC395	6293	2P	BG13NUC-HC93	10368	2P	BG18NUC-LC75
2218	2P	BG4NUC-HC396	6294	2P	BG13NUC-HC94	10369	2P	BG18NUC-LC76
2219	2P	BG4NUC-HC397	6295	RBD	BG13NUC-HC95	10370	RBD	BG18NUC-LC77
2220	2P	BG4NUC-HC398	6296	RBD	BG13NUC-HC96	10371	RBD	BG18NUC-LC78
2221	2P	BG4NUC-HC399	6297	RBD	BG13NUC-HC97	10372	2P	BG18NUC-LC79
2222	RBD	BG4NUC-HC400	6298	RBD	BG13NUC-HC98	10373	2P	BG18NUC-LC80
2223	RBD	BG4NUC-HC401	6299	RBD	BG13NUC-HC99	10374	2P	BG18NUC-LC81
2224	2P	BG4NUC-HC402	6300	2P	BG13NUC-HC100	10375	2P	BG18NUC-LC82
2225	2P	BG4NUC-HC403	6301	2P	BG13NUC-HC101	10376	2P	BG18NUC-LC83
2226	2P	BG4NUC-HC404	6302	RBD	BG13NUC-HC102	10377	2P	BG18NUC-LC84
2227	RBD	BG4NUC-HC405	6303	RBD	BG13NUC-HC103	10378	2P	BG18NUC-LC85
2228	2P	BG4NUC-HC406	6304	2P	BG13NUC-HC104	10379	2P	BG18NUC-LC86
2229	RBD	BG4NUC-HC407	6305	2P	BG13NUC-HC105	10380	2P	BG18NUC-LC87
2230	2P	BG4NUC-HC408	6306	RBD	BG13NUC-HC106	10381	2P	BG18NUC-LC88
2231	2P	BG4NUC-HC409	6307	RBD	BG13NUC-HC107	10382	2P	BG18NUC-LC89
2232	2P	BG4NUC-LC1	6308	RBD	BG13NUC-HC108	10383	2P	BG18NUC-LC90
2233	2P	BG4NUC-LC2	6309	RBD	BG13NUC-HC109	10384	RBD	BG18NUC-LC91
2234	2P	BG4NUC-LC3	6310	RBD	BG13NUC-HC110	10385	RBD	BG18NUC-LC92
2235	2P	BG4NUC-LC4	6311	2P	BG13NUC-HC111	10386	2P	BG18NUC-LC93
2236	2P	BG4NUC-LC5	6312	2P	BG13NUC-HC112	10387	2P	BG18NUC-LC94
2237	2P	BG4NUC-LC6	6313	RBD	BG13NUC-HC113	10388	2P	BG18NUC-LC95
2238	2P	BG4NUC-LC7	6314	RBD	BG13NUC-HC114	10389	RBD	BG18NUC-LC96
2239	2P	BG4NUC-LC8	6315	RBD	BG13NUC-HC115	10390	2P	BG18NUC-LC97
2240	2P	BG4NUC-LC9	6316	RBD	BG13NUC-HC116	10391	2P	BG18NUC-LC98
2241	2P	BG4NUC-LC10	6317	RBD	BG13NUC-HC117	10392	2P	BG18NUC-LC99
2242	2P	BG4NUC-LC11	6318	RBD	BG13NUC-HC118	10393	2P	BG18NUC-LC100
2243	2P	BG4NUC-LC12	6319	RBD	BG13NUC-HC119	10394	RBD	BG18NUC-LC101
2244	2P	BG4NUC-LC13	6320	2P	BG13NUC-HC120	10395	2P	BG18NUC-LC102
2245	2P	BG4NUC-LC14	6321	2P	BG13NUC-HC121	10396	RBD	BG18NUC-LC103
2246	RBD	BG4NUC-LC15	6322	2P	BG13NUC-HC122	10397	RBD	BG18NUC-LC104
2247	2P	BG4NUC-LC16	6323	RBD	BG13NUC-HC123	10398	2P	BG18NUC-LC105
2248	2P	BG4NUC-LC17	6324	RBD	BG13NUC-HC124	10399	RBD	BG18NUC-LC106
2249	2P	BG4NUC-LC18	6325	RBD	BG13NUC-HC125	10400	RBD	BG18NUC-LC107
2250	RBD	BG4NUC-LC19	6326	2P	BG13NUC-HC126	10401	2P	BG18NUC-LC108
2251	2P	BG4NUC-LC20	6327	2P	BG13NUC-HC127	10402	2P	BG18NUC-LC109
2252	2P	BG4NUC-LC21	6328	2P	BG13NUC-HC128	10403	RBD	BG18NUC-LC110
2253	RBD	BG4NUC-LC22	6329	2P	BG13NUC-HC129	10404	2P	BG18NUC-LC111
2254	RBD	BG4NUC-LC23	6330	2P	BG13NUC-HC130	10405	2P	BG18NUC-LC112
2255	2P	BG4NUC-LC24	6331	2P	BG13NUC-HC131	10406	2P	BG18NUC-LC113
2256	RBD	BG4NUC-LC25	6332	2P	BG13NUC-HC132	10407	2P	BG18NUC-LC114
2257	RBD	BG4NUC-LC26	6333	RBD	BG13NUC-HC133	10408	2P	BG18NUC-LC115
2258	RBD	BG4NUC-LC27	6334	RBD	BG13NUC-HC134	10409	RBD	BG18NUC-LC116

2259	RBD	BG4NUC-LC28	6335	2P	BG13NUC-HC135	10410	2P	BG18NUC-LC117
2260	RBD	BG4NUC-LC29	6336	2P	BG13NUC-HC136	10411	2P	BG18NUC-LC118
2261	RBD	BG4NUC-LC30	6337	RBD	BG13NUC-HC137	10412	2P	BG18NUC-LC119
2262	RBD	BG4NUC-LC31	6338	RBD	BG13NUC-HC138	10413	2P	BG18NUC-LC120
2263	RBD	BG4NUC-LC32	6339	RBD	BG13NUC-HC139	10414	2P	BG18NUC-LC121
2264	RBD	BG4NUC-LC33	6340	2P	BG13NUC-HC140	10415	2P	BG18NUC-LC122
2265	RBD	BG4NUC-LC34	6341	RBD	BG13NUC-HC141	10416	2P	BG18NUC-LC123
2266	2P	BG4NUC-LC35	6342	RBD	BG13NUC-HC142	10417	2P	BG18NUC-LC124
2267	RBD	BG4NUC-LC36	6343	RBD	BG13NUC-HC143	10418	2P	BG18NUC-LC125
2268	RBD	BG4NUC-LC37	6344	2P	BG13NUC-HC144	10419	2P	BG18NUC-LC126
2269	RBD	BG4NUC-LC38	6345	RBD	BG13NUC-HC145	10420	2P	BG18NUC-LC127
2270	2P	BG4NUC-LC39	6346	RBD	BG13NUC-HC146	10421	2P	BG18NUC-LC128
2271	2P	BG4NUC-LC40	6347	RBD	BG13NUC-HC147	10422	2P	BG18NUC-LC129
2272	2P	BG4NUC-LC41	6348	2P	BG13NUC-HC148	10423	2P	BG18NUC-LC130
2273	RBD	BG4NUC-LC42	6349	RBD	BG13NUC-HC149	10424	2P	BG18NUC-LC131
2274	2P	BG4NUC-LC43	6350	2P	BG13NUC-HC150	10425	RBD	BG18NUC-LC132
2275	2P	BG4NUC-LC44	6351	2P	BG13NUC-HC151	10426	2P	BG18NUC-LC133
2276	RBD	BG4NUC-LC45	6352	2P	BG13NUC-HC152	10427	RBD	BG18NUC-LC134
2277	2P	BG4NUC-LC46	6353	RBD	BG13NUC-HC153	10428	2P	BG18NUC-LC135
2278	2P	BG4NUC-LC47	6354	RBD	BG13NUC-HC154	10429	2P	BG18NUC-LC136
2279	RBD	BG4NUC-LC48	6355	2P	BG13NUC-HC155	10430	RBD	BG18NUC-LC137
2280	RBD	BG4NUC-LC49	6356	2P	BG13NUC-HC156	10431	2P	BG18NUC-LC138
2281	2P	BG4NUC-LC50	6357	RBD	BG13NUC-HC157	10432	RBD	BG18NUC-LC139
2282	RBD	BG4NUC-LC51	6358	RBD	BG13NUC-HC158	10433	RBD	BG18NUC-LC140
2283	2P	BG4NUC-LC52	6359	RBD	BG13NUC-HC159	10434	RBD	BG18NUC-LC141
2284	2P	BG4NUC-LC53	6360	2P	BG13NUC-HC160	10435	2P	BG18NUC-LC142
2285	RBD	BG4NUC-LC54	6361	2P	BG13NUC-HC161	10436	2P	BG18NUC-LC143
2286	2P	BG4NUC-LC55	6362	2P	BG13NUC-HC162	10437	2P	BG18NUC-LC144
2287	2P	BG4NUC-LC56	6363	RBD	BG13NUC-HC163	10438	2P	BG18NUC-LC145
2288	2P	BG4NUC-LC57	6364	2P	BG13NUC-HC164	10439	2P	BG18NUC-LC146
2289	RBD	BG4NUC-LC58	6365	RBD	BG13NUC-HC165	10440	2P	BG18NUC-LC147
2290	RBD	BG4NUC-LC59	6366	RBD	BG13NUC-HC166	10441	2P	BG18NUC-LC148
2291	2P	BG4NUC-LC60	6367	RBD	BG13NUC-HC167	10442	2P	BG18NUC-LC149
2292	2P	BG4NUC-LC61	6368	2P	BG13NUC-HC168	10443	2P	BG18NUC-LC150
2293	2P	BG4NUC-LC62	6369	RBD	BG13NUC-HC169	10444	2P	BG18NUC-LC151
2294	RBD	BG4NUC-LC63	6370	2P	BG13NUC-HC170	10445	2P	BG18NUC-LC152
2295	RBD	BG4NUC-LC64	6371	RBD	BG13NUC-HC171	10446	2P	BG18NUC-LC153
2296	RBD	BG4NUC-LC65	6372	RBD	BG13NUC-HC172	10447	2P	BG18NUC-LC154
2297	2P	BG4NUC-LC66	6373	RBD	BG13NUC-HC173	10448	RBD	BG18NUC-LC155
2298	2P	BG4NUC-LC67	6374	RBD	BG13NUC-HC174	10449	2P	BG18NUC-LC156
2299	2P	BG4NUC-LC68	6375	RBD	BG13NUC-HC175	10450	2P	BG18NUC-LC157
2300	RBD	BG4NUC-LC69	6376	RBD	BG13NUC-HC176	10451	2P	BG18NUC-LC158
2301	2P	BG4NUC-LC70	6377	RBD	BG13NUC-HC177	10452	2P	BG18NUC-LC159
2302	RBD	BG4NUC-LC71	6378	2P	BG13NUC-HC178	10453	2P	BG18NUC-LC160
2303	2P	BG4NUC-LC72	6379	2P	BG13NUC-HC179	10454	2P	BG18NUC-LC161
2304	RBD	BG4NUC-LC73	6380	2P	BG13NUC-HC180	10455	2P	BG18NUC-LC162
2305	2P	BG4NUC-LC74	6381	2P	BG13NUC-HC181	10456	RBD	BG18NUC-LC163
2306	RBD	BG4NUC-LC75	6382	2P	BG13NUC-HC182	10457	2P	BG18NUC-LC164
2307	2P	BG4NUC-LC76	6383	2P	BG13NUC-HC183	10458	RBD	BG18NUC-LC165
2308	2P	BG4NUC-LC77	6384	RBD	BG13NUC-HC184	10459	RBD	BG18NUC-LC166
2309	2P	BG4NUC-LC78	6385	RBD	BG13NUC-HC185	10460	2P	BG18NUC-LC167
2310	2P	BG4NUC-LC79	6386	RBD	BG13NUC-HC186	10461	2P	BG18NUC-LC168
2311	RBD	BG4NUC-LC80	6387	RBD	BG13NUC-HC187	10462	RBD	BG18NUC-LC169
2312	RBD	BG4NUC-LC81	6388	2P	BG13NUC-HC188	10463	2P	BG18NUC-LC170
2313	RBD	BG4NUC-LC82	6389	2P	BG13NUC-HC189	10464	2P	BG18NUC-LC171
2314	RBD	BG4NUC-LC83	6390	2P	BG13NUC-HC190	10465	2P	BG18NUC-LC172
2315	2P	BG4NUC-LC84	6391	RBD	BG13NUC-HC191	10466	2P	BG18NUC-LC173
2316	2P	BG4NUC-LC85	6392	2P	BG13NUC-HC192	10467	2P	BG18NUC-LC174
2317	2P	BG4NUC-LC86	6393	2P	BG13NUC-HC193	10468	2P	BG18NUC-LC175
2318	2P	BG4NUC-LC87	6394	2P	BG13NUC-HC194	10469	2P	BG18NUC-LC176
2319	2P	BG4NUC-LC88	6395	RBD	BG13NUC-HC195	10470	2P	BG18NUC-LC177
2320	RBD	BG4NUC-LC89	6396	2P	BG13NUC-HC196	10471	2P	BG18NUC-LC178
2321	RBD	BG4NUC-LC90	6397	RBD	BG13NUC-HC197	10472	2P	BG18NUC-LC179
2322	2P	BG4NUC-LC91	6398	2P	BG13NUC-HC198	10473	RBD	BG18NUC-LC180
2323	2P	BG4NUC-LC92	6399	RBD	BG13NUC-HC199	10474	RBD	BG18NUC-LC181
2324	2P	BG4NUC-LC93	6400	RBD	BG13NUC-HC200	10475	2P	BG18NUC-LC182
2325	RBD	BG4NUC-LC94	6401	RBD	BG13NUC-HC201	10476	2P	BG18NUC-LC183
2326	2P	BG4NUC-LC95	6402	2P	BG13NUC-HC202	10477	2P	BG18NUC-LC184
2327	RBD	BG4NUC-LC96	6403	2P	BG13NUC-HC203	10478	2P	BG18NUC-LC185
2328	RBD	BG4NUC-LC97	6404	2P	BG13NUC-HC204	10479	RBD	BG18NUC-LC186
2329	RBD	BG4NUC-LC98	6405	2P	BG13NUC-HC205	10480	2P	BG18NUC-LC187
2330	2P	BG4NUC-LC99	6406	2P	BG13NUC-HC206	10481	2P	BG18NUC-LC188
2331	2P	BG4NUC-LC100	6407	RBD	BG13NUC-HC207	10482	2P	BG18NUC-LC189
2332	2P	BG4NUC-LC101	6408	2P	BG13NUC-HC208	10483	2P	BG18NUC-LC190
2333	RBD	BG4NUC-LC102	6409	RBD	BG13NUC-HC209	10484	2P	BG18NUC-LC191
2334	2P	BG4NUC-LC103	6410	2P	BG13NUC-HC210	10485	2P	BG18NUC-LC192
2335	2P	BG4NUC-LC104	6411	RBD	BG13NUC-HC211	10486	RBD	BG18NUC-LC193
2336	2P	BG4NUC-LC105	6412	2P	BG13NUC-HC212	10487	2P	BG18NUC-LC194
2337	2P	BG4NUC-LC106	6413	RBD	BG13NUC-HC213	10488	2P	BG18NUC-LC195

2338	2P	BG4NUC-LC107	6414	2P	BG13NUC-HC214	10489	RBD	BG18NUC-LC196
2339	2P	BG4NUC-LC108	6415	RBD	BG13NUC-HC215	10490	RBD	BG18NUC-LC197
2340	2P	BG4NUC-LC109	6416	RBD	BG13NUC-HC216	10491	RBD	BG18NUC-LC198
2341	2P	BG4NUC-LC110	6417	RBD	BG13NUC-HC217	10492	RBD	BG18NUC-LC199
2342	2P	BG4NUC-LC111	6418	2P	BG13NUC-HC218	10493	2P	BG18NUC-LC200
2343	2P	BG4NUC-LC112	6419	RBD	BG13NUC-HC219	10494	RBD	BG18NUC-LC201
2344	RBD	BG4NUC-LC113	6420	RBD	BG13NUC-HC220	10495	2P	BG18NUC-LC202
2345	RBD	BG4NUC-LC114	6421	2P	BG13NUC-HC221	10496	RBD	BG18NUC-LC203
2346	RBD	BG4NUC-LC115	6422	2P	BG13NUC-HC222	10497	2P	BG18NUC-LC204
2347	2P	BG4NUC-LC116	6423	RBD	BG13NUC-HC223	10498	RBD	BG18NUC-LC205
2348	RBD	BG4NUC-LC117	6424	2P	BG13NUC-HC224	10499	2P	BG18NUC-LC206
2349	2P	BG4NUC-LC118	6425	RBD	BG13NUC-HC225	10500	2P	BG18NUC-LC207
2350	2P	BG4NUC-LC119	6426	2P	BG13NUC-HC226	10501	2P	BG18NUC-LC208
2351	2P	BG4NUC-LC120	6427	2P	BG13NUC-HC227	10502	2P	BG18NUC-LC209
2352	RBD	BG4NUC-LC121	6428	2P	BG13NUC-HC228	10503	2P	BG18NUC-LC210
2353	2P	BG4NUC-LC122	6429	RBD	BG13NUC-HC229	10504	2P	BG18NUC-LC211
2354	RBD	BG4NUC-LC123	6430	RBD	BG13NUC-HC230	10505	RBD	BG18NUC-LC212
2355	2P	BG4NUC-LC124	6431	RBD	BG13NUC-HC231	10506	2P	BG18NUC-LC213
2356	RBD	BG4NUC-LC125	6432	2P	BG13NUC-HC232	10507	RBD	BG18NUC-LC214
2357	RBD	BG4NUC-LC126	6433	2P	BG13NUC-HC233	10508	RBD	BG18NUC-LC215
2358	2P	BG4NUC-LC127	6434	2P	BG13NUC-HC234	10509	RBD	BG18NUC-LC216
2359	RBD	BG4NUC-LC128	6435	RBD	BG13NUC-HC235	10510	RBD	BG18NUC-LC217
2360	RBD	BG4NUC-LC129	6436	2P	BG13NUC-HC236	10511	2P	BG18NUC-LC218
2361	2P	BG4NUC-LC130	6437	2P	BG13NUC-HC237	10512	RBD	BG18NUC-LC219
2362	2P	BG4NUC-LC131	6438	2P	BG13NUC-HC238	10513	2P	BG18NUC-LC220
2363	2P	BG4NUC-LC132	6439	RBD	BG13NUC-HC239	10514	2P	BG18NUC-LC221
2364	2P	BG4NUC-LC133	6440	RBD	BG13NUC-HC240	10515	2P	BG18NUC-LC222
2365	RBD	BG4NUC-LC134	6441	RBD	BG13NUC-HC241	10516	2P	BG18NUC-LC223
2366	2P	BG4NUC-LC135	6442	RBD	BG13NUC-HC242	10517	RBD	BG18NUC-LC224
2367	2P	BG4NUC-LC136	6443	RBD	BG13NUC-HC243	10518	RBD	BG18NUC-LC225
2368	2P	BG4NUC-LC137	6444	RBD	BG13NUC-HC244	10519	2P	BG18NUC-LC226
2369	2P	BG4NUC-LC138	6445	RBD	BG13NUC-HC245	10520	2P	BG18NUC-LC227
2370	2P	BG4NUC-LC139	6446	2P	BG13NUC-HC246	10521	2P	BG18NUC-LC228
2371	2P	BG4NUC-LC140	6447	RBD	BG13NUC-HC247	10522	2P	BG18NUC-LC229
2372	2P	BG4NUC-LC141	6448	2P	BG13NUC-HC248	10523	RBD	BG18NUC-LC230
2373	2P	BG4NUC-LC142	6449	RBD	BG13NUC-HC249	10524	2P	BG18NUC-LC231
2374	2P	BG4NUC-LC143	6450	2P	BG13NUC-HC250	10525	RBD	BG18NUC-LC232
2375	RBD	BG4NUC-LC144	6451	2P	BG13NUC-HC251	10526	2P	BG18NUC-LC233
2376	2P	BG4NUC-LC145	6452	2P	BG13NUC-HC252	10527	2P	BG18NUC-LC234
2377	2P	BG4NUC-LC146	6453	RBD	BG13NUC-HC253	10528	2P	BG18NUC-LC235
2378	2P	BG4NUC-LC147	6454	2P	BG13NUC-HC254	10529	2P	BG18NUC-LC236
2379	2P	BG4NUC-LC148	6455	RBD	BG13NUC-HC255	10530	2P	BG18NUC-LC237
2380	2P	BG4NUC-LC149	6456	2P	BG13NUC-HC256	10531	RBD	BG18NUC-LC238
2381	2P	BG4NUC-LC150	6457	RBD	BG13NUC-HC257	10532	RBD	BG18NUC-LC239
2382	2P	BG4NUC-LC151	6458	RBD	BG13NUC-HC258	10533	RBD	BG18NUC-LC240
2383	2P	BG4NUC-LC152	6459	2P	BG13NUC-HC259	10534	2P	BG18NUC-LC241
2384	2P	BG4NUC-LC153	6460	2P	BG13NUC-HC260	10535	RBD	BG18NUC-LC242
2385	2P	BG4NUC-LC154	6461	2P	BG13NUC-HC261	10536	2P	BG18NUC-LC243
2386	2P	BG4NUC-LC155	6462	2P	BG13NUC-HC262	10537	2P	BG18NUC-LC244
2387	RBD	BG4NUC-LC156	6463	RBD	BG13NUC-HC263	10538	2P	BG18NUC-LC245
2388	2P	BG4NUC-LC157	6464	RBD	BG13NUC-HC264	10539	2P	BG18NUC-LC246
2389	RBD	BG4NUC-LC158	6465	RBD	BG13NUC-HC265	10540	2P	BG18NUC-LC247
2390	2P	BG4NUC-LC159	6466	2P	BG13NUC-HC266	10541	2P	BG18NUC-LC248
2391	RBD	BG4NUC-LC160	6467	RBD	BG13NUC-HC267	10542	2P	BG18NUC-LC249
2392	RBD	BG4NUC-LC161	6468	2P	BG13NUC-HC268	10543	2P	BG18NUC-LC250
2393	RBD	BG4NUC-LC162	6469	RBD	BG13NUC-HC269	10544	2P	BG18NUC-LC251
2394	2P	BG4NUC-LC163	6470	2P	BG13NUC-HC270	10545	RBD	BG18NUC-LC252
2395	RBD	BG4NUC-LC164	6471	2P	BG13NUC-HC271	10546	2P	BG18NUC-LC253
2396	RBD	BG4NUC-LC165	6472	2P	BG13NUC-HC272	10547	RBD	BG18NUC-LC254
2397	RBD	BG4NUC-LC166	6473	2P	BG13NUC-HC273	10548	RBD	BG18NUC-LC255
2398	RBD	BG4NUC-LC167	6474	2P	BG13NUC-HC274	10549	2P	BG18NUC-LC256
2399	2P	BG4NUC-LC168	6475	2P	BG13NUC-HC275	10550	2P	BG18NUC-LC257
2400	2P	BG4NUC-LC169	6476	2P	BG13NUC-HC276	10551	2P	BG18NUC-LC258
2401	2P	BG4NUC-LC170	6477	RBD	BG13NUC-HC277	10552	RBD	BG18NUC-LC259
2402	RBD	BG4NUC-LC171	6478	2P	BG13NUC-HC278	10553	2P	BG18NUC-LC260
2403	2P	BG4NUC-LC172	6479	2P	BG13NUC-HC279	10554	RBD	BG18NUC-LC261
2404	2P	BG4NUC-LC173	6480	RBD	BG13NUC-HC280	10555	2P	BG18NUC-LC262
2405	RBD	BG4NUC-LC174	6481	RBD	BG13NUC-HC281	10556	RBD	BG18NUC-LC263
2406	2P	BG4NUC-LC175	6482	RBD	BG13NUC-HC282	10557	2P	BG18NUC-LC264
2407	RBD	BG4NUC-LC176	6483	RBD	BG13NUC-HC283	10558	2P	BG18NUC-LC265
2408	2P	BG4NUC-LC177	6484	RBD	BG13NUC-HC284	10559	2P	BG18NUC-LC266
2409	2P	BG4NUC-LC178	6485	RBD	BG13NUC-HC285	10560	RBD	BG18NUC-LC267
2410	2P	BG4NUC-LC179	6486	2P	BG13NUC-HC286	10561	2P	BG18NUC-LC268
2411	RBD	BG4NUC-LC180	6487	2P	BG13NUC-HC287	10562	2P	BG18NUC-LC269
2412	2P	BG4NUC-LC181	6488	RBD	BG13NUC-HC288	10563	2P	BG18NUC-LC270
2413	RBD	BG4NUC-LC182	6489	2P	BG13NUC-HC289	10564	2P	BG18NUC-LC271
2414	2P	BG4NUC-LC183	6490	2P	BG13NUC-HC290	10565	2P	BG18NUC-LC272
2415	2P	BG4NUC-LC184	6491	2P	BG13NUC-HC291	10566	2P	BG18NUC-LC273
2416	2P	BG4NUC-LC185	6492	RBD	BG13NUC-HC292	10567	2P	BG18NUC-LC274

2417	2P	BG4NUC-LC186	6493	2P	BG13NUC-HC293	10568	2P	BG18NUC-LC275
2418	2P	BG4NUC-LC187	6494	RBD	BG13NUC-HC294	10569	2P	BG18NUC-LC276
2419	2P	BG4NUC-LC188	6495	RBD	BG13NUC-HC295	10570	2P	BG18NUC-LC277
2420	2P	BG4NUC-LC189	6496	RBD	BG13NUC-HC296	10571	2P	BG18NUC-LC278
2421	2P	BG4NUC-LC190	6497	2P	BG13NUC-HC297	10572	RBD	BG18NUC-LC279
2422	2P	BG4NUC-LC191	6498	2P	BG13NUC-HC298	10573	2P	BG18NUC-LC280
2423	2P	BG4NUC-LC192	6499	RBD	BG13NUC-HC299	10574	2P	BG18NUC-LC281
2424	RBD	BG4NUC-LC193	6500	2P	BG13NUC-HC300	10575	RBD	BG18NUC-LC282
2425	2P	BG4NUC-LC194	6501	RBD	BG13NUC-HC301	10576	2P	BG18NUC-LC283
2426	RBD	BG4NUC-LC195	6502	2P	BG13NUC-HC302	10577	RBD	BG18NUC-LC284
2427	RBD	BG4NUC-LC196	6503	RBD	BG13NUC-HC303	10578	2P	BG18NUC-LC285
2428	RBD	BG4NUC-LC197	6504	2P	BG13NUC-HC304	10579	RBD	BG18NUC-LC286
2429	2P	BG4NUC-LC198	6505	RBD	BG13NUC-HC305	10580	RBD	BG18NUC-LC287
2430	2P	BG4NUC-LC199	6506	2P	BG13NUC-HC306	10581	2P	BG18NUC-LC288
2431	2P	BG4NUC-LC200	6507	2P	BG13NUC-HC307	10582	2P	BG18NUC-LC289
2432	2P	BG4NUC-LC201	6508	RBD	BG13NUC-HC308	10583	2P	BG18NUC-LC290
2433	2P	BG4NUC-LC202	6509	RBD	BG13NUC-HC309	10584	RBD	BG18NUC-LC291
2434	2P	BG4NUC-LC203	6510	2P	BG13NUC-HC310	10585	RBD	BG18NUC-LC292
2435	2P	BG4NUC-LC204	6511	RBD	BG13NUC-HC311	10586	RBD	BG18NUC-LC293
2436	2P	BG4NUC-LC205	6512	2P	BG13NUC-HC312	10587	2P	BG18NUC-LC294
2437	2P	BG4NUC-LC206	6513	2P	BG13NUC-HC313	10588	2P	BG18NUC-LC295
2438	2P	BG4NUC-LC207	6514	RBD	BG13NUC-HC314	10589	2P	BG18NUC-LC296
2439	2P	BG4NUC-LC208	6515	2P	BG13NUC-HC315	10590	2P	BG18NUC-LC297
2440	2P	BG4NUC-LC209	6516	2P	BG13NUC-HC316	10591	2P	BG18NUC-LC298
2441	RBD	BG4NUC-LC210	6517	RBD	BG13NUC-HC317	10592	RBD	BG18NUC-LC299
2442	RBD	BG4NUC-LC211	6518	2P	BG13NUC-HC318	10593	2P	BG18NUC-LC300
2443	RBD	BG4NUC-LC212	6519	RBD	BG13NUC-HC319	10594	2P	BG18NUC-LC301
2444	2P	BG4NUC-LC213	6520	RBD	BG13NUC-HC320	10595	2P	BG18NUC-LC302
2445	2P	BG4NUC-LC214	6521	2P	BG13NUC-HC321	10596	2P	BG18NUC-LC303
2446	2P	BG4NUC-LC215	6522	2P	BG13NUC-HC322	10597	2P	BG18NUC-LC304
2447	2P	BG4NUC-LC216	6523	2P	BG13NUC-HC323	10598	2P	BG18NUC-LC305
2448	RBD	BG4NUC-LC217	6524	RBD	BG13NUC-HC324	10599	2P	BG18NUC-LC306
2449	2P	BG4NUC-LC218	6525	RBD	BG13NUC-HC325	10600	2P	BG18NUC-LC307
2450	RBD	BG4NUC-LC219	6526	RBD	BG13NUC-HC326	10601	2P	BG18NUC-LC308
2451	RBD	BG4NUC-LC220	6527	2P	BG13NUC-HC327	10602	RBD	BG18NUC-LC309
2452	2P	BG4NUC-LC221	6528	2P	BG13NUC-HC328	10603	2P	BG18NUC-LC310
2453	RBD	BG4NUC-LC222	6529	2P	BG13NUC-HC329	10604	RBD	BG18NUC-LC311
2454	RBD	BG4NUC-LC223	6530	2P	BG13NUC-HC330	10605	2P	BG18NUC-LC312
2455	2P	BG4NUC-LC224	6531	RBD	BG13NUC-HC331	10606	2P	BG18NUC-LC313
2456	RBD	BG4NUC-LC225	6532	2P	BG13NUC-HC332	10607	2P	BG18NUC-LC314
2457	RBD	BG4NUC-LC226	6533	RBD	BG13NUC-HC333	10608	RBD	BG18NUC-LC315
2458	2P	BG4NUC-LC227	6534	RBD	BG13NUC-HC334	10609	2P	BG18NUC-LC316
2459	RBD	BG4NUC-LC228	6535	2P	BG13NUC-HC335	10610	2P	BG18NUC-LC317
2460	2P	BG4NUC-LC229	6536	RBD	BG13NUC-HC336	10611	2P	BG18NUC-LC318
2461	2P	BG4NUC-LC230	6537	RBD	BG13NUC-HC337	10612	2P	BG18NUC-LC319
2462	RBD	BG4NUC-LC231	6538	RBD	BG13NUC-HC338	10613	2P	BG18NUC-LC320
2463	2P	BG4NUC-LC232	6539	RBD	BG13NUC-HC339	10614	2P	BG18NUC-LC321
2464	2P	BG4NUC-LC233	6540	RBD	BG13NUC-HC340	10615	RBD	BG18NUC-LC322
2465	2P	BG4NUC-LC234	6541	2P	BG13NUC-HC341	10616	RBD	BG18NUC-LC323
2466	RBD	BG4NUC-LC235	6542	2P	BG13NUC-HC342	10617	RBD	BG18NUC-LC324
2467	RBD	BG4NUC-LC236	6543	2P	BG13NUC-HC343	10618	RBD	BG18NUC-LC325
2468	2P	BG4NUC-LC237	6544	RBD	BG13NUC-HC344	10619	2P	BG18NUC-LC326
2469	2P	BG4NUC-LC238	6545	2P	BG13NUC-HC345	10620	2P	BG18NUC-LC327
2470	2P	BG4NUC-LC239	6546	2P	BG13NUC-HC346	10621	RBD	BG18NUC-LC328
2471	2P	BG4NUC-LC240	6547	RBD	BG13NUC-HC347	10622	2P	BG18NUC-LC329
2472	2P	BG4NUC-LC241	6548	2P	BG13NUC-HC348	10623	2P	BG18NUC-LC330
2473	2P	BG4NUC-LC242	6549	2P	BG13NUC-HC349	10624	2P	BG18NUC-LC331
2474	2P	BG4NUC-LC243	6550	2P	BG13NUC-HC350	10625	2P	BG18NUC-LC332
2475	2P	BG4NUC-LC244	6551	2P	BG13NUC-HC351	10626	2P	BG18NUC-LC333
2476	2P	BG4NUC-LC245	6552	RBD	BG13NUC-HC352	10627	RBD	BG18NUC-LC334
2477	2P	BG4NUC-LC246	6553	2P	BG13NUC-HC353	10628	2P	BG18NUC-LC335
2478	RBD	BG4NUC-LC247	6554	RBD	BG13NUC-HC354	10629	RBD	BG18NUC-LC336
2479	RBD	BG4NUC-LC248	6555	2P	BG13NUC-HC355	10630	RBD	BG18NUC-LC337
2480	RBD	BG4NUC-LC249	6556	RBD	BG13NUC-HC356	10631	2P	BG18NUC-LC338
2481	RBD	BG4NUC-LC250	6557	2P	BG13NUC-HC357	10632	2P	BG18NUC-LC339
2482	2P	BG4NUC-LC251	6558	RBD	BG13NUC-HC358	10633	2P	BG18NUC-LC340
2483	2P	BG4NUC-LC252	6559	2P	BG13NUC-HC359	10634	RBD	BG18NUC-LC341
2484	2P	BG4NUC-LC253	6560	RBD	BG13NUC-HC360	10635	2P	BG18NUC-LC342
2485	RBD	BG4NUC-LC254	6561	2P	BG13NUC-HC361	10636	RBD	BG18NUC-LC343
2486	2P	BG4NUC-LC255	6562	2P	BG13NUC-HC362	10637	2P	BG18NUC-LC344
2487	RBD	BG4NUC-LC256	6563	RBD	BG13NUC-HC363	10638	2P	BG18NUC-LC345
2488	RBD	BG4NUC-LC257	6564	RBD	BG13NUC-HC364	10639	2P	BG18NUC-LC346
2489	RBD	BG4NUC-LC258	6565	RBD	BG13NUC-HC365	10640	2P	BG18NUC-LC347
2490	2P	BG4NUC-LC259	6566	2P	BG13NUC-HC366	10641	2P	BG18NUC-LC348
2491	RBD	BG4NUC-LC260	6567	2P	BG13NUC-HC367	10642	2P	BG18NUC-LC349
2492	2P	BG4NUC-LC261	6568	2P	BG13NUC-HC368	10643	2P	BG18NUC-LC350
2493	RBD	BG4NUC-LC262	6569	2P	BG13NUC-HC369	10644	RBD	BG18NUC-LC351
2494	RBD	BG4NUC-LC263	6570	RBD	BG13NUC-HC370	10645	2P	BG18NUC-LC352
2495	RBD	BG4NUC-LC264	6571	2P	BG13NUC-HC371	10646	2P	BG18NUC-LC353

2496	2P	BG4NUC-LC265	6572	2P	BG13NUC-HC372	10647	2P	BG18NUC-LC354
2497	RBD	BG4NUC-LC266	6573	2P	BG13NUC-HC373	10648	2P	BG18NUC-LC355
2498	2P	BG4NUC-LC267	6574	RBD	BG13NUC-HC374	10649	2P	BG18NUC-LC356
2499	2P	BG4NUC-LC268	6575	2P	BG13NUC-HC375	10650	2P	BG18NUC-LC357
2500	RBD	BG4NUC-LC269	6576	2P	BG13NUC-HC376	10651	RBD	BG18NUC-LC358
2501	RBD	BG4NUC-LC270	6577	RBD	BG13NUC-HC377	10652	2P	BG18NUC-LC359
2502	RBD	BG4NUC-LC271	6578	2P	BG13NUC-HC378	10653	2P	BG18NUC-LC360
2503	2P	BG4NUC-LC272	6579	RBD	BG13NUC-HC379	10654	2P	BG18NUC-LC361
2504	RBD	BG4NUC-LC273	6580	RBD	BG13NUC-HC380	10655	2P	BG18NUC-LC362
2505	2P	BG4NUC-LC274	6581	2P	BG13NUC-HC381	10656	2P	BG18NUC-LC363
2506	2P	BG4NUC-LC275	6582	RBD	BG13NUC-HC382	10657	RBD	BG18NUC-LC364
2507	RBD	BG4NUC-LC276	6583	RBD	BG13NUC-HC383	10658	RBD	BG18NUC-LC365
2508	RBD	BG4NUC-LC277	6584	2P	BG13NUC-HC384	10659	2P	BG18NUC-LC366
2509	RBD	BG4NUC-LC278	6585	RBD	BG13NUC-HC385	10660	2P	BG18NUC-LC367
2510	2P	BG4NUC-LC279	6586	RBD	BG13NUC-HC386	10661	2P	BG18NUC-LC368
2511	RBD	BG4NUC-LC280	6587	RBD	BG13NUC-HC387	10662	2P	BG18NUC-LC369
2512	RBD	BG4NUC-LC281	6588	2P	BG13NUC-HC388	10663	2P	BG18NUC-LC370
2513	2P	BG4NUC-LC282	6589	2P	BG13NUC-HC389	10664	2P	BG18NUC-LC371
2514	2P	BG4NUC-LC283	6590	2P	BG13NUC-HC390	10665	2P	BG18NUC-LC372
2515	2P	BG4NUC-LC284	6591	2P	BG13NUC-HC391	10666	RBD	BG18NUC-LC373
2516	RBD	BG4NUC-LC285	6592	RBD	BG13NUC-HC392	10667	RBD	BG18NUC-LC374
2517	2P	BG4NUC-LC286	6593	RBD	BG13NUC-HC393	10668	RBD	BG18NUC-LC375
2518	2P	BG4NUC-LC287	6594	RBD	BG13NUC-HC394	10669	RBD	BG18NUC-LC376
2519	RBD	BG4NUC-LC288	6595	2P	BG13NUC-HC395	10670	RBD	BG18NUC-LC377
2520	2P	BG4NUC-LC289	6596	2P	BG13NUC-HC396	10671	2P	BG18NUC-LC378
2521	2P	BG4NUC-LC290	6597	2P	BG13NUC-HC397	10672	2P	BG18NUC-LC379
2522	RBD	BG4NUC-LC291	6598	2P	BG13NUC-HC398	10673	2P	BG18NUC-LC380
2523	2P	BG4NUC-LC292	6599	2P	BG13NUC-HC399	10674	RBD	BG18NUC-LC381
2524	RBD	BG4NUC-LC293	6600	RBD	BG13NUC-HC400	10675	RBD	BG18NUC-LC382
2525	2P	BG4NUC-LC294	6601	2P	BG13NUC-HC401	10676	2P	BG18NUC-LC383
2526	RBD	BG4NUC-LC295	6602	2P	BG13NUC-HC402	10677	RBD	BG18NUC-LC384
2527	2P	BG4NUC-LC296	6603	2P	BG13NUC-HC403	10678	2P	BG18NUC-LC385
2528	RBD	BG4NUC-LC297	6604	2P	BG13NUC-HC404	10679	2P	BG18NUC-LC386
2529	2P	BG4NUC-LC298	6605	2P	BG13NUC-HC405	10680	2P	BG18NUC-LC387
2530	2P	BG4NUC-LC299	6606	RBD	BG13NUC-HC406	10681	2P	BG18NUC-LC388
2531	2P	BG4NUC-LC300	6607	2P	BG13NUC-HC407	10682	RBD	BG18NUC-LC389
2532	2P	BG4NUC-LC301	6608	2P	BG13NUC-HC408	10683	2P	BG18NUC-LC390
2533	2P	BG4NUC-LC302	6609	2P	BG13NUC-HC409	10684	RBD	BG18NUC-LC391
2534	2P	BG4NUC-LC303	6610	2P	BG13NUC-HC410	10685	2P	BG18NUC-LC392
2535	2P	BG4NUC-LC304	6611	RBD	BG13NUC-HC411	10686	2P	BG18NUC-LC393
2536	2P	BG4NUC-LC305	6612	RBD	BG13NUC-HC412	10687	2P	BG18NUC-LC394
2537	RBD	BG4NUC-LC306	6613	RBD	BG13NUC-HC413	10688	2P	BG18NUC-LC395
2538	2P	BG4NUC-LC307	6614	RBD	BG13NUC-HC414	10689	2P	BG18NUC-LC396
2539	2P	BG4NUC-LC308	6615	2P	BG13NUC-HC415	10690	2P	BG18NUC-LC397
2540	2P	BG4NUC-LC309	6616	2P	BG13NUC-HC416	10691	2P	BG18NUC-LC398
2541	2P	BG4NUC-LC310	6617	RBD	BG13NUC-HC417	10692	2P	BG18NUC-LC399
2542	RBD	BG4NUC-LC311	6618	RBD	BG13NUC-HC418	10693	2P	BG18NUC-LC400
2543	2P	BG4NUC-LC312	6619	2P	BG13NUC-HC419	10694	2P	BG18NUC-LC401
2544	2P	BG4NUC-LC313	6620	2P	BG13NUC-HC420	10695	2P	BG18NUC-LC402
2545	2P	BG4NUC-LC314	6621	RBD	BG13NUC-HC421	10696	2P	BG18NUC-LC403
2546	2P	BG4NUC-LC315	6622	2P	BG13NUC-HC422	10697	2P	BG18NUC-LC404
2547	2P	BG4NUC-LC316	6623	2P	BG13NUC-HC423	10698	RBD	BG18NUC-LC405
2548	RBD	BG4NUC-LC317	6624	RBD	BG13NUC-HC424	10699	2P	BG18NUC-LC406
2549	RBD	BG4NUC-LC318	6625	RBD	BG13NUC-HC425	10700	RBD	BG18NUC-LC407
2550	2P	BG4NUC-LC319	6626	RBD	BG13NUC-HC426	10701	RBD	BG18NUC-LC408
2551	2P	BG4NUC-LC320	6627	2P	BG13NUC-HC427	10702	RBD	BG18NUC-LC409
2552	2P	BG4NUC-LC321	6628	2P	BG13NUC-HC428	10703	2P	BG18NUC-LC410
2553	RBD	BG4NUC-LC322	6629	2P	BG13NUC-HC429	10704	2P	BG18NUC-LC411
2554	2P	BG4NUC-LC323	6630	2P	BG13NUC-HC430	10705	2P	BG18NUC-LC412
2555	RBD	BG4NUC-LC324	6631	2P	BG13NUC-HC431	10706	RBD	BG18NUC-LC413
2556	2P	BG4NUC-LC325	6632	RBD	BG13NUC-HC432	10707	RBD	BG18NUC-LC414
2557	RBD	BG4NUC-LC326	6633	2P	BG13NUC-HC433	10708	2P	BG18NUC-LC415
2558	RBD	BG4NUC-LC327	6634	2P	BG13NUC-HC434	10709	RBD	BG18NUC-LC416
2559	RBD	BG4NUC-LC328	6635	2P	BG13NUC-HC435	10710	2P	BG18NUC-LC417
2560	2P	BG4NUC-LC329	6636	2P	BG13NUC-HC436	10711	2P	BG18NUC-LC418
2561	2P	BG4NUC-LC330	6637	2P	BG13NUC-HC437	10712	2P	BG18NUC-LC419
2562	RBD	BG4NUC-LC331	6638	2P	BG13NUC-HC438	10713	RBD	BG18NUC-LC420
2563	2P	BG4NUC-LC332	6639	RBD	BG13NUC-HC439	10714	2P	BG18NUC-LC421
2564	2P	BG4NUC-LC333	6640	RBD	BG13NUC-HC440	10715	2P	BG18NUC-LC422
2565	2P	BG4NUC-LC334	6641	2P	BG13NUC-HC441	10716	2P	BG18NUC-LC423
2566	2P	BG4NUC-LC335	6642	2P	BG13NUC-HC442	10717	RBD	BG18NUC-LC424
2567	RBD	BG4NUC-LC336	6643	2P	BG13NUC-HC443	10718	2P	BG18NUC-LC425
2568	2P	BG4NUC-LC337	6644	2P	BG13NUC-HC444	10719	2P	BG18NUC-LC426
2569	RBD	BG4NUC-LC338	6645	2P	BG13NUC-HC445	10720	2P	BG18NUC-LC427
2570	2P	BG4NUC-LC339	6646	2P	BG13NUC-HC446	10721	RBD	BG18NUC-LC428
2571	RBD	BG4NUC-LC340	6647	2P	BG13NUC-HC447	10722	2P	BG18NUC-LC429
2572	2P	BG4NUC-LC341	6648	2P	BG13NUC-HC448	10723	2P	BG18NUC-LC430
2573	RBD	BG4NUC-LC342	6649	RBD	BG13NUC-HC449	10724	RBD	BG18NUC-LC431
2574	RBD	BG4NUC-LC343	6650	2P	BG13NUC-HC450	10725	2P	BG18NUC-LC432

2575	RBD	BG4NUC-LC344	6651	2P	BG13NUC-HC451	10726	2P	BG18NUC-LC433
2576	2P	BG4NUC-LC345	6652	2P	BG13NUC-HC452	10727	RBD	BG18NUC-LC434
2577	RBD	BG4NUC-LC346	6653	2P	BG13NUC-HC453	10728	RBD	BG18NUC-LC435
2578	2P	BG4NUC-LC347	6654	RBD	BG13NUC-HC454	10729	2P	BG18NUC-LC436
2579	RBD	BG4NUC-LC348	6655	RBD	BG13NUC-HC455	10730	2P	BG18NUC-LC437
2580	2P	BG4NUC-LC349	6656	2P	BG13NUC-HC456	10731	2P	BG18NUC-LC438
2581	2P	BG4NUC-LC350	6657	2P	BG13NUC-HC457	10732	2P	BG18NUC-LC439
2582	2P	BG4NUC-LC351	6658	2P	BG13NUC-HC458	10733	2P	BG18NUC-LC440
2583	2P	BG4NUC-LC352	6659	RBD	BG13NUC-HC459	10734	2P	BG18NUC-LC441
2584	RBD	BG4NUC-LC353	6660	2P	BG13NUC-HC460	10735	2P	BG18NUC-LC442
2585	RBD	BG4NUC-LC354	6661	RBD	BG13NUC-HC461	10736	2P	BG18NUC-LC443
2586	RBD	BG4NUC-LC355	6662	2P	BG13NUC-HC462	10737	2P	BG18NUC-LC444
2587	2P	BG4NUC-LC356	6663	RBD	BG13NUC-HC463	10738	2P	BG18NUC-LC445
2588	2P	BG4NUC-LC357	6664	RBD	BG13NUC-HC464	10739	RBD	BG18NUC-LC446
2589	RBD	BG4NUC-LC358	6665	2P	BG13NUC-HC465	10740	2P	BG18NUC-LC447
2590	RBD	BG4NUC-LC359	6666	2P	BG13NUC-HC466	10741	2P	BG18NUC-LC448
2591	RBD	BG4NUC-LC360	6667	2P	BG13NUC-HC467	10742	2P	BG18NUC-LC449
2592	RBD	BG4NUC-LC361	6668	2P	BG13NUC-HC468	10743	2P	BG18NUC-LC450
2593	RBD	BG4NUC-LC362	6669	2P	BG13NUC-HC469	10744	2P	BG18NUC-LC451
2594	2P	BG4NUC-LC363	6670	2P	BG13NUC-HC470	10745	2P	BG18NUC-LC452
2595	2P	BG4NUC-LC364	6671	RBD	BG13NUC-HC471	10746	2P	BG18NUC-LC453
2596	RBD	BG4NUC-LC365	6672	2P	BG13NUC-HC472	10747	2P	BG18NUC-LC454
2597	2P	BG4NUC-LC366	6673	RBD	BG13NUC-HC473	10748	2P	BG18NUC-LC455
2598	2P	BG4NUC-LC367	6674	RBD	BG13NUC-HC474	10749	2P	BG18NUC-LC456
2599	2P	BG4NUC-LC368	6675	2P	BG13NUC-HC475	10750	2P	BG18NUC-LC457
2600	2P	BG4NUC-LC369	6676	2P	BG13NUC-HC476	10751	2P	BG18NUC-LC458
2601	2P	BG4NUC-LC370	6677	2P	BG13NUC-HC477	10752	2P	BG18NUC-LC459
2602	2P	BG4NUC-LC371	6678	2P	BG13NUC-HC478	10753	2P	BG18NUC-LC460
2603	2P	BG4NUC-LC372	6679	2P	BG13NUC-HC479	10754	2P	BG18NUC-LC461
2604	2P	BG4NUC-LC373	6680	2P	BG13NUC-HC480	10755	RBD	BG18NUC-LC462
2605	2P	BG4NUC-LC374	6681	2P	BG13NUC-HC481	10756	RBD	BG18NUC-LC463
2606	RBD	BG4NUC-LC375	6682	2P	BG13NUC-HC482	10757	2P	BG18NUC-LC464
2607	2P	BG4NUC-LC376	6683	2P	BG13NUC-HC483	10758	2P	BG18NUC-LC465
2608	2P	BG4NUC-LC377	6684	2P	BG13NUC-HC484	10759	2P	BG18NUC-LC466
2609	2P	BG4NUC-LC378	6685	2P	BG13NUC-HC485	10760	2P	BG18NUC-LC467
2610	RBD	BG4NUC-LC379	6686	RBD	BG13NUC-HC486	10761	RBD	BG18NUC-LC468
2611	2P	BG4NUC-LC380	6687	RBD	BG13NUC-HC487	10762	RBD	BG18NUC-LC469
2612	2P	BG4NUC-LC381	6688	2P	BG13NUC-HC488	10763	RBD	BG18NUC-LC470
2613	2P	BG4NUC-LC382	6689	2P	BG13NUC-HC489	10764	2P	BG18NUC-LC471
2614	2P	BG4NUC-LC383	6690	2P	BG13NUC-HC490	10765	2P	BG18NUC-LC472
2615	2P	BG4NUC-LC384	6691	2P	BG13NUC-HC491	10766	2P	BG18NUC-LC473
2616	2P	BG4NUC-LC385	6692	2P	BG13NUC-HC492	10767	2P	BG18NUC-LC474
2617	RBD	BG4NUC-LC386	6693	2P	BG13NUC-HC493	10768	RBD	BG18NUC-LC475
2618	RBD	BG4NUC-LC387	6694	2P	BG13NUC-HC494	10769	2P	BG18NUC-LC476
2619	2P	BG4NUC-LC388	6695	2P	BG13NUC-HC495	10770	RBD	BG18NUC-LC477
2620	2P	BG4NUC-LC389	6696	RBD	BG13NUC-HC496	10771	RBD	BG18NUC-LC478
2621	2P	BG4NUC-LC390	6697	RBD	BG13NUC-HC497	10772	RBD	BG18NUC-LC479
2622	2P	BG4NUC-LC391	6698	2P	BG13NUC-HC498	10773	RBD	BG18NUC-LC480
2623	2P	BG4NUC-LC392	6699	RBD	BG13NUC-HC499	10774	2P	BG18NUC-LC481
2624	2P	BG4NUC-LC393	6700	2P	BG13NUC-HC500	10775	RBD	BG18NUC-LC482
2625	RBD	BG4NUC-LC394	6701	RBD	BG13NUC-HC501	10776	2P	BG18NUC-LC483
2626	2P	BG4NUC-LC395	6702	2P	BG13NUC-HC502	10777	2P	BG18NUC-LC484
2627	2P	BG4NUC-LC396	6703	2P	BG13NUC-HC503	10778	2P	BG18NUC-LC485
2628	2P	BG4NUC-LC397	6704	RBD	BG13NUC-HC504	10779	2P	BG18NUC-LC486
2629	2P	BG4NUC-LC398	6705	2P	BG13NUC-HC505	10780	2P	BG18NUC-LC487
2630	2P	BG4NUC-LC399	6706	RBD	BG13NUC-HC506	10781	2P	BG18NUC-LC488
2631	RBD	BG4NUC-LC400	6707	RBD	BG13NUC-HC507	10782	2P	BG18NUC-LC489
2632	RBD	BG4NUC-LC401	6708	2P	BG13NUC-HC508	10783	2P	BG18NUC-LC490
2633	2P	BG4NUC-LC402	6709	2P	BG13NUC-HC509	10784	2P	BG18NUC-LC491
2634	2P	BG4NUC-LC403	6710	2P	BG13NUC-HC510	10785	RBD	BG18NUC-LC492
2635	2P	BG4NUC-LC404	6711	2P	BG13NUC-HC511	10786	2P	BG18NUC-LC493
2636	RBD	BG4NUC-LC405	6712	RBD	BG13NUC-HC512	10787	2P	BG18NUC-LC494
2637	2P	BG4NUC-LC406	6713	RBD	BG13NUC-HC513	10788	2P	BG18NUC-LC495
2638	RBD	BG4NUC-LC407	6714	RBD	BG13NUC-HC514	10789	2P	BG18NUC-LC496
2639	2P	BG4NUC-LC408	6715	2P	BG13NUC-HC515	10790	RBD	BG18NUC-LC497
2640	2P	BG4NUC-LC409	6716	2P	BG13NUC-HC516	10791	2P	BG18NUC-LC498
2641	2P	BG5NUC-HC1	6717	2P	BG13NUC-HC517	10792	2P	BG18NUC-LC499
2642	RBD	BG5NUC-HC2	6718	RBD	BG13NUC-HC518	10793	2P	BG18NUC-LC500
2643	RBD	BG5NUC-HC3	6719	RBD	BG13NUC-HC519	10794	2P	BG18NUC-LC501
2644	2P	BG5NUC-HC4	6720	2P	BG13NUC-HC520	10795	RBD	BG18NUC-LC502
2645	RBD	BG5NUC-HC5	6721	2P	BG13NUC-HC521	10796	2P	BG18NUC-LC503
2646	2P	BG5NUC-HC6	6722	RBD	BG13NUC-HC522	10797	2P	BG18NUC-LC504
2647	RBD	BG5NUC-HC7	6723	RBD	BG13NUC-HC523	10798	2P	BG18NUC-LC505
2648	2P	BG5NUC-HC8	6724	RBD	BG13NUC-HC524	10799	RBD	BG18NUC-LC506
2649	RBD	BG5NUC-HC9	6725	2P	BG13NUC-HC525	10800	2P	BG18NUC-LC507
2650	2P	BG5NUC-HC10	6726	2P	BG13NUC-HC526	10801	2P	BG18NUC-LC508
2651	RBD	BG5NUC-HC11	6727	2P	BG13NUC-HC527	10802	2P	BG18NUC-LC509
2652	2P	BG5NUC-HC12	6728	2P	BG13NUC-HC528	10803	2P	BG18NUC-LC510
2653	2P	BG5NUC-HC13	6729	2P	BG13NUC-HC529	10804	2P	BG18NUC-LC511

2654	2P	BG5NUC-HC14	6730	RBD	BG13NUC-HC530	10805	2P	BG18NUC-LC512
2655	2P	BG5NUC-HC15	6731	2P	BG13NUC-HC531	10806	2P	BG18NUC-LC513
2656	RBD	BG5NUC-HC16	6732	RBD	BG13NUC-HC532	10807	2P	BG18NUC-LC514
2657	RBD	BG5NUC-HC17	6733	RBD	BG13NUC-HC533	10808	2P	BG18NUC-LC515
2658	2P	BG5NUC-HC18	6734	RBD	BG13NUC-HC534	10809	RBD	BG18NUC-LC516
2659	RBD	BG5NUC-HC19	6735	RBD	BG13NUC-HC535	10810	2P	BG18NUC-LC517
2660	RBD	BG5NUC-HC20	6736	2P	BG13NUC-HC536	10811	2P	BG18NUC-LC518
2661	2P	BG5NUC-HC21	6737	2P	BG13NUC-HC537	10812	2P	BG18NUC-LC519
2662	RBD	BG5NUC-HC22	6738	2P	BG13NUC-HC538	10813	2P	BG18NUC-LC520
2663	2P	BG5NUC-HC23	6739	2P	BG13NUC-HC539	10814	2P	BG18NUC-LC521
2664	RBD	BG5NUC-HC24	6740	2P	BG13NUC-HC540	10815	RBD	BG18NUC-LC522
2665	RBD	BG5NUC-HC25	6741	2P	BG13NUC-HC541	10816	2P	BG18NUC-LC523
2666	2P	BG5NUC-HC26	6742	RBD	BG13NUC-HC542	10817	2P	BG18NUC-LC524
2667	RBD	BG5NUC-HC27	6743	RBD	BG13NUC-HC543	10818	2P	BG18NUC-LC525
2668	RBD	BG5NUC-HC28	6744	2P	BG13NUC-HC544	10819	RBD	BG18NUC-LC526
2669	RBD	BG5NUC-HC29	6745	2P	BG13NUC-HC545	10820	RBD	BG18NUC-LC527
2670	RBD	BG5NUC-HC30	6746	RBD	BG13NUC-HC546	10821	2P	BG18NUC-LC528
2671	RBD	BG5NUC-HC31	6747	RBD	BG13NUC-HC547	10822	2P	BG18NUC-LC529
2672	2P	BG5NUC-HC32	6748	2P	BG13NUC-HC548	10823	2P	BG18NUC-LC530
2673	RBD	BG5NUC-HC33	6749	RBD	BG13NUC-HC549	10824	2P	BG18NUC-LC531
2674	RBD	BG5NUC-HC34	6750	2P	BG13NUC-HC550	10825	2P	BG18NUC-LC532
2675	2P	BG5NUC-HC35	6751	2P	BG13NUC-HC551	10826	RBD	BG18NUC-LC533
2676	RBD	BG5NUC-HC36	6752	RBD	BG13NUC-HC552	10827	2P	BG18NUC-LC534
2677	RBD	BG5NUC-HC37	6753	RBD	BG13NUC-HC553	10828	2P	BG18NUC-LC535
2678	2P	BG5NUC-HC38	6754	RBD	BG13NUC-HC554	10829	2P	BG18NUC-LC536
2679	2P	BG5NUC-HC39	6755	RBD	BG13NUC-HC555	10830	2P	BG18NUC-LC537
2680	2P	BG5NUC-HC40	6756	2P	BG13NUC-HC556	10831	RBD	BG18NUC-LC538
2681	2P	BG5NUC-HC41	6757	2P	BG13NUC-HC557	10832	RBD	BG18NUC-LC539
2682	2P	BG5NUC-HC42	6758	RBD	BG13NUC-HC558	10833	2P	BG18NUC-LC540
2683	2P	BG5NUC-HC43	6759	2P	BG13NUC-HC559	10834	RBD	BG18NUC-LC541
2684	RBD	BG5NUC-HC44	6760	RBD	BG13NUC-HC560	10835	RBD	BG18NUC-LC542
2685	2P	BG5NUC-HC45	6761	2P	BG13NUC-HC561	10836	RBD	BG18NUC-LC543
2686	2P	BG5NUC-HC46	6762	2P	BG13NUC-HC562	10837	RBD	BG18NUC-LC544
2687	RBD	BG5NUC-HC47	6763	2P	BG13NUC-HC563	10838	RBD	BG18NUC-LC545
2688	RBD	BG5NUC-HC48	6764	2P	BG13NUC-HC564	10839	RBD	BG18NUC-LC546
2689	RBD	BG5NUC-HC49	6765	2P	BG13NUC-HC565	10840	2P	BG18NUC-LC547
2690	RBD	BG5NUC-HC50	6766	2P	BG13NUC-HC566	10841	RBD	BG18NUC-LC548
2691	2P	BG5NUC-HC51	6767	2P	BG13NUC-HC567	10842	RBD	BG18NUC-LC549
2692	2P	BG5NUC-HC52	6768	RBD	BG13NUC-HC568	10843	2P	BG18NUC-LC550
2693	2P	BG5NUC-HC53	6769	RBD	BG13NUC-HC569	10844	2P	BG18NUC-LC551
2694	2P	BG5NUC-HC54	6770	RBD	BG13NUC-HC570	10845	2P	BG18NUC-LC552
2695	2P	BG5NUC-HC55	6771	RBD	BG13NUC-HC571	10846	2P	BG18NUC-LC553
2696	2P	BG5NUC-HC56	6772	2P	BG13NUC-HC572	10847	2P	BG18NUC-LC554
2697	2P	BG5NUC-HC57	6773	2P	BG13NUC-HC573	10848	2P	BG18NUC-LC555
2698	2P	BG5NUC-HC58	6774	2P	BG13NUC-HC574	10849	RBD	BG18NUC-LC556
2699	2P	BG5NUC-HC59	6775	2P	BG13NUC-HC575	10850	2P	BG18NUC-LC557
2700	2P	BG5NUC-HC60	6776	2P	BG13NUC-HC576	10851	RBD	BG18NUC-LC558
2701	RBD	BG5NUC-HC61	6777	2P	BG13NUC-HC577	10852	2P	BG18NUC-LC559
2702	RBD	BG5NUC-HC62	6778	2P	BG13NUC-HC578	10853	2P	BG18NUC-LC560
2703	RBD	BG5NUC-HC63	6779	2P	BG13NUC-HC579	10854	2P	BG18NUC-LC561
2704	RBD	BG5NUC-HC64	6780	2P	BG13NUC-HC580	10855	2P	BG18NUC-LC562
2705	RBD	BG5NUC-HC65	6781	2P	BG13NUC-HC581	10856	RBD	BG18NUC-LC563
2706	RBD	BG5NUC-HC66	6782	2P	BG13NUC-HC582	10857	2P	BG18NUC-LC564
2707	RBD	BG5NUC-HC67	6783	2P	BG13NUC-HC583	10858	2P	BG18NUC-LC565
2708	RBD	BG5NUC-HC68	6784	2P	BG13NUC-HC584	10859	2P	BG18NUC-LC566
2709	RBD	BG5NUC-HC69	6785	2P	BG13NUC-HC585	10860	2P	BG18NUC-LC567
2710	RBD	BG5NUC-HC70	6786	2P	BG13NUC-HC586	10861	2P	BG18NUC-LC568
2711	2P	BG5NUC-HC71	6787	2P	BG13NUC-HC587	10862	2P	BG18NUC-LC569
2712	RBD	BG5NUC-HC72	6788	2P	BG13NUC-HC588	10863	2P	BG18NUC-LC570
2713	2P	BG5NUC-HC73	6789	2P	BG13NUC-HC589	10864	2P	BG18NUC-LC571
2714	2P	BG5NUC-HC74	6790	2P	BG13NUC-HC590	10865	2P	BG18NUC-LC572
2715	2P	BG5NUC-HC75	6791	RBD	BG13NUC-HC591	10866	2P	BG18NUC-LC573
2716	2P	BG5NUC-HC76	6792	2P	BG13NUC-HC592	10867	RBD	BG18NUC-LC574
2717	2P	BG5NUC-HC77	6793	RBD	BG13NUC-HC593	10868	RBD	BG18NUC-LC575
2718	2P	BG5NUC-HC78	6794	2P	BG13NUC-HC594	10869	2P	BG18NUC-LC576
2719	2P	BG5NUC-HC79	6795	RBD	BG13NUC-HC595	10870	RBD	BG18NUC-LC577
2720	2P	BG5NUC-HC80	6796	2P	BG13NUC-HC596	10871	2P	BG18NUC-LC578
2721	2P	BG5NUC-HC81	6797	2P	BG13NUC-HC597	10872	2P	BG18NUC-LC579
2722	2P	BG5NUC-HC82	6798	RBD	BG13NUC-HC598	10873	2P	BG18NUC-LC580
2723	2P	BG5NUC-HC83	6799	2P	BG13NUC-HC599	10874	2P	BG18NUC-LC581
2724	2P	BG5NUC-HC84	6800	2P	BG13NUC-HC600	10875	2P	BG18NUC-LC582
2725	2P	BG5NUC-HC85	6801	2P	BG13NUC-HC601	10876	2P	BG18NUC-LC583
2726	2P	BG5NUC-HC86	6802	2P	BG13NUC-HC602	10877	2P	BG18NUC-LC584
2727	2P	BG5NUC-HC87	6803	2P	BG13NUC-HC603	10878	2P	BG18NUC-LC585
2728	2P	BG5NUC-HC88	6804	2P	BG13NUC-HC604	10879	RBD	BG18NUC-LC586
2729	2P	BG5NUC-HC89	6805	2P	BG13NUC-HC605	10880	2P	BG18NUC-LC587
2730	2P	BG5NUC-HC90	6806	RBD	BG13NUC-HC606	10881	2P	BG18NUC-LC588
2731	2P	BG5NUC-HC91	6807	RBD	BG13NUC-HC607	10882	2P	BG18NUC-LC589
2732	2P	BG5NUC-HC92	6808	RBD	BG13NUC-HC608	10883	2P	BG18NUC-LC590

2733	2P	BG5NUC-HC93	6809	2P	BG13NUC-HC609	10884	2P	BG18NUC-LC591
2734	2P	BG5NUC-HC94	6810	RBD	BG13NUC-HC610	10885	2P	BG18NUC-LC592
2735	2P	BG5NUC-HC95	6811	2P	BG13NUC-HC611	10886	2P	BG18NUC-LC593
2736	2P	BG5NUC-HC96	6812	RBD	BG13NUC-HC612	10887	2P	BG18NUC-LC594
2737	RBD	BG5NUC-HC97	6813	RBD	BG13NUC-HC613	10888	2P	BG18NUC-LC595
2738	RBD	BG5NUC-HC98	6814	RBD	BG13NUC-HC614	10889	RBD	BG18NUC-LC596
2739	RBD	BG5NUC-HC99	6815	2P	BG13NUC-HC615	10890	2P	BG18NUC-LC597
2740	RBD	BG5NUC-HC100	6816	2P	BG13NUC-HC616	10891	RBD	BG18NUC-LC598
2741	2P	BG5NUC-HC101	6817	RBD	BG13NUC-HC617	10892	RBD	BG18NUC-LC599
2742	2P	BG5NUC-HC102	6818	RBD	BG13NUC-HC618	10893	RBD	BG18NUC-LC600
2743	2P	BG5NUC-HC103	6819	2P	BG13NUC-HC619	10894	2P	BG18NUC-LC601
2744	2P	BG5NUC-HC104	6820	RBD	BG13NUC-HC620	10895	2P	BG18NUC-LC602
2745	RBD	BG5NUC-HC105	6821	2P	BG13NUC-HC621	10896	2P	BG18NUC-LC603
2746	RBD	BG5NUC-HC106	6822	2P	BG13NUC-HC622	10897	2P	BG18NUC-LC604
2747	2P	BG5NUC-HC107	6823	RBD	BG13NUC-HC623	10898	2P	BG18NUC-LC605
2748	RBD	BG5NUC-HC108	6824	RBD	BG13NUC-HC624	10899	RBD	BG18NUC-LC606
2749	2P	BG5NUC-HC109	6825	2P	BG13NUC-HC625	10900	RBD	BG18NUC-LC607
2750	RBD	BG5NUC-HC110	6826	2P	BG13NUC-HC626	10901	2P	BG18NUC-LC608
2751	2P	BG5NUC-HC111	6827	2P	BG13NUC-HC627	10902	RBD	BG18NUC-LC609
2752	RBD	BG5NUC-HC112	6828	RBD	BG13NUC-HC628	10903	2P	BG18NUC-LC610
2753	2P	BG5NUC-HC113	6829	RBD	BG13NUC-HC629	10904	2P	BG18NUC-LC611
2754	2P	BG5NUC-HC114	6830	RBD	BG13NUC-HC630	10905	2P	BG18NUC-LC612
2755	2P	BG5NUC-HC115	6831	2P	BG13NUC-HC631	10906	2P	BG18NUC-LC613
2756	2P	BG5NUC-HC116	6832	2P	BG13NUC-HC632	10907	RBD	BG18NUC-LC614
2757	RBD	BG5NUC-HC117	6833	2P	BG13NUC-HC633	10908	2P	BG18NUC-LC615
2758	2P	BG5NUC-HC118	6834	2P	BG13NUC-HC634	10909	RBD	BG18NUC-LC616
2759	2P	BG5NUC-HC119	6835	2P	BG13NUC-HC635	10910	2P	BG18NUC-LC617
2760	2P	BG5NUC-HC120	6836	RBD	BG13NUC-HC636	10911	2P	BG18NUC-LC618
2761	RBD	BG5NUC-HC121	6837	RBD	BG13NUC-HC637	10912	2P	BG18NUC-LC619
2762	RBD	BG5NUC-HC122	6838	RBD	BG13NUC-HC638	10913	RBD	BG18NUC-LC620
2763	2P	BG5NUC-HC123	6839	2P	BG13NUC-HC639	10914	2P	BG18NUC-LC621
2764	2P	BG5NUC-HC124	6840	RBD	BG13NUC-HC640	10915	2P	BG18NUC-LC622
2765	2P	BG5NUC-HC125	6841	RBD	BG13NUC-HC641	10916	2P	BG18NUC-LC623
2766	2P	BG5NUC-HC126	6842	2P	BG13NUC-HC642	10917	2P	BG18NUC-LC624
2767	2P	BG5NUC-HC127	6843	2P	BG13NUC-HC643	10918	2P	BG18NUC-LC625
2768	2P	BG5NUC-HC128	6844	RBD	BG13NUC-HC644	10919	RBD	BG18NUC-LC626
2769	RBD	BG5NUC-HC129	6845	RBD	BG13NUC-HC645	10920	2P	BG18NUC-LC627
2770	2P	BG5NUC-HC130	6846	2P	BG13NUC-HC646	10921	RBD	BG18NUC-LC628
2771	RBD	BG5NUC-HC131	6847	RBD	BG13NUC-HC647	10922	2P	BG18NUC-LC629
2772	2P	BG5NUC-HC132	6848	2P	BG13NUC-HC648	10923	2P	BG18NUC-LC630
2773	RBD	BG5NUC-HC133	6849	2P	BG13NUC-HC649	10924	RBD	BG18NUC-LC631
2774	RBD	BG5NUC-HC134	6850	RBD	BG13NUC-HC650	10925	RBD	BG18NUC-LC632
2775	2P	BG5NUC-HC135	6851	RBD	BG13NUC-HC651	10926	2P	BG18NUC-LC633
2776	2P	BG5NUC-HC136	6852	2P	BG13NUC-HC652	10927	2P	BG18NUC-LC634
2777	2P	BG5NUC-HC137	6853	2P	BG13NUC-HC653	10928	2P	BG18NUC-LC635
2778	2P	BG5NUC-HC138	6854	2P	BG13NUC-HC654	10929	2P	BG18NUC-LC636
2779	2P	BG5NUC-HC139	6855	2P	BG13NUC-HC655	10930	2P	BG18NUC-LC637
2780	2P	BG5NUC-HC140	6856	RBD	BG13NUC-HC656	10931	2P	BG18NUC-LC638
2781	2P	BG5NUC-HC141	6857	RBD	BG13NUC-HC657	10932	RBD	BG18NUC-LC639
2782	2P	BG5NUC-HC142	6858	2P	BG13NUC-HC658	10933	2P	BG18NUC-LC640
2783	2P	BG5NUC-HC143	6859	2P	BG13NUC-HC659	10934	RBD	BG18NUC-LC641
2784	RBD	BG5NUC-HC144	6860	2P	BG13NUC-HC660	10935	2P	BG18NUC-LC642
2785	2P	BG5NUC-HC145	6861	2P	BG13NUC-HC661	10936	2P	BG18NUC-LC643
2786	2P	BG5NUC-HC146	6862	2P	BG13NUC-HC662	10937	2P	BG18NUC-LC644
2787	2P	BG5NUC-HC147	6863	2P	BG13NUC-HC663	10938	2P	BG18NUC-LC645
2788	2P	BG5NUC-HC148	6864	RBD	BG13NUC-HC664	10939	2P	BG18NUC-LC646
2789	2P	BG5NUC-HC149	6865	2P	BG13NUC-HC665	10940	2P	BG18NUC-LC647
2790	2P	BG5NUC-HC150	6866	RBD	BG13NUC-HC666	10941	RBD	BG18NUC-LC648
2791	2P	BG5NUC-HC151	6867	2P	BG13NUC-HC667	10942	2P	BG18NUC-LC649
2792	2P	BG5NUC-HC152	6868	RBD	BG13NUC-HC668	10943	2P	BG18NUC-LC650
2793	2P	BG5NUC-HC153	6869	RBD	BG13NUC-HC669	10944	2P	BG18NUC-LC651
2794	2P	BG5NUC-HC154	6870	RBD	BG13NUC-HC670	10945	RBD	BG18NUC-LC652
2795	2P	BG5NUC-HC155	6871	2P	BG13NUC-HC671	10946	2P	BG18NUC-LC653
2796	RBD	BG5NUC-HC156	6872	RBD	BG13NUC-HC672	10947	RBD	BG18NUC-LC654
2797	RBD	BG5NUC-HC157	6873	2P	BG13NUC-HC673	10948	2P	BG18NUC-LC655
2798	2P	BG5NUC-HC158	6874	RBD	BG13NUC-HC674	10949	2P	BG18NUC-LC656
2799	2P	BG5NUC-HC159	6875	RBD	BG13NUC-HC675	10950	2P	BG18NUC-LC657
2800	2P	BG5NUC-HC160	6876	2P	BG13NUC-HC676	10951	RBD	BG18NUC-LC658
2801	2P	BG5NUC-HC161	6877	2P	BG13NUC-HC677	10952	2P	BG18NUC-LC659
2802	2P	BG5NUC-HC162	6878	2P	BG13NUC-HC678	10953	2P	BG18NUC-LC660
2803	RBD	BG5NUC-HC163	6879	RBD	BG13NUC-HC679	10954	2P	BG18NUC-LC661
2804	2P	BG5NUC-HC164	6880	2P	BG13NUC-HC680	10955	2P	BG18NUC-LC662
2805	2P	BG5NUC-HC165	6881	2P	BG13NUC-HC681	10956	RBD	BG18NUC-LC663
2806	RBD	BG5NUC-HC166	6882	2P	BG13NUC-HC682	10957	RBD	BG18NUC-LC664
2807	2P	BG5NUC-HC167	6883	2P	BG13NUC-HC683	10958	RBD	BG18NUC-LC665
2808	2P	BG5NUC-HC168	6884	RBD	BG13NUC-HC684	10959	RBD	BG18NUC-LC666
2809	2P	BG5NUC-HC169	6885	2P	BG13NUC-HC685	10960	RBD	BG18NUC-LC667
2810	RBD	BG5NUC-HC170	6886	2P	BG13NUC-HC686	10961	RBD	BG18NUC-LC668
2811	RBD	BG5NUC-HC171	6887	2P	BG13NUC-HC687	10962	RBD	BG18NUC-LC669

2812	RBD	BG5NUC-HC172	6888	RBD	BG13NUC-HC688	10963	RBD	BG18NUC-LC670
2813	2P	BG5NUC-HC173	6889	2P	BG13NUC-HC689	10964	2P	BG18NUC-LC671
2814	2P	BG5NUC-HC174	6890	RBD	BG13NUC-HC690	10965	2P	BG18NUC-LC672
2815	2P	BG5NUC-HC175	6891	2P	BG13NUC-HC691	10966	2P	BG18NUC-LC673
2816	2P	BG5NUC-HC176	6892	RBD	BG13NUC-HC692	10967	RBD	BG18NUC-LC674
2817	2P	BG5NUC-HC177	6893	RBD	BG13NUC-HC693	10968	2P	BG18NUC-LC675
2818	2P	BG5NUC-HC178	6894	RBD	BG13NUC-HC694	10969	2P	BG18NUC-LC676
2819	RBD	BG5NUC-HC179	6895	2P	BG13NUC-HC695	10970	2P	BG18NUC-LC677
2820	RBD	BG5NUC-HC180	6896	RBD	BG13NUC-HC696	10971	RBD	BG18NUC-LC678
2821	2P	BG5NUC-HC181	6897	RBD	BG13NUC-HC697	10972	2P	BG18NUC-LC679
2822	2P	BG5NUC-HC182	6898	RBD	BG13NUC-HC698	10973	2P	BG18NUC-LC680
2823	2P	BG5NUC-HC183	6899	2P	BG13NUC-HC699	10974	2P	BG18NUC-LC681
2824	2P	BG5NUC-HC184	6900	RBD	BG13NUC-HC700	10975	RBD	BG18NUC-LC682
2825	2P	BG5NUC-HC185	6901	RBD	BG13NUC-HC701	10976	2P	BG18NUC-LC683
2826	2P	BG5NUC-HC186	6902	2P	BG13NUC-HC702	10977	2P	BG18NUC-LC684
2827	2P	BG5NUC-HC187	6903	2P	BG13NUC-HC703	10978	RBD	BG18NUC-LC685
2828	2P	BG5NUC-HC188	6904	2P	BG13NUC-HC704	10979	2P	BG18NUC-LC686
2829	2P	BG5NUC-HC189	6905	2P	BG13NUC-HC705	10980	2P	BG18NUC-LC687
2830	2P	BG5NUC-HC190	6906	2P	BG13NUC-HC706	10981	2P	BG18NUC-LC688
2831	2P	BG5NUC-HC191	6907	2P	BG13NUC-HC707	10982	2P	BG18NUC-LC689
2832	2P	BG5NUC-HC192	6908	2P	BG13NUC-HC708	10983	2P	BG18NUC-LC690
2833	2P	BG5NUC-HC193	6909	2P	BG13NUC-HC709	10984	RBD	BG18NUC-LC691
2834	2P	BG5NUC-HC194	6910	2P	BG13NUC-HC710	10985	RBD	BG18NUC-LC692
2835	2P	BG5NUC-HC195	6911	2P	BG13NUC-HC711	10986	RBD	BG18NUC-LC693
2836	2P	BG5NUC-HC196	6912	2P	BG13NUC-HC712	10987	2P	BG18NUC-LC694
2837	RBD	BG5NUC-HC197	6913	2P	BG13NUC-HC713	10988	RBD	BG18NUC-LC695
2838	2P	BG5NUC-HC198	6914	2P	BG13NUC-HC714	10989	2P	BG18NUC-LC696
2839	2P	BG5NUC-HC199	6915	RBD	BG13NUC-HC715	10990	2P	BG18NUC-LC697
2840	RBD	BG5NUC-HC200	6916	RBD	BG13NUC-HC716	10991	2P	BG18NUC-LC698
2841	2P	BG5NUC-HC201	6917	RBD	BG13NUC-HC717	10992	2P	BG18NUC-LC699
2842	RBD	BG5NUC-HC202	6918	RBD	BG13NUC-HC718	10993	2P	BG18NUC-LC700
2843	2P	BG5NUC-HC203	6919	RBD	BG13NUC-HC719	10994	2P	BG18NUC-LC701
2844	2P	BG5NUC-HC204	6920	2P	BG13NUC-HC720	10995	2P	BG18NUC-LC702
2845	2P	BG5NUC-HC205	6921	2P	BG13NUC-HC721	10996	2P	BG18NUC-LC703
2846	RBD	BG5NUC-HC206	6922	2P	BG13NUC-HC722	10997	2P	BG18NUC-LC704
2847	2P	BG5NUC-HC207	6923	2P	BG13NUC-HC723	10998	2P	BG18NUC-LC705
2848	RBD	BG5NUC-HC208	6924	2P	BG13NUC-HC724	10999	2P	BG18NUC-LC706
2849	2P	BG5NUC-HC209	6925	2P	BG13NUC-HC725	11000	RBD	BG18NUC-LC707
2850	2P	BG5NUC-HC210	6926	2P	BG13NUC-HC726	11001	2P	BG18NUC-LC708
2851	RBD	BG5NUC-HC211	6927	2P	BG13NUC-HC727	11002	2P	BG18NUC-LC709
2852	2P	BG5NUC-HC212	6928	2P	BG13NUC-HC728	11003	2P	BG18NUC-LC710
2853	2P	BG5NUC-HC213	6929	RBD	BG13NUC-HC729	11004	RBD	BG18NUC-LC711
2854	2P	BG5NUC-HC214	6930	2P	BG13NUC-HC730	11005	2P	BG18NUC-LC712
2855	2P	BG5NUC-HC215	6931	2P	BG13NUC-HC731	11006	RBD	BG18NUC-LC713
2856	RBD	BG5NUC-HC216	6932	2P	BG13NUC-HC732	11007	RBD	BG18NUC-LC714
2857	RBD	BG5NUC-HC217	6933	2P	BG13NUC-HC733	11008	RBD	BG18NUC-LC715
2858	2P	BG5NUC-HC218	6934	2P	BG13NUC-HC734	11009	RBD	BG18NUC-LC716
2859	RBD	BG5NUC-HC219	6935	2P	BG13NUC-HC735	11010	RBD	BG18NUC-LC717
2860	2P	BG5NUC-HC220	6936	2P	BG13NUC-HC736	11011	2P	BG18NUC-LC718
2861	2P	BG5NUC-HC221	6937	RBD	BG13NUC-HC737	11012	2P	BG18NUC-LC719
2862	2P	BG5NUC-HC222	6938	2P	BG13NUC-HC738	11013	RBD	BG18NUC-LC720
2863	RBD	BG5NUC-HC223	6939	RBD	BG13NUC-HC739	11014	RBD	BG18NUC-LC721
2864	2P	BG5NUC-HC224	6940	RBD	BG13NUC-HC740	11015	RBD	BG18NUC-LC722
2865	2P	BG5NUC-HC225	6941	RBD	BG13NUC-HC741	11016	2P	BG18NUC-LC723
2866	2P	BG5NUC-HC226	6942	2P	BG13NUC-HC742	11017	RBD	BG18NUC-LC724
2867	RBD	BG5NUC-HC227	6943	2P	BG13NUC-HC743	11018	2P	BG18NUC-LC725
2868	2P	BG5NUC-HC228	6944	2P	BG13NUC-HC744	11019	2P	BG18NUC-LC726
2869	2P	BG5NUC-HC229	6945	RBD	BG13NUC-HC745	11020	2P	BG18NUC-LC727
2870	RBD	BG5NUC-HC230	6946	2P	BG13NUC-HC746	11021	2P	BG18NUC-LC728
2871	RBD	BG5NUC-HC231	6947	RBD	BG13NUC-HC747	11022	2P	BG18NUC-LC729
2872	2P	BG5NUC-HC232	6948	2P	BG13NUC-HC748	11023	2P	BG18NUC-LC730
2873	2P	BG5NUC-HC233	6949	2P	BG13NUC-HC749	11024	RBD	BG18NUC-LC731
2874	2P	BG5NUC-HC234	6950	2P	BG13NUC-HC750	11025	RBD	BG18NUC-LC732
2875	2P	BG5NUC-HC235	6951	2P	BG13NUC-HC751	11026	2P	BG18NUC-LC733
2876	2P	BG5NUC-HC236	6952	2P	BG13NUC-HC752	11027	RBD	BG18NUC-LC734
2877	2P	BG5NUC-HC237	6953	2P	BG13NUC-HC753	11028	2P	BG18NUC-LC735
2878	2P	BG5NUC-HC238	6954	2P	BG13NUC-HC754	11029	2P	BG18NUC-LC736
2879	2P	BG5NUC-HC239	6955	2P	BG13NUC-HC755	11030	2P	BG18NUC-LC737
2880	RBD	BG5NUC-HC240	6956	2P	BG13NUC-HC756	11031	2P	BG18NUC-LC738
2881	RBD	BG5NUC-HC241	6957	2P	BG13NUC-HC757	11032	RBD	BG18NUC-LC739
2882	RBD	BG5NUC-HC242	6958	RBD	BG13NUC-HC758	11033	2P	BG18NUC-LC740
2883	RBD	BG5NUC-HC243	6959	2P	BG13NUC-HC759	11034	2P	BG18NUC-LC741
2884	2P	BG5NUC-HC244	6960	2P	BG13NUC-HC760	11035	2P	BG18NUC-LC742
2885	2P	BG5NUC-HC245	6961	2P	BG13NUC-HC761	11036	2P	BG18NUC-LC743
2886	2P	BG5NUC-HC246	6962	2P	BG13NUC-HC762	11037	RBD	BG18NUC-LC744
2887	RBD	BG5NUC-HC247	6963	RBD	BG13NUC-HC763	11038	2P	BG18NUC-LC745
2888	RBD	BG5NUC-HC248	6964	2P	BG13NUC-HC764	11039	RBD	BG18NUC-LC746
2889	RBD	BG5NUC-HC249	6965	2P	BG13NUC-HC765	11040	RBD	BG18NUC-LC747
2890	2P	BG5NUC-HC250	6966	2P	BG13NUC-HC766	11041	RBD	BG18NUC-LC748

2891	2P	BG5NUC-HC251	6967	2P	BG13NUC-HC767	11042	2P	BG18NUC-LC749
2892	2P	BG5NUC-HC252	6968	2P	BG13NUC-HC768	11043	2P	BG18NUC-LC750
2893	2P	BG5NUC-HC253	6969	2P	BG13NUC-HC769	11044	2P	BG18NUC-LC751
2894	2P	BG5NUC-HC254	6970	2P	BG13NUC-HC770	11045	2P	BG19NUC-HC1
2895	2P	BG5NUC-HC255	6971	2P	BG13NUC-HC771	11046	RBD	BG19NUC-HC2
2896	RBD	BG5NUC-HC256	6972	2P	BG13NUC-HC772	11047	RBD	BG19NUC-HC3
2897	2P	BG5NUC-HC257	6973	RBD	BG13NUC-HC773	11048	RBD	BG19NUC-HC4
2898	2P	BG5NUC-HC258	6974	RBD	BG13NUC-HC774	11049	2P	BG19NUC-HC5
2899	2P	BG5NUC-HC259	6975	RBD	BG13NUC-HC775	11050	2P	BG19NUC-HC6
2900	2P	BG5NUC-HC260	6976	RBD	BG13NUC-HC776	11051	RBD	BG19NUC-HC7
2901	2P	BG5NUC-HC261	6977	RBD	BG13NUC-HC777	11052	RBD	BG19NUC-HC8
2902	2P	BG5NUC-HC262	6978	RBD	BG13NUC-HC778	11053	2P	BG19NUC-HC9
2903	2P	BG5NUC-HC263	6979	2P	BG13NUC-HC779	11054	2P	BG19NUC-HC10
2904	2P	BG5NUC-HC264	6980	RBD	BG13NUC-HC780	11055	2P	BG19NUC-HC11
2905	2P	BG5NUC-HC265	6981	RBD	BG13NUC-HC781	11056	RBD	BG19NUC-HC12
2906	2P	BG5NUC-HC266	6982	2P	BG13NUC-HC782	11057	RBD	BG19NUC-HC13
2907	RBD	BG5NUC-HC267	6983	2P	BG13NUC-HC783	11058	2P	BG19NUC-HC14
2908	2P	BG5NUC-HC268	6984	RBD	BG13NUC-HC784	11059	RBD	BG19NUC-HC15
2909	RBD	BG5NUC-HC269	6985	RBD	BG13NUC-HC785	11060	RBD	BG19NUC-HC16
2910	RBD	BG5NUC-HC270	6986	2P	BG13NUC-HC786	11061	2P	BG19NUC-HC17
2911	2P	BG5NUC-HC271	6987	2P	BG13NUC-HC787	11062	2P	BG19NUC-HC18
2912	2P	BG5NUC-HC272	6988	2P	BG13NUC-HC788	11063	2P	BG19NUC-HC19
2913	RBD	BG5NUC-HC273	6989	2P	BG13NUC-HC789	11064	2P	BG19NUC-HC20
2914	2P	BG5NUC-HC274	6990	RBD	BG13NUC-HC790	11065	2P	BG19NUC-HC21
2915	2P	BG5NUC-HC275	6991	2P	BG13NUC-HC791	11066	2P	BG19NUC-HC22
2916	2P	BG5NUC-HC276	6992	RBD	BG13NUC-HC792	11067	RBD	BG19NUC-HC23
2917	RBD	BG5NUC-HC277	6993	RBD	BG13NUC-HC793	11068	2P	BG19NUC-HC24
2918	2P	BG5NUC-HC278	6994	2P	BG13NUC-HC794	11069	2P	BG19NUC-HC25
2919	RBD	BG5NUC-HC279	6995	2P	BG13NUC-HC795	11070	RBD	BG19NUC-HC26
2920	RBD	BG5NUC-HC280	6996	2P	BG13NUC-HC796	11071	2P	BG19NUC-HC27
2921	2P	BG5NUC-HC281	6997	2P	BG13NUC-HC797	11072	RBD	BG19NUC-HC28
2922	2P	BG5NUC-HC282	6998	2P	BG13NUC-HC798	11073	2P	BG19NUC-HC29
2923	RBD	BG5NUC-HC283	6999	RBD	BG13NUC-HC799	11074	RBD	BG19NUC-HC30
2924	RBD	BG5NUC-HC284	7000	RBD	BG13NUC-HC800	11075	2P	BG19NUC-HC31
2925	RBD	BG5NUC-HC285	7001	RBD	BG13NUC-HC801	11076	2P	BG19NUC-HC32
2926	2P	BG5NUC-HC286	7002	2P	BG13NUC-HC802	11077	2P	BG19NUC-HC33
2927	2P	BG5NUC-HC287	7003	2P	BG13NUC-HC803	11078	RBD	BG19NUC-HC34
2928	2P	BG5NUC-HC288	7004	2P	BG13NUC-HC804	11079	2P	BG19NUC-HC35
2929	2P	BG5NUC-HC289	7005	2P	BG13NUC-HC805	11080	RBD	BG19NUC-HC36
2930	2P	BG5NUC-HC290	7006	2P	BG13NUC-HC806	11081	RBD	BG19NUC-HC37
2931	2P	BG5NUC-HC291	7007	2P	BG13NUC-HC807	11082	2P	BG19NUC-HC38
2932	2P	BG5NUC-HC292	7008	2P	BG13NUC-HC808	11083	2P	BG19NUC-HC39
2933	2P	BG5NUC-HC293	7009	2P	BG13NUC-HC809	11084	RBD	BG19NUC-HC40
2934	2P	BG5NUC-HC294	7010	2P	BG13NUC-HC810	11085	2P	BG19NUC-HC41
2935	2P	BG5NUC-HC295	7011	RBD	BG13NUC-HC811	11086	2P	BG19NUC-HC42
2936	RBD	BG5NUC-HC296	7012	RBD	BG13NUC-HC812	11087	2P	BG19NUC-HC43
2937	RBD	BG5NUC-HC297	7013	RBD	BG13NUC-HC813	11088	2P	BG19NUC-HC44
2938	2P	BG5NUC-HC298	7014	2P	BG13NUC-HC814	11089	2P	BG19NUC-HC45
2939	RBD	BG5NUC-HC299	7015	2P	BG13NUC-HC815	11090	2P	BG19NUC-HC46
2940	RBD	BG5NUC-HC300	7016	2P	BG13NUC-HC816	11091	RBD	BG19NUC-HC47
2941	2P	BG5NUC-HC301	7017	2P	BG13NUC-HC817	11092	RBD	BG19NUC-HC48
2942	2P	BG5NUC-HC302	7018	2P	BG13NUC-HC818	11093	RBD	BG19NUC-HC49
2943	RBD	BG5NUC-HC303	7019	2P	BG13NUC-HC819	11094	2P	BG19NUC-HC50
2944	2P	BG5NUC-HC304	7020	2P	BG13NUC-HC820	11095	2P	BG19NUC-HC51
2945	RBD	BG5NUC-HC305	7021	2P	BG13NUC-HC821	11096	2P	BG19NUC-HC52
2946	RBD	BG5NUC-HC306	7022	2P	BG13NUC-HC822	11097	2P	BG19NUC-HC53
2947	RBD	BG5NUC-HC307	7023	RBD	BG13NUC-HC823	11098	RBD	BG19NUC-HC54
2948	2P	BG5NUC-HC308	7024	RBD	BG13NUC-HC824	11099	2P	BG19NUC-HC55
2949	2P	BG5NUC-HC309	7025	RBD	BG13NUC-HC825	11100	2P	BG19NUC-HC56
2950	RBD	BG5NUC-HC310	7026	RBD	BG13NUC-HC826	11101	2P	BG19NUC-HC57
2951	2P	BG5NUC-HC311	7027	RBD	BG13NUC-HC827	11102	2P	BG19NUC-HC58
2952	2P	BG5NUC-HC312	7028	2P	BG13NUC-HC828	11103	RBD	BG19NUC-HC59
2953	2P	BG5NUC-HC313	7029	2P	BG13NUC-HC829	11104	RBD	BG19NUC-HC60
2954	2P	BG5NUC-HC314	7030	2P	BG13NUC-HC830	11105	RBD	BG19NUC-HC61
2955	RBD	BG5NUC-HC315	7031	2P	BG13NUC-HC831	11106	2P	BG19NUC-HC62
2956	2P	BG5NUC-HC316	7032	2P	BG13NUC-HC832	11107	2P	BG19NUC-HC63
2957	RBD	BG5NUC-HC317	7033	RBD	BG13NUC-HC833	11108	RBD	BG19NUC-HC64
2958	RBD	BG5NUC-HC318	7034	RBD	BG13NUC-HC834	11109	2P	BG19NUC-HC65
2959	2P	BG5NUC-HC319	7035	RBD	BG13NUC-HC835	11110	2P	BG19NUC-HC66
2960	RBD	BG5NUC-HC320	7036	2P	BG13NUC-HC836	11111	2P	BG19NUC-HC67
2961	RBD	BG5NUC-HC321	7037	RBD	BG13NUC-HC837	11112	2P	BG19NUC-HC68
2962	RBD	BG5NUC-HC322	7038	2P	BG13NUC-HC838	11113	2P	BG19NUC-HC69
2963	2P	BG5NUC-HC323	7039	RBD	BG13NUC-HC839	11114	2P	BG19NUC-HC70
2964	2P	BG5NUC-HC324	7040	2P	BG13NUC-HC840	11115	2P	BG19NUC-HC71
2965	2P	BG5NUC-HC325	7041	2P	BG13NUC-HC841	11116	2P	BG19NUC-HC72
2966	RBD	BG5NUC-HC326	7042	RBD	BG13NUC-HC842	11117	2P	BG19NUC-HC73
2967	2P	BG5NUC-HC327	7043	RBD	BG13NUC-HC843	11118	2P	BG19NUC-HC74
2968	2P	BG5NUC-HC328	7044	2P	BG13NUC-HC844	11119	2P	BG19NUC-HC75
2969	2P	BG5NUC-HC329	7045	RBD	BG13NUC-HC845	11120	RBD	BG19NUC-HC76

2970	2P	BG5NUC-HC330	7046	RBD	BG13NUC-HC846	11121	2P	BG19NUC-HC77
2971	2P	BG5NUC-HC331	7047	2P	BG13NUC-HC847	11122	RBD	BG19NUC-HC78
2972	RBD	BG5NUC-HC332	7048	2P	BG13NUC-HC848	11123	2P	BG19NUC-HC79
2973	RBD	BG5NUC-HC333	7049	RBD	BG13NUC-HC849	11124	RBD	BG19NUC-HC80
2974	RBD	BG5NUC-HC334	7050	RBD	BG13NUC-HC850	11125	2P	BG19NUC-HC81
2975	RBD	BG5NUC-HC335	7051	RBD	BG13NUC-HC851	11126	2P	BG19NUC-HC82
2976	RBD	BG5NUC-HC336	7052	2P	BG13NUC-HC852	11127	2P	BG19NUC-HC83
2977	RBD	BG5NUC-HC337	7053	2P	BG13NUC-HC853	11128	2P	BG19NUC-HC84
2978	2P	BG5NUC-HC338	7054	2P	BG13NUC-HC854	11129	2P	BG19NUC-HC85
2979	2P	BG5NUC-HC339	7055	2P	BG13NUC-HC855	11130	2P	BG19NUC-HC86
2980	2P	BG5NUC-HC340	7056	2P	BG13NUC-HC856	11131	2P	BG19NUC-HC87
2981	2P	BG5NUC-HC341	7057	RBD	BG13NUC-HC857	11132	2P	BG19NUC-HC88
2982	2P	BG5NUC-HC342	7058	2P	BG13NUC-HC858	11133	2P	BG19NUC-HC89
2983	2P	BG5NUC-HC343	7059	2P	BG13NUC-HC859	11134	2P	BG19NUC-HC90
2984	2P	BG5NUC-HC344	7060	2P	BG13NUC-HC860	11135	2P	BG19NUC-HC91
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2986	RBD	BG5NUC-HC346	7062	2P	BG13NUC-HC862	11137	2P	BG19NUC-HC93
2987	RBD	BG5NUC-HC347	7063	RBD	BG13NUC-HC863	11138	2P	BG19NUC-HC94
2988	2P	BG5NUC-HC348	7064	2P	BG13NUC-HC864	11139	2P	BG19NUC-HC95
2989	2P	BG5NUC-HC349	7065	2P	BG13NUC-HC865	11140	2P	BG19NUC-HC96
2990	2P	BG5NUC-HC350	7066	2P	BG13NUC-HC866	11141	2P	BG19NUC-HC97
2991	2P	BG5NUC-HC351	7067	2P	BG13NUC-HC867	11142	2P	BG19NUC-HC98
2992	RBD	BG5NUC-HC352	7068	2P	BG13NUC-HC868	11143	2P	BG19NUC-HC99
2993	2P	BG5NUC-HC353	7069	2P	BG13NUC-HC869	11144	2P	BG19NUC-HC100
2994	RBD	BG5NUC-HC354	7070	RBD	BG13NUC-HC870	11145	2P	BG19NUC-HC101
2995	RBD	BG5NUC-HC355	7071	2P	BG13NUC-HC871	11146	2P	BG19NUC-HC102
2996	2P	BG5NUC-HC356	7072	RBD	BG13NUC-HC872	11147	2P	BG19NUC-HC103
2997	RBD	BG5NUC-HC357	7073	RBD	BG13NUC-HC873	11148	2P	BG19NUC-HC104
2998	2P	BG5NUC-HC358	7074	RBD	BG13NUC-HC874	11149	2P	BG19NUC-HC105
2999	RBD	BG5NUC-HC359	7075	RBD	BG13NUC-HC875	11150	RBD	BG19NUC-HC106
3000	2P	BG5NUC-HC360	7076	RBD	BG13NUC-HC876	11151	RBD	BG19NUC-HC107
3001	2P	BG5NUC-HC361	7077	RBD	BG13NUC-HC877	11152	RBD	BG19NUC-HC108
3002	2P	BG5NUC-HC362	7078	2P	BG13NUC-HC878	11153	2P	BG19NUC-HC109
3003	RBD	BG5NUC-HC363	7079	2P	BG13NUC-HC879	11154	RBD	BG19NUC-HC110
3004	2P	BG5NUC-HC364	7080	2P	BG13NUC-HC880	11155	2P	BG19NUC-HC111
3005	2P	BG5NUC-HC365	7081	2P	BG13NUC-HC881	11156	2P	BG19NUC-HC112
3006	2P	BG5NUC-HC366	7082	RBD	BG13NUC-HC882	11157	2P	BG19NUC-HC113
3007	2P	BG5NUC-HC367	7083	2P	BG13NUC-HC883	11158	RBD	BG19NUC-HC114
3008	RBD	BG5NUC-HC368	7084	RBD	BG13NUC-HC884	11159	2P	BG19NUC-HC115
3009	RBD	BG5NUC-HC369	7085	RBD	BG13NUC-HC885	11160	2P	BG19NUC-HC116
3010	2P	BG5NUC-HC370	7086	2P	BG13NUC-HC886	11161	2P	BG19NUC-HC117
3011	RBD	BG5NUC-HC371	7087	RBD	BG13NUC-HC887	11162	RBD	BG19NUC-HC118
3012	2P	BG5NUC-HC372	7088	RBD	BG13NUC-HC888	11163	RBD	BG19NUC-HC119
3013	RBD	BG5NUC-HC373	7089	RBD	BG13NUC-HC889	11164	RBD	BG19NUC-HC120
3014	2P	BG5NUC-HC374	7090	RBD	BG13NUC-HC890	11165	RBD	BG19NUC-HC121
3015	2P	BG5NUC-HC375	7091	RBD	BG13NUC-HC891	11166	2P	BG19NUC-HC122
3016	2P	BG5NUC-HC376	7092	RBD	BG13NUC-HC892	11167	2P	BG19NUC-HC123
3017	RBD	BG5NUC-HC377	7093	2P	BG13NUC-HC893	11168	2P	BG19NUC-HC124
3018	2P	BG5NUC-HC378	7094	RBD	BG13NUC-HC894	11169	2P	BG19NUC-HC125
3019	2P	BG5NUC-HC379	7095	RBD	BG13NUC-HC895	11170	RBD	BG19NUC-HC126
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3022	RBD	BG5NUC-HC382	7098	RBD	BG13NUC-HC898	11173	2P	BG19NUC-HC129
3023	RBD	BG5NUC-HC383	7099	RBD	BG13NUC-HC899	11174	2P	BG19NUC-HC130
3024	2P	BG5NUC-HC384	7100	2P	BG13NUC-HC900	11175	2P	BG19NUC-HC131
3025	2P	BG5NUC-HC385	7101	2P	BG13NUC-HC901	11176	RBD	BG19NUC-HC132
3026	2P	BG5NUC-HC386	7102	2P	BG13NUC-HC902	11177	2P	BG19NUC-HC133
3027	2P	BG5NUC-HC387	7103	2P	BG13NUC-HC903	11178	2P	BG19NUC-HC134
3028	2P	BG5NUC-HC388	7104	2P	BG13NUC-HC904	11179	RBD	BG19NUC-HC135
3029	2P	BG5NUC-HC389	7105	RBD	BG13NUC-HC905	11180	RBD	BG19NUC-HC136
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3031	2P	BG5NUC-HC391	7107	RBD	BG13NUC-HC907	11182	2P	BG19NUC-HC138
3032	2P	BG5NUC-HC392	7108	2P	BG13NUC-HC908	11183	RBD	BG19NUC-HC139
3033	2P	BG5NUC-HC393	7109	2P	BG13NUC-HC909	11184	2P	BG19NUC-HC140
3034	RBD	BG5NUC-HC394	7110	2P	BG13NUC-HC910	11185	RBD	BG19NUC-HC141
3035	RBD	BG5NUC-HC395	7111	2P	BG13NUC-HC911	11186	2P	BG19NUC-HC142
3036	RBD	BG5NUC-HC396	7112	2P	BG13NUC-HC912	11187	2P	BG19NUC-HC143
3037	2P	BG5NUC-HC397	7113	2P	BG13NUC-HC913	11188	2P	BG19NUC-HC144
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3039	2P	BG5NUC-HC399	7115	2P	BG13NUC-HC915	11190	RBD	BG19NUC-HC146
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3041	2P	BG5NUC-HC401	7117	2P	BG13NUC-HC917	11192	2P	BG19NUC-HC148
3042	2P	BG5NUC-HC402	7118	2P	BG13NUC-HC918	11193	2P	BG19NUC-HC149
3043	2P	BG5NUC-HC403	7119	RBD	BG13NUC-HC919	11194	2P	BG19NUC-HC150
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3045	2P	BG5NUC-HC405	7121	RBD	BG13NUC-HC921	11196	RBD	BG19NUC-HC152
3046	2P	BG5NUC-HC406	7122	RBD	BG13NUC-HC922	11197	2P	BG19NUC-HC153
3047	RBD	BG5NUC-HC407	7123	RBD	BG13NUC-HC923	11198	2P	BG19NUC-HC154
3048	2P	BG5NUC-HC408	7124	RBD	BG13NUC-HC924	11199	2P	BG19NUC-HC155

3049	RBD	BG5NUC-HC409	7125	2P	BG13NUC-HC925	11200	RBD	BG19NUC-HC156
3050	RBD	BG5NUC-HC410	7126	2P	BG13NUC-HC926	11201	2P	BG19NUC-HC157
3051	2P	BG5NUC-HC411	7127	RBD	BG13NUC-HC927	11202	2P	BG19NUC-HC158
3052	2P	BG5NUC-HC412	7128	2P	BG13NUC-HC928	11203	2P	BG19NUC-HC159
3053	2P	BG5NUC-HC413	7129	2P	BG13NUC-HC929	11204	2P	BG19NUC-HC160
3054	2P	BG5NUC-HC414	7130	2P	BG13NUC-HC930	11205	2P	BG19NUC-HC161
3055	2P	BG5NUC-HC415	7131	2P	BG13NUC-HC931	11206	2P	BG19NUC-HC162
3056	RBD	BG5NUC-HC416	7132	2P	BG13NUC-HC932	11207	2P	BG19NUC-HC163
3057	2P	BG5NUC-HC417	7133	2P	BG13NUC-HC933	11208	RBD	BG19NUC-HC164
3058	RBD	BG5NUC-HC418	7134	2P	BG13NUC-HC934	11209	2P	BG19NUC-HC165
3059	2P	BG5NUC-HC419	7135	RBD	BG13NUC-HC935	11210	2P	BG19NUC-HC166
3060	2P	BG5NUC-HC420	7136	RBD	BG13NUC-HC936	11211	RBD	BG19NUC-HC167
3061	2P	BG5NUC-HC421	7137	2P	BG13NUC-HC937	11212	2P	BG19NUC-HC168
3062	2P	BG5NUC-HC422	7138	2P	BG13NUC-HC938	11213	2P	BG19NUC-HC169
3063	2P	BG5NUC-HC423	7139	2P	BG13NUC-HC939	11214	2P	BG19NUC-HC170
3064	2P	BG5NUC-HC424	7140	RBD	BG13NUC-HC940	11215	2P	BG19NUC-HC171
3065	RBD	BG5NUC-HC425	7141	2P	BG13NUC-HC941	11216	2P	BG19NUC-HC172
3066	2P	BG5NUC-HC426	7142	RBD	BG13NUC-HC942	11217	2P	BG19NUC-HC173
3067	RBD	BG5NUC-HC427	7143	RBD	BG13NUC-HC943	11218	RBD	BG19NUC-HC174
3068	2P	BG5NUC-HC428	7144	RBD	BG13NUC-HC944	11219	RBD	BG19NUC-HC175
3069	2P	BG5NUC-HC429	7145	RBD	BG13NUC-HC945	11220	2P	BG19NUC-HC176
3070	2P	BG5NUC-HC430	7146	2P	BG13NUC-HC946	11221	RBD	BG19NUC-HC177
3071	2P	BG5NUC-HC431	7147	RBD	BG13NUC-HC947	11222	RBD	BG19NUC-HC178
3072	2P	BG5NUC-HC432	7148	RBD	BG13NUC-HC948	11223	2P	BG19NUC-HC179
3073	2P	BG5NUC-HC433	7149	RBD	BG13NUC-HC949	11224	2P	BG19NUC-HC180
3074	RBD	BG5NUC-HC434	7150	2P	BG13NUC-HC950	11225	2P	BG19NUC-HC181
3075	RBD	BG5NUC-HC435	7151	RBD	BG13NUC-HC951	11226	2P	BG19NUC-HC182
3076	2P	BG5NUC-HC436	7152	2P	BG13NUC-HC952	11227	RBD	BG19NUC-HC183
3077	RBD	BG5NUC-HC437	7153	2P	BG13NUC-HC953	11228	RBD	BG19NUC-HC184
3078	2P	BG5NUC-HC438	7154	2P	BG13NUC-HC954	11229	RBD	BG19NUC-HC185
3079	2P	BG5NUC-HC439	7155	2P	BG13NUC-HC955	11230	RBD	BG19NUC-HC186
3080	2P	BG5NUC-HC440	7156	2P	BG13NUC-HC956	11231	RBD	BG19NUC-HC187
3081	2P	BG5NUC-HC441	7157	RBD	BG13NUC-HC957	11232	2P	BG19NUC-HC188
3082	RBD	BG5NUC-HC442	7158	2P	BG13NUC-HC958	11233	2P	BG19NUC-HC189
3083	2P	BG5NUC-HC443	7159	RBD	BG13NUC-HC959	11234	RBD	BG19NUC-HC190
3084	2P	BG5NUC-HC444	7160	RBD	BG13NUC-HC960	11235	RBD	BG19NUC-HC191
3085	2P	BG5NUC-HC445	7161	2P	BG13NUC-HC961	11236	2P	BG19NUC-HC192
3086	2P	BG5NUC-HC446	7162	RBD	BG13NUC-HC962	11237	2P	BG19NUC-HC193
3087	2P	BG5NUC-HC447	7163	RBD	BG13NUC-HC963	11238	2P	BG19NUC-HC194
3088	RBD	BG5NUC-HC448	7164	2P	BG13NUC-HC964	11239	RBD	BG19NUC-HC195
3089	2P	BG5NUC-HC449	7165	RBD	BG13NUC-HC965	11240	RBD	BG19NUC-HC196
3090	2P	BG5NUC-HC450	7166	2P	BG13NUC-HC966	11241	2P	BG19NUC-HC197
3091	2P	BG5NUC-HC451	7167	2P	BG13NUC-HC967	11242	RBD	BG19NUC-HC198
3092	2P	BG5NUC-HC452	7168	2P	BG13NUC-HC968	11243	2P	BG19NUC-HC199
3093	2P	BG5NUC-HC453	7169	2P	BG13NUC-HC969	11244	RBD	BG19NUC-HC200
3094	2P	BG5NUC-HC454	7170	RBD	BG13NUC-HC970	11245	RBD	BG19NUC-HC201
3095	2P	BG5NUC-HC455	7171	2P	BG13NUC-HC971	11246	RBD	BG19NUC-HC202
3096	2P	BG5NUC-HC456	7172	RBD	BG13NUC-HC972	11247	RBD	BG19NUC-HC203
3097	2P	BG5NUC-HC457	7173	2P	BG13NUC-HC973	11248	2P	BG19NUC-HC204
3098	2P	BG5NUC-HC458	7174	RBD	BG13NUC-HC974	11249	2P	BG19NUC-HC205
3099	2P	BG5NUC-HC459	7175	RBD	BG13NUC-HC975	11250	2P	BG19NUC-HC206
3100	2P	BG5NUC-HC460	7176	RBD	BG13NUC-HC976	11251	2P	BG19NUC-HC207
3101	RBD	BG5NUC-HC461	7177	2P	BG13NUC-HC977	11252	2P	BG19NUC-HC208
3102	2P	BG5NUC-HC462	7178	RBD	BG13NUC-HC978	11253	2P	BG19NUC-HC209
3103	2P	BG5NUC-HC463	7179	2P	BG13NUC-HC979	11254	2P	BG19NUC-HC210
3104	2P	BG5NUC-HC464	7180	2P	BG13NUC-HC980	11255	2P	BG19NUC-HC211
3105	2P	BG5NUC-HC465	7181	RBD	BG13NUC-HC981	11256	2P	BG19NUC-HC212
3106	RBD	BG5NUC-HC466	7182	2P	BG13NUC-HC982	11257	2P	BG19NUC-HC213
3107	2P	BG5NUC-HC467	7183	2P	BG13NUC-HC983	11258	RBD	BG19NUC-HC214
3108	2P	BG5NUC-HC468	7184	RBD	BG13NUC-HC984	11259	RBD	BG19NUC-HC215
3109	2P	BG5NUC-HC469	7185	RBD	BG13NUC-HC985	11260	2P	BG19NUC-HC216
3110	RBD	BG5NUC-HC470	7186	RBD	BG13NUC-HC986	11261	2P	BG19NUC-HC217
3111	RBD	BG5NUC-HC471	7187	RBD	BG13NUC-HC987	11262	RBD	BG19NUC-HC218
3112	2P	BG5NUC-HC472	7188	2P	BG13NUC-HC988	11263	2P	BG19NUC-HC219
3113	RBD	BG5NUC-HC473	7189	2P	BG13NUC-HC989	11264	2P	BG19NUC-HC220
3114	RBD	BG5NUC-HC474	7190	2P	BG13NUC-HC990	11265	2P	BG19NUC-HC221
3115	RBD	BG5NUC-HC475	7191	RBD	BG13NUC-HC991	11266	RBD	BG19NUC-HC222
3116	2P	BG5NUC-HC476	7192	2P	BG13NUC-HC992	11267	RBD	BG19NUC-HC223
3117	2P	BG5NUC-LC1	7193	2P	BG13NUC-HC993	11268	2P	BG19NUC-HC224
3118	RBD	BG5NUC-LC2	7194	RBD	BG13NUC-HC994	11269	2P	BG19NUC-HC225
3119	RBD	BG5NUC-LC3	7195	RBD	BG13NUC-HC995	11270	2P	BG19NUC-HC226
3120	2P	BG5NUC-LC4	7196	2P	BG13NUC-HC996	11271	2P	BG19NUC-HC227
3121	RBD	BG5NUC-LC5	7197	RBD	BG13NUC-HC997	11272	2P	BG19NUC-HC228
3122	2P	BG5NUC-LC6	7198	2P	BG13NUC-HC998	11273	RBD	BG19NUC-HC229
3123	RBD	BG5NUC-LC7	7199	RBD	BG13NUC-HC999	11274	2P	BG19NUC-HC230
3124	2P	BG5NUC-LC8	7200	2P	BG13NUC-HC1000	11275	2P	BG19NUC-HC231
3125	RBD	BG5NUC-LC9	7201	RBD	BG13NUC-HC1001	11276	RBD	BG19NUC-HC232
3126	2P	BG5NUC-LC10	7202	RBD	BG13NUC-HC1002	11277	RBD	BG19NUC-HC233
3127	RBD	BG5NUC-LC11	7203	2P	BG13NUC-HC1003	11278	2P	BG19NUC-HC234

3128	2P	BG5NUC-LC12	7204	RBD	BG13NUC-HC1004	11279	2P	BG19NUC-HC235
3129	2P	BG5NUC-LC13	7205	2P	BG13NUC-HC1005	11280	2P	BG19NUC-HC236
3130	2P	BG5NUC-LC14	7206	2P	BG13NUC-HC1006	11281	RBD	BG19NUC-HC237
3131	2P	BG5NUC-LC15	7207	2P	BG13NUC-HC1007	11282	RBD	BG19NUC-HC238
3132	RBD	BG5NUC-LC16	7208	2P	BG13NUC-HC1008	11283	RBD	BG19NUC-HC239
3133	RBD	BG5NUC-LC17	7209	2P	BG13NUC-HC1009	11284	2P	BG19NUC-HC240
3134	2P	BG5NUC-LC18	7210	RBD	BG13NUC-HC1010	11285	2P	BG19NUC-HC241
3135	RBD	BG5NUC-LC19	7211	2P	BG13NUC-HC1011	11286	2P	BG19NUC-HC242
3136	RBD	BG5NUC-LC20	7212	2P	BG13NUC-HC1012	11287	2P	BG19NUC-HC243
3137	2P	BG5NUC-LC21	7213	RBD	BG13NUC-HC1013	11288	2P	BG19NUC-HC244
3138	RBD	BG5NUC-LC22	7214	RBD	BG13NUC-HC1014	11289	RBD	BG19NUC-HC245
3139	2P	BG5NUC-LC23	7215	2P	BG13NUC-HC1015	11290	RBD	BG19NUC-HC246
3140	RBD	BG5NUC-LC24	7216	2P	BG13NUC-HC1016	11291	2P	BG19NUC-HC247
3141	RBD	BG5NUC-LC25	7217	2P	BG13NUC-HC1017	11292	RBD	BG19NUC-HC248
3142	2P	BG5NUC-LC26	7218	2P	BG13NUC-HC1018	11293	2P	BG19NUC-HC249
3143	RBD	BG5NUC-LC27	7219	2P	BG13NUC-HC1019	11294	2P	BG19NUC-HC250
3144	RBD	BG5NUC-LC28	7220	2P	BG13NUC-HC1020	11295	2P	BG19NUC-HC251
3145	RBD	BG5NUC-LC29	7221	2P	BG13NUC-HC1021	11296	2P	BG19NUC-HC252
3146	RBD	BG5NUC-LC30	7222	RBD	BG13NUC-HC1022	11297	2P	BG19NUC-HC253
3147	RBD	BG5NUC-LC31	7223	2P	BG13NUC-HC1023	11298	RBD	BG19NUC-HC254
3148	2P	BG5NUC-LC32	7224	2P	BG13NUC-HC1024	11299	RBD	BG19NUC-HC255
3149	RBD	BG5NUC-LC33	7225	2P	BG13NUC-HC1025	11300	2P	BG19NUC-HC256
3150	RBD	BG5NUC-LC34	7226	RBD	BG13NUC-HC1026	11301	2P	BG19NUC-HC257
3151	2P	BG5NUC-LC35	7227	2P	BG13NUC-HC1027	11302	RBD	BG19NUC-HC258
3152	RBD	BG5NUC-LC36	7228	2P	BG13NUC-HC1028	11303	2P	BG19NUC-HC259
3153	RBD	BG5NUC-LC37	7229	2P	BG13NUC-HC1029	11304	2P	BG19NUC-HC260
3154	2P	BG5NUC-LC38	7230	2P	BG13NUC-HC1030	11305	RBD	BG19NUC-HC261
3155	2P	BG5NUC-LC39	7231	2P	BG13NUC-HC1031	11306	2P	BG19NUC-HC262
3156	2P	BG5NUC-LC40	7232	RBD	BG13NUC-HC1032	11307	2P	BG19NUC-HC263
3157	2P	BG5NUC-LC41	7233	RBD	BG13NUC-HC1033	11308	RBD	BG19NUC-HC264
3158	2P	BG5NUC-LC42	7234	2P	BG13NUC-HC1034	11309	2P	BG19NUC-HC265
3159	2P	BG5NUC-LC43	7235	2P	BG13NUC-HC1035	11310	2P	BG19NUC-HC266
3160	RBD	BG5NUC-LC44	7236	2P	BG13NUC-HC1036	11311	2P	BG19NUC-HC267
3161	2P	BG5NUC-LC45	7237	2P	BG13NUC-HC1037	11312	2P	BG19NUC-HC268
3162	2P	BG5NUC-LC46	7238	RBD	BG13NUC-HC1038	11313	RBD	BG19NUC-HC269
3163	RBD	BG5NUC-LC47	7239	RBD	BG13NUC-HC1039	11314	2P	BG19NUC-HC270
3164	RBD	BG5NUC-LC48	7240	RBD	BG13NUC-HC1040	11315	RBD	BG19NUC-HC271
3165	RBD	BG5NUC-LC49	7241	2P	BG13NUC-HC1041	11316	RBD	BG19NUC-HC272
3166	RBD	BG5NUC-LC50	7242	2P	BG13NUC-HC1042	11317	RBD	BG19NUC-HC273
3167	2P	BG5NUC-LC51	7243	RBD	BG13NUC-HC1043	11318	2P	BG19NUC-HC274
3168	2P	BG5NUC-LC52	7244	2P	BG13NUC-HC1044	11319	RBD	BG19NUC-HC275
3169	2P	BG5NUC-LC53	7245	2P	BG13NUC-HC1045	11320	2P	BG19NUC-LC1
3170	2P	BG5NUC-LC54	7246	2P	BG13NUC-HC1046	11321	RBD	BG19NUC-LC2
3171	2P	BG5NUC-LC55	7247	2P	BG13NUC-HC1047	11322	RBD	BG19NUC-LC3
3172	2P	BG5NUC-LC56	7248	2P	BG13NUC-HC1048	11323	RBD	BG19NUC-LC4
3173	2P	BG5NUC-LC57	7249	RBD	BG13NUC-HC1049	11324	2P	BG19NUC-LC5
3174	2P	BG5NUC-LC58	7250	2P	BG13NUC-HC1050	11325	2P	BG19NUC-LC6
3175	2P	BG5NUC-LC59	7251	2P	BG13NUC-HC1051	11326	RBD	BG19NUC-LC7
3176	2P	BG5NUC-LC60	7252	2P	BG13NUC-HC1052	11327	RBD	BG19NUC-LC8
3177	RBD	BG5NUC-LC61	7253	RBD	BG13NUC-HC1053	11328	2P	BG19NUC-LC9
3178	RBD	BG5NUC-LC62	7254	2P	BG13NUC-HC1054	11329	2P	BG19NUC-LC10
3179	RBD	BG5NUC-LC63	7255	2P	BG13NUC-HC1055	11330	2P	BG19NUC-LC11
3180	RBD	BG5NUC-LC64	7256	2P	BG13NUC-HC1056	11331	RBD	BG19NUC-LC12
3181	RBD	BG5NUC-LC65	7257	2P	BG13NUC-HC1057	11332	RBD	BG19NUC-LC13
3182	RBD	BG5NUC-LC66	7258	2P	BG13NUC-HC1058	11333	2P	BG19NUC-LC14
3183	RBD	BG5NUC-LC67	7259	RBD	BG13NUC-HC1059	11334	RBD	BG19NUC-LC15
3184	RBD	BG5NUC-LC68	7260	2P	BG13NUC-HC1060	11335	RBD	BG19NUC-LC16
3185	RBD	BG5NUC-LC69	7261	RBD	BG13NUC-HC1061	11336	2P	BG19NUC-LC17
3186	RBD	BG5NUC-LC70	7262	2P	BG13NUC-HC1062	11337	2P	BG19NUC-LC18
3187	2P	BG5NUC-LC71	7263	2P	BG13NUC-HC1063	11338	2P	BG19NUC-LC19
3188	RBD	BG5NUC-LC72	7264	2P	BG13NUC-HC1064	11339	2P	BG19NUC-LC20
3189	2P	BG5NUC-LC73	7265	RBD	BG13NUC-HC1065	11340	2P	BG19NUC-LC21
3190	2P	BG5NUC-LC74	7266	2P	BG13NUC-HC1066	11341	2P	BG19NUC-LC22
3191	2P	BG5NUC-LC75	7267	2P	BG13NUC-HC1067	11342	RBD	BG19NUC-LC23
3192	2P	BG5NUC-LC76	7268	RBD	BG13NUC-HC1068	11343	2P	BG19NUC-LC24
3193	2P	BG5NUC-LC77	7269	2P	BG13NUC-HC1069	11344	2P	BG19NUC-LC25
3194	2P	BG5NUC-LC78	7270	2P	BG13NUC-HC1070	11345	RBD	BG19NUC-LC26
3195	2P	BG5NUC-LC79	7271	2P	BG13NUC-HC1071	11346	2P	BG19NUC-LC27
3196	2P	BG5NUC-LC80	7272	RBD	BG13NUC-HC1072	11347	RBD	BG19NUC-LC28
3197	2P	BG5NUC-LC81	7273	RBD	BG13NUC-HC1073	11348	2P	BG19NUC-LC29
3198	2P	BG5NUC-LC82	7274	2P	BG13NUC-HC1074	11349	RBD	BG19NUC-LC30
3199	2P	BG5NUC-LC83	7275	RBD	BG13NUC-HC1075	11350	2P	BG19NUC-LC31
3200	2P	BG5NUC-LC84	7276	2P	BG13NUC-HC1076	11351	2P	BG19NUC-LC32
3201	2P	BG5NUC-LC85	7277	2P	BG13NUC-HC1077	11352	2P	BG19NUC-LC33
3202	2P	BG5NUC-LC86	7278	RBD	BG13NUC-HC1078	11353	RBD	BG19NUC-LC34
3203	2P	BG5NUC-LC87	7279	RBD	BG13NUC-HC1079	11354	2P	BG19NUC-LC35
3204	2P	BG5NUC-LC88	7280	RBD	BG13NUC-HC1080	11355	RBD	BG19NUC-LC36
3205	2P	BG5NUC-LC89	7281	RBD	BG13NUC-HC1081	11356	RBD	BG19NUC-LC37
3206	2P	BG5NUC-LC90	7282	2P	BG13NUC-HC1082	11357	2P	BG19NUC-LC38

3207	2P	BG5NUC-LC91	7283	2P	BG13NUC-HC1083	11358	2P	BG19NUC-LC39
3208	2P	BG5NUC-LC92	7284	RBD	BG13NUC-HC1084	11359	RBD	BG19NUC-LC40
3209	2P	BG5NUC-LC93	7285	2P	BG13NUC-HC1085	11360	2P	BG19NUC-LC41
3210	2P	BG5NUC-LC94	7286	RBD	BG13NUC-HC1086	11361	2P	BG19NUC-LC42
3211	2P	BG5NUC-LC95	7287	2P	BG13NUC-HC1087	11362	2P	BG19NUC-LC43
3212	2P	BG5NUC-LC96	7288	2P	BG13NUC-HC1088	11363	2P	BG19NUC-LC44
3213	RBD	BG5NUC-LC97	7289	2P	BG13NUC-HC1089	11364	2P	BG19NUC-LC45
3214	RBD	BG5NUC-LC98	7290	RBD	BG13NUC-HC1090	11365	2P	BG19NUC-LC46
3215	RBD	BG5NUC-LC99	7291	RBD	BG13NUC-HC1091	11366	RBD	BG19NUC-LC47
3216	RBD	BG5NUC-LC100	7292	2P	BG13NUC-HC1092	11367	RBD	BG19NUC-LC48
3217	2P	BG5NUC-LC101	7293	RBD	BG13NUC-HC1093	11368	RBD	BG19NUC-LC49
3218	2P	BG5NUC-LC102	7294	2P	BG13NUC-HC1094	11369	2P	BG19NUC-LC50
3219	2P	BG5NUC-LC103	7295	RBD	BG13NUC-HC1095	11370	2P	BG19NUC-LC51
3220	2P	BG5NUC-LC104	7296	RBD	BG13NUC-HC1096	11371	2P	BG19NUC-LC52
3221	RBD	BG5NUC-LC105	7297	RBD	BG13NUC-HC1097	11372	2P	BG19NUC-LC53
3222	RBD	BG5NUC-LC106	7298	RBD	BG13NUC-HC1098	11373	RBD	BG19NUC-LC54
3223	2P	BG5NUC-LC107	7299	2P	BG13NUC-HC1099	11374	2P	BG19NUC-LC55
3224	RBD	BG5NUC-LC108	7300	RBD	BG13NUC-HC1100	11375	2P	BG19NUC-LC56
3225	2P	BG5NUC-LC109	7301	RBD	BG13NUC-HC1101	11376	2P	BG19NUC-LC57
3226	RBD	BG5NUC-LC110	7302	RBD	BG13NUC-HC1102	11377	2P	BG19NUC-LC58
3227	2P	BG5NUC-LC111	7303	RBD	BG13NUC-HC1103	11378	RBD	BG19NUC-LC59
3228	RBD	BG5NUC-LC112	7304	2P	BG13NUC-HC1104	11379	RBD	BG19NUC-LC60
3229	2P	BG5NUC-LC113	7305	2P	BG13NUC-HC1105	11380	RBD	BG19NUC-LC61
3230	2P	BG5NUC-LC114	7306	RBD	BG13NUC-HC1106	11381	2P	BG19NUC-LC62
3231	2P	BG5NUC-LC115	7307	2P	BG13NUC-HC1107	11382	2P	BG19NUC-LC63
3232	2P	BG5NUC-LC116	7308	RBD	BG13NUC-HC1108	11383	RBD	BG19NUC-LC64
3233	RBD	BG5NUC-LC117	7309	2P	BG13NUC-HC1109	11384	2P	BG19NUC-LC65
3234	2P	BG5NUC-LC118	7310	2P	BG13NUC-HC1110	11385	2P	BG19NUC-LC66
3235	2P	BG5NUC-LC119	7311	2P	BG13NUC-HC1111	11386	2P	BG19NUC-LC67
3236	2P	BG5NUC-LC120	7312	RBD	BG13NUC-HC1112	11387	2P	BG19NUC-LC68
3237	RBD	BG5NUC-LC121	7313	2P	BG13NUC-HC1113	11388	2P	BG19NUC-LC69
3238	RBD	BG5NUC-LC122	7314	RBD	BG13NUC-HC1114	11389	2P	BG19NUC-LC70
3239	2P	BG5NUC-LC123	7315	2P	BG13NUC-HC1115	11390	2P	BG19NUC-LC71
3240	2P	BG5NUC-LC124	7316	2P	BG13NUC-HC1116	11391	2P	BG19NUC-LC72
3241	2P	BG5NUC-LC125	7317	2P	BG13NUC-HC1117	11392	2P	BG19NUC-LC73
3242	2P	BG5NUC-LC126	7318	2P	BG13NUC-HC1118	11393	2P	BG19NUC-LC74
3243	2P	BG5NUC-LC127	7319	2P	BG13NUC-HC1119	11394	2P	BG19NUC-LC75
3244	2P	BG5NUC-LC128	7320	2P	BG13NUC-HC1120	11395	RBD	BG19NUC-LC76
3245	RBD	BG5NUC-LC129	7321	2P	BG13NUC-HC1121	11396	2P	BG19NUC-LC77
3246	2P	BG5NUC-LC130	7322	2P	BG13NUC-HC1122	11397	RBD	BG19NUC-LC78
3247	RBD	BG5NUC-LC131	7323	2P	BG13NUC-HC1123	11398	2P	BG19NUC-LC79
3248	2P	BG5NUC-LC132	7324	2P	BG13NUC-HC1124	11399	RBD	BG19NUC-LC80
3249	RBD	BG5NUC-LC133	7325	2P	BG13NUC-HC1125	11400	2P	BG19NUC-LC81
3250	RBD	BG5NUC-LC134	7326	RBD	BG13NUC-HC1126	11401	2P	BG19NUC-LC82
3251	2P	BG5NUC-LC135	7327	2P	BG13NUC-HC1127	11402	2P	BG19NUC-LC83
3252	2P	BG5NUC-LC136	7328	2P	BG13NUC-HC1128	11403	2P	BG19NUC-LC84
3253	2P	BG5NUC-LC137	7329	2P	BG13NUC-HC1129	11404	2P	BG19NUC-LC85
3254	2P	BG5NUC-LC138	7330	2P	BG13NUC-HC1130	11405	2P	BG19NUC-LC86
3255	2P	BG5NUC-LC139	7331	RBD	BG13NUC-HC1131	11406	2P	BG19NUC-LC87
3256	2P	BG5NUC-LC140	7332	RBD	BG13NUC-HC1132	11407	2P	BG19NUC-LC88
3257	2P	BG5NUC-LC141	7333	2P	BG13NUC-HC1133	11408	2P	BG19NUC-LC89
3258	2P	BG5NUC-LC142	7334	RBD	BG13NUC-HC1134	11409	2P	BG19NUC-LC90
3259	2P	BG5NUC-LC143	7335	RBD	BG13NUC-HC1135	11410	2P	BG19NUC-LC91
3260	RBD	BG5NUC-LC144	7336	RBD	BG13NUC-HC1136	11411	RBD	BG19NUC-LC92
3261	2P	BG5NUC-LC145	7337	RBD	BG13NUC-LC1	11412	2P	BG19NUC-LC93
3262	2P	BG5NUC-LC146	7338	RBD	BG13NUC-LC2	11413	2P	BG19NUC-LC94
3263	2P	BG5NUC-LC147	7339	RBD	BG13NUC-LC3	11414	2P	BG19NUC-LC95
3264	2P	BG5NUC-LC148	7340	RBD	BG13NUC-LC4	11415	2P	BG19NUC-LC96
3265	2P	BG5NUC-LC149	7341	RBD	BG13NUC-LC5	11416	2P	BG19NUC-LC97
3266	2P	BG5NUC-LC150	7342	RBD	BG13NUC-LC6	11417	2P	BG19NUC-LC98
3267	2P	BG5NUC-LC151	7343	RBD	BG13NUC-LC7	11418	2P	BG19NUC-LC99
3268	2P	BG5NUC-LC152	7344	RBD	BG13NUC-LC8	11419	2P	BG19NUC-LC100
3269	2P	BG5NUC-LC153	7345	RBD	BG13NUC-LC9	11420	2P	BG19NUC-LC101
3270	2P	BG5NUC-LC154	7346	RBD	BG13NUC-LC10	11421	2P	BG19NUC-LC102
3271	2P	BG5NUC-LC155	7347	RBD	BG13NUC-LC11	11422	2P	BG19NUC-LC103
3272	RBD	BG5NUC-LC156	7348	2P	BG13NUC-LC12	11423	2P	BG19NUC-LC104
3273	RBD	BG5NUC-LC157	7349	2P	BG13NUC-LC13	11424	2P	BG19NUC-LC105
3274	2P	BG5NUC-LC158	7350	2P	BG13NUC-LC14	11425	RBD	BG19NUC-LC106
3275	2P	BG5NUC-LC159	7351	2P	BG13NUC-LC15	11426	RBD	BG19NUC-LC107
3276	2P	BG5NUC-LC160	7352	2P	BG13NUC-LC16	11427	RBD	BG19NUC-LC108
3277	2P	BG5NUC-LC161	7353	2P	BG13NUC-LC17	11428	2P	BG19NUC-LC109
3278	2P	BG5NUC-LC162	7354	2P	BG13NUC-LC18	11429	RBD	BG19NUC-LC110
3279	RBD	BG5NUC-LC163	7355	2P	BG13NUC-LC19	11430	2P	BG19NUC-LC111
3280	2P	BG5NUC-LC164	7356	RBD	BG13NUC-LC20	11431	2P	BG19NUC-LC112
3281	2P	BG5NUC-LC165	7357	RBD	BG13NUC-LC21	11432	2P	BG19NUC-LC113
3282	RBD	BG5NUC-LC166	7358	RBD	BG13NUC-LC22	11433	RBD	BG19NUC-LC114
3283	2P	BG5NUC-LC167	7359	RBD	BG13NUC-LC23	11434	2P	BG19NUC-LC115
3284	2P	BG5NUC-LC168	7360	RBD	BG13NUC-LC24	11435	2P	BG19NUC-LC116
3285	2P	BG5NUC-LC169	7361	RBD	BG13NUC-LC25	11436	2P	BG19NUC-LC117

3286	RBD	BG5NUC-LC170	7362	RBD	BG13NUC-LC26	11437	RBD	BG19NUC-LC118
3287	RBD	BG5NUC-LC171	7363	2P	BG13NUC-LC27	11438	RBD	BG19NUC-LC119
3288	RBD	BG5NUC-LC172	7364	2P	BG13NUC-LC28	11439	RBD	BG19NUC-LC120
3289	2P	BG5NUC-LC173	7365	2P	BG13NUC-LC29	11440	RBD	BG19NUC-LC121
3290	2P	BG5NUC-LC174	7366	2P	BG13NUC-LC30	11441	2P	BG19NUC-LC122
3291	2P	BG5NUC-LC175	7367	2P	BG13NUC-LC31	11442	2P	BG19NUC-LC123
3292	2P	BG5NUC-LC176	7368	2P	BG13NUC-LC32	11443	2P	BG19NUC-LC124
3293	2P	BG5NUC-LC177	7369	2P	BG13NUC-LC33	11444	2P	BG19NUC-LC125
3294	2P	BG5NUC-LC178	7370	2P	BG13NUC-LC34	11445	RBD	BG19NUC-LC126
3295	RBD	BG5NUC-LC179	7371	RBD	BG13NUC-LC35	11446	RBD	BG19NUC-LC127
3296	RBD	BG5NUC-LC180	7372	RBD	BG13NUC-LC36	11447	2P	BG19NUC-LC128
3297	2P	BG5NUC-LC181	7373	RBD	BG13NUC-LC37	11448	2P	BG19NUC-LC129
3298	2P	BG5NUC-LC182	7374	RBD	BG13NUC-LC38	11449	2P	BG19NUC-LC130
3299	2P	BG5NUC-LC183	7375	RBD	BG13NUC-LC39	11450	2P	BG19NUC-LC131
3300	2P	BG5NUC-LC184	7376	RBD	BG13NUC-LC40	11451	RBD	BG19NUC-LC132
3301	2P	BG5NUC-LC185	7377	RBD	BG13NUC-LC41	11452	2P	BG19NUC-LC133
3302	2P	BG5NUC-LC186	7378	2P	BG13NUC-LC42	11453	2P	BG19NUC-LC134
3303	2P	BG5NUC-LC187	7379	2P	BG13NUC-LC43	11454	RBD	BG19NUC-LC135
3304	2P	BG5NUC-LC188	7380	2P	BG13NUC-LC44	11455	RBD	BG19NUC-LC136
3305	2P	BG5NUC-LC189	7381	2P	BG13NUC-LC45	11456	2P	BG19NUC-LC137
3306	2P	BG5NUC-LC190	7382	2P	BG13NUC-LC46	11457	2P	BG19NUC-LC138
3307	2P	BG5NUC-LC191	7383	RBD	BG13NUC-LC47	11458	RBD	BG19NUC-LC139
3308	2P	BG5NUC-LC192	7384	RBD	BG13NUC-LC48	11459	2P	BG19NUC-LC140
3309	2P	BG5NUC-LC193	7385	RBD	BG13NUC-LC49	11460	RBD	BG19NUC-LC141
3310	2P	BG5NUC-LC194	7386	RBD	BG13NUC-LC50	11461	2P	BG19NUC-LC142
3311	2P	BG5NUC-LC195	7387	RBD	BG13NUC-LC51	11462	2P	BG19NUC-LC143
3312	2P	BG5NUC-LC196	7388	RBD	BG13NUC-LC52	11463	2P	BG19NUC-LC144
3313	RBD	BG5NUC-LC197	7389	RBD	BG13NUC-LC53	11464	2P	BG19NUC-LC145
3314	2P	BG5NUC-LC198	7390	RBD	BG13NUC-LC54	11465	RBD	BG19NUC-LC146
3315	2P	BG5NUC-LC199	7391	RBD	BG13NUC-LC55	11466	2P	BG19NUC-LC147
3316	RBD	BG5NUC-LC200	7392	RBD	BG13NUC-LC56	11467	2P	BG19NUC-LC148
3317	2P	BG5NUC-LC201	7393	2P	BG13NUC-LC57	11468	2P	BG19NUC-LC149
3318	RBD	BG5NUC-LC202	7394	2P	BG13NUC-LC58	11469	2P	BG19NUC-LC150
3319	2P	BG5NUC-LC203	7395	RBD	BG13NUC-LC59	11470	2P	BG19NUC-LC151
3320	2P	BG5NUC-LC204	7396	RBD	BG13NUC-LC60	11471	RBD	BG19NUC-LC152
3321	2P	BG5NUC-LC205	7397	RBD	BG13NUC-LC61	11472	2P	BG19NUC-LC153
3322	RBD	BG5NUC-LC206	7398	RBD	BG13NUC-LC62	11473	2P	BG19NUC-LC154
3323	2P	BG5NUC-LC207	7399	RBD	BG13NUC-LC63	11474	2P	BG19NUC-LC155
3324	RBD	BG5NUC-LC208	7400	RBD	BG13NUC-LC64	11475	RBD	BG19NUC-LC156
3325	2P	BG5NUC-LC209	7401	RBD	BG13NUC-LC65	11476	2P	BG19NUC-LC157
3326	2P	BG5NUC-LC210	7402	RBD	BG13NUC-LC66	11477	2P	BG19NUC-LC158
3327	RBD	BG5NUC-LC211	7403	2P	BG13NUC-LC67	11478	2P	BG19NUC-LC159
3328	2P	BG5NUC-LC212	7404	2P	BG13NUC-LC68	11479	2P	BG19NUC-LC160
3329	2P	BG5NUC-LC213	7405	RBD	BG13NUC-LC69	11480	2P	BG19NUC-LC161
3330	2P	BG5NUC-LC214	7406	RBD	BG13NUC-LC70	11481	2P	BG19NUC-LC162
3331	2P	BG5NUC-LC215	7407	RBD	BG13NUC-LC71	11482	2P	BG19NUC-LC163
3332	RBD	BG5NUC-LC216	7408	RBD	BG13NUC-LC72	11483	RBD	BG19NUC-LC164
3333	RBD	BG5NUC-LC217	7409	RBD	BG13NUC-LC73	11484	2P	BG19NUC-LC165
3334	2P	BG5NUC-LC218	7410	2P	BG13NUC-LC74	11485	2P	BG19NUC-LC166
3335	RBD	BG5NUC-LC219	7411	2P	BG13NUC-LC75	11486	RBD	BG19NUC-LC167
3336	2P	BG5NUC-LC220	7412	2P	BG13NUC-LC76	11487	2P	BG19NUC-LC168
3337	2P	BG5NUC-LC221	7413	2P	BG13NUC-LC77	11488	2P	BG19NUC-LC169
3338	2P	BG5NUC-LC222	7414	2P	BG13NUC-LC78	11489	2P	BG19NUC-LC170
3339	RBD	BG5NUC-LC223	7415	RBD	BG13NUC-LC79	11490	2P	BG19NUC-LC171
3340	2P	BG5NUC-LC224	7416	RBD	BG13NUC-LC80	11491	2P	BG19NUC-LC172
3341	2P	BG5NUC-LC225	7417	RBD	BG13NUC-LC81	11492	2P	BG19NUC-LC173
3342	2P	BG5NUC-LC226	7418	RBD	BG13NUC-LC82	11493	RBD	BG19NUC-LC174
3343	RBD	BG5NUC-LC227	7419	RBD	BG13NUC-LC83	11494	RBD	BG19NUC-LC175
3344	2P	BG5NUC-LC228	7420	2P	BG13NUC-LC84	11495	2P	BG19NUC-LC176
3345	2P	BG5NUC-LC229	7421	2P	BG13NUC-LC85	11496	RBD	BG19NUC-LC177
3346	RBD	BG5NUC-LC230	7422	2P	BG13NUC-LC86	11497	RBD	BG19NUC-LC178
3347	RBD	BG5NUC-LC231	7423	RBD	BG13NUC-LC87	11498	2P	BG19NUC-LC179
3348	2P	BG5NUC-LC232	7424	RBD	BG13NUC-LC88	11499	2P	BG19NUC-LC180
3349	2P	BG5NUC-LC233	7425	RBD	BG13NUC-LC89	11500	2P	BG19NUC-LC181
3350	2P	BG5NUC-LC234	7426	RBD	BG13NUC-LC90	11501	2P	BG19NUC-LC182
3351	2P	BG5NUC-LC235	7427	RBD	BG13NUC-LC91	11502	RBD	BG19NUC-LC183
3352	2P	BG5NUC-LC236	7428	2P	BG13NUC-LC92	11503	RBD	BG19NUC-LC184
3353	2P	BG5NUC-LC237	7429	2P	BG13NUC-LC93	11504	RBD	BG19NUC-LC185
3354	2P	BG5NUC-LC238	7430	2P	BG13NUC-LC94	11505	RBD	BG19NUC-LC186
3355	2P	BG5NUC-LC239	7431	RBD	BG13NUC-LC95	11506	RBD	BG19NUC-LC187
3356	RBD	BG5NUC-LC240	7432	RBD	BG13NUC-LC96	11507	2P	BG19NUC-LC188
3357	RBD	BG5NUC-LC241	7433	RBD	BG13NUC-LC97	11508	2P	BG19NUC-LC189
3358	RBD	BG5NUC-LC242	7434	RBD	BG13NUC-LC98	11509	RBD	BG19NUC-LC190
3359	RBD	BG5NUC-LC243	7435	RBD	BG13NUC-LC99	11510	RBD	BG19NUC-LC191
3360	2P	BG5NUC-LC244	7436	2P	BG13NUC-LC100	11511	2P	BG19NUC-LC192
3361	2P	BG5NUC-LC245	7437	2P	BG13NUC-LC101	11512	2P	BG19NUC-LC193
3362	2P	BG5NUC-LC246	7438	RBD	BG13NUC-LC102	11513	2P	BG19NUC-LC194
3363	RBD	BG5NUC-LC247	7439	RBD	BG13NUC-LC103	11514	RBD	BG19NUC-LC195
3364	RBD	BG5NUC-LC248	7440	2P	BG13NUC-LC104	11515	RBD	BG19NUC-LC196

3365	RBD	BG5NUC-LC249	7441	2P	BG13NUC-LC105	11516	2P	BG19NUC-LC197
3366	2P	BG5NUC-LC250	7442	RBD	BG13NUC-LC106	11517	RBD	BG19NUC-LC198
3367	2P	BG5NUC-LC251	7443	RBD	BG13NUC-LC107	11518	2P	BG19NUC-LC199
3368	2P	BG5NUC-LC252	7444	RBD	BG13NUC-LC108	11519	RBD	BG19NUC-LC200
3369	2P	BG5NUC-LC253	7445	RBD	BG13NUC-LC109	11520	RBD	BG19NUC-LC201
3370	2P	BG5NUC-LC254	7446	RBD	BG13NUC-LC110	11521	RBD	BG19NUC-LC202
3371	2P	BG5NUC-LC255	7447	2P	BG13NUC-LC111	11522	RBD	BG19NUC-LC203
3372	RBD	BG5NUC-LC256	7448	2P	BG13NUC-LC112	11523	2P	BG19NUC-LC204
3373	2P	BG5NUC-LC257	7449	RBD	BG13NUC-LC113	11524	2P	BG19NUC-LC205
3374	2P	BG5NUC-LC258	7450	RBD	BG13NUC-LC114	11525	2P	BG19NUC-LC206
3375	2P	BG5NUC-LC259	7451	RBD	BG13NUC-LC115	11526	2P	BG19NUC-LC207
3376	2P	BG5NUC-LC260	7452	RBD	BG13NUC-LC116	11527	2P	BG19NUC-LC208
3377	2P	BG5NUC-LC261	7453	RBD	BG13NUC-LC117	11528	2P	BG19NUC-LC209
3378	2P	BG5NUC-LC262	7454	RBD	BG13NUC-LC118	11529	2P	BG19NUC-LC210
3379	2P	BG5NUC-LC263	7455	RBD	BG13NUC-LC119	11530	2P	BG19NUC-LC211
3380	2P	BG5NUC-LC264	7456	2P	BG13NUC-LC120	11531	2P	BG19NUC-LC212
3381	2P	BG5NUC-LC265	7457	2P	BG13NUC-LC121	11532	2P	BG19NUC-LC213
3382	2P	BG5NUC-LC266	7458	2P	BG13NUC-LC122	11533	RBD	BG19NUC-LC214
3383	RBD	BG5NUC-LC267	7459	RBD	BG13NUC-LC123	11534	RBD	BG19NUC-LC215
3384	2P	BG5NUC-LC268	7460	RBD	BG13NUC-LC124	11535	2P	BG19NUC-LC216
3385	RBD	BG5NUC-LC269	7461	RBD	BG13NUC-LC125	11536	2P	BG19NUC-LC217
3386	RBD	BG5NUC-LC270	7462	2P	BG13NUC-LC126	11537	RBD	BG19NUC-LC218
3387	2P	BG5NUC-LC271	7463	2P	BG13NUC-LC127	11538	2P	BG19NUC-LC219
3388	2P	BG5NUC-LC272	7464	2P	BG13NUC-LC128	11539	2P	BG19NUC-LC220
3389	RBD	BG5NUC-LC273	7465	2P	BG13NUC-LC129	11540	2P	BG19NUC-LC221
3390	2P	BG5NUC-LC274	7466	2P	BG13NUC-LC130	11541	RBD	BG19NUC-LC222
3391	2P	BG5NUC-LC275	7467	2P	BG13NUC-LC131	11542	RBD	BG19NUC-LC223
3392	2P	BG5NUC-LC276	7468	2P	BG13NUC-LC132	11543	2P	BG19NUC-LC224
3393	RBD	BG5NUC-LC277	7469	RBD	BG13NUC-LC133	11544	2P	BG19NUC-LC225
3394	2P	BG5NUC-LC278	7470	RBD	BG13NUC-LC134	11545	2P	BG19NUC-LC226
3395	RBD	BG5NUC-LC279	7471	2P	BG13NUC-LC135	11546	2P	BG19NUC-LC227
3396	RBD	BG5NUC-LC280	7472	2P	BG13NUC-LC136	11547	2P	BG19NUC-LC228
3397	2P	BG5NUC-LC281	7473	RBD	BG13NUC-LC137	11548	RBD	BG19NUC-LC229
3398	2P	BG5NUC-LC282	7474	RBD	BG13NUC-LC138	11549	2P	BG19NUC-LC230
3399	RBD	BG5NUC-LC283	7475	RBD	BG13NUC-LC139	11550	2P	BG19NUC-LC231
3400	RBD	BG5NUC-LC284	7476	2P	BG13NUC-LC140	11551	RBD	BG19NUC-LC232
3401	RBD	BG5NUC-LC285	7477	RBD	BG13NUC-LC141	11552	RBD	BG19NUC-LC233
3402	2P	BG5NUC-LC286	7478	RBD	BG13NUC-LC142	11553	2P	BG19NUC-LC234
3403	2P	BG5NUC-LC287	7479	RBD	BG13NUC-LC143	11554	2P	BG19NUC-LC235
3404	2P	BG5NUC-LC288	7480	2P	BG13NUC-LC144	11555	2P	BG19NUC-LC236
3405	2P	BG5NUC-LC289	7481	RBD	BG13NUC-LC145	11556	RBD	BG19NUC-LC237
3406	2P	BG5NUC-LC290	7482	RBD	BG13NUC-LC146	11557	RBD	BG19NUC-LC238
3407	2P	BG5NUC-LC291	7483	RBD	BG13NUC-LC147	11558	RBD	BG19NUC-LC239
3408	2P	BG5NUC-LC292	7484	2P	BG13NUC-LC148	11559	2P	BG19NUC-LC240
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3410	2P	BG5NUC-LC294	7486	2P	BG13NUC-LC150	11561	2P	BG19NUC-LC242
3411	2P	BG5NUC-LC295	7487	2P	BG13NUC-LC151	11562	2P	BG19NUC-LC243
3412	RBD	BG5NUC-LC296	7488	2P	BG13NUC-LC152	11563	2P	BG19NUC-LC244
3413	RBD	BG5NUC-LC297	7489	RBD	BG13NUC-LC153	11564	RBD	BG19NUC-LC245
3414	2P	BG5NUC-LC298	7490	RBD	BG13NUC-LC154	11565	RBD	BG19NUC-LC246
3415	RBD	BG5NUC-LC299	7491	2P	BG13NUC-LC155	11566	2P	BG19NUC-LC247
3416	RBD	BG5NUC-LC300	7492	2P	BG13NUC-LC156	11567	RBD	BG19NUC-LC248
3417	2P	BG5NUC-LC301	7493	RBD	BG13NUC-LC157	11568	2P	BG19NUC-LC249
3418	2P	BG5NUC-LC302	7494	RBD	BG13NUC-LC158	11569	2P	BG19NUC-LC250
3419	RBD	BG5NUC-LC303	7495	RBD	BG13NUC-LC159	11570	2P	BG19NUC-LC251
3420	2P	BG5NUC-LC304	7496	2P	BG13NUC-LC160	11571	2P	BG19NUC-LC252
3421	RBD	BG5NUC-LC305	7497	2P	BG13NUC-LC161	11572	2P	BG19NUC-LC253
3422	RBD	BG5NUC-LC306	7498	2P	BG13NUC-LC162	11573	RBD	BG19NUC-LC254
3423	RBD	BG5NUC-LC307	7499	RBD	BG13NUC-LC163	11574	RBD	BG19NUC-LC255
3424	2P	BG5NUC-LC308	7500	2P	BG13NUC-LC164	11575	2P	BG19NUC-LC256
3425	2P	BG5NUC-LC309	7501	RBD	BG13NUC-LC165	11576	2P	BG19NUC-LC257
3426	RBD	BG5NUC-LC310	7502	RBD	BG13NUC-LC166	11577	RBD	BG19NUC-LC258
3427	2P	BG5NUC-LC311	7503	RBD	BG13NUC-LC167	11578	2P	BG19NUC-LC259
3428	2P	BG5NUC-LC312	7504	2P	BG13NUC-LC168	11579	2P	BG19NUC-LC260
3429	2P	BG5NUC-LC313	7505	RBD	BG13NUC-LC169	11580	RBD	BG19NUC-LC261
3430	2P	BG5NUC-LC314	7506	2P	BG13NUC-LC170	11581	2P	BG19NUC-LC262
3431	RBD	BG5NUC-LC315	7507	RBD	BG13NUC-LC171	11582	2P	BG19NUC-LC263
3432	2P	BG5NUC-LC316	7508	RBD	BG13NUC-LC172	11583	RBD	BG19NUC-LC264
3433	RBD	BG5NUC-LC317	7509	RBD	BG13NUC-LC173	11584	2P	BG19NUC-LC265
3434	RBD	BG5NUC-LC318	7510	RBD	BG13NUC-LC174	11585	2P	BG19NUC-LC266
3435	2P	BG5NUC-LC319	7511	RBD	BG13NUC-LC175	11586	2P	BG19NUC-LC267
3436	RBD	BG5NUC-LC320	7512	RBD	BG13NUC-LC176	11587	2P	BG19NUC-LC268
3437	RBD	BG5NUC-LC321	7513	RBD	BG13NUC-LC177	11588	RBD	BG19NUC-LC269
3438	RBD	BG5NUC-LC322	7514	2P	BG13NUC-LC178	11589	2P	BG19NUC-LC270
3439	2P	BG5NUC-LC323	7515	2P	BG13NUC-LC179	11590	RBD	BG19NUC-LC271
3440	2P	BG5NUC-LC324	7516	2P	BG13NUC-LC180	11591	RBD	BG19NUC-LC272
3441	2P	BG5NUC-LC325	7517	2P	BG13NUC-LC181	11592	RBD	BG19NUC-LC273
3442	RBD	BG5NUC-LC326	7518	2P	BG13NUC-LC182	11593	2P	BG19NUC-LC274
3443	2P	BG5NUC-LC327	7519	2P	BG13NUC-LC183	11594	RBD	BG19NUC-LC275

3444	2P	BG5NUC-LC328	7520	RBD	BG13NUC-LC184	11595	2P	BG20NUC-HC1
3445	2P	BG5NUC-LC329	7521	RBD	BG13NUC-LC185	11596	2P	BG20NUC-HC2
3446	2P	BG5NUC-LC330	7522	RBD	BG13NUC-LC186	11597	2P	BG20NUC-HC3
3447	2P	BG5NUC-LC331	7523	RBD	BG13NUC-LC187	11598	RBD	BG20NUC-HC4
3448	RBD	BG5NUC-LC332	7524	2P	BG13NUC-LC188	11599	2P	BG20NUC-HC5
3449	RBD	BG5NUC-LC333	7525	2P	BG13NUC-LC189	11600	2P	BG20NUC-HC6
3450	RBD	BG5NUC-LC334	7526	2P	BG13NUC-LC190	11601	2P	BG20NUC-HC7
3451	RBD	BG5NUC-LC335	7527	RBD	BG13NUC-LC191	11602	2P	BG20NUC-HC8
3452	RBD	BG5NUC-LC336	7528	2P	BG13NUC-LC192	11603	2P	BG20NUC-HC9
3453	RBD	BG5NUC-LC337	7529	2P	BG13NUC-LC193	11604	2P	BG20NUC-HC10
3454	2P	BG5NUC-LC338	7530	2P	BG13NUC-LC194	11605	2P	BG20NUC-HC11
3455	2P	BG5NUC-LC339	7531	RBD	BG13NUC-LC195	11606	2P	BG20NUC-HC12
3456	2P	BG5NUC-LC340	7532	2P	BG13NUC-LC196	11607	RBD	BG20NUC-HC13
3457	2P	BG5NUC-LC341	7533	RBD	BG13NUC-LC197	11608	2P	BG20NUC-HC14
3458	2P	BG5NUC-LC342	7534	2P	BG13NUC-LC198	11609	2P	BG20NUC-HC15
3459	2P	BG5NUC-LC343	7535	RBD	BG13NUC-LC199	11610	2P	BG20NUC-HC16
3460	2P	BG5NUC-LC344	7536	RBD	BG13NUC-LC200	11611	2P	BG20NUC-HC17
3461	2P	BG5NUC-LC345	7537	RBD	BG13NUC-LC201	11612	RBD	BG20NUC-HC18
3462	RBD	BG5NUC-LC346	7538	2P	BG13NUC-LC202	11613	RBD	BG20NUC-HC19
3463	RBD	BG5NUC-LC347	7539	2P	BG13NUC-LC203	11614	RBD	BG20NUC-HC20
3464	2P	BG5NUC-LC348	7540	2P	BG13NUC-LC204	11615	2P	BG20NUC-HC21
3465	2P	BG5NUC-LC349	7541	2P	BG13NUC-LC205	11616	2P	BG20NUC-HC22
3466	2P	BG5NUC-LC350	7542	2P	BG13NUC-LC206	11617	2P	BG20NUC-HC23
3467	2P	BG5NUC-LC351	7543	RBD	BG13NUC-LC207	11618	2P	BG20NUC-HC24
3468	RBD	BG5NUC-LC352	7544	2P	BG13NUC-LC208	11619	2P	BG20NUC-HC25
3469	2P	BG5NUC-LC353	7545	RBD	BG13NUC-LC209	11620	2P	BG20NUC-HC26
3470	RBD	BG5NUC-LC354	7546	2P	BG13NUC-LC210	11621	2P	BG20NUC-HC27
3471	RBD	BG5NUC-LC355	7547	RBD	BG13NUC-LC211	11622	2P	BG20NUC-HC28
3472	2P	BG5NUC-LC356	7548	2P	BG13NUC-LC212	11623	2P	BG20NUC-HC29
3473	RBD	BG5NUC-LC357	7549	RBD	BG13NUC-LC213	11624	2P	BG20NUC-HC30
3474	2P	BG5NUC-LC358	7550	2P	BG13NUC-LC214	11625	RBD	BG20NUC-HC31
3475	RBD	BG5NUC-LC359	7551	RBD	BG13NUC-LC215	11626	2P	BG20NUC-HC32
3476	2P	BG5NUC-LC360	7552	RBD	BG13NUC-LC216	11627	2P	BG20NUC-HC33
3477	2P	BG5NUC-LC361	7553	RBD	BG13NUC-LC217	11628	RBD	BG20NUC-HC34
3478	2P	BG5NUC-LC362	7554	2P	BG13NUC-LC218	11629	2P	BG20NUC-HC35
3479	RBD	BG5NUC-LC363	7555	RBD	BG13NUC-LC219	11630	2P	BG20NUC-HC36
3480	2P	BG5NUC-LC364	7556	RBD	BG13NUC-LC220	11631	2P	BG20NUC-HC37
3481	2P	BG5NUC-LC365	7557	2P	BG13NUC-LC221	11632	2P	BG20NUC-HC38
3482	2P	BG5NUC-LC366	7558	2P	BG13NUC-LC222	11633	RBD	BG20NUC-HC39
3483	2P	BG5NUC-LC367	7559	RBD	BG13NUC-LC223	11634	2P	BG20NUC-HC40
3484	RBD	BG5NUC-LC368	7560	2P	BG13NUC-LC224	11635	2P	BG20NUC-HC41
3485	RBD	BG5NUC-LC369	7561	RBD	BG13NUC-LC225	11636	2P	BG20NUC-HC42
3486	2P	BG5NUC-LC370	7562	2P	BG13NUC-LC226	11637	2P	BG20NUC-HC43
3487	RBD	BG5NUC-LC371	7563	2P	BG13NUC-LC227	11638	2P	BG20NUC-HC44
3488	2P	BG5NUC-LC372	7564	2P	BG13NUC-LC228	11639	RBD	BG20NUC-HC45
3489	RBD	BG5NUC-LC373	7565	RBD	BG13NUC-LC229	11640	2P	BG20NUC-HC46
3490	2P	BG5NUC-LC374	7566	RBD	BG13NUC-LC230	11641	2P	BG20NUC-HC47
3491	2P	BG5NUC-LC375	7567	RBD	BG13NUC-LC231	11642	RBD	BG20NUC-HC48
3492	2P	BG5NUC-LC376	7568	2P	BG13NUC-LC232	11643	RBD	BG20NUC-HC49
3493	RBD	BG5NUC-LC377	7569	2P	BG13NUC-LC233	11644	2P	BG20NUC-HC50
3494	2P	BG5NUC-LC378	7570	2P	BG13NUC-LC234	11645	2P	BG20NUC-HC51
3495	2P	BG5NUC-LC379	7571	RBD	BG13NUC-LC235	11646	2P	BG20NUC-HC52
3496	RBD	BG5NUC-LC380	7572	2P	BG13NUC-LC236	11647	RBD	BG20NUC-HC53
3497	RBD	BG5NUC-LC381	7573	2P	BG13NUC-LC237	11648	2P	BG20NUC-HC54
3498	RBD	BG5NUC-LC382	7574	2P	BG13NUC-LC238	11649	2P	BG20NUC-HC55
3499	RBD	BG5NUC-LC383	7575	RBD	BG13NUC-LC239	11650	2P	BG20NUC-HC56
3500	2P	BG5NUC-LC384	7576	RBD	BG13NUC-LC240	11651	RBD	BG20NUC-HC57
3501	2P	BG5NUC-LC385	7577	RBD	BG13NUC-LC241	11652	2P	BG20NUC-HC58
3502	2P	BG5NUC-LC386	7578	RBD	BG13NUC-LC242	11653	2P	BG20NUC-HC59
3503	2P	BG5NUC-LC387	7579	RBD	BG13NUC-LC243	11654	2P	BG20NUC-HC60
3504	2P	BG5NUC-LC388	7580	RBD	BG13NUC-LC244	11655	2P	BG20NUC-HC61
3505	2P	BG5NUC-LC389	7581	RBD	BG13NUC-LC245	11656	2P	BG20NUC-HC62
3506	2P	BG5NUC-LC390	7582	2P	BG13NUC-LC246	11657	RBD	BG20NUC-HC63
3507	2P	BG5NUC-LC391	7583	RBD	BG13NUC-LC247	11658	2P	BG20NUC-HC64
3508	2P	BG5NUC-LC392	7584	2P	BG13NUC-LC248	11659	2P	BG20NUC-HC65
3509	2P	BG5NUC-LC393	7585	RBD	BG13NUC-LC249	11660	2P	BG20NUC-HC66
3510	RBD	BG5NUC-LC394	7586	2P	BG13NUC-LC250	11661	2P	BG20NUC-HC67
3511	RBD	BG5NUC-LC395	7587	2P	BG13NUC-LC251	11662	2P	BG20NUC-HC68
3512	RBD	BG5NUC-LC396	7588	2P	BG13NUC-LC252	11663	2P	BG20NUC-HC69
3513	2P	BG5NUC-LC397	7589	RBD	BG13NUC-LC253	11664	2P	BG20NUC-HC70
3514	2P	BG5NUC-LC398	7590	2P	BG13NUC-LC254	11665	RBD	BG20NUC-HC71
3515	2P	BG5NUC-LC399	7591	RBD	BG13NUC-LC255	11666	2P	BG20NUC-HC72
3516	2P	BG5NUC-LC400	7592	2P	BG13NUC-LC256	11667	2P	BG20NUC-HC73
3517	2P	BG5NUC-LC401	7593	RBD	BG13NUC-LC257	11668	2P	BG20NUC-HC74
3518	2P	BG5NUC-LC402	7594	RBD	BG13NUC-LC258	11669	2P	BG20NUC-HC75
3519	2P	BG5NUC-LC403	7595	2P	BG13NUC-LC259	11670	2P	BG20NUC-HC76
3520	2P	BG5NUC-LC404	7596	2P	BG13NUC-LC260	11671	2P	BG20NUC-HC77
3521	2P	BG5NUC-LC405	7597	2P	BG13NUC-LC261	11672	2P	BG20NUC-HC78
3522	2P	BG5NUC-LC406	7598	2P	BG13NUC-LC262	11673	2P	BG20NUC-HC79

3523	RBD	BG5NUC-LC407	7599	RBD	BG13NUC-LC263	11674	2P	BG20NUC-HC80
3524	2P	BG5NUC-LC408	7600	RBD	BG13NUC-LC264	11675	2P	BG20NUC-HC81
3525	RBD	BG5NUC-LC409	7601	RBD	BG13NUC-LC265	11676	2P	BG20NUC-HC82
3526	RBD	BG5NUC-LC410	7602	2P	BG13NUC-LC266	11677	2P	BG20NUC-HC83
3527	2P	BG5NUC-LC411	7603	RBD	BG13NUC-LC267	11678	2P	BG20NUC-HC84
3528	2P	BG5NUC-LC412	7604	2P	BG13NUC-LC268	11679	RBD	BG20NUC-HC85
3529	2P	BG5NUC-LC413	7605	RBD	BG13NUC-LC269	11680	RBD	BG20NUC-HC86
3530	2P	BG5NUC-LC414	7606	2P	BG13NUC-LC270	11681	2P	BG20NUC-HC87
3531	2P	BG5NUC-LC415	7607	2P	BG13NUC-LC271	11682	RBD	BG20NUC-HC88
3532	RBD	BG5NUC-LC416	7608	2P	BG13NUC-LC272	11683	RBD	BG20NUC-HC89
3533	2P	BG5NUC-LC417	7609	2P	BG13NUC-LC273	11684	2P	BG20NUC-HC90
3534	RBD	BG5NUC-LC418	7610	2P	BG13NUC-LC274	11685	RBD	BG20NUC-HC91
3535	2P	BG5NUC-LC419	7611	2P	BG13NUC-LC275	11686	RBD	BG20NUC-HC92
3536	2P	BG5NUC-LC420	7612	2P	BG13NUC-LC276	11687	2P	BG20NUC-HC93
3537	2P	BG5NUC-LC421	7613	RBD	BG13NUC-LC277	11688	2P	BG20NUC-HC94
3538	2P	BG5NUC-LC422	7614	2P	BG13NUC-LC278	11689	2P	BG20NUC-HC95
3539	2P	BG5NUC-LC423	7615	2P	BG13NUC-LC279	11690	2P	BG20NUC-HC96
3540	2P	BG5NUC-LC424	7616	RBD	BG13NUC-LC280	11691	2P	BG20NUC-HC97
3541	RBD	BG5NUC-LC425	7617	RBD	BG13NUC-LC281	11692	2P	BG20NUC-HC98
3542	2P	BG5NUC-LC426	7618	RBD	BG13NUC-LC282	11693	2P	BG20NUC-HC99
3543	RBD	BG5NUC-LC427	7619	RBD	BG13NUC-LC283	11694	2P	BG20NUC-HC100
3544	2P	BG5NUC-LC428	7620	RBD	BG13NUC-LC284	11695	2P	BG20NUC-HC101
3545	2P	BG5NUC-LC429	7621	RBD	BG13NUC-LC285	11696	RBD	BG20NUC-HC102
3546	2P	BG5NUC-LC430	7622	2P	BG13NUC-LC286	11697	2P	BG20NUC-HC103
3547	2P	BG5NUC-LC431	7623	2P	BG13NUC-LC287	11698	2P	BG20NUC-HC104
3548	2P	BG5NUC-LC432	7624	RBD	BG13NUC-LC288	11699	RBD	BG20NUC-HC105
3549	2P	BG5NUC-LC433	7625	2P	BG13NUC-LC289	11700	RBD	BG20NUC-HC106
3550	RBD	BG5NUC-LC434	7626	2P	BG13NUC-LC290	11701	RBD	BG20NUC-HC107
3551	RBD	BG5NUC-LC435	7627	2P	BG13NUC-LC291	11702	2P	BG20NUC-HC108
3552	2P	BG5NUC-LC436	7628	RBD	BG13NUC-LC292	11703	2P	BG20NUC-HC109
3553	RBD	BG5NUC-LC437	7629	2P	BG13NUC-LC293	11704	2P	BG20NUC-HC110
3554	2P	BG5NUC-LC438	7630	RBD	BG13NUC-LC294	11705	2P	BG20NUC-HC111
3555	2P	BG5NUC-LC439	7631	RBD	BG13NUC-LC295	11706	2P	BG20NUC-HC112
3556	2P	BG5NUC-LC440	7632	RBD	BG13NUC-LC296	11707	2P	BG20NUC-HC113
3557	2P	BG5NUC-LC441	7633	2P	BG13NUC-LC297	11708	RBD	BG20NUC-HC114
3558	RBD	BG5NUC-LC442	7634	2P	BG13NUC-LC298	11709	2P	BG20NUC-HC115
3559	2P	BG5NUC-LC443	7635	RBD	BG13NUC-LC299	11710	2P	BG20NUC-HC116
3560	2P	BG5NUC-LC444	7636	2P	BG13NUC-LC300	11711	2P	BG20NUC-HC117
3561	2P	BG5NUC-LC445	7637	RBD	BG13NUC-LC301	11712	RBD	BG20NUC-HC118
3562	2P	BG5NUC-LC446	7638	2P	BG13NUC-LC302	11713	2P	BG20NUC-HC119
3563	2P	BG5NUC-LC447	7639	RBD	BG13NUC-LC303	11714	2P	BG20NUC-HC120
3564	RBD	BG5NUC-LC448	7640	2P	BG13NUC-LC304	11715	2P	BG20NUC-HC121
3565	2P	BG5NUC-LC449	7641	RBD	BG13NUC-LC305	11716	2P	BG20NUC-HC122
3566	2P	BG5NUC-LC450	7642	2P	BG13NUC-LC306	11717	2P	BG20NUC-HC123
3567	2P	BG5NUC-LC451	7643	2P	BG13NUC-LC307	11718	2P	BG20NUC-HC124
3568	2P	BG5NUC-LC452	7644	RBD	BG13NUC-LC308	11719	2P	BG20NUC-HC125
3569	2P	BG5NUC-LC453	7645	RBD	BG13NUC-LC309	11720	RBD	BG20NUC-HC126
3570	2P	BG5NUC-LC454	7646	2P	BG13NUC-LC310	11721	2P	BG20NUC-HC127
3571	2P	BG5NUC-LC455	7647	RBD	BG13NUC-LC311	11722	2P	BG20NUC-HC128
3572	2P	BG5NUC-LC456	7648	2P	BG13NUC-LC312	11723	2P	BG20NUC-HC129
3573	2P	BG5NUC-LC457	7649	2P	BG13NUC-LC313	11724	RBD	BG20NUC-HC130
3574	2P	BG5NUC-LC458	7650	RBD	BG13NUC-LC314	11725	RBD	BG20NUC-HC131
3575	2P	BG5NUC-LC459	7651	2P	BG13NUC-LC315	11726	RBD	BG20NUC-HC132
3576	2P	BG5NUC-LC460	7652	2P	BG13NUC-LC316	11727	2P	BG20NUC-HC133
3577	RBD	BG5NUC-LC461	7653	RBD	BG13NUC-LC317	11728	RBD	BG20NUC-HC134
3578	2P	BG5NUC-LC462	7654	2P	BG13NUC-LC318	11729	2P	BG20NUC-HC135
3579	2P	BG5NUC-LC463	7655	RBD	BG13NUC-LC319	11730	2P	BG20NUC-HC136
3580	2P	BG5NUC-LC464	7656	RBD	BG13NUC-LC320	11731	RBD	BG20NUC-HC137
3581	2P	BG5NUC-LC465	7657	2P	BG13NUC-LC321	11732	RBD	BG20NUC-HC138
3582	RBD	BG5NUC-LC466	7658	2P	BG13NUC-LC322	11733	RBD	BG20NUC-HC139
3583	2P	BG5NUC-LC467	7659	2P	BG13NUC-LC323	11734	2P	BG20NUC-HC140
3584	2P	BG5NUC-LC468	7660	RBD	BG13NUC-LC324	11735	RBD	BG20NUC-HC141
3585	2P	BG5NUC-LC469	7661	RBD	BG13NUC-LC325	11736	2P	BG20NUC-HC142
3586	RBD	BG5NUC-LC470	7662	RBD	BG13NUC-LC326	11737	2P	BG20NUC-HC143
3587	RBD	BG5NUC-LC471	7663	2P	BG13NUC-LC327	11738	2P	BG20NUC-HC144
3588	2P	BG5NUC-LC472	7664	2P	BG13NUC-LC328	11739	2P	BG20NUC-HC145
3589	RBD	BG5NUC-LC473	7665	2P	BG13NUC-LC329	11740	2P	BG20NUC-HC146
3590	RBD	BG5NUC-LC474	7666	2P	BG13NUC-LC330	11741	2P	BG20NUC-HC147
3591	RBD	BG5NUC-LC475	7667	RBD	BG13NUC-LC331	11742	RBD	BG20NUC-HC148
3592	2P	BG5NUC-LC476	7668	2P	BG13NUC-LC332	11743	2P	BG20NUC-HC149
3593	RBD	BG6NUC-HC1	7669	RBD	BG13NUC-LC333	11744	2P	BG20NUC-HC150
3594	2P	BG6NUC-HC2	7670	RBD	BG13NUC-LC334	11745	RBD	BG20NUC-HC151
3595	RBD	BG6NUC-HC3	7671	2P	BG13NUC-LC335	11746	2P	BG20NUC-HC152
3596	RBD	BG6NUC-HC4	7672	RBD	BG13NUC-LC336	11747	RBD	BG20NUC-HC153
3597	RBD	BG6NUC-HC5	7673	RBD	BG13NUC-LC337	11748	RBD	BG20NUC-HC154
3598	RBD	BG6NUC-HC6	7674	RBD	BG13NUC-LC338	11749	2P	BG20NUC-HC155
3599	2P	BG6NUC-HC7	7675	RBD	BG13NUC-LC339	11750	RBD	BG20NUC-HC156
3600	2P	BG6NUC-HC8	7676	RBD	BG13NUC-LC340	11751	RBD	BG20NUC-HC157
3601	RBD	BG6NUC-HC9	7677	2P	BG13NUC-LC341	11752	RBD	BG20NUC-HC158

3602	RBD	BG6NUC-HC10	7678	2P	BG13NUC-LC342	11753	2P	BG20NUC-HC159
3603	RBD	BG6NUC-HC11	7679	2P	BG13NUC-LC343	11754	2P	BG20NUC-HC160
3604	2P	BG6NUC-HC12	7680	RBD	BG13NUC-LC344	11755	2P	BG20NUC-HC161
3605	2P	BG6NUC-HC13	7681	2P	BG13NUC-LC345	11756	2P	BG20NUC-HC162
3606	2P	BG6NUC-HC14	7682	2P	BG13NUC-LC346	11757	RBD	BG20NUC-HC163
3607	2P	BG6NUC-HC15	7683	RBD	BG13NUC-LC347	11758	2P	BG20NUC-HC164
3608	2P	BG6NUC-HC16	7684	2P	BG13NUC-LC348	11759	RBD	BG20NUC-HC165
3609	2P	BG6NUC-HC17	7685	2P	BG13NUC-LC349	11760	2P	BG20NUC-HC166
3610	2P	BG6NUC-HC18	7686	2P	BG13NUC-LC350	11761	2P	BG20NUC-HC167
3611	2P	BG6NUC-HC19	7687	2P	BG13NUC-LC351	11762	2P	BG20NUC-HC168
3612	2P	BG6NUC-HC20	7688	RBD	BG13NUC-LC352	11763	2P	BG20NUC-HC169
3613	2P	BG6NUC-HC21	7689	2P	BG13NUC-LC353	11764	2P	BG20NUC-HC170
3614	2P	BG6NUC-HC22	7690	RBD	BG13NUC-LC354	11765	2P	BG20NUC-HC171
3615	2P	BG6NUC-HC23	7691	2P	BG13NUC-LC355	11766	RBD	BG20NUC-HC172
3616	2P	BG6NUC-HC24	7692	RBD	BG13NUC-LC356	11767	2P	BG20NUC-HC173
3617	RBD	BG6NUC-HC25	7693	2P	BG13NUC-LC357	11768	RBD	BG20NUC-HC174
3618	2P	BG6NUC-HC26	7694	RBD	BG13NUC-LC358	11769	2P	BG20NUC-HC175
3619	2P	BG6NUC-HC27	7695	2P	BG13NUC-LC359	11770	2P	BG20NUC-HC176
3620	2P	BG6NUC-HC28	7696	RBD	BG13NUC-LC360	11771	2P	BG20NUC-LC1
3621	2P	BG6NUC-HC29	7697	2P	BG13NUC-LC361	11772	2P	BG20NUC-LC2
3622	RBD	BG6NUC-HC30	7698	2P	BG13NUC-LC362	11773	2P	BG20NUC-LC3
3623	RBD	BG6NUC-HC31	7699	RBD	BG13NUC-LC363	11774	RBD	BG20NUC-LC4
3624	RBD	BG6NUC-HC32	7700	RBD	BG13NUC-LC364	11775	2P	BG20NUC-LC5
3625	RBD	BG6NUC-HC33	7701	RBD	BG13NUC-LC365	11776	2P	BG20NUC-LC6
3626	2P	BG6NUC-HC34	7702	2P	BG13NUC-LC366	11777	2P	BG20NUC-LC7
3627	RBD	BG6NUC-HC35	7703	2P	BG13NUC-LC367	11778	2P	BG20NUC-LC8
3628	RBD	BG6NUC-HC36	7704	2P	BG13NUC-LC368	11779	2P	BG20NUC-LC9
3629	2P	BG6NUC-HC37	7705	2P	BG13NUC-LC369	11780	2P	BG20NUC-LC10
3630	2P	BG6NUC-HC38	7706	RBD	BG13NUC-LC370	11781	2P	BG20NUC-LC11
3631	2P	BG6NUC-HC39	7707	2P	BG13NUC-LC371	11782	2P	BG20NUC-LC12
3632	RBD	BG6NUC-HC40	7708	2P	BG13NUC-LC372	11783	RBD	BG20NUC-LC13
3633	2P	BG6NUC-HC41	7709	2P	BG13NUC-LC373	11784	2P	BG20NUC-LC14
3634	RBD	BG6NUC-HC42	7710	RBD	BG13NUC-LC374	11785	2P	BG20NUC-LC15
3635	2P	BG6NUC-HC43	7711	2P	BG13NUC-LC375	11786	2P	BG20NUC-LC16
3636	2P	BG6NUC-HC44	7712	2P	BG13NUC-LC376	11787	2P	BG20NUC-LC17
3637	RBD	BG6NUC-HC45	7713	RBD	BG13NUC-LC377	11788	RBD	BG20NUC-LC18
3638	RBD	BG6NUC-HC46	7714	2P	BG13NUC-LC378	11789	RBD	BG20NUC-LC19
3639	2P	BG6NUC-HC47	7715	RBD	BG13NUC-LC379	11790	RBD	BG20NUC-LC20
3640	2P	BG6NUC-HC48	7716	RBD	BG13NUC-LC380	11791	2P	BG20NUC-LC21
3641	RBD	BG6NUC-HC49	7717	2P	BG13NUC-LC381	11792	2P	BG20NUC-LC22
3642	RBD	BG6NUC-HC50	7718	RBD	BG13NUC-LC382	11793	2P	BG20NUC-LC23
3643	2P	BG6NUC-HC51	7719	RBD	BG13NUC-LC383	11794	2P	BG20NUC-LC24
3644	2P	BG6NUC-HC52	7720	2P	BG13NUC-LC384	11795	2P	BG20NUC-LC25
3645	RBD	BG6NUC-HC53	7721	RBD	BG13NUC-LC385	11796	2P	BG20NUC-LC26
3646	2P	BG6NUC-HC54	7722	RBD	BG13NUC-LC386	11797	2P	BG20NUC-LC27
3647	RBD	BG6NUC-HC55	7723	RBD	BG13NUC-LC387	11798	2P	BG20NUC-LC28
3648	2P	BG6NUC-HC56	7724	2P	BG13NUC-LC388	11799	2P	BG20NUC-LC29
3649	2P	BG6NUC-HC57	7725	2P	BG13NUC-LC389	11800	2P	BG20NUC-LC30
3650	2P	BG6NUC-HC58	7726	2P	BG13NUC-LC390	11801	RBD	BG20NUC-LC31
3651	2P	BG6NUC-HC59	7727	2P	BG13NUC-LC391	11802	2P	BG20NUC-LC32
3652	2P	BG6NUC-HC60	7728	RBD	BG13NUC-LC392	11803	2P	BG20NUC-LC33
3653	RBD	BG6NUC-HC61	7729	RBD	BG13NUC-LC393	11804	RBD	BG20NUC-LC34
3654	2P	BG6NUC-HC62	7730	RBD	BG13NUC-LC394	11805	2P	BG20NUC-LC35
3655	RBD	BG6NUC-HC63	7731	2P	BG13NUC-LC395	11806	2P	BG20NUC-LC36
3656	2P	BG6NUC-HC64	7732	2P	BG13NUC-LC396	11807	2P	BG20NUC-LC37
3657	2P	BG6NUC-HC65	7733	2P	BG13NUC-LC397	11808	2P	BG20NUC-LC38
3658	RBD	BG6NUC-HC66	7734	2P	BG13NUC-LC398	11809	RBD	BG20NUC-LC39
3659	2P	BG6NUC-HC67	7735	2P	BG13NUC-LC399	11810	2P	BG20NUC-LC40
3660	2P	BG6NUC-HC68	7736	RBD	BG13NUC-LC400	11811	2P	BG20NUC-LC41
3661	RBD	BG6NUC-HC69	7737	2P	BG13NUC-LC401	11812	2P	BG20NUC-LC42
3662	2P	BG6NUC-HC70	7738	2P	BG13NUC-LC402	11813	2P	BG20NUC-LC43
3663	2P	BG6NUC-HC71	7739	2P	BG13NUC-LC403	11814	2P	BG20NUC-LC44
3664	2P	BG6NUC-HC72	7740	2P	BG13NUC-LC404	11815	RBD	BG20NUC-LC45
3665	RBD	BG6NUC-HC73	7741	2P	BG13NUC-LC405	11816	2P	BG20NUC-LC46
3666	RBD	BG6NUC-HC74	7742	RBD	BG13NUC-LC406	11817	2P	BG20NUC-LC47
3667	RBD	BG6NUC-HC75	7743	2P	BG13NUC-LC407	11818	RBD	BG20NUC-LC48
3668	RBD	BG6NUC-HC76	7744	2P	BG13NUC-LC408	11819	RBD	BG20NUC-LC49
3669	RBD	BG6NUC-HC77	7745	2P	BG13NUC-LC409	11820	2P	BG20NUC-LC50
3670	RBD	BG6NUC-HC78	7746	2P	BG13NUC-LC410	11821	2P	BG20NUC-LC51
3671	2P	BG6NUC-HC79	7747	RBD	BG13NUC-LC411	11822	2P	BG20NUC-LC52
3672	2P	BG6NUC-HC80	7748	RBD	BG13NUC-LC412	11823	RBD	BG20NUC-LC53
3673	2P	BG6NUC-HC81	7749	RBD	BG13NUC-LC413	11824	2P	BG20NUC-LC54
3674	2P	BG6NUC-HC82	7750	RBD	BG13NUC-LC414	11825	2P	BG20NUC-LC55
3675	2P	BG6NUC-HC83	7751	2P	BG13NUC-LC415	11826	2P	BG20NUC-LC56
3676	RBD	BG6NUC-HC84	7752	2P	BG13NUC-LC416	11827	RBD	BG20NUC-LC57
3677	2P	BG6NUC-HC85	7753	RBD	BG13NUC-LC417	11828	2P	BG20NUC-LC58
3678	RBD	BG6NUC-HC86	7754	RBD	BG13NUC-LC418	11829	2P	BG20NUC-LC59
3679	2P	BG6NUC-HC87	7755	2P	BG13NUC-LC419	11830	2P	BG20NUC-LC60
3680	2P	BG6NUC-HC88	7756	2P	BG13NUC-LC420	11831	2P	BG20NUC-LC61

3681	RBD	BG6NUC-HC89	7757	RBD	BG13NUC-LC421	11832	2P	BG20NUC-LC62
3682	2P	BG6NUC-HC90	7758	2P	BG13NUC-LC422	11833	RBD	BG20NUC-LC63
3683	2P	BG6NUC-HC91	7759	2P	BG13NUC-LC423	11834	2P	BG20NUC-LC64
3684	RBD	BG6NUC-HC92	7760	RBD	BG13NUC-LC424	11835	2P	BG20NUC-LC65
3685	RBD	BG6NUC-HC93	7761	RBD	BG13NUC-LC425	11836	2P	BG20NUC-LC66
3686	2P	BG6NUC-HC94	7762	RBD	BG13NUC-LC426	11837	2P	BG20NUC-LC67
3687	2P	BG6NUC-HC95	7763	2P	BG13NUC-LC427	11838	2P	BG20NUC-LC68
3688	2P	BG6NUC-HC96	7764	2P	BG13NUC-LC428	11839	2P	BG20NUC-LC69
3689	2P	BG6NUC-HC97	7765	2P	BG13NUC-LC429	11840	2P	BG20NUC-LC70
3690	RBD	BG6NUC-HC98	7766	2P	BG13NUC-LC430	11841	RBD	BG20NUC-LC71
3691	2P	BG6NUC-HC99	7767	2P	BG13NUC-LC431	11842	2P	BG20NUC-LC72
3692	RBD	BG6NUC-HC100	7768	RBD	BG13NUC-LC432	11843	2P	BG20NUC-LC73
3693	2P	BG6NUC-HC101	7769	2P	BG13NUC-LC433	11844	2P	BG20NUC-LC74
3694	2P	BG6NUC-HC102	7770	2P	BG13NUC-LC434	11845	2P	BG20NUC-LC75
3695	2P	BG6NUC-HC103	7771	2P	BG13NUC-LC435	11846	2P	BG20NUC-LC76
3696	2P	BG6NUC-HC104	7772	2P	BG13NUC-LC436	11847	2P	BG20NUC-LC77
3697	2P	BG6NUC-HC105	7773	2P	BG13NUC-LC437	11848	2P	BG20NUC-LC78
3698	RBD	BG6NUC-HC106	7774	2P	BG13NUC-LC438	11849	2P	BG20NUC-LC79
3699	RBD	BG6NUC-HC107	7775	RBD	BG13NUC-LC439	11850	2P	BG20NUC-LC80
3700	RBD	BG6NUC-HC108	7776	RBD	BG13NUC-LC440	11851	2P	BG20NUC-LC81
3701	RBD	BG6NUC-HC109	7777	2P	BG13NUC-LC441	11852	2P	BG20NUC-LC82
3702	2P	BG6NUC-HC110	7778	2P	BG13NUC-LC442	11853	2P	BG20NUC-LC83
3703	2P	BG6NUC-HC111	7779	2P	BG13NUC-LC443	11854	2P	BG20NUC-LC84
3704	RBD	BG6NUC-HC112	7780	2P	BG13NUC-LC444	11855	RBD	BG20NUC-LC85
3705	2P	BG6NUC-HC113	7781	2P	BG13NUC-LC445	11856	RBD	BG20NUC-LC86
3706	RBD	BG6NUC-HC114	7782	2P	BG13NUC-LC446	11857	2P	BG20NUC-LC87
3707	RBD	BG6NUC-HC115	7783	2P	BG13NUC-LC447	11858	RBD	BG20NUC-LC88
3708	RBD	BG6NUC-HC116	7784	2P	BG13NUC-LC448	11859	RBD	BG20NUC-LC89
3709	RBD	BG6NUC-HC117	7785	RBD	BG13NUC-LC449	11860	2P	BG20NUC-LC90
3710	2P	BG6NUC-HC118	7786	2P	BG13NUC-LC450	11861	RBD	BG20NUC-LC91
3711	RBD	BG6NUC-HC119	7787	2P	BG13NUC-LC451	11862	RBD	BG20NUC-LC92
3712	2P	BG6NUC-HC120	7788	2P	BG13NUC-LC452	11863	2P	BG20NUC-LC93
3713	2P	BG6NUC-HC121	7789	2P	BG13NUC-LC453	11864	2P	BG20NUC-LC94
3714	2P	BG6NUC-HC122	7790	RBD	BG13NUC-LC454	11865	2P	BG20NUC-LC95
3715	2P	BG6NUC-HC123	7791	RBD	BG13NUC-LC455	11866	2P	BG20NUC-LC96
3716	RBD	BG6NUC-HC124	7792	2P	BG13NUC-LC456	11867	2P	BG20NUC-LC97
3717	RBD	BG6NUC-HC125	7793	2P	BG13NUC-LC457	11868	2P	BG20NUC-LC98
3718	2P	BG6NUC-HC126	7794	2P	BG13NUC-LC458	11869	2P	BG20NUC-LC99
3719	RBD	BG6NUC-HC127	7795	RBD	BG13NUC-LC459	11870	2P	BG20NUC-LC100
3720	2P	BG6NUC-HC128	7796	2P	BG13NUC-LC460	11871	2P	BG20NUC-LC101
3721	2P	BG6NUC-HC129	7797	RBD	BG13NUC-LC461	11872	RBD	BG20NUC-LC102
3722	2P	BG6NUC-HC130	7798	2P	BG13NUC-LC462	11873	2P	BG20NUC-LC103
3723	2P	BG6NUC-HC131	7799	RBD	BG13NUC-LC463	11874	2P	BG20NUC-LC104
3724	RBD	BG6NUC-HC132	7800	RBD	BG13NUC-LC464	11875	RBD	BG20NUC-LC105
3725	2P	BG6NUC-HC133	7801	2P	BG13NUC-LC465	11876	RBD	BG20NUC-LC106
3726	2P	BG6NUC-HC134	7802	2P	BG13NUC-LC466	11877	RBD	BG20NUC-LC107
3727	RBD	BG6NUC-HC135	7803	2P	BG13NUC-LC467	11878	2P	BG20NUC-LC108
3728	RBD	BG6NUC-HC136	7804	2P	BG13NUC-LC468	11879	2P	BG20NUC-LC109
3729	RBD	BG6NUC-HC137	7805	2P	BG13NUC-LC469	11880	2P	BG20NUC-LC110
3730	2P	BG6NUC-HC138	7806	2P	BG13NUC-LC470	11881	2P	BG20NUC-LC111
3731	2P	BG6NUC-HC139	7807	RBD	BG13NUC-LC471	11882	2P	BG20NUC-LC112
3732	2P	BG6NUC-HC140	7808	2P	BG13NUC-LC472	11883	2P	BG20NUC-LC113
3733	2P	BG6NUC-HC141	7809	RBD	BG13NUC-LC473	11884	RBD	BG20NUC-LC114
3734	RBD	BG6NUC-HC142	7810	RBD	BG13NUC-LC474	11885	2P	BG20NUC-LC115
3735	2P	BG6NUC-HC143	7811	2P	BG13NUC-LC475	11886	2P	BG20NUC-LC116
3736	2P	BG6NUC-HC144	7812	2P	BG13NUC-LC476	11887	2P	BG20NUC-LC117
3737	2P	BG6NUC-HC145	7813	2P	BG13NUC-LC477	11888	RBD	BG20NUC-LC118
3738	RBD	BG6NUC-HC146	7814	2P	BG13NUC-LC478	11889	2P	BG20NUC-LC119
3739	RBD	BG6NUC-HC147	7815	2P	BG13NUC-LC479	11890	2P	BG20NUC-LC120
3740	2P	BG6NUC-HC148	7816	2P	BG13NUC-LC480	11891	2P	BG20NUC-LC121
3741	2P	BG6NUC-HC149	7817	2P	BG13NUC-LC481	11892	2P	BG20NUC-LC122
3742	RBD	BG6NUC-HC150	7818	2P	BG13NUC-LC482	11893	2P	BG20NUC-LC123
3743	RBD	BG6NUC-HC151	7819	2P	BG13NUC-LC483	11894	2P	BG20NUC-LC124
3744	2P	BG6NUC-HC152	7820	2P	BG13NUC-LC484	11895	2P	BG20NUC-LC125
3745	2P	BG6NUC-HC153	7821	2P	BG13NUC-LC485	11896	RBD	BG20NUC-LC126
3746	RBD	BG6NUC-HC154	7822	RBD	BG13NUC-LC486	11897	2P	BG20NUC-LC127
3747	RBD	BG6NUC-HC155	7823	RBD	BG13NUC-LC487	11898	2P	BG20NUC-LC128
3748	RBD	BG6NUC-HC156	7824	2P	BG13NUC-LC488	11899	2P	BG20NUC-LC129
3749	2P	BG6NUC-HC157	7825	2P	BG13NUC-LC489	11900	RBD	BG20NUC-LC130
3750	RBD	BG6NUC-HC158	7826	2P	BG13NUC-LC490	11901	RBD	BG20NUC-LC131
3751	2P	BG6NUC-HC159	7827	2P	BG13NUC-LC491	11902	RBD	BG20NUC-LC132
3752	2P	BG6NUC-HC160	7828	2P	BG13NUC-LC492	11903	2P	BG20NUC-LC133
3753	2P	BG6NUC-HC161	7829	2P	BG13NUC-LC493	11904	RBD	BG20NUC-LC134
3754	2P	BG6NUC-HC162	7830	2P	BG13NUC-LC494	11905	2P	BG20NUC-LC135
3755	2P	BG6NUC-HC163	7831	2P	BG13NUC-LC495	11906	2P	BG20NUC-LC136
3756	RBD	BG6NUC-HC164	7832	RBD	BG13NUC-LC496	11907	RBD	BG20NUC-LC137
3757	2P	BG6NUC-HC165	7833	RBD	BG13NUC-LC497	11908	RBD	BG20NUC-LC138
3758	RBD	BG6NUC-HC166	7834	2P	BG13NUC-LC498	11909	RBD	BG20NUC-LC139
3759	RBD	BG6NUC-HC167	7835	RBD	BG13NUC-LC499	11910	2P	BG20NUC-LC140

3760	2P	BG6NUC-HC168	7836	2P	BG13NUC-LC500	11911	RBD	BG20NUC-LC141
3761	RBD	BG6NUC-HC169	7837	RBD	BG13NUC-LC501	11912	2P	BG20NUC-LC142
3762	2P	BG6NUC-HC170	7838	2P	BG13NUC-LC502	11913	2P	BG20NUC-LC143
3763	2P	BG6NUC-HC171	7839	2P	BG13NUC-LC503	11914	2P	BG20NUC-LC144
3764	2P	BG6NUC-HC172	7840	RBD	BG13NUC-LC504	11915	2P	BG20NUC-LC145
3765	2P	BG6NUC-HC173	7841	2P	BG13NUC-LC505	11916	2P	BG20NUC-LC146
3766	RBD	BG6NUC-HC174	7842	RBD	BG13NUC-LC506	11917	2P	BG20NUC-LC147
3767	2P	BG6NUC-HC175	7843	RBD	BG13NUC-LC507	11918	RBD	BG20NUC-LC148
3768	RBD	BG6NUC-HC176	7844	2P	BG13NUC-LC508	11919	2P	BG20NUC-LC149
3769	RBD	BG6NUC-HC177	7845	2P	BG13NUC-LC509	11920	2P	BG20NUC-LC150
3770	2P	BG6NUC-HC178	7846	2P	BG13NUC-LC510	11921	RBD	BG20NUC-LC151
3771	2P	BG6NUC-HC179	7847	2P	BG13NUC-LC511	11922	2P	BG20NUC-LC152
3772	2P	BG6NUC-HC180	7848	RBD	BG13NUC-LC512	11923	RBD	BG20NUC-LC153
3773	RBD	BG6NUC-HC181	7849	RBD	BG13NUC-LC513	11924	RBD	BG20NUC-LC154
3774	RBD	BG6NUC-HC182	7850	RBD	BG13NUC-LC514	11925	2P	BG20NUC-LC155
3775	2P	BG6NUC-HC183	7851	2P	BG13NUC-LC515	11926	RBD	BG20NUC-LC156
3776	2P	BG6NUC-HC184	7852	2P	BG13NUC-LC516	11927	RBD	BG20NUC-LC157
3777	2P	BG6NUC-HC185	7853	2P	BG13NUC-LC517	11928	RBD	BG20NUC-LC158
3778	2P	BG6NUC-HC186	7854	RBD	BG13NUC-LC518	11929	2P	BG20NUC-LC159
3779	RBD	BG6NUC-HC187	7855	RBD	BG13NUC-LC519	11930	2P	BG20NUC-LC160
3780	2P	BG6NUC-HC188	7856	2P	BG13NUC-LC520	11931	2P	BG20NUC-LC161
3781	RBD	BG6NUC-HC189	7857	2P	BG13NUC-LC521	11932	2P	BG20NUC-LC162
3782	2P	BG6NUC-HC190	7858	RBD	BG13NUC-LC522	11933	RBD	BG20NUC-LC163
3783	RBD	BG6NUC-HC191	7859	RBD	BG13NUC-LC523	11934	2P	BG20NUC-LC164
3784	RBD	BG6NUC-HC192	7860	RBD	BG13NUC-LC524	11935	RBD	BG20NUC-LC165
3785	2P	BG6NUC-HC193	7861	2P	BG13NUC-LC525	11936	2P	BG20NUC-LC166
3786	RBD	BG6NUC-HC194	7862	2P	BG13NUC-LC526	11937	2P	BG20NUC-LC167
3787	2P	BG6NUC-HC195	7863	2P	BG13NUC-LC527	11938	2P	BG20NUC-LC168
3788	2P	BG6NUC-HC196	7864	2P	BG13NUC-LC528	11939	2P	BG20NUC-LC169
3789	2P	BG6NUC-HC197	7865	2P	BG13NUC-LC529	11940	2P	BG20NUC-LC170
3790	2P	BG6NUC-HC198	7866	RBD	BG13NUC-LC530	11941	2P	BG20NUC-LC171
3791	2P	BG6NUC-HC199	7867	2P	BG13NUC-LC531	11942	RBD	BG20NUC-LC172
3792	2P	BG6NUC-HC200	7868	RBD	BG13NUC-LC532	11943	2P	BG20NUC-LC173
3793	RBD	BG6NUC-HC201	7869	RBD	BG13NUC-LC533	11944	RBD	BG20NUC-LC174
3794	RBD	BG6NUC-HC202	7870	RBD	BG13NUC-LC534	11945	2P	BG20NUC-LC175
3795	2P	BG6NUC-HC203	7871	RBD	BG13NUC-LC535	11946	2P	BG20NUC-LC176
3796	RBD	BG6NUC-HC204	7872	2P	BG13NUC-LC536	11947	2P	BG21NUC-HC1
3797	RBD	BG6NUC-HC205	7873	2P	BG13NUC-LC537	11948	2P	BG21NUC-HC2
3798	2P	BG6NUC-HC206	7874	2P	BG13NUC-LC538	11949	RBD	BG21NUC-HC3
3799	2P	BG6NUC-HC207	7875	2P	BG13NUC-LC539	11950	2P	BG21NUC-HC4
3800	2P	BG6NUC-HC208	7876	2P	BG13NUC-LC540	11951	2P	BG21NUC-HC5
3801	RBD	BG6NUC-HC209	7877	2P	BG13NUC-LC541	11952	2P	BG21NUC-HC6
3802	2P	BG6NUC-HC210	7878	RBD	BG13NUC-LC542	11953	2P	BG21NUC-HC7
3803	RBD	BG6NUC-HC211	7879	RBD	BG13NUC-LC543	11954	2P	BG21NUC-HC8
3804	2P	BG6NUC-HC212	7880	2P	BG13NUC-LC544	11955	2P	BG21NUC-HC9
3805	2P	BG6NUC-HC213	7881	2P	BG13NUC-LC545	11956	2P	BG21NUC-HC10
3806	2P	BG6NUC-HC214	7882	RBD	BG13NUC-LC546	11957	2P	BG21NUC-HC11
3807	2P	BG6NUC-HC215	7883	RBD	BG13NUC-LC547	11958	RBD	BG21NUC-HC12
3808	2P	BG6NUC-HC216	7884	2P	BG13NUC-LC548	11959	2P	BG21NUC-HC13
3809	2P	BG6NUC-HC217	7885	RBD	BG13NUC-LC549	11960	2P	BG21NUC-HC14
3810	2P	BG6NUC-HC218	7886	2P	BG13NUC-LC550	11961	2P	BG21NUC-HC15
3811	RBD	BG6NUC-HC219	7887	2P	BG13NUC-LC551	11962	2P	BG21NUC-HC16
3812	RBD	BG6NUC-HC220	7888	RBD	BG13NUC-LC552	11963	2P	BG21NUC-HC17
3813	2P	BG6NUC-HC221	7889	RBD	BG13NUC-LC553	11964	2P	BG21NUC-HC18
3814	2P	BG6NUC-HC222	7890	RBD	BG13NUC-LC554	11965	2P	BG21NUC-HC19
3815	RBD	BG6NUC-HC223	7891	RBD	BG13NUC-LC555	11966	2P	BG21NUC-HC20
3816	RBD	BG6NUC-HC224	7892	2P	BG13NUC-LC556	11967	2P	BG21NUC-HC21
3817	RBD	BG6NUC-HC225	7893	2P	BG13NUC-LC557	11968	RBD	BG21NUC-HC22
3818	2P	BG6NUC-HC226	7894	RBD	BG13NUC-LC558	11969	2P	BG21NUC-HC23
3819	2P	BG6NUC-HC227	7895	2P	BG13NUC-LC559	11970	2P	BG21NUC-HC24
3820	RBD	BG6NUC-HC228	7896	RBD	BG13NUC-LC560	11971	2P	BG21NUC-HC25
3821	RBD	BG6NUC-HC229	7897	2P	BG13NUC-LC561	11972	2P	BG21NUC-HC26
3822	RBD	BG6NUC-HC230	7898	2P	BG13NUC-LC562	11973	RBD	BG21NUC-HC27
3823	RBD	BG6NUC-HC231	7899	2P	BG13NUC-LC563	11974	2P	BG21NUC-HC28
3824	2P	BG6NUC-HC232	7900	2P	BG13NUC-LC564	11975	2P	BG21NUC-HC29
3825	RBD	BG6NUC-HC233	7901	2P	BG13NUC-LC565	11976	2P	BG21NUC-HC30
3826	2P	BG6NUC-HC234	7902	2P	BG13NUC-LC566	11977	2P	BG21NUC-HC31
3827	RBD	BG6NUC-HC235	7903	2P	BG13NUC-LC567	11978	2P	BG21NUC-HC32
3828	RBD	BG6NUC-HC236	7904	RBD	BG13NUC-LC568	11979	RBD	BG21NUC-HC33
3829	RBD	BG6NUC-HC237	7905	RBD	BG13NUC-LC569	11980	2P	BG21NUC-HC34
3830	2P	BG6NUC-HC238	7906	RBD	BG13NUC-LC570	11981	2P	BG21NUC-HC35
3831	2P	BG6NUC-HC239	7907	RBD	BG13NUC-LC571	11982	RBD	BG21NUC-HC36
3832	RBD	BG6NUC-HC240	7908	2P	BG13NUC-LC572	11983	2P	BG21NUC-HC37
3833	2P	BG6NUC-HC241	7909	2P	BG13NUC-LC573	11984	2P	BG21NUC-HC38
3834	2P	BG6NUC-HC242	7910	2P	BG13NUC-LC574	11985	2P	BG21NUC-HC39
3835	RBD	BG6NUC-HC243	7911	2P	BG13NUC-LC575	11986	2P	BG21NUC-HC40
3836	2P	BG6NUC-HC244	7912	2P	BG13NUC-LC576	11987	2P	BG21NUC-HC41
3837	2P	BG6NUC-HC245	7913	2P	BG13NUC-LC577	11988	RBD	BG21NUC-HC42
3838	2P	BG6NUC-HC246	7914	2P	BG13NUC-LC578	11989	2P	BG21NUC-HC43

3839	RBD	BG6NUC-LC1	7915	2P	BG13NUC-LC579	11990	2P	BG21NUC-HC44
3840	2P	BG6NUC-LC2	7916	2P	BG13NUC-LC580	11991	RBD	BG21NUC-HC45
3841	RBD	BG6NUC-LC3	7917	2P	BG13NUC-LC581	11992	2P	BG21NUC-HC46
3842	RBD	BG6NUC-LC4	7918	2P	BG13NUC-LC582	11993	2P	BG21NUC-HC47
3843	RBD	BG6NUC-LC5	7919	2P	BG13NUC-LC583	11994	2P	BG21NUC-HC48
3844	RBD	BG6NUC-LC6	7920	2P	BG13NUC-LC584	11995	2P	BG21NUC-HC49
3845	2P	BG6NUC-LC7	7921	2P	BG13NUC-LC585	11996	2P	BG21NUC-HC50
3846	2P	BG6NUC-LC8	7922	2P	BG13NUC-LC586	11997	RBD	BG21NUC-HC51
3847	RBD	BG6NUC-LC9	7923	2P	BG13NUC-LC587	11998	RBD	BG21NUC-HC52
3848	RBD	BG6NUC-LC10	7924	2P	BG13NUC-LC588	11999	2P	BG21NUC-HC53
3849	RBD	BG6NUC-LC11	7925	2P	BG13NUC-LC589	12000	RBD	BG21NUC-HC54
3850	2P	BG6NUC-LC12	7926	2P	BG13NUC-LC590	12001	2P	BG21NUC-HC55
3851	2P	BG6NUC-LC13	7927	RBD	BG13NUC-LC591	12002	RBD	BG21NUC-HC56
3852	2P	BG6NUC-LC14	7928	2P	BG13NUC-LC592	12003	2P	BG21NUC-HC57
3853	2P	BG6NUC-LC15	7929	RBD	BG13NUC-LC593	12004	RBD	BG21NUC-HC58
3854	2P	BG6NUC-LC16	7930	2P	BG13NUC-LC594	12005	RBD	BG21NUC-HC59
3855	2P	BG6NUC-LC17	7931	RBD	BG13NUC-LC595	12006	RBD	BG21NUC-HC60
3856	2P	BG6NUC-LC18	7932	2P	BG13NUC-LC596	12007	RBD	BG21NUC-HC61
3857	2P	BG6NUC-LC19	7933	2P	BG13NUC-LC597	12008	RBD	BG21NUC-HC62
3858	2P	BG6NUC-LC20	7934	RBD	BG13NUC-LC598	12009	RBD	BG21NUC-HC63
3859	2P	BG6NUC-LC21	7935	2P	BG13NUC-LC599	12010	2P	BG21NUC-HC64
3860	2P	BG6NUC-LC22	7936	2P	BG13NUC-LC600	12011	2P	BG21NUC-HC65
3861	2P	BG6NUC-LC23	7937	2P	BG13NUC-LC601	12012	RBD	BG21NUC-HC66
3862	2P	BG6NUC-LC24	7938	2P	BG13NUC-LC602	12013	RBD	BG21NUC-HC67
3863	RBD	BG6NUC-LC25	7939	2P	BG13NUC-LC603	12014	RBD	BG21NUC-HC68
3864	2P	BG6NUC-LC26	7940	2P	BG13NUC-LC604	12015	2P	BG21NUC-HC69
3865	2P	BG6NUC-LC27	7941	2P	BG13NUC-LC605	12016	RBD	BG21NUC-HC70
3866	2P	BG6NUC-LC28	7942	RBD	BG13NUC-LC606	12017	RBD	BG21NUC-HC71
3867	2P	BG6NUC-LC29	7943	RBD	BG13NUC-LC607	12018	2P	BG21NUC-HC72
3868	RBD	BG6NUC-LC30	7944	RBD	BG13NUC-LC608	12019	RBD	BG21NUC-HC73
3869	RBD	BG6NUC-LC31	7945	2P	BG13NUC-LC609	12020	2P	BG21NUC-HC74
3870	RBD	BG6NUC-LC32	7946	RBD	BG13NUC-LC610	12021	2P	BG21NUC-HC75
3871	RBD	BG6NUC-LC33	7947	2P	BG13NUC-LC611	12022	2P	BG21NUC-HC76
3872	2P	BG6NUC-LC34	7948	RBD	BG13NUC-LC612	12023	2P	BG21NUC-HC77
3873	RBD	BG6NUC-LC35	7949	RBD	BG13NUC-LC613	12024	2P	BG21NUC-HC78
3874	RBD	BG6NUC-LC36	7950	RBD	BG13NUC-LC614	12025	2P	BG21NUC-HC79
3875	2P	BG6NUC-LC37	7951	2P	BG13NUC-LC615	12026	2P	BG21NUC-HC80
3876	2P	BG6NUC-LC38	7952	2P	BG13NUC-LC616	12027	RBD	BG21NUC-HC81
3877	2P	BG6NUC-LC39	7953	RBD	BG13NUC-LC617	12028	2P	BG21NUC-HC82
3878	RBD	BG6NUC-LC40	7954	RBD	BG13NUC-LC618	12029	2P	BG21NUC-HC83
3879	2P	BG6NUC-LC41	7955	2P	BG13NUC-LC619	12030	2P	BG21NUC-HC84
3880	RBD	BG6NUC-LC42	7956	RBD	BG13NUC-LC620	12031	2P	BG21NUC-HC85
3881	2P	BG6NUC-LC43	7957	2P	BG13NUC-LC621	12032	2P	BG21NUC-HC86
3882	2P	BG6NUC-LC44	7958	2P	BG13NUC-LC622	12033	2P	BG21NUC-HC87
3883	RBD	BG6NUC-LC45	7959	RBD	BG13NUC-LC623	12034	2P	BG21NUC-HC88
3884	RBD	BG6NUC-LC46	7960	RBD	BG13NUC-LC624	12035	RBD	BG21NUC-HC89
3885	2P	BG6NUC-LC47	7961	2P	BG13NUC-LC625	12036	2P	BG21NUC-HC90
3886	2P	BG6NUC-LC48	7962	2P	BG13NUC-LC626	12037	2P	BG21NUC-HC91
3887	RBD	BG6NUC-LC49	7963	2P	BG13NUC-LC627	12038	2P	BG21NUC-HC92
3888	RBD	BG6NUC-LC50	7964	RBD	BG13NUC-LC628	12039	2P	BG21NUC-HC93
3889	2P	BG6NUC-LC51	7965	RBD	BG13NUC-LC629	12040	2P	BG21NUC-HC94
3890	2P	BG6NUC-LC52	7966	RBD	BG13NUC-LC630	12041	RBD	BG21NUC-HC95
3891	RBD	BG6NUC-LC53	7967	2P	BG13NUC-LC631	12042	2P	BG21NUC-HC96
3892	2P	BG6NUC-LC54	7968	2P	BG13NUC-LC632	12043	2P	BG21NUC-HC97
3893	RBD	BG6NUC-LC55	7969	2P	BG13NUC-LC633	12044	2P	BG21NUC-HC98
3894	2P	BG6NUC-LC56	7970	2P	BG13NUC-LC634	12045	2P	BG21NUC-HC99
3895	2P	BG6NUC-LC57	7971	2P	BG13NUC-LC635	12046	2P	BG21NUC-HC100
3896	2P	BG6NUC-LC58	7972	RBD	BG13NUC-LC636	12047	2P	BG21NUC-HC101
3897	2P	BG6NUC-LC59	7973	RBD	BG13NUC-LC637	12048	2P	BG21NUC-HC102
3898	2P	BG6NUC-LC60	7974	RBD	BG13NUC-LC638	12049	RBD	BG21NUC-HC103
3899	RBD	BG6NUC-LC61	7975	2P	BG13NUC-LC639	12050	RBD	BG21NUC-HC104
3900	2P	BG6NUC-LC62	7976	RBD	BG13NUC-LC640	12051	RBD	BG21NUC-HC105
3901	RBD	BG6NUC-LC63	7977	RBD	BG13NUC-LC641	12052	RBD	BG21NUC-HC106
3902	2P	BG6NUC-LC64	7978	2P	BG13NUC-LC642	12053	2P	BG21NUC-HC107
3903	2P	BG6NUC-LC65	7979	2P	BG13NUC-LC643	12054	2P	BG21NUC-HC108
3904	RBD	BG6NUC-LC66	7980	RBD	BG13NUC-LC644	12055	2P	BG21NUC-HC109
3905	2P	BG6NUC-LC67	7981	RBD	BG13NUC-LC645	12056	2P	BG21NUC-HC110
3906	2P	BG6NUC-LC68	7982	2P	BG13NUC-LC646	12057	2P	BG21NUC-HC111
3907	RBD	BG6NUC-LC69	7983	RBD	BG13NUC-LC647	12058	2P	BG21NUC-HC112
3908	2P	BG6NUC-LC70	7984	2P	BG13NUC-LC648	12059	2P	BG21NUC-HC113
3909	2P	BG6NUC-LC71	7985	2P	BG13NUC-LC649	12060	2P	BG21NUC-HC114
3910	2P	BG6NUC-LC72	7986	RBD	BG13NUC-LC650	12061	2P	BG21NUC-HC115
3911	RBD	BG6NUC-LC73	7987	RBD	BG13NUC-LC651	12062	2P	BG21NUC-HC116
3912	RBD	BG6NUC-LC74	7988	2P	BG13NUC-LC652	12063	2P	BG21NUC-HC117
3913	RBD	BG6NUC-LC75	7989	2P	BG13NUC-LC653	12064	2P	BG21NUC-HC118
3914	RBD	BG6NUC-LC76	7990	2P	BG13NUC-LC654	12065	2P	BG21NUC-HC119
3915	RBD	BG6NUC-LC77	7991	2P	BG13NUC-LC655	12066	RBD	BG21NUC-HC120
3916	RBD	BG6NUC-LC78	7992	RBD	BG13NUC-LC656	12067	2P	BG21NUC-HC121
3917	2P	BG6NUC-LC79	7993	RBD	BG13NUC-LC657	12068	2P	BG21NUC-HC122

3918	2P	BG6NUC-LC80	7994	2P	BG13NUC-LC658	12069	2P	BG21NUC-HC123
3919	2P	BG6NUC-LC81	7995	2P	BG13NUC-LC659	12070	2P	BG21NUC-HC124
3920	2P	BG6NUC-LC82	7996	2P	BG13NUC-LC660	12071	RBD	BG21NUC-HC125
3921	2P	BG6NUC-LC83	7997	2P	BG13NUC-LC661	12072	2P	BG21NUC-HC126
3922	RBD	BG6NUC-LC84	7998	2P	BG13NUC-LC662	12073	2P	BG21NUC-HC127
3923	2P	BG6NUC-LC85	7999	2P	BG13NUC-LC663	12074	2P	BG21NUC-HC128
3924	RBD	BG6NUC-LC86	8000	RBD	BG13NUC-LC664	12075	2P	BG21NUC-HC129
3925	2P	BG6NUC-LC87	8001	2P	BG13NUC-LC665	12076	RBD	BG21NUC-HC130
3926	2P	BG6NUC-LC88	8002	RBD	BG13NUC-LC666	12077	RBD	BG21NUC-HC131
3927	RBD	BG6NUC-LC89	8003	2P	BG13NUC-LC667	12078	RBD	BG21NUC-HC132
3928	2P	BG6NUC-LC90	8004	RBD	BG13NUC-LC668	12079	2P	BG21NUC-HC133
3929	2P	BG6NUC-LC91	8005	RBD	BG13NUC-LC669	12080	2P	BG21NUC-HC134
3930	RBD	BG6NUC-LC92	8006	RBD	BG13NUC-LC670	12081	RBD	BG21NUC-HC135
3931	RBD	BG6NUC-LC93	8007	2P	BG13NUC-LC671	12082	2P	BG21NUC-HC136
3932	2P	BG6NUC-LC94	8008	RBD	BG13NUC-LC672	12083	2P	BG21NUC-HC137
3933	2P	BG6NUC-LC95	8009	2P	BG13NUC-LC673	12084	RBD	BG21NUC-HC138
3934	2P	BG6NUC-LC96	8010	RBD	BG13NUC-LC674	12085	2P	BG21NUC-HC139
3935	2P	BG6NUC-LC97	8011	RBD	BG13NUC-LC675	12086	2P	BG21NUC-HC140
3936	RBD	BG6NUC-LC98	8012	2P	BG13NUC-LC676	12087	2P	BG21NUC-HC141
3937	2P	BG6NUC-LC99	8013	2P	BG13NUC-LC677	12088	RBD	BG21NUC-HC142
3938	RBD	BG6NUC-LC100	8014	2P	BG13NUC-LC678	12089	2P	BG21NUC-HC143
3939	2P	BG6NUC-LC101	8015	RBD	BG13NUC-LC679	12090	2P	BG21NUC-HC144
3940	2P	BG6NUC-LC102	8016	2P	BG13NUC-LC680	12091	2P	BG21NUC-HC145
3941	2P	BG6NUC-LC103	8017	2P	BG13NUC-LC681	12092	2P	BG21NUC-HC146
3942	2P	BG6NUC-LC104	8018	2P	BG13NUC-LC682	12093	2P	BG21NUC-HC147
3943	2P	BG6NUC-LC105	8019	2P	BG13NUC-LC683	12094	RBD	BG21NUC-HC148
3944	RBD	BG6NUC-LC106	8020	RBD	BG13NUC-LC684	12095	RBD	BG21NUC-HC149
3945	RBD	BG6NUC-LC107	8021	2P	BG13NUC-LC685	12096	RBD	BG21NUC-HC150
3946	RBD	BG6NUC-LC108	8022	2P	BG13NUC-LC686	12097	2P	BG21NUC-HC151
3947	RBD	BG6NUC-LC109	8023	2P	BG13NUC-LC687	12098	2P	BG21NUC-HC152
3948	2P	BG6NUC-LC110	8024	RBD	BG13NUC-LC688	12099	2P	BG21NUC-HC153
3949	2P	BG6NUC-LC111	8025	2P	BG13NUC-LC689	12100	2P	BG21NUC-HC154
3950	RBD	BG6NUC-LC112	8026	RBD	BG13NUC-LC690	12101	2P	BG21NUC-HC155
3951	2P	BG6NUC-LC113	8027	2P	BG13NUC-LC691	12102	RBD	BG21NUC-HC156
3952	RBD	BG6NUC-LC114	8028	RBD	BG13NUC-LC692	12103	RBD	BG21NUC-HC157
3953	RBD	BG6NUC-LC115	8029	RBD	BG13NUC-LC693	12104	RBD	BG21NUC-HC158
3954	RBD	BG6NUC-LC116	8030	RBD	BG13NUC-LC694	12105	RBD	BG21NUC-HC159
3955	RBD	BG6NUC-LC117	8031	2P	BG13NUC-LC695	12106	RBD	BG21NUC-HC160
3956	2P	BG6NUC-LC118	8032	RBD	BG13NUC-LC696	12107	2P	BG21NUC-HC161
3957	RBD	BG6NUC-LC119	8033	RBD	BG13NUC-LC697	12108	2P	BG21NUC-HC162
3958	2P	BG6NUC-LC120	8034	RBD	BG13NUC-LC698	12109	RBD	BG21NUC-HC163
3959	2P	BG6NUC-LC121	8035	2P	BG13NUC-LC699	12110	2P	BG21NUC-HC164
3960	2P	BG6NUC-LC122	8036	RBD	BG13NUC-LC700	12111	2P	BG21NUC-HC165
3961	2P	BG6NUC-LC123	8037	RBD	BG13NUC-LC701	12112	RBD	BG21NUC-HC166
3962	RBD	BG6NUC-LC124	8038	2P	BG13NUC-LC702	12113	2P	BG21NUC-HC167
3963	RBD	BG6NUC-LC125	8039	2P	BG13NUC-LC703	12114	2P	BG21NUC-HC168
3964	2P	BG6NUC-LC126	8040	2P	BG13NUC-LC704	12115	2P	BG21NUC-HC169
3965	RBD	BG6NUC-LC127	8041	2P	BG13NUC-LC705	12116	2P	BG21NUC-HC170
3966	2P	BG6NUC-LC128	8042	2P	BG13NUC-LC706	12117	2P	BG21NUC-HC171
3967	2P	BG6NUC-LC129	8043	2P	BG13NUC-LC707	12118	2P	BG21NUC-HC172
3968	2P	BG6NUC-LC130	8044	2P	BG13NUC-LC708	12119	2P	BG21NUC-HC173
3969	2P	BG6NUC-LC131	8045	2P	BG13NUC-LC709	12120	2P	BG21NUC-HC174
3970	RBD	BG6NUC-LC132	8046	2P	BG13NUC-LC710	12121	2P	BG21NUC-HC175
3971	2P	BG6NUC-LC133	8047	2P	BG13NUC-LC711	12122	2P	BG21NUC-HC176
3972	2P	BG6NUC-LC134	8048	2P	BG13NUC-LC712	12123	2P	BG21NUC-HC177
3973	RBD	BG6NUC-LC135	8049	2P	BG13NUC-LC713	12124	2P	BG21NUC-HC178
3974	RBD	BG6NUC-LC136	8050	2P	BG13NUC-LC714	12125	2P	BG21NUC-HC179
3975	RBD	BG6NUC-LC137	8051	RBD	BG13NUC-LC715	12126	2P	BG21NUC-HC180
3976	2P	BG6NUC-LC138	8052	RBD	BG13NUC-LC716	12127	2P	BG21NUC-HC181
3977	2P	BG6NUC-LC139	8053	RBD	BG13NUC-LC717	12128	2P	BG21NUC-HC182
3978	2P	BG6NUC-LC140	8054	RBD	BG13NUC-LC718	12129	2P	BG21NUC-HC183
3979	2P	BG6NUC-LC141	8055	RBD	BG13NUC-LC719	12130	RBD	BG21NUC-HC184
3980	RBD	BG6NUC-LC142	8056	2P	BG13NUC-LC720	12131	2P	BG21NUC-HC185
3981	2P	BG6NUC-LC143	8057	2P	BG13NUC-LC721	12132	2P	BG21NUC-HC186
3982	2P	BG6NUC-LC144	8058	2P	BG13NUC-LC722	12133	RBD	BG21NUC-HC187
3983	2P	BG6NUC-LC145	8059	2P	BG13NUC-LC723	12134	RBD	BG21NUC-HC188
3984	RBD	BG6NUC-LC146	8060	2P	BG13NUC-LC724	12135	RBD	BG21NUC-HC189
3985	RBD	BG6NUC-LC147	8061	2P	BG13NUC-LC725	12136	2P	BG21NUC-HC190
3986	2P	BG6NUC-LC148	8062	2P	BG13NUC-LC726	12137	2P	BG21NUC-HC191
3987	2P	BG6NUC-LC149	8063	2P	BG13NUC-LC727	12138	RBD	BG21NUC-HC192
3988	RBD	BG6NUC-LC150	8064	2P	BG13NUC-LC728	12139	RBD	BG21NUC-HC193
3989	RBD	BG6NUC-LC151	8065	RBD	BG13NUC-LC729	12140	2P	BG21NUC-HC194
3990	2P	BG6NUC-LC152	8066	2P	BG13NUC-LC730	12141	2P	BG21NUC-HC195
3991	2P	BG6NUC-LC153	8067	2P	BG13NUC-LC731	12142	2P	BG21NUC-HC196
3992	RBD	BG6NUC-LC154	8068	2P	BG13NUC-LC732	12143	2P	BG21NUC-HC197
3993	RBD	BG6NUC-LC155	8069	2P	BG13NUC-LC733	12144	2P	BG21NUC-HC198
3994	RBD	BG6NUC-LC156	8070	2P	BG13NUC-LC734	12145	2P	BG21NUC-HC199
3995	2P	BG6NUC-LC157	8071	2P	BG13NUC-LC735	12146	RBD	BG21NUC-HC200
3996	RBD	BG6NUC-LC158	8072	2P	BG13NUC-LC736	12147	RBD	BG21NUC-HC201

3997	2P	BG6NUC-LC159	8073	RBD	BG13NUC-LC737	12148	2P	BG21NUC-HC202
3998	2P	BG6NUC-LC160	8074	2P	BG13NUC-LC738	12149	RBD	BG21NUC-HC203
3999	2P	BG6NUC-LC161	8075	RBD	BG13NUC-LC739	12150	2P	BG21NUC-HC204
4000	2P	BG6NUC-LC162	8076	RBD	BG13NUC-LC740	12151	2P	BG21NUC-HC205
4001	2P	BG6NUC-LC163	8077	RBD	BG13NUC-LC741	12152	2P	BG21NUC-HC206
4002	RBD	BG6NUC-LC164	8078	2P	BG13NUC-LC742	12153	2P	BG21NUC-HC207
4003	2P	BG6NUC-LC165	8079	2P	BG13NUC-LC743	12154	2P	BG21NUC-HC208
4004	RBD	BG6NUC-LC166	8080	2P	BG13NUC-LC744	12155	2P	BG21NUC-HC209
4005	RBD	BG6NUC-LC167	8081	RBD	BG13NUC-LC745	12156	2P	BG21NUC-HC210
4006	2P	BG6NUC-LC168	8082	2P	BG13NUC-LC746	12157	RBD	BG21NUC-HC211
4007	RBD	BG6NUC-LC169	8083	RBD	BG13NUC-LC747	12158	2P	BG21NUC-HC212
4008	2P	BG6NUC-LC170	8084	2P	BG13NUC-LC748	12159	2P	BG21NUC-HC213
4009	2P	BG6NUC-LC171	8085	2P	BG13NUC-LC749	12160	2P	BG21NUC-HC214
4010	2P	BG6NUC-LC172	8086	2P	BG13NUC-LC750	12161	2P	BG21NUC-HC215
4011	2P	BG6NUC-LC173	8087	2P	BG13NUC-LC751	12162	2P	BG21NUC-HC216
4012	RBD	BG6NUC-LC174	8088	2P	BG13NUC-LC752	12163	2P	BG21NUC-HC217
4013	2P	BG6NUC-LC175	8089	2P	BG13NUC-LC753	12164	2P	BG21NUC-HC218
4014	RBD	BG6NUC-LC176	8090	2P	BG13NUC-LC754	12165	RBD	BG21NUC-HC219
4015	RBD	BG6NUC-LC177	8091	2P	BG13NUC-LC755	12166	2P	BG21NUC-HC220
4016	2P	BG6NUC-LC178	8092	2P	BG13NUC-LC756	12167	RBD	BG21NUC-HC221
4017	2P	BG6NUC-LC179	8093	2P	BG13NUC-LC757	12168	2P	BG21NUC-HC222
4018	2P	BG6NUC-LC180	8094	RBD	BG13NUC-LC758	12169	RBD	BG21NUC-HC223
4019	RBD	BG6NUC-LC181	8095	2P	BG13NUC-LC759	12170	2P	BG21NUC-HC224
4020	RBD	BG6NUC-LC182	8096	2P	BG13NUC-LC760	12171	2P	BG21NUC-HC225
4021	2P	BG6NUC-LC183	8097	2P	BG13NUC-LC761	12172	2P	BG21NUC-HC226
4022	2P	BG6NUC-LC184	8098	2P	BG13NUC-LC762	12173	2P	BG21NUC-HC227
4023	2P	BG6NUC-LC185	8099	RBD	BG13NUC-LC763	12174	2P	BG21NUC-HC228
4024	2P	BG6NUC-LC186	8100	2P	BG13NUC-LC764	12175	2P	BG21NUC-HC229
4025	RBD	BG6NUC-LC187	8101	2P	BG13NUC-LC765	12176	2P	BG21NUC-HC230
4026	2P	BG6NUC-LC188	8102	2P	BG13NUC-LC766	12177	2P	BG21NUC-HC231
4027	RBD	BG6NUC-LC189	8103	2P	BG13NUC-LC767	12178	2P	BG21NUC-HC232
4028	2P	BG6NUC-LC190	8104	2P	BG13NUC-LC768	12179	2P	BG21NUC-HC233
4029	RBD	BG6NUC-LC191	8105	2P	BG13NUC-LC769	12180	2P	BG21NUC-HC234
4030	RBD	BG6NUC-LC192	8106	2P	BG13NUC-LC770	12181	2P	BG21NUC-HC235
4031	2P	BG6NUC-LC193	8107	2P	BG13NUC-LC771	12182	2P	BG21NUC-HC236
4032	RBD	BG6NUC-LC194	8108	2P	BG13NUC-LC772	12183	2P	BG21NUC-HC237
4033	2P	BG6NUC-LC195	8109	RBD	BG13NUC-LC773	12184	2P	BG21NUC-HC238
4034	2P	BG6NUC-LC196	8110	RBD	BG13NUC-LC774	12185	2P	BG21NUC-HC239
4035	2P	BG6NUC-LC197	8111	RBD	BG13NUC-LC775	12186	RBD	BG21NUC-HC240
4036	2P	BG6NUC-LC198	8112	RBD	BG13NUC-LC776	12187	2P	BG21NUC-HC241
4037	2P	BG6NUC-LC199	8113	RBD	BG13NUC-LC777	12188	2P	BG21NUC-HC242
4038	2P	BG6NUC-LC200	8114	RBD	BG13NUC-LC778	12189	RBD	BG21NUC-HC243
4039	RBD	BG6NUC-LC201	8115	2P	BG13NUC-LC779	12190	RBD	BG21NUC-HC244
4040	RBD	BG6NUC-LC202	8116	RBD	BG13NUC-LC780	12191	2P	BG21NUC-HC245
4041	2P	BG6NUC-LC203	8117	RBD	BG13NUC-LC781	12192	RBD	BG21NUC-HC246
4042	RBD	BG6NUC-LC204	8118	2P	BG13NUC-LC782	12193	RBD	BG21NUC-HC247
4043	RBD	BG6NUC-LC205	8119	2P	BG13NUC-LC783	12194	RBD	BG21NUC-HC248
4044	2P	BG6NUC-LC206	8120	RBD	BG13NUC-LC784	12195	2P	BG21NUC-HC249
4045	2P	BG6NUC-LC207	8121	RBD	BG13NUC-LC785	12196	2P	BG21NUC-HC250
4046	2P	BG6NUC-LC208	8122	2P	BG13NUC-LC786	12197	RBD	BG21NUC-HC251
4047	RBD	BG6NUC-LC209	8123	2P	BG13NUC-LC787	12198	2P	BG21NUC-HC252
4048	2P	BG6NUC-LC210	8124	2P	BG13NUC-LC788	12199	2P	BG21NUC-HC253
4049	RBD	BG6NUC-LC211	8125	2P	BG13NUC-LC789	12200	2P	BG21NUC-HC254
4050	2P	BG6NUC-LC212	8126	RBD	BG13NUC-LC790	12201	2P	BG21NUC-HC255
4051	2P	BG6NUC-LC213	8127	2P	BG13NUC-LC791	12202	2P	BG21NUC-HC256
4052	2P	BG6NUC-LC214	8128	RBD	BG13NUC-LC792	12203	RBD	BG21NUC-HC257
4053	2P	BG6NUC-LC215	8129	RBD	BG13NUC-LC793	12204	2P	BG21NUC-HC258
4054	2P	BG6NUC-LC216	8130	2P	BG13NUC-LC794	12205	2P	BG21NUC-HC259
4055	2P	BG6NUC-LC217	8131	2P	BG13NUC-LC795	12206	2P	BG21NUC-HC260
4056	2P	BG6NUC-LC218	8132	2P	BG13NUC-LC796	12207	2P	BG21NUC-HC261
4057	RBD	BG6NUC-LC219	8133	2P	BG13NUC-LC797	12208	2P	BG21NUC-HC262
4058	RBD	BG6NUC-LC220	8134	2P	BG13NUC-LC798	12209	RBD	BG21NUC-HC263
4059	2P	BG6NUC-LC221	8135	RBD	BG13NUC-LC799	12210	2P	BG21NUC-HC264
4060	2P	BG6NUC-LC222	8136	RBD	BG13NUC-LC800	12211	2P	BG21NUC-HC265
4061	RBD	BG6NUC-LC223	8137	RBD	BG13NUC-LC801	12212	RBD	BG21NUC-HC266
4062	RBD	BG6NUC-LC224	8138	2P	BG13NUC-LC802	12213	2P	BG21NUC-HC267
4063	RBD	BG6NUC-LC225	8139	2P	BG13NUC-LC803	12214	2P	BG21NUC-HC268
4064	2P	BG6NUC-LC226	8140	2P	BG13NUC-LC804	12215	2P	BG21NUC-HC269
4065	2P	BG6NUC-LC227	8141	2P	BG13NUC-LC805	12216	2P	BG21NUC-HC270
4066	RBD	BG6NUC-LC228	8142	2P	BG13NUC-LC806	12217	2P	BG21NUC-HC271
4067	RBD	BG6NUC-LC229	8143	2P	BG13NUC-LC807	12218	2P	BG21NUC-HC272
4068	RBD	BG6NUC-LC230	8144	2P	BG13NUC-LC808	12219	2P	BG21NUC-HC273
4069	RBD	BG6NUC-LC231	8145	2P	BG13NUC-LC809	12220	2P	BG21NUC-HC274
4070	2P	BG6NUC-LC232	8146	2P	BG13NUC-LC810	12221	2P	BG21NUC-HC275
4071	RBD	BG6NUC-LC233	8147	RBD	BG13NUC-LC811	12222	2P	BG21NUC-HC276
4072	2P	BG6NUC-LC234	8148	RBD	BG13NUC-LC812	12223	2P	BG21NUC-HC277
4073	RBD	BG6NUC-LC235	8149	RBD	BG13NUC-LC813	12224	2P	BG21NUC-HC278
4074	RBD	BG6NUC-LC236	8150	2P	BG13NUC-LC814	12225	2P	BG21NUC-HC279
4075	RBD	BG6NUC-LC237	8151	2P	BG13NUC-LC815	12226	RBD	BG21NUC-HC280

4076	2P	BG6NUC-LC238	8152	2P	BG13NUC-LC816	12227	2P	BG21NUC-HC281
4077	2P	BG6NUC-LC239	8153	2P	BG13NUC-LC817	12228	RBD	BG21NUC-HC282
4078	RBD	BG6NUC-LC240	8154	2P	BG13NUC-LC818	12229	2P	BG21NUC-HC283
4079	2P	BG6NUC-LC241	8155	2P	BG13NUC-LC819	12230	2P	BG21NUC-HC284
4080	2P	BG6NUC-LC242	8156	2P	BG13NUC-LC820	12231	RBD	BG21NUC-HC285
4081	RBD	BG6NUC-LC243	8157	2P	BG13NUC-LC821	12232	2P	BG21NUC-HC286
4082	2P	BG6NUC-LC244	8158	2P	BG13NUC-LC822	12233	RBD	BG21NUC-HC287
4083	2P	BG6NUC-LC245	8159	RBD	BG13NUC-LC823	12234	RBD	BG21NUC-HC288
4084	2P	BG6NUC-LC246	8160	RBD	BG13NUC-LC824	12235	2P	BG21NUC-HC289
4085	2P	BG7NUC-HC1	8161	RBD	BG13NUC-LC825	12236	2P	BG21NUC-HC290
4086	2P	BG7NUC-HC2	8162	RBD	BG13NUC-LC826	12237	2P	BG21NUC-HC291
4087	2P	BG7NUC-HC3	8163	RBD	BG13NUC-LC827	12238	RBD	BG21NUC-HC292
4088	2P	BG7NUC-HC4	8164	2P	BG13NUC-LC828	12239	2P	BG21NUC-HC293
4089	2P	BG7NUC-HC5	8165	2P	BG13NUC-LC829	12240	2P	BG21NUC-HC294
4090	2P	BG7NUC-HC6	8166	2P	BG13NUC-LC830	12241	RBD	BG21NUC-HC295
4091	2P	BG7NUC-HC7	8167	2P	BG13NUC-LC831	12242	2P	BG21NUC-HC296
4092	2P	BG7NUC-HC8	8168	2P	BG13NUC-LC832	12243	2P	BG21NUC-HC297
4093	2P	BG7NUC-HC9	8169	RBD	BG13NUC-LC833	12244	2P	BG21NUC-HC298
4094	2P	BG7NUC-HC10	8170	RBD	BG13NUC-LC834	12245	2P	BG21NUC-HC299
4095	2P	BG7NUC-HC11	8171	RBD	BG13NUC-LC835	12246	2P	BG21NUC-HC300
4096	2P	BG7NUC-HC12	8172	2P	BG13NUC-LC836	12247	2P	BG21NUC-HC301
4097	2P	BG7NUC-HC13	8173	RBD	BG13NUC-LC837	12248	2P	BG21NUC-HC302
4098	2P	BG7NUC-HC14	8174	2P	BG13NUC-LC838	12249	2P	BG21NUC-HC303
4099	2P	BG7NUC-HC15	8175	RBD	BG13NUC-LC839	12250	2P	BG21NUC-HC304
4100	2P	BG7NUC-HC16	8176	2P	BG13NUC-LC840	12251	RBD	BG21NUC-HC305
4101	2P	BG7NUC-HC17	8177	2P	BG13NUC-LC841	12252	2P	BG21NUC-HC306
4102	2P	BG7NUC-HC18	8178	RBD	BG13NUC-LC842	12253	2P	BG21NUC-HC307
4103	2P	BG7NUC-HC19	8179	RBD	BG13NUC-LC843	12254	RBD	BG21NUC-HC308
4104	2P	BG7NUC-HC20	8180	2P	BG13NUC-LC844	12255	RBD	BG21NUC-HC309
4105	2P	BG7NUC-HC21	8181	RBD	BG13NUC-LC845	12256	RBD	BG21NUC-HC310
4106	2P	BG7NUC-HC22	8182	RBD	BG13NUC-LC846	12257	2P	BG21NUC-HC311
4107	2P	BG7NUC-HC23	8183	2P	BG13NUC-LC847	12258	2P	BG21NUC-HC312
4108	2P	BG7NUC-HC24	8184	2P	BG13NUC-LC848	12259	2P	BG21NUC-HC313
4109	2P	BG7NUC-HC25	8185	RBD	BG13NUC-LC849	12260	2P	BG21NUC-HC314
4110	2P	BG7NUC-HC26	8186	RBD	BG13NUC-LC850	12261	RBD	BG21NUC-HC315
4111	2P	BG7NUC-HC27	8187	RBD	BG13NUC-LC851	12262	2P	BG21NUC-HC316
4112	2P	BG7NUC-HC28	8188	2P	BG13NUC-LC852	12263	RBD	BG21NUC-HC317
4113	2P	BG7NUC-HC29	8189	2P	BG13NUC-LC853	12264	2P	BG21NUC-HC318
4114	2P	BG7NUC-HC30	8190	2P	BG13NUC-LC854	12265	2P	BG21NUC-HC319
4115	2P	BG7NUC-HC31	8191	2P	BG13NUC-LC855	12266	2P	BG21NUC-HC320
4116	2P	BG7NUC-HC32	8192	2P	BG13NUC-LC856	12267	RBD	BG21NUC-HC321
4117	RBD	BG7NUC-HC33	8193	RBD	BG13NUC-LC857	12268	2P	BG21NUC-HC322
4118	RBD	BG7NUC-HC34	8194	2P	BG13NUC-LC858	12269	2P	BG21NUC-HC323
4119	RBD	BG7NUC-HC35	8195	2P	BG13NUC-LC859	12270	2P	BG21NUC-HC324
4120	RBD	BG7NUC-HC36	8196	2P	BG13NUC-LC860	12271	2P	BG21NUC-HC325
4121	2P	BG7NUC-HC37	8197	2P	BG13NUC-LC861	12272	RBD	BG21NUC-HC326
4122	2P	BG7NUC-HC38	8198	2P	BG13NUC-LC862	12273	2P	BG21NUC-HC327
4123	2P	BG7NUC-HC39	8199	RBD	BG13NUC-LC863	12274	RBD	BG21NUC-HC328
4124	2P	BG7NUC-HC40	8200	2P	BG13NUC-LC864	12275	2P	BG21NUC-HC329
4125	2P	BG7NUC-HC41	8201	2P	BG13NUC-LC865	12276	2P	BG21NUC-HC330
4126	2P	BG7NUC-HC42	8202	2P	BG13NUC-LC866	12277	2P	BG21NUC-HC331
4127	2P	BG7NUC-HC43	8203	2P	BG13NUC-LC867	12278	2P	BG21NUC-HC332
4128	2P	BG7NUC-HC44	8204	2P	BG13NUC-LC868	12279	2P	BG21NUC-HC333
4129	2P	BG7NUC-HC45	8205	2P	BG13NUC-LC869	12280	2P	BG21NUC-HC334
4130	2P	BG7NUC-HC46	8206	RBD	BG13NUC-LC870	12281	RBD	BG21NUC-HC335
4131	2P	BG7NUC-HC47	8207	2P	BG13NUC-LC871	12282	2P	BG21NUC-HC336
4132	2P	BG7NUC-HC48	8208	RBD	BG13NUC-LC872	12283	RBD	BG21NUC-HC337
4133	2P	BG7NUC-HC49	8209	RBD	BG13NUC-LC873	12284	RBD	BG21NUC-HC338
4134	2P	BG7NUC-HC50	8210	RBD	BG13NUC-LC874	12285	RBD	BG21NUC-HC339
4135	2P	BG7NUC-HC51	8211	RBD	BG13NUC-LC875	12286	2P	BG21NUC-HC340
4136	2P	BG7NUC-HC52	8212	RBD	BG13NUC-LC876	12287	2P	BG21NUC-HC341
4137	2P	BG7NUC-HC53	8213	RBD	BG13NUC-LC877	12288	2P	BG21NUC-HC342
4138	2P	BG7NUC-HC54	8214	2P	BG13NUC-LC878	12289	2P	BG21NUC-HC343
4139	2P	BG7NUC-HC55	8215	2P	BG13NUC-LC879	12290	2P	BG21NUC-HC344
4140	2P	BG7NUC-HC56	8216	2P	BG13NUC-LC880	12291	RBD	BG21NUC-HC345
4141	2P	BG7NUC-HC57	8217	2P	BG13NUC-LC881	12292	2P	BG21NUC-HC346
4142	2P	BG7NUC-HC58	8218	RBD	BG13NUC-LC882	12293	2P	BG21NUC-HC347
4143	2P	BG7NUC-HC59	8219	2P	BG13NUC-LC883	12294	2P	BG21NUC-HC348
4144	2P	BG7NUC-HC60	8220	RBD	BG13NUC-LC884	12295	2P	BG21NUC-HC349
4145	RBD	BG7NUC-HC61	8221	RBD	BG13NUC-LC885	12296	2P	BG21NUC-HC350
4146	2P	BG7NUC-HC62	8222	2P	BG13NUC-LC886	12297	2P	BG21NUC-HC351
4147	2P	BG7NUC-HC63	8223	RBD	BG13NUC-LC887	12298	2P	BG21NUC-HC352
4148	RBD	BG7NUC-HC64	8224	RBD	BG13NUC-LC888	12299	RBD	BG21NUC-HC353
4149	RBD	BG7NUC-HC65	8225	RBD	BG13NUC-LC889	12300	2P	BG21NUC-HC354
4150	RBD	BG7NUC-HC66	8226	RBD	BG13NUC-LC890	12301	2P	BG21NUC-HC355
4151	RBD	BG7NUC-HC67	8227	RBD	BG13NUC-LC891	12302	2P	BG21NUC-HC356
4152	RBD	BG7NUC-HC68	8228	RBD	BG13NUC-LC892	12303	2P	BG21NUC-HC357
4153	2P	BG7NUC-HC69	8229	2P	BG13NUC-LC893	12304	2P	BG21NUC-HC358
4154	2P	BG7NUC-HC70	8230	RBD	BG13NUC-LC894	12305	2P	BG21NUC-HC359

4155	2P	BG7NUC-HC71	8231	RBD	BG13NUC-LC895	12306	2P	BG21NUC-HC360
4156	2P	BG7NUC-HC72	8232	RBD	BG13NUC-LC896	12307	RBD	BG21NUC-HC361
4157	2P	BG7NUC-HC73	8233	RBD	BG13NUC-LC897	12308	2P	BG21NUC-HC362
4158	2P	BG7NUC-HC74	8234	RBD	BG13NUC-LC898	12309	2P	BG21NUC-HC363
4159	2P	BG7NUC-HC75	8235	RBD	BG13NUC-LC899	12310	2P	BG21NUC-LC1
4160	2P	BG7NUC-HC76	8236	2P	BG13NUC-LC900	12311	2P	BG21NUC-LC2
4161	2P	BG7NUC-HC77	8237	2P	BG13NUC-LC901	12312	RBD	BG21NUC-LC3
4162	2P	BG7NUC-HC78	8238	2P	BG13NUC-LC902	12313	2P	BG21NUC-LC4
4163	2P	BG7NUC-HC79	8239	2P	BG13NUC-LC903	12314	2P	BG21NUC-LC5
4164	2P	BG7NUC-HC80	8240	2P	BG13NUC-LC904	12315	2P	BG21NUC-LC6
4165	2P	BG7NUC-HC81	8241	RBD	BG13NUC-LC905	12316	2P	BG21NUC-LC7
4166	2P	BG7NUC-HC82	8242	2P	BG13NUC-LC906	12317	2P	BG21NUC-LC8
4167	2P	BG7NUC-HC83	8243	RBD	BG13NUC-LC907	12318	2P	BG21NUC-LC9
4168	2P	BG7NUC-HC84	8244	2P	BG13NUC-LC908	12319	2P	BG21NUC-LC10
4169	2P	BG7NUC-HC85	8245	2P	BG13NUC-LC909	12320	2P	BG21NUC-LC11
4170	2P	BG7NUC-HC86	8246	2P	BG13NUC-LC910	12321	RBD	BG21NUC-LC12
4171	2P	BG7NUC-HC87	8247	2P	BG13NUC-LC911	12322	2P	BG21NUC-LC13
4172	2P	BG7NUC-HC88	8248	2P	BG13NUC-LC912	12323	2P	BG21NUC-LC14
4173	2P	BG7NUC-HC89	8249	2P	BG13NUC-LC913	12324	2P	BG21NUC-LC15
4174	2P	BG7NUC-HC90	8250	2P	BG13NUC-LC914	12325	2P	BG21NUC-LC16
4175	2P	BG7NUC-HC91	8251	2P	BG13NUC-LC915	12326	2P	BG21NUC-LC17
4176	2P	BG7NUC-HC92	8252	2P	BG13NUC-LC916	12327	2P	BG21NUC-LC18
4177	2P	BG7NUC-HC93	8253	2P	BG13NUC-LC917	12328	2P	BG21NUC-LC19
4178	2P	BG7NUC-HC94	8254	2P	BG13NUC-LC918	12329	2P	BG21NUC-LC20
4179	2P	BG7NUC-HC95	8255	RBD	BG13NUC-LC919	12330	2P	BG21NUC-LC21
4180	2P	BG7NUC-HC96	8256	2P	BG13NUC-LC920	12331	RBD	BG21NUC-LC22
4181	2P	BG7NUC-HC97	8257	RBD	BG13NUC-LC921	12332	2P	BG21NUC-LC23
4182	2P	BG7NUC-HC98	8258	RBD	BG13NUC-LC922	12333	2P	BG21NUC-LC24
4183	2P	BG7NUC-HC99	8259	RBD	BG13NUC-LC923	12334	2P	BG21NUC-LC25
4184	2P	BG7NUC-HC100	8260	RBD	BG13NUC-LC924	12335	2P	BG21NUC-LC26
4185	2P	BG7NUC-HC101	8261	2P	BG13NUC-LC925	12336	RBD	BG21NUC-LC27
4186	2P	BG7NUC-HC102	8262	2P	BG13NUC-LC926	12337	2P	BG21NUC-LC28
4187	2P	BG7NUC-HC103	8263	RBD	BG13NUC-LC927	12338	2P	BG21NUC-LC29
4188	2P	BG7NUC-HC104	8264	2P	BG13NUC-LC928	12339	2P	BG21NUC-LC30
4189	2P	BG7NUC-HC105	8265	2P	BG13NUC-LC929	12340	2P	BG21NUC-LC31
4190	2P	BG7NUC-HC106	8266	2P	BG13NUC-LC930	12341	2P	BG21NUC-LC32
4191	2P	BG7NUC-HC107	8267	2P	BG13NUC-LC931	12342	RBD	BG21NUC-LC33
4192	2P	BG7NUC-HC108	8268	2P	BG13NUC-LC932	12343	2P	BG21NUC-LC34
4193	2P	BG7NUC-HC109	8269	2P	BG13NUC-LC933	12344	2P	BG21NUC-LC35
4194	2P	BG7NUC-HC110	8270	2P	BG13NUC-LC934	12345	RBD	BG21NUC-LC36
4195	2P	BG7NUC-HC111	8271	RBD	BG13NUC-LC935	12346	2P	BG21NUC-LC37
4196	2P	BG7NUC-HC112	8272	RBD	BG13NUC-LC936	12347	2P	BG21NUC-LC38
4197	2P	BG7NUC-HC113	8273	2P	BG13NUC-LC937	12348	2P	BG21NUC-LC39
4198	2P	BG7NUC-HC114	8274	2P	BG13NUC-LC938	12349	2P	BG21NUC-LC40
4199	2P	BG7NUC-HC115	8275	2P	BG13NUC-LC939	12350	2P	BG21NUC-LC41
4200	2P	BG7NUC-HC116	8276	RBD	BG13NUC-LC940	12351	RBD	BG21NUC-LC42
4201	2P	BG7NUC-HC117	8277	2P	BG13NUC-LC941	12352	2P	BG21NUC-LC43
4202	2P	BG7NUC-HC118	8278	RBD	BG13NUC-LC942	12353	2P	BG21NUC-LC44
4203	2P	BG7NUC-HC119	8279	RBD	BG13NUC-LC943	12354	RBD	BG21NUC-LC45
4204	2P	BG7NUC-HC120	8280	RBD	BG13NUC-LC944	12355	2P	BG21NUC-LC46
4205	2P	BG7NUC-HC121	8281	RBD	BG13NUC-LC945	12356	2P	BG21NUC-LC47
4206	2P	BG7NUC-HC122	8282	2P	BG13NUC-LC946	12357	2P	BG21NUC-LC48
4207	2P	BG7NUC-HC123	8283	RBD	BG13NUC-LC947	12358	2P	BG21NUC-LC49
4208	2P	BG7NUC-HC124	8284	RBD	BG13NUC-LC948	12359	2P	BG21NUC-LC50
4209	2P	BG7NUC-HC125	8285	RBD	BG13NUC-LC949	12360	RBD	BG21NUC-LC51
4210	2P	BG7NUC-HC126	8286	2P	BG13NUC-LC950	12361	RBD	BG21NUC-LC52
4211	2P	BG7NUC-HC127	8287	RBD	BG13NUC-LC951	12362	2P	BG21NUC-LC53
4212	2P	BG7NUC-HC128	8288	2P	BG13NUC-LC952	12363	RBD	BG21NUC-LC54
4213	2P	BG7NUC-HC129	8289	2P	BG13NUC-LC953	12364	2P	BG21NUC-LC55
4214	2P	BG7NUC-HC130	8290	2P	BG13NUC-LC954	12365	RBD	BG21NUC-LC56
4215	2P	BG7NUC-HC131	8291	2P	BG13NUC-LC955	12366	2P	BG21NUC-LC57
4216	2P	BG7NUC-HC132	8292	2P	BG13NUC-LC956	12367	RBD	BG21NUC-LC58
4217	2P	BG7NUC-HC133	8293	RBD	BG13NUC-LC957	12368	RBD	BG21NUC-LC59
4218	2P	BG7NUC-HC134	8294	2P	BG13NUC-LC958	12369	RBD	BG21NUC-LC60
4219	2P	BG7NUC-HC135	8295	RBD	BG13NUC-LC959	12370	RBD	BG21NUC-LC61
4220	2P	BG7NUC-HC136	8296	RBD	BG13NUC-LC960	12371	RBD	BG21NUC-LC62
4221	2P	BG7NUC-HC137	8297	2P	BG13NUC-LC961	12372	RBD	BG21NUC-LC63
4222	2P	BG7NUC-HC138	8298	RBD	BG13NUC-LC962	12373	2P	BG21NUC-LC64
4223	2P	BG7NUC-HC139	8299	RBD	BG13NUC-LC963	12374	2P	BG21NUC-LC65
4224	2P	BG7NUC-HC140	8300	2P	BG13NUC-LC964	12375	RBD	BG21NUC-LC66
4225	2P	BG7NUC-HC141	8301	RBD	BG13NUC-LC965	12376	RBD	BG21NUC-LC67
4226	2P	BG7NUC-HC142	8302	2P	BG13NUC-LC966	12377	RBD	BG21NUC-LC68
4227	2P	BG7NUC-HC143	8303	2P	BG13NUC-LC967	12378	2P	BG21NUC-LC69
4228	2P	BG7NUC-HC144	8304	2P	BG13NUC-LC968	12379	RBD	BG21NUC-LC70
4229	2P	BG7NUC-HC145	8305	2P	BG13NUC-LC969	12380	RBD	BG21NUC-LC71
4230	2P	BG7NUC-HC146	8306	RBD	BG13NUC-LC970	12381	2P	BG21NUC-LC72
4231	2P	BG7NUC-HC147	8307	2P	BG13NUC-LC971	12382	RBD	BG21NUC-LC73
4232	2P	BG7NUC-HC148	8308	RBD	BG13NUC-LC972	12383	2P	BG21NUC-LC74
4233	2P	BG7NUC-HC149	8309	2P	BG13NUC-LC973	12384	2P	BG21NUC-LC75

4234	2P	BG7NUC-HC150	8310	RBD	BG13NUC-LC974	12385	2P	BG21NUC-LC76
4235	2P	BG7NUC-HC151	8311	RBD	BG13NUC-LC975	12386	2P	BG21NUC-LC77
4236	2P	BG7NUC-HC152	8312	RBD	BG13NUC-LC976	12387	2P	BG21NUC-LC78
4237	2P	BG7NUC-HC153	8313	2P	BG13NUC-LC977	12388	2P	BG21NUC-LC79
4238	2P	BG7NUC-HC154	8314	RBD	BG13NUC-LC978	12389	2P	BG21NUC-LC80
4239	2P	BG7NUC-HC155	8315	2P	BG13NUC-LC979	12390	RBD	BG21NUC-LC81
4240	2P	BG7NUC-HC156	8316	2P	BG13NUC-LC980	12391	2P	BG21NUC-LC82
4241	2P	BG7NUC-HC157	8317	RBD	BG13NUC-LC981	12392	2P	BG21NUC-LC83
4242	2P	BG7NUC-HC158	8318	2P	BG13NUC-LC982	12393	2P	BG21NUC-LC84
4243	2P	BG7NUC-HC159	8319	2P	BG13NUC-LC983	12394	2P	BG21NUC-LC85
4244	2P	BG7NUC-HC160	8320	RBD	BG13NUC-LC984	12395	2P	BG21NUC-LC86
4245	2P	BG7NUC-HC161	8321	RBD	BG13NUC-LC985	12396	2P	BG21NUC-LC87
4246	2P	BG7NUC-HC162	8322	RBD	BG13NUC-LC986	12397	2P	BG21NUC-LC88
4247	2P	BG7NUC-HC163	8323	RBD	BG13NUC-LC987	12398	RBD	BG21NUC-LC89
4248	2P	BG7NUC-HC164	8324	2P	BG13NUC-LC988	12399	2P	BG21NUC-LC90
4249	2P	BG7NUC-HC165	8325	2P	BG13NUC-LC989	12400	2P	BG21NUC-LC91
4250	2P	BG7NUC-HC166	8326	2P	BG13NUC-LC990	12401	2P	BG21NUC-LC92
4251	2P	BG7NUC-HC167	8327	RBD	BG13NUC-LC991	12402	2P	BG21NUC-LC93
4252	2P	BG7NUC-HC168	8328	2P	BG13NUC-LC992	12403	2P	BG21NUC-LC94
4253	2P	BG7NUC-HC169	8329	2P	BG13NUC-LC993	12404	RBD	BG21NUC-LC95
4254	2P	BG7NUC-HC170	8330	RBD	BG13NUC-LC994	12405	2P	BG21NUC-LC96
4255	2P	BG7NUC-HC171	8331	RBD	BG13NUC-LC995	12406	2P	BG21NUC-LC97
4256	2P	BG7NUC-HC172	8332	2P	BG13NUC-LC996	12407	2P	BG21NUC-LC98
4257	2P	BG7NUC-HC173	8333	RBD	BG13NUC-LC997	12408	2P	BG21NUC-LC99
4258	2P	BG7NUC-HC174	8334	2P	BG13NUC-LC998	12409	2P	BG21NUC-LC100
4259	2P	BG7NUC-HC175	8335	RBD	BG13NUC-LC999	12410	2P	BG21NUC-LC101
4260	2P	BG7NUC-HC176	8336	2P	BG13NUC-LC1000	12411	2P	BG21NUC-LC102
4261	2P	BG7NUC-HC177	8337	RBD	BG13NUC-LC1001	12412	RBD	BG21NUC-LC103
4262	2P	BG7NUC-HC178	8338	RBD	BG13NUC-LC1002	12413	RBD	BG21NUC-LC104
4263	2P	BG7NUC-HC179	8339	2P	BG13NUC-LC1003	12414	RBD	BG21NUC-LC105
4264	2P	BG7NUC-HC180	8340	RBD	BG13NUC-LC1004	12415	RBD	BG21NUC-LC106
4265	2P	BG7NUC-HC181	8341	2P	BG13NUC-LC1005	12416	2P	BG21NUC-LC107
4266	2P	BG7NUC-HC182	8342	2P	BG13NUC-LC1006	12417	2P	BG21NUC-LC108
4267	2P	BG7NUC-HC183	8343	2P	BG13NUC-LC1007	12418	2P	BG21NUC-LC109
4268	2P	BG7NUC-HC184	8344	2P	BG13NUC-LC1008	12419	2P	BG21NUC-LC110
4269	2P	BG7NUC-HC185	8345	2P	BG13NUC-LC1009	12420	2P	BG21NUC-LC111
4270	2P	BG7NUC-HC186	8346	RBD	BG13NUC-LC1010	12421	2P	BG21NUC-LC112
4271	2P	BG7NUC-HC187	8347	2P	BG13NUC-LC1011	12422	2P	BG21NUC-LC113
4272	2P	BG7NUC-HC188	8348	2P	BG13NUC-LC1012	12423	2P	BG21NUC-LC114
4273	2P	BG7NUC-HC189	8349	RBD	BG13NUC-LC1013	12424	2P	BG21NUC-LC115
4274	2P	BG7NUC-HC190	8350	RBD	BG13NUC-LC1014	12425	2P	BG21NUC-LC116
4275	2P	BG7NUC-HC191	8351	2P	BG13NUC-LC1015	12426	2P	BG21NUC-LC117
4276	2P	BG7NUC-HC192	8352	2P	BG13NUC-LC1016	12427	2P	BG21NUC-LC118
4277	2P	BG7NUC-HC193	8353	2P	BG13NUC-LC1017	12428	2P	BG21NUC-LC119
4278	2P	BG7NUC-HC194	8354	2P	BG13NUC-LC1018	12429	RBD	BG21NUC-LC120
4279	2P	BG7NUC-HC195	8355	2P	BG13NUC-LC1019	12430	2P	BG21NUC-LC121
4280	2P	BG7NUC-HC196	8356	2P	BG13NUC-LC1020	12431	2P	BG21NUC-LC122
4281	2P	BG7NUC-HC197	8357	2P	BG13NUC-LC1021	12432	2P	BG21NUC-LC123
4282	2P	BG7NUC-HC198	8358	RBD	BG13NUC-LC1022	12433	2P	BG21NUC-LC124
4283	2P	BG7NUC-HC199	8359	2P	BG13NUC-LC1023	12434	RBD	BG21NUC-LC125
4284	2P	BG7NUC-HC200	8360	2P	BG13NUC-LC1024	12435	2P	BG21NUC-LC126
4285	2P	BG7NUC-HC201	8361	2P	BG13NUC-LC1025	12436	2P	BG21NUC-LC127
4286	2P	BG7NUC-HC202	8362	RBD	BG13NUC-LC1026	12437	2P	BG21NUC-LC128
4287	2P	BG7NUC-HC203	8363	2P	BG13NUC-LC1027	12438	2P	BG21NUC-LC129
4288	2P	BG7NUC-HC204	8364	2P	BG13NUC-LC1028	12439	RBD	BG21NUC-LC130
4289	2P	BG7NUC-HC205	8365	2P	BG13NUC-LC1029	12440	RBD	BG21NUC-LC131
4290	2P	BG7NUC-HC206	8366	2P	BG13NUC-LC1030	12441	RBD	BG21NUC-LC132
4291	2P	BG7NUC-HC207	8367	2P	BG13NUC-LC1031	12442	2P	BG21NUC-LC133
4292	2P	BG7NUC-HC208	8368	RBD	BG13NUC-LC1032	12443	2P	BG21NUC-LC134
4293	2P	BG7NUC-HC209	8369	RBD	BG13NUC-LC1033	12444	RBD	BG21NUC-LC135
4294	2P	BG7NUC-HC210	8370	2P	BG13NUC-LC1034	12445	2P	BG21NUC-LC136
4295	2P	BG7NUC-HC211	8371	2P	BG13NUC-LC1035	12446	2P	BG21NUC-LC137
4296	2P	BG7NUC-HC212	8372	2P	BG13NUC-LC1036	12447	RBD	BG21NUC-LC138
4297	2P	BG7NUC-HC213	8373	2P	BG13NUC-LC1037	12448	2P	BG21NUC-LC139
4298	2P	BG7NUC-HC214	8374	RBD	BG13NUC-LC1038	12449	2P	BG21NUC-LC140
4299	2P	BG7NUC-HC215	8375	RBD	BG13NUC-LC1039	12450	2P	BG21NUC-LC141
4300	2P	BG7NUC-HC216	8376	RBD	BG13NUC-LC1040	12451	RBD	BG21NUC-LC142
4301	2P	BG7NUC-HC217	8377	2P	BG13NUC-LC1041	12452	2P	BG21NUC-LC143
4302	2P	BG7NUC-HC218	8378	2P	BG13NUC-LC1042	12453	2P	BG21NUC-LC144
4303	2P	BG7NUC-HC219	8379	RBD	BG13NUC-LC1043	12454	2P	BG21NUC-LC145
4304	2P	BG7NUC-HC220	8380	2P	BG13NUC-LC1044	12455	2P	BG21NUC-LC146
4305	2P	BG7NUC-HC221	8381	2P	BG13NUC-LC1045	12456	2P	BG21NUC-LC147
4306	2P	BG7NUC-HC222	8382	2P	BG13NUC-LC1046	12457	RBD	BG21NUC-LC148
4307	2P	BG7NUC-HC223	8383	2P	BG13NUC-LC1047	12458	RBD	BG21NUC-LC149
4308	2P	BG7NUC-HC224	8384	2P	BG13NUC-LC1048	12459	RBD	BG21NUC-LC150
4309	2P	BG7NUC-HC225	8385	RBD	BG13NUC-LC1049	12460	2P	BG21NUC-LC151
4310	2P	BG7NUC-HC226	8386	2P	BG13NUC-LC1050	12461	2P	BG21NUC-LC152
4311	2P	BG7NUC-HC227	8387	2P	BG13NUC-LC1051	12462	2P	BG21NUC-LC153
4312	2P	BG7NUC-HC228	8388	2P	BG13NUC-LC1052	12463	2P	BG21NUC-LC154

4313	2P	BG7NUC-HC229	8389	RBD	BG13NUC-LC1053	12464	2P	BG21NUC-LC155
4314	2P	BG7NUC-HC230	8390	2P	BG13NUC-LC1054	12465	RBD	BG21NUC-LC156
4315	2P	BG7NUC-HC231	8391	2P	BG13NUC-LC1055	12466	RBD	BG21NUC-LC157
4316	2P	BG7NUC-HC232	8392	2P	BG13NUC-LC1056	12467	RBD	BG21NUC-LC158
4317	2P	BG7NUC-HC233	8393	2P	BG13NUC-LC1057	12468	RBD	BG21NUC-LC159
4318	2P	BG7NUC-HC234	8394	2P	BG13NUC-LC1058	12469	RBD	BG21NUC-LC160
4319	2P	BG7NUC-HC235	8395	RBD	BG13NUC-LC1059	12470	2P	BG21NUC-LC161
4320	2P	BG7NUC-HC236	8396	2P	BG13NUC-LC1060	12471	2P	BG21NUC-LC162
4321	2P	BG7NUC-HC237	8397	RBD	BG13NUC-LC1061	12472	RBD	BG21NUC-LC163
4322	2P	BG7NUC-HC238	8398	2P	BG13NUC-LC1062	12473	2P	BG21NUC-LC164
4323	2P	BG7NUC-HC239	8399	2P	BG13NUC-LC1063	12474	2P	BG21NUC-LC165
4324	2P	BG7NUC-HC240	8400	2P	BG13NUC-LC1064	12475	RBD	BG21NUC-LC166
4325	2P	BG7NUC-HC241	8401	RBD	BG13NUC-LC1065	12476	2P	BG21NUC-LC167
4326	2P	BG7NUC-HC242	8402	2P	BG13NUC-LC1066	12477	2P	BG21NUC-LC168
4327	2P	BG7NUC-HC243	8403	2P	BG13NUC-LC1067	12478	2P	BG21NUC-LC169
4328	2P	BG7NUC-HC244	8404	RBD	BG13NUC-LC1068	12479	2P	BG21NUC-LC170
4329	2P	BG7NUC-HC245	8405	2P	BG13NUC-LC1069	12480	2P	BG21NUC-LC171
4330	2P	BG7NUC-HC246	8406	2P	BG13NUC-LC1070	12481	2P	BG21NUC-LC172
4331	2P	BG7NUC-HC247	8407	2P	BG13NUC-LC1071	12482	2P	BG21NUC-LC173
4332	2P	BG7NUC-HC248	8408	RBD	BG13NUC-LC1072	12483	2P	BG21NUC-LC174
4333	2P	BG7NUC-HC249	8409	RBD	BG13NUC-LC1073	12484	2P	BG21NUC-LC175
4334	2P	BG7NUC-HC250	8410	2P	BG13NUC-LC1074	12485	2P	BG21NUC-LC176
4335	2P	BG7NUC-HC251	8411	RBD	BG13NUC-LC1075	12486	2P	BG21NUC-LC177
4336	2P	BG7NUC-HC252	8412	2P	BG13NUC-LC1076	12487	2P	BG21NUC-LC178
4337	2P	BG7NUC-HC253	8413	2P	BG13NUC-LC1077	12488	2P	BG21NUC-LC179
4338	RBD	BG7NUC-HC254	8414	RBD	BG13NUC-LC1078	12489	2P	BG21NUC-LC180
4339	RBD	BG7NUC-HC255	8415	RBD	BG13NUC-LC1079	12490	2P	BG21NUC-LC181
4340	RBD	BG7NUC-HC256	8416	RBD	BG13NUC-LC1080	12491	2P	BG21NUC-LC182
4341	RBD	BG7NUC-HC257	8417	RBD	BG13NUC-LC1081	12492	2P	BG21NUC-LC183
4342	RBD	BG7NUC-HC258	8418	2P	BG13NUC-LC1082	12493	RBD	BG21NUC-LC184
4343	RBD	BG7NUC-HC259	8419	2P	BG13NUC-LC1083	12494	2P	BG21NUC-LC185
4344	RBD	BG7NUC-HC260	8420	RBD	BG13NUC-LC1084	12495	2P	BG21NUC-LC186
4345	RBD	BG7NUC-HC261	8421	2P	BG13NUC-LC1085	12496	RBD	BG21NUC-LC187
4346	RBD	BG7NUC-HC262	8422	RBD	BG13NUC-LC1086	12497	RBD	BG21NUC-LC188
4347	RBD	BG7NUC-HC263	8423	2P	BG13NUC-LC1087	12498	RBD	BG21NUC-LC189
4348	RBD	BG7NUC-HC264	8424	2P	BG13NUC-LC1088	12499	2P	BG21NUC-LC190
4349	RBD	BG7NUC-HC265	8425	2P	BG13NUC-LC1089	12500	2P	BG21NUC-LC191
4350	RBD	BG7NUC-HC266	8426	RBD	BG13NUC-LC1090	12501	RBD	BG21NUC-LC192
4351	RBD	BG7NUC-HC267	8427	RBD	BG13NUC-LC1091	12502	RBD	BG21NUC-LC193
4352	RBD	BG7NUC-HC268	8428	2P	BG13NUC-LC1092	12503	2P	BG21NUC-LC194
4353	RBD	BG7NUC-HC269	8429	RBD	BG13NUC-LC1093	12504	2P	BG21NUC-LC195
4354	RBD	BG7NUC-HC270	8430	2P	BG13NUC-LC1094	12505	2P	BG21NUC-LC196
4355	RBD	BG7NUC-HC271	8431	RBD	BG13NUC-LC1095	12506	2P	BG21NUC-LC197
4356	RBD	BG7NUC-HC272	8432	RBD	BG13NUC-LC1096	12507	2P	BG21NUC-LC198
4357	RBD	BG7NUC-HC273	8433	RBD	BG13NUC-LC1097	12508	2P	BG21NUC-LC199
4358	RBD	BG7NUC-HC274	8434	RBD	BG13NUC-LC1098	12509	RBD	BG21NUC-LC200
4359	RBD	BG7NUC-HC275	8435	2P	BG13NUC-LC1099	12510	RBD	BG21NUC-LC201
4360	RBD	BG7NUC-HC276	8436	RBD	BG13NUC-LC1100	12511	2P	BG21NUC-LC202
4361	RBD	BG7NUC-HC277	8437	RBD	BG13NUC-LC1101	12512	RBD	BG21NUC-LC203
4362	RBD	BG7NUC-HC278	8438	RBD	BG13NUC-LC1102	12513	2P	BG21NUC-LC204
4363	RBD	BG7NUC-HC279	8439	RBD	BG13NUC-LC1103	12514	2P	BG21NUC-LC205
4364	RBD	BG7NUC-HC280	8440	2P	BG13NUC-LC1104	12515	2P	BG21NUC-LC206
4365	RBD	BG7NUC-HC281	8441	2P	BG13NUC-LC1105	12516	2P	BG21NUC-LC207
4366	RBD	BG7NUC-HC282	8442	RBD	BG13NUC-LC1106	12517	2P	BG21NUC-LC208
4367	RBD	BG7NUC-HC283	8443	2P	BG13NUC-LC1107	12518	2P	BG21NUC-LC209
4368	RBD	BG7NUC-HC284	8444	RBD	BG13NUC-LC1108	12519	2P	BG21NUC-LC210
4369	RBD	BG7NUC-HC285	8445	2P	BG13NUC-LC1109	12520	RBD	BG21NUC-LC211
4370	RBD	BG7NUC-HC286	8446	2P	BG13NUC-LC1110	12521	2P	BG21NUC-LC212
4371	RBD	BG7NUC-HC287	8447	2P	BG13NUC-LC1111	12522	2P	BG21NUC-LC213
4372	RBD	BG7NUC-HC288	8448	RBD	BG13NUC-LC1112	12523	2P	BG21NUC-LC214
4373	RBD	BG7NUC-HC289	8449	2P	BG13NUC-LC1113	12524	2P	BG21NUC-LC215
4374	RBD	BG7NUC-HC290	8450	RBD	BG13NUC-LC1114	12525	2P	BG21NUC-LC216
4375	RBD	BG7NUC-HC291	8451	2P	BG13NUC-LC1115	12526	2P	BG21NUC-LC217
4376	RBD	BG7NUC-HC292	8452	2P	BG13NUC-LC1116	12527	2P	BG21NUC-LC218
4377	RBD	BG7NUC-HC293	8453	2P	BG13NUC-LC1117	12528	RBD	BG21NUC-LC219
4378	RBD	BG7NUC-HC294	8454	2P	BG13NUC-LC1118	12529	2P	BG21NUC-LC220
4379	RBD	BG7NUC-HC295	8455	2P	BG13NUC-LC1119	12530	RBD	BG21NUC-LC221
4380	RBD	BG7NUC-HC296	8456	2P	BG13NUC-LC1120	12531	2P	BG21NUC-LC222
4381	RBD	BG7NUC-HC297	8457	2P	BG13NUC-LC1121	12532	RBD	BG21NUC-LC223
4382	RBD	BG7NUC-HC298	8458	2P	BG13NUC-LC1122	12533	2P	BG21NUC-LC224
4383	RBD	BG7NUC-HC299	8459	2P	BG13NUC-LC1123	12534	2P	BG21NUC-LC225
4384	RBD	BG7NUC-HC300	8460	2P	BG13NUC-LC1124	12535	2P	BG21NUC-LC226
4385	RBD	BG7NUC-HC301	8461	2P	BG13NUC-LC1125	12536	2P	BG21NUC-LC227
4386	RBD	BG7NUC-HC302	8462	RBD	BG13NUC-LC1126	12537	2P	BG21NUC-LC228
4387	RBD	BG7NUC-HC303	8463	2P	BG13NUC-LC1127	12538	2P	BG21NUC-LC229
4388	RBD	BG7NUC-HC304	8464	2P	BG13NUC-LC1128	12539	2P	BG21NUC-LC230
4389	RBD	BG7NUC-HC305	8465	2P	BG13NUC-LC1129	12540	2P	BG21NUC-LC231
4390	RBD	BG7NUC-HC306	8466	2P	BG13NUC-LC1130	12541	2P	BG21NUC-LC232
4391	RBD	BG7NUC-HC307	8467	RBD	BG13NUC-LC1131	12542	2P	BG21NUC-LC233

4392	RBD	BG7NUC-HC308	8468	RBD	BG13NUC-LC1132	12543	2P	BG21NUC-LC234
4393	RBD	BG7NUC-HC309	8469	2P	BG13NUC-LC1133	12544	2P	BG21NUC-LC235
4394	RBD	BG7NUC-HC310	8470	RBD	BG13NUC-LC1134	12545	2P	BG21NUC-LC236
4395	RBD	BG7NUC-HC311	8471	RBD	BG13NUC-LC1135	12546	2P	BG21NUC-LC237
4396	RBD	BG7NUC-HC312	8472	RBD	BG13NUC-LC1136	12547	2P	BG21NUC-LC238
4397	RBD	BG7NUC-HC313	8473	RBD	BG14NUC-HC1	12548	2P	BG21NUC-LC239
4398	RBD	BG7NUC-HC314	8474	RBD	BG14NUC-HC2	12549	RBD	BG21NUC-LC240
4399	RBD	BG7NUC-HC315	8475	RBD	BG14NUC-HC3	12550	2P	BG21NUC-LC241
4400	RBD	BG7NUC-HC316	8476	RBD	BG14NUC-HC4	12551	2P	BG21NUC-LC242
4401	RBD	BG7NUC-HC317	8477	RBD	BG14NUC-HC5	12552	RBD	BG21NUC-LC243
4402	RBD	BG7NUC-HC318	8478	RBD	BG14NUC-HC6	12553	RBD	BG21NUC-LC244
4403	RBD	BG7NUC-HC319	8479	RBD	BG14NUC-HC7	12554	2P	BG21NUC-LC245
4404	RBD	BG7NUC-HC320	8480	RBD	BG14NUC-HC8	12555	RBD	BG21NUC-LC246
4405	RBD	BG7NUC-HC321	8481	RBD	BG14NUC-HC9	12556	RBD	BG21NUC-LC247
4406	RBD	BG7NUC-HC322	8482	RBD	BG14NUC-HC10	12557	RBD	BG21NUC-LC248
4407	RBD	BG7NUC-HC323	8483	RBD	BG14NUC-HC11	12558	2P	BG21NUC-LC249
4408	RBD	BG7NUC-HC324	8484	RBD	BG14NUC-HC12	12559	2P	BG21NUC-LC250
4409	RBD	BG7NUC-HC325	8485	RBD	BG14NUC-HC13	12560	RBD	BG21NUC-LC251
4410	RBD	BG7NUC-HC326	8486	RBD	BG14NUC-HC14	12561	2P	BG21NUC-LC252
4411	RBD	BG7NUC-HC327	8487	RBD	BG14NUC-HC15	12562	2P	BG21NUC-LC253
4412	RBD	BG7NUC-HC328	8488	RBD	BG14NUC-HC16	12563	2P	BG21NUC-LC254
4413	RBD	BG7NUC-HC329	8489	RBD	BG14NUC-HC17	12564	2P	BG21NUC-LC255
4414	RBD	BG7NUC-HC330	8490	RBD	BG14NUC-HC18	12565	2P	BG21NUC-LC256
4415	RBD	BG7NUC-HC331	8491	RBD	BG14NUC-HC19	12566	RBD	BG21NUC-LC257
4416	RBD	BG7NUC-HC332	8492	RBD	BG14NUC-HC20	12567	2P	BG21NUC-LC258
4417	RBD	BG7NUC-HC333	8493	RBD	BG14NUC-HC21	12568	2P	BG21NUC-LC259
4418	RBD	BG7NUC-HC334	8494	RBD	BG14NUC-HC22	12569	2P	BG21NUC-LC260
4419	RBD	BG7NUC-HC335	8495	RBD	BG14NUC-HC23	12570	2P	BG21NUC-LC261
4420	RBD	BG7NUC-HC336	8496	RBD	BG14NUC-HC24	12571	2P	BG21NUC-LC262
4421	RBD	BG7NUC-HC337	8497	RBD	BG14NUC-HC25	12572	RBD	BG21NUC-LC263
4422	RBD	BG7NUC-HC338	8498	2P	BG14NUC-HC26	12573	2P	BG21NUC-LC264
4423	RBD	BG7NUC-HC339	8499	2P	BG14NUC-HC27	12574	2P	BG21NUC-LC265
4424	RBD	BG7NUC-HC340	8500	2P	BG14NUC-HC28	12575	RBD	BG21NUC-LC266
4425	RBD	BG7NUC-HC341	8501	2P	BG14NUC-HC29	12576	2P	BG21NUC-LC267
4426	RBD	BG7NUC-HC342	8502	2P	BG14NUC-HC30	12577	2P	BG21NUC-LC268
4427	RBD	BG7NUC-HC343	8503	2P	BG14NUC-HC31	12578	2P	BG21NUC-LC269
4428	RBD	BG7NUC-HC344	8504	2P	BG14NUC-HC32	12579	2P	BG21NUC-LC270
4429	RBD	BG7NUC-HC345	8505	2P	BG14NUC-HC33	12580	2P	BG21NUC-LC271
4430	RBD	BG7NUC-HC346	8506	2P	BG14NUC-HC34	12581	2P	BG21NUC-LC272
4431	RBD	BG7NUC-HC347	8507	2P	BG14NUC-HC35	12582	2P	BG21NUC-LC273
4432	RBD	BG7NUC-HC348	8508	2P	BG14NUC-HC36	12583	2P	BG21NUC-LC274
4433	RBD	BG7NUC-HC349	8509	2P	BG14NUC-HC37	12584	2P	BG21NUC-LC275
4434	RBD	BG7NUC-HC350	8510	2P	BG14NUC-HC38	12585	2P	BG21NUC-LC276
4435	RBD	BG7NUC-HC351	8511	2P	BG14NUC-HC39	12586	2P	BG21NUC-LC277
4436	RBD	BG7NUC-HC352	8512	2P	BG14NUC-HC40	12587	2P	BG21NUC-LC278
4437	RBD	BG7NUC-HC353	8513	2P	BG14NUC-HC41	12588	2P	BG21NUC-LC279
4438	RBD	BG7NUC-HC354	8514	2P	BG14NUC-HC42	12589	RBD	BG21NUC-LC280
4439	RBD	BG7NUC-HC355	8515	2P	BG14NUC-HC43	12590	2P	BG21NUC-LC281
4440	RBD	BG7NUC-HC356	8516	2P	BG14NUC-HC44	12591	RBD	BG21NUC-LC282
4441	RBD	BG7NUC-HC357	8517	2P	BG14NUC-HC45	12592	2P	BG21NUC-LC283
4442	RBD	BG7NUC-HC358	8518	2P	BG14NUC-HC46	12593	2P	BG21NUC-LC284
4443	RBD	BG7NUC-HC359	8519	2P	BG14NUC-HC47	12594	RBD	BG21NUC-LC285
4444	RBD	BG7NUC-HC360	8520	2P	BG14NUC-HC48	12595	2P	BG21NUC-LC286
4445	RBD	BG7NUC-HC361	8521	2P	BG14NUC-HC49	12596	RBD	BG21NUC-LC287
4446	RBD	BG7NUC-HC362	8522	RBD	BG14NUC-HC50	12597	RBD	BG21NUC-LC288
4447	RBD	BG7NUC-HC363	8523	RBD	BG14NUC-HC51	12598	2P	BG21NUC-LC289
4448	RBD	BG7NUC-HC364	8524	RBD	BG14NUC-HC52	12599	2P	BG21NUC-LC290
4449	RBD	BG7NUC-HC365	8525	RBD	BG14NUC-HC53	12600	2P	BG21NUC-LC291
4450	RBD	BG7NUC-HC366	8526	RBD	BG14NUC-HC54	12601	RBD	BG21NUC-LC292
4451	RBD	BG7NUC-HC367	8527	RBD	BG14NUC-HC55	12602	2P	BG21NUC-LC293
4452	RBD	BG7NUC-HC368	8528	RBD	BG14NUC-HC56	12603	2P	BG21NUC-LC294
4453	RBD	BG7NUC-HC369	8529	RBD	BG14NUC-HC57	12604	RBD	BG21NUC-LC295
4454	RBD	BG7NUC-HC370	8530	RBD	BG14NUC-HC58	12605	2P	BG21NUC-LC296
4455	RBD	BG7NUC-HC371	8531	2P	BG14NUC-HC59	12606	2P	BG21NUC-LC297
4456	RBD	BG7NUC-HC372	8532	2P	BG14NUC-HC60	12607	2P	BG21NUC-LC298
4457	RBD	BG7NUC-HC373	8533	2P	BG14NUC-HC61	12608	2P	BG21NUC-LC299
4458	RBD	BG7NUC-HC374	8534	2P	BG14NUC-HC62	12609	2P	BG21NUC-LC300
4459	RBD	BG7NUC-HC375	8535	2P	BG14NUC-HC63	12610	2P	BG21NUC-LC301
4460	RBD	BG7NUC-HC376	8536	2P	BG14NUC-HC64	12611	2P	BG21NUC-LC302
4461	RBD	BG7NUC-HC377	8537	2P	BG14NUC-HC65	12612	2P	BG21NUC-LC303
4462	RBD	BG7NUC-HC378	8538	RBD	BG14NUC-HC66	12613	2P	BG21NUC-LC304
4463	RBD	BG7NUC-HC379	8539	RBD	BG14NUC-HC67	12614	RBD	BG21NUC-LC305
4464	RBD	BG7NUC-HC380	8540	RBD	BG14NUC-HC68	12615	2P	BG21NUC-LC306
4465	RBD	BG7NUC-HC381	8541	RBD	BG14NUC-HC69	12616	2P	BG21NUC-LC307
4466	RBD	BG7NUC-HC382	8542	RBD	BG14NUC-HC70	12617	RBD	BG21NUC-LC308
4467	RBD	BG7NUC-HC383	8543	2P	BG14NUC-HC71	12618	RBD	BG21NUC-LC309
4468	RBD	BG7NUC-HC384	8544	2P	BG14NUC-HC72	12619	RBD	BG21NUC-LC310
4469	RBD	BG7NUC-HC385	8545	RBD	BG14NUC-HC73	12620	2P	BG21NUC-LC311
4470	RBD	BG7NUC-HC386	8546	RBD	BG14NUC-HC74	12621	2P	BG21NUC-LC312

4471	RBD	BG7NUC-HC387	8547	RBD	BG14NUC-HC75	12622	2P	BG21NUC-LC313
4472	RBD	BG7NUC-HC388	8548	2P	BG14NUC-HC76	12623	2P	BG21NUC-LC314
4473	RBD	BG7NUC-HC389	8549	RBD	BG14NUC-HC77	12624	RBD	BG21NUC-LC315
4474	RBD	BG7NUC-HC390	8550	RBD	BG14NUC-HC78	12625	2P	BG21NUC-LC316
4475	RBD	BG7NUC-HC391	8551	RBD	BG14NUC-HC79	12626	RBD	BG21NUC-LC317
4476	RBD	BG7NUC-HC392	8552	RBD	BG14NUC-HC80	12627	2P	BG21NUC-LC318
4477	RBD	BG7NUC-HC393	8553	RBD	BG14NUC-HC81	12628	2P	BG21NUC-LC319
4478	RBD	BG7NUC-HC394	8554	RBD	BG14NUC-HC82	12629	2P	BG21NUC-LC320
4479	RBD	BG7NUC-HC395	8555	RBD	BG14NUC-HC83	12630	RBD	BG21NUC-LC321
4480	RBD	BG7NUC-HC396	8556	RBD	BG14NUC-HC84	12631	2P	BG21NUC-LC322
4481	RBD	BG7NUC-HC397	8557	RBD	BG14NUC-HC85	12632	2P	BG21NUC-LC323
4482	2P	BG7NUC-LC1	8558	2P	BG14NUC-HC86	12633	2P	BG21NUC-LC324
4483	2P	BG7NUC-LC2	8559	2P	BG14NUC-HC87	12634	2P	BG21NUC-LC325
4484	2P	BG7NUC-LC3	8560	2P	BG14NUC-HC88	12635	RBD	BG21NUC-LC326
4485	2P	BG7NUC-LC4	8561	2P	BG14NUC-HC89	12636	2P	BG21NUC-LC327
4486	2P	BG7NUC-LC5	8562	RBD	BG14NUC-HC90	12637	RBD	BG21NUC-LC328
4487	2P	BG7NUC-LC6	8563	RBD	BG14NUC-HC91	12638	2P	BG21NUC-LC329
4488	2P	BG7NUC-LC7	8564	RBD	BG14NUC-HC92	12639	2P	BG21NUC-LC330
4489	2P	BG7NUC-LC8	8565	2P	BG14NUC-HC93	12640	2P	BG21NUC-LC331
4490	2P	BG7NUC-LC9	8566	2P	BG14NUC-HC94	12641	2P	BG21NUC-LC332
4491	2P	BG7NUC-LC10	8567	2P	BG14NUC-HC95	12642	2P	BG21NUC-LC333
4492	2P	BG7NUC-LC11	8568	RBD	BG14NUC-HC96	12643	2P	BG21NUC-LC334
4493	2P	BG7NUC-LC12	8569	RBD	BG14NUC-HC97	12644	RBD	BG21NUC-LC335
4494	2P	BG7NUC-LC13	8570	RBD	BG14NUC-HC98	12645	2P	BG21NUC-LC336
4495	2P	BG7NUC-LC14	8571	2P	BG14NUC-HC99	12646	RBD	BG21NUC-LC337
4496	2P	BG7NUC-LC15	8572	RBD	BG14NUC-HC100	12647	RBD	BG21NUC-LC338
4497	2P	BG7NUC-LC16	8573	RBD	BG14NUC-HC101	12648	RBD	BG21NUC-LC339
4498	2P	BG7NUC-LC17	8574	RBD	BG14NUC-HC102	12649	2P	BG21NUC-LC340
4499	2P	BG7NUC-LC18	8575	2P	BG14NUC-HC103	12650	2P	BG21NUC-LC341
4500	2P	BG7NUC-LC19	8576	RBD	BG14NUC-HC104	12651	2P	BG21NUC-LC342
4501	2P	BG7NUC-LC20	8577	RBD	BG14NUC-HC105	12652	2P	BG21NUC-LC343
4502	2P	BG7NUC-LC21	8578	RBD	BG14NUC-HC106	12653	2P	BG21NUC-LC344
4503	2P	BG7NUC-LC22	8579	RBD	BG14NUC-HC107	12654	RBD	BG21NUC-LC345
4504	2P	BG7NUC-LC23	8580	RBD	BG14NUC-HC108	12655	2P	BG21NUC-LC346
4505	2P	BG7NUC-LC24	8581	2P	BG14NUC-HC109	12656	2P	BG21NUC-LC347
4506	2P	BG7NUC-LC25	8582	2P	BG14NUC-HC110	12657	2P	BG21NUC-LC348
4507	2P	BG7NUC-LC26	8583	RBD	BG14NUC-HC111	12658	2P	BG21NUC-LC349
4508	2P	BG7NUC-LC27	8584	RBD	BG14NUC-HC112	12659	2P	BG21NUC-LC350
4509	2P	BG7NUC-LC28	8585	2P	BG14NUC-HC113	12660	2P	BG21NUC-LC351
4510	2P	BG7NUC-LC29	8586	2P	BG14NUC-HC114	12661	2P	BG21NUC-LC352
4511	2P	BG7NUC-LC30	8587	2P	BG14NUC-HC115	12662	RBD	BG21NUC-LC353
4512	2P	BG7NUC-LC31	8588	RBD	BG14NUC-HC116	12663	2P	BG21NUC-LC354
4513	2P	BG7NUC-LC32	8589	RBD	BG14NUC-HC117	12664	2P	BG21NUC-LC355
4514	RBD	BG7NUC-LC33	8590	RBD	BG14NUC-HC118	12665	2P	BG21NUC-LC356
4515	RBD	BG7NUC-LC34	8591	RBD	BG14NUC-HC119	12666	2P	BG21NUC-LC357
4516	RBD	BG7NUC-LC35	8592	RBD	BG14NUC-HC120	12667	2P	BG21NUC-LC358
4517	RBD	BG7NUC-LC36	8593	2P	BG14NUC-HC121	12668	2P	BG21NUC-LC359
4518	2P	BG7NUC-LC37	8594	2P	BG14NUC-HC122	12669	2P	BG21NUC-LC360
4519	2P	BG7NUC-LC38	8595	RBD	BG14NUC-HC123	12670	RBD	BG21NUC-LC361
4520	2P	BG7NUC-LC39	8596	RBD	BG14NUC-HC124	12671	2P	BG21NUC-LC362
4521	2P	BG7NUC-LC40	8597	RBD	BG14NUC-HC125	12672	2P	BG21NUC-LC363
4522	2P	BG7NUC-LC41						

Table 8B.

SEQ ID NO	BAIT USED	SEQUENCE NAME	Produced Antibody Name	SEQ ID NO	BAIT USED	SEQUENCE NAME	Produced Antibody Name
447	RBD	BG1NUC-HC1	BG1-1	2271	2P	BG4NUC-LC40	BG4-12
456	RBD	BG1NUC-HC10	BG1-3	2273	RBD	BG4NUC-LC42	BG4-13
459	RBD	BG1NUC-HC13	BG1-4	2275	2P	BG4NUC-LC44	BG4-14
462	RBD	BG1NUC-HC16	BG1-5	2277	2P	BG4NUC-LC46	BG4-15
466	RBD	BG1NUC-HC20	BG1-6	2279	RBD	BG4NUC-LC48	BG4-16
467	2P	BG1NUC-HC21	BG1-7	2281	2P	BG4NUC-LC50	BG4-17
469	2P	BG1NUC-HC23	BG1-8	2283	2P	BG4NUC-LC52	BG4-18
471	RBD	BG1NUC-HC25	BG1-9	2285	RBD	BG4NUC-LC54	BG4-19
473	RBD	BG1NUC-HC27	BG1-10	2288	2P	BG4NUC-LC57	BG4-20
475	RBD	BG1NUC-HC29	BG1-11	2289	RBD	BG4NUC-LC58	BG4-21
477	RBD	BG1NUC-HC31	BG1-12	2364	2P	BG4NUC-LC133	BG4-22
479	2P	BG1NUC-HC33	BG1-13	2389	RBD	BG4NUC-LC158	BG4-23
481	RBD	BG1NUC-HC35	BG1-14	2448	RBD	BG4NUC-LC217	BG4-24
483	RBD	BG1NUC-HC37	BG1-15	2460	2P	BG4NUC-LC229	BG4-25
485	2P	BG1NUC-HC39	BG1-16	2537	RBD	BG4NUC-LC306	BG4-26
487	RBD	BG1NUC-HC41	BG1-17	2614	2P	BG4NUC-LC383	BG4-27

489	2P	BG1NUC-HC43	BG1-18	4085	2P	BG7NUC-HC1	BG7-1
514	RBD	BG1NUC-HC68	BG1-19	4097	2P	BG7NUC-HC13	BG7-2
528	2P	BG1NUC-HC82	BG1-20	4106	2P	BG7NUC-HC22	BG7-3
536	RBD	BG1NUC-HC90	BG1-21	4115	2P	BG7NUC-HC31	BG7-4
542	RBD	BG1NUC-HC96	BG1-22	4121	2P	BG7NUC-HC37	BG7-5
548	RBD	BG1NUC-HC102	BG1-23	4126	2P	BG7NUC-HC42	BG7-6
571	RBD	BG1NUC-HC125	BG1-24	4129	2P	BG7NUC-HC45	BG7-8
602	RBD	BG1NUC-HC156	BG1-25	4132	2P	BG7NUC-HC48	BG7-9
634	RBD	BG1NUC-HC188	BG1-26	4134	2P	BG7NUC-HC50	BG7-10
690	RBD	BG1NUC-HC244	BG1-27	4136	2P	BG7NUC-HC52	BG7-11
701	RBD	BG1NUC-HC255	BG1-28	4138	2P	BG7NUC-HC54	BG7-12
755	RBD	BG1NUC-LC1	BG1-1	4140	2P	BG7NUC-HC56	BG7-13
764	RBD	BG1NUC-LC10	BG1-3	4346	RBD	BG7NUC-HC262	BG7-14
767	RBD	BG1NUC-LC13	BG1-4	4369	RBD	BG7NUC-HC285	BG7-15
770	RBD	BG1NUC-LC16	BG1-5	4372	RBD	BG7NUC-HC288	BG7-16
774	RBD	BG1NUC-LC20	BG1-6	4386	RBD	BG7NUC-HC302	BG7-17
775	2P	BG1NUC-LC21	BG1-7	4393	RBD	BG7NUC-HC309	BG7-18
777	2P	BG1NUC-LC23	BG1-8	4402	RBD	BG7NUC-HC318	BG7-19
779	RBD	BG1NUC-LC25	BG1-9	4414	RBD	BG7NUC-HC330	BG7-20
781	RBD	BG1NUC-LC27	BG1-10	4482	2P	BG7NUC-LC1	BG7-1
783	RBD	BG1NUC-LC29	BG1-11	4494	2P	BG7NUC-LC13	BG7-2
785	RBD	BG1NUC-LC31	BG1-12	4503	2P	BG7NUC-LC22	BG7-3
787	2P	BG1NUC-LC33	BG1-13	4512	2P	BG7NUC-LC31	BG7-4
789	RBD	BG1NUC-LC35	BG1-14	4518	2P	BG7NUC-LC37	BG7-5
791	RBD	BG1NUC-LC37	BG1-15	4523	2P	BG7NUC-LC42	BG7-6
793	2P	BG1NUC-LC39	BG1-16	4526	2P	BG7NUC-LC45	BG7-8
795	RBD	BG1NUC-LC41	BG1-17	4529	2P	BG7NUC-LC48	BG7-9
797	2P	BG1NUC-LC43	BG1-18	4531	2P	BG7NUC-LC50	BG7-10
822	RBD	BG1NUC-LC68	BG1-19	4533	2P	BG7NUC-LC52	BG7-11
836	2P	BG1NUC-LC82	BG1-20	4535	2P	BG7NUC-LC54	BG7-12
844	RBD	BG1NUC-LC90	BG1-21	4537	2P	BG7NUC-LC56	BG7-13
850	RBD	BG1NUC-LC96	BG1-22	4743	RBD	BG7NUC-LC262	BG7-14
856	RBD	BG1NUC-LC102	BG1-23	4766	RBD	BG7NUC-LC285	BG7-15
879	RBD	BG1NUC-LC125	BG1-24	4769	RBD	BG7NUC-LC288	BG7-16
910	RBD	BG1NUC-LC156	BG1-25	4783	RBD	BG7NUC-LC302	BG7-17
942	RBD	BG1NUC-LC188	BG1-26	4790	RBD	BG7NUC-LC309	BG7-18
998	RBD	BG1NUC-LC244	BG1-27	4799	RBD	BG7NUC-LC318	BG7-19
1009	RBD	BG1NUC-LC255	BG1-28	4811	RBD	BG7NUC-LC330	BG7-20
1823	2P	BG4NUC-HC1	BG4-1	5347	RBD	BG10NUC-HC1	BG10-1
1834	2P	BG4NUC-HC12	BG4-2	5383	RBD	BG10NUC-HC37	BG10-2
1838	2P	BG4NUC-HC16	BG4-3	5398	RBD	BG10NUC-HC52	BG10-3
1843	2P	BG4NUC-HC21	BG4-4	5407	RBD	BG10NUC-HC61	BG10-4
1845	RBD	BG4NUC-HC23	BG4-5	5416	RBD	BG10NUC-HC70	BG10-5
1847	RBD	BG4NUC-HC25	BG4-6	5424	RBD	BG10NUC-HC78	BG10-6
1850	RBD	BG4NUC-HC28	BG4-7	5431	RBD	BG10NUC-HC85	BG10-7
1853	RBD	BG4NUC-HC31	BG4-8	5436	RBD	BG10NUC-HC90	BG10-8
1856	RBD	BG4NUC-HC34	BG4-9	5441	2P	BG10NUC-HC95	BG10-9
1859	RBD	BG4NUC-HC37	BG4-10	5446	RBD	BG10NUC-HC100	BG10-10
1860	RBD	BG4NUC-HC38	BG4-11	5450	RBD	BG10NUC-HC104	BG10-11
1862	2P	BG4NUC-HC40	BG4-12	5453	2P	BG10NUC-HC107	BG10-12
1864	RBD	BG4NUC-HC42	BG4-13	5457	RBD	BG10NUC-HC111	BG10-13
1866	2P	BG4NUC-HC44	BG4-14	5459	2P	BG10NUC-HC113	BG10-14
1868	2P	BG4NUC-HC46	BG4-15	5461	RBD	BG10NUC-HC115	BG10-15
1870	RBD	BG4NUC-HC48	BG4-16	5467	2P	BG10NUC-HC121	BG10-16
1872	2P	BG4NUC-HC50	BG4-17	5471	2P	BG10NUC-HC125	BG10-17
1874	2P	BG4NUC-HC52	BG4-18	5473	RBD	BG10NUC-HC127	BG10-18
1876	RBD	BG4NUC-HC54	BG4-19	5475	RBD	BG10NUC-HC129	BG10-19
1879	2P	BG4NUC-HC57	BG4-20	5774	RBD	BG10NUC-LC1	BG10-1
1880	RBD	BG4NUC-HC58	BG4-21	5810	RBD	BG10NUC-LC37	BG10-2
1955	2P	BG4NUC-HC133	BG4-22	5825	RBD	BG10NUC-LC52	BG10-3
1980	RBD	BG4NUC-HC158	BG4-23	5834	RBD	BG10NUC-LC61	BG10-4
2039	RBD	BG4NUC-HC217	BG4-24	5843	RBD	BG10NUC-LC70	BG10-5
2051	2P	BG4NUC-HC229	BG4-25	5851	RBD	BG10NUC-LC78	BG10-6
2128	RBD	BG4NUC-HC306	BG4-26	5858	RBD	BG10NUC-LC85	BG10-7
2205	2P	BG4NUC-HC383	BG4-27	5863	RBD	BG10NUC-LC90	BG10-8

2232	2P	BG4NUC-LC1	BG4-1	5868	2P	BG10NUC-LC95	BG10-9
2243	2P	BG4NUC-LC12	BG4-2	5873	RBD	BG10NUC-LC100	BG10-10
2247	2P	BG4NUC-LC16	BG4-3	5877	RBD	BG10NUC-LC104	BG10-11
2252	2P	BG4NUC-LC21	BG4-4	5880	2P	BG10NUC-LC107	BG10-12
2254	RBD	BG4NUC-LC23	BG4-5	5884	RBD	BG10NUC-LC111	BG10-13
2256	RBD	BG4NUC-LC25	BG4-6	5886	2P	BG10NUC-LC113	BG10-14
2259	RBD	BG4NUC-LC28	BG4-7	5888	RBD	BG10NUC-LC115	BG10-15
2262	RBD	BG4NUC-LC31	BG4-8	5894	2P	BG10NUC-LC121	BG10-16
2265	RBD	BG4NUC-LC34	BG4-9	5898	2P	BG10NUC-LC125	BG10-17
2268	RBD	BG4NUC-LC37	BG4-10	5900	RBD	BG10NUC-LC127	BG10-18
2269	RBD	BG4NUC-LC38	BG4-11	5902	RBD	BG10NUC-LC129	BG10-19

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[0215] Various modifications and variations of the described methods, pharmaceutical compositions, and kits of the invention will be apparent to those skilled in the art without departing from the scope and spirit of the invention. Although the invention has been described in connection with specific embodiments, it will be understood that it is capable of further modifications and that the invention as claimed should not be unduly limited to such specific embodiments. Indeed, various modifications of the described modes for carrying out the invention that are obvious to those skilled in the art are intended to be within the scope of the invention. This application is intended to cover any variations, uses, or adaptations of the invention following, in general, the principles of the invention and including such departures from the present disclosure come within known customary practice within the art to which the invention pertains and may be applied to the essential features herein before set forth.

CLAIMS

What is claimed:

1. An antibody or antigen binding fragment thereof that binds to the SARS-CoV-2 receptor-binding domain (RBD) and/or SARS-CoV-2 spike trimer comprising:
a complementarity-determining region 3 (CDR3) heavy chain and light chain pair that shares at least 90% identity with the heavy chain and/or light chain of a pair selected from the group consisting of: BG1-1, BG1-3 to BG1-28, BG4-1 to BG4-27, BG7-1 to BG7-7, BG7-9 to BG7-20, and BG10-1 to BG10-19 (SEQ ID NOS: 1-184); or
a heavy chain and light chain pair that shares at least 90% identity with the heavy chain and/or light chain of a pair selected from the group consisting of: BG1-1, BG1-3 to BG1-28, BG4-1 to BG4-27, BG7-1 to BG7-7, BG7-9 to BG7-20, and BG10-1 to BG10-19 (SEQ ID NOS: 185-368).
2. The antibody or antigen binding fragment thereof of claim 1, wherein said antibody or antigen binding fragment is an IgG antibody or antigen binding fragment.
3. The antibody or antigen binding fragment thereof of claim 1, wherein said antibody or antigen binding fragment is a monoclonal antibody.
4. The antibody or antigen binding fragment thereof of claim 1, wherein said CDR3 heavy chain and light chain pair or heavy chain and light chain pair is selected from the group consisting of: BG1-6, BG1-12, BG1-14, BG1-17, BG1-22, BG1-23, BG1-24, BG1-25, BG1-26, BG1-28, BG4-10, BG4-11, BG4-14, BG4-16, BG4-17, BG4-24, BG4-25, BG4-26, BG7-14, BG7-15, BG7-16, BG7-18, BG7-19, BG7-20, BG10-10, BG1014, and BG10-19.
5. The antibody or antigen binding fragment thereof of claim 1, wherein said CDR3 heavy chain and light chain pair or heavy chain and light chain pair is selected from the group consisting of: BG1-22, BG1-24, BG4-25, BG7-15, BG7-20, and BG10-19.
6. The antibody or antigen binding fragment thereof of claim 1, wherein said heavy chain and light chain pair is BG7-15.

7. The antibody or antigen binding fragment thereof of claim 6, wherein said antibody or antigen binding fragment thereof binds the two “down” / one “up” RBD conformation on the SARS CoV2 spike trimer with no glycan or interprotomer contacts.
8. The antibody or antigen binding fragment thereof of claim 6, wherein said antibody or antigen binding fragment recognizes an epitope in proximity to RBD residues 439-450.
9. The antibody or antigen binding fragment thereof of claim 6, wherein said antibody or antigen binding fragment blocks RBD-ACE2 interactions.
10. The antibody or antigen binding fragment thereof of claim 1, wherein said heavy chain and light chain pair is BG7-20.
11. The antibody or antigen binding fragment thereof of claim 10, wherein said antibody or antigen binding fragment thereof binds a 2d/1u or 1d/2u binding state in the SARS CoV2 spike trimer.
12. The antibody or antigen binding fragment thereof of claim 1, wherein said heavy chain and light chain pair is BG10-19.
13. The antibody or antigen binding fragment thereof of claim 12, wherein said antibody or antigen binding fragment thereof binds to an all down RBD conformation in the SARS CoV2 spike trimer.
14. The antibody or antigen binding fragment thereof of claim 12, wherein said antibody or antigen binding fragment recognizes an epitope in proximity to the N343-glycan.
15. The antibody or antigen binding fragment thereof of claim 12, wherein said antibody or antigen binding fragment light chain makes secondary contacts with an adjacent RBD.
16. The antibody or antigen binding fragment thereof of claim 12, wherein said antibody or antigen binding fragment heavy chain makes contacts with an epitope in proximity to the N343-glycan and the light chain contacts adjacent down RBDs and interacts with residues that overlap with the ACE2 receptor binding motif.

17. The antibody or antigen binding fragment thereof of claim 1, wherein said heavy chain and light chain pair is BG1-24.
18. The antibody or antigen binding fragment thereof of claim 17, wherein said antibody or antigen binding fragment thereof binds both the up/down RBD conformation on the SARS CoV2 spike trimer.
19. The antibody or antigen binding fragment thereof of claim 1, wherein said heavy chain and light chain pair is BG1-22.
20. The antibody or antigen binding fragment thereof of claim 19, wherein said antibody or antigen binding fragment thereof binds only the up RBD conformation on the SARS CoV2 spike trimer.
21. The antibody or antigen binding fragment thereof of claim 1, wherein said antibody or antigen binding fragment is a VH3-53/3-66 antibody.
22. The antibody or antigen binding fragment thereof of claim 21, wherein said antibody or antigen binding fragment comprises a CDR3 having a consensus sequence according to Figure 29.
23. The antibody or antigen binding fragment thereof of claim 21, wherein said heavy chain and light chain pair is BG4-25.
24. An antibody or antigen binding fragment thereof that binds to the SARS, MERS and CoV2 spike trimers outside of the receptor-binding domain (RBD) comprising a complementarity-determining region 3 (CDR3) heavy chain and light chain pair that shares at least 90% identity with the heavy chain and/or light chain of a pair selected from the group consisting of LKA-1-17 (Table 7).
25. The antibody or antigen binding fragment of any of claims 1 to 24, wherein the antibody or antigen binding fragment is modified to enhance stabilization, *in vivo* half-life, neutralizing activity and/or dimerization.
26. The antibody or antigen binding fragment of claim 25, wherein the antibody or antigen binding fragment is a fusion protein.

27. The antibody or antigen binding fragment of claim 26, wherein the antibody or antigen binding fragment is fused to another antibody or antibody fragment, Fc domain, antigen binding domain, glutathione S-transferase (GST), and/or serum albumin.
28. The antibody or antigen binding fragment of claim 25, wherein the antibody or antigen binding fragment comprises amino acid substitutions that increase antibody binding and/or viral neutralization activity.
29. A method of treating a coronavirus infection comprising administering to a subject in need thereof one or more antibodies or antigen binding fragments of any of claims 1 to 28.
30. The method of claim 29, wherein the coronavirus is selected from the group consisting of SARS-CoV-2, SARS and MERS.
31. The method of claim 30, wherein the SARS-CoV-2 is a SARS-CoV-2 variant.
32. The method of claim 31, wherein the SARS-CoV-2 variant is selected from the group consisting of B.1.1.7 and B.1.351.
33. The method of any of claims 29 to 32, wherein BG10-19 is administered.
34. The method of any of claims 29 to 32, wherein BG10-19 and BG4-25 are administered.
35. A method of identifying neutralizing antibodies from a subject infected with a virus comprising selecting antibodies expressed in B cells further expressing a transcriptional program, wherein the transcriptional program comprises one or more genes selected from the group consisting of:
- a. GRAMD1C, TMEM156, PDE4D, NFKBIA, S100A10, TKT, CAPG, CXCR3, CFLAR, HMGA1, MARCKSL1, PIM3, RHOF, MIF, ZFP36L1, NME2, MGAT4A, COCH, HOPX, ITGB2-AS1, BASP1, CD80, PAPSS1, CD70, LYPLAL1, LMNA, and FAS; or
 - b. TKT, ARHGDIB, CFL1, CNN2, S100A10, HSPA8, HMGA1, PPIA, RAC2, CLIC1, SLC25A5, ARPC1B, SELL, PPP1CA, CAPZB, PPP1R18, CAPG, LDHB, S100A4, VIM, LTB, ANXA2, LCP1, TUBB, ACTG1, GAPDH, ACTB, PFN1, CORO1A, and TMSB10; or
 - c. CD27, CD80, CD46 and CD86.

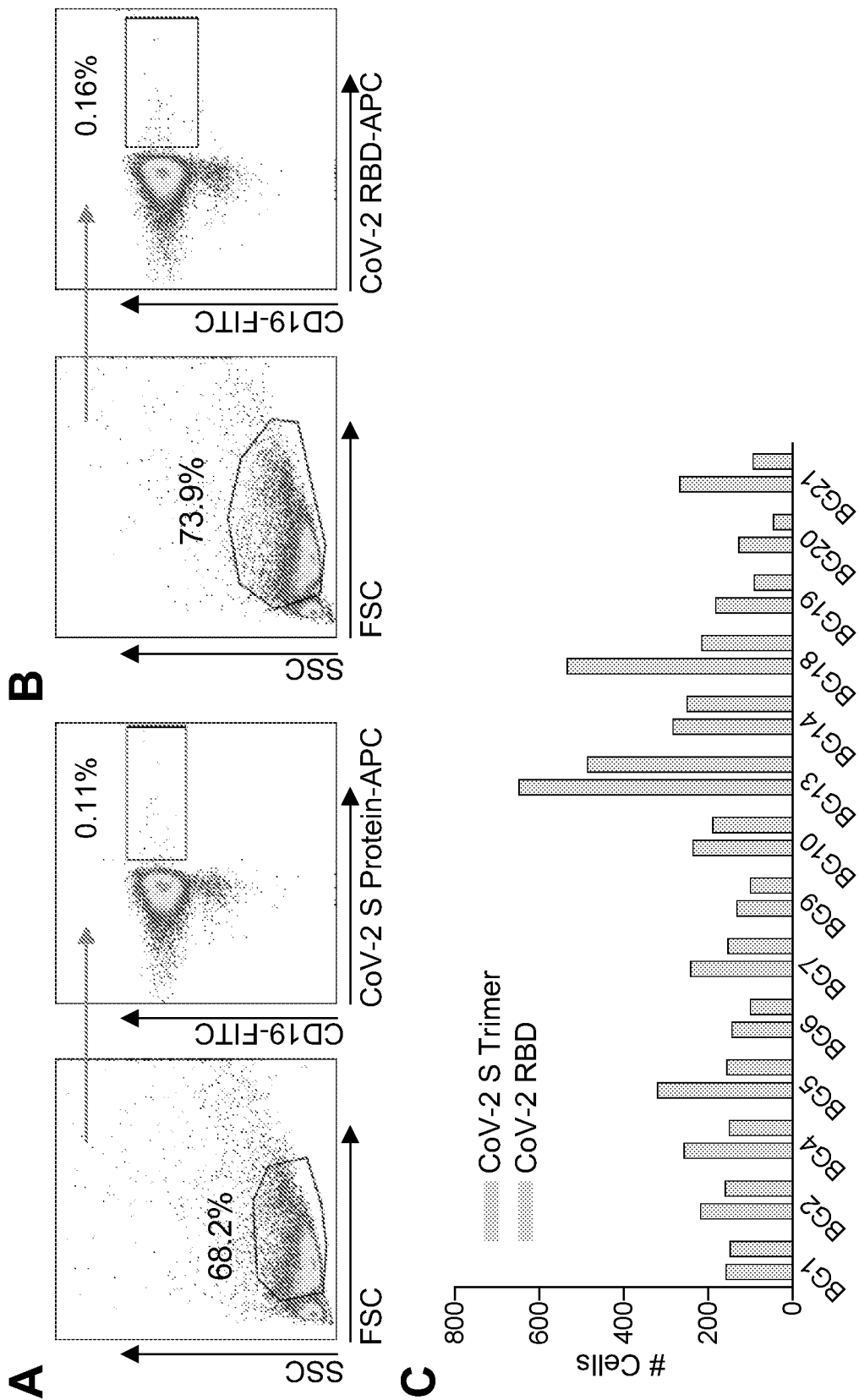


FIG. 1A-C

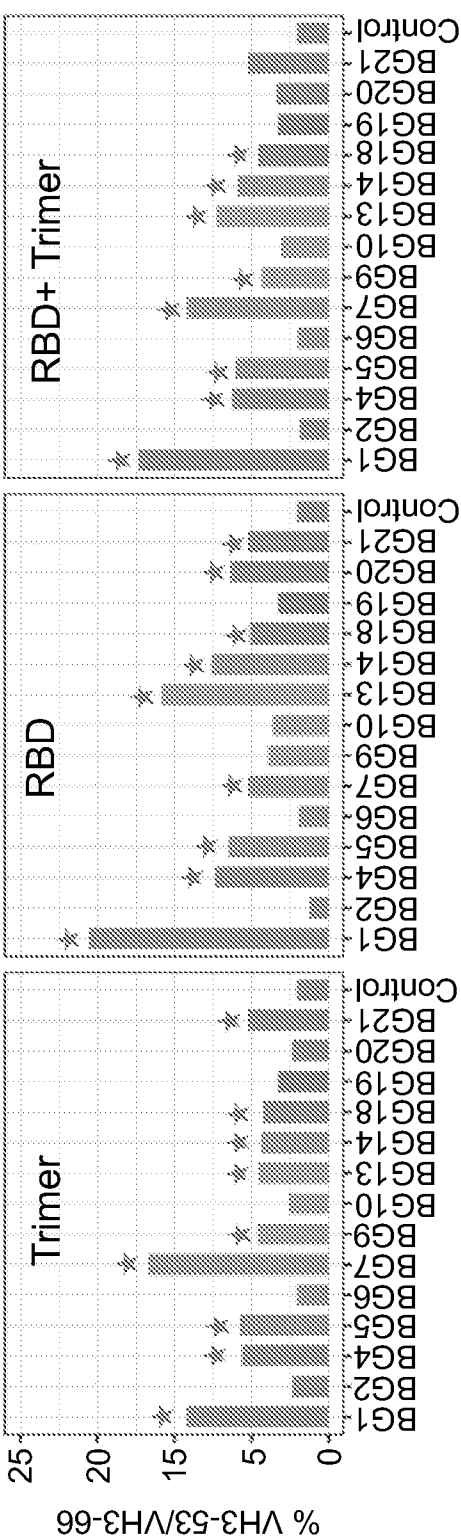
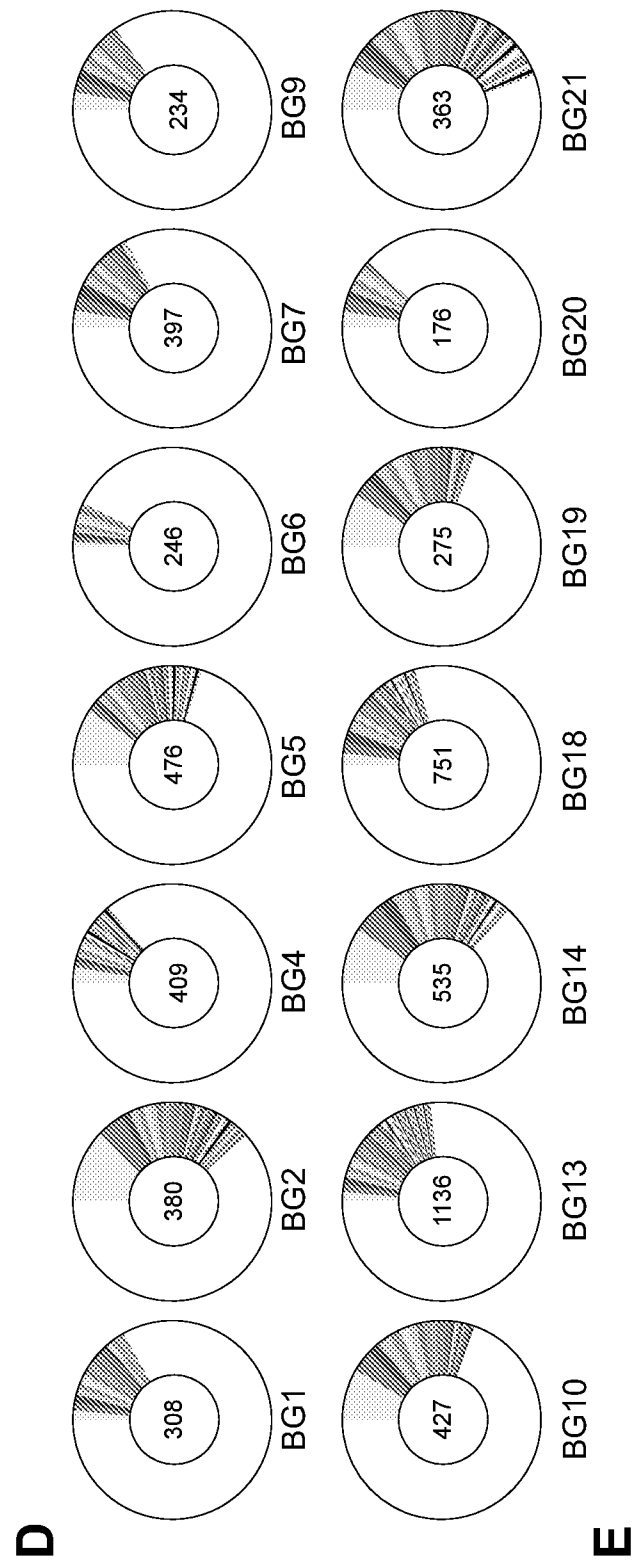
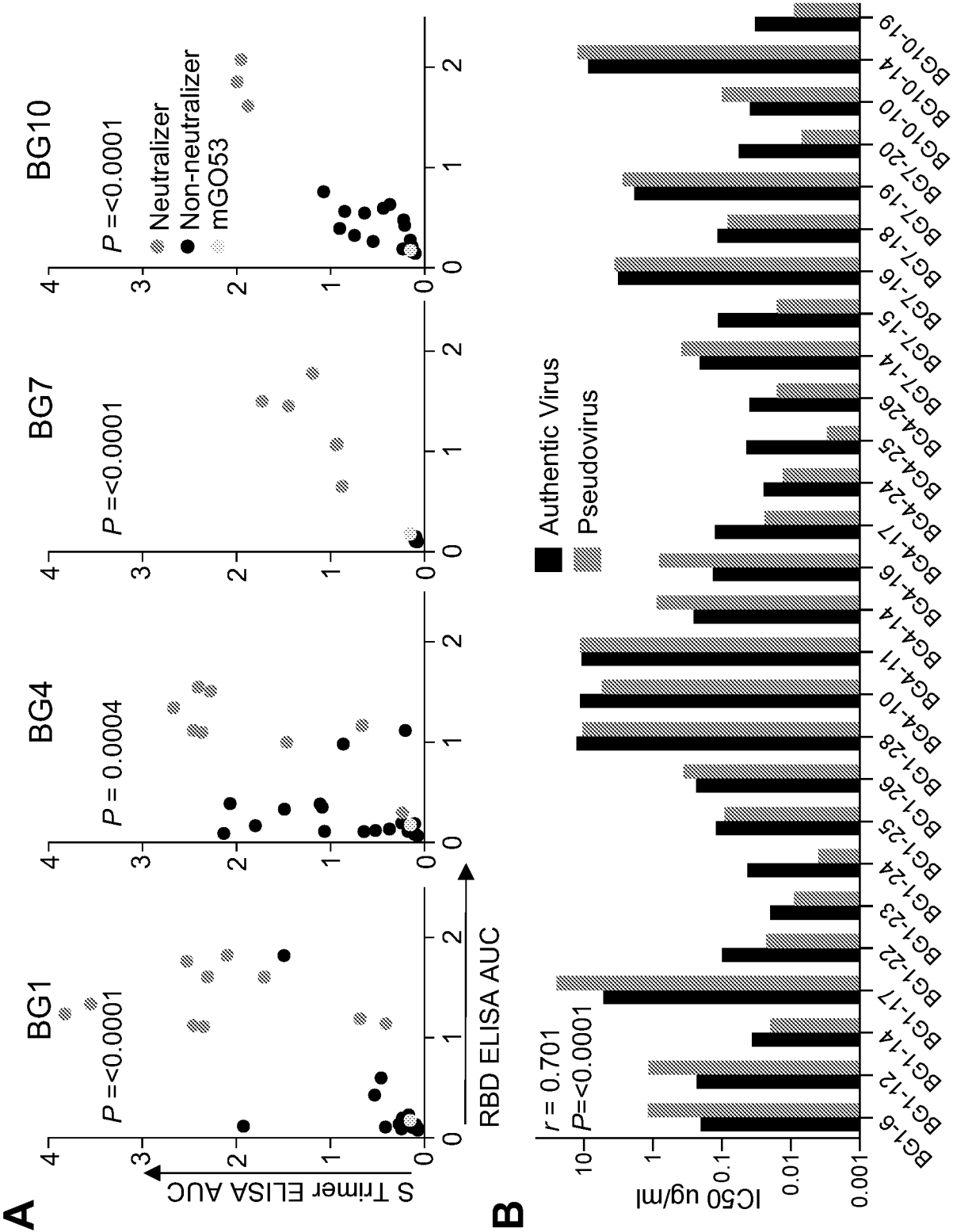


FIG. 1D-E



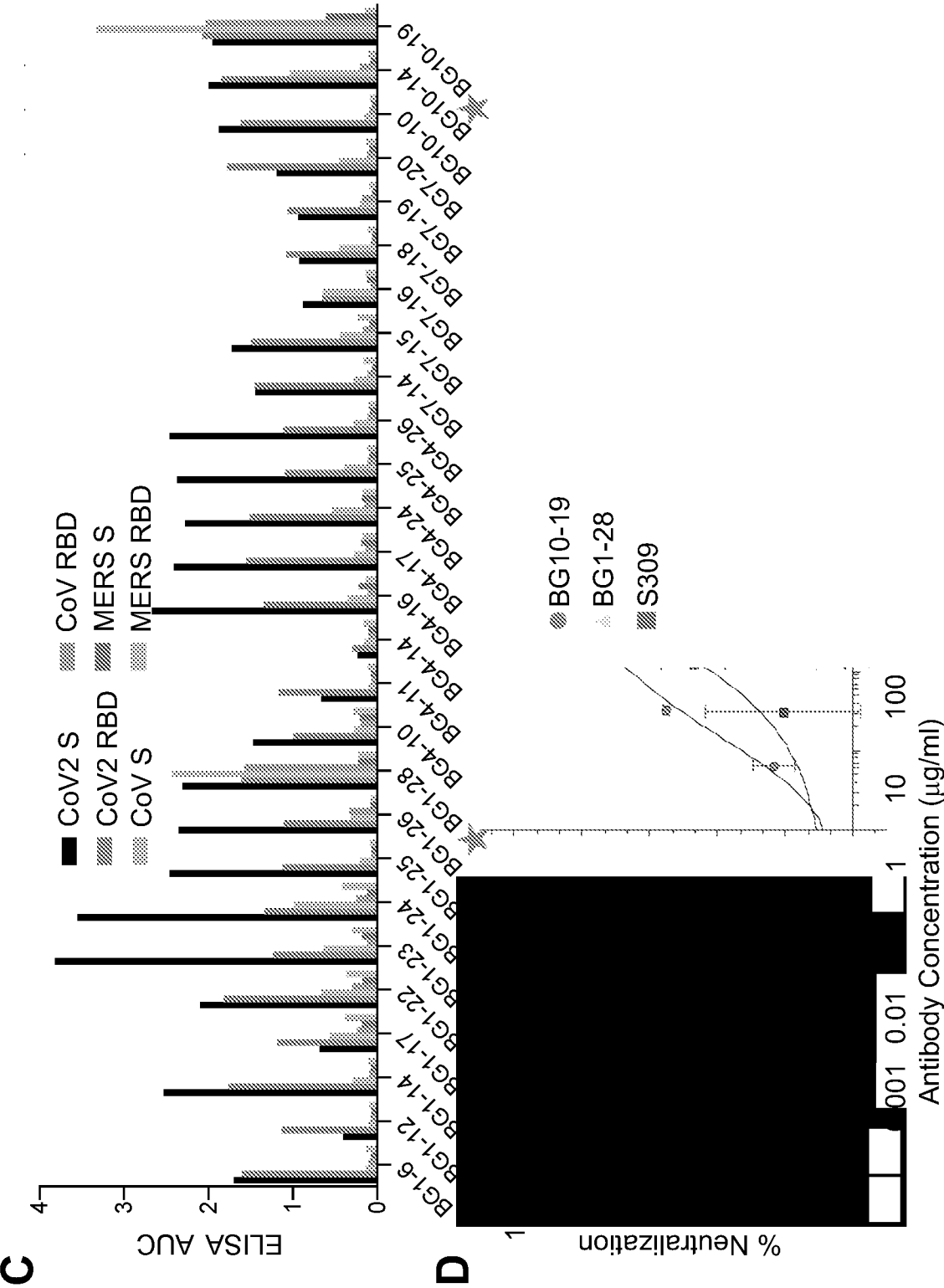


FIG. 2C-D

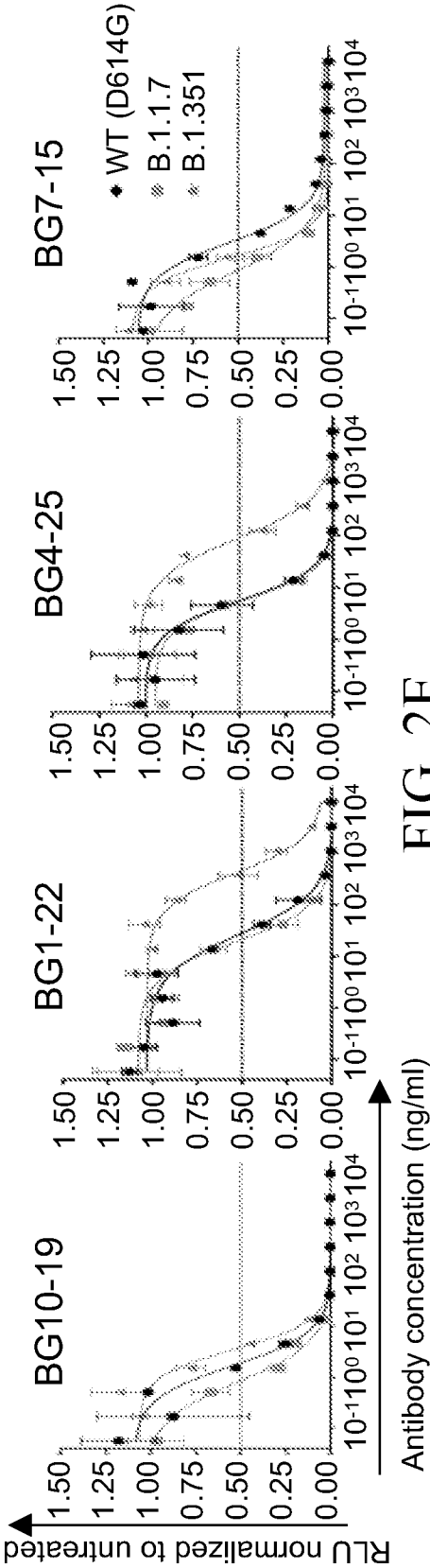


FIG. 2E

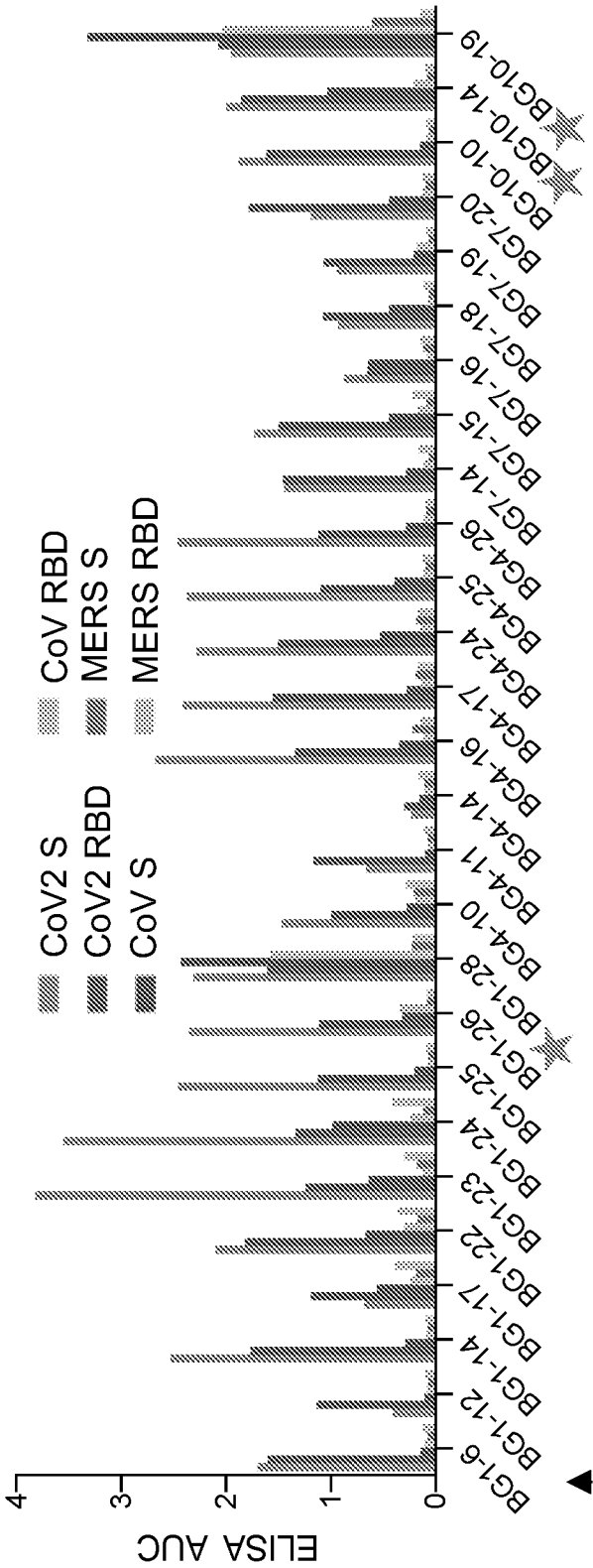


FIG. 2F

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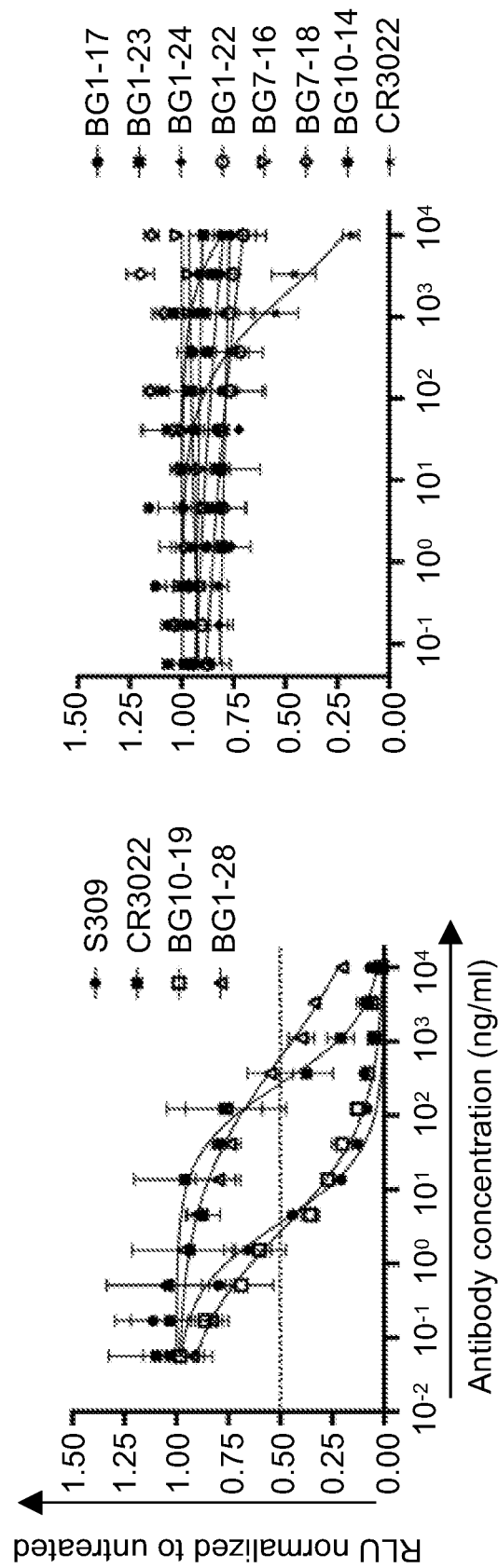


FIG. 2G

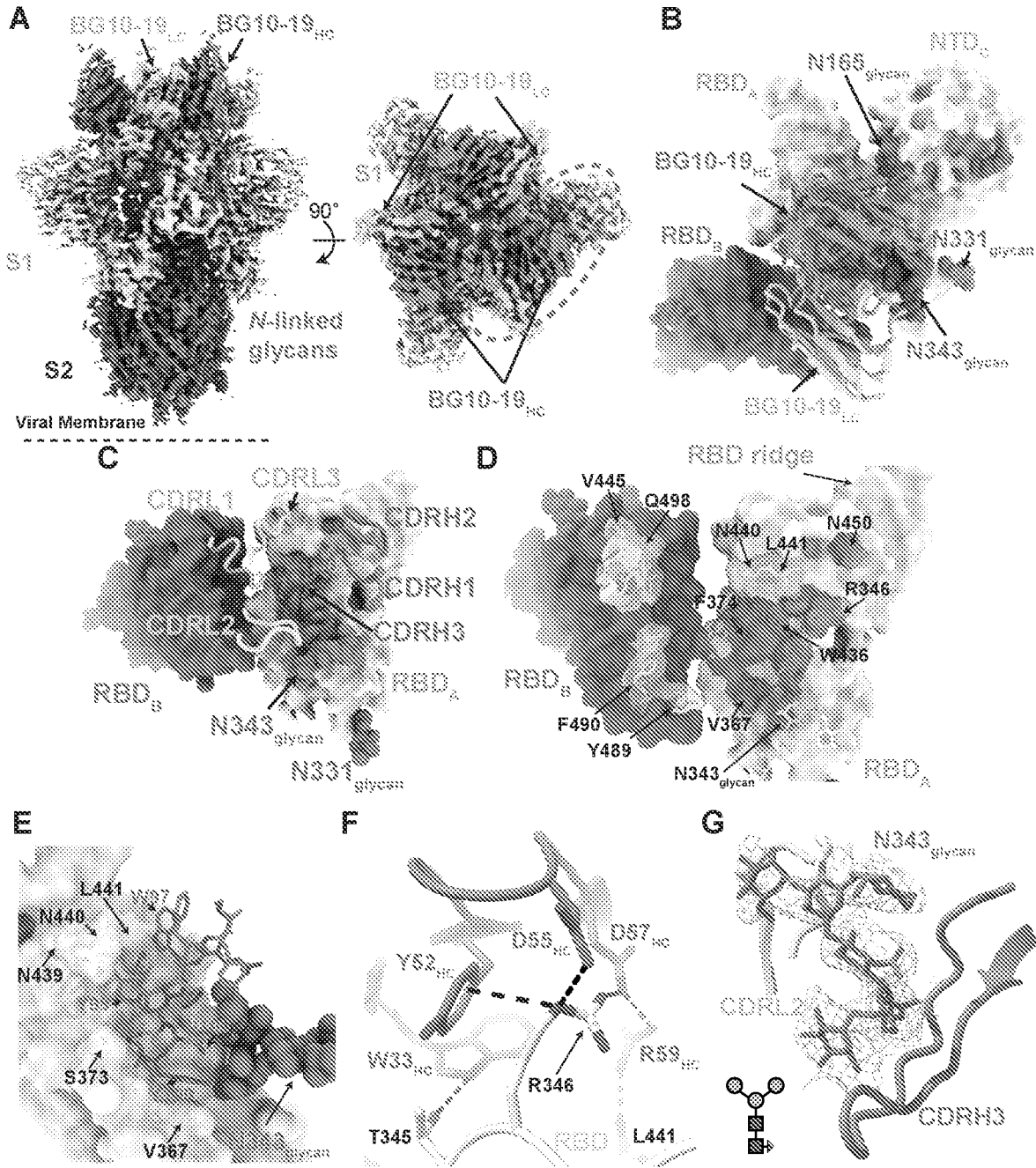


FIG. 3A-G

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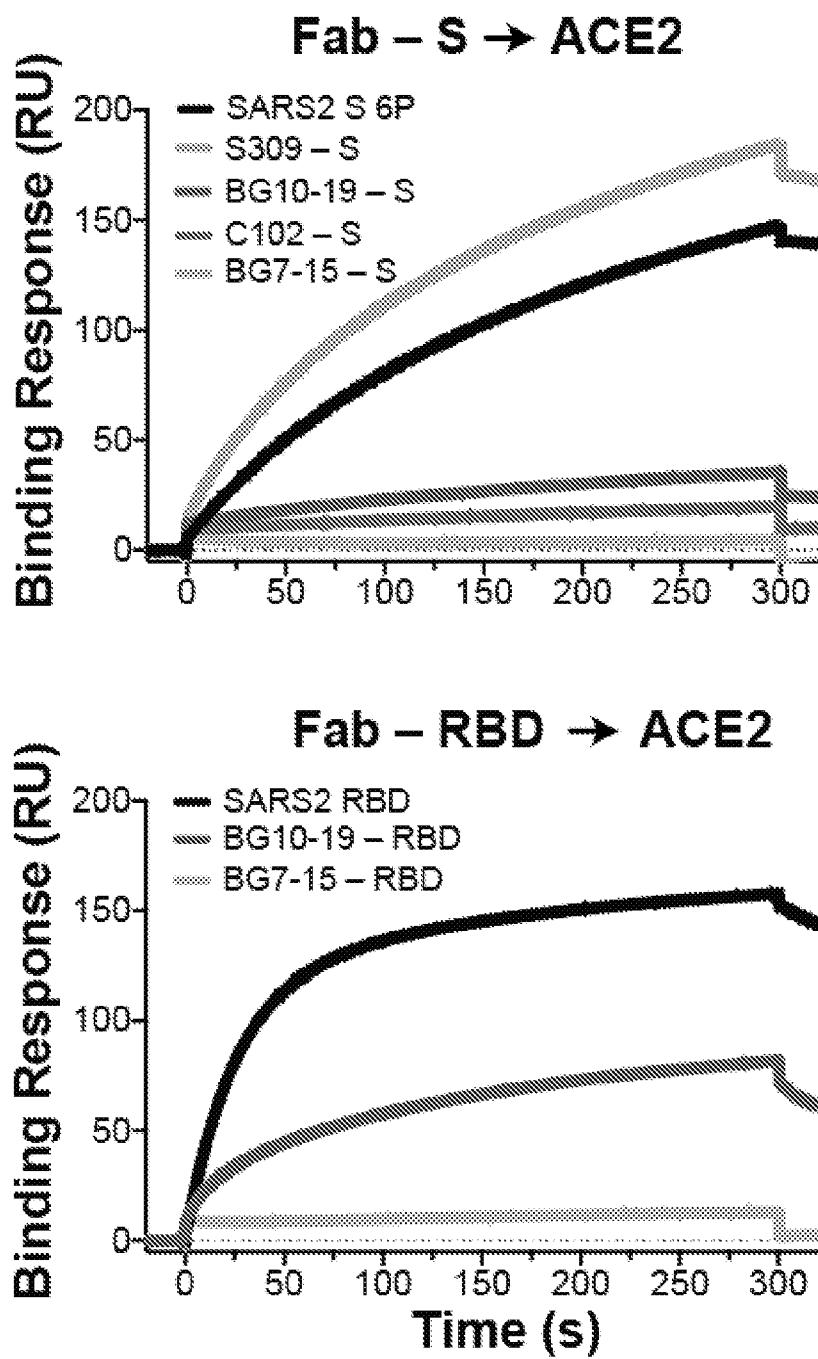


FIG. 3H

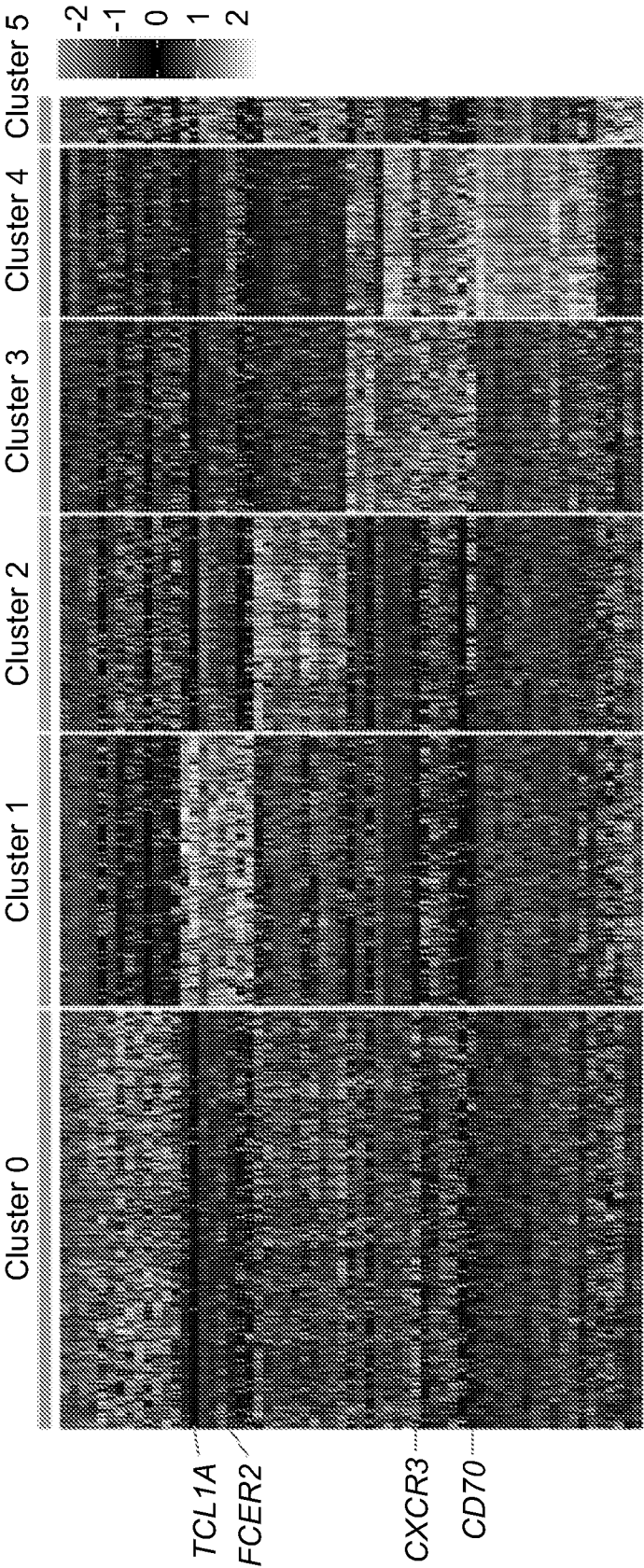


FIG. 4A

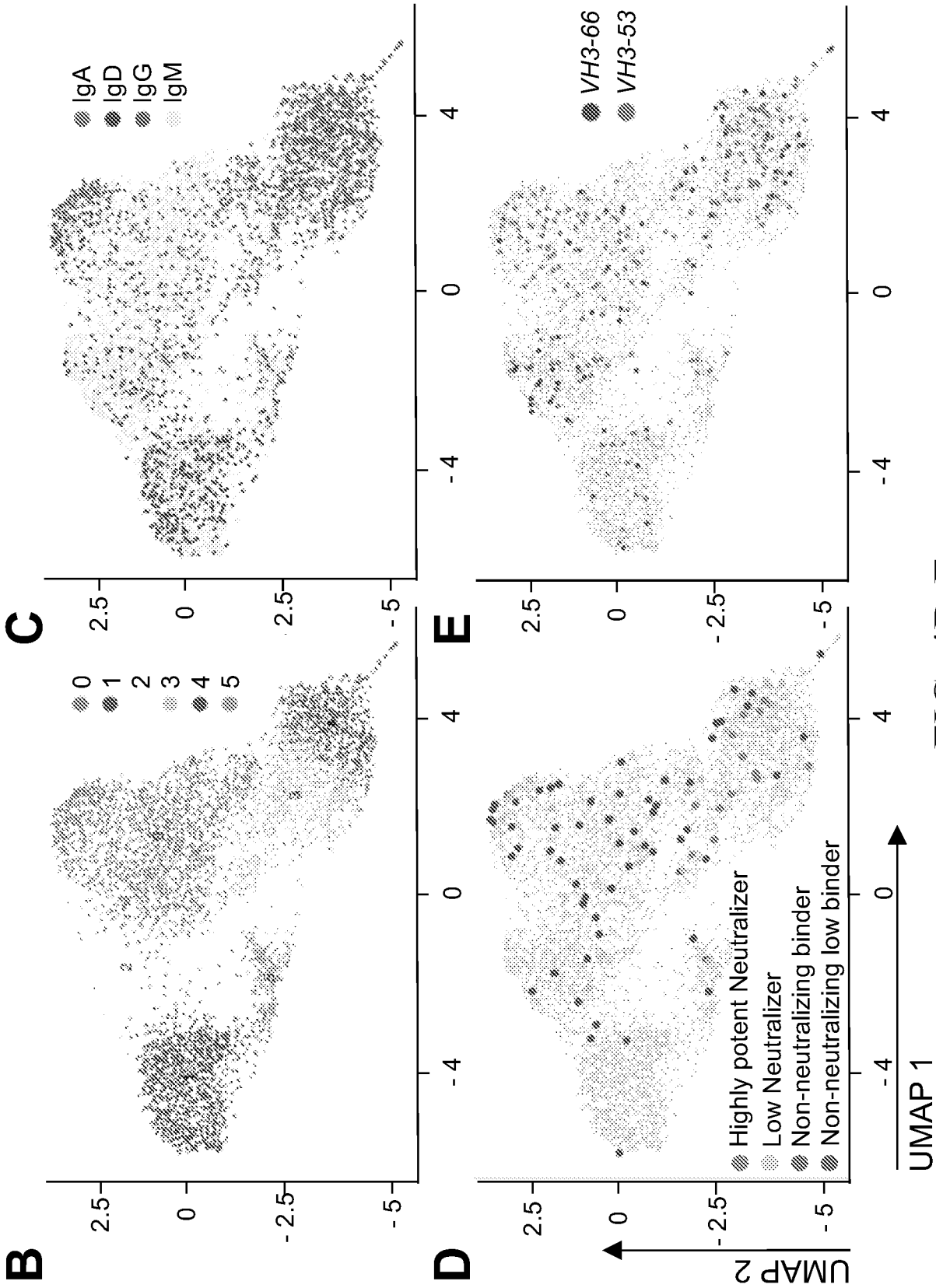


FIG. 4B-E

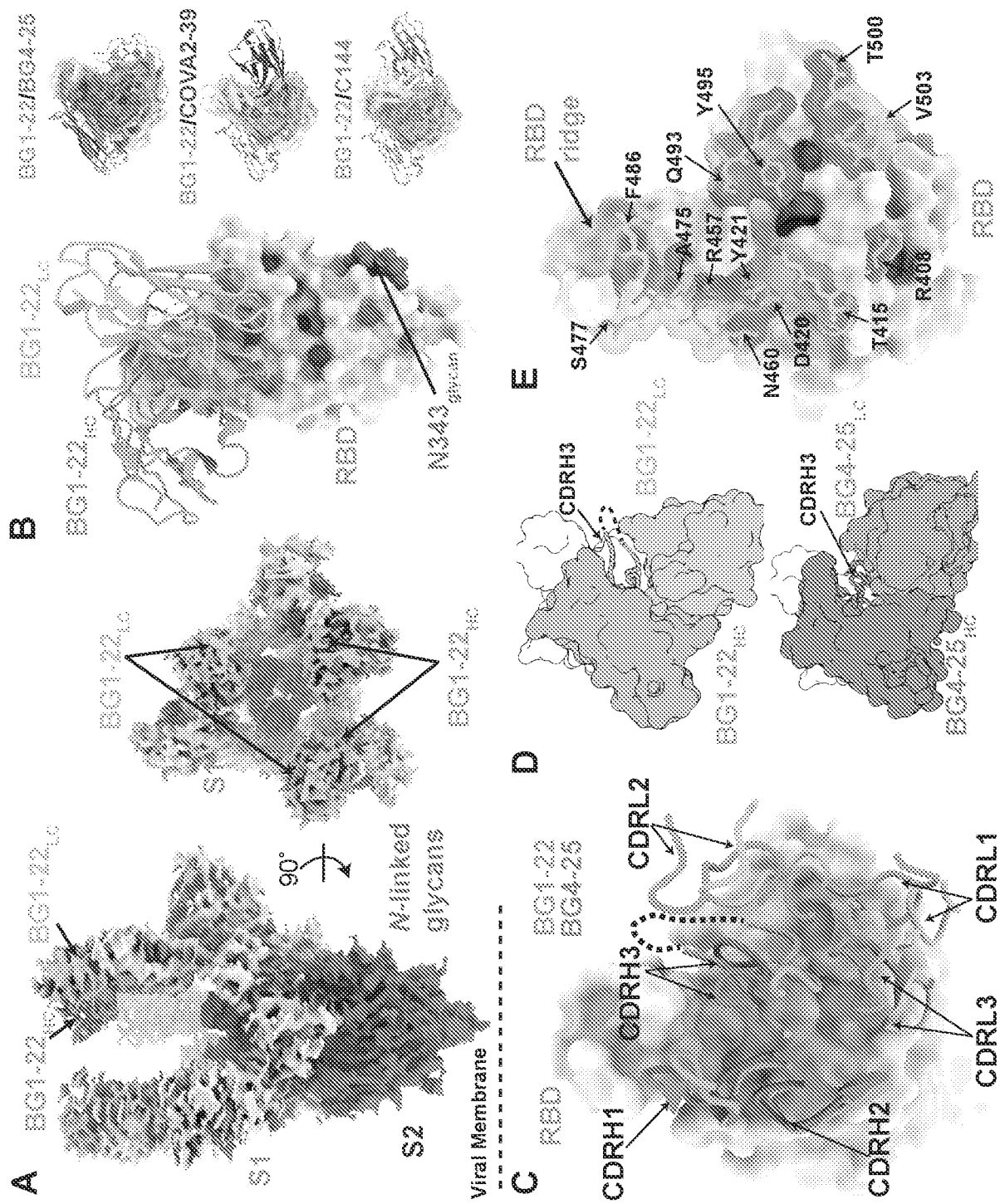


FIG. 5A-E

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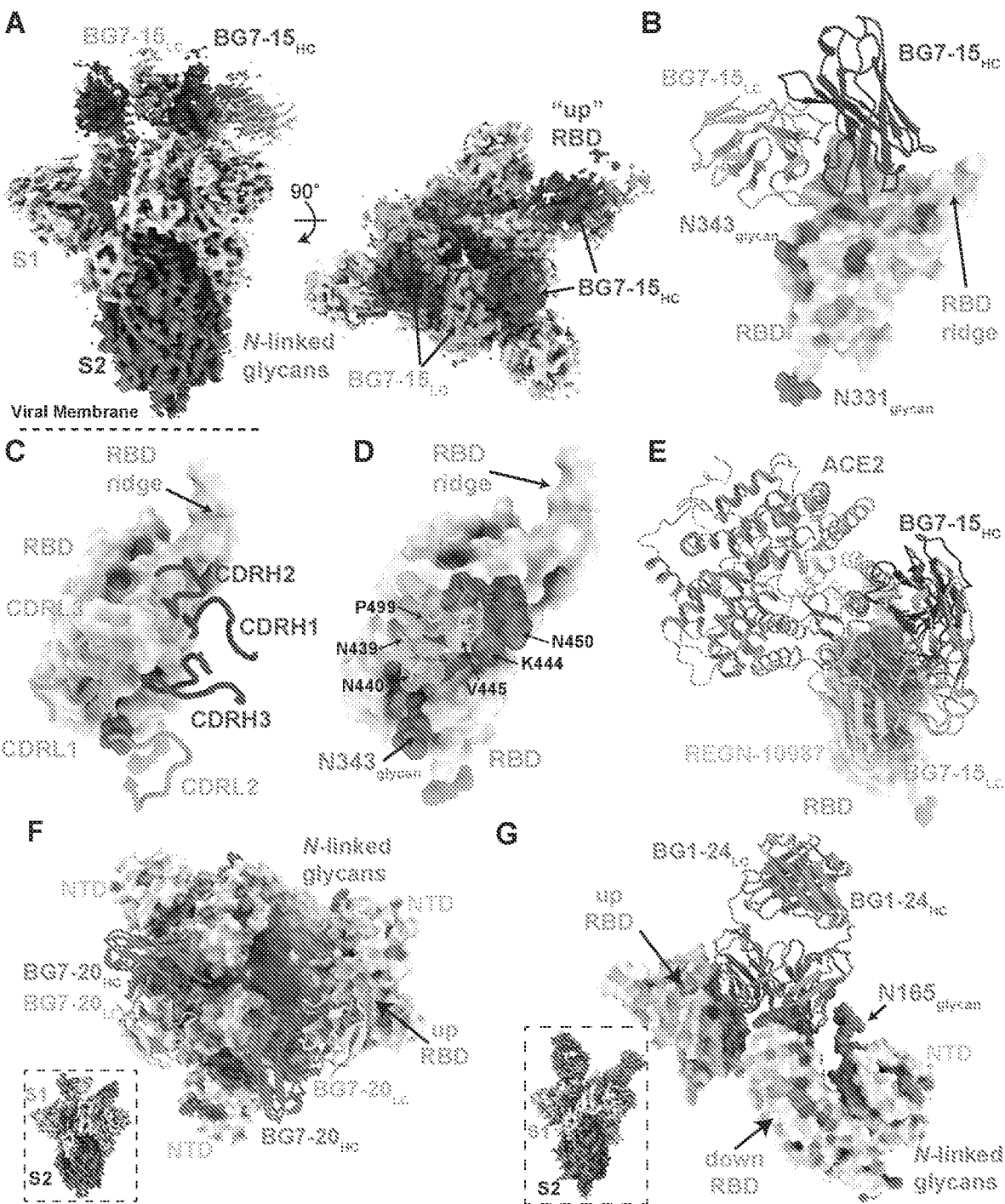


FIG. 6A-G

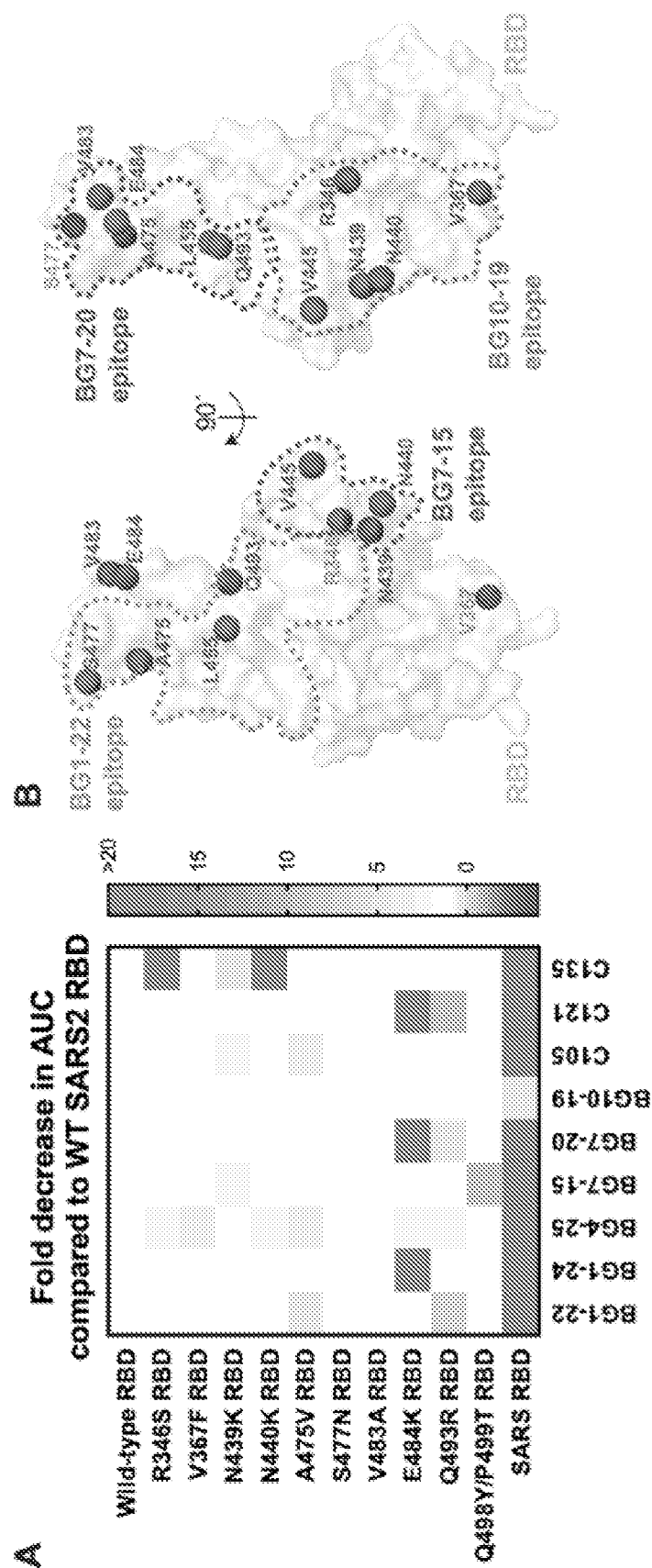


FIG. 7A-B

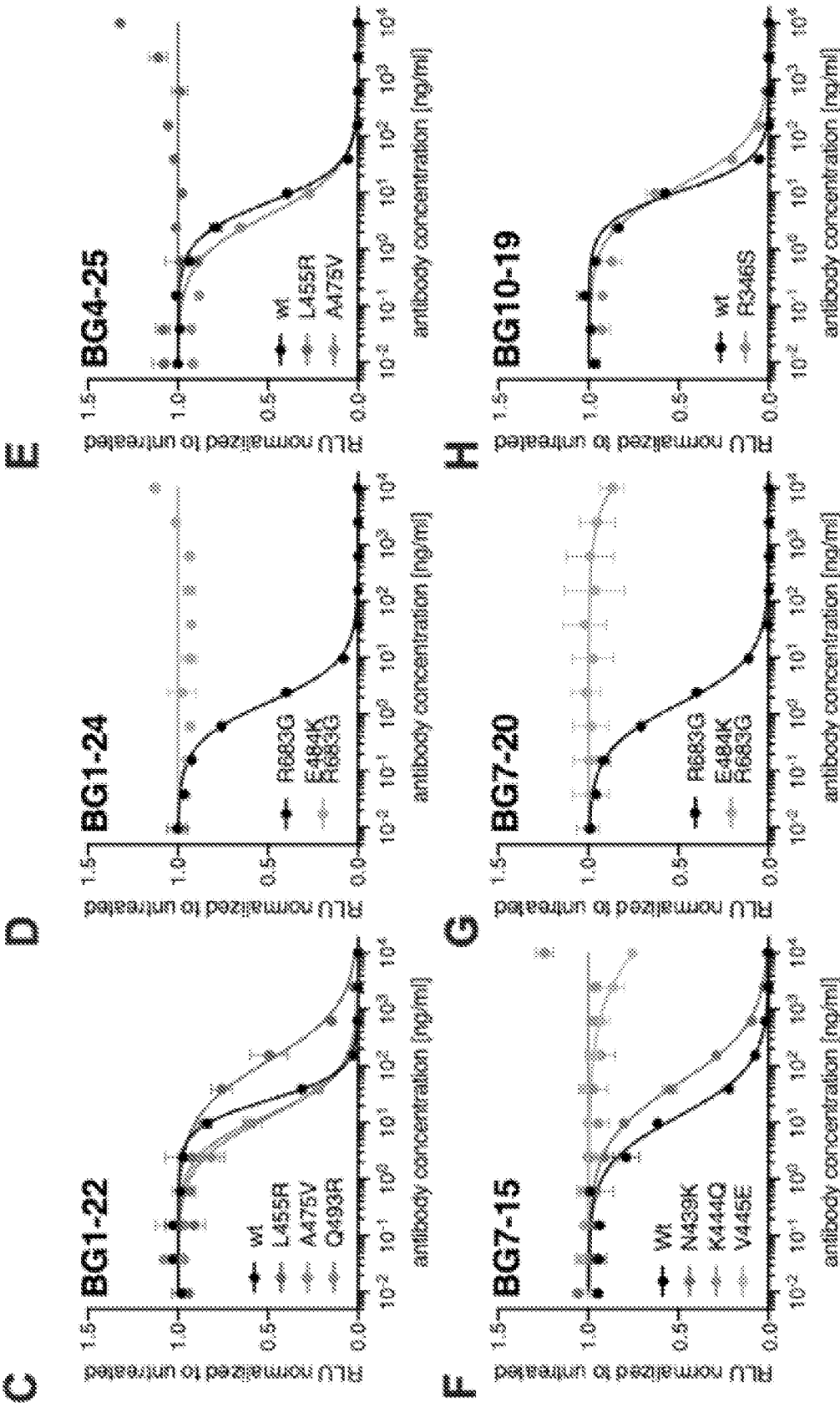


FIG. 7C-H

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mAb	spike	IC50 [ng/ml]	IC90 [ng/ml]
BG1-22	wt	38.00	105.50
	L455R	160.70	1297.10
	A475V	17.23	108.35
	Q493R	13.17	96.33
BG1-24	R683G	3.68	17.31
	E484K R683G	>10000	
BG4-25	wt	14.12	56.13
	L455R	>10000	
	A475V	6.02	39.91
BG7-15	wt	26.59	185.37
	N439K	62.09	850.64
	K444Q	>10000	
	V445E	>10000	
BG7-20	R683G	4.10	19.80
	E484K R683G	>10000	
BG10-19	wt	14.08	69.06
	R346S	17.69	130.73

FIG. 7I

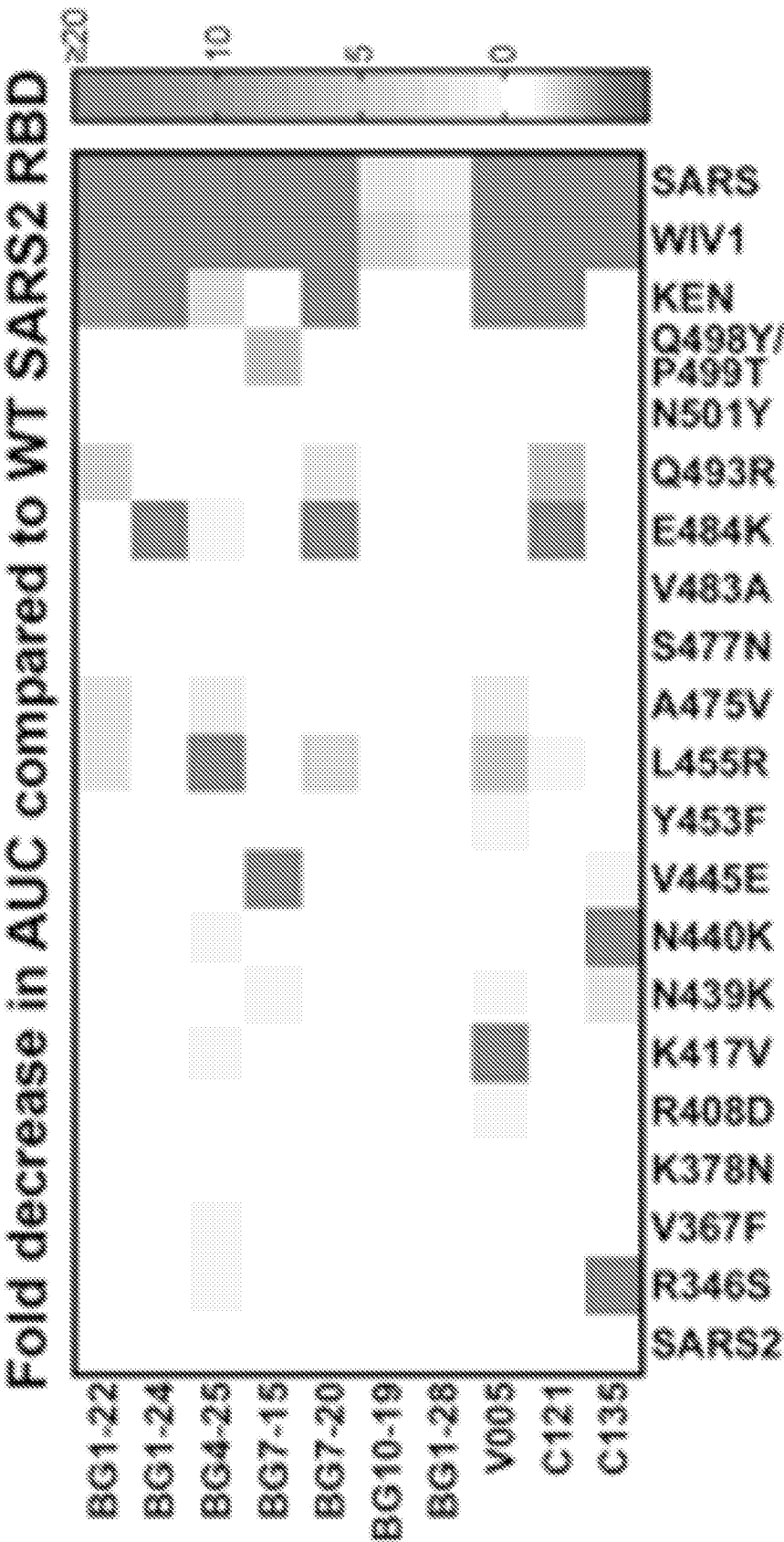


FIG. 7J

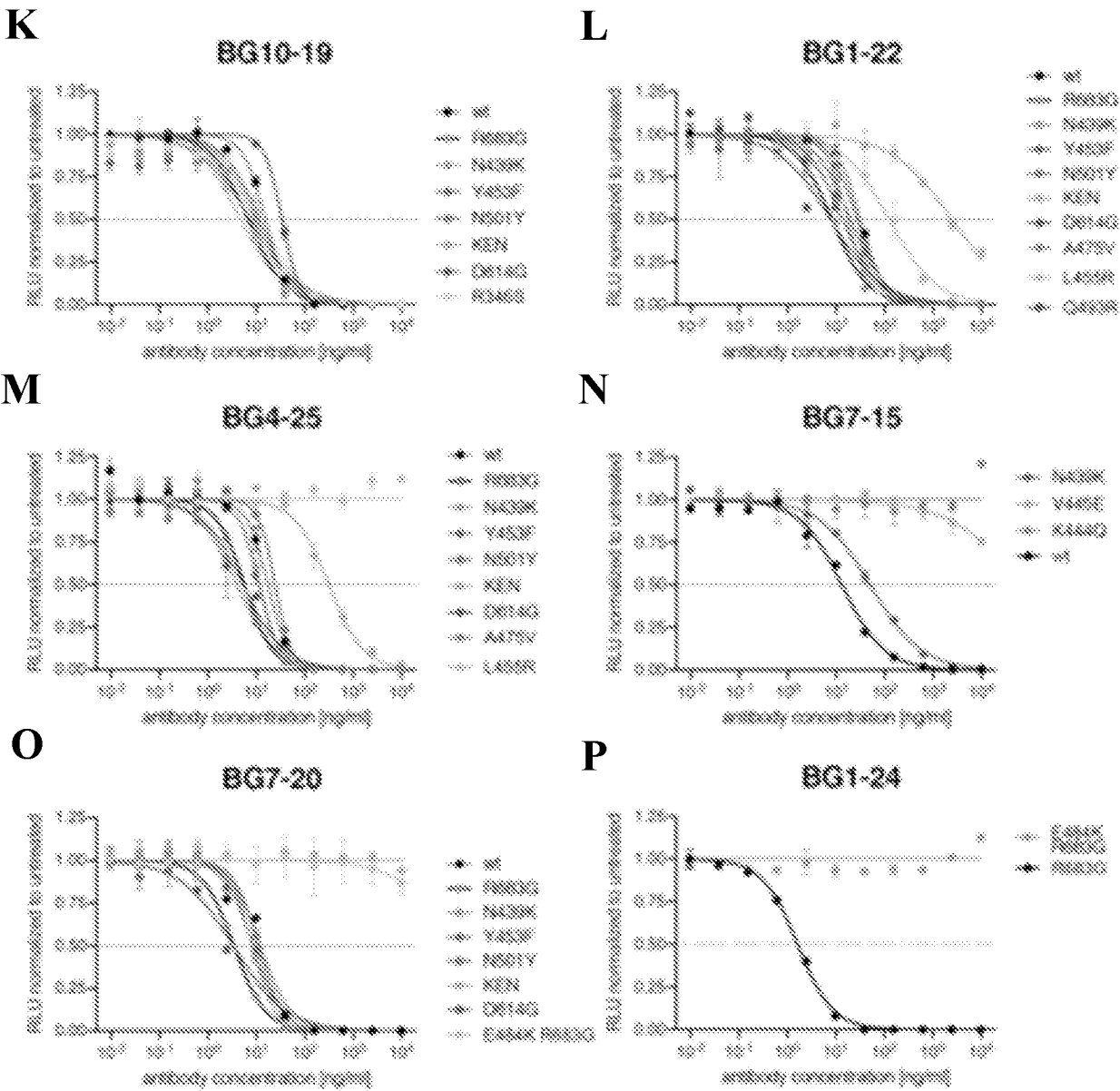


FIG. 7K-P

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**Neutralization potency against
Full Length SARS-CoV-2 D614G**

Monoclonals	IC50 [$\mu\text{g/ml}$]	IC80 [$\mu\text{g/ml}$]	IC50 _{rel}
BG10-19	0.004	0.014	-
BG1-22	0.005	0.042	-
BG1-24	0.002	0.010	-
BG4-25	0.004	0.027	-
BG7-15	0.002	0.012	-
BG7-20	0.001	0.005	-
Combinations			
BG10-19 + BG1-22	0.006	0.029	0.61
BG10-19 + BG4-25	0.002	0.012	1.66
BG10-19 + BG7-20	0.002	0.009	0.70
BG10-19 + BG1-24	0.002	0.013	1.12
BG7-15 + BG4-25	0.004	0.011	0.56
BG7-15 + BG1-22	0.006	0.026	0.40

FIG. 7Q

**rVSV/SARS-CoV-2 neutralization for
selection resistance mutations
against BG10-19**

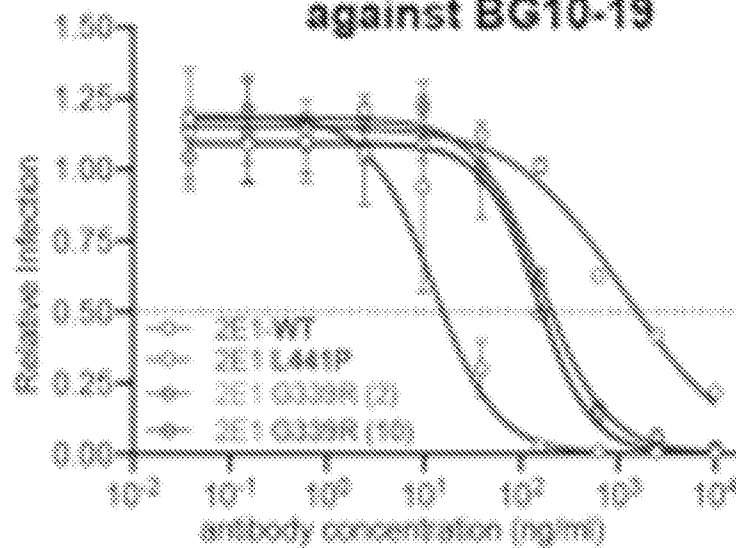


FIG. 7R

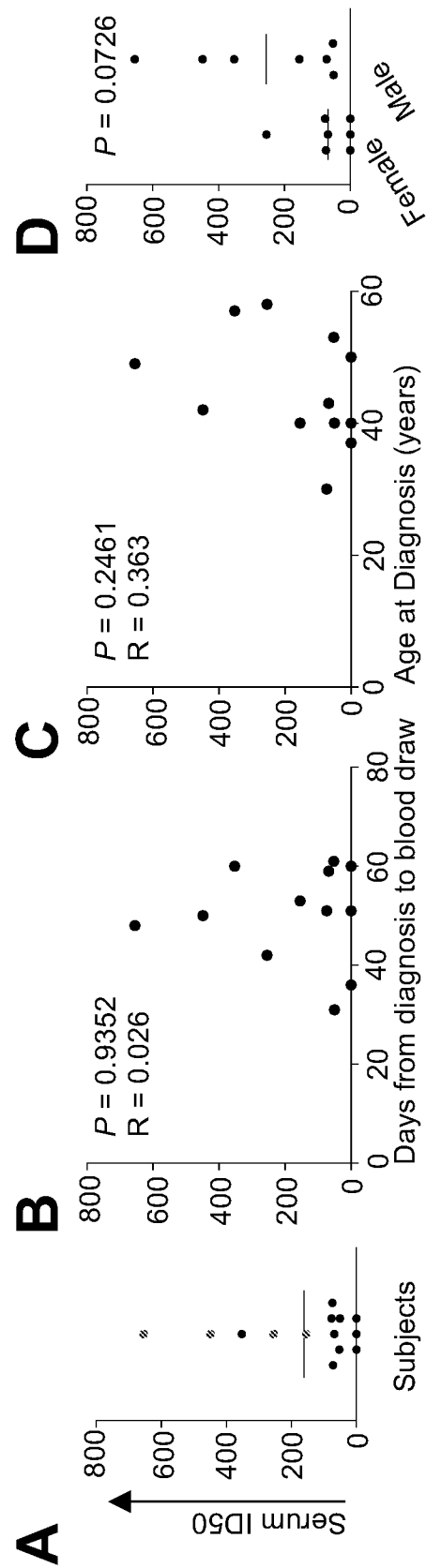


FIG. 8A-D

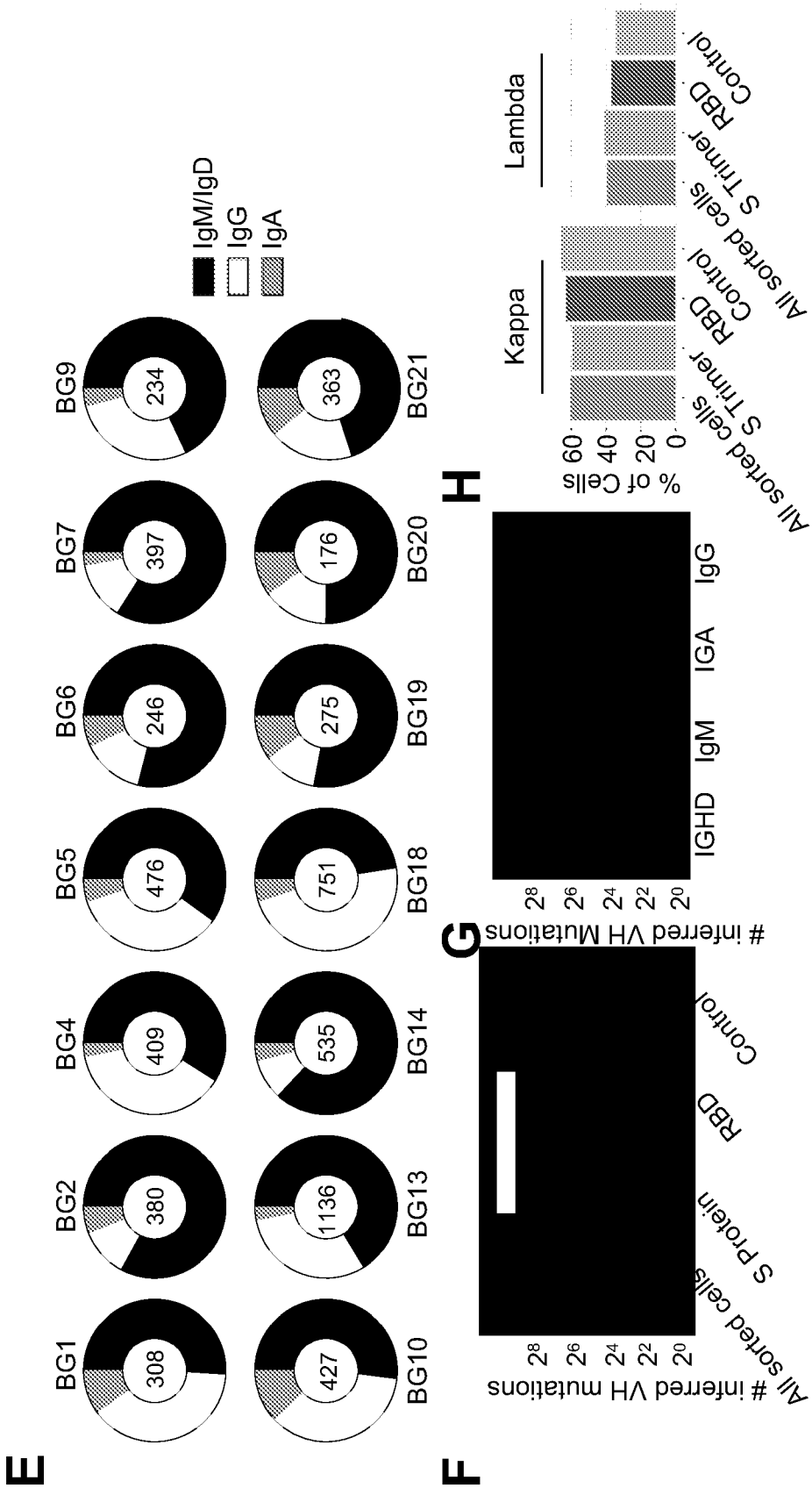


FIG. 8E-H

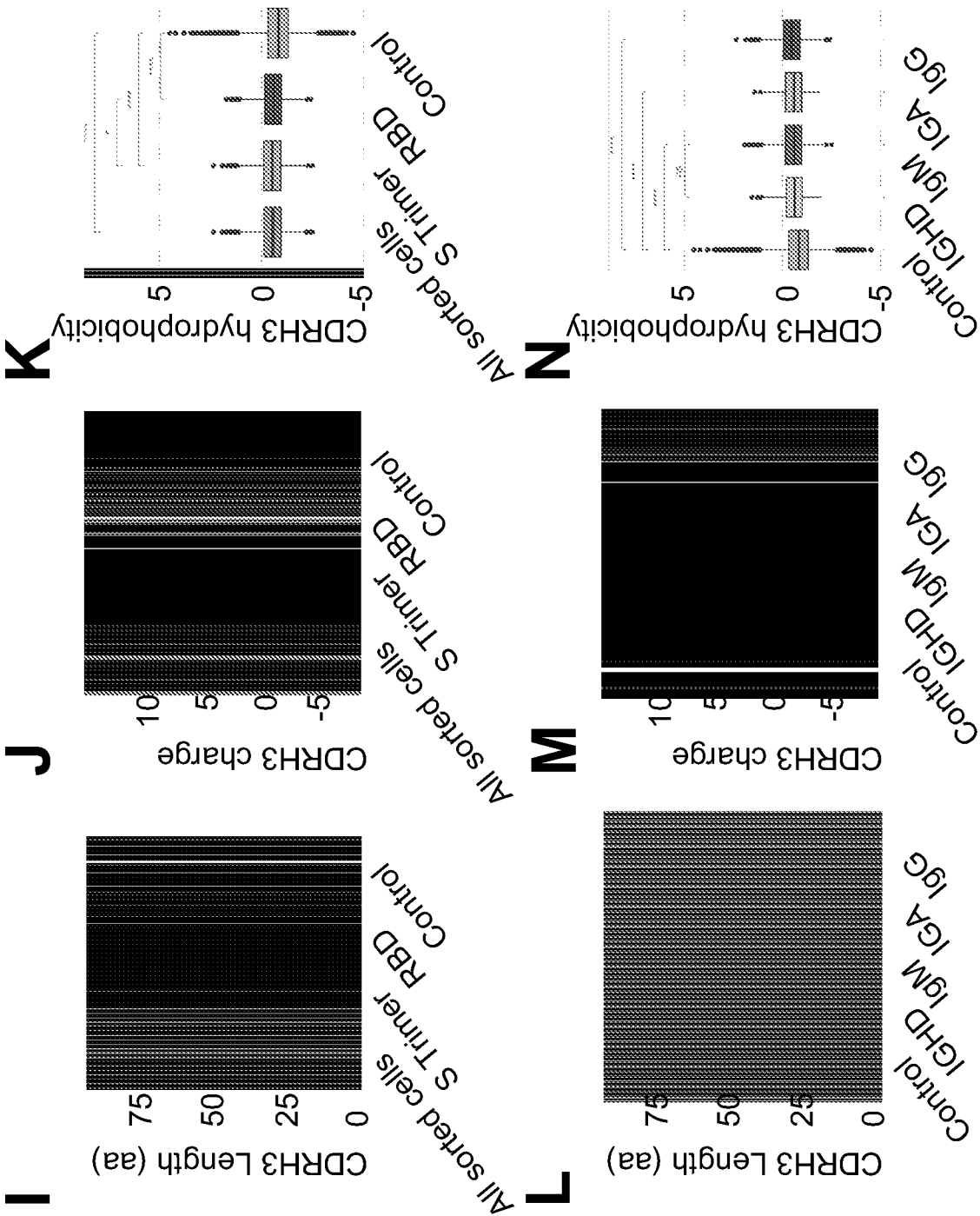


FIG. 8I-N

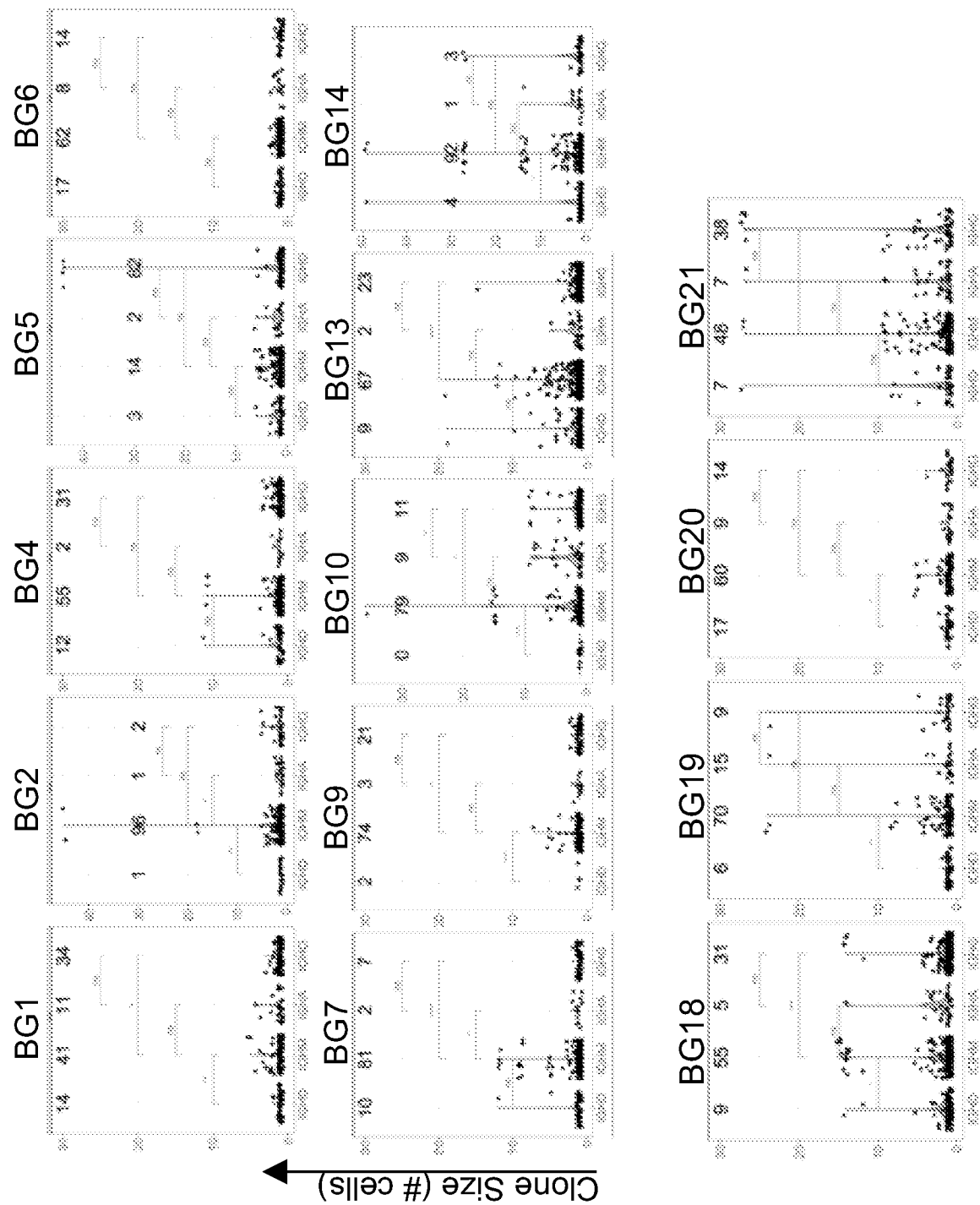


FIG. 80

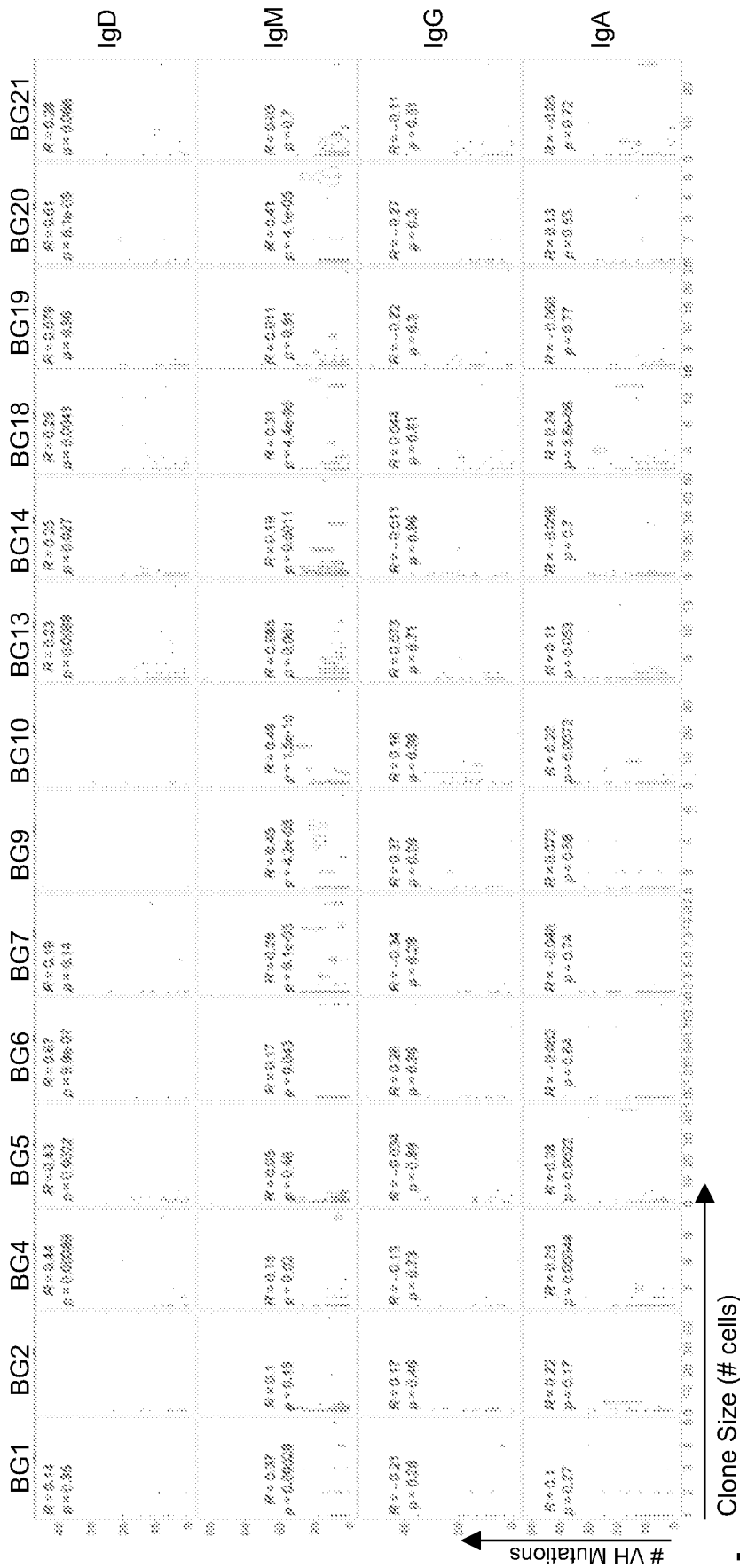


FIG. 8P

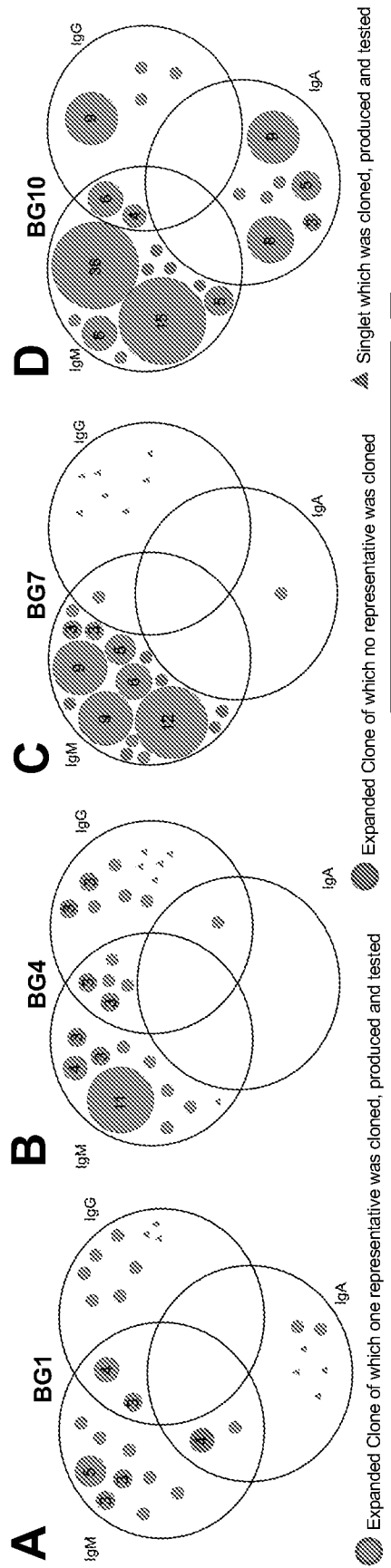


FIG. 9A-D

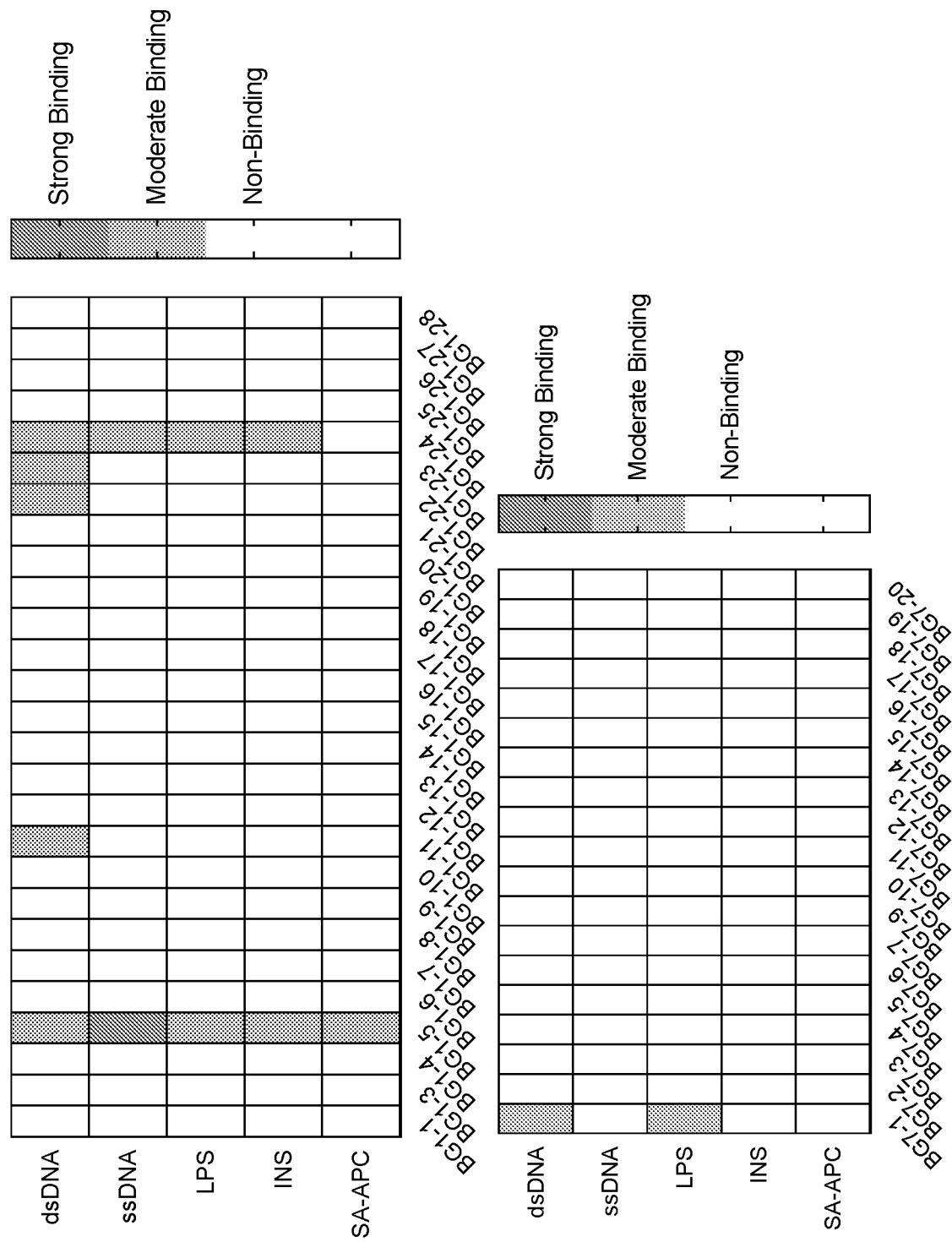


FIG. 9E

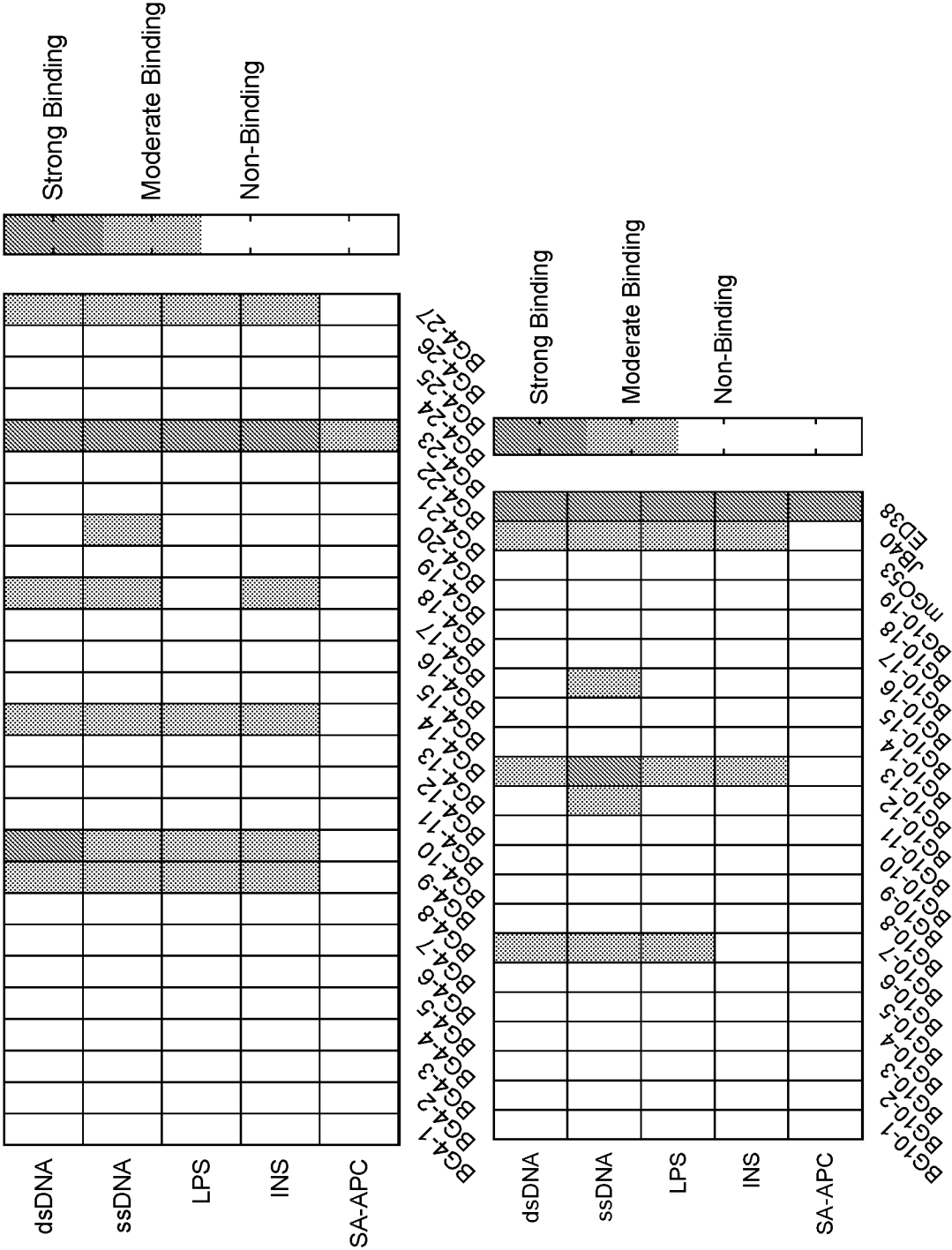


FIG. 9E continued

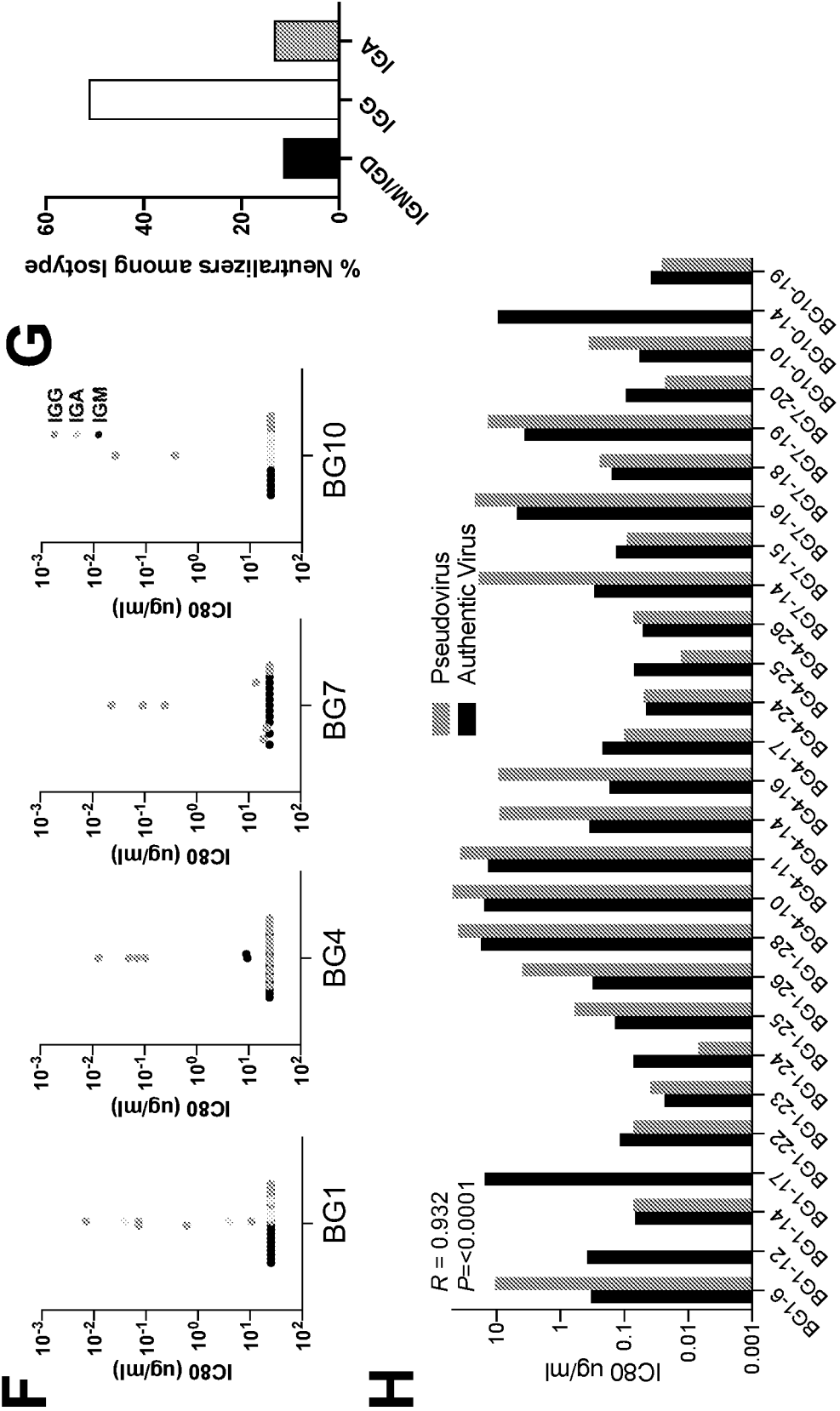


FIG. 9F-H

IC50 (µg/ml)			
Antibody	WT (614G)	B.1.1.7	B.1.351
BG10-19	0.002	0.001	0.004
BG1-22	0.027	0.019	0.414
BG4-25	0.006	0.006	0.087
BG7-15	0.003	0.001	0.002

IC80 (µg/ml)			
Antibody	WT (614G)	B.1.1.7	B.1.351
BG10-19	0.006	0.003	0.009
BG1-22	0.107	0.065	1.679
BG4-25	0.015	0.014	0.336
BG7-15	0.011	0.004	0.004

FIG. 9I

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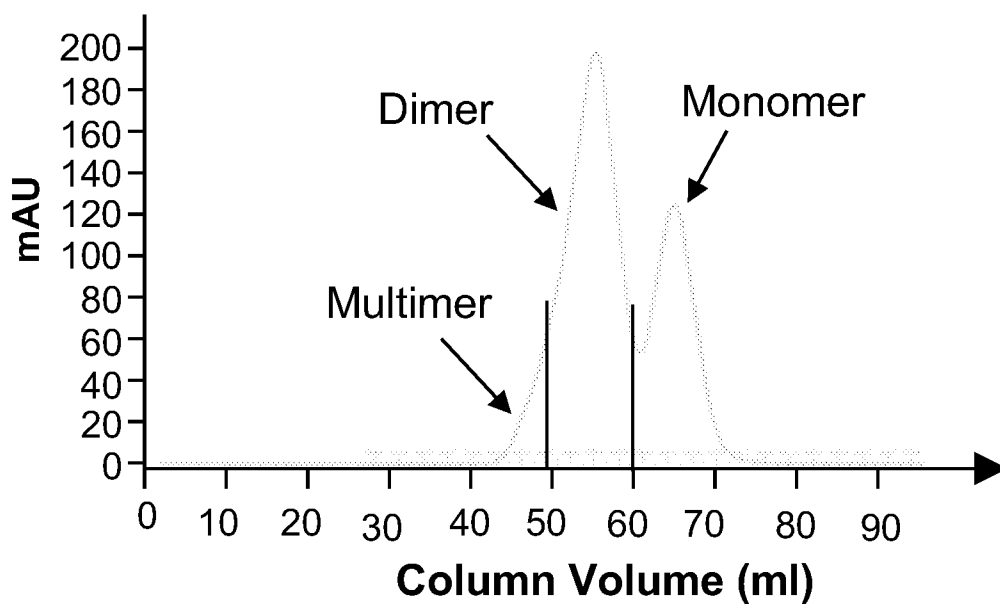


FIG. 9J

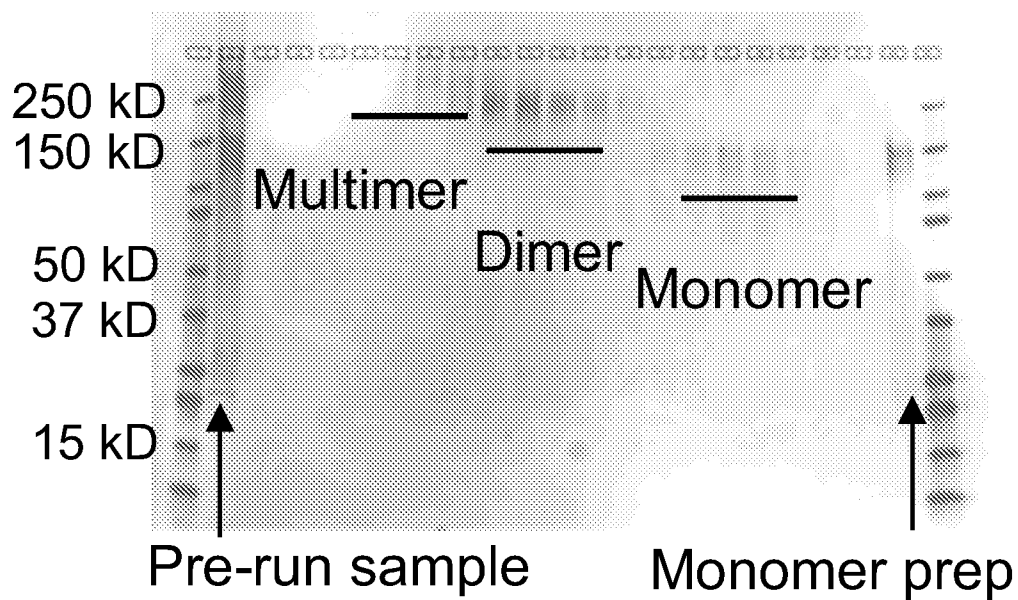


FIG. 9K

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Antibody	IC50 (µg/ml)	IC80 (µg/ml)	IC50 (nmol)	IC80 (nmol)	IC50 (nmol, Corr)	IC80 (nmol, Corr)	MNR IC50	MNR IC80
BG1-18 (G)	>50	>50						
BG1-18 (mA)	2.864	>10	12.90		12.90			
BG1-18 (dA)	6.534	>10	18.67		37.34		6.69	
BG1-20 (G)	>50	>50						
BG1-20 (mA)	>10	>10						
BG1-20 (dA)	>10	>10						
BG1-21 (G)	>25	>25						
BG1-21 (mA)	>10	>10						
BG1-21 (dA)	>10	>10						
BG1-23 (G)	0.009	0.039	0.06	0.26	0.06	0.26		
BG1-23 (mA)	0.009	0.039	0.06	0.24	0.06	0.24		
BG1-23 (dA)	0.004	0.015	0.01	0.04	0.02	0.08	6.00	6.00
BG1-26 (G)	0.360	3.962	3.40	36.40	2.40	26.40		
BG1-26 (mA)	0.219	1.706	1.37	10.60	1.37	10.60		
BG1-26 (dA)	0.061	0.484	0.17	1.38	0.34	2.76	8.06	7.68
BG1-27 (G)	>40	>40						
BG1-27 (mA)	5.664	>10	35.40		35.40			
BG1-27 (dA)	4.136	>10	11.80		23.60		3.00	
BG7-12 (G)	>50	>50						
BG7-12 (mA)	>10	>10						
BG7-12 (dA)	>10	>10						
BG10-4 (G)	>50	>50						
BG10-4 (mA)	0.674	0.764	0.46	4.78	0.46	4.78		
BG10-4 (dA)	0.105	1.980	0.30	5.86	0.60	11.32	1.53	0.54
BG10-5 (G)	>50	>50						
BG10-5 (mA)	>10	>10						
BG10-5 (dA)	3.506	>10	10.00		20.00			
BG10-8 (G)	>50	>50						
BG10-8 (mA)	0.121	1.079	0.76	6.74	0.76	6.74		
BG10-8 (dA)	0.026	0.977	0.07	2.79	0.14	5.58	10.86	2.42
BG10-11 (G)	>50	>50						
BG10-11 (mA)	0.328	3.282	2.00	20.58	2.00	20.58		
BG10-11 (dA)	0.554	4.616	1.58	13.20	3.16	26.40	1.27	1.56
BG10-12 (G)	>50	>50						
BG10-12 (mA)	>10	>10						
BG10-12 (dA)	>10	>10						
BG10-17 (G)	>50	>50						
BG10-17 (mA)	>10	>10						
BG10-17 (dA)	>10	>10						

FIG. 9L

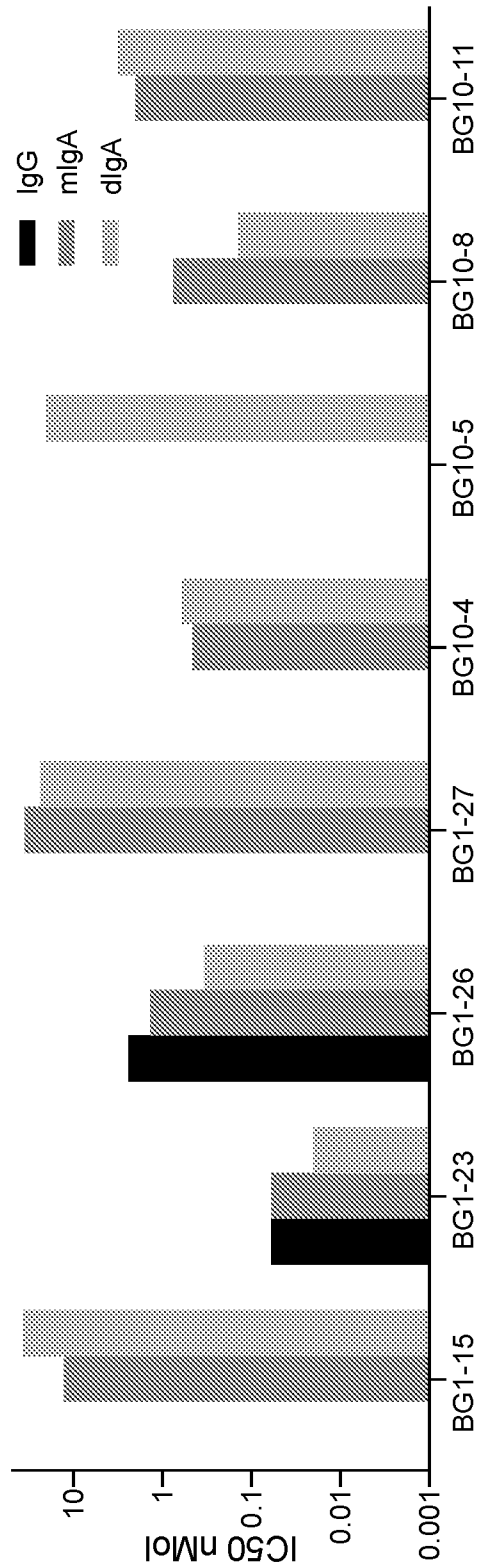


FIG. 9M

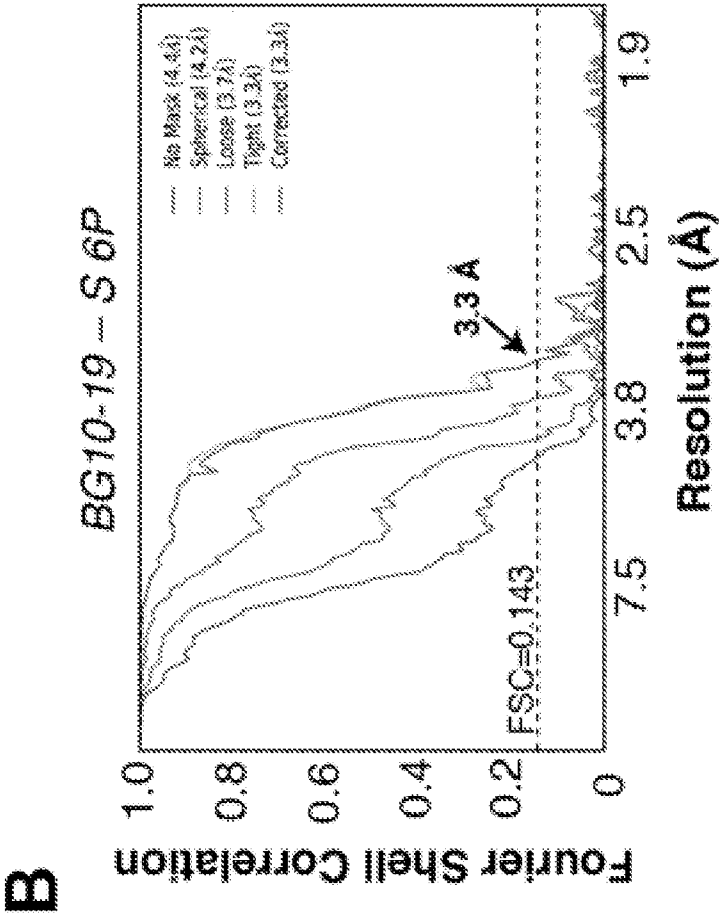
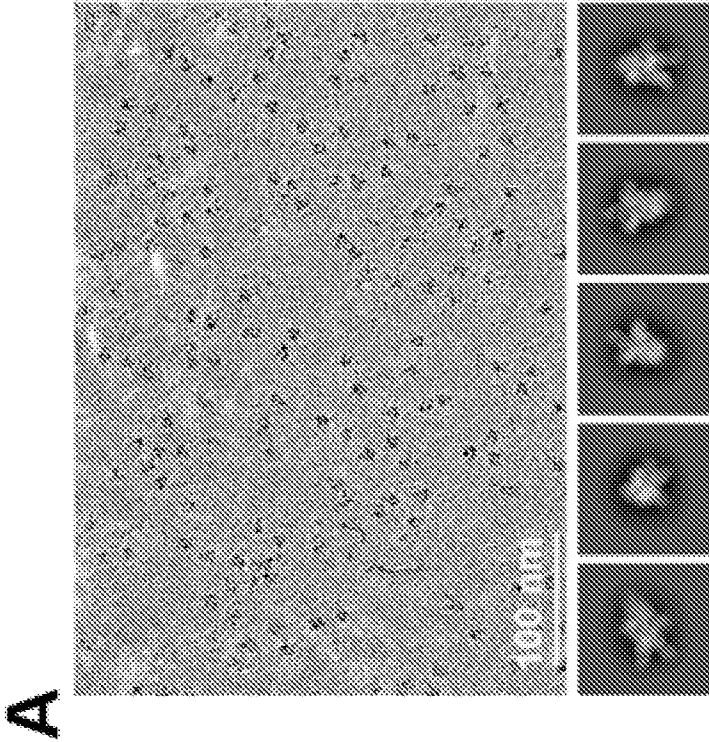


FIG. 10A-B

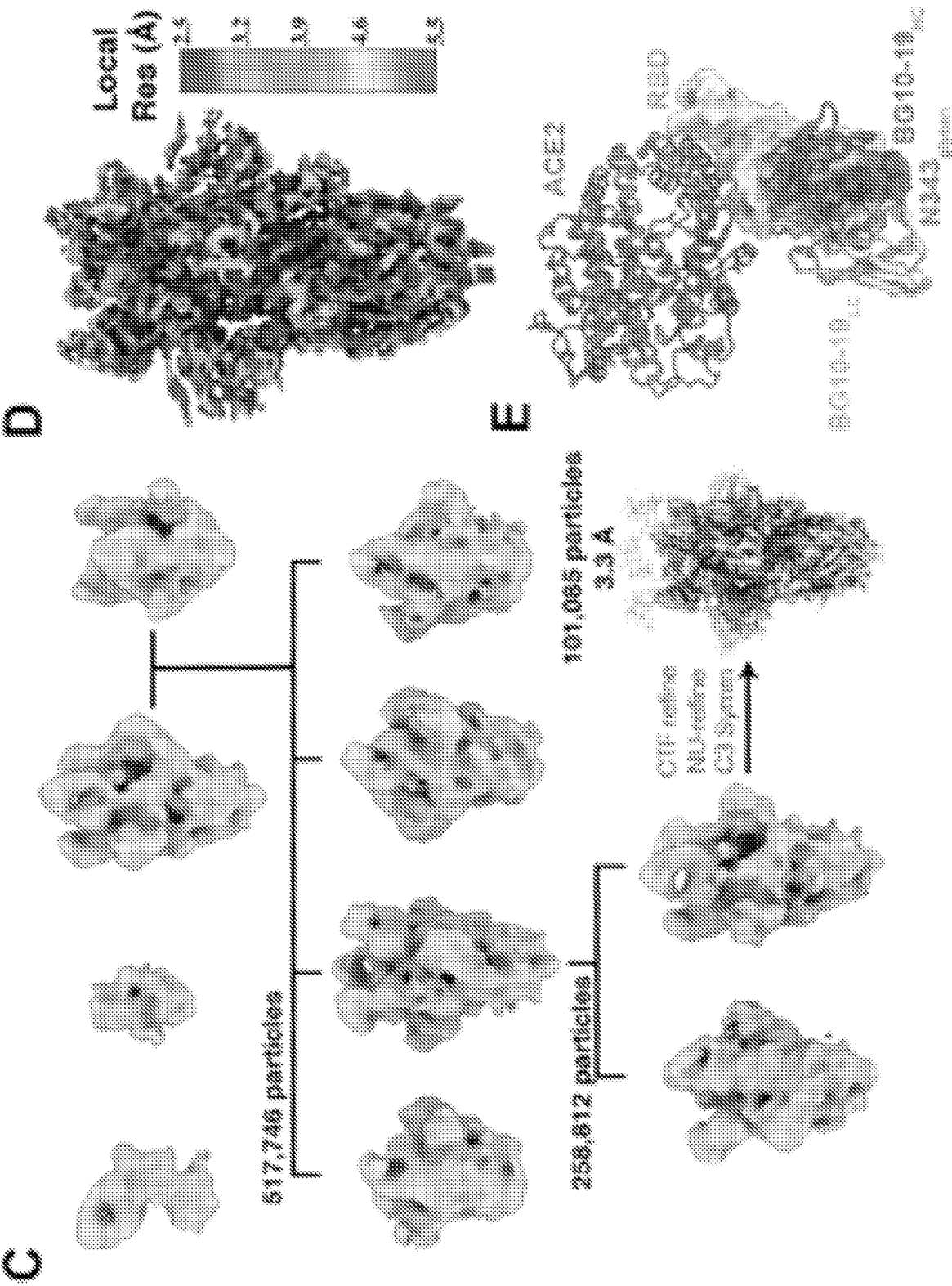


FIG. 10C-E

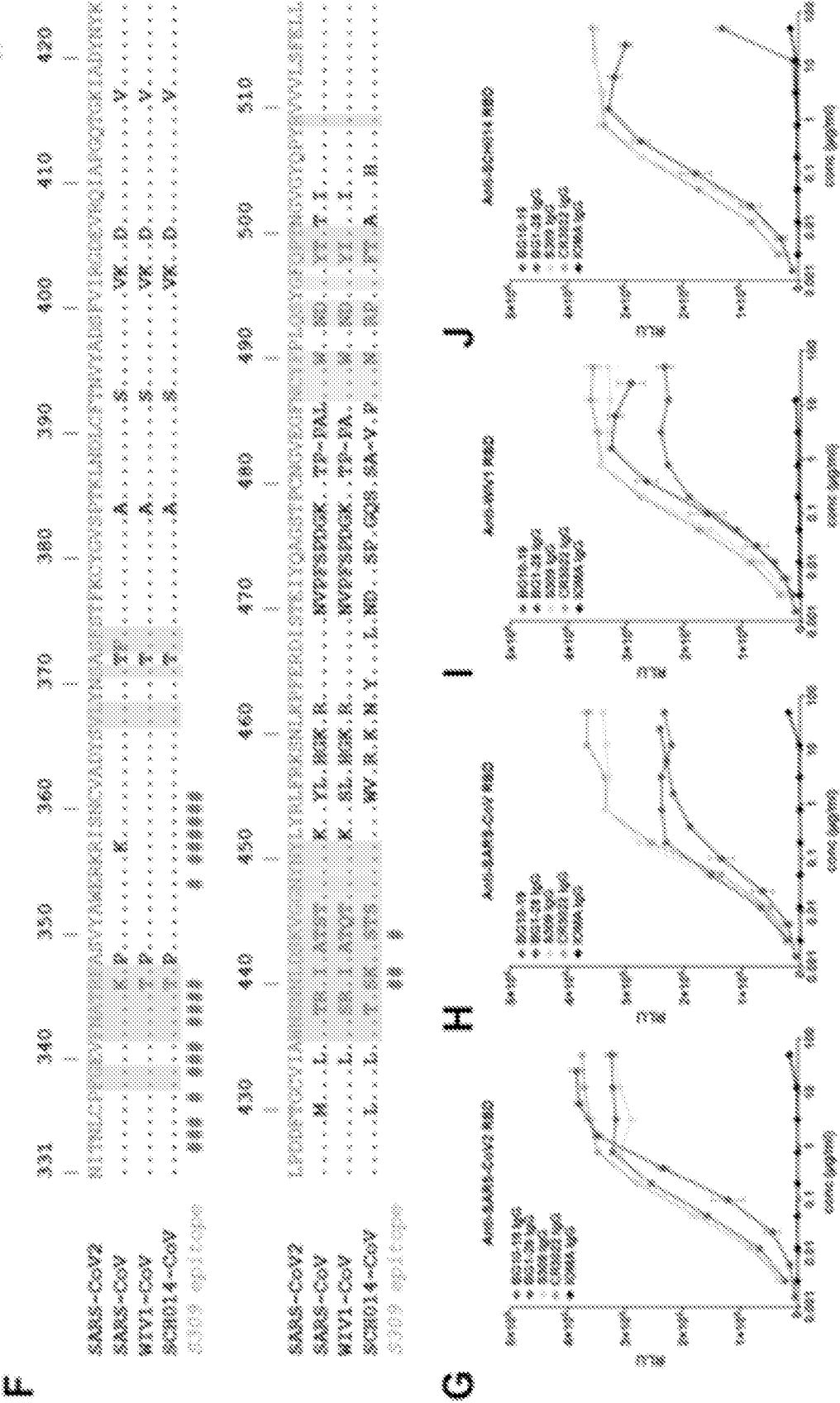


FIG. 10F-J

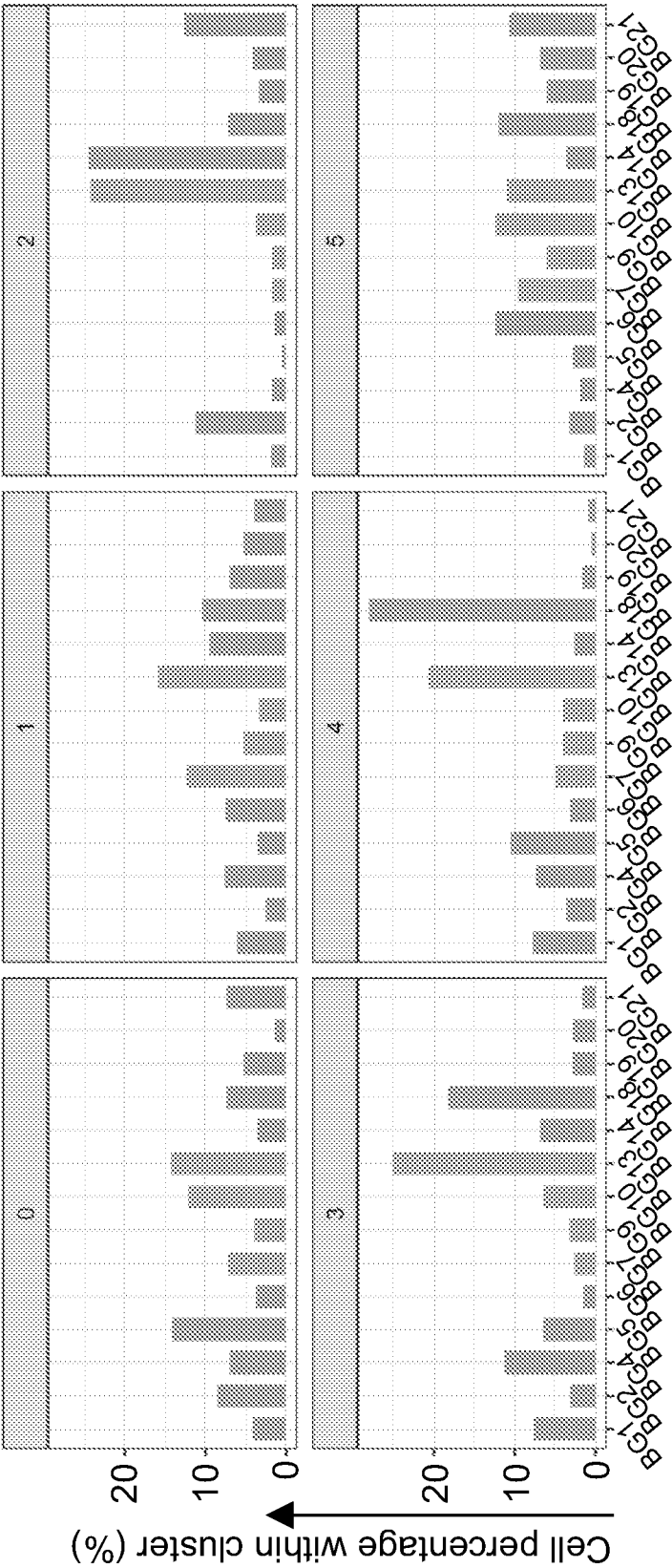


FIG. 11A

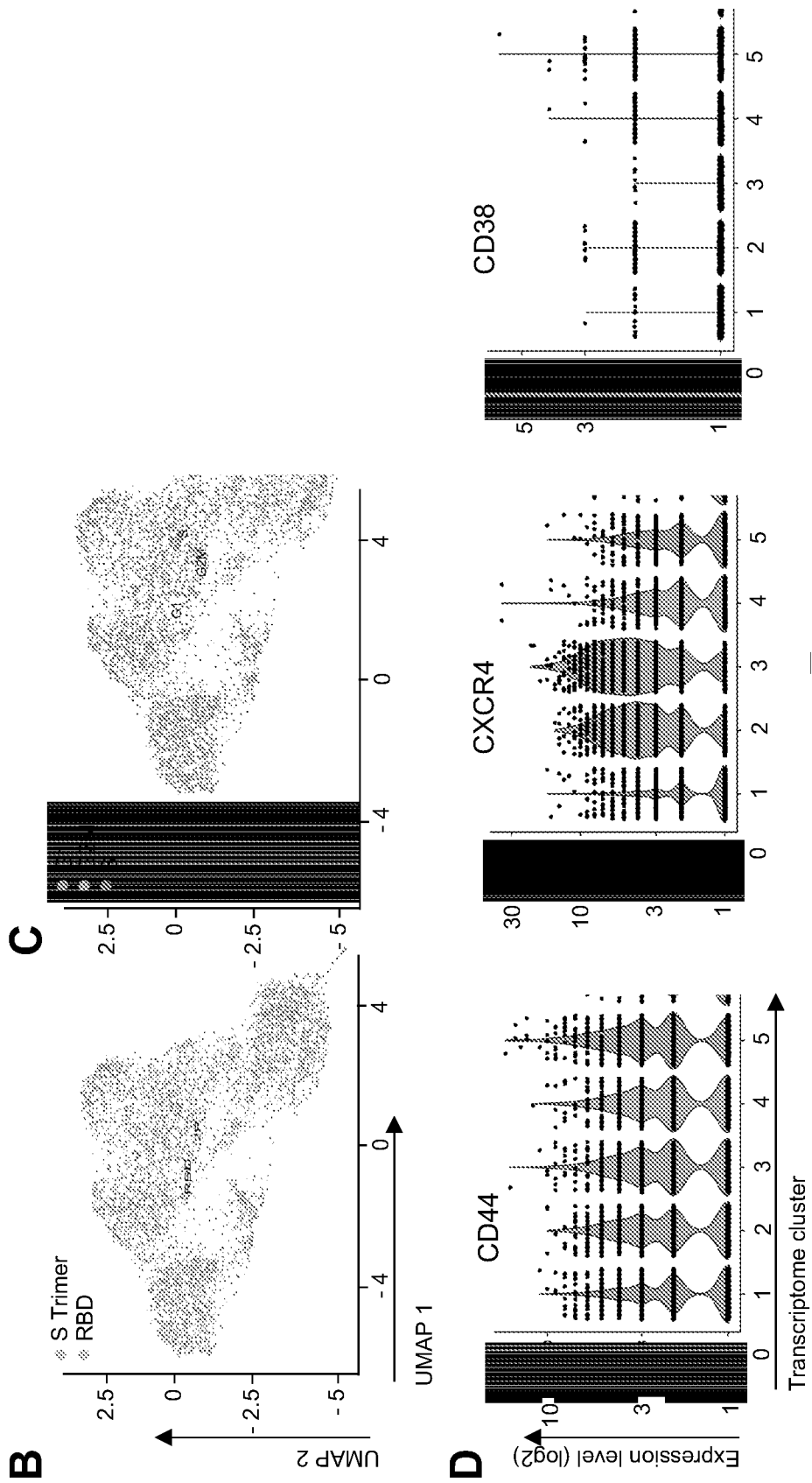


FIG. 11B-D

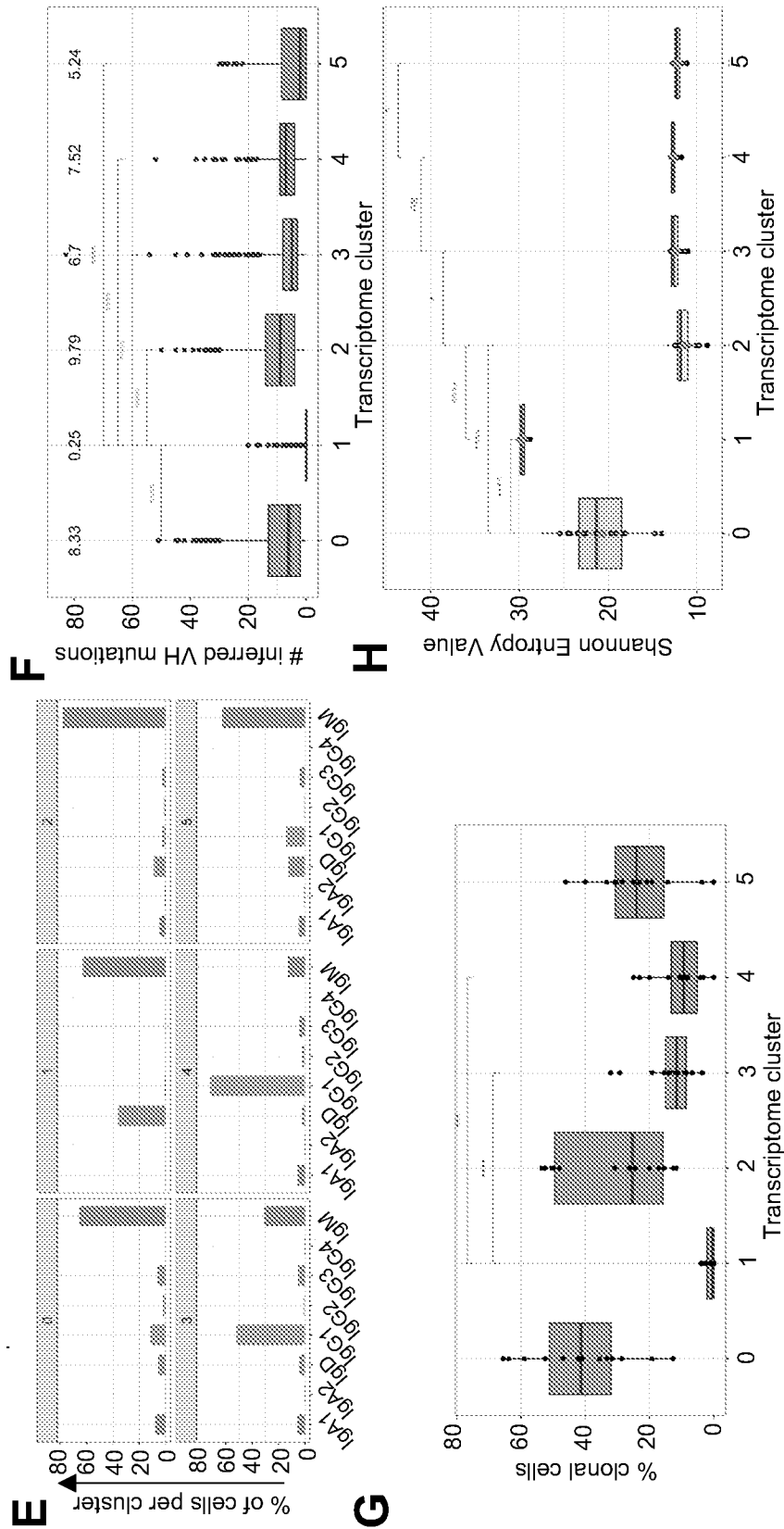


FIG. 11E-H

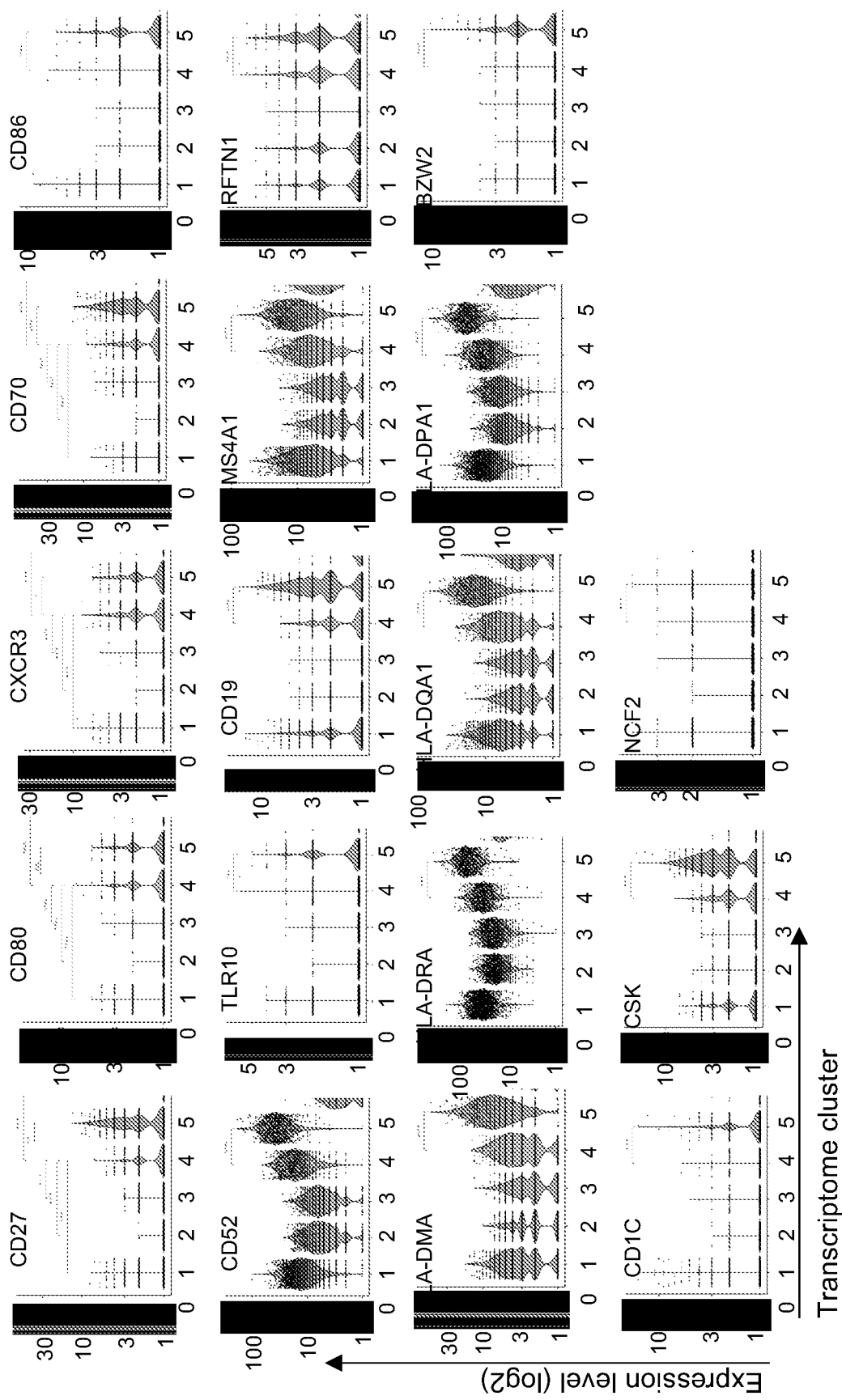


FIG. 12A

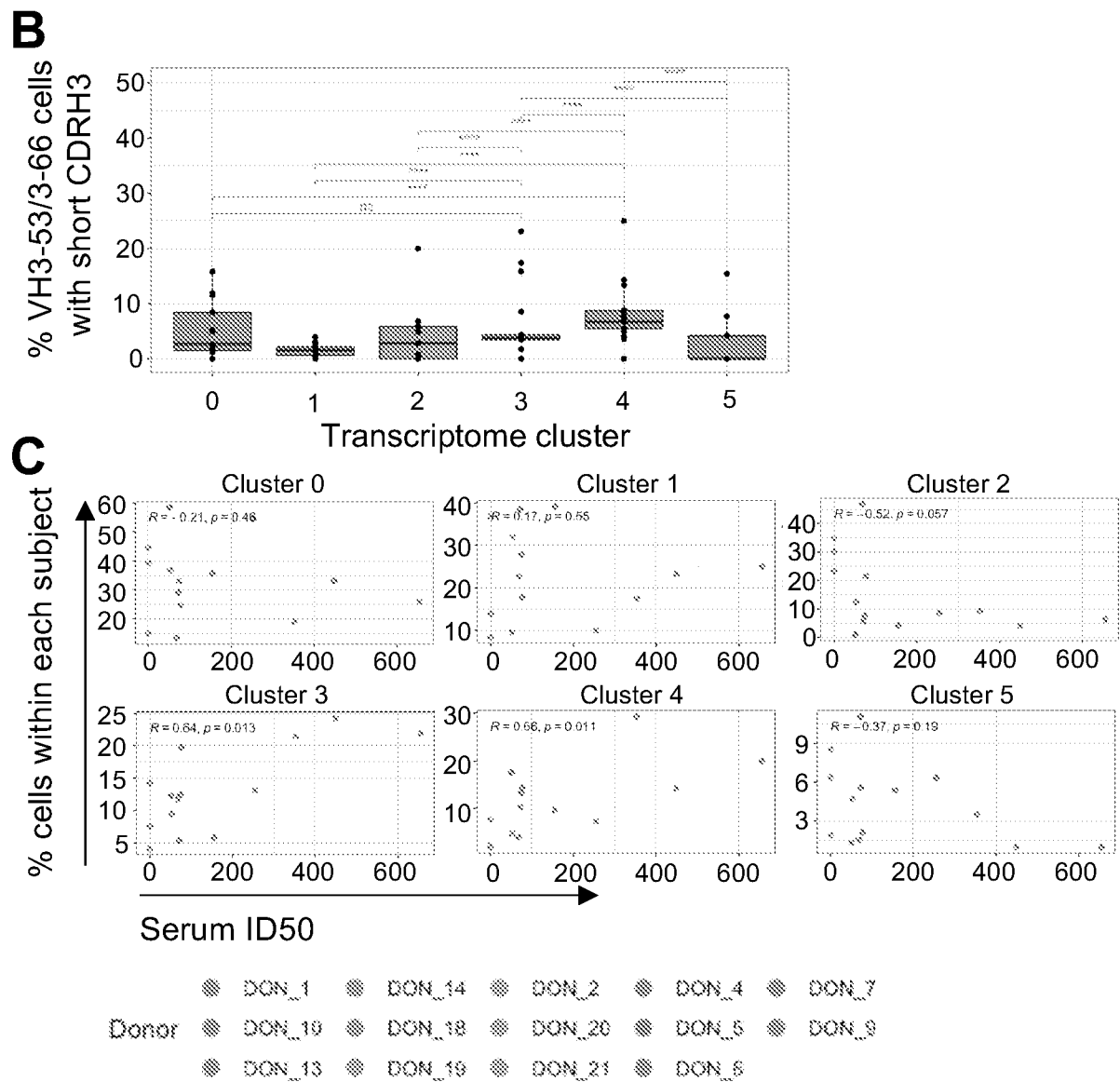


FIG. 12B-C

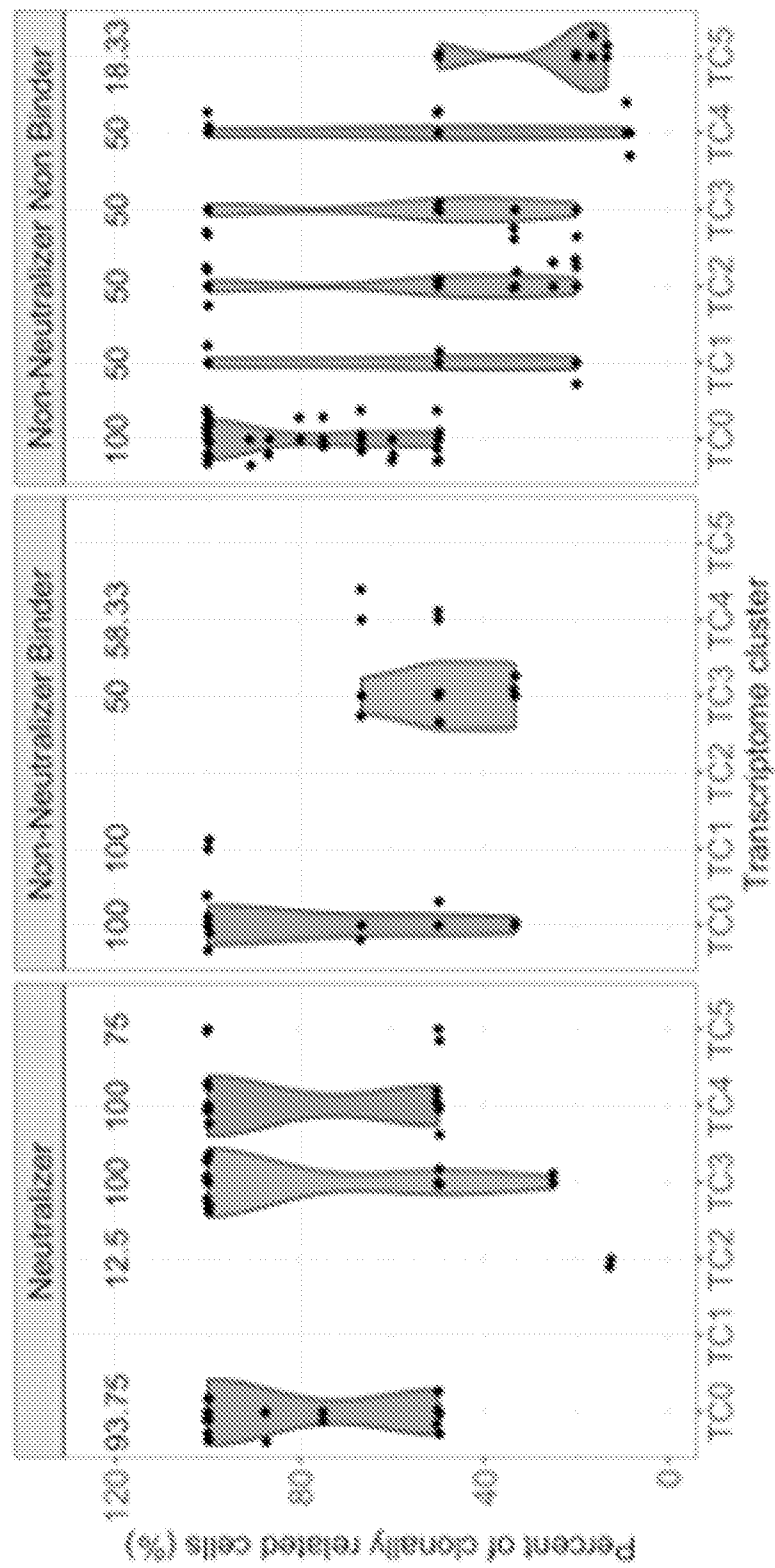


FIG. 12D

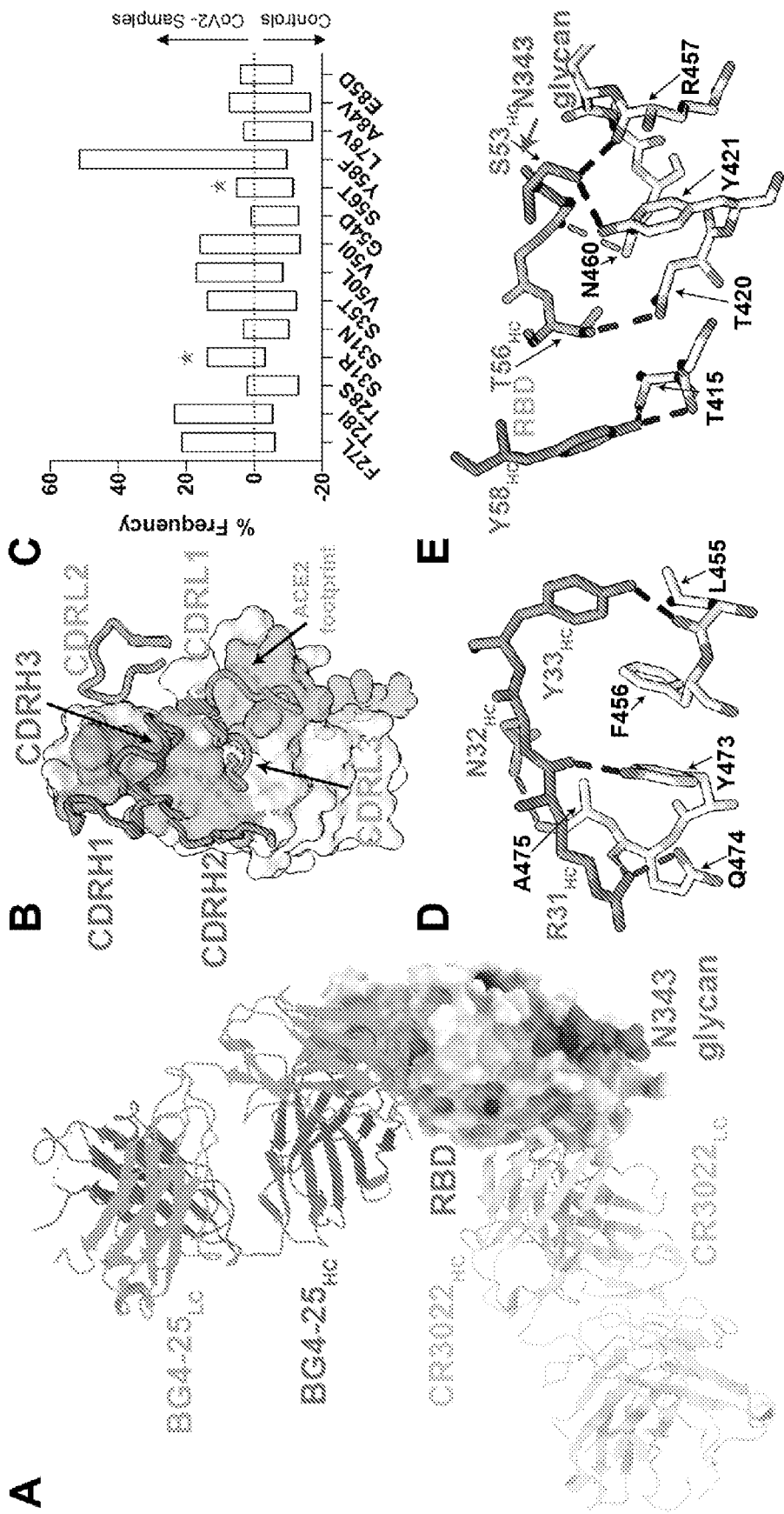


FIG. 13A-E

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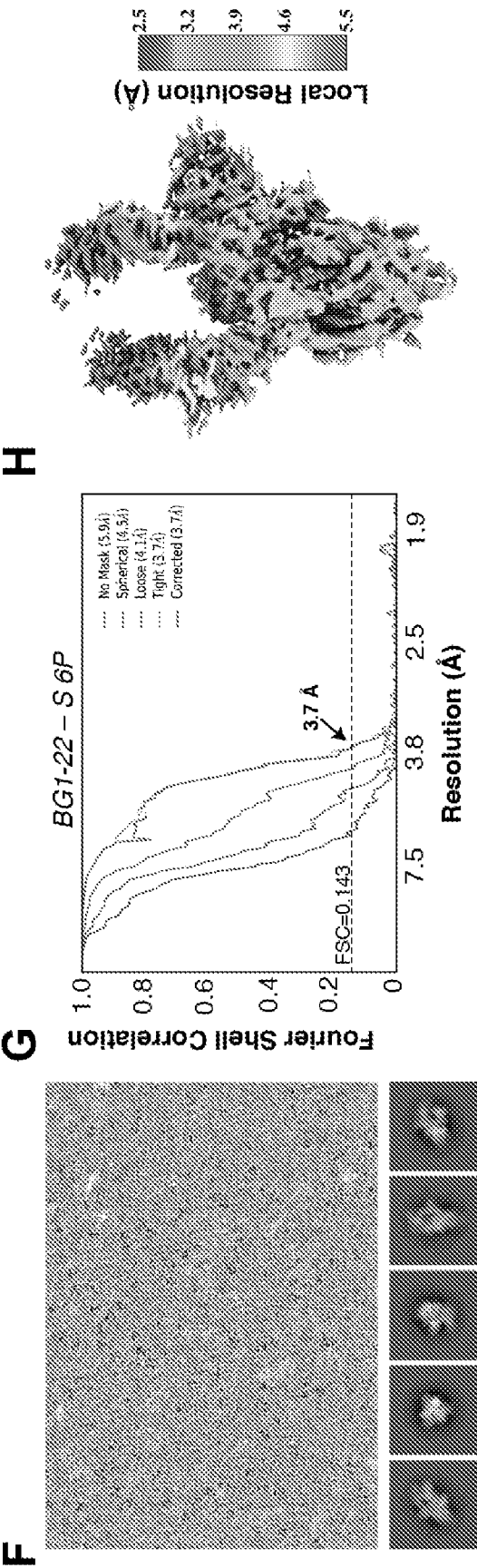


FIG. 13F-H

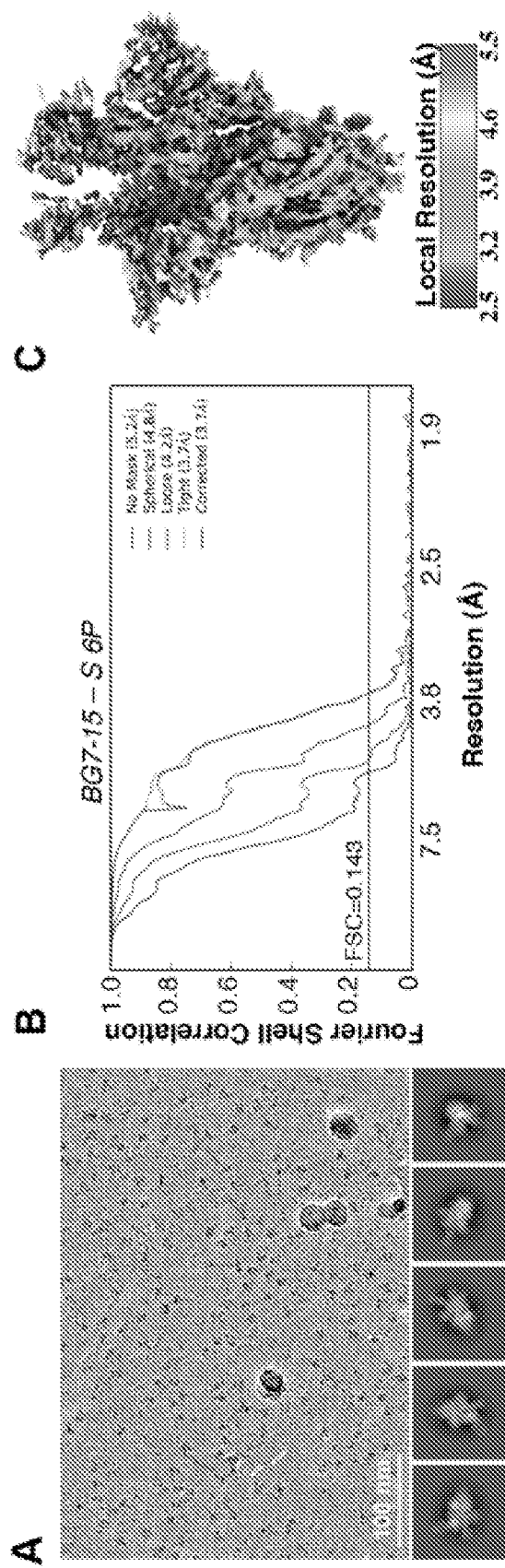


FIG. 14A-C

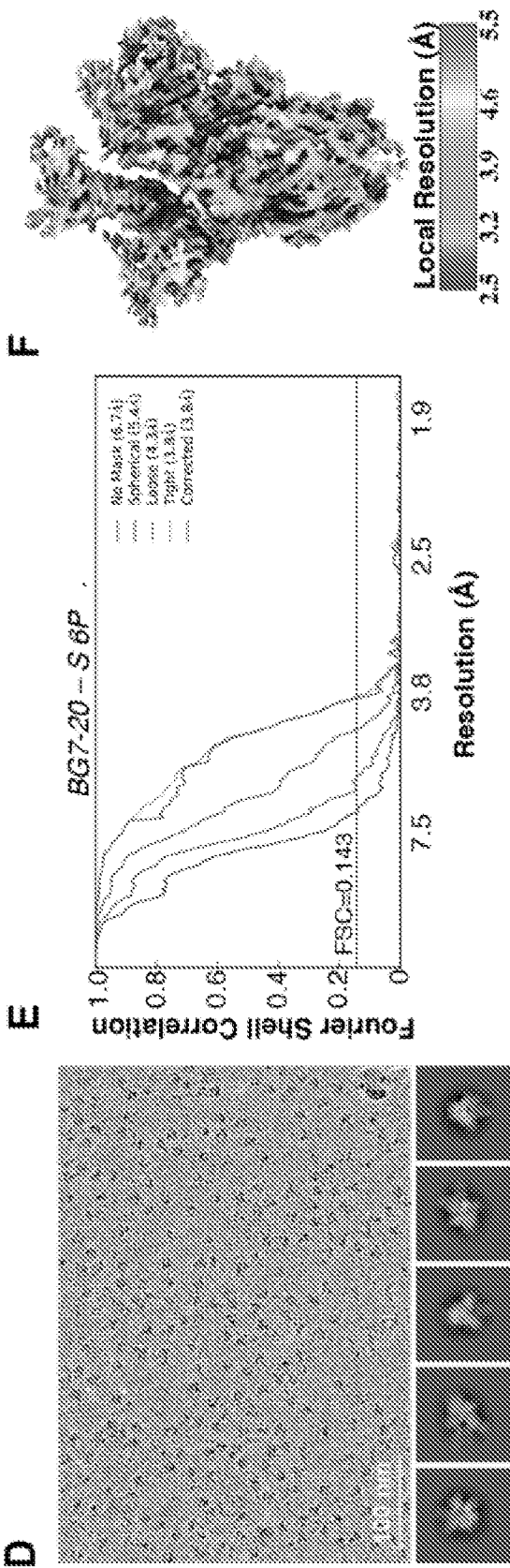


FIG. 14D-F

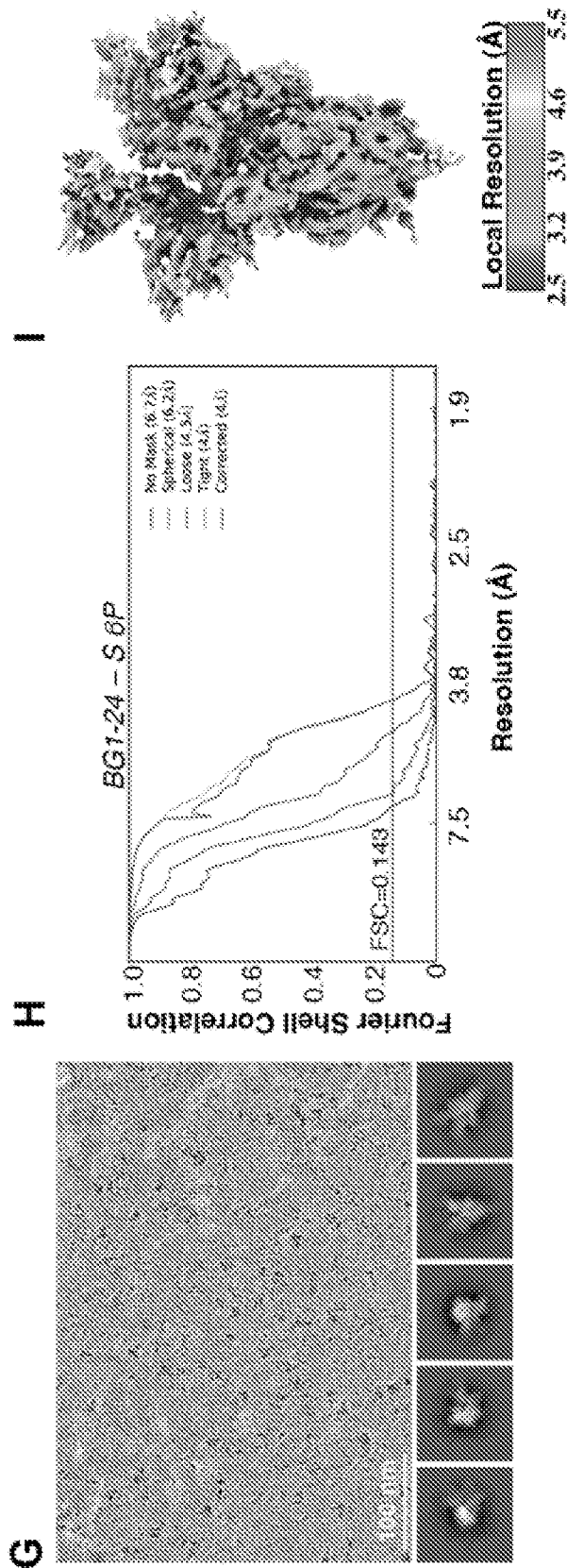


FIG. 14G-I

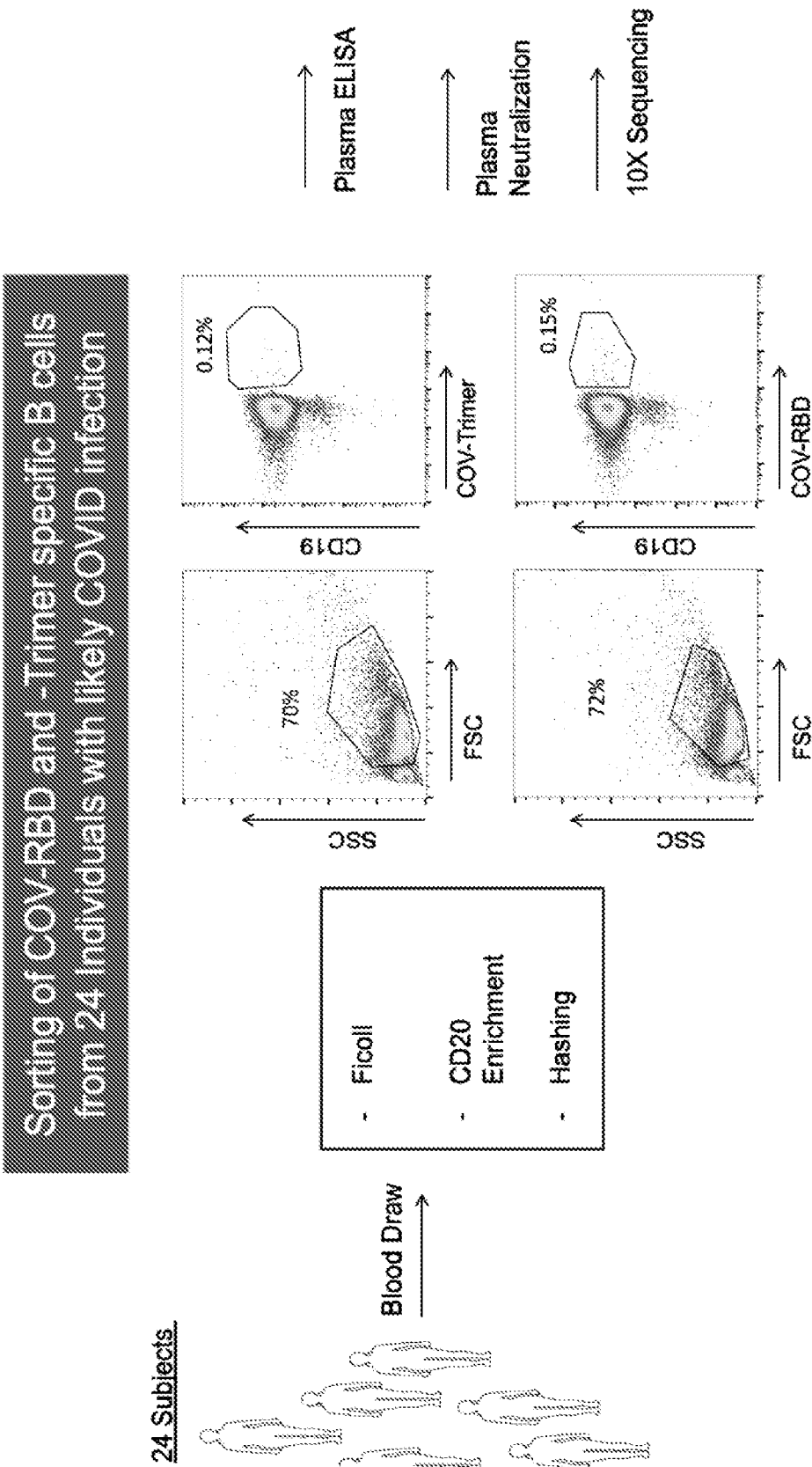


FIG. 15

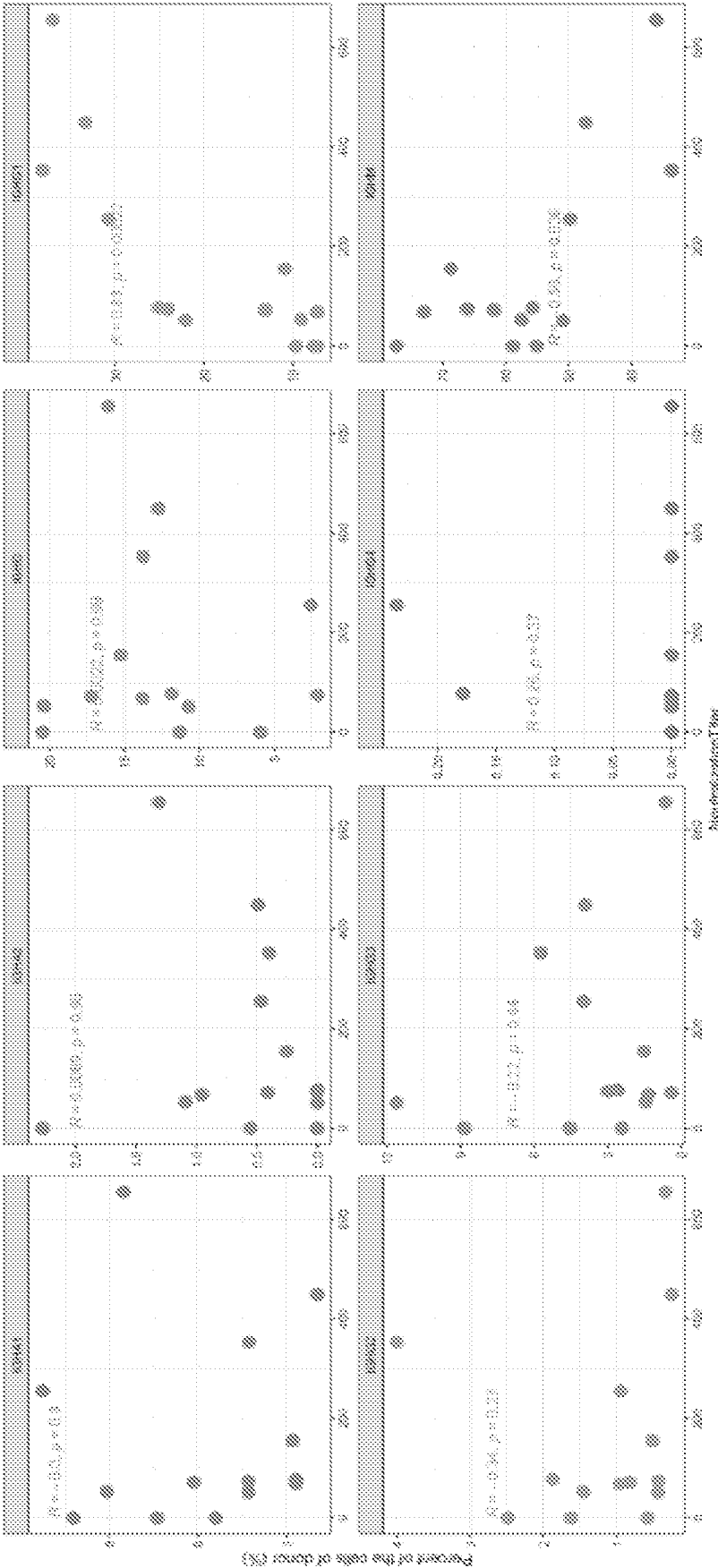
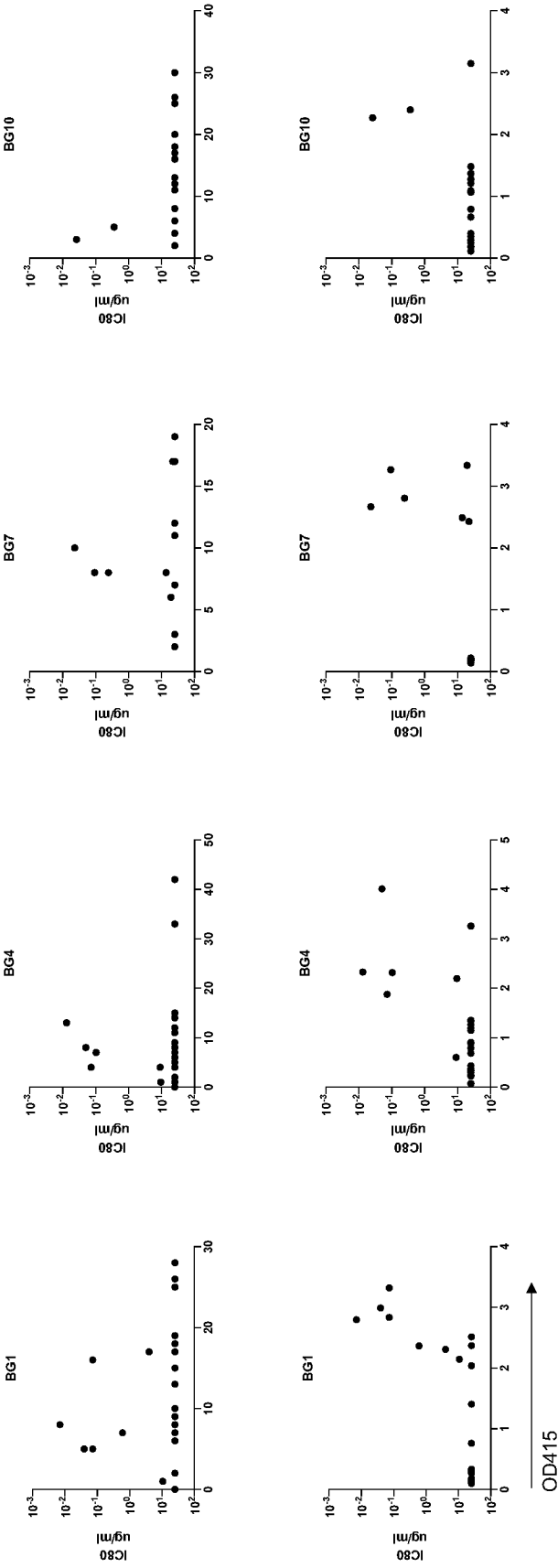


FIG. 16



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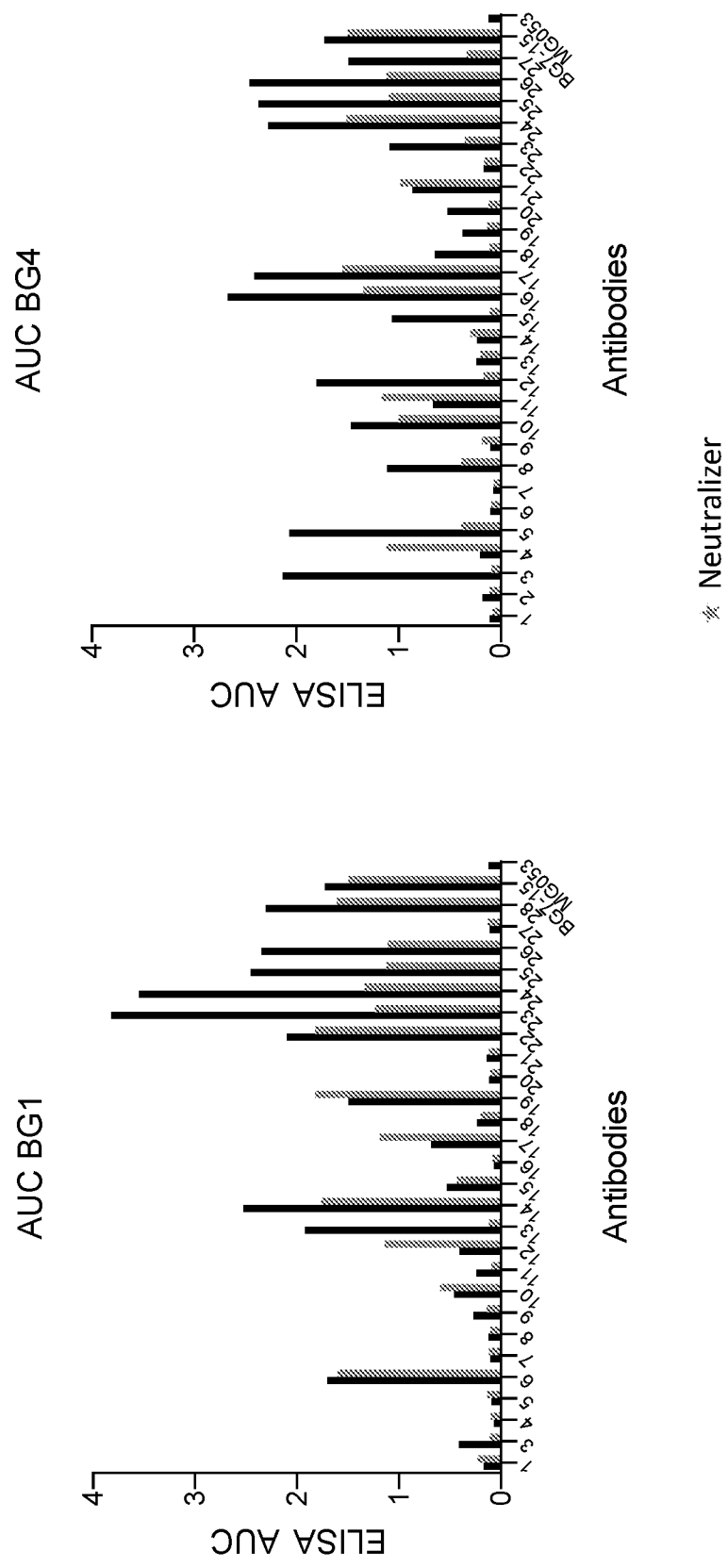


FIG. 18

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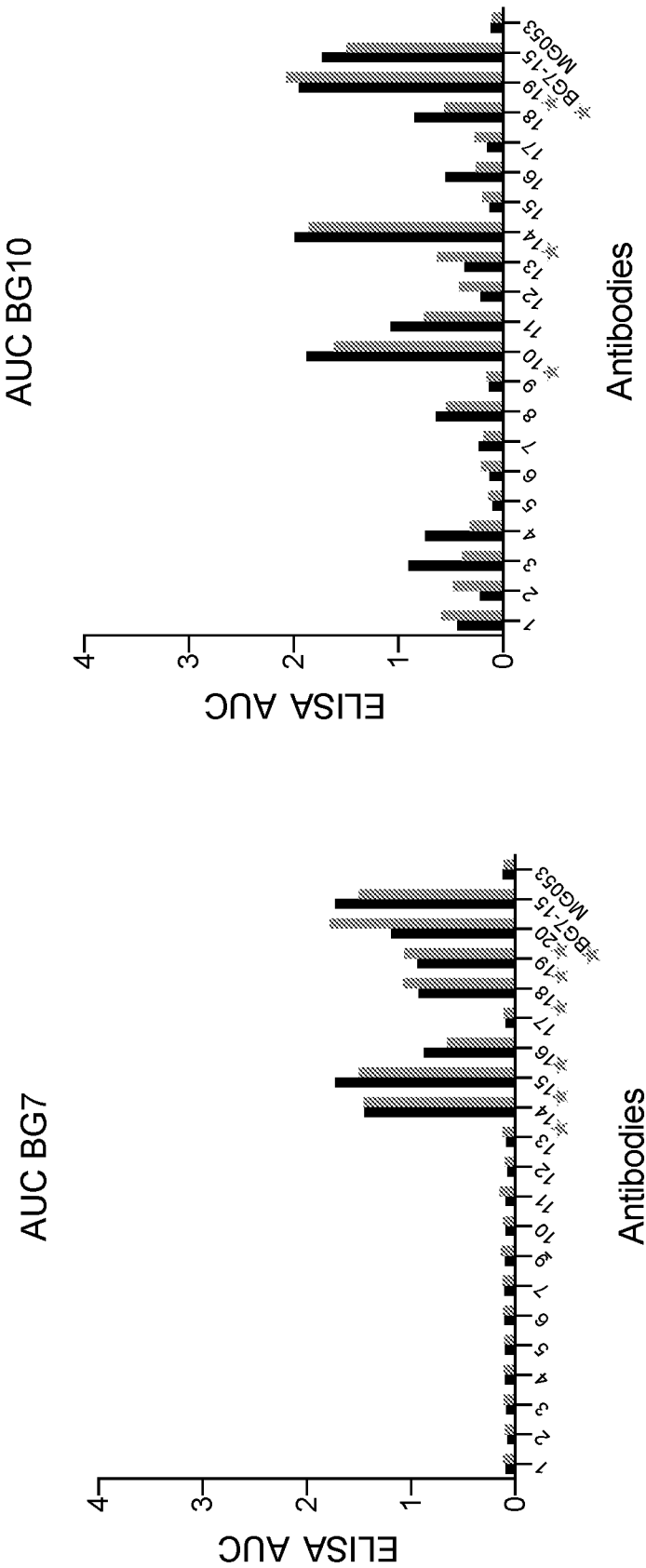


FIG. 19

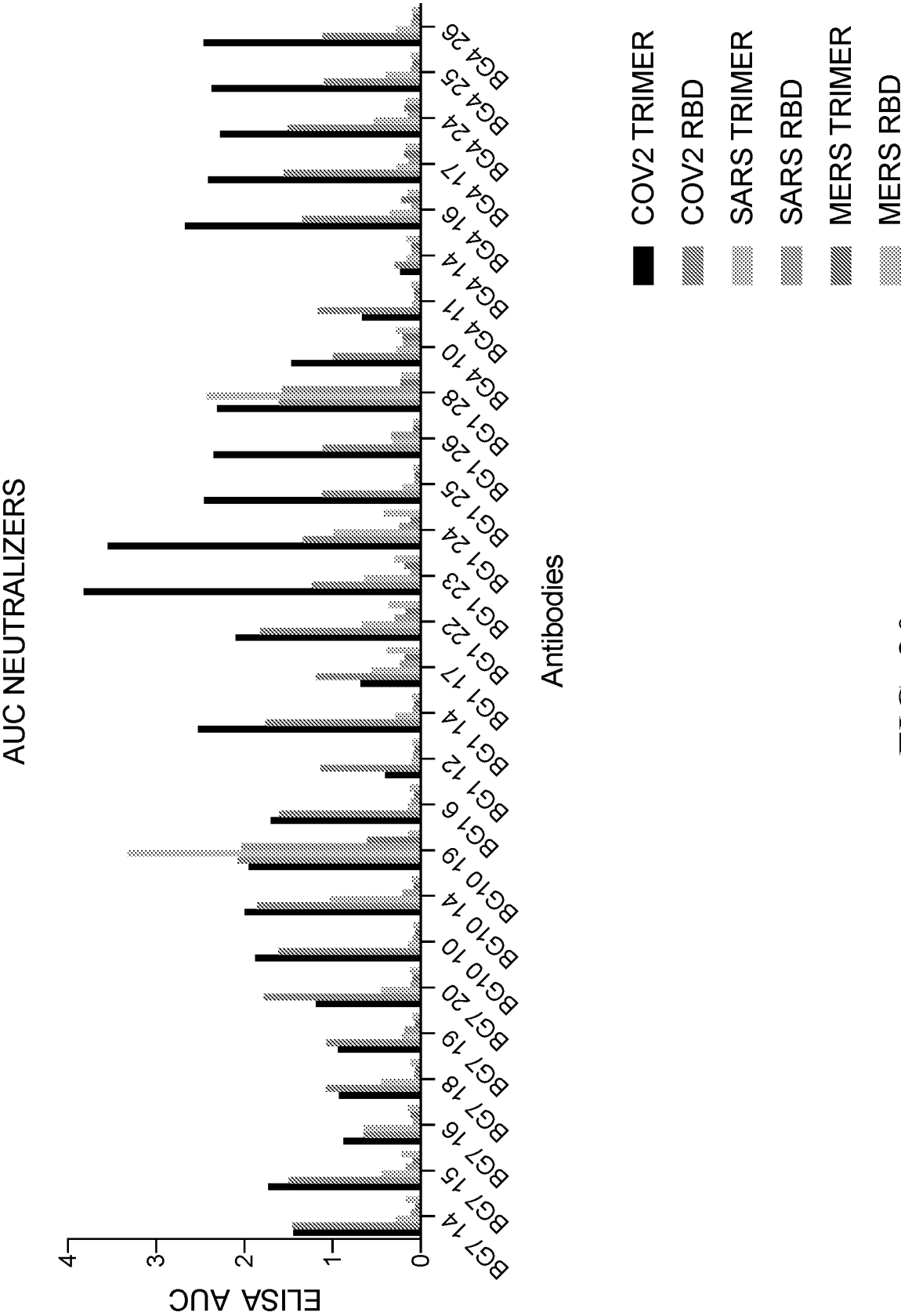


FIG. 20

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ISOTYPE	VH GENE	CDR3 HEAVY CHAIN	LIGHT CHAIN	VK/λL GENE	CDR3 LIGHT CHAIN	SORT BAIT	Name	IC50 (μg/ml)	IC80 (μg/ml)
IGHG1	IGHV3-66/IGHV3-66	CASSRPFGQLVPGLDLDFWSPW	κL1	κL1V1-40	CDSTDSRLSGWVF	RED	BG1-22	0.023	0.072
IGHG1	IGHV1-69/IGHV1-69	CARGPYTDSGGYLLDYW	κK	κK1V3-20	CDSTYAGSPRTF	RED	BG1-24	0.004	0.037
IGHG1	IGHV2-53	CARDLEVWGADYW	κK	κK1V3-20	CDSTYGSFMYTF	2P	BG1-25	0.003	0.013
IGHG1	IGHV1-18	CAPTSSVTTDWW	κK	κK1V3-20	CDSTYGSSPRTF	RED	BG7-15	0.016	0.092
IGHG1	IGHV1-8	DARGERYCSSTTCTSGNMDYW	κL1	κL1V1-40	CDSTDSRLSGWVF	RED	BG1-20	0.007	0.023
IGHG1	IGHV2-61	CARTQWGYNGSHEFTMDWW	κL1	κL1V1-47	CAAWCASLGGYVF	RED	BG10-19	0.009	0.026

FIG. 21

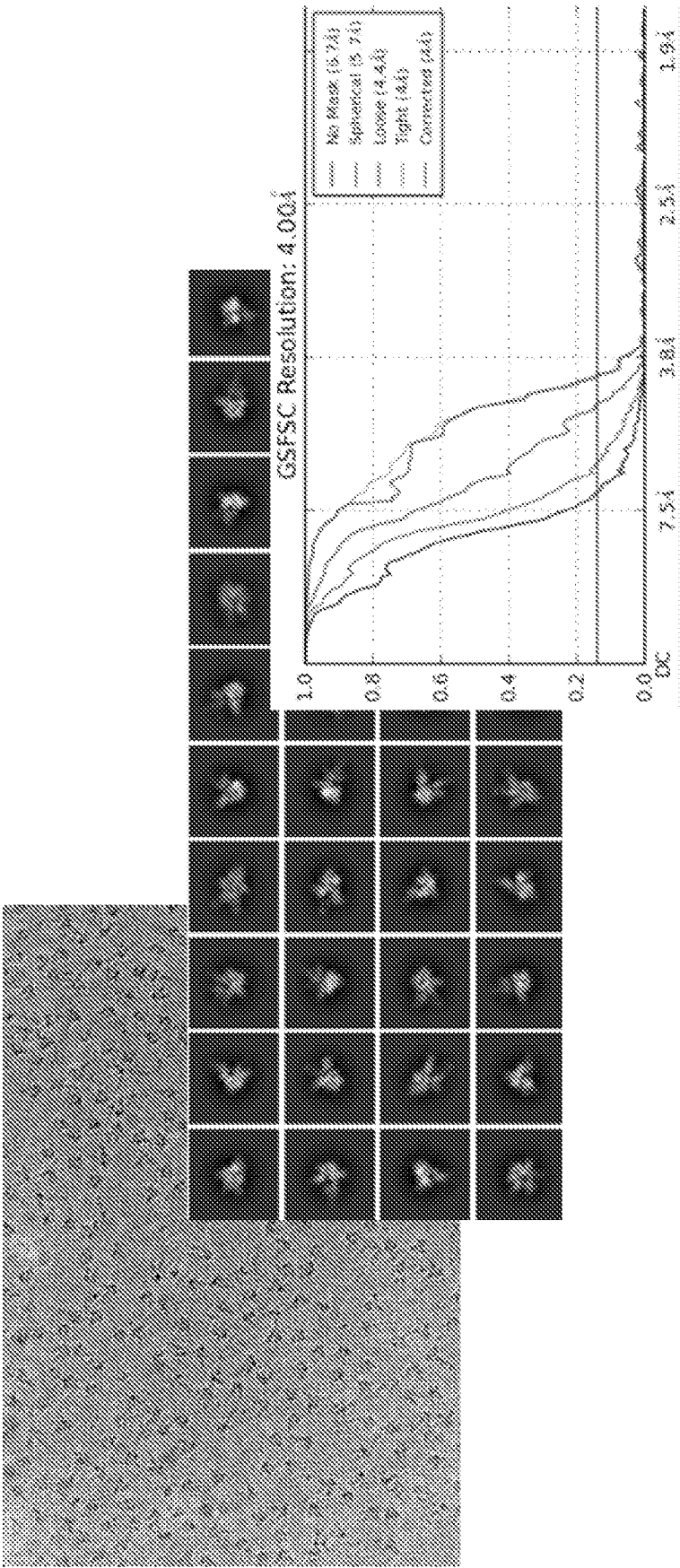


FIG. 22

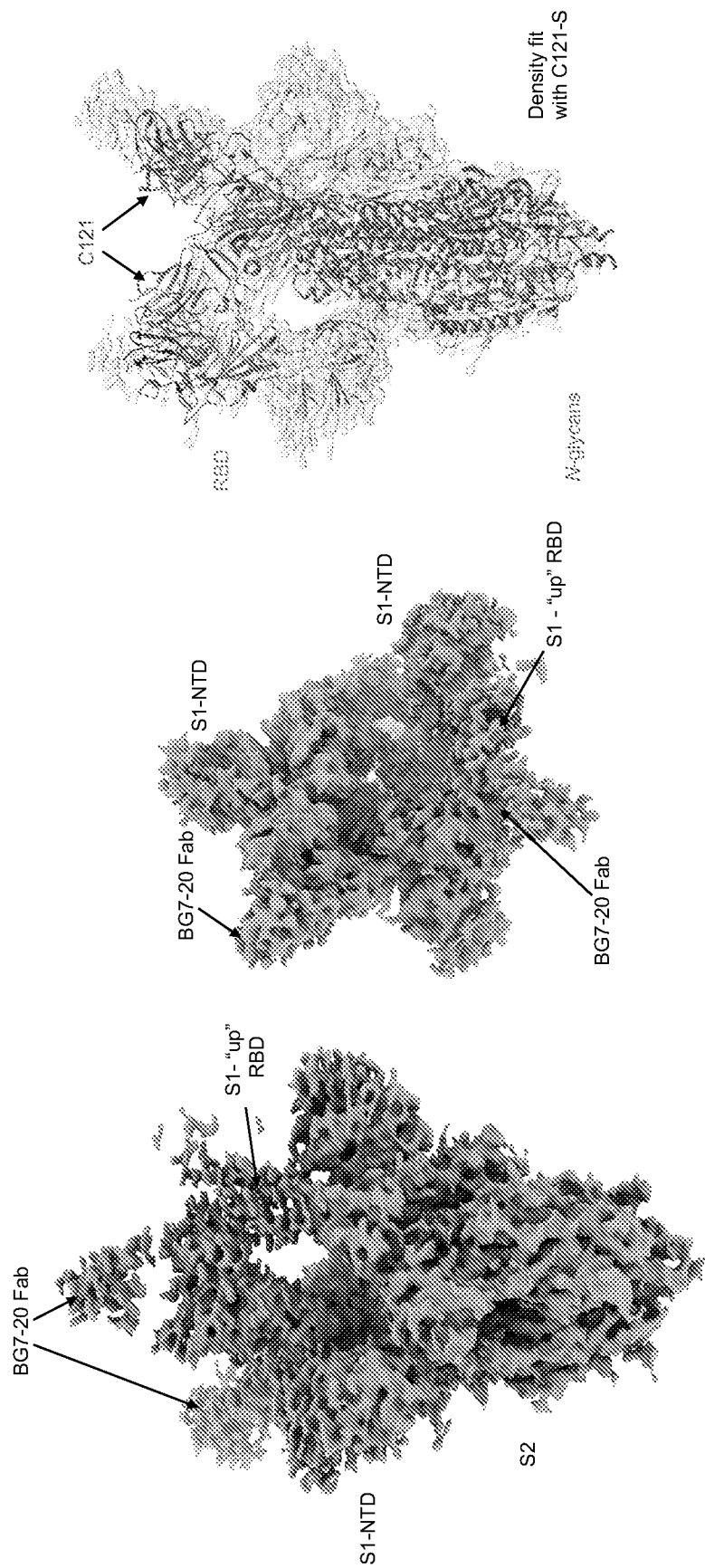


FIG. 23

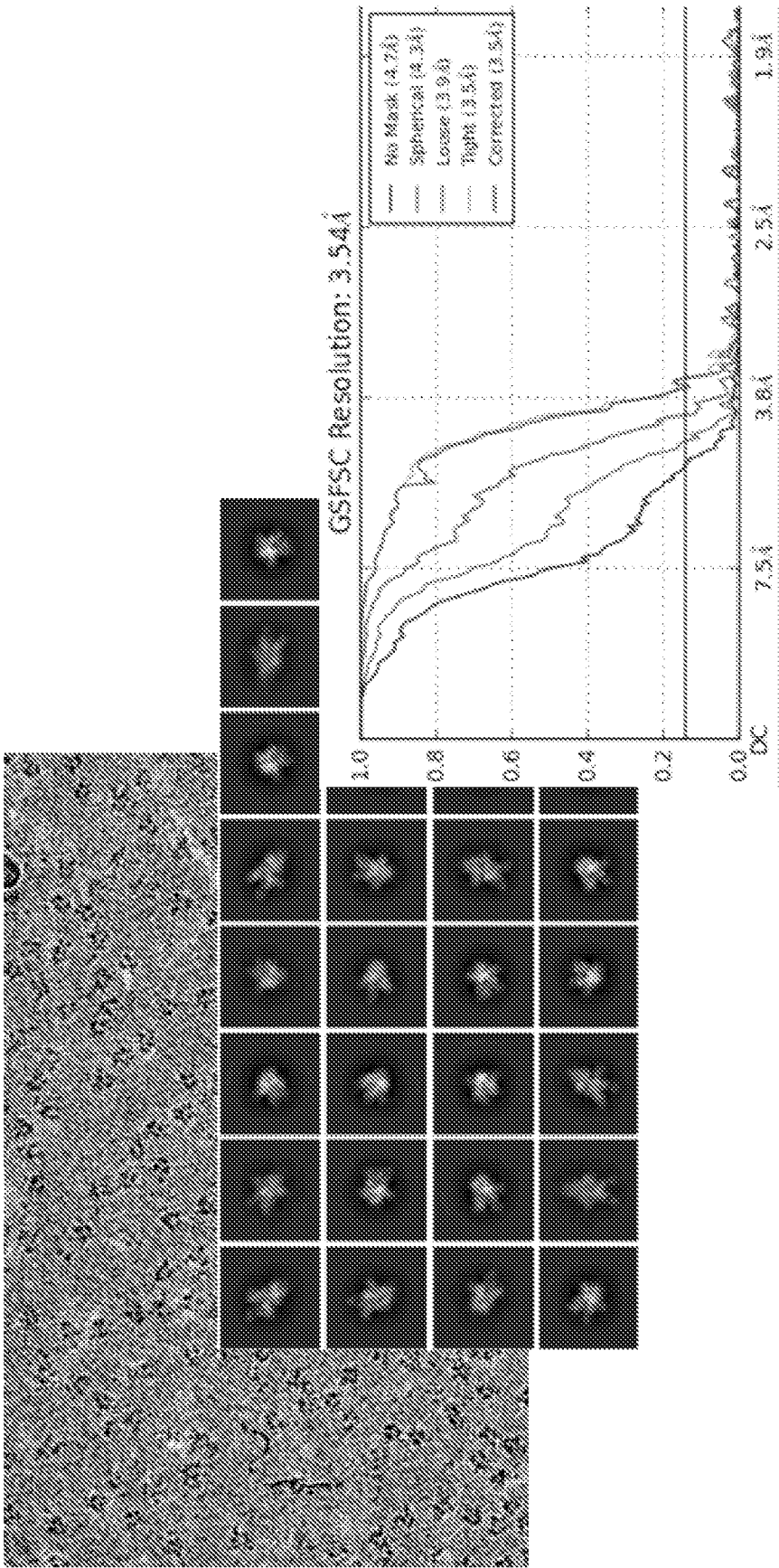


FIG. 24

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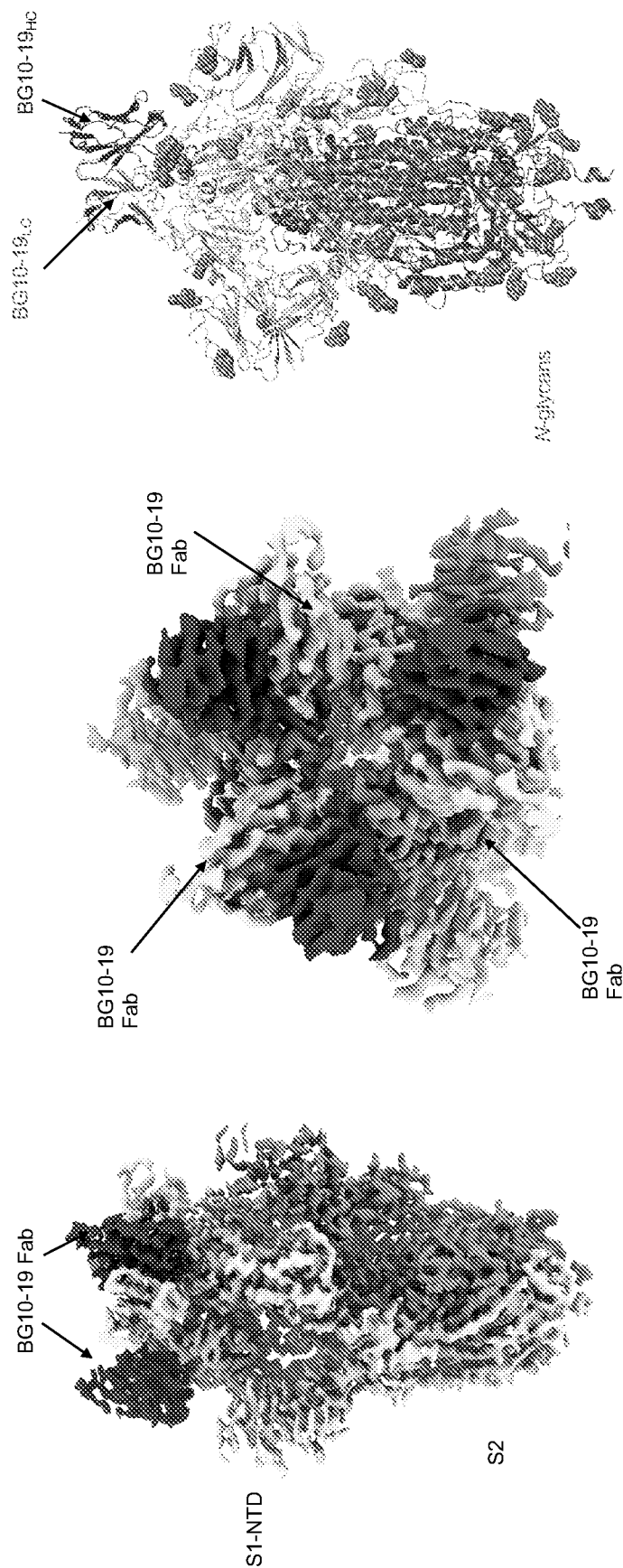


FIG. 25

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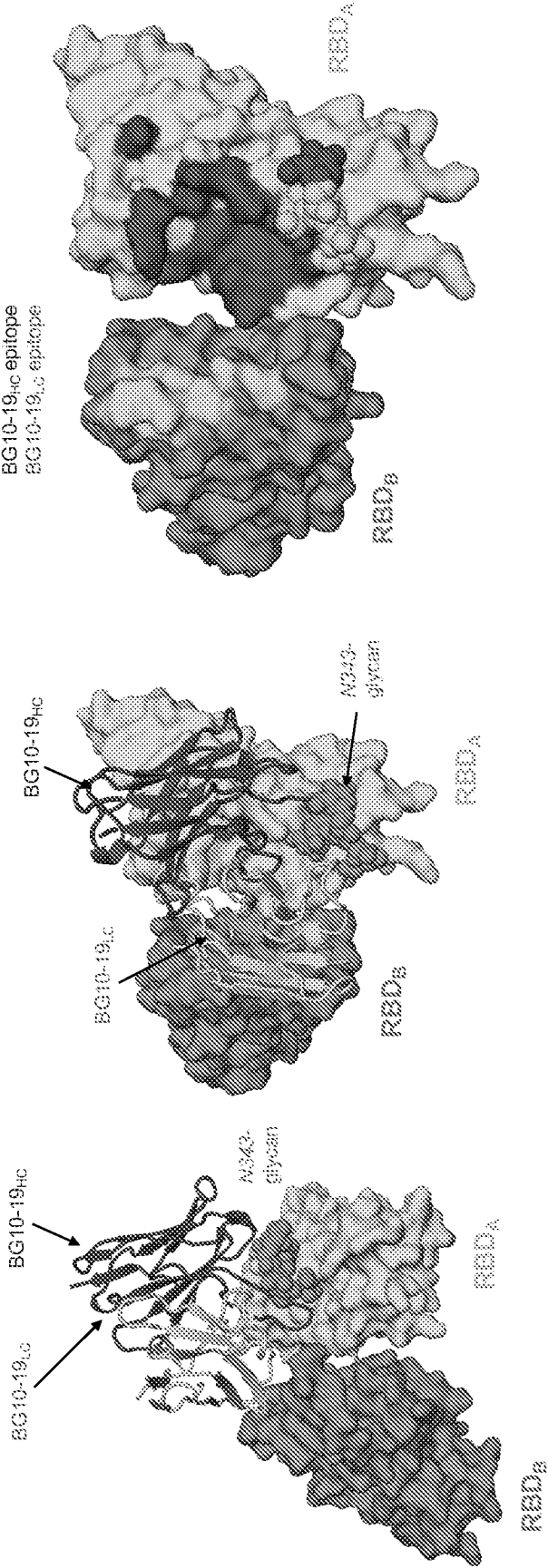


FIG. 26

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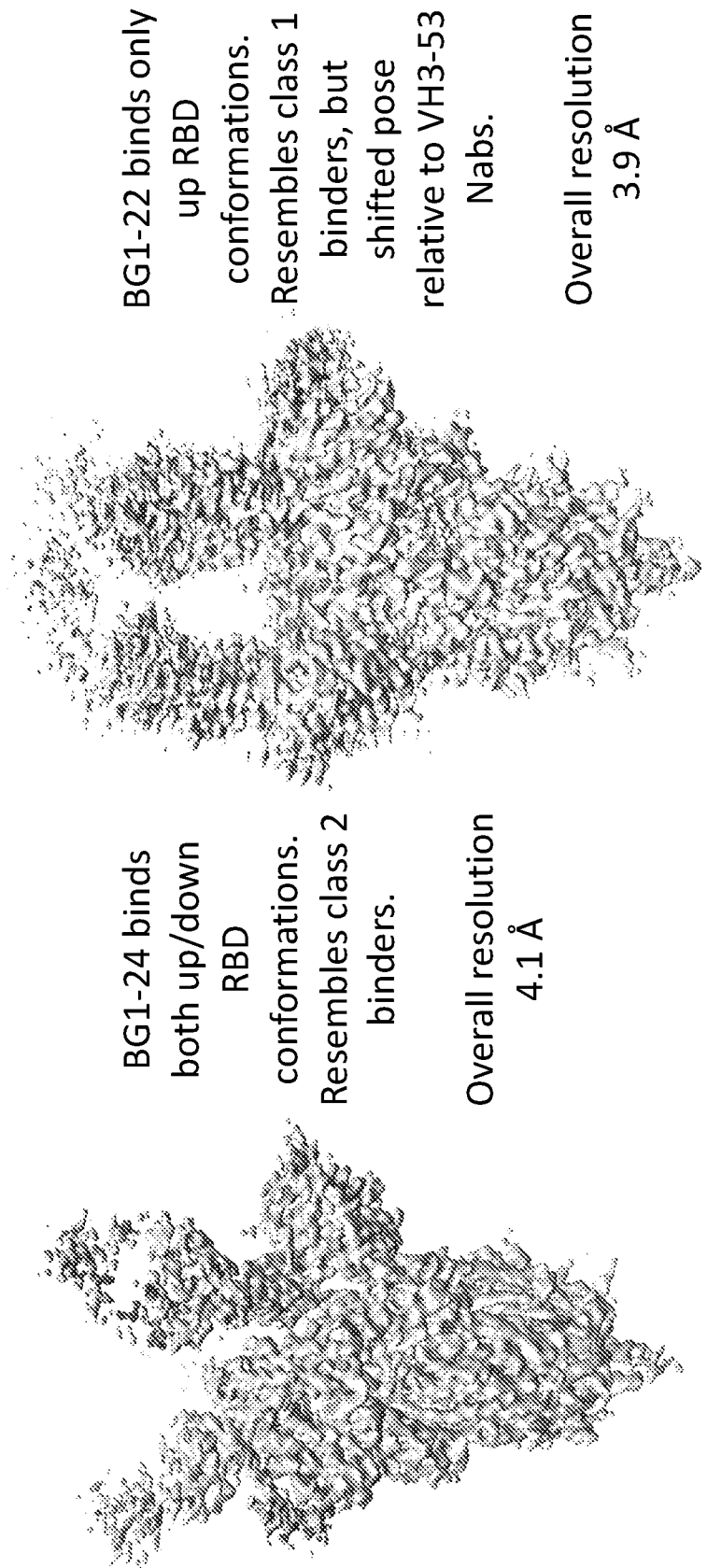


FIG. 27

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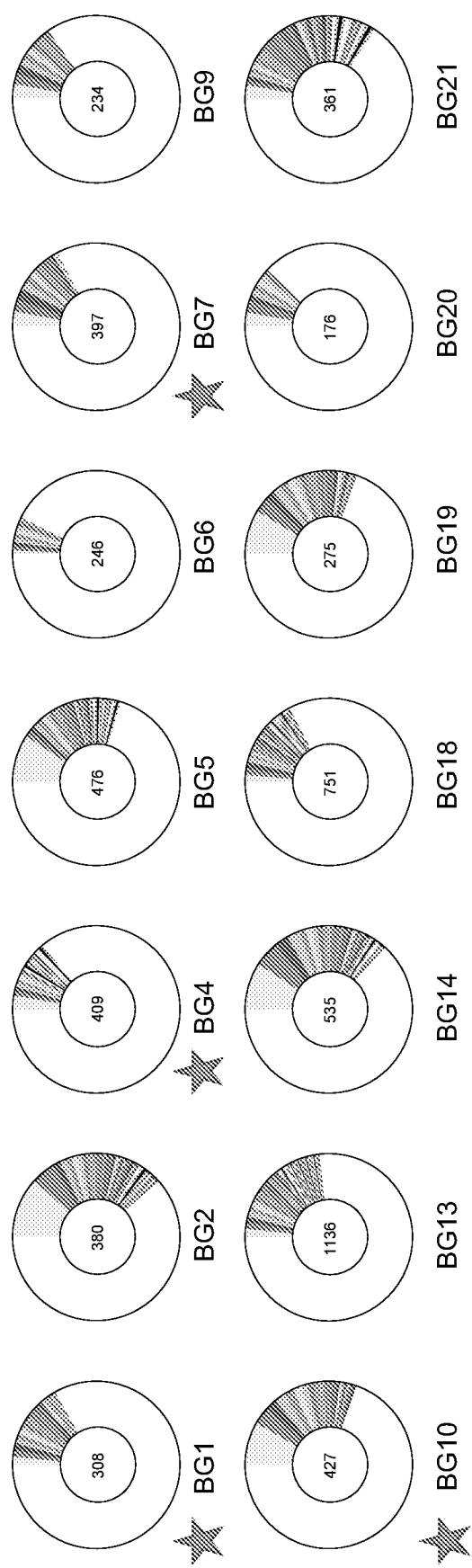


FIG. 28

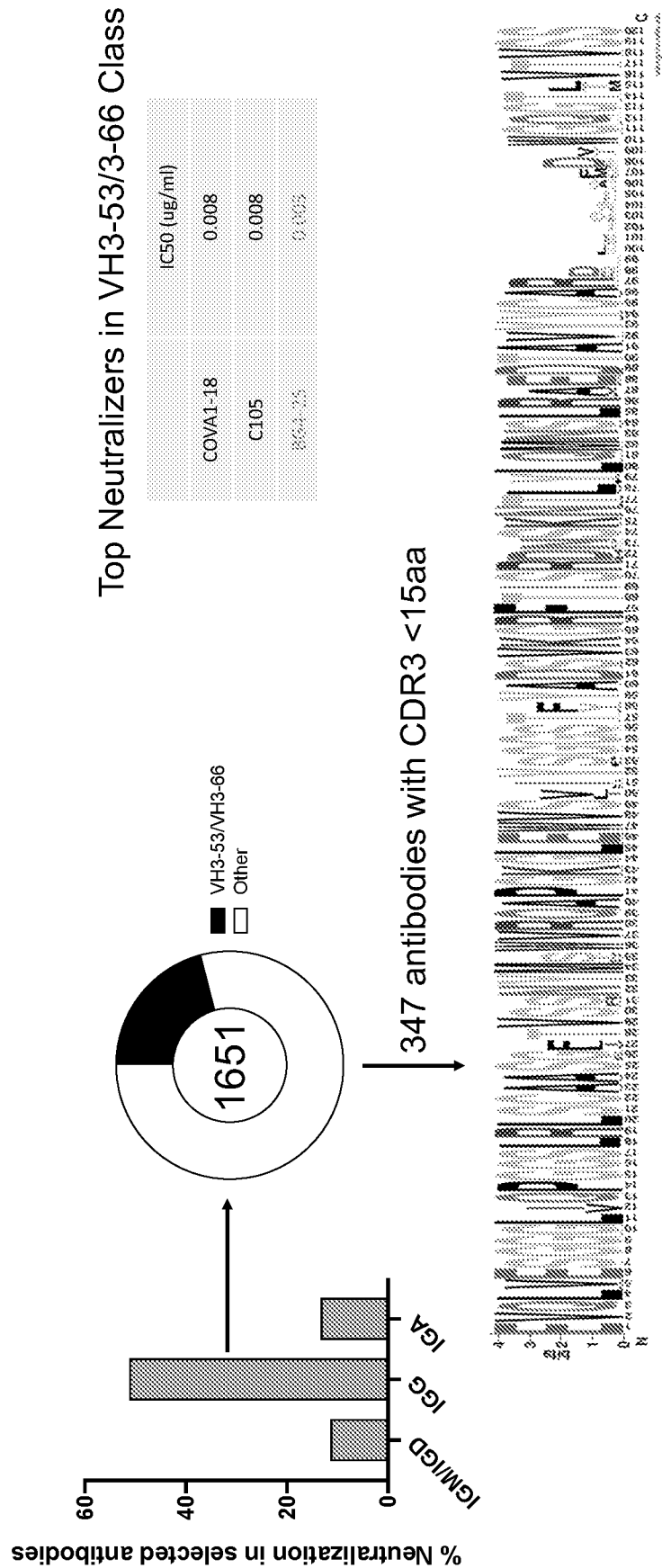


FIG. 29

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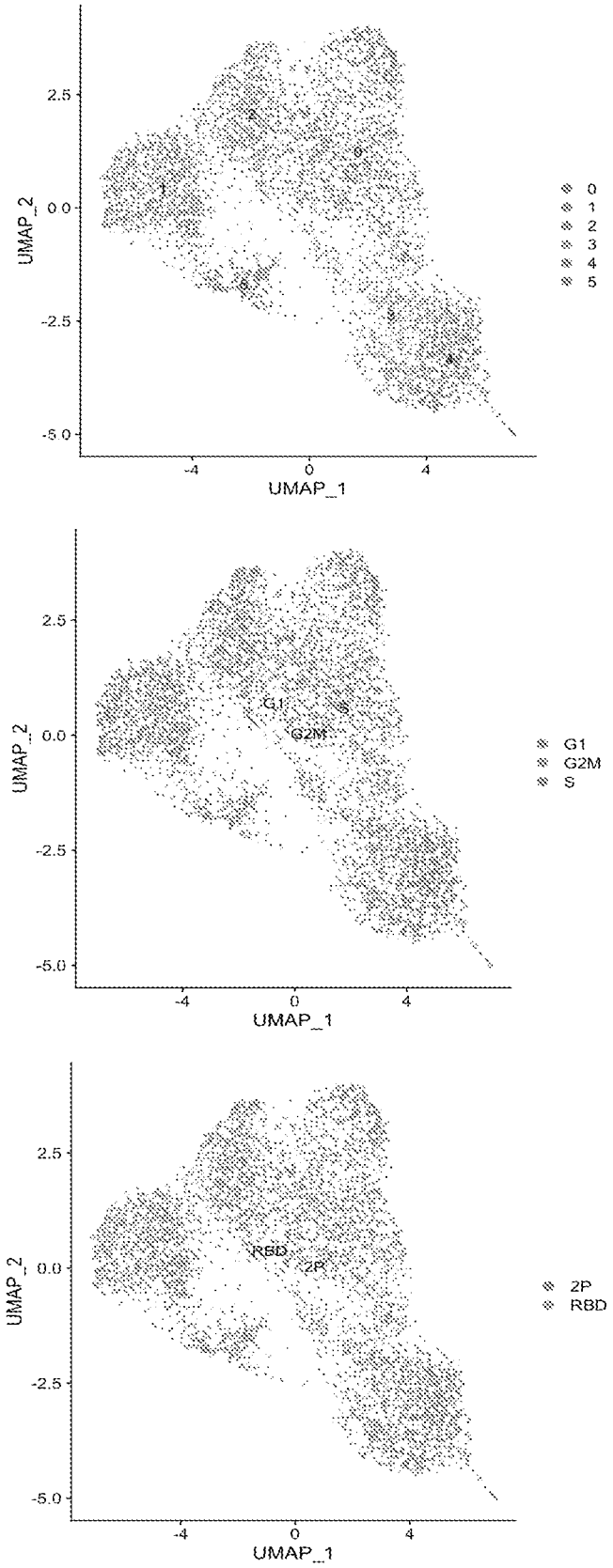


FIG. 30

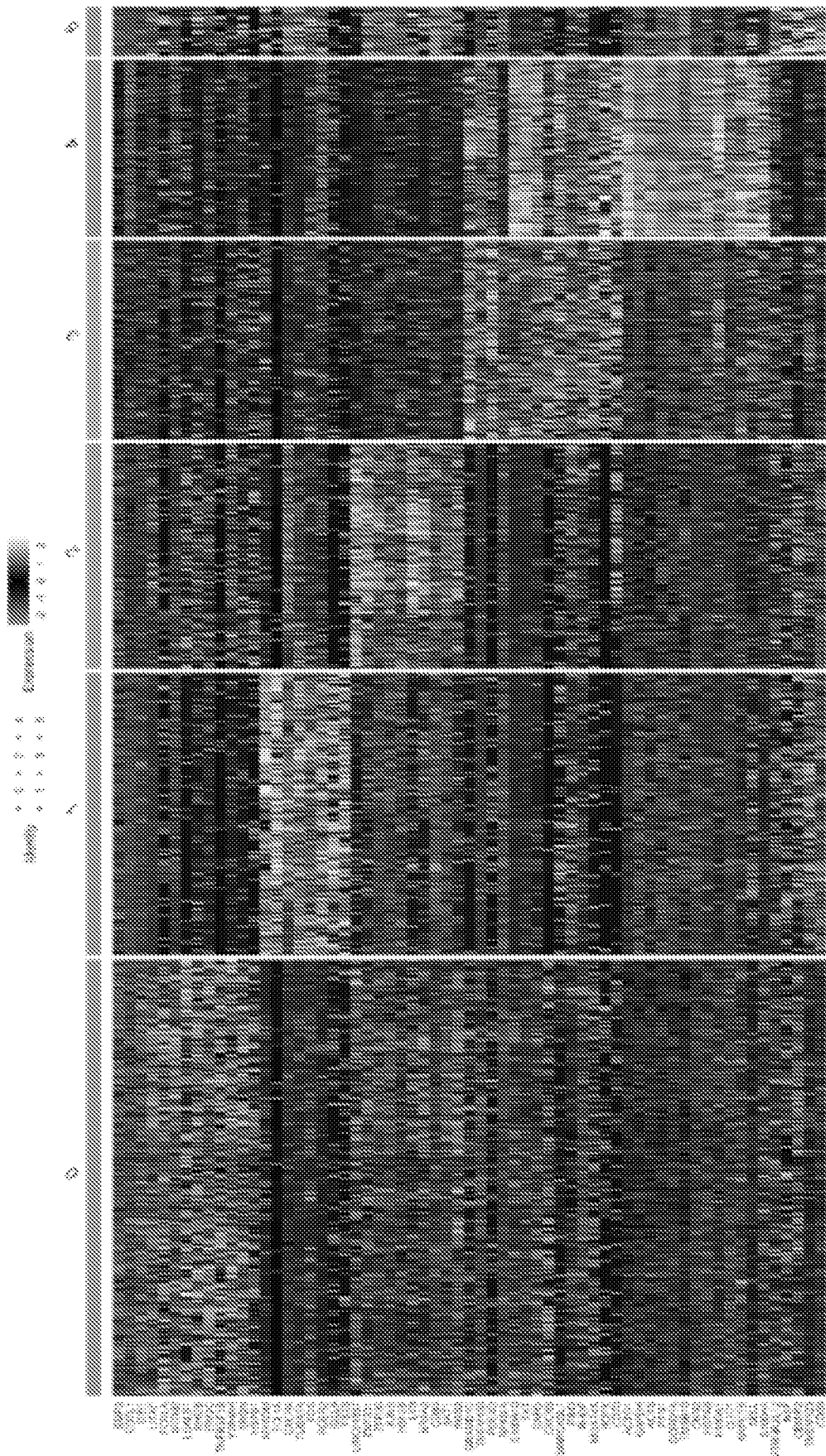


FIG. 31

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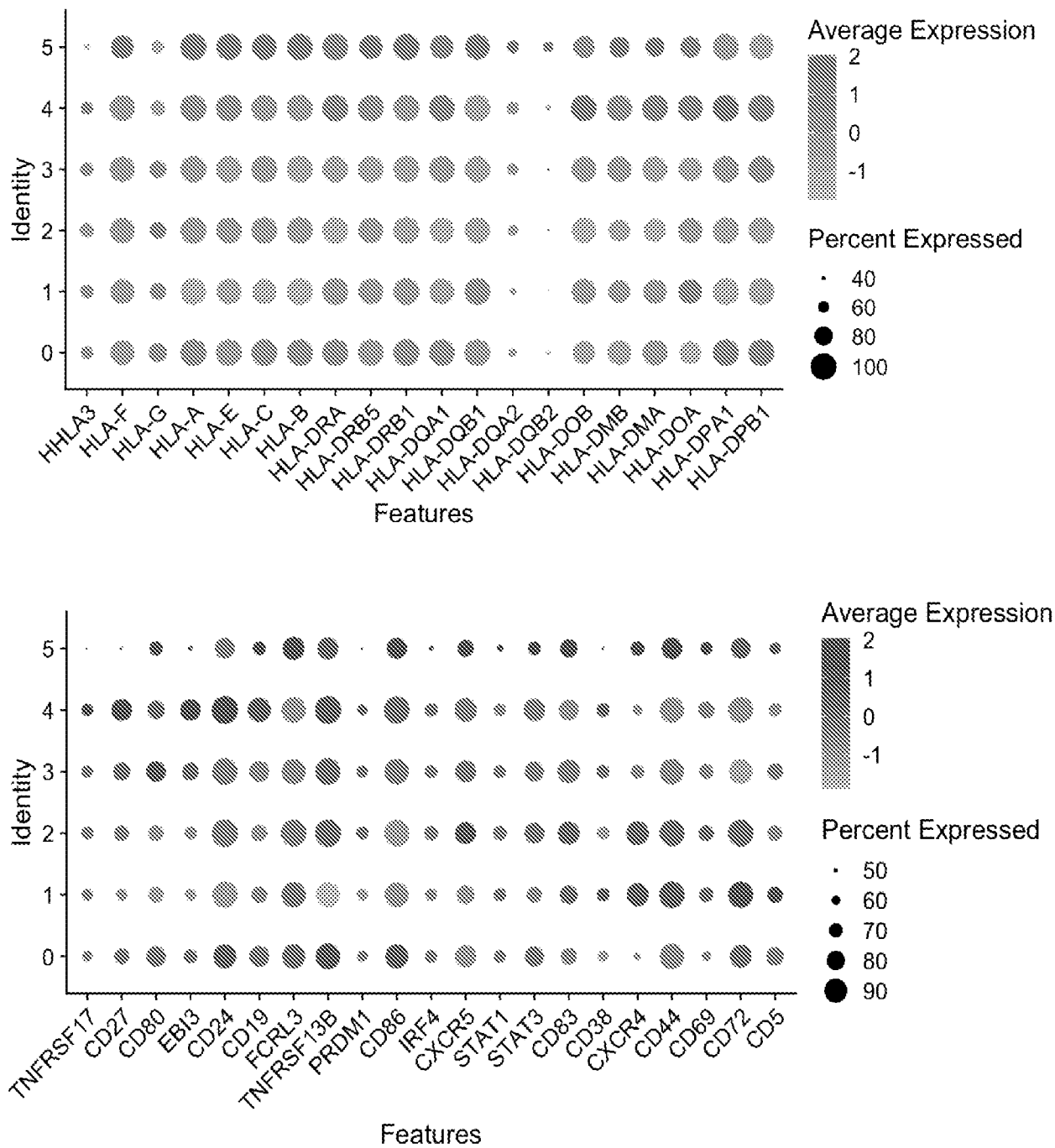


FIG. 32

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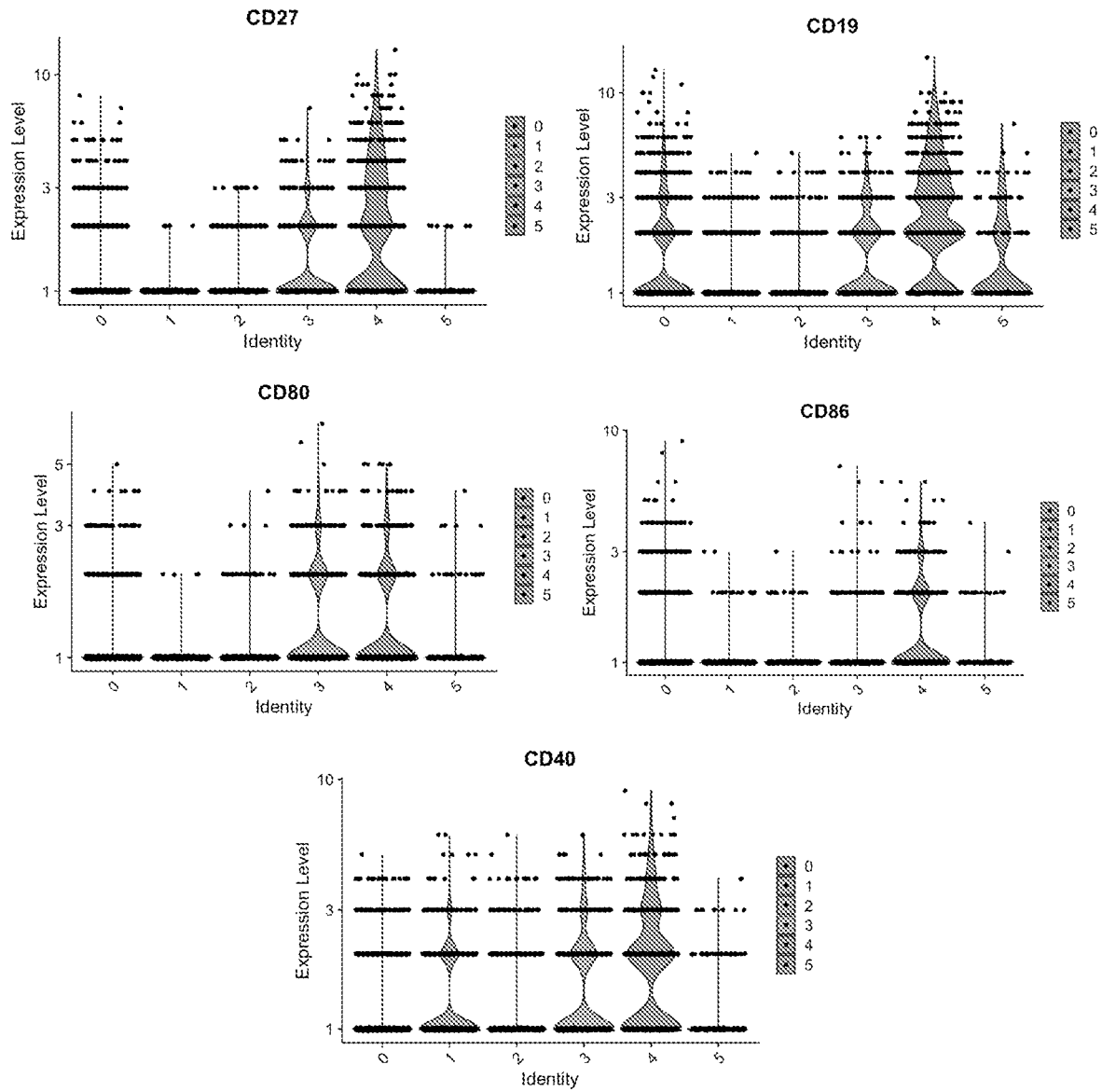


FIG. 32 continued

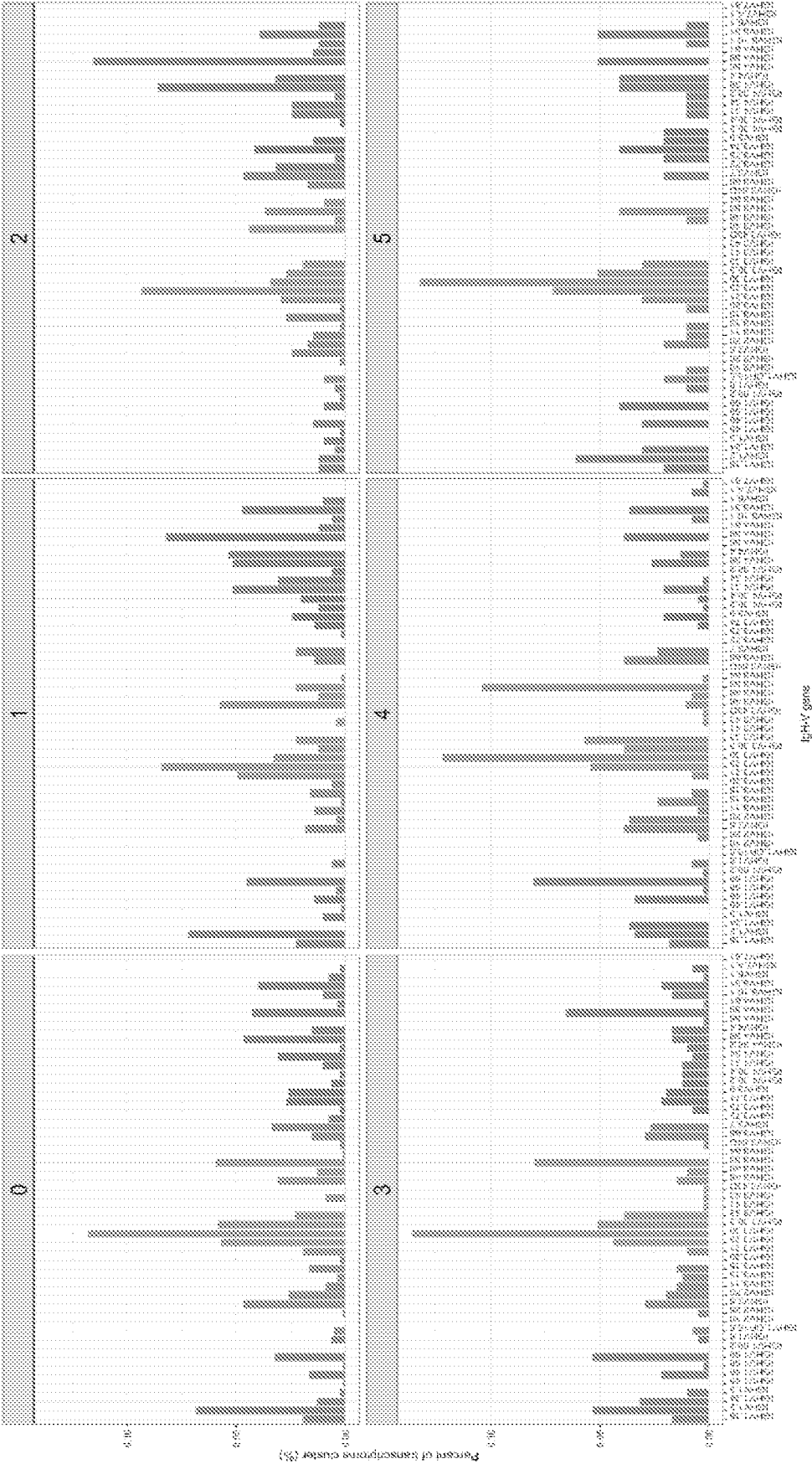


FIG. 33

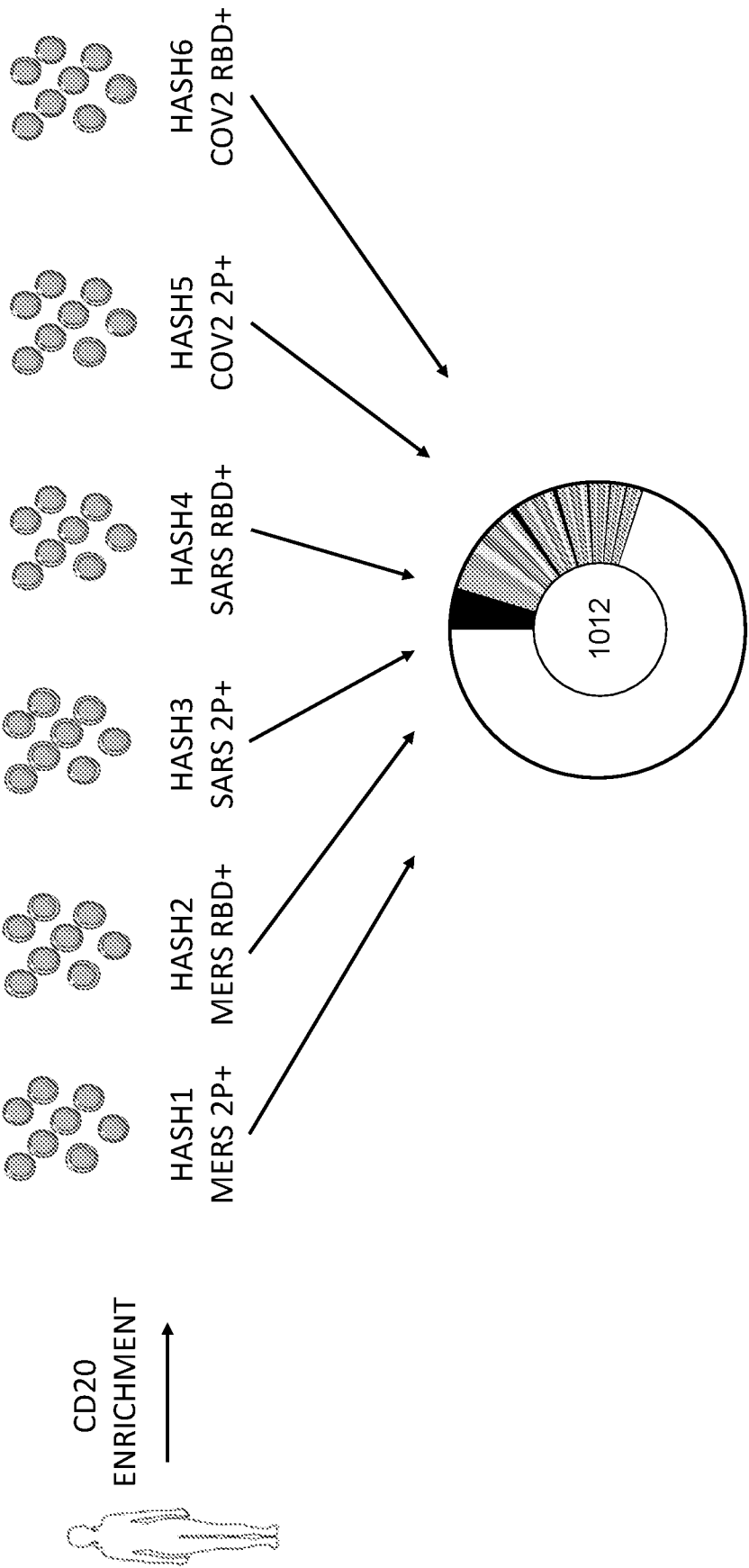


FIG. 34

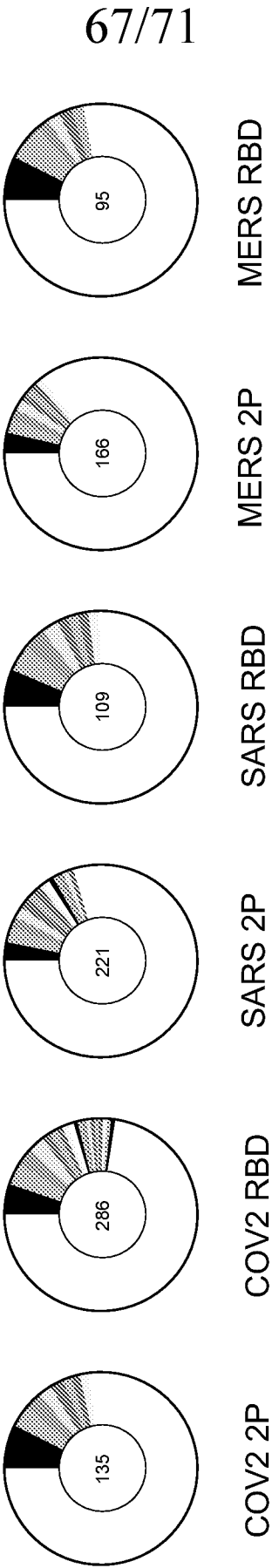


FIG. 35

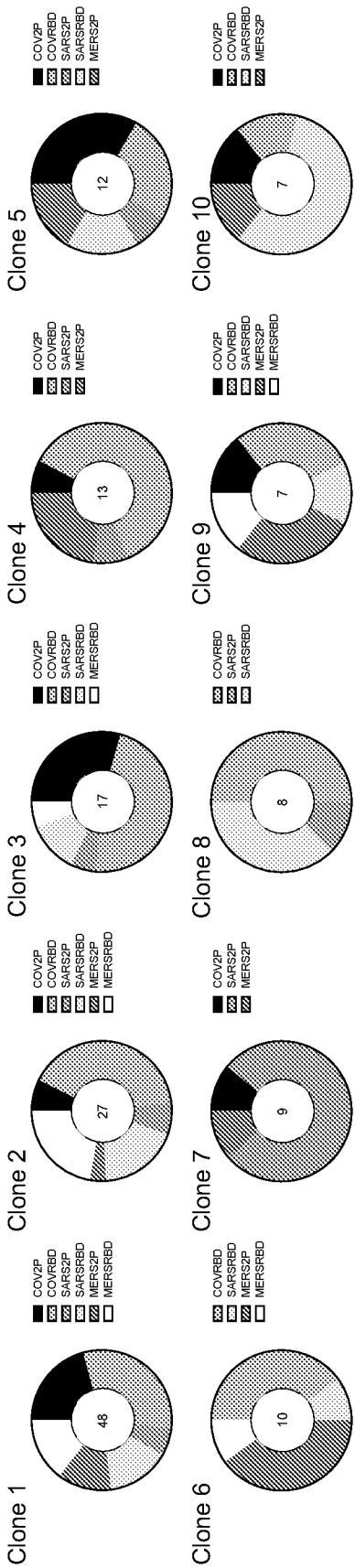


FIG. 36

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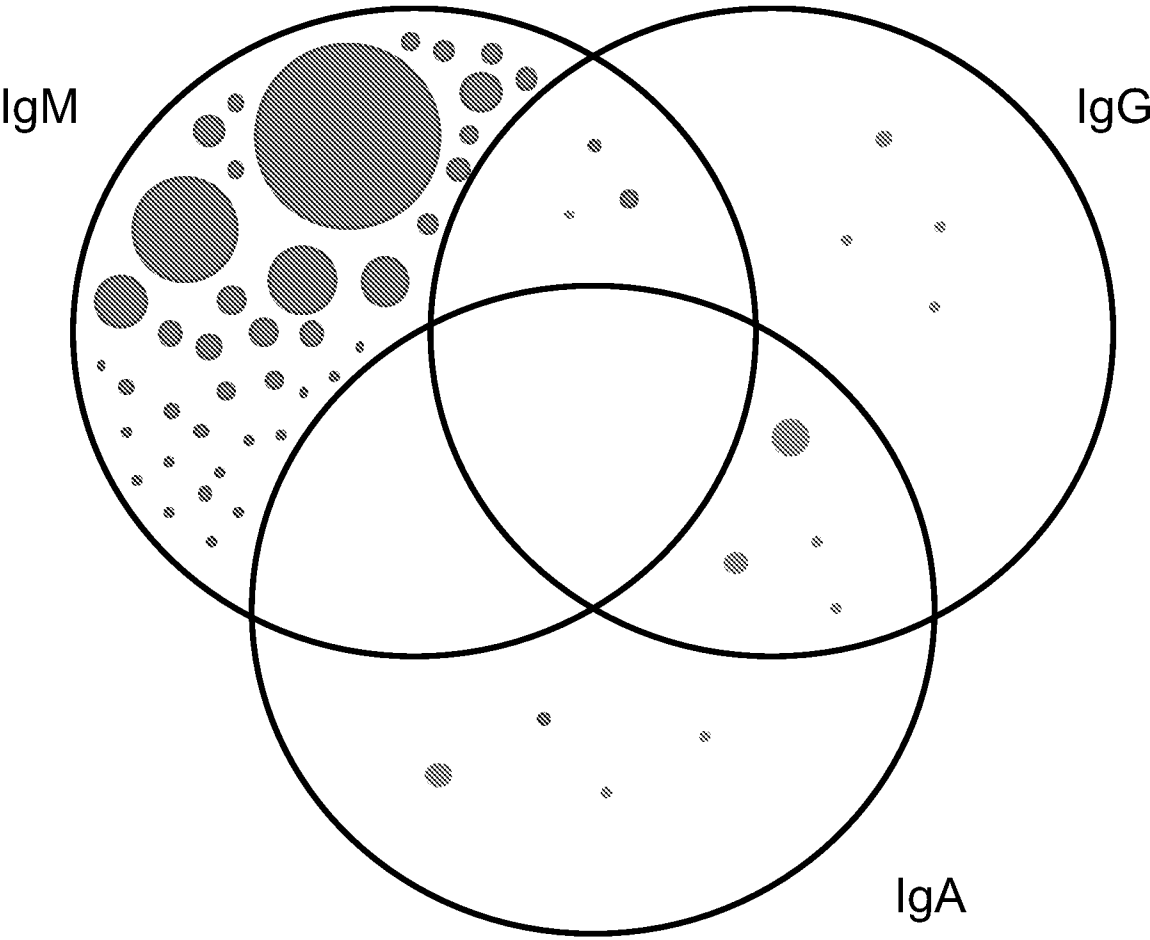


FIG. 37

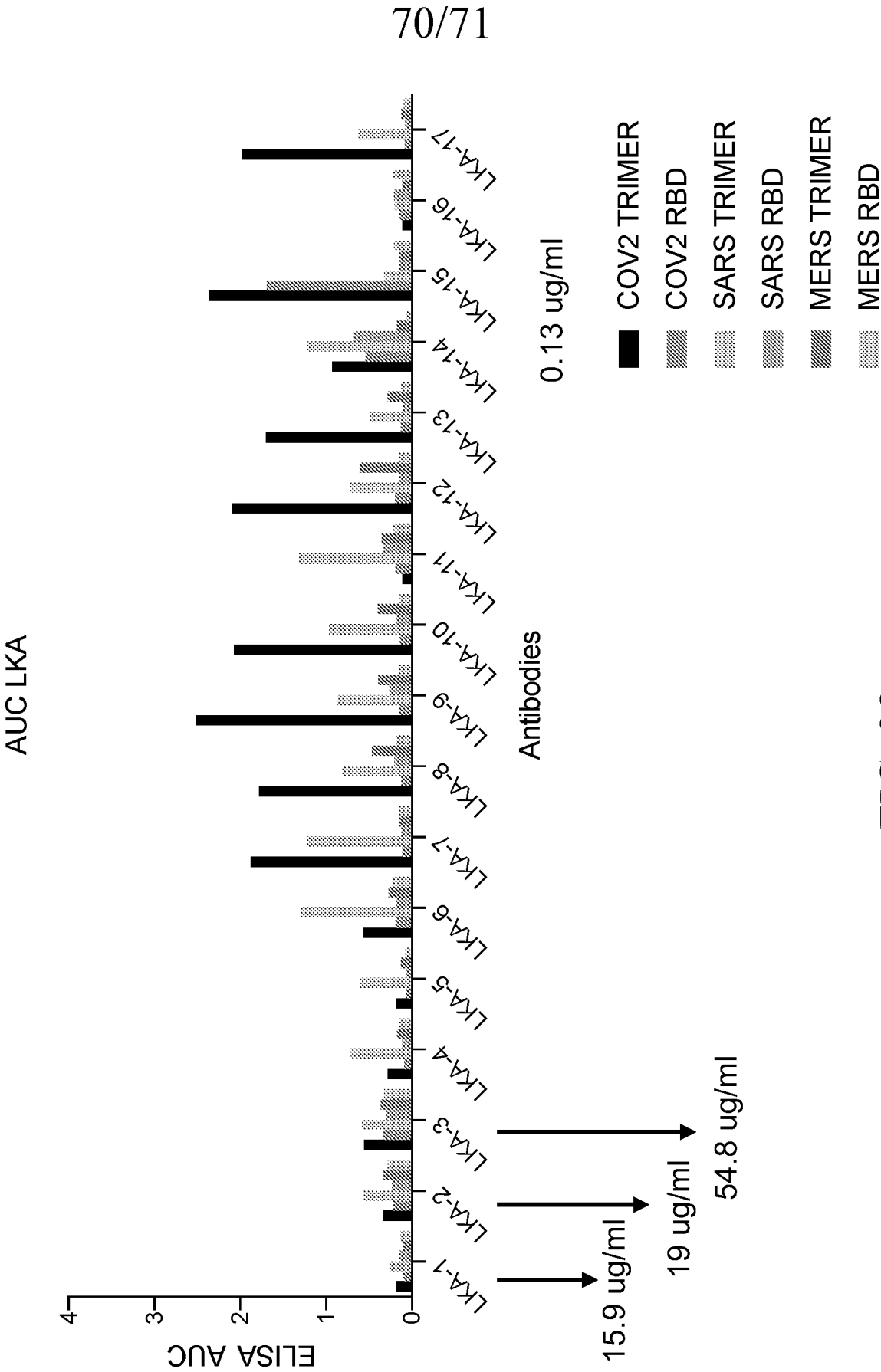


FIG. 38

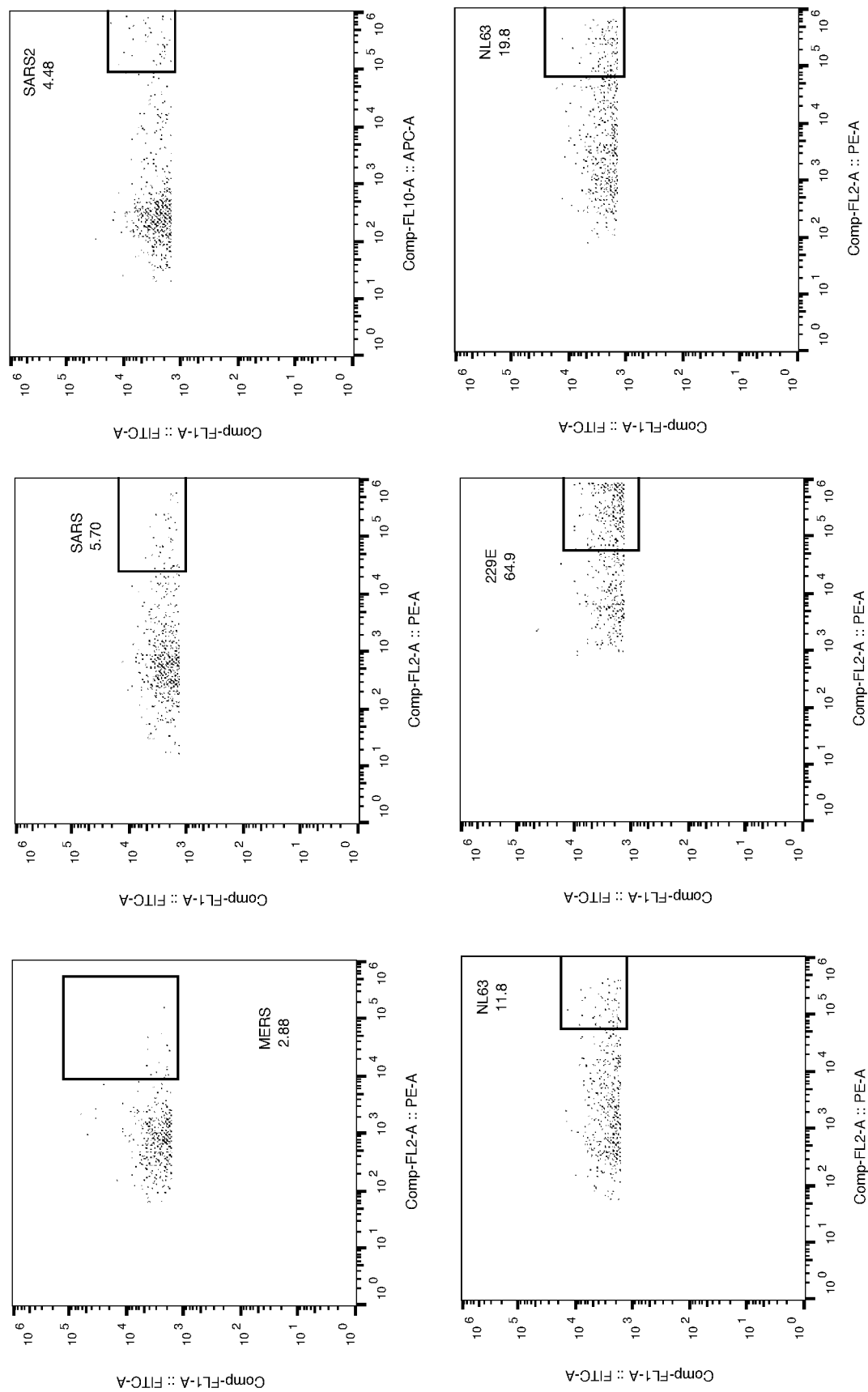


FIG. 39

INTERNATIONAL SEARCH REPORT

International application No.

PCT/US2021/065737

A. CLASSIFICATION OF SUBJECT MATTER

IPC(8) - A61K 39/395; A61K 39/42; A61P 31/14; C07K 16/10; C12N 15/13 (2022.01)

CPC - A61K 39/42; A61K 2039/505; A61P 31/14; C07K 16/10; C07K 2317/565; C07K 2317/76 (2022.05)

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

see Search History document

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

see Search History document

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

see Search History document

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	WO 2004/099251 A2 (ALBERT EINSTEIN COLLEGE OF MEDICINE OF YESHIVA UNIVERSITY et al) 18 November 2004 (18.11.2004) entire document	1-3, 24-28
A ✓	CN 111981133 B (WEIFANG MEDICAL UNIVERSITY) 20 November 2020 (20.11.2020) entire document	1-3, 24-28
A	US 10,787,501 B1 (REGENERON PHARMACEUTICALS INC.) 29 September 2020 (29.09.2020) entire document	1-3, 24-28

☐ Further documents are listed in the continuation of Box C.☐ See patent family annex.

* Special categories of cited documents:

"A" document defining the general state of the art which is not considered to be of particular relevance

"D" document cited by the applicant in the international application

"E" earlier application or patent but published on or after the international filing date

"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)

"O" document referring to an oral disclosure, use, exhibition or other means

"P" document published prior to the international filing date but later than the priority date claimed

"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art

"&" document member of the same patent family

Date of the actual completion of the international search

11 May 2022

Date of mailing of the international search report

JUN 06 2022

Name and mailing address of the ISA/US

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INTERNATIONAL SEARCH REPORT

International application No.

PCT/US2021/065737

Box No. I Nucleotide and/or amino acid sequence(s) (Continuation of item 1.c of the first sheet)

1. With regard to any nucleotide and/or amino acid sequence disclosed in the international application, the international search was carried out on the basis of a sequence listing:

- a. ☒ forming part of the international application as filed:
 - ☒ in the form of an Annex C/ST.25 text file.
 - ☐ on paper or in the form of an image file.
 - b. ☐ furnished together with the international application under PCT Rule 13ter.1(a) for the purposes of international search only in the form of an Annex C/ST.25 text file.
 - c. ☐ furnished subsequent to the international filing date for the purposes of international search only:
 - ☐ in the form of an Annex C/ST.25 text file (Rule 13ter.1(a)).
 - ☐ on paper or in the form of an image file (Rule 13ter.1(b) and Administrative Instructions, Section 713).
2. ☐ In addition, in the case that more than one version or copy of a sequence listing has been filed or furnished, the required statements that the information in the subsequent or additional copies is identical to that forming part of the application as filed or does not go beyond the application as filed, as appropriate, were furnished.

3. Additional comments:

SEQ ID NOs: 1, 2, 18, 44, 75, 185, 186, 447, and 755 were searched.

INTERNATIONAL SEARCH REPORT

International application No.

PCT/US2021/065737

Box No. II Observations where certain claims were found unsearchable (Continuation of item 2 of first sheet)

This international search report has not been established in respect of certain claims under Article 17(2)(a) for the following reasons:

1. ☐ Claims Nos.:
because they relate to subject matter not required to be searched by this Authority, namely:

2. ☐ Claims Nos.:
because they relate to parts of the international application that do not comply with the prescribed requirements to such an extent that no meaningful international search can be carried out, specifically:

3. ☒ Claims Nos.: 29-34
because they are dependent claims and are not drafted in accordance with the second and third sentences of Rule 6.4(a).

Box No. III Observations where unity of invention is lacking (Continuation of item 3 of first sheet)

This International Searching Authority found multiple inventions in this international application, as follows:

See extra sheet(s).

1. ☐ As all required additional search fees were timely paid by the applicant, this international search report covers all searchable claims.
2. ☐ As all searchable claims could be searched without effort justifying additional fees, this Authority did not invite payment of additional fees.
3. ☐ As only some of the required additional search fees were timely paid by the applicant, this international search report covers only those claims for which fees were paid, specifically claims Nos.:
4. ☒ No required additional search fees were timely paid by the applicant. Consequently, this international search report is restricted to the invention first mentioned in the claims; it is covered by claims Nos.:
1-3, 24-28

Remark on Protest

- ☐ The additional search fees were accompanied by the applicant's protest and, where applicable, the payment of a protest fee.
- ☐ The additional search fees were accompanied by the applicant's protest but the applicable protest fee was not paid within the time limit specified in the invitation.
- ☐ No protest accompanied the payment of additional search fees.

INTERNATIONAL SEARCH REPORT

International application No.

PCT/US2021/065737

Continued from Box No. III Observations where unity of invention is lacking

This application contains the following inventions or groups of inventions which are not so linked as to form a single general inventive concept under PCT Rule 13.1. In order for all inventions to be examined, the appropriate additional examination fees need to be paid.

Group I+: claims 1-28 are drawn to anti-SARS-CoV-2 antibodies.

Group II+: claim 35 is drawn to a method of identifying neutralizing antibodies from a subject infected with a virus.

The first invention of Group I+ is restricted to an antibody comprising a heavy chain variable region (VH) and a light chain variable region (VL), where the VH is selected to be SEQ ID NO:185 (HCBG1-1), which further contains CDR3 (SEQ ID NO:1), and the VL is selected to be SEQ ID NO:277 (KCBG1-1), which further contains CDR3 (SEQ ID NO:93). It is believed that claims 1-3 and 24-28 read on this first named invention and thus these claims will be searched without fee to the extent that they read on SEQ ID NO:185 and 278.

The first invention of Group II+ is restricted to a gene selected to be GRAMD1C and methods comprising the same.

Applicant is invited to elect additional antibody VH and VL, and their respective, corresponding, SEQ ID NOs to be searched in a specific combination by paying additional fee for each set of election. An exemplary election would be an antibody comprising a heavy chain variable region (VH) and a light chain variable region (VL), where the VH is selected to be SEQ ID NO:186, which further contains CDR3 (SEQ ID NO:2), and the VL is selected to be SEQ ID NO:278, which further contains CDR3 (SEQ ID NO:94). Additional antibody VH and VL, and their respective, corresponding, SEQ ID NOs will be searched upon the payment of additional fees. Applicants must specify the claims that read on any additional elected inventions. Applicants must further indicate, if applicable, the claims which read on the first named invention if different than what was indicated above for this group. Failure to clearly identify how any paid additional invention fees are to be applied to the "+" group(s) will result in only the first claimed invention to be searched/examined.

The inventions listed in Groups I+ do not relate to a single general inventive concept under PCT Rule 13.1, because under PCT Rule 13.2 they lack the same or corresponding special technical features for the following reasons:

The Groups I+ formulas do not share a significant structural element responsible for binding to a SARS-CoV-2 receptor-binding domain (RBD), or identifying neutralizing antibodies, requiring the selection of alternative VH and VL where "An antibody or antigen binding fragment thereof that binds to the SARS-CoV-2 receptor-binding domain (RBD) and/or SARS-CoV-2 spike trimer comprising: a complementarity-determining region 3 (CDR3) heavy chain and light chain pair that shares at least 90% identity with the heavy chain and/or light chain of a pair selected from the group consisting of: BG1-1, BG1-3 to BG1-28, BG4-1 to BG4-27, BG7-1 to BG7-7, BG7-9 to BG7-20, and BG10-1 to BG10-19 (SEQ ID NOS: 1-184); or a heavy chain and light chain pair that shares at least 90% identity with the heavy chain and/or light chain of a pair selected from the group consisting of: BG1-1, BG1-3 to BG1-28, BG4-1 to BG4-27, BG7-1 to BG7-7, BG7-9 to BG7-20, and BG10-1 to BG10-19 (SEQ ID NOS: 185-368)," and genes where "A method of identifying neutralizing antibodies from a subject infected with a virus comprising selecting antibodies expressed in B cells further expressing a transcriptional program, wherein the transcriptional program comprises one or more genes selected from the group consisting of: a. GRAMD1C, TMEM156, PDE4D, NFKBIA, S100A10, TKT, CAPG, CXCR3, CFLAR, IMGA1, MARCKSL1, PIM3, RHOF, MIF, ZFP36L1, NME2, MGAT4A, COCH, HOPX, ITGB2-AS1, BASP1, CD80, PAPSS1, CD70, LYPLAL1, LMNA, and FAS; or b. TKT, ARHGDIB, CFL1, CNN2, S100A10, HSPA8, HMGA1, PPIA, RAC2, CLIC1, SLC25A5, ARPCIB, SELL, PPPICA, CAPZB, PPP1R18, CAPG, LDHB, S100A4, VIM, LTB, ANXA2, LCP1, TUBB, ACTG1, GAPDH, ACTB, PFN1, CORO1A, and TMSB10; or c. CD27, CD80, CD46 and CD86."

The special technical features of Groups I+, anti-SARS-CoV-2 antibodies, are not present in Groups II+; and the special technical features of Groups II+, one or more genes selected from the group consisting of: a. GRAMD1C, TMEM156, PDE4D, NFKBIA, S100A10, TKT, CAPG, CXCR3, CFLAR, IMGA1, MARCKSL1, PIM3, RHOF, MIF, ZFP36L1, NME2, MGAT4A, COCH, HOPX, ITGB2-AS1, BASP1, CD80, PAPSS1, CD70, LYPLAL1, LMNA, and FAS; or b. TKT, ARHGDIB, CFL1, CNN2, S100A10, HSPA8, HMGA1, PPIA, RAC2, CLIC1, SLC25A5, ARPCIB, SELL, PPPICA, CAPZB, PPP1R18, CAPG, LDHB, S100A4, VIM, LTB, ANXA2, LCP1, TUBB, ACTG1, GAPDH, ACTB, PFN1, CORO1A, and TMSB10; or c. CD27, CD80, CD46 and CD86, are not present in Groups I+.

Additionally, even if Groups I+ and II+ were considered to share the technical features of an antibody or antigen binding fragment thereof that binds to the SARS-CoV-2 receptor-binding domain (RBD) and/or SARS-CoV-2 spike trimer comprising: a complementarity-determining region 3 (CDR3) heavy chain and light chain pair; an antibody or antigen binding fragment thereof that binds to the SARS, MERS and CoV-2 spike trimers outside of the receptor-binding domain (RBD) comprising a complementarity-determining region 3 (CDR3) heavy chain and light chain pair. However, these shared technical features do not represent a contribution over the prior art.

Specifically, US 10,787,501 B1 to Babb et al. discloses an antibody or antigen binding fragment thereof that binds to the SARS-CoV-2 receptor-binding domain (RBD) and/or SARS-CoV-2 spike trimer ([t]he present disclosure provides neutralizing human antigen-binding proteins that specifically bind to SARS-(CoV2-S, Col. 2, Lns. 8-10; CoV-S binds to its cognate receptor via a receptor binding domain (RBD) present in the S1 subunit, Col. 9, Lns. 52-54) comprising: a complementarity-determining region 3 (CDR3) heavy chain and light chain pair (HCDR3 ...LCDR3, Col. 4, Lns. 21-22); an antibody or antigen binding fragment thereof that binds to the SARS, MERS and CoV2 spike trimers outside of the receptor-binding domain (RBD) ([t]he present disclosure provides neutralizing human antigen-binding proteins that specifically bind to SARS-(CoV2-S, Col. 2, Lns. 8-10; CoV-S binds to its cognate receptor via a receptor binding domain (RBD) present in the S1 subunit, Col. 9, Lns. 52-54) comprising a complementarity-determining region 3 (CDR3) heavy chain and light chain pair (HCDR3 ...LCDR3, Col. 4, Lns. 21-22).

The inventions listed in Groups I+ and II therefore lack unity under Rule 13 because they do not share a same or corresponding special technical features.