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(54) Title: TARGETING HOST-BACTERIA INTERACTIONS FOR THE TREATMENT OF MICROBIOTA-MEDIATED DISEASES

(57) Abstract: The present invention generally relates to compositions and methods for modulating specific paired host protein-microbiota interactions and the use thereof for the prevention and treatment of diseases and disorders.



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TITLE OF THE INVENTION

Targeting host-bacteria interactions for the treatment of microbiota-mediated diseases

CROSS REFERENCE TO RELATED APPLICATIONS

5 This application claims priority to U.S. Provisional Application No. 63/114,627, filed November 17, 2020 which is hereby incorporated by reference herein in its entirety.

BACKGROUND OF THE INVENTION

10 Direct interactions with host proteins are key factors in microbial infections and provide insight into mechanisms of bacterial pathogenesis. By contrast, the collective understanding of the molecular mechanisms by which host-associated microbial communities (microbiotas) interact with host proteins is comparatively limited. This is despite widespread evidence of close physical association between select
15 members of the microbiota and host tissues and the profound effects of the microbiome on host physiology. A limitation to better understanding direct host-microbe interactions is the paucity of systems and methods for high-throughput screening of microbial binding by host extracellular proteins – those most likely to come into contact with microbes.

 Thus, there is a need in the art for improved systems and high-throughput
20 methods for identifying microbial interactions with specific host proteins that would enable mapping of host-microbiota interactions at scale. This invention satisfies this unmet need.

SUMMARY OF THE INVENTION

25 In one embodiment, the invention relates to a composition for modulating an interaction of a host protein with an associated microbial cell, wherein the host protein and microbial cell are interacting partners selected from the group consisting of host protein and microbial cell interacting partners as set forth in Table 1.

 In one embodiment, the modulator is an inhibitor of the host protein
30 selected from the group consisting of the host protein listed in Table 1.

In one embodiment, the inhibitor is a small interfering RNA (siRNA), a microRNA, an antisense nucleic acid, a ribozyme, an expression vector encoding a transdominant negative mutant, an antibody, an antibody fragment, a peptide, a chemical compound or a small molecule.

5 In one embodiment, the modulator is an activator of a host protein listed in Table 1. In one embodiment, the activator increases one or more of transcription and translation of the host protein listed in Table 1.

In one embodiment, the activator is a nucleic acid, a protein, a peptide, a peptidomimetic, a chemical compound or a small molecule.

10 In one embodiment, the interaction of the host protein with the associated microbial cell is the interaction of *Fusobacterium* with an immune-modulatory protein. In one embodiment, the immune-modulatory protein is AGER, BTN3A3, BTNL8, C3AR, CCL5, CCR9, CD55, CD99L2, CEACAM4, CSF3, DKK1, DKK2, IL15RA, LAIR1, MADCAM1, MCAM, MERTK, NPY5R, SIRPA, SOST, TMEM149, TNFRSF10B, 15 TNFRSF4, or TREML1. In one embodiment, the interaction of the host protein with the associated microbial cell is the interaction of *Ruminococcus gnavus* with CD7, TFF1, TFF2, or TFF3.

In one embodiment, the invention relates to a method of modulating an interaction of a host protein with an associated microbial cell, wherein the host protein 20 and microbial cell are interacting partners selected from the group consisting of host protein and microbial cell interacting partners as set forth in Table 1, the method comprising contacting a host cell with a composition for modulating the interaction of the host protein and the microbial cell.

In one embodiment, the modulator is an inhibitor of a host protein listed in 25 Table 1. In one embodiment, the inhibitor is a small interfering RNA (siRNA), a microRNA, an antisense nucleic acid, a ribozyme, an expression vector encoding a transdominant negative mutant, an antibody, an antibody fragment, a peptide, a chemical compound or a small molecule.

In one embodiment, the modulator is an activator a host protein listed in 30 Table 1. In one embodiment, the activator increases one or more of transcription and translation of a host protein listed in Table 1. In one embodiment, the activator is a

nucleic acid, a protein, a peptide, a peptidomimetic, a chemical compound or a small molecule.

In one embodiment, the invention relates to a method of treating or preventing a disease or disorder in a subject in need thereof, the method comprising
5 administering a composition for modulating the interaction of a host protein and a microbial cell to the subject, wherein the host protein and microbial cell are interacting partners selected from the group consisting of host protein and microbial cell interacting partners as set forth in Table 1.

In one embodiment, the modulator is an inhibitor of the host protein
10 selected from the group consisting of the host protein listed in Table 1.

In one embodiment, the inhibitor is a small interfering RNA (siRNA), a microRNA, an antisense nucleic acid, a ribozyme, an expression vector encoding a transdominant negative mutant, an antibody, an antibody fragment, a peptide, a chemical compound or a small molecule.

15 In one embodiment, the modulator is an activator of a host protein listed in Table 1. In one embodiment, the activator increases one or more of transcription and translation of a host protein listed in Table 1.

In one embodiment, the activator is a nucleic acid, a protein, a peptide, a peptidomimetic, a chemical compound or a small molecule.

20 In one embodiment, the disease or disorder is inflammatory diseases, inflammatory bowel disease (IBD), irritable bowel syndrome (IBS), obesity, type 2 diabetes, cardiovascular disease, Alzheimer's disease, Parkinson's disease, cancer or atopy.

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BRIEF DESCRIPTION OF THE DRAWINGS

The following detailed description of embodiments of the invention will be better understood when read in conjunction with the appended drawings. It should be understood that the invention is not limited to the precise arrangements and
30 instrumentalities of the embodiments shown in the drawings.

Figure 1 depicts a diagram demonstrating that BASEHIT profiling enables screening of hundreds of isolates representing a broad sample of the human microbiome

against the human exoproteome to identify global patterns as well as highlight individual bacterial activities.

Figure 2 depicts exemplary results demonstrating heatmap visualization of all binary interactions between 519 screened strains and 3336 host proteins.

5 Figure 3A and Figure 3B depict exemplary results demonstrating orthogonal validations of newly identified host-microbe interactions by flow cytometry (Figures 3A) or ELISA (Figure 3D). Staining with indicated Fc-fusion proteins (red, green, blue) is compared to Fc-control protein (black).

10 Figure 4 depicts exemplary results demonstrating that host-microbe interaction patterns vary substantially across the collective human microbiome. Bars represent the tissue of origin for microbial strains (left column), phylum (middle column), and number of detected interactions with host proteins (right). Flows between bars represent the fraction of strains sharing the properties of the two connected bars.

15 Figure 5A through Figure 5B depict exemplary results demonstrating that host-specific interactions vary across closely related strains of microbes. Figure 5A depicts exemplary results demonstrating a bar plot of interactions with skin-expressed proteins across *Staphylococcus* isolates. Each column represents a single strain and is colored according to species. Bars above the x-axis represent hits. Figure 5B depicts the network of interactions between *Staphylococcus* strains from various species and host
20 proteins. Strains and proteins, represented as differently colored circles, are connected by a line if there is a detected interaction between that particular strain/protein pair.

 Figure 6A depicts exemplary results demonstrating that staining of *R. gnavus* strains NWP327 (red), 325 (blue), and 326 (black) show strain-level variability in CD7 binding.

25 Figure 6B depicts exemplary results demonstrating that staining of *R. gnavus* NWP327 with increasing concentrations of human or mouse CD7 protein shows species specificity in host receptor binding.

 Figure 7 depicts exemplary results demonstrating interactions of *Fusobacterium* strains with tissue and immune proteins. Each strain is a row, while each
30 protein is a column. If an interaction was detected between a particular strain/protein pair, a grey circle is shown.

DETAILED DESCRIPTION

The present invention relates to systems and methods for large-scale, high-throughput mapping of host protein-microbiota interactions. The present invention is based, in part, on the optimization and validation of the BASEHIT technique and, in part, on the identification of novel host protein-microbiota interactions identified in Table 1. In some embodiments, invention provides composition and methods for modulating host protein-microbe interactions. In some embodiments, the host protein-microbe interaction is modulated to alleviate symptoms of a disease or disorder mediated by said interactions. In some embodiments, the invention provides methods of inhibiting one or more host protein-microbe interaction. In some embodiments, the invention provides methods of promoting one or more host protein-microbe interaction.

Definitions

Unless defined otherwise, all technical and scientific terms used herein have the same meaning as commonly understood by one of ordinary skill in the art to which this invention belongs.

As used herein, each of the following terms has the meaning associated with it in this section.

The articles “a” and “an” are used herein to refer to one or to more than one (*i.e.*, to at least one) of the grammatical object of the article. By way of example, “an element” means one element or more than one element.

“About” as used herein when referring to a measurable value such as an amount, a temporal duration, and the like, is meant to encompass variations of $\pm 20\%$, $\pm 10\%$, $\pm 5\%$, $\pm 1\%$, or $\pm 0.1\%$ from the specified value, as such variations are appropriate to perform the disclosed methods.

The term “activate,” as used herein, means to induce or increase an activity or function, for example, about ten percent relative to a control value. Preferably, the activity is induced or increased by 50% compared to a control value, more preferably by 75%, and even more preferably by 95%. “Activate,” as used herein, also means to increase a molecule, a reaction, an interaction, a gene, an mRNA, and/or a protein’s

expression, stability, function or activity by a measurable amount or to increase entirely. Activators are compounds that, e.g., bind to, partially or totally induce stimulation, increase, promote, induce activation, activate, sensitize, or up regulate a protein, a gene, and an mRNA stability, expression, function and activity, e.g., agonists.

5 As used herein in reference to a display library, a “barcode” refers to a unique molecular identifier to distinguish cells expressing distinct display molecules. For example, the barcode may be a unique DNA sequence within a cell that corresponds to a display molecule expressed by said cell. This barcode may be detected using methods including, but not limited to, next generation sequencing

10 As used herein the term “cell surface molecule” refers to a peptide, polypeptide, binding domain, ligand, lipid, or carbohydrate that is directed to the extracellular surface of the host cell. The cell surface molecule may be anchored to the cell surface by covalent binding or non-covalent binding. The cell surface molecule may include a phospholipid, carbohydrate, or protein through which it attaches to the surface
15 of the host cell. The cell surface molecule may be a polypeptide that binds to, or is conjugated to, a phospholipid, carbohydrate, or a polypeptide on the surface of the cell. For example, the polypeptide may use a phosphatidyl-inositol-glycan (GPI) anchor to attach to the surface of the cell, such as a-agglutinins, α -agglutinins, and flocculins. The cell surface molecule may also be a transmembrane protein.

20 “Coding sequence” or “encoding nucleic acid” as used herein may refer to the nucleic acid (RNA or DNA molecule) that comprise a nucleotide sequence which encodes an antigen set forth herein. The coding sequence may further include initiation and termination signals operably linked to regulatory elements including a promoter and polyadenylation signal capable of directing expression in the one or more cells of an
25 individual or mammal to whom the nucleic acid is administered. The coding sequence may further include sequences that encode signal peptides.

A “constitutive” promoter is a nucleotide sequence which, when operably linked with a polynucleotide which encodes or specifies a gene product, causes the gene product to be produced in a cell under most or all physiological conditions of the cell.

30 A “disease” is a state of health of an animal wherein the animal cannot maintain homeostasis, and wherein if the disease is not ameliorated then the animal’s

health continues to deteriorate. In contrast, a “disorder” in an animal is a state of health in which the animal is able to maintain homeostasis, but in which the animal’s state of health is less favorable than it would be in the absence of the disorder. Left untreated, a disorder does not necessarily cause a further decrease in the animal’s state of health.

5 A disease or disorder is “alleviated” if the severity of a sign or symptom of the disease, or disorder, the frequency with which such a sign or symptom is experienced by a patient, or both, is reduced.

 As used herein the term “display molecule” refers to a molecule that can be localized to the surface of a target cell. The display molecule will typically comprise a
10 first amino acid sequence to be displayed (e.g., a protein of interest, etc.) and a second amino acid sequence that anchors the display molecule to the surface of the target cell (e.g., a transmembrane domain, etc.). In certain instances, the first and second amino acid sequences are linked in a single polypeptide. In an alternative embodiment, the first and second amino acid sequences may interact with each other to anchor the first amino acid
15 sequence to the surface of a target cell. A display molecule may comprise a peptide, polypeptide, binding domain, ligand, lipid, or carbohydrate or combination thereof. The display molecule may also comprise a tag or peptide that can be labeled so as to detect binding of the display molecule to the cell surface, or sort cells displaying said molecule.

 As used herein the term “display library” refers to a plurality of cells,
20 wherein each cell comprises a non-identical display molecule that is displayed on the surface of the cell.

 As used herein the term “enrich” or “enrichment” refers to the state or process, respectively, of increasing the proportion of a species of interest within a mixed pool of species through some form of selection. For example, a protein of interest can be
25 enriched from a mixed sample of multiple proteins using positive selection with a protein-specific antibody.

 The term “expression” as used herein is defined as the transcription of a particular nucleotide sequence driven by its promoter and/or the translation of said nucleotide sequence into an amino acid sequence.

30 An “expression cassette” is a nucleic acid construct, generated recombinantly or synthetically, with a series of specified nucleic acid elements that

permit transcription of a particular polynucleotide sequence in a host cell. An expression cassette may be part of a plasmid, viral genome, or nucleic acid fragment. Typically, an expression cassette includes a polynucleotide to be transcribed, operably linked to a promoter.

5 The term “gene” means the segment of DNA involved in producing a polypeptide chain. It may include regions preceding and following the coding region (leader and trailer) as well as intervening sequences (introns) between individual coding segments (exons).

 As used herein, an “inducible” promoter is a nucleotide sequence which,
10 when operably linked with a polynucleotide which encodes or specifies a gene product, causes the gene product to be produced substantially only when an inducer which corresponds to the promoter is present.

 The term “inhibit,” as used herein, means to suppress or block an activity or function, for example, about ten percent relative to a control value. Preferably, the
15 activity is suppressed or blocked by 50% compared to a control value, more preferably by 75%, and even more preferably by 95%. “Inhibit,” as used herein, also means to reduce a molecule, a reaction, an interaction, a gene, an mRNA, and/or a protein’s expression, stability, function or activity by a measurable amount or to prevent entirely. Inhibitors are compounds that, e.g., bind to, partially or totally block stimulation, decrease, prevent,
20 delay activation, inactivate, desensitize, or down regulate a protein, a gene, and an mRNA stability, expression, function and activity, e.g., antagonists.

 As used herein, an “instructional material” includes a publication, a recording, a diagram, or any other medium of expression which can be used to communicate the usefulness of a compound, composition, vector, or delivery system of
25 the invention in the kit for effecting alleviation of the various diseases or disorders recited herein. Optionally, or alternately, the instructional material can describe one or more methods of alleviating the diseases or disorders in a cell or a tissue of a mammal. The instructional material of the kit of the invention can, for example, be affixed to a container which contains the identified compound, composition, vector, or delivery
30 system of the invention or be shipped together with a container which contains the identified compound, composition, vector, or delivery system. Alternatively, the

instructional material can be shipped separately from the container with the intention that the instructional material and the compound be used cooperatively by the recipient.

“Measuring” or “measurement,” or alternatively “detecting” or “detection,” means assessing the presence, absence, quantity or amount (which can be an effective amount) of a given substance.

The term “modulate,” as used herein, refers to mediating a detectable increase or decrease in a desired response. For example, a small molecule may be used to increase or decrease the level of interaction between two proteins.

As used herein, the term “next generation sequencing” refers to sequencing methods that allow for massively parallel sequencing of clonally amplified molecules and of single nucleic acid molecules. Next generation sequencing is synonymous with “massively parallel sequencing” for most purposes. Non-limiting examples of next generation sequencing include sequencing-by-synthesis using reversible dye terminators, and sequencing-by-ligation.

The term “nucleic acid” or “polynucleotide” refers to deoxyribonucleic acids (DNA) or ribonucleic acids (RNA) and polymers thereof in either single- or double-stranded form. Unless specifically limited, the term encompasses nucleic acids containing known analogues of natural nucleotides that have similar binding properties as the reference nucleic acid and are metabolized in a manner similar to naturally occurring nucleotides. Unless otherwise indicated, a particular nucleic acid sequence also implicitly encompasses conservatively modified variants thereof (e.g., degenerate codon substitutions), alleles, orthologs, SNPs, and complementary sequences as well as the sequence explicitly indicated. Specifically, degenerate codon substitutions may be achieved by generating sequences in which the third position of one or more selected (or all) codons is substituted with mixed-base and/or deoxyinosine residues (Batzer et al., Nucleic Acid Res. 19:5081 (1991); Ohtsuka et al., J. Biol. Chem. 260:2605-2608 (1985); and Rossolini et al, Mol. Cell. Probes 8:91-98 (1994)). The term nucleic acid is used interchangeably with gene, cDNA, and mRNA encoded by a gene.

“Operably linked” as used herein may mean that expression of a gene is under the control of a promoter with which it is spatially connected. A promoter may be positioned 5' (upstream) or 3' (downstream) of a gene under its control. The distance

between the promoter and a gene may be approximately the same as the distance between that promoter and the gene it controls in the gene from which the promoter is derived. As is known in the art, variation in this distance may be accommodated without loss of promoter function.

5 As used herein, a “plurality of cells” herein is meant roughly from about 10^3 cells to 10^8 or 10^9 , with from 10^6 to 10^8 being common.

As used herein, the term “plurality of display molecules” refers to at least two copies of a display molecule displayed on the surface of a target cell. In certain instances, each unique display molecule is displayed by a different target cell.

10 As used herein in reference to interactions, “promote” refers to inducing or increasing an interaction between two species. For example, a small molecule may promote or increase interactions between two proteins.

“Promoter” as used herein may mean a synthetic or naturally-derived molecule which is capable of conferring, activating or enhancing expression of a nucleic acid in a cell. A promoter may comprise one or more specific transcriptional regulatory sequences to further enhance expression and/or to alter the spatial expression and/or temporal expression of same. A promoter may also comprise distal enhancer or repressor elements, which can be located as much as several thousand base pairs from the start site of transcription. A promoter may be derived from sources including viral, bacterial, fungal, plants, insects, and animals. A promoter may regulate the expression of a gene component constitutively, or differentially with respect to cell, the tissue or organ in which expression occurs or, with respect to the developmental stage at which expression occurs, or in response to external stimuli such as physiological stresses, pathogens, metal ions, or inducing agents. Representative examples of promoters include the promoters from GAL1 (galactose), PGK (phosphoglycerate kinase), ADH (alcohol dehydrogenase), AOX1 (alcohol oxidase), HIS4 (histidinol dehydrogenase), metallothionein, 3-phosphoglycerate kinase, such as enolase, glyceraldehyde-3-phosphate dehydrogenase, hexokinase, pyruvate decarboxylase, phospho-fructokinase, glucose-6-phosphate isomerase, 3-phosphoglycerate mutase, pyruvate kinase, triosephosphate isomerase, phospho-glucose isomerase, and glucokinase.

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The term “regulating” as used herein can mean any method of altering the level or activity of a substrate. Non-limiting examples of regulating with regard to a protein include affecting expression (including transcription and/or translation), affecting folding, affecting degradation or protein turnover, and affecting localization of a protein.

- 5 Non-limiting examples of regulating with regard to an enzyme further include affecting the enzymatic activity. “Regulator” refers to a molecule whose activity includes affecting the level or activity of a substrate. A regulator can be direct or indirect. A regulator can function to activate or inhibit or otherwise modulate its substrate.

- The terms “subject”, “individual”, “patient” and the like are used
10 interchangeably herein, and refer to any animal, or cells thereof whether in vitro or in situ, amenable to the methods described herein. In some non-limiting embodiments, the patient, subject or individual is a human. In various embodiments, the subject is a human subject, and may be of any race, sex, and age.

- “Vector” as used herein may mean a nucleic acid sequence containing an
15 origin of replication. A vector may be a plasmid, bacteriophage, bacterial artificial chromosome or yeast artificial chromosome. A vector may be a DNA or RNA vector. A vector may be either a self-replicating extrachromosomal vector or a vector which integrates into a host genome.

- As used herein, the term “wild-type” refers to a gene or gene product
20 isolated from a naturally occurring source. A wild-type gene is that which is most frequently observed in a population and is thus arbitrarily designed the “normal” or “wild-type” form of the gene. In contrast, the term “modified” or “mutant” refers to a gene or gene product that displays modifications in sequence and/or functional properties (i.e., altered characteristics) when compared to the wild-type gene or gene product. It is
25 noted that naturally occurring mutants can be isolated; these are identified by the fact that they have altered characteristics (including altered nucleic acid sequences) when compared to the wild-type gene or gene product

- Ranges: throughout this disclosure, various aspects of the invention can be presented in a range format. It should be understood that the description in range format
30 is merely for convenience and brevity and should not be construed as an inflexible limitation on the scope of the invention. Accordingly, the description of a range should be

considered to have specifically disclosed all the possible subranges as well as individual numerical values within that range. For example, description of a range such as from 1 to 6 should be considered to have specifically disclosed subranges such as from 1 to 3, from 1 to 4, from 1 to 5, from 2 to 4, from 2 to 6, from 3 to 6 etc., as well as individual
5 numbers within that range, for example, 1, 2, 2.7, 3, 4, 5, 5.3, and 6. This applies regardless of the breadth of the range.

Description

In one embodiment, the method relates to the identification of direct
10 binding interactions between a host protein and a microbial cell using BASEHIT (described in WO2018208877, incorporated herein by reference). In some embodiments the invention relates to a composition for modulating the interaction of one or more host protein and a microbial cell, and methods of use thereof. Modulating the interaction of a host protein and a microbial cell can be done through a variety of well-understood means,
15 including, but not limited to, antibodies, inhibitory nucleic acid molecules (e.g., siRNA), small molecules, proteins, drug modalities or by targeting individual bacteria that have an effect on the host.

In various embodiments, the compositions of the invention include modulators of host proteins, modulators of microbial cells, and modulators of the
20 interaction between a host protein and a microbial cell. In some embodiments, the host protein is selected from a protein identified in Table 1. In some embodiments, the microbial cell is selected from a strain identified in Table 1.

Exemplary specific interactions that are included in Table 1, and can be modulated according to the invention include, but are not limited to, the interaction of a
25 Streptococcus strain with BACE2, a protease involved in Alzheimer's disease; interactions between strains of Fusobacterium isolated from colon tumors and immune-modulatory proteins; and interactions between Ruminococcus gnavus strains isolated from IBD patients and proteins expressed on T cells, including CD7 and members of the TNF receptor superfamily including, but not limited to, TMEM149, TNFRSF1B,
30 TNFRSF4, TNFRSF7, TNFRSF9. Therefore, in one embodiment, the invention includes compositions and methods for modulating the interaction of Streptococcus with BACE2.

In one embodiment, the invention includes compositions and methods for modulating the interaction of *Fusobacterium* and immune-modulatory proteins including, but not limited to, AGER, BTN3A3, BTNL8, C3AR, CCL5, CCR9, CD55, CD99L2, CEACAM4, CSF3, DKK1, DKK2, IL15RA, LAIR1, MADCAM1, MCAM, MERTK, NPY5R, SIRPA, SOST, TMEM149, TNFRSF10B, TNFRSF4, and TREML1. In one embodiment, the invention includes compositions and methods for modulating the interaction of *Ruminococcus gnavus* and proteins expressed on T cells, including CD7 and members of the TNF receptor superfamily including, but not limited to, CD7, TFF1, TFF2, and TFF3. In one embodiment, the invention includes compositions and methods for modulating the interaction of *Citrobacter* and a fibroblast growth factor (FGF) including, but not limited to, FGF1 and FGF7.

Activators

In various embodiments, the present invention includes compositions and methods of modulating a host protein, or the interaction of a host protein with a microbial cell, or a combination thereof, to activate or increase the level of interaction between the host protein and the microbial cell.

Therefore, in various embodiments, the composition for modulating a host protein, or the interaction of a host protein with a microbial cell, or a combination thereof, increases the amount of host protein polypeptide, the amount of host protein mRNA, the amount of host protein activity, or a combination thereof.

It will be understood by one skilled in the art, based upon the disclosure provided herein, that an increase in the level of the host protein encompasses the increase in host protein expression, including transcription, translation, or both. The skilled artisan will also appreciate, once armed with the teachings of the present invention, that an increase in the level of the host protein includes an increase in host protein activity. Thus, increasing the level or activity of a host protein includes, but is not limited to, increasing the amount of the host protein polypeptide, increasing transcription, translation, or both, of a nucleic acid encoding the host protein; and it also includes increasing any activity of a host protein polypeptide as well, such that the activity results in an increase in interaction of the host protein with a microbial cell.

In some embodiments, the present invention relates to the prevention and treatment of a disease or disorder by administration of a host protein polypeptide, a recombinant host protein polypeptide, an active host protein polypeptide fragment, or an activator of host protein expression or activity.

5 Activation of a host protein can be assessed using a wide variety of methods, including those disclosed herein, as well as methods well-known in the art or to be developed in the future. That is, a person of skill in the art would appreciate, based upon the disclosure provided herein, that increasing the level or activity of a host protein can be readily assessed using methods that assess the level of a nucleic acid encoding the
10 host protein (e.g., mRNA) and/or the level of host protein polypeptide in a biological sample obtained from a subject.

 A host protein activator can include, but should not be construed as being limited to, a chemical compound, a protein, a peptidomimetic, an antibody, and a nucleic acid molecule. One of skill in the art would readily appreciate, based on the disclosure
15 provided herein, that a host protein activator encompasses a chemical compound that increases the level, activity, or the like of host protein. Additionally, a host protein activator encompasses a chemically modified compound, and derivatives, as is well known to one of skill in the chemical arts.

 Further, one of skill in the art would, when equipped with this disclosure
20 and the methods exemplified herein, appreciate that a host protein activator includes such activators as discovered in the future, as can be identified by well-known criteria in the art of pharmacology, such as the physiological results of activation of host protein as described in detail herein and/or as known in the art. Therefore, the present invention is not limited in any way to any particular host protein activator as exemplified or disclosed
25 herein; rather, the invention encompasses those activators that would be understood by one of skill in the art to be useful, as are known in the art, and as are discovered in the future.

 Further methods of identifying and producing a host protein activator are well known to those of ordinary skill in the art, including, but not limited, obtaining an
30 activator from a naturally occurring source. Alternatively, a host protein activator can be synthesized chemically. Further, one of skill in the art would appreciate, based upon the

teachings provided herein, that a host protein activator can be obtained from a recombinant organism. Compositions and methods for chemically synthesizing host protein activators and for obtaining them from natural sources are well known in the art and are described in the art.

5 One of skill in the art will appreciate that an activator can be administered as a small molecule chemical, a protein, a nucleic acid construct encoding a protein, or combinations thereof. Numerous vectors and other compositions and methods are well known for administering a protein or a nucleic acid construct encoding a protein to cells or tissues. Therefore, the invention includes a method of administering a protein or a
10 nucleic acid encoding a protein that is an activator of host protein.

 One of skill in the art will realize that diminishing the amount or activity of a molecule that itself diminishes the amount or activity of host protein can serve to increase the amount or activity of host protein. Exemplary inhibitory compositions include, but are not limited to, antisense oligonucleotides, antibodies, small molecule
15 chemical compounds and other inhibitory compositions as discussed elsewhere herein. Any inhibitor of a regulator of host protein is encompassed in the invention.

 In some embodiments, the host protein activator compositions and methods of the invention can selectively activate the host protein. Thus, in various embodiments, the present invention relates to compositions comprising a host protein
20 polypeptide, a recombinant host protein polypeptide, or an active host protein polypeptide fragment.

 One of skill in the art will appreciate that a host protein polypeptide, a recombinant host protein polypeptide, or an active host protein polypeptide fragment can be administered singly or in any combination thereof. Further, a host protein polypeptide,
25 a recombinant host protein polypeptide, or an active host protein polypeptide fragment can be administered singly or in any combination thereof in a temporal sense, in that they may be administered simultaneously, before, and/or after each other. One of ordinary skill in the art will appreciate, based on the disclosure provided herein, that a host protein polypeptide, a recombinant host protein polypeptide, or an active host protein
30 polypeptide fragment can be used to prevent or treat a disease or disorder, and that an activator can be used alone or in any combination with another host protein polypeptide,

recombinant host protein polypeptide, active host protein polypeptide fragment, or host protein activator to effect a therapeutic result.

One of skill in the art, when armed with the disclosure herein, would appreciate that the treating or preventing a disease or disorder encompasses administering
5 to a subject a host protein polypeptide, a recombinant host protein polypeptide, an active host protein polypeptide fragment, or host protein activator as a preventative measure against a neurodegenerative disease or disorder. As more fully discussed elsewhere herein, methods of increasing the level or activity of a host protein encompass a wide
10 plethora of techniques for increasing not only host protein activity, but also for increasing expression of a nucleic acid encoding host protein. Additionally, as disclosed elsewhere herein, one skilled in the art would understand, once armed with the teaching provided herein, that the present invention encompasses a method of preventing a wide variety of diseases where increased expression and/or interaction of a host protein with a microbial cell mediates, treats or prevents the disease. Further, the invention encompasses treatment
15 or prevention of such diseases discovered in the future.

The invention encompasses administration of a host protein polypeptide, a recombinant host protein polypeptide, an active host protein polypeptide fragment, or a host protein activator to practice the methods of the invention; the skilled artisan would understand, based on the disclosure provided herein, how to formulate and administer the
20 appropriate host protein polypeptide, recombinant host protein polypeptide, active host protein polypeptide fragment, or host protein activator to a subject. However, the present invention is not limited to any particular method of administration or treatment regimen. This is especially true where it would be appreciated by one skilled in the art, equipped with the disclosure provided herein, including the reduction to practice using an art-
25 recognized model of a neurodegenerative disease, that methods of administering a host protein polypeptide, a recombinant host protein polypeptide, an active host protein polypeptide fragment, or host protein activator can be determined by one of skill in the pharmacological arts.

As used herein, the term “pharmaceutically-acceptable carrier” means a
30 chemical composition with which an appropriate host protein polypeptide, recombinant host protein polypeptide, active host protein polypeptide fragment, or host protein

activator, may be combined and which, following the combination, can be used to administer the appropriate host protein polypeptide, recombinant host protein polypeptide, active host protein polypeptide fragment, or host protein activator to a subject.

5

Inhibitors

In various embodiments, the present invention includes compositions and methods of modulating a host protein, or the interaction of a host protein with a microbial cell, or a combination thereof, which inhibit or decrease the level of interaction between
10 the host protein and the microbial cell.

Therefore, in various embodiments, the composition for modulating a host protein, or the interaction of a host protein with a microbial cell, or a combination thereof, decreases the amount of host protein polypeptide, the amount of host protein mRNA, the amount of host protein activity, or a combination thereof.

15

It will be understood by one skilled in the art, based upon the disclosure provided herein, that a decrease in the level of a host protein encompasses the decrease in the expression, including transcription, translation, or both. The skilled artisan will also appreciate, once armed with the teachings of the present invention, that a decrease in the level of the host protein includes a decrease in the activity of host protein. Thus, a
20 decrease in the level or activity of host protein includes, but is not limited to, decreasing the amount of polypeptide of the host protein, and decreasing transcription, translation, or both, of a nucleic acid encoding the host protein; and it also includes decreasing any activity of host protein as well, wherein the activity is associated with the interaction of the host protein and a microbial cell.

25

In one embodiment, the composition of the invention comprises an inhibitor of host protein. In one embodiment, the inhibitor is selected from the group consisting of a small interfering RNA (siRNA), a microRNA, an antisense nucleic acid, a ribozyme, an expression vector encoding a transdominant negative mutant, an antibody, a peptide and a small molecule.

30

One skilled in the art will appreciate, based on the disclosure provided herein, that one way to decrease the mRNA and/or protein levels of a host protein in a

cell is by reducing or inhibiting expression of the nucleic acid encoding the host protein. Thus, the protein level of the host protein in a cell can be decreased using a molecule or compound that inhibits or reduces gene expression such as, for example, siRNA, an antisense molecule or a ribozyme. However, the invention should not be limited to these
5 examples.

In one embodiment, siRNA is used to decrease the level of host protein. RNA interference (RNAi) is a phenomenon in which the introduction of double-stranded RNA (dsRNA) into a diverse range of organisms and cell types causes degradation of the complementary mRNA. In the cell, long dsRNAs are cleaved into short 21-25 nucleotide
10 small interfering RNAs, or siRNAs, by a ribonuclease known as Dicer. The siRNAs subsequently assemble with protein components into an RNA-induced silencing complex (RISC), unwinding in the process. Activated RISC then binds to complementary transcript by base pairing interactions between the siRNA antisense strand and the mRNA. The bound mRNA is cleaved and sequence specific degradation of mRNA
15 results in gene silencing. See, for example, U.S. Patent No. 6,506,559; Fire et al., 1998, Nature 391(19):306-311; Timmons et al., 1998, Nature 395:854; Montgomery et al., 1998, TIG 14 (7):255-258; David R. Engelke, Ed., RNA Interference (RNAi) Nuts & Bolts of RNAi Technology, DNA Press, Eagleville, PA (2003); and Gregory J. Hannon, Ed., RNAi A Guide to Gene Silencing, Cold Spring Harbor Laboratory Press, Cold
20 Spring Harbor, NY (2003). Soutschek et al. (2004, Nature 432:173-178) describe a chemical modification to siRNAs that aids in intravenous systemic delivery. Optimizing siRNAs involves consideration of overall G/C content, C/T content at the termini, Tm and the nucleotide content of the 3' overhang. See, for instance, Schwartz et al., 2003, Cell, 115:199-208 and Khvorova et al., 2003, Cell 115:209-216. Therefore, the present
25 invention also includes methods of decreasing levels of host protein at the protein level using RNAi technology.

In other related aspects, the invention includes an isolated nucleic acid encoding an inhibitor, wherein an inhibitor such as an siRNA or antisense molecule, inhibits the host protein, a derivative thereof, a regulator thereof, or a downstream
30 effector, operably linked to a nucleic acid comprising a promoter/regulatory sequence such that the nucleic acid is preferably capable of directing expression of the protein

encoded by the nucleic acid. Thus, the invention encompasses expression vectors and methods for the introduction of exogenous DNA into cells with concomitant expression of the exogenous DNA in the cells such as those described, for example, in Sambrook et al. (2012, Molecular Cloning: A Laboratory Manual, Cold Spring Harbor Laboratory, New York) and as described elsewhere herein. In another aspect of the invention, the host protein or a regulator thereof, can be inhibited by way of inactivating and/or sequestering one or more of the host protein, or a regulator thereof. As such, inhibiting the effects of the host protein can be accomplished by using a transdominant negative mutant.

In another aspect, the invention includes a vector comprising an siRNA or antisense polynucleotide. Preferably, the siRNA or antisense polynucleotide is capable of inhibiting the expression of host protein. The incorporation of a desired polynucleotide into a vector and the choice of vectors is well-known in the art as described in, for example, Sambrook et al., *supra*.

The siRNA or antisense polynucleotide can be cloned into a number of types of vectors as described elsewhere herein. For expression of the siRNA or antisense polynucleotide, at least one module in each promoter functions to position the start site for RNA synthesis.

In order to assess the expression of the siRNA or antisense polynucleotide, the expression vector to be introduced into a cell can also contain either a selectable marker gene or a reporter gene or both to facilitate identification and selection of expressing cells from the population of cells sought to be transfected or infected through viral vectors. In other embodiments, the selectable marker may be carried on a separate piece of DNA and used in a co-transfection procedure. Both selectable markers and reporter genes may be flanked with appropriate regulatory sequences to enable expression in the host cells. Useful selectable markers are known in the art and include, for example, antibiotic-resistance genes, such as neomycin resistance and the like.

In one embodiment of the invention, an antisense nucleic acid sequence which is expressed by a plasmid vector is used to inhibit the host protein. The antisense expressing vector is used to transfect a mammalian cell or the mammal itself, thereby causing reduced endogenous expression of host protein.

Antisense molecules and their use for inhibiting gene expression are well known in the art (*see, e.g.*, Cohen, 1989, In: Oligodeoxyribonucleotides, Antisense Inhibitors of Gene Expression, CRC Press). Antisense nucleic acids are DNA or RNA molecules that are complementary, as that term is defined elsewhere herein, to at least a
5 portion of a specific mRNA molecule (Weintraub, 1990, Scientific American 262:40). In the cell, antisense nucleic acids hybridize to the corresponding mRNA, forming a double-stranded molecule thereby inhibiting the translation of genes.

The use of antisense methods to inhibit the translation of genes is known in the art, and is described, for example, in Marcus-Sakura (1988, Anal. Biochem.
10 172:289). Such antisense molecules may be provided to the cell via genetic expression using DNA encoding the antisense molecule as taught by Inoue, 1993, U.S. Patent No. 5,190,931.

Alternatively, antisense molecules of the invention may be made synthetically and then provided to the cell. In some embodiments, the antisense oligomers
15 are about 10 to about 30, , since they are easily synthesized and introduced into a target cell. Synthetic antisense molecules contemplated by the invention include oligonucleotide derivatives known in the art which have improved biological activity compared to unmodified oligonucleotides (*see* U.S. Patent No. 5,023,243).

Ribozymes and their use for inhibiting gene expression are also well
20 known in the art (*see, e.g.*, Cech et al., 1992, J. Biol. Chem. 267:17479-17482; Hampel et al., 1989, Biochemistry 28:4929-4933; Eckstein et al., International Publication No. WO 92/07065; Altman et al., U.S. Patent No. 5,168,053). Ribozymes are RNA molecules possessing the ability to specifically cleave other single-stranded RNA in a manner analogous to DNA restriction endonucleases. Through the modification of nucleotide
25 sequences encoding these RNAs, molecules can be engineered to recognize specific nucleotide sequences in an RNA molecule and cleave it (Cech, 1988, J. Amer. Med. Assn. 260:3030). A major advantage of this approach is the fact that ribozymes are sequence-specific.

There are two basic types of ribozymes, namely, tetrahymena-type
30 (Hasselhoff, 1988, Nature 334:585) and hammerhead-type. Tetrahymena-type ribozymes recognize sequences which are four bases in length, while hammerhead-type ribozymes

recognize base sequences 11-18 bases in length. The longer the sequence, the greater the likelihood that the sequence will occur exclusively in the target mRNA species.

Consequently, hammerhead-type ribozymes are preferable to tetrahymena-type ribozymes for inactivating specific mRNA species, and 18-base recognition sequences
5 are preferable to shorter recognition sequences which may occur randomly within various unrelated mRNA molecules.

In one embodiment of the invention, a ribozyme is used to inhibit the host protein. Ribozymes useful for inhibiting the expression of a target molecule may be designed by incorporating target sequences into the basic ribozyme structure which are
10 complementary, for example, to the mRNA sequence of the host protein of the present invention. Ribozymes targeting the host protein may be synthesized using commercially available reagents (Applied Biosystems, Inc., Foster City, CA) or they may be genetically expressed from DNA encoding them.

When the inhibitor of the invention is a small molecule, a small molecule
15 antagonist may be obtained using standard methods known to the skilled artisan. Such methods include chemical organic synthesis or biological means. Biological means include purification from a biological source, recombinant synthesis and in vitro translation systems, using methods well known in the art.

Combinatorial libraries of molecularly diverse chemical compounds
20 potentially useful in treating a variety of diseases and conditions are well known in the art as are method of making the libraries. The method may use a variety of techniques well-known to the skilled artisan including solid phase synthesis, solution methods, parallel synthesis of single compounds, synthesis of chemical mixtures, rigid core structures, flexible linear sequences, deconvolution strategies, tagging techniques, and generating
25 unbiased molecular landscapes for lead discovery vs. biased structures for lead development.

In a general method for small library synthesis, an activated core molecule is condensed with a number of building blocks, resulting in a combinatorial library of covalently linked, core-building block ensembles. The shape and rigidity of the core
30 determines the orientation of the building blocks in shape space. The libraries can be biased by changing the core, linkage, or building blocks to target a characterized

biological structure (“focused libraries”) or synthesized with less structural bias using flexible cores.

In another aspect of the invention, the host protein can be inhibited by way of inactivating and/or sequestering the host protein. As such, inhibiting the effects of host protein can be accomplished by using a transdominant negative mutant.

In some embodiments, an antibody specific for the host protein (e.g., an antagonist to host protein) may be used. In one embodiment, the antagonist is a protein and/or compound having the desirable property of interacting with a binding partner of host protein (e.g., a microbial cell) and thereby competing with the corresponding protein. In another embodiment, the antagonist is a protein and/or compound having the desirable property of interacting with the host protein and thereby sequestering the host protein.

As will be understood by one skilled in the art, any antibody that can recognize and bind to an antigen of interest is useful in the present invention. Methods of making and using antibodies are well known in the art. For example, polyclonal antibodies useful in the present invention are generated by immunizing rabbits according to standard immunological techniques well-known in the art (*see, e.g.*, Harlow et al., 1988, In: *Antibodies, A Laboratory Manual*, Cold Spring Harbor, NY). Such techniques include immunizing an animal with a chimeric protein comprising a portion of another protein such as a maltose binding protein or glutathione (GSH) tag polypeptide portion, and/or a moiety such that the antigenic protein of interest is rendered immunogenic (*e.g.*, an antigen of interest conjugated with keyhole limpet hemocyanin, KLH) and a portion comprising the respective antigenic protein amino acid residues. The chimeric proteins are produced by cloning the appropriate nucleic acids encoding the marker protein into a plasmid vector suitable for this purpose, such as but not limited to, pMAL-2 or pCMX.

However, the invention should not be construed as being limited solely to methods and compositions including these antibodies or to these portions of the antigens. Rather, the invention should be construed to include other antibodies, as that term is defined elsewhere herein, to antigens, or portions thereof. Further, the present invention should be construed to encompass antibodies, *inter alia*, bind to the specific antigens of interest, and they are able to bind the antigen present on Western blots, in solution in

enzyme linked immunoassays, in fluorescence activated cells sorting (FACS) assays, in magnetic affinity cell sorting (MACS) assays, and in immunofluorescence microscopy of a cell transiently transfected with a nucleic acid encoding at least a portion of the antigenic protein, for example.

5 One skilled in the art would appreciate, based upon the disclosure provided herein, that the antibody can specifically bind with any portion of the antigen and the full-length protein can be used to generate antibodies specific therefor. However, the present invention is not limited to using the full-length protein as an immunogen. Rather, the present invention includes using an immunogenic portion of the protein to
10 produce an antibody that specifically binds with a specific antigen. That is, the invention includes immunizing an animal using an immunogenic portion, or antigenic determinant, of the antigen.

 Once armed with the sequence of a specific antigen of interest and the detailed analysis localizing the various conserved and non-conserved domains of the
15 protein, the skilled artisan would understand, based upon the disclosure provided herein, how to obtain antibodies specific for the various portions of the antigen using methods well-known in the art or to be developed.

 The skilled artisan would appreciate, based upon the disclosure provided herein, that that present invention includes use of a single antibody recognizing a single
20 antigenic epitope but that the invention is not limited to use of a single antibody. Instead, the invention encompasses use of at least one antibody where the antibodies can be directed to the same or different antigenic protein epitopes.

 The generation of polyclonal antibodies is accomplished by inoculating the desired animal with the antigen and isolating antibodies which specifically bind the
25 antigen therefrom using standard antibody production methods such as those described in, for example, Harlow et al. (1988, In: Antibodies, A Laboratory Manual, Cold Spring Harbor, NY).

 Monoclonal antibodies directed against full length or peptide fragments of a protein or peptide may be prepared using any well-known monoclonal antibody
30 preparation procedures, such as those described, for example, in Harlow et al. (1988, In: Antibodies, A Laboratory Manual, Cold Spring Harbor, NY) and in Tuszynski et al.

(1988, Blood, 72:109-115). Quantities of the desired peptide may also be synthesized using chemical synthesis technology. Alternatively, DNA encoding the desired peptide may be cloned and expressed from an appropriate promoter sequence in cells suitable for the generation of large quantities of peptide. Monoclonal antibodies directed against the peptide are generated from mice immunized with the peptide using standard procedures as referenced herein.

Nucleic acid encoding the monoclonal antibody obtained using the procedures described herein may be cloned and sequenced using technology which is available in the art, and is described, for example, in Wright et al. (1992, Critical Rev. Immunol. 12:125-168), and the references cited therein.

Further, the antibody of the invention may be "humanized" using the technology described in, for example, Wright et al., and in the references cited therein, and in Gu et al. (1997, Thrombosis and Hematocyst 77:755-759), and other methods of humanizing antibodies well-known in the art or to be developed.

The present invention also includes the use of humanized antibodies specifically reactive with epitopes of an antigen of interest. The humanized antibodies of the invention have a human framework and have one or more complementarity determining regions (CDRs) from an antibody, typically a mouse antibody, specifically reactive with an antigen of interest. When the antibody used in the invention is humanized, the antibody may be generated as described in Queen, et al. (U.S. Patent No. 6, 180,370), Wright et al., (supra) and in the references cited therein, or in Gu et al. (1997, Thrombosis and Hematocyst 77(4):755-759). The method disclosed in Queen et al. is directed in part toward designing humanized immunoglobulins that are produced by expressing recombinant DNA segments encoding the heavy and light chain complementarity determining regions (CDRs) from a donor immunoglobulin capable of binding to a desired antigen, such as an epitope on an antigen of interest, attached to DNA segments encoding acceptor human framework regions. Generally speaking, the invention in the Queen patent has applicability toward the design of substantially any humanized immunoglobulin. Queen explains that the DNA segments will typically include an expression control DNA sequence operably linked to the humanized immunoglobulin coding sequences, including naturally-associated or heterologous

promoter regions. The expression control sequences can be eukaryotic promoter systems in vectors capable of transforming or transfecting eukaryotic host cells or the expression control sequences can be prokaryotic promoter systems in vectors capable of transforming or transfecting prokaryotic host cells. Once the vector has been incorporated
5 into the appropriate host, the host is maintained under conditions suitable for high level expression of the introduced nucleotide sequences and as desired the collection and purification of the humanized light chains, heavy chains, light/heavy chain dimers or intact antibodies, binding fragments or other immunoglobulin forms may follow (Beychok, Cells of Immunoglobulin Synthesis, Academic Press, New York, (1979),
10 which is incorporated herein by reference).

The invention also includes functional equivalents of the antibodies described herein. Functional equivalents have binding characteristics comparable to those of the antibodies, and include, for example, hybridized and single chain antibodies, as well as fragments thereof. Methods of producing such functional equivalents are
15 disclosed in PCT Application WO 93/21319 and PCT Application WO 89/09622.

Functional equivalents include polypeptides with amino acid sequences substantially the same as the amino acid sequence of the variable or hypervariable regions of the antibodies. "Substantially the same" amino acid sequence is defined herein as a sequence with at least 70%, preferably at least about 80%, more preferably at least
20 about 90%, even more preferably at least about 95%, and most preferably at least 99% homology to another amino acid sequence (or any integer in between 70 and 99), as determined by the FASTA search method in accordance with Pearson and Lipman, 1988 Proc. Nat'l. Acad. Sci. USA 85: 2444-2448. Chimeric or other hybrid antibodies have constant regions derived substantially or exclusively from human antibody constant
25 regions and variable regions derived substantially or exclusively from the sequence of the variable region of a monoclonal antibody from each stable hybridoma.

In some embodiments, antibodies include functional antibody fragments for example, a Fab fragment, a single chain Fv fragment, or a heavy chain antibody (such as camelid antibodies). Single chain antibodies (scFv) or Fv fragments are polypeptides
30 that consist of the variable region of the heavy chain of the antibody linked to the variable

region of the light chain, with or without an interconnecting linker. Thus, the Fv comprises an antibody combining site.

Functional equivalents of the antibodies of the invention further include fragments of antibodies that have the same, or substantially the same, binding characteristics to those of the whole antibody. Such fragments may contain one or both Fab fragments or the F(ab')₂ fragment. In some embodiments, the antibody fragments contain all six complement determining regions of the whole antibody, although fragments containing fewer than all of such regions, such as three, four or five complement determining regions, are also functional. For example, in some embodiments, the antibody fragment is a heavy chain antibody (e.g., a nanobody) comprising three complement determining regions. The functional equivalents are members of the IgG immunoglobulin class and subclasses thereof, but may be or may combine with any one of the following immunoglobulin classes: IgM, IgA, IgD, or IgE, and subclasses thereof. Heavy chains of various subclasses, such as the IgG subclasses, are responsible for different effector functions and thus, by choosing the desired heavy chain constant region, hybrid antibodies with desired effector function are produced. Exemplary constant regions are gamma 1 (IgG1), gamma 2 (IgG2), gamma 3 (IgG3), and gamma 4 (IgG4). The light chain constant region can be of the kappa or lambda type.

The immunoglobulins of the present invention can be monovalent, divalent or polyvalent. Monovalent immunoglobulins are dimers (HL) formed of a hybrid heavy chain associated through disulfide bridges with a hybrid light chain. Divalent immunoglobulins are tetramers (H₂L₂) formed of two dimers associated through at least one disulfide bridge.

25 Methods of Use

In one exemplary embodiment, the invention provides methods of use of the compositions of the invention to modulate one or more interaction between a host protein and associated microbe. In some embodiments, the invention provides methods of modulating the interaction of a host protein with the associated microbe as listed in Table 1. For example, in some embodiments, the invention provides methods of inhibiting the interaction of Streptococcus with BACE2. In some embodiments, the invention provides

methods of inhibiting the interaction of *Fusobacterium* with immune-modulatory proteins. In some embodiments, the invention provides methods of inhibiting the interaction of *Ruminococcus gnavus* with one or more proteins expressed on T cells, including CD7 and members of the TNF receptor superfamily including, but not limited to, TMEM149, TNFRSF1B, TNFRSF4, TNFRSF7, TNFRSF9. In one embodiment, the invention provides methods of inhibiting the interaction of *Citrobacter* and a fibroblast growth factor (FGF) including, but not limited to, FGF1 and FGF7.

In one embodiment, the present invention provides methods for treatment, inhibition, prevention, or reduction of a disease or disorder in a subject in need thereof using modulator of the invention.

In one embodiment, the disease or disorder is associated with a commensal bacterium. Exemplary commensal microbes include, but are not limited to, *peptostreptococcus* spp., *clostridium* spp., *lactobacillus* spp. (*lactobacillus acidophilus*, *lactobacillus crispatus*, *lactobacillus johnsonii*, *lactobacillus sakei*, *lactobacillus bulgaris*, *lactobacillus jensenii*, *lactobacillus rhamnosus*, *lactobacillus reuteri*, *lactobacillus casei* var *rhamnosus*, *lactobacillus gasseri*, *lactobacillus fermentum*, *lactobacillus iners*, *lactobacillus helveticus*, *lactobacillus leichmannii*, *lactobacillus brevis*, *lactobacillus plantarum*, *lactobacillus delbrueckii*, *lactobacillus vaginalis*, *lactobacillus salivarius*, *lactobacillus coleohominis*, *lactobacillus pentosus*, *propionibacterium* spp., *eubacterium* spp., *bifidobacterium* spp., *prevotella* spp., *bacteroides* spp., *fusobacterium* spp., *veillonella* spp., *diphtheroides* spp., and *actinomycetales* spp.

In one embodiment, the disease or disorder is associated with at least one potentially pathogenic commensal microbe (i.e., pathobiont). Exemplary pathobionts include, but are not limited to, *helicobacter* spp., segmented filamentous bacteria, pathogenic *Bacteroides fragilis* strains, pathogenic *Enterobacter* spp., pathogenic *Prevotellaceae* spp., pathogenic *Erysipelotrichaceae* spp., *Klebsiella* spp. and pathogenic *Clostridia* spp.

In one embodiment, the disease or disorder is associated with a strain of *Erysipelotrichaceae* or *Proteus mirabilis* such as, but not limited to, *Erysipelotrichaceae* strain NWP_0324 ("Ery128"), *Proteus mirabilis* strain WGLW6 (NWP59).

Examples of diseases or disorders that can be treated or prevented by modulating host-microbiome interactions include, but are not limited to inflammatory diseases, inflammatory bowel disease (IBD), irritable bowel syndrome (IBS), obesity, type 2 diabetes, cardiovascular disease, Alzheimer's disease, Parkinson's disease, cancer
5 and atopy.

In one exemplary embodiment, the method includes treating or preventing Alzheimer's disease through inhibiting the interaction of Streptococcus with BACE2. In one exemplary embodiment, the method includes treating or preventing cancer through inhibiting the interaction of Fusobacterium with immune-modulatory proteins including,
10 but not limited to, AGER, BTN3A3, BTNL8, C3AR, CCL5, CCR9, CD55, CD99L2, CEACAM4, CSF3, DKK1, DKK2, IL15RA, LAIR1, MADCAM1, MCAM, MERTK, NPY5R, SIRPA, SOST, TMEM149, TNFRSF10B, TNFRSF4, and TREML1. In some embodiments, the cancer is colon cancer.

In one exemplary embodiment, the method includes treating or preventing
15 inflammatory diseases such as IBD through inhibiting the interaction of Ruminococcus gnavus with proteins expressed on T cells, including CD7, TFF1, TFF2, and TFF3. In one embodiment, the method includes methods of treating or preventing inflammatory diseases such as IBD through inhibiting the interaction of RG151 or NWP327 to proteins expressed on T cells, including CD7, TFF1, TFF2, and TFF3.

20 In one embodiment, the method includes treating or preventing inflammatory diseases through inhibiting the interaction of Citrobacter and a fibroblast growth factor (FGF) including, but not limited to, FGF1 and FGF7.

Therapeutic Compositions

25 In one embodiment, the invention relates to therapeutic composition comprising a molecule, such as a protein or peptide, that modulates a host-microbe interaction. Such a molecule (e.g., protein or peptide, etc.) and the encoding nucleic acid sequence may then serve as a target for modulating host-microbe interaction in the host organism. In one embodiment, the molecule inhibits host-microbe interactions. In one
30 embodiment, the molecule promotes host-microbe interactions. In one embodiment, the therapeutic modulates interactions between host proteins and microbes identified using

the methods according to the present invention. In one embodiment, the therapeutic modulates interactions between host proteins and microbes identified in Table 1.

In various embodiments, the invention relates to compositions comprising therapeutic agents identified using the methods described herein and their use in treating or preventing a disease or disorder associated with a microbe. In one embodiment, the invention relates to compositions comprising therapeutic agents and their use in treating or preventing a disease or disorder associated with one or more microbes as set forth in Table 1.

In one embodiment, the method of identifying a therapeutic agent that modulates a host:microbe interaction comprises performing an appropriate assay in the presence of one or more candidate agent and evaluating the effect of the agent on the ability of at least one microbe to interact with its associated host protein as set forth in Table 1. In one embodiment, the therapeutic agent is one that increases or promotes interaction of a microbe with its associated host protein. In one embodiment, the interaction is increased by at least 2%, 3%, 4%, 5%, 6%, 7%, 8%, 9%, 10%, 20%, 30%, 40%, 50%, 75%, 100%, or greater than 100% compared to a control value. In one embodiment, the therapeutic agent is one that decreases or inhibits interaction of a microbe with its associated host protein. In one embodiment, the interaction is decreased or inhibited by at least 2%, 3%, 4%, 5%, 6%, 7%, 8%, 9%, 10%, 20%, 30%, 40%, 50%, 75%, 100%, or greater than 100% compared to a control value.

In one embodiment, the present invention relates to a composition comprising a therapeutic agent that interacts with a microbe to modulate its interaction with its associated host protein. In one embodiment, the present invention relates to a composition comprising a therapeutic agent that interacts with a host protein to modulate its interaction with a microbe.

In one embodiment, the composition comprises an antibody or fragment thereof. In some embodiments, the antibody or fragment thereof is useful for therapeutic applications. For example, in some embodiments, the antibody or fragment thereof, can be used to reduce or eliminate pathogenic or potentially pathogenic commensal bacteria, or inhibit bacterial pathogenicity. In some embodiments, the antibody or fragment thereof, is modified to produce precision antibiotics that specifically target a bacteria of

interest. For example, in some embodiments, the antibody or fragment thereof is fused to an antibiotic, bacteriolysin, bacteriocin, or other compound that results in the reduction of the pathogenicity of a pathogenic or potentially pathogenic commensal bacterium. For example, in one embodiment, the composition comprises an antibody or fragment thereof
5 fused, linked, or otherwise attached to a delivery vehicle comprising an antibiotic or other agent that reduces the pathogenicity of a pathogenic or potentially pathogenic commensal bacterium. In some embodiments, the antibody or fragment thereof is fused to an agent that promotes the growth of beneficial bacteria. For example, the antibody or fragment thereof can be fused to specific growth-promoting nutrients. In one embodiment, the
10 composition comprises an antibody or fragment thereof fused, linked, or otherwise attached to a delivery vehicle comprising a growth-promoting agent.

In one embodiment, the therapeutic agent comprises a bispecific antibody targeting both a microbe and a display molecule. Exemplary bispecific antibodies include antibodies targeting a microbe and further targeting a display molecule comprising an
15 antibody, antibody fragment or antibody mimetic. In one embodiment, a bispecific antibody targets an IgG, IgA, IgM, or IgE antibody. Such an embodiment is useful, for example, in targeting antibodies to a microbe of interest.

In one embodiment, the bispecific antibody comprises a region that binds to a specific microbe of Table 1 to inhibit the interaction of the microbe with the
20 associated host protein. In one embodiment, the bispecific antibody comprises a region that binds to a specific host protein of Table 1 to inhibit the interaction of the host protein with the associated microbe. In one embodiment, the bispecific antibody further comprises a region that binds to luminal IgA.

In some embodiments, the composition comprises a therapeutic or
25 diagnostic agent comprising an affinity reagent described herein, including, but not limited to nanobodies, conventional antibodies, affibodies, anticalins, and monobodies. In some embodiments, the therapeutic or diagnostic agent comprises an antibody or fragment thereof, that specifically binds to a specific microbe of Table 1 to detect or inhibit the interaction of the microbe with the associated host protein. In one
30 embodiment, the therapeutic or diagnostic agent comprises an antibody or fragment

thereof, that binds to a specific host protein of Table 1 to detect or inhibit the interaction of the host protein with the associated microbe.

In one embodiment, the invention relates to methods of treatment or prevention of a disease or disorder associated with a microbe using the therapeutic agents of the invention. In one embodiment, the invention relates to methods of treatment or prevention of a disease or disorder associated with at least one host-microbe interaction identified in Table 1 using the therapeutic agents of the invention. Administration of the therapeutic agent in accordance with the present invention may be continuous or intermittent, depending, for example, upon the recipient's physiological condition, whether the purpose of the administration is therapeutic or prophylactic, and other factors known to skilled practitioners. The administration of the agents of the invention may be essentially continuous over a preselected period of time or may be in a series of spaced doses. Both local and systemic administration is contemplated. The amount administered will vary depending on various factors including, but not limited to, the composition chosen, the particular disease, the weight, the physical condition, and the age of the subject, and whether prevention or treatment is to be achieved. Such factors can be readily determined by the clinician employing animal models or other test systems which are well known to the art

Kits

The present invention also pertains to kits useful in the methods of the invention. Such kits comprise various combinations of components useful in any of the methods described elsewhere herein. For example, in one embodiment, the kit comprises components useful for modulating one or more host protein-microbial cell interaction as described herein. In one embodiment, the kit contains additional components. In one embodiment, an additional component includes but is not limited to instructional material. In one embodiment, instructional material for use with a kit of the invention may be provided electronically.

The invention is further described in detail by reference to the following experimental examples. These examples are provided for purposes of illustration only, and are not intended to be limiting unless otherwise specified. Thus, the invention should in no way be construed as being limited to the following examples, but rather, should be
5 construed to encompass any and all variations which become evident as a result of the teaching provided herein.

Without further description, it is believed that one of ordinary skill in the art can, using the preceding description and the following illustrative examples, make and utilize the present invention and practice the claimed methods. The following working
10 examples therefore are not to be construed as limiting in any way the remainder of the disclosure.

Example 1: A tool to discover bacterial interactions with the host exoproteome

A high-throughput technology to screen intact microbial cells for the
15 ability to bind to human proteins displayed on the surface of yeast was developed, optimized, and deemed BASEHIT (Figure 1). The BASEHIT process involves light biotinylation of the bacterial cell surface, mixing of bacterial cells with barcoded yeast clones that display individual human extracellular proteins, isolation of bacterially-bound yeast, and next-generation sequencing of the barcodes encoded by the enriched yeast
20 clones (Figure 1). Using these data, a “BASEHIT Score” is derived that represents the predicted degree of interaction between an individual microbe and a given host protein.

To enable simultaneous evaluation of potential bacterial binding to thousands of human proteins, a barcoded library of 3336 human extracellular and secreted proteins (the “exoproteome”) displayed clonally on the surface of yeast was
25 created and validated. This library covers over 50% of the total human exoproteome and includes a broad range of transmembrane, secreted, and membrane-associated proteins with diverse protein folds, expression patterns, and biological functions.

A draft atlas of the host-microbiota interactome

Next, BASEHIT was used to begin to map the landscape of host-
30 microbiota interactions across diverse bacterial phylogenies and tissue sites. A collection

of 519 bacterial strains isolated from the mouth, gut, lung, skin, or vagina that spanned 6 phyla and 59 genera was assembled and screened. This collection also included multiple strains from numerous species to evaluate the impact of strain variation on host-microbiome interactions. In total, over 1.7 million potential binary interactions between individual host proteins and unique bacterial strains were interrogated and 3650 predicted binding events that passed the BASEHIT score cutoff were identified (Figure 2). To test the veracity of the BASEHIT results, selected interactions were validated via either ELISA or flow cytometry, which demonstrates that BASEHIT has high predictive value for identifying novel host-microbe interactions (Figure 3A-B). This screen therefore revealed thousands of newly predicted molecular-level host-microbiome interactions and dramatically expands the collective understanding of the mechanisms by which indigenous microbes can potentially interface with and impact the host.

The thousands of predicted interactions that were identified span diverse phylogenies, tissues, and proteins, and thus begin to define the distributions of interactions across bacterial taxonomies and tissues of origin, as well as host protein families and folds (Figure 4). With a few notable exceptions, the distribution of host interactions was highly variable across isolates both within and between phylogenetic groups, and across different tissues of origin. Thus, whether and how members of the microbiome directly interface with host proteins is unpredictable based on their phylogeny or tissue of origin.

Interaction patterns also varied widely across protein families and folds. For example, 2705 (81%) of the 3336 proteins in the present library failed to interact significantly with any bacterial strains in the present culture collections, 261 proteins interacted with only one strain, and only 42 (1.2%) proteins interacted with 10 or more strains. Lack of predicted interactions was not due to failure of protein expression or aberrant protein folding in the yeast library as many non-interacting proteins were readily detected via staining with specific antibodies. Proteins that bound to multiple taxa spanned diverse protein families and folds.

Divergent host protein binding patterns imply functional variation between phylogenetically-related bacterial strains

The present collections of this Example included a deep sampling of skin-derived *Staphylococcus* isolates from five common *Staphylococcus* species, so patterns of host-microbiota interaction were compared across dozens of bacterial strains assigned to the same species (Figure 5A). Multiple *Staphylococcus* isolates interacted with known skin-expressed proteins, including the corneodesmosome protein CDSN, junctional protein FAT2, and hematopoietic or epithelial related proteins CCL2, CSF2RA, EPO, and XG. However, protein-binding patterns varied dramatically both within and between species, and most interactions were highly strain-specific even within a given species designation. Strain variation can also be made clear by visualizing the network of interactions between strains and host proteins, where multiple distinct sub-clusters are visible that can separate related strains (Figure 5B). These results demonstrate that patterns of host interaction vary dramatically among strains from the same species that occupy similar host-niches and imply functional variation between phylogenetically-related bacterial strains.

Disease-relevant gut commensals exhibit unique host protein-binding patterns

Next, two bacterial taxa associated with human disease, the genus *Fusobacterium* and the species *Ruminococcus gnavus*, were interrogated.

R. gnavus is enriched in inflammatory bowel disease (IBD) subjects, and strain-level variation and “clade switching” correlates with IBD flares. Two *R. gnavus* isolates exhibited strong interactions with the T cell protein CD7. Additionally, *R. gnavus* has been shown to exhibit high aerotolerance and mucosal localization, which is additionally supported by the strong interaction with the mucus-associated trefoil factors TFF1, TFF2, and TFF3. These interactions may provide direct molecular insight into the mechanism of *R. gnavus* modulation of human inflammatory disease. Close examination of CD7 binding by *R. gnavus* revealed specificity towards both bacterial strains and host species. Bacterial flow cytometry of three distinct isolates, all from IBD patients, showed that two strains bound CD7 (at variable levels), while one strain showed no CD7 binding activity (Figure 6A). Similarly, the host species specificity of the *R. gnavus*-CD7 interaction was examined by staining with recombinant mouse or human CD7, and no

binding of mouse CD7, even to the strain (NWP327) with the highest CD7 binding activity, was observed (Figure 6B). These results emphasize the potentially complex nature and co-evolution of host-microbe interactions, and highlight the need for careful consideration of precise molecular function in strains to unravel associations with human disease.

Fusobacterium species, particularly *Fusobacterium nucleatum*, are enriched in tumors and modulate host immunity through direct interactions. The seventeen *Fusobacterium* strains in the present collection spanned five tissues of origin. However, many *Fusobacterium* isolates bound to at least one known immunomodulatory host protein or key epithelial proteins potentially involved in tumorigenesis (Figure 7). These interactions include two ITIM- coupled immunosuppressive proteins (e.g., SIRPA and LAIR1), cytokine receptors (e.g., IL15RA, TNFRSF4, and TNFRSF10B), cytokines and chemokines (CSF3, CCL5), WNT-pathway modulators (DKK1, DKK2, SOST), and adhesion proteins (CEACAM4, MCAM, MADCAM1). The breadth of cell types and immunological processes targeted by *Fusobacterium* strains build upon the previously identified strain-specific interaction with the immunoreceptors TIGIT and CEACAM1 and expand the range of *Fusobacterium* immunomodulatory potential. Mounting evidence demonstrates that the direct interaction of *F. nucleatum* strains with immune and tumor cells directly modulates important steps of metastasis and tumor killing, and these newly discovered interactions may provide molecular insight into these effects.

The high-throughput screening tool, BASEHIT, reveals novel host-microbe interactions

This Example identifies thousands of direct host-microbe interactions spanning a range of tissues and protein functions, offering new insight into the mechanisms by which microbes may influence host physiology and colonize host-associated niches. These interactions may underlie the ability of microbes to enter non-mucosal, supposedly “sterile”, tissues, and exert effects on the host upon entering those tissues. In particular, these data complement recent observations of tumor-associated microbiomes that influence treatment efficacy, as mechanisms for immune modulation or

tissue colonization may enable selective translocation, survival, and activity of particular microbial strains into the tumor microenvironment.

Importantly, BASEHIT enables a phylogenetically unbiased description of microbial function. While some interactions were phylogenetically biased, substantial
5 variation in individual interactions among closely related strains and shared interactions across diverse microbes were observed, highlighting that direct host interactions are not predictable simply from bacterial phylogeny. Additionally, BASEHIT does not require prior annotation of bacterial genes. As more than 40% of bacterial genes in human-associated metagenomes lack any annotated function, the ability to highlight microbes
10 with direct host associations in a high-throughput manner will complement expanding sequencing-based efforts to define tissue-specific adaptations and effects of commensal microbes.

This Example highlights the complex network of direct host-microbe interactions present within the human microbiota. These interactions may inform the role
15 of microbes in shaping host physiology, and reflect tissue-specific adaptations of microbes to their unique niches. They additionally reveal candidate host pathways that may control or respond to the microbiota. Additionally, a technology that vastly enhances the rate at which new host-microbe interactions may be identified in an unbiased fashion, and which is applicable to a broad range of culturable microbes, has been described
20 herein. This functional-profiling approach should offer further insight into the mechanisms of microbial control of host physiology, the evolution of microbes in specific host-associated niches, and offer new targets for host-directed investigation into microbially mediated disease.

Table 1: Paired host protein - microbial interactions

<u>Strain Name</u>	<u>Strain ID</u>	<u>Protein</u>
Streptococcus sp., Strain CM6	NWP136	SLC10A4
Lachnospiraceae sp., Oral Taxon 082, Strain F0431	NWP232	TFF2
Lachnospiraceae sp., Oral Taxon 107, Strain F0167	NWP262	TFF2
Lachnospiraceae sp., Oral Taxon 082, Strain F0431	NWP232	TFF3
Lachnospiraceae sp., Oral Taxon 107, Strain F0167	NWP262	TFF3
Lachnospiraceae sp., Strain ICM7	NWP241	TFF3
Escherichia coli, Strain MS 21-1	NWP38	CEACAM1
Rothia mucilaginosa, Strain CC871B	NWP84	LGALS7
Lactobacillus crispatus, Strain GED7749C	NWP104	CGA
Staphylococcus warneri , Strain SK66	NWP11	PSORS1C2
Bacteroides dorei, Strain 5_1_36/D4	NWP244	EPHA2
Fingoldia magna, Strain SY01	NWP138	XG
Lachnospiraceae sp., Strain ICM7	NWP241	TFF2
Lactobacillus gasseri, Strain JV-V03	NWP106	TFF3
Ruminococcus gnavus, Strain NWP327	RG151	TFF2
Lactobacillus jensenii, Strain 208-1	NWP111	TFF3
Lachnospiraceae sp., Oral Taxon 107, Strain F0167	NWP262	TFF1
Lactobacillus jensenii, Strain 208-1	NWP111	TFF2
Lactobacillus crispatus, Strain GED7749C	NWP104	STIM2
Lactobacillus gasseri, Strain JV-V03	NWP106	TFF2
Bacteroidales bacterium, Strain KA00344	NWP302	LCN2
Staphylococcus warneri , Strain SK66	NWP11	PPY
Staphylococcus pasteurii C9	pasteuriiC9	GPR15L
Lachnospiraceae sp., Strain ICM7	NWP241	TFF1
Lachnospiraceae sp., Oral Taxon 082, Strain F0431	NWP232	TFF1
Staphylococcus capitis B12	capitisB12	PSORS1C2
Staphylococcus pasteurii C9	pasteuriiC9	XG
Ruminococcus gnavus, Strain NWP327	RG151	TFF3
Bacteroidales bacterium, Strain KA00344	NWP302	MYPR_Epitope-2
Escherichia coli, Strain MS 21-1	NWP38	CD55
Bacteroides dorei, Strain 5_1_36/D4	NWP244	MCAM
Bacteroides sp., Strain 4_1_36	NWP312	SMR3A
Staphylococcus epidermidis G4	EpiG4	XG
Staphylococcus warneri , Strain SK66	NWP11	FGFR1
Lactobacillus rhamnosus, Strain LMS2-1	NWP97	TFF2
Lactobacillus crispatus, Strain JV-V01	NWP107	TFF2
Staphylococcus warneri , Strain SK66	NWP11	XG
Lactobacillus parafarraginis, Strain F0439	NWP105	TFF2
Oscillibacter sp., Strain KLE-1728	NWP269	PDIA6
Prevotella disiens, Strain DNF00882	NWP177	CLEC4M
Lactobacillus crispatus, Strain JV-V01	NWP107	TFF3
Bacteroides fragilis, Strain CL05T00C42	NWP287	OTOR
Lactobacillus crispatus, Strain GED7749C	NWP104	CLU
Ruminococcus gnavus, Strain NWP327	RG151	TFF1
Bacteroidales bacterium, Strain KA00344	NWP302	PDGFA
Lactobacillus jensenii, Strain EX849587VC03	NWP108	TFF2
Staphylococcus warneri E6	warneriE6	GPR15L
Staphylococcus warneri , Strain SK66	NWP11	CSPG5
Staphylococcus warneri E6	warneriE6	XG
Lactobacillus jensenii, Strain 269-3	NWP110	TFF3
Staphylococcus warneri D11	warneriD12	XG
Bacteroidales bacterium, Strain KA00344	NWP302	PSORS1C2
Lactobacillus parafarraginis, Strain F0439	NWP105	TFF3
Staphylococcus warneri D11	warneriD12	SLCO2B1
Lachnospiraceae bacterium, Strain AAB19	AB19	UNQ9165/PRO28630
Lactobacillus crispatus, Strain GED7749C	NWP104	ENDOU
Staphylococcus warneri D11	warneriD12	GPR15L
Capnocytophaga sputigena, Strain CC21_001D	NWP163	CST4
Staphylococcus warneri E6	warneriE6	SLCO2B1
Bacteroides dorei, Strain 5_1_36/D4	NWP244	EPHA5
Proteus mirabilis, Strain WGLW6	NWP59	NGFR
Staphylococcus pasteurii C9	pasteuriiC9	EPO
Staphylococcus capitis B12	capitisB12	F3

Clostridium orbiscindens, Strain CC43_001K	NWP259	PGLYRP1
Lactobacillus jensenii, Strain EX849587VC03	NWP108	TFF3
Staphylococcus warneri D11	warneriD12	RLN2
Staphylococcus warneri E6	warneriE6	RLN2
Fusobacterium sp., Strain CM22	NWP153	IL15RA
Klebsiella oxytoca, Strain MIT 10-5249	NWP52	SLC22A5
Streptococcus parasanguinis, Strain F0449	NWP114	GCGR
Staphylococcus warneri E4	warneriE4	XG
Staphylococcus warneri E4	warneriE4	GPR15L
Staphylococcus warneri, Strain SK66	NWP11	CXCR3
Bacteroides bacterium, Strain KA00344	NWP302	RCN1
Lactobacillus jensenii, Strain 269-3	NWP110	TFF2
Staphylococcus warneri E4	warneriE4	SLCO2B1
Staphylococcus pasteurii C9	pasteuriiC9	MEPE
Staphylococcus epidermidis G10	EpiG10	PDIA6
Proteus mirabilis, Strain WGLW6	NWP59	AXL
Prevotella melaninogenica, Strain D18	NWP151	PDIA3
Staphylococcus warneri B9	warneriB9	PSORS1C2
Staphylococcus warneri E4	warneriE4	RLN2
Ruminococcus gnavus, Strain NWP325	RG74	TFF2
Streptococcus downei, Oral Taxon 594, Strain F0415	NWP123	CTRB1
Staphylococcus pasteurii C9	pasteuriiC9	GPC1
Streptococcus sp., Strain OBRC6	NWP124	CTRB1
Weissella cibaria, Strain F16_1	NWP101	TFF2
Prevotella nigrescens, Strain F0103	NWP145	T4S19_Epitope-2
Propionibacterium acnes, Strain HL044PA1	NWP237	TFF2
Streptococcus sobrinus, Strain W1703	NWP85	LOC644613
Lactobacillus jensenii, Strain EX849587VC06	NWP109	TFF2
Lactobacillus rhamnosus, Strain LMS2-1	NWP97	TFF3
Lachnospiraceae bacterium, Strain AAB26	AB26	TMEM119
Sporosarcina sp., Strain 2681	NWP29	LOC644613
Achromobacter xylosoxidans, Strain C54	NWP22	PF4V1
Fusobacterium nucleatum, Strain CTI-03	NWP187	SOST
Staphylococcus capitis C11	capitisC11	PDIA6
Staphylococcus capitis A7	capitisA7	PROCR
Propionibacterium acnes, Strain HL002PA3	NWP219	TMEM119
Bacteroides fragilis, Strain 3_1_12	NWP271	ENDOU
Lactobacillus crispatus, Strain GED7749C	NWP104	GREM2
Staphylococcus hominis, Strain C80	NWP25	MUCL3
Fusobacterium sp., Strain CM22	NWP167	SGCA
Klebsiella oxytoca, Strain MIT 10-5249	NWP52	SLC22A4
Streptococcus sp., Strain CM6	NWP136	SMR3A
Staphylococcus warneri, Strain SK66	NWP11	SDC4
Streptococcus downei, Oral Taxon 594, Strain F0415	NWP123	RTBDN
Prevotella timonensis, Strain CRIS 5C-B1	NWP156	PDIA6
Staphylococcus haemolyticus B6	haemolyticusB6	SLC8B1
Lactobacillus gasseri, Strain JV-V03	NWP106	ENDOU
Corynebacterium sp., Strain HFH0082	NWP61	LOC644613
Streptococcus downei, Oral Taxon 594, Strain F0415	NWP123	LOC644613
Escherichia coli, Strain MS 85-1	NWP30	LOC644613
Staphylococcus aureus, Strain MN8	NWP17	PF4V1
Clostridium cadaveris, Strain CC40_001C	NWP246	EPOR
Fusobacterium nucleatum subsp. animalis, Oral Taxon 420, Strain F0419	NWP196	DRAXIN
Staphylococcus pasteurii G3	pasteuriiG3	PPY
Streptococcus sp., Strain CM6	NWP136	SMR3B
Staphylococcus epidermidis, Strain NIHLM067	NWP68	XG
Escherichia coli, Strain MS 110-3	NWP35	LOC644613
Bacteroides dorei, Strain 5_1_36/D4	NWP244	CD248
Lactobacillus parafarraginis, Strain F0439	NWP105	MUCL3
Staphylococcus caprae, Strain C87	NWP24	MUCL3
Staphylococcus warneri B9	warneriB9	SLCO2B1
Enterococcus faecium, Strain E417	NWP79	LOC644613
Streptococcus downei, Oral Taxon 594, Strain F0415	NWP123	MUCL3
Rothia mucilaginosa, Strain CC87LB	NWP84	LGALS9
Prevotella bivia, Strain DNF00188	NWP193	RCN1
Staphylococcus capitis B12	capitisB12	SLC24A3

Staphylococcus warneri E6	warneriE6	TFPI2
Enterococcus faecium, Strain TX0133a04	NWP44	SYCN
Prevotella timonensis, Strain CRIS 5C-B1	NWP156	PDIA3
Staphylococcus warneri , Strain SK66	NWP11	FGFR2
Staphylococcus capitis A7	capitisA7	XG
Klebsiella oxytoca, Strain MIT 10-5243	NWP47	PF4V1
Staphylococcus pasteurii E5	pasteuriiE5	PPY
Staphylococcus pasteurii F12	pasteuriiF12	PPY
Corynebacterium amycolatium, Strain SK46	NWP07	LOC644613
Staphylococcus warneri E6	warneriE6	PROCR
Enterococcus faecium, Strain TX1330	NWP19	LOC644613
Prevotella oralis, Strain HGA0225	NWP147	PDIA3
Klebsiella sp., Strain 4_1_44FAA	NWP21	PF4V1
Lactobacillus parafarraginis, Strain F0439	NWP105	LOC644613
Escherichia coli, Strain MS 115-1	NWP36	LOC644613
Enterococcus faecium, Strain ERV165	NWP81	LOC644613
Prevotella bivia, Strain DNF00650	NWP176	MSLN
Prevotella disiens, Strain DNF00882	NWP177	SHISA7
Dermabacter sp., Strain HFH0086	NWP92	CLU
Bacteroides sp., Strain AAB9	AB9	MCAM
Enterococcus faecium, Strain ERV102	NWP80	LOC644613
Veillonella sp., Oral Taxon 780, Strain F0422	NWP268	PDIA6
Prevotella bivia, Strain DNF00650	NWP176	RCN1
Lactobacillus jensenii, Strain 208-1	NWP111	LOC644613
Staphylococcus capitis A7	capitisA7	GPR15L
Staphylococcus epidermidis, Strain M23864:W2	NWP16	PF4V1
Staphylococcus warneri D11	warneriD12	TFPI2
Catabacter hongkongensis, Strain AB8_9	NWP299	LCN1
Staphylococcus epidermidis, Strain NIHLM001	NWP66	MUCL3
Staphylococcus pasteurii F11	pasteuriiF11	PPY
Staphylococcus capitis A7	capitisA7	RLN2
Streptococcus vestibularis, Strain F0396	NWP132	MUCL3
Staphylococcus pasteurii G7	pasteuriiG7	PPY
Staphylococcus capitis B12	capitisB12	SDC4
Fusobacterium ulcerans, Strain AC2_8_11 AN FAA D5 7	NWP140	SYCN
Sporosarcina sp., Strain 2681	NWP29	DEFB130B
Streptococcus sp., Strain SR4	NWP130	MUCL3
Streptococcus mitis, Strain F0392	NWP26	LOC644613
Corynebacterium sp., Strain CMW7794	NWP98	TFF2
Bacteroides fragilis, Strain CL05T00C42	NWP287	DQA2_Epitope-1
Propionibacterium acnes, Strain HL038PA1	NWP235	FAM174A
Enterococcus faecalis, Strain TX2137	NWP117	FAM3B
Coprococcus sp., Strain AAb34	AB34	SMR3A
Staphylococcus capitis A7	capitisA7	SLCO2B1
Streptococcus downei, Oral Taxon 594, Strain F0415	NWP123	UNQ6190/PRO20217
Staphylococcus pasteurii F12	pasteuriiF12	CSF2RA
Staphylococcus capitis D5	capitisD5	PDIA6
Staphylococcus warneri D11	warneriD12	PROCR
Fusobacterium sp., Strain CM22	NWP167	NPY5R
Hungatella hathewayi, Strain WAL-18680	NWP231	TFF3
Staphylococcus pasteurii G3	pasteuriiG3	CSF2RA
Streptococcus sobrinus, Strain W1703	NWP85	CTRB1
Staphylococcus warneri , Strain SK66	NWP11	DQA2_Epitope-1
Propionibacterium acnes, Strain HL036PA1	NWP226	TMEM119
Micrococcus luteus, Strain SK58	NWP08	LOC644613
Staphylococcus warneri , Strain SK66	NWP11	F3
Streptococcus parasanguinis, Strain F0449	NWP114	C1QL3
Prevotella melaninogenica, Strain D18	NWP151	PDIA6
Lactobacillus crispatus, Strain GED7749C	NWP104	KLRC2
Proteus mirabilis, Strain WGLW6	NWP59	TNFRSF10B
Staphylococcus aureus, Strain CM05	NWP83	PF4V1
Staphylococcus haemolyticus B5	haemolyticusB5	SLC8B1
Streptococcus anginosus, Strain F0211	NWP125	CTRB1
Oscillibacter sp., Strain KLE-1728	NWP269	TXNDC12
Staphylococcus pasteurii F11	pasteuriiF11	CSF2RA
Staphylococcus epidermidis, Strain NIHLM001	NWP66	LOC644613

Propionibacterium acnes, Strain HL005PA3	NWP216	TMEM119
Lactobacillus jensenii, Strain 208-1	NWP111	TFF1
Staphylococcus hominis C10	hominisC10	TEPP
Streptococcus sobrinus, Strain W1703	NWP85	UNQ6190/PRO20217
Streptococcus sp., Strain C150	NWP121	CTRB2
Staphylococcus capitis B12	capitisB12	OTOS
Peptoniphilus lacrimalis, Strain UPII 315-B	NWP261	PGLYRP1
Propionibacterium acnes, Strain HL045PA1	NWP265	TMEM119
Lachnospiraceae sp., Strain DNF00160	NWP150	MUCL3
Bacteroidales bacterium, Strain KA00344	NWP302	PTPRR
Staphylococcus warneri B9	warneriB9	RLN2
Propionibacterium acnes, Strain HL060PA1	NWP239	OPRK1
Streptococcus sobrinus, Strain W1703	NWP85	MUCL3
Staphylococcus capitis B12	capitisB12	HRC
Bacteroides dorei, Strain 5_1_36/D4	NWP244	EPHB2
Dermabacter sp., Strain HFH0086	NWP92	KCNMB4
Proteus mirabilis, Strain WGLW6	NWP59	CSPG5
Staphylococcus warneri , Strain SK66	NWP11	CDSN
Streptococcus sobrinus, Strain W1703	NWP85	ENDOU
Staphylococcus capitis A7	capitisA7	TFPI2
Allobaculum sp., Strain NWP324	Ery128	SLC22A5
Escherichia coli, Strain 83972	NWP04	LOC644613
Prevotella sp., Oral Taxon 472, Strain F0295	NWP191	GFY_Epitope-1
Staphylococcus warneri E4	warneriE4	TFPI2
Ruminococcus gnavus, Strain NWP325	RG74	TFF3
Streptococcus downei, Oral Taxon 594, Strain F0415	NWP123	FGF17
Staphylococcus pasteurii C9	pasteuriiC9	CNPY3
Collinsella aerofaciens, Strain AAB3	AB3	COL10A1
Bacteroidales bacterium, Strain KA00344	NWP302	DEFB119
Staphylococcus aureus, Strain CM05	NWP83	KCNK1
Staphylococcus pasteurii G7	pasteuriiG7	CSF2RA
Finegoldia magna, Strain SY01	NWP138	PDIA3
Corynebacterium sp., Strain HFH0082	NWP61	PLA2G2E
Sporosarcina sp., Strain 2681	NWP29	PLA2G2E
Staphylococcus warneri B9	warneriB9	XG
Klebsiella oxytoca, Strain MIT 10-5249	NWP52	LYSMD4
Klebsiella oxytoca, Strain MIT 09-7231	NWP45	PF4V1
Hungatella hathewayi, Strain WAL-18680	NWP231	TFF2
Staphylococcus warneri , Strain SK66	NWP11	PODXL2
Staphylococcus lugdunensis, Strain M23590	NWP14	PF4V1
Corynebacterium sp., Strain HFH0082	NWP61	FAM19A3
Escherichia coli, Strain MS 115-1	NWP36	PLA2G2E
Clostridium cadaveris, Strain CC40_001C	NWP246	PDIA6
Arthrobacter albus, Strain DNF00011	NWP86	MUCL3
Escherichia coli, Strain MS 110-3	NWP35	FAM19A3
Oscillibacter sp., Strain KLE-1728	NWP269	MFSD2A
Propionibacterium acnes, Strain HL036PA1	NWP226	FAM174A
Proteus mirabilis, Strain WGLW6	NWP59	SFN
Prevotella oris, Strain F0302	NWP159	TNFRSF10B
Streptococcus downei, Oral Taxon 594, Strain F0415	NWP123	CSAG1
Staphylococcus capitis B12	capitisB12	MMP24
Citrobacter sp., Strain 30_2	NWP01	DRAXIN
Lactobacillus gasseri, Strain JV-V03	NWP106	LOC644613
Escherichia coli, Strain MS 196-1	NWP42	LOC644613
Fusobacterium nucleatum subsp. animalis, Oral Taxon 420, Strain F0419	NWP196	SOST
Sporosarcina sp., Strain 2681	NWP29	FAM19A3
Prevotella bivia, Strain GED7760C	NWP233	MANF
Klebsiella oxytoca, Strain MIT 10-5245	NWP49	PF4V1
Propionibacterium acnes, Strain HL050PA2	NWP238	IGFBP1
Staphylococcus capitis B12	capitisB12	T4S19_Epitope-2
Micrococcus luteus, Strain SK58	NWP08	DEFB130B
Corynebacterium sp., Strain HFH0082	NWP61	CCL18
Dorea sp., Strain AAB35	AB35	AGR3
Staphylococcus aureus, Strain CM05	NWP83	SRGN
Escherichia coli, Strain MS 69-1	NWP39	LOC644613
Staphylococcus xylosus F2	xylosusF2	ENDOU

Staphylococcus warneri , Strain SK66	NWP11	ADCY5
Fusobacterium sp., Strain CM22	NWP153	NPY5R
Streptococcus sp., Strain AS20	NWP116	LOC644613
Enterococcus faecium, Strain TX0133a04	NWP44	PF4V1
Bacteroides sp., Strain AAB9	AB9	EPHA2
Staphylococcus saprophyticus E8	saprophyticusE8	SLC6A13
Staphylococcus epidermidis C3	EpiC3	XG
Staphylococcus epidermidis, Strain NIHLM023	NWP75	PF4V1
Fusobacterium sp., Strain CM22	NWP167	SLC5A8
Acidaminococcus sp., Strain D21	NWP157	PDIA3
Catabacter hongkongensis, Strain AB8_9	NWP299	CD248
Sporosarcina sp., Strain 2681	NWP29	CCL18
Staphylococcus saprophyticus E8	saprophyticusE8	IGFBP4
Veillonella sp., Oral Taxon 780, Strain F0422	NWP268	MFS02A
Staphylococcus hominis, Strain C80	NWP25	LOC644613
Clostridium orbiscindens, Strain 1_3_50AFAA	NWP137	PDIA3
Staphylococcus aureus, Strain CM05	NWP83	CD320
Enterococcus faecium, Strain TX1330	NWP19	FAM19A3
Klebsiella oxytoca, Strain MIT 10-5242	NWP46	PF4V1
Corynebacterium amycolatum, Strain SK46	NWP07	CCL18
Corynebacterium amycolatum, Strain SK46	NWP07	DEFB130B
Fusobacterium nucleatum subsp. animalis, Oral Taxon 420, Strain F0419	NWP196	DKK1
Finegoldia magna, Strain SY01	NWP138	PDIA6
Corynebacterium amycolatum, Strain SK46	NWP07	FAM19A3
Escherichia coli, Strain MS 198-1	NWP43	PF4V1
Propionibacterium acnes, Strain HL044PA1	NWP237	TFF3
Streptococcus sanguinis, Strain VMC66	NWP135	GCGR
Staphylococcus warneri E4	warneriE4	PROCR
Clostridium difficile, Strain 002-P50-2011	NWP230	TXNDC12
Klebsiella oxytoca, Strain MIT 10-5243	NWP47	TMEM119
Staphylococcus epidermidis, Strain NIH04008	NWP77	LOC644613
Escherichia coli, Strain MS 110-3	NWP35	PLA2G2E
Shuttleworthia sp., Strain MSX8B	NWP149	PRND
Corynebacterium sp., Strain HFH0082	NWP61	DEFB130B
Streptococcus sp., Strain ACC21	NWP134	MUCL3
Staphylococcus aureus, Strain TCH70	NWP12	KCNK1
Bacteroides stercoris, Strain CC31F	NWP270	TFF3
Staphylococcus aureus, Strain TCH70	NWP12	CD320
Ruminococcus gnavus, Strain AAB28	AB28	MUCL3
Corynebacterium sp., Strain HFH0082	NWP61	NPPC
Klebsiella oxytoca, Strain MIT 10-5249	NWP52	ICAM1
Oscillibacter sp., Strain KLE-1728	NWP269	KCMA1_Epitope-1
Lactobacillus jensenii, Strain EX849587VC06	NWP109	TFF3
Enterococcus faecium, Strain TX1330	NWP19	DEFB130B
Sporosarcina sp., Strain 2681	NWP29	NPPC
Corynebacterium amycolatum, Strain SK46	NWP07	PLA2G2E
Klebsiella sp., Strain 4_1_44FAA	NWP21	TMEM119
Escherichia coli, Strain MS 110-3	NWP35	CCL18
Lactobacillus jensenii, Strain EX849587VC06	NWP109	DEFB130B
Propionibacterium acnes, Strain HL053PA1	NWP260	FAM174A
Staphylococcus capitis B8	capitisB8	PLA2G2E
Plesiomonas sp., Strain HPP0020	NWP62	LOC644613
Staphylococcus aureus, Strain CM05	NWP83	SHISA7
Micrococcus luteus, Strain SK58	NWP08	PIANP
Ruminococcus gnavus, Strain NWP326	RG109	MANF
Klebsiella sp., Strain MS 92-3	NWP40	PF4V1
Staphylococcus aureus, Strain CM05	NWP83	SLC8B1
Propionibacterium acnes, Strain HL036PA2	NWP227	FAM174A
Enterococcus faecium, Strain TX1330	NWP19	NPPA
Dorea formicigenerans, Strain AAB36	AB36	MANF
Sporosarcina sp., Strain 2681	NWP29	NPPA
Streptococcus mitis, Strain F0392	NWP26	CTRB1
Clostridium difficile, Strain 002-P50-2011	NWP230	MFS02A
Prevotella sp., Oral Taxon 472, Strain F0295	NWP191	SDC1
Lactobacillus gasseri, Strain SV-16A-US	NWP102	ENDOU
Staphylococcus capitis C4	capitisC4	PLA2G2E

Staphylococcus capitis A7	capitisA7	PSORS1C2
Lactobacillus jensenii, Strain EX849587VC06	NWP109	FAM19A2
Streptococcus sp., Strain OBR06	NWP124	MUCL3
Prevotella bivia, Strain GED7760C	NWP233	MUCL3
Streptococcus sobrinus, Strain W1703	NWP85	CSAG1
Erysipelotrichaceae sp., Strain 6_1_45	NWP174	LOC644613
Streptococcus sp., Strain C150	NWP121	PF4V1
Escherichia coli, Strain MS 115-1	NWP36	DEFB130B
Micrococcus luteus, Strain SK58	NWP08	NPPA
Streptococcus sp., Strain C150	NWP121	MUCL3
Bacteroides stercoris, Strain CC31F	NWP270	SPINT3
Streptococcus mitis, Strain F0392	NWP26	MUCL3
Bacteroidales bacterium, Strain KA00344	NWP302	PEBP4
Micrococcus luteus, Strain SK58	NWP08	FAM19A3
Blautia sp., Strain AAB30	AB30	COL10A1
Enterococcus faecium, Strain ERV165	NWP81	FAM19A3
Staphylococcus warneri, Strain SK66	NWP11	FAM174A
Propionibacterium acnes, Strain HL007PA1	NWP225	FAM174A
Erysipelotrichaceae sp., Strain 6_1_45	NWP174	PLA2G2E
Bacteroides stercoris, Strain CC31F	NWP270	PEBP4
Staphylococcus capitis B12	capitisB12	FGFR1
Eggerthella sp., Strain MVA1	NWP185	LOC644613
Streptococcus sp., Strain C150	NWP121	ENDOU
Streptococcus salivarius, Strain SK126	NWP118	LOC644613
Escherichia coli, Strain MS 196-1	NWP42	FAM19A3
Lactobacillus jensenii, Strain 208-1	NWP111	MUCL3
Corynebacterium sp., Strain HFH0082	NWP61	NPPA
Streptococcus sobrinus, Strain W1703	NWP85	FGF17
Enterococcus faecium, Strain E417	NWP79	MUCL3
Staphylococcus warneri, Strain SK66	NWP11	GAST
Escherichia coli, Strain MS 110-3	NWP35	DEFB130B
Rothia dentocariosa, Strain M567	NWP23	TMEM119
Fusobacterium nucleatum subsp. animalis, Oral Taxon 420, Strain F0419	NWP196	FAM19A2
Escherichia coli, Strain MS 115-1	NWP36	FAM19A3
Escherichia coli, Strain MS 115-1	NWP36	CCL18
Staphylococcus saprophyticus E8	saprophyticusE8	XG
Enterococcus faecium, Strain TX1330	NWP19	CCL18
Acidaminococcus sp., Strain D21	NWP157	PDIA6
Staphylococcus warneri B9	warneriB9	CHGA
Oscillibacter sp., Strain KLE 1745	NWP252	PDIA6
Staphylococcus lugdunensis, Strain M23590	NWP14	TMEM119
Klebsiella oxytoca, Strain MIT 10-5249	NWP52	GHRHR
Lactobacillus crispatus, Strain GED7749C	NWP104	GPR37
Lactobacillus parafarraginis, Strain F0439	NWP105	FGF17
Prevotella disiens, Strain DNF00882	NWP177	SLC6A13
Streptococcus sp., Strain SR1	NWP122	CTRB2
Fusobacterium sp., Strain CM22	NWP167	SLC29A4
Clostridium orbiscindens, Strain 1_3_50AFAA	NWP137	PDIA6
Enterococcus faecalis, Strain HH22	NWP18	PF4V1
Propionibacterium acnes, Strain HL043PA2	NWP264	FAM174A
Staphylococcus pasteurii C9	pasteuriiC9	GPR156
Fusobacterium sp., Strain CM22	NWP167	IL15RA
Proteus mirabilis, Strain WGLW6	NWP59	C1QBP
Staphylococcus pasteurii C9	pasteuriiC9	CSMT1_Epitope-1
Escherichia coli, Strain MS 16-3	NWP37	PF4V1
Escherichia coli, Strain MS 85-1	NWP30	DEFB130B
Prevotella bivia, Strain DNF00188	NWP193	AMELX
Escherichia coli, Strain MS 200-1	NWP41	PF4V1
Staphylococcus warneri B9	warneriB9	FGFR1
Enterococcus faecium, Strain ERV165	NWP81	DEFB130B
Staphylococcus warneri E6	warneriE6	TMEM8
Ruminococcus gnavus, Strain NWP325	RG74	TFF1
Arthrobacter albus, Strain DNF00011	NWP86	SERPINA3
Bacteroides stercoris, Strain CC31F	NWP270	EPHA5
Streptococcus sp., Strain C150	NWP121	LOC644613
Streptococcus sp., Strain ACS2	NWP115	PF4V1

Prevotella bivia, Strain DNF00650	NWP176	CALU
Staphylococcus aureus, Strain TCH70	NWP12	SRGN
Staphylococcus warneri, Strain SK66	NWP11	CHGA
Propionibacterium acnes, Strain HL002PA2	NWP214	FAM174A
Staphylococcus epidermidis, Strain NIH04008	NWP77	MUCL3
Escherichia coli, Strain MS 85-1	NWP30	FAM19A3
Prevotella oralis, Strain HGA0225	NWP147	PDIA6
Staphylococcus warneri D11	warneriD12	TMEM8
Escherichia coli, Strain MS 200-1	NWP41	TFF2
Enterococcus faecium, Strain TX1330	NWP19	PLA2G2E
Enterococcus faecium, Strain E417	NWP79	FGF17
Lachnospiraceae sp., Strain ICM7	NWP241	SPINK9
Klebsiella oxytoca, Strain MIT 10-5244	NWP48	PF4V1
Megasphaera micronuciformis, Strain DNF00954	NWP307	SMR3A
Staphylococcus aureus, Strain TCH70	NWP12	KCNK4_Epitope-1
Klebsiella oxytoca, Strain MIT 10-5242	NWP46	TMEM119
Proteus mirabilis, Strain WGLW6	NWP59	CHGA
Fusobacterium sp., Strain CM22	NWP167	GP6
Escherichia coli, Strain MS 85-1	NWP30	CCL18
Lactobacillus parafarraginis, Strain F0439	NWP105	CTRB1
Staphylococcus epidermidis, Strain NIHLM040	NWP76	PF4V1
Pseudomonas sp., Strain 2_1_26	NWP20	PF4V1
Corynebacterium amycolatum, Strain SK46	NWP07	NPPA
Streptococcus mitis, Strain F0392	NWP26	FAM19A3
Staphylococcus capitis E7	capitisE7	PLA2G2E
Streptococcus downei, Oral Taxon 594, Strain F0415	NWP123	SHISA6
Sporosarcina sp., Strain 2681	NWP29	DEFB130A
Propionibacterium acnes, Strain HL002PA3	NWP219	FAM174A
Fusobacterium sp., Strain CM22	NWP167	PDPN
Staphylococcus caprae, Strain C87	NWP24	PF4V1
Lactobacillus jensenii, Strain EX849587VC03	NWP108	PGLYRP1
Streptococcus sobrinus, Strain W1703	NWP85	RTBDN
Streptococcus downei, Oral Taxon 594, Strain F0415	NWP123	CTRB2
Proteus mirabilis, Strain WGLW6	NWP59	DRAXIN
Staphylococcus capitis B12	capitisB12	FGFR2
Escherichia coli, Strain MS 21-1	NWP38	PF4V1
Plesiomonas sp., Strain HPP0020	NWP62	PF4V1
Prevotella melaninogenica, Strain D18	NWP151	C3AR_Epitope-3
Staphylococcus epidermidis, Strain W23144	NWP15	PF4V1
Escherichia coli, Strain MS 21-1 (AIEC/NWP38)	AIEC	CEACAM1
Escherichia coli, Strain MS 21-1 (AIEC/NWP38)	AIEC	CD55
Staphylococcus capitis B12	capitisB12	TENM1
Bacteroides bacterium, Strain KA00344	NWP302	GPC6
Micrococcus luteus, Strain SK58	NWP08	PLA2G2E
Weissella cibaria, Strain F16_1	NWP101	TFF3
Staphylococcus aureus, Strain TCH70	NWP12	PF4V1
Propionibacterium acnes, Strain HL045PA1	NWP265	FAM174A
Hungatella hathewayi, Strain WAL-18680	NWP231	SMR3A
Escherichia coli, Strain 83972	NWP04	CCL18
Propionibacterium acnes, Strain HL043PA2	NWP264	TMEM119
Escherichia coli, Strain MS 85-1	NWP30	PLA2G2E
Staphylococcus capitis D5	capitisD5	PDIA3
Citrobacter freundii, Strain 4_7_47CFAA	NWP88	DRAXIN
Corynebacterium sp., Strain CMW7794	NWP98	PLA2G2E
Allobaculum sp., Strain NWP324	Ery128	PF4V1
Lactobacillus parafarraginis, Strain F0439	NWP105	CTRB2
Streptococcus sobrinus, Strain W1703	NWP85	PDGFB
Clostridium difficile, Strain 002-P50-2011	NWP230	KCMA1_Epitope-1
Clostridium sp., Strain MSTE9	NWP253	SPINK9
Staphylococcus epidermidis E11	EpiE11	XG
Citrobacter freundii, Strain 4_7_47CFAA	NWP28	DRAXIN
Staphylococcus epidermidis, Strain NIHLM001	NWP66	UNQ6190/PRO20217
Staphylococcus warneri E6	warneriE6	ACTR3C
Bacteroides stercoris, Strain CC31F	NWP270	DQA2_Epitope-1
Staphylococcus epidermidis, Strain NIH05001	NWP78	PF4V1
Streptococcus mitis, Strain F0392	NWP26	CCL18

Propionibacterium acnes, Strain HL002PA2	NWP214	TMEM119
Enterococcus faecalis, Strain TX2137	NWP117	SCNAA_Epitope-3
Oscillibacter sp., Strain KLE-1728	NWP269	PDIA2
Staphylococcus pasteurii E5	pasteuriiE5	GYPA
Escherichia coli, Strain MS 110-3	NWP35	NPPA
Lactobacillus jensenii, Strain EX849587VC06	NWP109	PF4V1
Bacteroides stercoris, Strain CC31F	NWP270	TFF2
Propionibacterium acnes, Strain HL020PA1	NWP221	FAM174A
Prevotella bivia, Strain DNF00650	NWP176	AMELX
Prevotella disiens, Strain DNF00882	NWP177	CLU
Sporosarcina sp., Strain 2681	NWP29	PIANP
Clostridium orbiscindens, Strain CC43_001K	NWP259	PDIA6
Lactobacillus crispatus, Strain GED7749C	NWP104	KLRC1
Enterococcus faecium, Strain ERV165	NWP81	PLA2G2E
Propionibacterium acnes, Strain HL046PA2	NWP266	TMEM119
Citrobacter sp., Strain 30_2	NWP01	CCL21
Peptoniphilus sp., Oral Taxon 386, Strain F0131	NWP255	IGFBP6
Staphylococcus warneri E6	warneriE6	PLA2G2A
Streptococcus mitis, Strain F0392	NWP26	DEFB130B
Staphylococcus saprophyticus E8	saprophyticusE8	MTNR1B
Staphylococcus aureus, Strain CM05	NWP83	KCNK4_Epitope-1
Streptococcus anginosus, Strain F0211	NWP125	CTRB2
Plesiomonas sp., Strain HPP0020	NWP62	PLA2G2E
Erysipelotrichaceae sp., Strain 6_1_45	NWP181	LOC644613
Fusobacterium nucleatum subsp. animalis, Oral Taxon 420, Strain F0419	NWP196	CCL21
Escherichia coli, Strain MS 69-1	NWP39	FAM19A3
Acidaminococcus sp., Strain D21	NWP157	TXNDC12
Enterococcus faecium, Strain TX1330	NWP19	NPPC
Prevotella nigrescens, Strain F0103	NWP145	TTYH1_Epitope-3
Bacteroides stercoris, Strain CC31F	NWP270	SCN9A_Epitope-3
Enterococcus faecalis, Strain TX2137	NWP117	ENDOU
Staphylococcus warneri F1	warneriF1	PSORS1C2
Propionibacterium acnes, Strain HL005PA1	NWP224	TMEM119
Deinococcus grandis, Strain SK125	NWP89	PLA2G2E
Propionibacterium acnes, Strain HL005PA4	NWP220	FAM174A
Citrobacter sp., Strain 30_2	NWP01	FAM19A2
Lachnospiraceae bacterium, Strain AAB23	AB23	SMR3A
Propionibacterium acnes, Strain HL056PA1	NWP267	TMEM119
Staphylococcus hominis, Strain SK119	NWP10	PF4V1
Staphylococcus pasteurii E5	pasteuriiE5	FAM174A
Erysipelotrichaceae sp., Strain 6_1_45	NWP181	PLA2G2E
Sporosarcina sp., Strain 2681	NWP29	SMR3A
Streptococcus mitis, Strain F0392	NWP26	PLA2G2E
Streptococcus sp., Strain BS21	NWP131	ENDOU
Corynebacterium amycolatum, Strain SK46	NWP07	PIANP
Propionibacterium acnes, Strain HL005PA2	NWP215	TMEM119
Lactobacillus crispatus, Strain JV-V01	NWP107	PDIA2
Corynebacterium sp., Strain FHF0082	NWP61	PIANP
Staphylococcus pasteurii E5	pasteuriiE5	CSF2RA
Escherichia coli, Strain MS 200-1	NWP41	LOC644613
Escherichia coli, Strain MS 85-1	NWP30	NPPC
Proteus mirabilis, Strain WGLW6	NWP59	GPR1
Erysipelotrichaceae sp., Strain 6_1_45	NWP174	NPPC
Staphylococcus epidermidis, Strain NIHLM015	NWP71	PF4V1
Staphylococcus warneri D11	warneriD12	ACTR3C
Propionibacterium sp., Strain 5_U_42AFAA	NWP300	TMEM119
Erysipelotrichaceae sp., Strain 6_1_45	NWP174	CCL18
Megasphaera sp., Strain DNF00912	NWP296	SMR3A
Bacteroides dorei, Strain 5_1_36/D4	NWP244	PTPRJ
Staphylococcus aureus, Strain MN8	NWP17	SRGN
Plesiomonas sp., Strain HPP0020	NWP62	CCL18
Enterococcus faecium, Strain TX1330	NWP19	PIANP
Klebsiella oxytoca, Strain MIT 10-5249	NWP52	ACVR2B
Streptococcus mitis, Strain F0392	NWP26	NPPA
Prevotella bivia, Strain DNF00188	NWP193	CALU
Staphylococcus caprae, Strain C87	NWP24	LOC644613

Lactobacillus crispatus, Strain JV-V01	NWP107	TFF1
Corynebacterium sp., Strain HFH0082	NWP61	SMR3A
Staphylococcus warneri B9	warneriB9	PPY
Klebsiella oxytoca, Strain MIT 09-7231	NWP45	TMEM119
Lachnospiraceae bacterium, Strain AAB19	AB19	SMR3A
Erysipelotrichaceae sp., Strain 6_1_45	NWP181	CCL18
Escherichia coli, Strain MS 115-1	NWP36	PIANP
Staphylococcus epidermidis, Strain BCM0060	NWP13	PF4V1
Escherichia sp., Strain 3_2_53FAA	NWP02	LOC644613
Staphylococcus cohnii G11	cohniiG11	SLC8B1
Achromobacter xylosoxidans, Strain C54	NWP22	TMEM119
Citrobacter freundii, Strain 4_7_47CFAA	NWP28	IGFBP5
Oscillibacter sp., Strain KLE-1728	NWP269	PDIA3
Staphylococcus epidermidis, Strain NIHLM001	NWP66	FGF17
Bacteroides sp., Strain AAB9	AB9	EPHA5
Klebsiella sp., Strain MS 92-3	NWP40	TMEM119
Escherichia coli, Strain MS 85-1	NWP30	SMR3A
Citrobacter freundii, Strain 4_7_47CFAA	NWP88	IGFBP5
Staphylococcus warneri B9	warneriB9	AT134_Epitope-2
Propionibacterium acnes, Strain HLO27PA2	NWP218	FAM174A
Staphylococcus aureus, Strain TCH70	NWP12	MSMB
Lactobacillus gasseri, Strain 224-1	NWP112	PF4V1
Lactobacillus jensenii, Strain 269-3	NWP110	TMEM149
Staphylococcus pasteurii C9	pasteuriiC9	PLA2G2A
Propionibacterium acnes, Strain HLO36PA2	NWP227	TMEM119
Bacteroides dorei, Strain 5_1_36/D4	NWP244	BTN1A1
Erysipelotrichaceae sp., Strain 6_1_45	NWP181	COL10A1
Fusobacterium sp., Strain CM22	NWP167	CSF3
Prevotella sp., Oral Taxon 317, Strain F0108	NWP173	CSPG5
Micrococcus luteus, Strain SK58	NWP08	SMR3A
Streptococcus sp., Strain C150	NWP121	PDGFB
Bacillus sp., Strain DNF00233	NWP90	PLA2G2E
Propionibacterium acnes, Strain HLO13PA1	NWP209	TMEM119
Prevotella timonensis, Strain CRIS 5C-B1	NWP156	TXNDC12
Lactobacillus rhamnosus, Strain LMS2-1	NWP97	TFF1
Propionibacterium acnes, Strain HLO56PA1	NWP267	FAM174A
Streptococcus mitis, Strain F0392	NWP26	NPPC
Escherichia coli, Strain MS 85-1	NWP30	PIANP
Propionibacterium acnes, Strain HLO20PA1	NWP221	TMEM119
Escherichia coli, Strain 83972	NWP04	PLA2G2E
Bacteroides stercoris, Strain CC31F	NWP270	TEX29_Epitope-1
Staphylococcus aureus, Strain TCH70	NWP12	SLC8B1
Plesiomonas sp., Strain HPP0020	NWP62	NPPA
Staphylococcus pasteurii E5	pasteuriiE5	HCG22
Propionibacterium acnes, Strain HLO25PA2	NWP210	OPRK1
Blautia sp., Strain AAB30	AB30	TREML1
Streptococcus sp., Strain SR1	NWP122	ENDOU
Escherichia coli, Strain MS 85-1	NWP30	NPPA
Proteus mirabilis, Strain WGLW6	NWP59	SGCA
Dermabacter sp., Strain HFH0086	NWP92	LRRC8D
Clostridium sp., Strain 7_2_43FAA	NWP243	PDIA6
Sporosarcina sp., Strain 2681	NWP29	IGFBP5
Rothia dentocariosa, Strain M567	NWP23	PF4V1
Fusobacterium nucleatum subsp. animalis, Oral Taxon 420, Strain F0419	NWP196	CCL5
Fusobacterium sp., Strain CM21	NWP166	LOC644613
Proteus mirabilis, Strain WGLW6	NWP59	PODXL2
Propionibacterium acnes, Strain HLO30PA2	NWP207	OPRK1
Escherichia coli, Strain MS 69-1	NWP39	PF4V1
Staphylococcus warneri B9	warneriB9	F3
Enterococcus faecium, Strain ERV165	NWP81	PIANP
Escherichia coli, Strain 83972	NWP04	FAM19A3
Bacteroides sp., Strain D20	NWP288	ENDOU
Enterococcus faecalis, Strain HH22	NWP18	TMEM119
Fusobacterium nucleatum subsp. animalis, Oral Taxon 420, Strain F0419	NWP196	IGFBP5
Staphylococcus pasteurii G3	pasteuriiG3	GYPA
Pseudomonas sp., Strain HPB0071	NWP65	PF4V1

Eggerthella sp., Strain MVA1	NWP185	CCL18
Bacteroides fragilis, Strain CL05T00C42	NWP287	ENDOU
Corynebacterium amycolatum, Strain SK46	NWP07	SMR3A
Escherichia coli, Strain MS 110-3	NWP35	PIANP
Klebsiella oxytoca, Strain MIT 10-5244	NWP48	TMEM119
Megasphaera sp., Strain DNF00912	NWP296	SPINK9
Corynebacterium amycolatum, Strain SK46	NWP07	COL10A1
Staphylococcus pasteurii C9	pasteuriiC9	TMEM178B
Staphylococcus pasteurii G3	pasteuriiG3	HCG22
Proteus mirabilis, Strain WGLW6	NWP59	AGRN
Lactobacillus crispatus, Strain 125-2-CHN	NWP99	ENDOU
Escherichia coli, Strain MS 69-1	NWP39	PLA2G2E
Propionibacterium acnes, Strain HL027PA2	NWP218	TMEM119
Propionibacterium acnes, Strain HL007PA1	NWP225	TMEM119
Staphylococcus epidermidis, Strain NIHLM040	NWP76	XG
Clostridium sp., Strain MSTE9	NWP253	IGFBP6
Streptococcus mitis, Strain F0392	NWP26	PIANP
Bacteroides stercoris, Strain CC31F	NWP270	AGRN
Fusobacterium nucleatum, Strain CTI-07	NWP190	ENDOU
Lactobacillus parafarraginis, Strain F0439	NWP105	UNQ6190/PRO20217
Streptococcus sp., Strain CM7	NWP133	MUCL3
Propionibacterium acnes, Strain HL053PA1	NWP260	TMEM119
Staphylococcus warneri C2	warneriC2	C2orf40
Staphylococcus epidermidis, Strain NIHLM001	NWP66	CCL2
Streptococcus sp., Strain OBR6C	NWP124	RTBDN
Coprococcus sp., Strain AAb34	AB34	PLA2G2E
Corynebacterium sp., Strain HFH0082	NWP61	COL10A1
Propionibacterium acidifaciens, Oral Taxon 191, Strain F0233	NWP263	SPINK9
Propionibacterium acnes, Strain HL037PA1	NWP208	FAM174A
Propionibacterium acnes, Strain HL002PA1	NWP206	FAM174A
Propionibacterium acnes, Strain HL038PA1	NWP235	TMEM119
Propionibacterium acnes, Strain HL053PA2	NWP236	FAM174A
Fusobacterium sp., Strain CM22	NWP167	PSORS1C2
Staphylococcus warneri D11	warneriD12	DKK4
Clostridium orbiscindens, Strain 1_3_50AFAA	NWP137	GPR25
Propionibacterium acnes, Strain HL030PA2	NWP207	FAM174A
Staphylococcus pasteurii E5	pasteuriiE5	KLK13
Streptococcus gallolyticus subsp. gallolyticus, Strain TX20005	NWP27	CST6
Staphylococcus capitis A7	capitisA7	EPO
Enterococcus faecium, Strain ERV165	NWP81	NPPC
Lactobacillus jensenii, Strain 208-1	NWP111	ASIP
Staphylococcus pasteurii E1	pasteuriiE1	PPY
Proteus mirabilis, Strain WGLW6	NWP59	DKK1
Enterococcus faecium, Strain TX1330	NWP19	COL10A1
Propionibacterium acnes, Strain HL110PA3	NWP297	SMR3A
Streptococcus vestibularis, Strain F0396	NWP132	UNQ6190/PRO20217
Proteus mirabilis, Strain WGLW6	NWP59	SYNDIG1L
Escherichia coli, Strain MS 115-1	NWP36	NPPA
Prevotella bivia, Strain DNF00188	NWP193	MANF
Prevotella histicola, Strain F0411	NWP144	PRRG1
Escherichia coli, Strain MS 145-7	NWP33	TNFSF9
Klebsiella oxytoca, Strain MIT 10-5249	NWP52	AHSG
Pseudomonas sp., Strain 2_1_26	NWP20	TMEM119
Staphylococcus saprophyticus F6	saprophyticusF6	PDGFB
Propionibacterium acnes, Strain HL013PA2	NWP217	TMEM119
Bacteroides bacterium, Strain KA00344	NWP302	CD248
Staphylococcus saprophyticus E8	saprophyticusE8	GPR17
Micrococcus luteus, Strain SK58	NWP08	CCL18
Capnocytophaga sputigena, Strain CC21_001D	NWP163	CST1
Enterococcus faecium, Strain ERV165	NWP81	SMR3A
Enterococcus faecalis, Strain TUSoD Ef11	NWP05	PF4V1
Staphylococcus capitis B12	capitisB12	P2RX5
Staphylococcus warneri D11	warneriD12	PLA2G3
Staphylococcus saprophyticus E8	saprophyticusE8	SHISA7
Oscillibacter sp., Strain KLE-1728	NWP269	CXCR4
Streptococcus sp., Strain ACS2	NWP115	FAM3C

Eggerthella sp., Strain MVA1	NWP185	PLA2G2E
Citrobacter freundii, Strain 4_7_47CFAA	NWP28	CCL21
Staphylococcus pasteurii G3	pasteuriiG3	KLK13
Ruminococcus gnavus, Strain NWP325	RG74	CD7
Staphylococcus capitis C11	capitisC11	PDIA3
Propionibacterium acnes, Strain HL060PA1	NWP239	FAM174A
Clostridium difficile, Strain 002-P50-2011	NWP230	PDIA6
Enterococcus faecium, Strain ERV102	NWP80	MUCL3
Propionibacterium acnes, Strain HL025PA1	NWP204	OPRK1
Propionibacterium acnes, Strain HL036PA3	NWP222	FAM174A
Streptococcus sp., Strain SR1	NWP122	TMEM149
Lactobacillus jensenii, Strain EX849587VC06	NWP109	SHISA2
Fusobacterium sp., Strain CM22	NWP153	SGCA
Enterococcus faecium, Strain E417	NWP79	UNQ6190/PRO20217
Sporosarcina sp., Strain 2681	NWP29	CHRD12
Staphylococcus epidermidis, Strain NIHLM020	NWP74	LOC644613
Staphylococcus epidermidis F6	EpiF6	COL10A1
Arthrobacter albus, Strain DNF00011	NWP86	LTB
Staphylococcus pasteurii F11	pasteuriiF11	HCG22
Staphylococcus pasteurii G7	pasteuriiG7	GYPA
Streptococcus sp., Strain SR4	NWP130	UNQ6190/PRO20217
Streptococcus sobrinus, Strain W1703	NWP85	PIANP
Streptococcus sp., Strain BS29a	NWP129	FAM168B
Proteus mirabilis, Strain WGLW6	NWP59	LDLRAD3
Streptococcus sobrinus, Strain W1703	NWP85	SHISA6
Lactobacillus crispatus, Strain JV-V01	NWP107	PF4V1
Eubacterium sp., Strain AS15	NWP254	SPINK9
Escherichia coli, Strain MS 145-7	NWP33	PF4V1
Veillonella sp., Oral Taxon 780, Strain F0422	NWP268	TXNDC12
Staphylococcus warneri B9	warneriB9	SLC24A3
Staphylococcus warneri D11	warneriD12	EPHB3
Staphylococcus hominis C10	hominisC10	XG
Staphylococcus warneri E6	warneriE6	RTN4R
Fusobacterium sp., Strain CM22	NWP167	TRABD2B
Bacteroides sp., Strain 4_1_36	NWP312	PRR27
Collinsella aerofaciens, Strain AAB3	AB3	SMR3A
Staphylococcus warneri , Strain SK66	NWP11	MCFD2
Escherichia coli, Strain MS 124-1	NWP32	TMEM119
Ruminococcus gnavus, Strain NWP326	RG109	AGER
Staphylococcus warneri E6	warneriE6	DKK4
Bacteroides stercoris, Strain CC31F	NWP270	CSF2
Prevotella bivia, Strain DNF00650	NWP176	OTOS
Proteus mirabilis, Strain WGLW6	NWP59	GAST
Staphylococcus warneri B9	warneriB9	SDC4
Staphylococcus warneri E4	warneriE4	TMEM8
Erysipelotrichaceae sp., Strain 6_1_45	NWP181	SMR3A
Propionibacterium acnes, Strain HL030PA1	NWP212	FAM174A
Propionibacterium acnes, Strain HL036PA3	NWP222	TMEM119
Lactobacillus reuteri, Strain CF48-3A	NWP100	TFF2
Blautia sp., Strain AAB32	AB32	TFF2
Prevotella bivia, Strain DNF00650	NWP176	PMCH
Enterococcus faecium, Strain ERV99	NWP82	PF4V1
Staphylococcus warneri E6	warneriE6	EPHB3
Escherichia coli, Strain MS 124-1	NWP32	SMR3A
Dorea sp., Strain AAB35	AB35	PDIA2
Enterococcus faecium, Strain ERV165	NWP81	DEFB130A
Fusobacterium sp., Strain CM22	NWP167	OR5T3_Epitope-1
Staphylococcus saprophyticus E8	saprophyticusE8	RLN2
Staphylococcus epidermidis, Strain NIH04008	NWP77	FGF17
Staphylococcus capitis A7	capitisA7	TMEM8
Propionibacterium acnes, Strain HL005PA1	NWP224	FAM174A
Escherichia coli, Strain MS 196-1	NWP42	DEFB130B
Lactobacillus jensenii, Strain 208-1	NWP111	CTRB1
Lactobacillus crispatus, Strain GED7749C	NWP104	BPIFA3
Staphylococcus pasteurii E5	pasteuriiE5	PODXL2
Prevotella bivia, Strain DNF00188	NWP193	PMCH

Staphylococcus warneri E6	warneriE6	SFRP4
Prevotella nigrescens, Strain F0103	NWP145	SLC22A5
Staphylococcus epidermidis, Strain NIHLM001	NWP66	CSAG1
Lactobacillus jensenii, Strain 208-1	NWP111	CTRB2
Staphylococcus warneri E6	warneriE6	DCN
Escherichia coli, Strain MS 196-1	NWP42	PLA2G2E
Escherichia coli, Strain MS 69-1	NWP39	DEFB130B
Bacteroides fragilis, Strain CL03T12C07	NWP281	ENDOU
Staphylococcus warneri, Strain SK66	NWP11	CP
Prevotella veroralis, Oral Taxon 572, Strain F0319	NWP155	PDIA3
Staphylococcus saprophyticus G1	saprophyticusG1	PDGFB
Staphylococcus warneri B9	warneriB9	P2RX5
Megasphaera sp., Strain DNF00912	NWP296	PDIA6
Lactobacillus parafarraginis, Strain F0439	NWP105	RTBDN
Staphylococcus pasteurii G7	pasteuriiG7	HCG22
Escherichia coli, Strain MS 115-1	NWP36	NPPC
Staphylococcus warneri D11	warneriD12	DCN
Citrobacter freundii, Strain 4_7_47CFAA	NWP88	FAM19A2
Bacteroides sp., Strain D2	NWP192	PLA2G2E
Lachnospiraceae bacterium, Strain AAB19	AB19	SEMA6C
Collinsella aerofaciens, Strain AAB3	AB3	PRR27
Streptococcus sp., Strain SR1	NWP122	C3AR_Epitope-3
Staphylococcus pasteurii F11	pasteuriiF11	KLK13
Staphylococcus pasteurii F12	pasteuriiF12	HCG22
Bacteroides sp., Strain D2	NWP192	CCL18
Klebsiella oxytoca, Strain MIT 10-5245	NWP49	TMEM119
Citrobacter freundii, Strain 4_7_47CFAA	NWP28	FAM19A2
Enterococcus faecium, Strain ERV102	NWP80	FAM19A3
Staphylococcus warneri B9	warneriB9	TMPRSS11D
Oscillibacter sp., Strain KLE-1728	NWP269	P4HB
Staphylococcus saprophyticus E8	saprophyticusE8	PSORS1C2
Escherichia coli, Strain MS 110-3	NWP35	DEFB130A
Streptococcus sp., Strain C150	NWP121	FGF17
Erysipelotrichaceae sp., Strain 6_1_45	NWP181	DEFB130B
Eubacterium sp., Strain AS15	NWP254	IGFBP6
Staphylococcus epidermidis, Strain NIHLM023	NWP75	TMEM119
Escherichia coli, Strain MS 110-3	NWP35	NPPC
Escherichia coli, Strain MS 69-1	NWP39	NPPA
Klebsiella sp., Strain OBRC7	NWP60	TMEM119
Bacteroidales bacterium, Strain KA00344	NWP302	C1QTNF2
Klebsiella pneumoniae subsp. pneumoniae, Strain WGLW5	NWP55	TMEM119
Staphylococcus epidermidis, Strain M23864:W2	NWP16	TMEM119
Staphylococcus capitis B12	capitisB12	C2orf40
Staphylococcus epidermidis, Strain NIH04008	NWP77	PF4V1
Staphylococcus warneri E4	warneriE4	ACTR3C
Prevotella oralis, Strain HGA0225	NWP147	GPR25
Rothia mucilaginosa, Strain CC87LB	NWP84	PF4V1
Bacteroides fragilis, Strain CL05T00C42	NWP287	FKBP2
Peptoniphilus sp., Oral Taxon 386, Strain F0131	NWP255	SPINK9
Enterococcus faecium, Strain E417	NWP79	CSAG1
Fusobacterium sp., Strain CM22	NWP167	GYPA
Lactobacillus parafarraginis, Strain F0439	NWP105	CSAG1
Enterococcus faecium, Strain ERV165	NWP81	CCL18
Lactobacillus jensenii, Strain EX849587VC03	NWP108	FAM19A2
Prevotella denticola, Strain DNF00960	NWP179	MUCL3
Lactobacillus jensenii, Strain 208-1	NWP111	UNQ6190/PRO20217
Escherichia coli, Strain MS 200-1	NWP41	DEFB130B
Staphylococcus epidermidis, Strain NIH04008	NWP77	UNQ6190/PRO20217
Clostridium aldenense, Strain WAL-18727	NWP314	PRR27
Staphylococcus warneri B9	warneriB9	GPR15L
Propionibacterium acnes, Strain HL053PA2	NWP236	OPRK1
Escherichia coli, Strain MS 57-2	NWP34	PF4V1
Staphylococcus hominis, Strain C80	NWP25	PIANP
Staphylococcus pasteurii G3	pasteuriiG3	PODXL2
Propionibacterium acnes, Strain HL005PA4	NWP220	OPRK1
Propionibacterium acnes, Strain HL013PA2	NWP217	FAM174A

Enterococcus faecium, Strain TX1330	NWP19	DEFB130A
Prevotella oris, Strain F0302	NWP159	PDIA6
Staphylococcus pasteurii F12	pasteuriiF12	KLK13
Proteus mirabilis, Strain WGLW6	NWP59	THBD
Escherichia coli, Strain 83972	NWP04	PIANP
Streptococcus anginosus, Strain F0211	NWP125	MUCL3
Staphylococcus warneri E6	warneriE6	PLA2G3
Enterococcus faecium, Strain ERV165	NWP81	NPPA
Lachnospiraceae bacterium, Strain AAB19	AB19	SYCN
Enterococcus faecium, Strain ERV102	NWP80	UNQ6190/PRO20217
Peptoniphilus lacrimalis, Strain DNF00528	NWP304	SMR3A
Staphylococcus epidermidis, Strain NIH05001	NWP78	TMEM119
Propionibacterium acidifaciens, Oral Taxon 191, Strain F0233	NWP263	FGF1
Proteus mirabilis, Strain WGLW6	NWP59	TMG2_Epitope-1
Staphylococcus pasteurii F12	pasteuriiF12	GYP A
Staphylococcus epidermidis, Strain W23144	NWP15	TMEM119
Erysipelotrichaceae sp., Strain 6_1_45	NWP181	NPPC
Proteus mirabilis, Strain WGLW6	NWP59	EPHA2
Propionibacterium acnes, Strain HL059PA2	NWP251	TMEM119
Enterococcus faecium, Strain ERV102	NWP80	FGF17
Corynebacterium amycolatum, Strain SK46	NWP07	NPPC
Fusobacterium sp., Oral Taxon 370, Strain F0437	NWP143	VSTM2B
Staphylococcus warneri E6	warneriE6	EXOC3-AS1
Klebsiella oxytoca, Strain MIT 10-5248	NWP51	TMEM119
Escherichia coli, Strain MS 196-1	NWP42	CCL18
Staphylococcus pasteurii C9	pasteuriiC9	GPHB5
Klebsiella pneumoniae subsp. pneumoniae, Strain WGLW1	NWP56	LOC644613
Staphylococcus epidermidis C3	EpIC3	PMCH
Micrococcus luteus, Strain SK58	NWP08	PRR27
Eubacterium sp., Strain AS15	NWP254	TMEM119
Escherichia coli, Strain MS 69-1	NWP39	PIANP
Staphylococcus hominis B3	hominisB3	LOC644613
Proteus mirabilis, Strain WGLW6	NWP59	SPOCK1
Staphylococcus epidermidis, Strain E13A	NWP63	PF4V1
Prevotella melaninogenica, Strain D18	NWP151	GPR25
Klebsiella oxytoca, Strain MIT 10-5250	NWP53	TMEM119
Enterococcus faecalis, Strain TX2137	NWP117	PDGFB
Staphylococcus capitis C4	capitisC4	SMR3A
Klebsiella oxytoca, Strain MIT 10-5248	NWP51	PF4V1
Propionibacterium sp., Strain 5_U_42AFAA	NWP300	FAM174A
Bacteroides stercoris, Strain CC31F	NWP270	SYCN
Staphylococcus capitis C12	capitisC12	PLA2G2E
Propionibacterium acnes, Strain HL050PA3	NWP249	FAM174A
Clostridiales bacterium, Strain 3_1_39B/D5	NWP240	PF4V1
Escherichia coli, Strain MS 85-1	NWP30	DEFB130A
Corynebacterium amycolatum, Strain SK46	NWP07	FAM19A2
Prevotella bivia, Strain DNF00188	NWP193	AMELY
Eggerthella sp., Strain MVA1	NWP185	COL10A1
Klebsiella sp., Strain 1_1_55	NWP03	TMEM119
Erysipelotrichaceae sp., Strain 6_1_45	NWP181	FAM19A3
Propionibacterium acnes, Strain HL005PA2	NWP215	FAM174A
Streptococcus sp., Strain C150	NWP121	RTBDN
Escherichia coli, Strain MS 196-1	NWP42	PIANP
Micrococcus luteus, Strain SK58	NWP08	KLK10
Staphylococcus saprophyticus D1	saprophyticusD1	PDGFB
Staphylococcus warneri E6	warneriE6	CNPY3
Clostridium sp., Strain 7_2_43FAA	NWP243	ENDOU
Staphylococcus warneri D9	warneriD9	CTRB1
Streptococcus sp., Strain C150	NWP121	TMEM119
Blautia sp., Strain AAB31	AB31	MUCL3
Corynebacterium sp., Strain HFH0082	NWP61	SEMG1
Prevotella disiens, Strain DNF00882	NWP177	CFC1
Erysipelotrichaceae sp., Strain 6_1_45	NWP181	PIANP
Staphylococcus warneri D11	warneriD12	CDSN
Sporosarcina sp., Strain 2681	NWP29	PRND
Eggerthella sp., Strain MVA1	NWP185	IGFBP5

Escherichia coli, Strain MS 124-1	NWP32	GPR17
Fusobacterium nucleatum, Strain CTI-07	NWP190	IGFBP5
Prevotella sp., Oral Taxon 472, Strain F0295	NWP191	CSPG5
Enterococcus faecium, Strain E417	NWP79	FAM19A3
Citrobacter sp., Strain 30_2	NWP01	IGFBP5
Prevotella bivia, Strain DNF00650	NWP176	AMELY
Staphylococcus epidermidis, Strain NIHLM067	NWP68	PF4V1
Bifidobacterium longum subsp. longum, Strain 44B	NWP308	SMR3A
Fusobacterium sp., Strain CM21	NWP166	PIANP
Enterococcus faecium, Strain ERV165	NWP81	FAM19A2
Streptococcus downei, Oral Taxon 594, Strain F0415	NWP123	PIANP
Staphylococcus warneri E6	warneriE6	OPN3
Propionibacterium acidifaciens, Oral Taxon 191, Strain F0233	NWP263	TFF2
Staphylococcus warneri E4	warneriE4	DCN
Klebsiella oxytoca, Strain MIT 10-5250	NWP53	PF4V1
Erysipelotrichaceae sp., Strain 6_1_45	NWP174	FAM19A3
Bifidobacterium longum subsp. longum, Strain 44B	NWP308	CCL24
Corynebacterium amycolatum, Strain SK46	NWP07	DEFB130A
Propionibacterium acidifaciens, Oral Taxon 191, Strain F0233	NWP263	ENDOU
Lachnospiraceae bacterium, Strain AAB23	AB23	SMR3B
Enterococcus faecium, Strain TX1330	NWP19	SMR3A
Staphylococcus hominis B3	hominisB3	MUCL3
Streptococcus downei, Oral Taxon 594, Strain F0415	NWP123	ASIP
Bacteroides sp., Strain D2	NWP192	LOC644613
Eggerthella sp., Strain MVA1	NWP185	NPPC
Arthrobacter albus, Strain DNF00011	NWP86	PF4V1
Fusobacterium sp., Oral Taxon 370, Strain F0437	NWP143	MUC20
Bifidobacterium sp., Strain MSTE12	NWP242	EPHA5
Escherichia coli, Strain MS 124-1	NWP32	PF4V1
Staphylococcus saprophyticus E8	saprophyticusE8	ADRA2C
Streptococcus sp., Strain AS20	NWP116	PIANP
Escherichia coli, Strain MS 110-3	NWP35	AGRP
Escherichia coli, Strain 83972	NWP04	DEFB130B
Erysipelotrichaceae sp., Strain 6_1_45	NWP174	PIANP
Oscillibacter sp., Strain KLE-1728	NWP269	NGFR
Staphylococcus pasteurii C9	pasteuriiC9	CNTN1
Streptococcus gallolyticus subsp. gallolyticus, Strain TX20005	NWP27	TMEM119
Proteus mirabilis, Strain WGLW6	NWP59	DQA2_Epitope-1
Bacillus sp., Strain DNF00233	NWP90	CCL18
Clostridium aldenense, Strain WAL-18727	NWP314	PLA2G2E
Lactobacillus gasseri, Strain EX33690VC16	NWP113	PF4V1
Peptoniphilus lacrimalis, Strain UPII 315-B	NWP261	PF4V1
Escherichia coli, Strain MS 69-1	NWP39	CCL18
Rothia aeria, Oral Taxon 188, Strain F0474	NWP64	TMEM119
Lactobacillus gasseri, Strain EX33690VC16	NWP113	ENDOU
Shigella sp., Strain D9	NWP06	PRR27
Fusobacterium nucleatum, Strain CTI-02	NWP186	MANF
Streptococcus vestibularis, Strain F0396	NWP132	CTRB1
Propionibacterium acnes, Strain HL037PA1	NWP208	OPRK1
Fusobacterium sp., Strain CM22	NWP167	EPHA5
Escherichia coli, Strain MS 21-1	NWP38	CEACAM5
Staphylococcus warneri F1	warneriF1	MUCL3
Eggerthella sp., Strain MVA1	NWP185	FAM19A3
Staphylococcus epidermidis, Strain NIHLM018	NWP72	XG
Fusobacterium periodonticum, Strain 1_A_54/D10	NWP142	MSLN
Bacteroides stercoris, Strain CC31F	NWP270	MCAM
Fusobacterium nucleatum, Strain CTI-05	NWP188	CCL18
Staphylococcus epidermidis, Strain NIHLM040	NWP76	TMEM119
Prevotella buccae, Strain D17	NWP256	DPP7
Staphylococcus pasteurii F11	pasteuriiF11	PODXL2
Streptococcus downei, Oral Taxon 594, Strain F0415	NWP123	FGFRL1
Streptococcus anginosus, Strain F0211	NWP125	PF4V1
Staphylococcus pasteurii F11	pasteuriiF11	GYP A
Lachnospiraceae sp., Strain DNF00160	NWP150	UNQ6190/PRO20217
Staphylococcus warneri, Strain SK66	NWP11	CCER2
Actinomyces neuii, Strain MJR8396A	NWP258	PF4V1

Enterococcus faecium, Strain TX0133a04	NWP44	TMEM119
Sporosarcina sp., Strain 2681	NWP29	COL10A1
Fusobacterium nucleatum subsp. animalis, Oral Taxon 420, Strain F0419	NWP196	SPINK9
Fusobacterium sp., Strain CM21	NWP166	PLA2G2E
Lactobacillus jensenii, Strain 208-1	NWP111	RTBDN
Plesiomonas sp., Strain HPP0020	NWP62	FAM19A3
Prevotella veroralis, Oral Taxon 572, Strain F0319	NWP155	SFN
Klebsiella oxytoca, Strain MIT 10-5246	NWP50	PF4V1
Staphylococcus pasteurii G7	pasteuriiG7	KLK13
Staphylococcus epidermidis, Strain BCM0060	NWP13	TMEM119
Collinsella sp., Strain 4_8_47FAA	NWP198	MUCL3
Prevotella timonensis, Strain CRIS 5C-B1	NWP156	GPR25
Ruminococcus gnavus, Strain NWP325	RG74	TXNDC12
Enterococcus faecium, Strain ERV102	NWP80	PIANP
Staphylococcus capitis B12	capitisB12	CD22
Corynebacterium amycolatum, Strain SK46	NWP07	AGRP
Eubacterium infirmum, Strain F0142	NWP223	PDIAG
Staphylococcus epidermidis, Strain NIHLM070	NWP69	PF4V1
Proteus mirabilis, Strain WGLW6	NWP59	PSORS1C2
Staphylococcus warneri E4	warneriE4	DKK4
Streptococcus sp., Strain AS20	NWP116	MUCL3
Propionibacterium acnes, Strain HL037PA1	NWP208	TMEM119
Streptococcus sp., Strain AS20	NWP116	CTRB2
Micrococcus luteus, Strain SK58	NWP08	NPPC
Escherichia coli, Strain MS 110-3	NWP35	SMR3A
Plesiomonas sp., Strain HPP0020	NWP62	SMR3A
Lactobacillus reuteri, Strain CF48-3A	NWP100	PF4V1
Staphylococcus saprophyticus E8	saprophyticusE8	OSTN
Staphylococcus epidermidis C6	EpiC6	MUCL3
Streptococcus mitis, Strain F0392	NWP26	KLK10
Corynebacterium amycolatum, Strain SK46	NWP07	CHRD12
Lactobacillus jensenii, Strain EX849587VC03	NWP108	TMEM119
Propionibacterium acnes, Strain HL025PA1	NWP204	FAM174A
Enterococcus faecium, Strain ERV165	NWP81	PRR27
Staphylococcus warneri E4	warneriE4	EPHB3
Staphylococcus epidermidis, Strain NIHLM018	NWP72	PF4V1
Klebsiella oxytoca, Strain MIT 10-5246	NWP50	TMEM119
Staphylococcus epidermidis, Strain NIHLM020	NWP74	PF4V1
Corynebacterium sp., Strain HFH0082	NWP61	PRR27
Streptococcus sp., Strain SR1	NWP122	UNQ6190/PRO20217
Lactobacillus reuteri, Strain CF48-3A	NWP100	TMEM119
Propionibacterium acnes, Strain HL002PA1	NWP206	OPRK1
Bacteroides bacterium, Strain KA00344	NWP302	IL4
Bacteroides sp., Strain 4_1_36	NWP312	FGF1
Streptococcus mitis, Strain F0392	NWP26	UNQ6190/PRO20217
Fusobacterium periodonticum, Strain 2_1_31	NWP160	ENDOU
Streptococcus sp., Strain C150	NWP121	UNQ6190/PRO20217
Staphylococcus hominis, Strain C80	NWP25	CSAG1
Collinsella aerofaciens, Strain AAB3	AB3	ADAMTS16
Propionibacterium acnes, Strain HL013PA1	NWP209	OPRK1
Fusobacterium sp., Strain CM22	NWP167	TNFRSF4
Corynebacterium amycolatum, Strain SK46	NWP07	PRR27
Corynebacterium sp., Strain HFH0082	NWP61	DEFB130A
Staphylococcus warneri D11	warneriD11	PLA2G2A
Klebsiella pneumoniae subsp. pneumoniae, Strain WGLW2	NWP57	PF4V1
Bacteroides eggerthii, Strain 1_2_48FAA	NWP180	RCN3
Staphylococcus epidermidis, Strain NIHLM008	NWP70	PF4V1
Bacillus sp., Strain DNF00233	NWP90	DEFB130B
Fusobacterium sp., Strain CM22	NWP167	C3AR_Epitope-3
Escherichia sp., Strain 3_2_53FAA	NWP02	CCL18
Klebsiella pneumoniae subsp. pneumoniae, Strain WGLW1	NWP56	PF4V1
Staphylococcus capitis A5	capitisA5	PLA2G2E
Corynebacterium amycolatum, Strain SK46	NWP07	IGFBP5
Propionibacterium acnes, Strain HL044PA1	NWP237	TFF1
Staphylococcus epidermidis, Strain NIHLM031	NWP73	MUCL3
Staphylococcus warneri D11	warneriD12	OPN3

Streptococcus sp., Strain SR1	NWP122	PF4V1
Staphylococcus capitis A7	capitisA7	EXOC3-AS1
Lachnospiraceae sp., Strain ICM7	NWP241	IL29
Lactobacillus jensenii, Strain EX849587VC06	NWP109	LOC644613
Lactobacillus jensenii, Strain EX849587VC06	NWP109	FAM19A3
Propionibacterium acidifaciens, Oral Taxon 191, Strain F0233	NWP263	TFF3
Streptococcus gallolyticus subsp. gallolyticus, Strain TX20005	NWP27	PF4V1
Fusobacterium sp., Strain CM22	NWP153	RCN2
Klebsiella sp., Strain OBRC7	NWP60	PF4V1
Escherichia coli, Strain 83972	NWP04	PF4V1
Klebsiella pneumoniae subsp. pneumoniae, Strain WGLW2	NWP57	TMEM119
Peptoniphilus sp., Oral Taxon 836, Strain F0141	NWP313	IGFBP5
Lactobacillus jensenii, Strain 208-1	NWP111	AGER
Sporosarcina sp., Strain 2681	NWP29	PRR27
Staphylococcus capitis A7	capitisA7	ACTR3C
Escherichia coli, Strain MS 85-1	NWP30	PRR27
Staphylococcus pasteurii C9	pasteuriiC9	CDSN
Escherichia coli, Strain MS 16-3	NWP37	LOC644613
Streptococcus sp., Strain SR1	NWP122	LGALS3
Lactobacillus crispatus, Strain JV-V01	NWP107	CTRB1
Escherichia coli, Strain MS 196-1	NWP42	NPPA
Lactobacillus gasseri, Strain 224-1	NWP112	TMEM119
Enterococcus faecium, Strain ERV165	NWP81	MUCL3
Lactobacillus jensenii, Strain EX849587VC03	NWP108	PF4V1
Citrobacter freundii, Strain 4_7_47CFAA	NWP88	CCL21
Lactobacillus jensenii, Strain 269-3	NWP110	C3AR_Epitope-3
Escherichia coli, Strain MS 21-1	NWP38	TMEM119
Bacteroides fragilis, Strain CL05T00C42	NWP287	LCN1
Staphylococcus warneri D9	warneriD9	SSBP3-AS1
Escherichia coli, Strain MS 196-1	NWP42	PF4V1
Ruminococcus gnavus, Strain AAB28	AB28	LOC644613
Staphylococcus warneri D11	warneriD12	CNPY3
Fusobacterium sp., Oral Taxon 370, Strain F0437	NWP143	GFY_Epitope-1
Staphylococcus aureus, Strain MN8	NWP17	CD320
Plesiomonas sp., Strain HPP0020	NWP62	AGRP
Prevotella disiens, Strain DNF00882	NWP177	GLP1R
Staphylococcus gallinarum E9	gallinarumE9	PDGFB
Fusobacterium sp., Strain CM22	NWP167	GPRC6A
Enterococcus faecalis, Strain TX2137	NWP117	LOC644613
Bacteroides stercoris, Strain CC31F	NWP270	EPHA2
Escherichia coli, Strain MS 115-1	NWP36	PRR27
Klebsiella sp., Strain 1_1_55	NWP03	PF4V1
Enterococcus faecium, Strain E417	NWP79	PF4V1
Ruminococcus gnavus, Strain NWP326	RG109	BTC
Staphylococcus warneri B9	warneriB9	PROCR
Bacteroides dorei, Strain 5_1_36/D4	NWP244	PVRL4
Streptococcus salivarius, Strain SK126	NWP118	MUCL3
Enterococcus faecium, Strain ERV102	NWP80	CSAG1
Proteus mirabilis, Strain WGLW6	NWP59	ACVR2B
Fusobacterium sp., Oral Taxon 370, Strain F0437	NWP143	FAM174A
Micrococcus luteus, Strain SK58	NWP08	FAM19A2
Lactobacillus parafarraginis, Strain F0439	NWP105	TFF1
Staphylococcus warneri F1	warneriF1	LOC644613
Dorea formicigenerans, Strain AAB36	AB36	BTC
Staphylococcus capitis , Strain SK14	NWP09	PF4V1
Staphylococcus caprae, Strain C87	NWP24	UNQ6190/PRO20217
Staphylococcus capitis A7	capitisA7	ADRA2C
Staphylococcus warneri B9	warneriB9	CCER2
Streptococcus mitis, Strain F0392	NWP26	SMR3A
Staphylococcus xylosus F2	xylosusF2	PDGFB
Streptococcus downei, Oral Taxon 594, Strain F0415	NWP123	CXCL9
Staphylococcus aureus, Strain TCH70	NWP12	SHISA7
Proteus mirabilis, Strain WGLW6	NWP59	PGA4
Citrobacter freundii, Strain 4_7_47CFAA	NWP28	CCL5
Catabacter hongkongensis, Strain AB8_9	NWP299	COL10A1
Staphylococcus succinus D11	succinusD11	ENDOU

Enterococcus faecium, Strain E417	NWP79	CCL17
Shuttleworthia sp., Strain MSX8B	NWP149	MILR1
Escherichia coli, Strain MS 196-1	NWP42	AGRP
Citrobacter sp., Strain 30_2	NWP01	PF4V1
Plesiomonas sp., Strain HPP0020	NWP62	COL10A1
Enterococcus faecium, Strain E417	NWP79	SHISA6
Propionibacterium acnes, Strain HL005PA3	NWP216	FAM174A
Fusobacterium periodonticum, Strain 2_1_31	NWP160	EPHA5
Rhodococcus erythropolis, Strain SK121	NWP95	PLA2G2E
Staphylococcus pasteurii G7	pasteuriiG7	PODXL2
Lactobacillus parafarraginis, Strain F0439	NWP105	CXCL9
Escherichia coli, Strain MS 119-7	NWP31	PF4V1
Veillonella sp., Oral Taxon 780, Strain F0422	NWP268	ENDOU
Staphylococcus warneri E4	warneriE4	PLA2G2A
Streptococcus sp., Strain AS20	NWP116	FAM19A3
Prevotella histicola, Strain F0411	NWP144	S6A17_Epitope-2
Staphylococcus pasteurii G3	pasteuriiG3	FAM174A
Escherichia coli, Strain MS 85-1	NWP30	CONA1_Epitope-1
Proteus mirabilis, Strain WGLW6	NWP59	TMED1
Propionibacterium acnes, Strain HL050PA1	NWP248	OPRK1
Klebsiella oxytoca, Strain MIT 10-5249	NWP52	PF4V1
Megasphaera sp., Strain DNF00912	NWP296	MFSD2A
Eggerthella sp., Strain MVA1	NWP185	PIANP
Klebsiella oxytoca, Strain MIT 10-5249	NWP52	LY6D
Bacillus sp., Strain DNF00233	NWP90	KLK10
Shigella sp., Strain D9	NWP06	LOC644613
Streptococcus sp., Strain OBRC6	NWP124	CTRB2
Staphylococcus pasteurii C9	pasteuriiC9	SOSTDC1
Proteus mirabilis, Strain WGLW6	NWP59	OTOS
Escherichia coli, Strain 83972	NWP04	INSL4
Escherichia coli, Strain MS 115-1	NWP36	COL10A1
Fusobacterium nucleatum, Strain CTI-05	NWP188	PLA2G2E
Enterococcus faecalis, Strain R712	NWP120	TMEM119
Propionibacterium acnes, Strain HL060PA1	NWP239	CC50C_Epitope-1
Streptococcus anginosus, Strain F0211	NWP125	LOC644613
Streptococcus sp., Strain SR1	NWP122	RTBDN
Catabacter hongkongensis, Strain AB8_9	NWP299	EPHA2
Bacteroides stercoris, Strain CC31F	NWP270	LAYN
Bifidobacterium breve, Strain JCP7499	NWP310	SPINK9
Fusobacterium nucleatum subsp. animalis, Oral Taxon 420, Strain F0419	NWP196	EPHA5
Dorea sp., Strain AAB35	AB35	PDIA6
Streptococcus mitis, Strain F0392	NWP26	IGFBP5
Citrobacter sp., Strain 30_2	NWP01	SPINK9
Propionibacterium acnes, Strain HL025PA1	NWP204	TMEM119
Lactobacillus gasseri, Strain JV-V03	NWP106	TFF1
Prevotella nigrescens, Strain F0103	NWP145	GP6
Propionibacterium acnes, Strain HL002PA1	NWP206	TMEM119
Staphylococcus hominis, Strain C80	NWP25	UNQ6190/PRO20217
Lachnospiraceae bacterium, Strain AAB23	AB23	UNQ9165/PRO28630
Staphylococcus caprae, Strain C87	NWP24	TMEM119
Peptoniphilus lacrimalis, Strain UPII 315-B	NWP261	CAC1D_Epitope-12
Propionibacterium acidifaciens, Oral Taxon 191, Strain F0233	NWP263	IGFBP6
Staphylococcus hominis, Strain C80	NWP25	CTRB1
Prevotella bivia, Strain DNF00188	NWP193	MUCL3
Staphylococcus warneri C2	warneriC2	GRIA2_Epitope-2
Sporosarcina sp., Strain 2681	NWP29	CONA1_Epitope-1
Staphylococcus epidermidis, Strain NIHLM015	NWP71	TMEM119
Enterococcus faecium, Strain E417	NWP79	PIANP
Staphylococcus epidermidis, Strain NIHLM031	NWP73	PF4V1
Escherichia sp., Strain 3_2_53FAA	NWP02	PLA2G2E
Lactobacillus crispatus, Strain GED7749C	NWP104	MCHR1
Escherichia coli, Strain MS 110-3	NWP35	PRR27
Staphylococcus warneri D11	warneriD12	EXOC3-AS1
Staphylococcus warneri E6	warneriE6	CRELD1
Bacteroides bacterium, Strain KA00344	NWP302	C9orf47
Proteus mirabilis, Strain WGLW6	NWP59	LRRN4CL

Catabacter hongkongensis, Strain AB8_9	NWP299	PLA2G2E
Plesiomonas sp., Strain HPP0020	NWP62	PIANP
Staphylococcus epidermidis, Strain NIHLM003	NWP67	PF4V1
Enterococcus faecalis, Strain R712	NWP120	PF4V1
Staphylococcus caprae, Strain C87	NWP24	CTRB1
Erysipelotrichaceae sp., Strain 6_1_45	NWP174	COL10A1
Propionibacterium acnes, Strain HL013PA1	NWP209	FAM174A
Streptococcus downei, Oral Taxon 594, Strain F0415	NWP123	CCL17
Escherichia coli, Strain MS 200-1	NWP41	NPPA
Bacteroides stercoris, Strain CC31F	NWP270	CD97_1_2_5
Escherichia coli, Strain MS 69-1	NWP39	SMR3A
Clostridium sp., Strain MSTE9	NWP253	COL10A1
Proteus mirabilis, Strain WGLW6	NWP59	CD320
Lactobacillus jensenii, Strain 269-3	NWP110	MTLR_Epitope-3
Plesiomonas sp., Strain HPP0020	NWP62	DEFB130B
Staphylococcus aureus, Strain TCH70	NWP12	C1QL3
Lactobacillus parafarraginis, Strain F0439	NWP105	CCL17
Staphylococcus haemolyticus B5	haemolyticusB5	KCNK1
Sporosarcina sp., Strain 2681	NWP29	MUC7
Enterococcus faecalis, Strain S613	NWP119	PF4V1
Fusobacterium nucleatum, Strain CTI-02	NWP186	PLA2G2E
Oscillibacter sp., Strain KLE 1745	NWP252	PDIA2
Escherichia coli, Strain MS 85-1	NWP30	AGRP
Staphylococcus capitis B12	capitisB12	CCER2
Erysipelotrichaceae sp., Strain 6_1_45	NWP174	CSAG1
Propionibacterium acnes, Strain HL050PA3	NWP249	OPRK1
Staphylococcus warneri E6	warneriE6	EPHA6
Fusobacterium sp., Strain CM21	NWP166	MUCL3
Arthrobacter albus, Strain DNF00011	NWP86	CTRB1
Eubacterium infirmum, Strain F0142	NWP223	SPINK9
Enterococcus faecium, Strain E417	NWP79	CXCL9
Weissella cibaria, Strain F16_1	NWP101	LOC644613
Bacteroides vulgatus, Strain CL09T03C04	NWP283	EPHA2
Escherichia coli, Strain MS 115-1	NWP36	PRND
Staphylococcus epidermidis, Strain NIHLM040	NWP76	C2orf40
Staphylococcus warneri B9	warneriB9	BMPR1B
Escherichia coli, Strain MS 115-1	NWP36	SEMG1
Staphylococcus epidermidis, Strain NIHLM001	NWP66	PIANP
Staphylococcus saprophyticus E8	saprophyticusE8	CCL25
Plesiomonas sp., Strain HPP0020	NWP62	PIANP
Lactobacillus parafarraginis, Strain F0439	NWP105	PIANP
Clostridium difficile, Strain 050-P50-2011	NWP278	ENDOU
Fusobacterium nucleatum, Strain CTI-07	NWP190	FAM19A2
Streptococcus mitis, Strain F0392	NWP26	FGF17
Corynebacterium amycolatum, Strain SK46	NWP07	FGF19
Lactobacillus jensenii, Strain 208-1	NWP111	FGF17
Bacteroides stercoris, Strain CC31F	NWP270	PF4V1
Enterococcus faecium, Strain E417	NWP79	RTBDN
Staphylococcus warneri D4	warneriD4	C2orf40
Enterococcus faecium, Strain TX0133a04	NWP44	ENDOU
Streptococcus parasanguinis, Strain F0449	NWP114	PF4V1
Propionibacterium acnes, Strain HL053PA2	NWP236	TMEM119
Shigella sp., Strain D9	NWP06	PIANP
Staphylococcus capitis C4	capitisC4	LOC644613
Finnegoldia magna, Strain GED7760A	NWP200	PDIA6
Enterococcus faecium, Strain E417	NWP79	PGLYRP1
Lachnospiraceae bacterium, Strain AAB19	AB19	CSN3
Staphylococcus succinus D11	succinusD11	PDGFB
Staphylococcus warneri F1	warneriF1	CSPG5
Prevotella bivia, Strain DNF00650	NWP176	IL22
Proteus mirabilis, Strain WGLW4	NWP58	PF4V1
Proteus mirabilis, Strain WGLW6	NWP59	GHRHR
Streptococcus sp., Strain C150	NWP121	CTRB1
Arthrobacter albus, Strain DNF00011	NWP86	CCL2
Bacteroides dorei, Strain 5_1_36/D4	NWP244	SPINK9
Lactobacillus crispatus, Strain GED7749C	NWP104	LILRA3

Proteus mirabilis, Strain WGLW6	NWP59	CGREF1
Lactobacillus reuteri, Strain CF48-3A	NWP100	TFF3
Prevotella sp., Oral Taxon 317, Strain F0108	NWP173	PSORS1C2
Klebsiella oxytoca, Strain MIT 10-5242	NWP46	SHISA2
Streptococcus anginosus, Strain F0211	NWP125	RTBDN
Escherichia coli, Strain MS 69-1	NWP39	COL10A1
Fusobacterium sp., Oral Taxon 370, Strain F0437	NWP143	C3AR_Epitope-3
Streptococcus sp., Strain SR1	NWP122	PDGFB
Propionibacterium acnes, Strain HL025PA2	NWP210	TMEM119
Citrobacter freundii, Strain 4_7_47CFAA	NWP28	SPINK9
Lactobacillus jensenii, Strain EX849587VC06	NWP109	AVP
Citrobacter sp., Strain 30_2	NWP01	GNLY
Staphylococcus warneri E4	warneriE4	OPN3
Staphylococcus capitis A7	capitisA7	ECE1
Bacteroides stercoris, Strain CC31F	NWP270	BSG
Streptococcus sp., Strain CM7	NWP133	UNQ6190/PRO20217
Erysipelotrichaceae sp., Strain 6_1_45	NWP174	SMR3A
Bacteroides fragilis, Strain CL05T00C42	NWP287	AZGP1
Corynebacterium sp., Strain HFH0082	NWP61	IGFBP5
Propionibacterium acnes, Strain HL025PA2	NWP210	SPINT3
Collinsella aerofaciens, Strain AAB3	AB3	PLA2G2E
Streptococcus sp., Strain BS29a	NWP129	PDGFB
Prevotella veroralis, Oral Taxon 572, Strain F0319	NWP155	MUCL3
Collinsella aerofaciens, Strain AAB3	AB3	CSN3
Enterococcus faecium, Strain TX1330	NWP19	C4A
Staphylococcus capitis B8	capitisB8	FAM19A3
Enterococcus faecium, Strain TX1330	NWP19	PRR27
Prevotella bivia, Strain GED7760C	NWP233	FGF17
Escherichia coli, Strain MS 200-1	NWP41	DEFB130A
Prevotella disiens, Strain DNF00882	NWP177	GPER1_Epitope-1
Staphylococcus epidermidis, Strain NIHLM031	NWP73	CTRB2
Eubacterium sp., Strain AS15	NWP254	COL10A1
Eubacterium infirmum, Strain F0142	NWP223	ENDOU
Streptococcus salivarius, Strain SK126	NWP118	FAM19A3
Streptococcus sp., Strain BS21	NWP131	FAM168B
Sporosarcina sp., Strain 2681	NWP29	SEMG1
Lactobacillus jensenii, Strain 208-1	NWP111	PIANP
Staphylococcus aureus, Strain MN8	NWP17	KCNK1
Enterococcus faecium, Strain TX1330	NWP19	SEMG1
Streptococcus parasanguinis, Strain F0449	NWP114	FZD8
Sporosarcina sp., Strain 2681	NWP29	DRAXIN
Megasphaera sp., Strain DNF00912	NWP296	PLA2G2E
Enterococcus faecalis, Strain TX2137	NWP117	TMEM119
Streptococcus sp., Strain AS20	NWP116	DEFB130B
Streptococcus sp., Strain SR4	NWP130	PIANP
Blautia sp., Strain AAB30	AB30	SMR3A
Staphylococcus epidermidis, Strain NIH04008	NWP77	CSAG1
Micrococcus luteus, Strain SK58	NWP08	DEFB130A
Sporosarcina sp., Strain 2681	NWP29	RCN1
Lactobacillus jensenii, Strain EX849587VC03	NWP108	DEFB130B
Lactobacillus jensenii, Strain EX849587VC06	NWP109	DEFB130A
Blautia sp., Strain AAB30	AB30	MUC7
Staphylococcus capitis B12	capitisB12	CLCC1
Staphylococcus capitis A7	capitisA7	PLA2G2A
Staphylococcus capitis E7	capitisE7	FAM19A3
Finnegoldia magna, Strain SY01	NWP138	GPR25
Ruminococcus gnavus, Strain NWP325	RG74	MFSD2A
Staphylococcus capitis C4	capitisC4	FAM19A3
Staphylococcus warneri E4	warneriE4	CDSN
Corynebacterium amycolatum, Strain SK46	NWP07	LECT2
Propionibacterium acnes, Strain HL050PA1	NWP248	TMEM119
Escherichia coli, Strain MS 16-3	NWP37	CCL18
Lachnospiraceae bacterium, Strain AAB23	AB23	INSL4
Prevotella nigrescens, Strain F0103	NWP145	CLDN7
Escherichia coli, Strain MS 16-3	NWP37	PIANP
Staphylococcus haemolyticus, Strain DNF00585	NWP87	PF4V1

Lactobacillus jensenii, Strain EX849587VC06	NWP109	FGF17
Arthrobacter albus, Strain DNF00011	NWP86	AVP
Eubacterium sp., Strain 3_1_31	NWP182	LOC644613
Staphylococcus warneri C2	warneriC2	AMELX
Collinsella sp., Strain 4_8_47FAA	NWP198	LOC644613
Lactobacillus jensenii, Strain EX849587VC03	NWP108	FAM19A3
Rothia aerea, Oral Taxon 188, Strain F0474	NWP64	PF4V1
Staphylococcus saprophyticus G1	saprophyticusG1	ENDOU
Enterococcus faecium, Strain ERV102	NWP80	PLA2G2E
Citrobacter freundii, Strain 4_7_47CFAA	NWP88	PF4V1
Escherichia coli, Strain MS 200-1	NWP41	FAM19A3
Fusobacterium nucleatum, Strain CTI-05	NWP188	PRR27
Corynebacterium sp., Strain HFH0082	NWP61	AGRP
Fusobacterium sp., Oral Taxon 370, Strain F0437	NWP143	SMR3B
Fusobacterium nucleatum, Strain CTI-05	NWP188	PIANP
Enterococcus faecium, Strain E417	NWP79	CTRB1
Staphylococcus warneri, Strain SK66	NWP11	OSTN
Staphylococcus capitis B12	capitisB12	CALU
Bacteroides sp., Strain 4_1_36	NWP312	IGFBP6
Streptococcus sobrinus, Strain W1703	NWP85	FAM19A3
Fusobacterium sp., Strain CM21	NWP166	CCL18
Staphylococcus haemolyticus B6	haemolyticusB6	KCNK1
Bacteroides stercoris, Strain CC31F	NWP270	C19orf10
Bacteroides fragilis, Strain 3_1_12	NWP271	EPHA5
Erysipelotrichaceae sp., Strain 6_1_45	NWP181	IGFBP5
Corynebacterium sp., Strain HFH0082	NWP61	CHRD12
Escherichia coli, Strain MS 69-1	NWP39	NPPC
Lactobacillus gasseri, Strain JV-V03	NWP106	PEBP4
Staphylococcus capitis A7	capitisA7	CSF2RA
Escherichia coli, Strain 83972	NWP04	SMR3A
Weissella cibaria, Strain F16_1	NWP101	MUCL3
Escherichia sp., Strain 3_2_53FAA	NWP02	FAM19A3
Lactobacillus jensenii, Strain 208-1	NWP111	FAM19A3
Escherichia coli, Strain MS 115-1	NWP36	SMR3A
Staphylococcus capitis A7	capitisA7	PLA2G3
Sporosarcina sp., Strain 2681	NWP29	AGRP
Enterococcus faecium, Strain E417	NWP79	PEBP4
Erysipelotrichaceae sp., Strain 6_1_45	NWP174	DEFB130B
Escherichia coli, Strain MS 115-1	NWP36	AGRP
Prevotella melaninogenica, Strain D18	NWP151	TXNDC12
Staphylococcus intermedius F7	intermediusF7	PLA2G2E
Bacteroides stercoris, Strain CC31F	NWP270	KCNK1
Corynebacterium amycolatum, Strain SK46	NWP07	PRND
Staphylococcus hominis B3	hominisB3	BTC
Streptococcus sp., Strain OBRC6	NWP124	PIANP
Lactobacillus jensenii, Strain 208-1	NWP111	FGFRL1
Propionibacterium acnes, Strain HL059PA1	NWP250	OPRK1
Streptococcus sp., Strain OBRC6	NWP124	FGF17
Streptococcus mitis, Strain F0392	NWP26	CHRD12
Enterococcus faecalis, Strain TX2137	NWP117	UNQ6190/PRO20217
Escherichia sp., Strain 3_2_53FAA	NWP02	TMEM119
Staphylococcus capitis A7	capitisA7	EPHB3
Lachnospiraceae bacterium, Strain AAB23	AB23	COL10A1
Enterococcus faecalis, Strain TUSoD Ef11	NWP05	TMEM119
Bacteroides sp., Strain D2	NWP192	PIANP
Staphylococcus pasteurii C9	pasteuriiC9	NLGN3
Enterococcus faecium, Strain ERV102	NWP80	CCL18
Fusobacterium nucleatum, Strain CTI-07	NWP190	DRAXIN
Bacteroides sp., Strain 4_1_36	NWP312	SPINK9
Lactobacillus gasseri, Strain JV-V03	NWP106	CTRB2
Corynebacterium amycolatum, Strain SK46	NWP07	MUC7
Staphylococcus capitis, Strain SK14	NWP09	TMEM119
Proteus mirabilis, Strain WGLW6	NWP59	SERPINI1
Escherichia coli, Strain MS 110-3	NWP35	SEMG1
Citrobacter freundii, Strain 4_7_47CFAA	NWP28	AGER
Staphylococcus warneri D11	warneriD12	CRELD1

Fusobacterium sp., Strain CM21	NWP166	COL10A1
Staphylococcus warneri E6	warneriE6	CDSN
Staphylococcus epidermidis B11	EpiB11	XG
Staphylococcus capitis E12	capitisE12	MUCL3
Staphylococcus cohnii G11	cohniiG11	KCNK4_Epitope-1
Staphylococcus aureus, Strain CM05	NWP83	SO1C1_Epitope-5
Bifidobacterium longum subsp. longum, Strain 44B	NWP308	FAM19A3
Streptococcus mitis, Strain F0392	NWP26	COL10A1
Staphylococcus capitis C11	capitisC11	AMELX
Escherichia coli, Strain MS 110-3	NWP35	FAM19A2
Escherichia coli, Strain MS 85-1	NWP30	SEMG1
Bacteroides bacterium, Strain KA00344	NWP302	PANX3
Enterococcus faecium, Strain ERV165	NWP81	FGF17
Staphylococcus pasteurii C9	pasteuriiC9	IGFBP3
Peptoniphilus sp., Oral Taxon 836, Strain F0141	NWP313	SMR3A
Enterococcus faecalis, Strain S613	NWP119	TMEM119
Shigella sp., Strain D9	NWP06	PF4V1
Bacteroides sp., Strain D2	NWP192	INSL3
Enterococcus faecium, Strain E417	NWP79	FGFRL1
Staphylococcus saprophyticus E2	saprophyticusE2	MUCL3
Escherichia coli, Strain MS 16-3	NWP37	FAM19A3
Citrobacter freundii, Strain 4_7_47CFAA	NWP28	GNLY
Enterococcus faecium, Strain TX1330	NWP19	FAM19A2
Sporosarcina sp., Strain 2681	NWP29	KLK10
Staphylococcus epidermidis, Strain NIH04008	NWP77	RTBDN
Staphylococcus warneri E6	warneriE6	OR1L1_Epitope-1
Staphylococcus cohnii G11	cohniiG11	SCGB1A1
Escherichia coli, Strain MS 69-1	NWP39	DEFB130A
Staphylococcus epidermidis, Strain M23864:W2	NWP16	XG
Staphylococcus pasteurii E1	pasteuriiE1	CSF2RA
Staphylococcus pasteurii C9	pasteuriiC9	TMEM8
Citrobacter freundii, Strain 4_7_47CFAA	NWP28	PF4V1
Staphylococcus pasteurii C9	pasteuriiC9	RLN2
Arthrobacter albus, Strain DNF00011	NWP86	CAC1F_Epitope-6
Prevotella nigrescens, Strain F0103	NWP145	PDIA6
Propionibacterium acnes, Strain HL037PA2	NWP205	NLGN4X
Enterococcus faecium, Strain TX1330	NWP19	FGF17
Propionibacterium acnes, Strain SK182	NWP306	FAM174A
Bacteroides sp., Strain D2	NWP192	FAM19A3
Lactobacillus parafarraginis, Strain F0439	NWP105	FGFRL1
Micrococcus luteus, Strain SK58	NWP08	COL10A1
Corynebacterium amycolatum, Strain SK46	NWP07	SEMG1
Staphylococcus warneri E6	warneriE6	EPO
Klebsiella oxytoca, Strain MIT 09-7231	NWP45	CHGA
Megasphaera micronuciformis, Strain DNF00954	NWP307	ENDOU
Staphylococcus capitis E12	capitisE12	LOC644613
Escherichia coli, Strain MS 196-1	NWP42	NPPC
Staphylococcus capitis B12	capitisB12	CLU
Fusobacterium sp., Strain CM22	NWP167	BTNL8
Fusobacterium sp., Strain CM21	NWP166	NPPC
Peptoniphilus sp., Strain CMW7756A	NWP162	MFSD8_Epitope-5
Fusobacterium nucleatum subsp. animalis, Oral Taxon 420, Strain F0419	NWP196	C1QTNF2
Lactobacillus parafarraginis, Strain F0439	NWP105	BTC
Staphylococcus saprophyticus E8	saprophyticusE8	CSPG5
Enterococcus faecium, Strain TX1330	NWP19	FGF19
Staphylococcus warneri B9	warneriB9	TFPI2
Staphylococcus warneri , Strain SK66	NWP11	NPY5R
Klebsiella oxytoca, Strain MIT 10-5242	NWP46	PDCD1
Streptococcus salivarius, Strain SK126	NWP118	PEBP4
Peptoniphilus sp., Oral Taxon 836, Strain F0141	NWP313	COL10A1
Blautia sp., Strain AAB30	AB30	ADAMTS16
Klebsiella pneumoniae subsp. pneumoniae, Strain WGLW1	NWP56	FAM19A3
Escherichia coli, Strain MS 85-1	NWP30	COL10A1
Eubacterium sp., Strain AS15	NWP254	PF4V1
Propionibacterium acnes, Strain HLO30PA2	NWP207	TMEM119
Staphylococcus aureus, Strain TCH70	NWP12	NRN1L

Streptococcus sp., Strain CM7	NWP133	CTRB1
Staphylococcus warneri E4	warneriE4	PLA2G3
Propionibacterium acnes, Strain HL037PA1	NWP208	SPINT3
Bacteroides fragilis, Strain 3_1_12	NWP271	LGALS7
Escherichia coli, Strain MS 200-1	NWP41	NPPC
Citrobacter freundii, Strain 4_7_47CFAA	NWP28	ASIP
Ruminococcus gnavus, Strain NWP326	RG109	CTRB2
Prevotella disiens, Strain DNF00882	NWP177	EPHA5
Lactobacillus crispatus, Strain JV-V01	NWP107	ENDOU
Enterococcus faecium, Strain TX1330	NWP19	AGRP
Lactobacillus parafarraginis, Strain F0439	NWP105	PEBP4
Propionibacterium acnes, Strain HL005PA4	NWP220	CST6
Staphylococcus warneri E6	warneriE6	ECE1
Arthrobacter albus, Strain DNF00011	NWP86	TMEM119
Staphylococcus saprophyticus E2	saprophyticusE2	LOC644613
Staphylococcus capitis B8	capitisB8	SMR3A
Propionibacterium propionicum, Oral Taxon 739, Strain F0230	NWP301	AVP
Staphylococcus cohnii G11	cohniiG11	KCNK1
Lactobacillus gasseri, Strain EX33690VC16	NWP113	CTRB2
Klebsiella pneumoniae subsp. pneumoniae, Strain WGLW3	NWP54	PF4V1
Lactobacillus gasseri, Strain JV-V03	NWP106	FAM19A3
Lactobacillus jensenii, Strain 208-1	NWP111	CXCL9
Micrococcus luteus, Strain SK58	NWP08	LECT2
Fusobacterium sp., Oral Taxon 370, Strain F0437	NWP143	CD99L2
Fusobacterium nucleatum, Strain CTI-07	NWP190	SOST
Streptococcus sp., Strain ACS2	NWP115	TMEM119
Enterococcus faecium, Strain ERV165	NWP81	SEM61
Streptococcus salivarius, Strain SK126	NWP118	UNQ6190/PRO20217
Enterococcus faecium, Strain TX1330	NWP19	IGFBP5
Capnocytophaga sp., Oral Taxon 336, Strain F0502	NWP139	PDIA3
Staphylococcus saprophyticus D6	saprophyticusD6	LOC644613
Blautia sp., Strain KLE 1732	NWP292	SMR3A
Staphylococcus capitis E7	capitisE7	COL10A1
Escherichia sp., Strain 3_2_53FAA	NWP02	PIANP
Staphylococcus epidermidis, Strain NIHLM001	NWP66	FAM19A3
Micrococcus luteus, Strain SK58	NWP08	IGFBP5
Streptococcus gallolyticus subsp. gallolyticus, Strain TX20005	NWP27	DEFA6
Catabacter hongkongensis, Strain AB8_9	NWP299	IL1A
Prevotella histicola, Strain F0411	NWP144	IL1F9
Propionibacterium acnes, Strain HL059PA1	NWP250	FAM174A
Corynebacterium sp., Strain HHF0082	NWP61	C4A
Blautia sp., Strain KLE 1732	NWP292	NPPC
Staphylococcus capitis B12	capitisB12	CXCR3
Eggerthella sp., Strain MVA1	NWP185	CONA1_Epitope-1
Streptococcus sp., Strain AS20	NWP116	FGF17
Staphylococcus capitis B12	capitisB12	DRAXIN
Staphylococcus epidermidis, Strain NIHLM001	NWP66	RTBDN
Propionibacterium acnes, Strain HL013PA2	NWP217	SLC22A31
Streptococcus gallolyticus subsp. gallolyticus, Strain TX20005	NWP27	TMEM149
Staphylococcus caprae, Strain C87	NWP24	PIANP
Micrococcus luteus, Strain SK58	NWP08	FGF17
Staphylococcus aureus, Strain MN8	NWP17	MSMB
Staphylococcus warneri D11	warneriD12	SFRP4
Bacteroides sp., Strain 1_1_30	NWP272	ENDOU
Staphylococcus capitis E12	capitisE12	ENDOU
Clostridium difficile, Strain 002-P50-2011	NWP230	PDGFB
Streptococcus sp., Strain ACC21	NWP134	UNQ6190/PRO20217
Escherichia coli, Strain MS 200-1	NWP41	PIANP
Staphylococcus warneri D11	warneriD12	EPO
Streptococcus mitis, Strain F0392	NWP26	PRR27
Collinsella aerofaciens, Strain AAB3	AB3	NPPA
Dorea sp., Strain AAB35	AB35	SLC8B1
Shigella sp., Strain D9	NWP06	DEFB130B
Enterococcus faecium, Strain ERV102	NWP80	PGLYRP1
Staphylococcus capitis A7	capitisA7	CRELD1
Enterococcus faecium, Strain ERV165	NWP81	COL10A1

Lactobacillus jensenii, Strain 269-3	NWP110	PF4V1
Staphylococcus warneri E4	warneriE4	RTN4R
Klebsiella pneumoniae subsp. pneumoniae, Strain WGLW1	NWP56	CCL18
Staphylococcus warneri E4	warneriE4	CNPY3
Enterococcus faecium, Strain TX1330	NWP19	CHRD2
Streptococcus sp., Strain BS21	NWP131	PDGFB
Escherichia coli, Strain MS 145-7	NWP33	ALPP
Klebsiella oxytoca, Strain MIT 10-5249	NWP52	CLU
Streptococcus anginosus, Strain F0211	NWP125	BTC
Erysipelotrichaceae sp., Strain 6_1_45	NWP181	DEFB130A
Enterococcus faecalis, Strain R712	NWP120	SCNAA_Epitope-3
Staphylococcus pasteurii E1	pasteuriiE1	KLK13
Klebsiella oxytoca, Strain MIT 10-5246	NWP50	AVP
Staphylococcus pasteurii F12	pasteuriiF12	PODXL2
Proteus mirabilis, Strain WGLW6	NWP59	TMEFF2
Staphylococcus warneri D11	warneriD12	ECE1
Klebsiella pneumoniae subsp. pneumoniae, Strain WGLW3	NWP54	LOC644613
Propionibacterium acnes, Strain HL050PA1	NWP248	FAM174A
Streptococcus sp., Strain BS29a	NWP129	MUCL3
Escherichia coli, Strain MS 145-7	NWP33	LGALS7
Eubacterium infirmum, Strain F0142	NWP223	CLPSL1
Staphylococcus epidermidis, Strain E13A	NWP63	TMEM119
Enterococcus faecium, Strain E417	NWP79	CTRB2
Escherichia coli, Strain MS 16-3	NWP37	DEFB130B
Staphylococcus saprophyticus D10	saprophyticusD10	MUCL3
Sporosarcina sp., Strain 2681	NWP29	C4A
Staphylococcus saprophyticus E8	saprophyticusE8	GABRB2
Fusobacterium sp., Strain CM22	NWP167	HCTR1
Lachnospiraceae sp., Strain DNF00160	NWP150	CTRB1
Fusobacterium sp., Oral Taxon 370, Strain F0437	NWP143	LAIR1
Staphylococcus warneri E6	warneriE6	GPHB5
Bacteroides sp., Strain D2	NWP192	IGFBP5
Enterococcus faecium, Strain ERV102	NWP80	NPPC
Staphylococcus warneri D11	warneriD12	RTN4R
Staphylococcus capitis B8	capitisB8	LOC644613
Staphylococcus epidermidis H4	EpiH4	MUCL3
Staphylococcus epidermidis, Strain NIHLM003	NWP67	TMEM119
Streptococcus cristatus, Strain F0329	NWP126	AXL
Paenisporsarcina sp., Strain HGH0030	NWP94	PLA2G2E
Fusobacterium periodonticum, Strain 1_A_54/D10	NWP142	EPHA5
Proteus mirabilis, Strain WGLW6	NWP59	IFNA17
Escherichia sp., Strain 3_2_53FAA	NWP02	PF4V1
Corynebacterium sp., Strain HFH0082	NWP61	KLK10
Streptococcus salivarius, Strain SK126	NWP118	FGF17
Collinsella aerofaciens, Strain AAB3	AB3	AGRP
Escherichia coli, Strain MS 110-3	NWP35	KLK10
Blautia sp., Strain AAB32	AB32	TFF3
Escherichia coli, Strain MS 200-1	NWP41	CCL18
Fusobacterium nucleatum subsp. animalis, Oral Taxon 420, Strain F0419	NWP196	SERPINE1
Staphylococcus aureus, Strain TCH70	NWP12	SO1C1_Epitope-5
Staphylococcus epidermidis G10	EpiG10	PDIA2
Bacteroides stercoris, Strain CC31F	NWP270	CNPY2
Propionibacterium acnes, Strain HL056PA1	NWP267	CNGB3_Epitope-3
Shuttleworthia sp., Strain MSX8B	NWP149	MUCL3
Propionibacterium acnes, Strain HL027PA1	NWP211	DSA2D_Epitope-1
Collinsella aerofaciens, Strain AAB3	AB3	LOC644613
Erysipelotrichaceae sp., Strain 6_1_45	NWP174	IGFBP5
Bacteroides sp., Strain D2	NWP192	CHRD2
Staphylococcus warneri E4	warneriE4	EXOC3-AS1
Staphylococcus capitis E7	capitisE7	LOC644613
Enterococcus faecium, Strain ERV165	NWP81	UNQ6190/PRO20217
Escherichia coli, Strain MS 110-3	NWP35	FGF17
Staphylococcus warneri B9	warneriB9	MMP24
Prevotella bivia, Strain GED7760C	NWP233	TMEM119
Lachnospiraceae bacterium, Strain AAB19	AB19	AMY2B
Enterococcus faecium, Strain ERV102	NWP80	PF4V1

Propionibacterium acnes, Strain HL005PA4	NWP220	TMEM119
Escherichia coli, Strain MS 16-3	NWP37	COL10A1
Escherichia coli, Strain MS 110-3	NWP35	IGFBP5
Prevotella sp., Oral Taxon 317, Strain F0108	NWP173	SDC1
Propionibacterium acnes, Strain HL059PA1	NWP250	TMEM119
Propionibacterium acnes, Strain HL005PA1	NWP224	CNGB3_Epitope-3
Lactobacillus crispatus, Strain JV-V01	NWP107	CTRB2
Enterococcus faecium, Strain ERV102	NWP80	CTRB1
Dorea formicigenerans, Strain AAB36	AB36	FAM19A4
Escherichia coli, Strain MS 200-1	NWP41	SMR3A
Escherichia coli, Strain MS 16-3	NWP37	SMR3A
Fusobacterium nucleatum, Strain CTI-07	NWP190	CCL18
Staphylococcus epidermidis, Strain NIHLM020	NWP74	CTRB2
Staphylococcus pasteurii G3	pasteuriiG3	TNFRSF21
Streptococcus sobrinus, Strain W1703	NWP85	LYVE1
Staphylococcus pasteurii G7	pasteuriiG7	FAM174A
Escherichia coli, Strain 83972	NWP04	COL10A1
Escherichia coli, Strain MS 69-1	NWP39	SEMG1
Proteus mirabilis, Strain WGLW6	NWP59	EDAR
Rothia mucilaginosa, Strain CC87LB	NWP84	MUCL3
Escherichia coli, Strain MS 200-1	NWP41	PLA2G2E
Streptococcus sp., Strain BS29a	NWP129	ENDOU
Lactobacillus jensenii, Strain EX849587VC06	NWP109	CLU
Staphylococcus warneri B9	warneriB9	PDGFA
Enterococcus faecium, Strain ERV102	NWP80	DEFB130B
Corynebacterium sp., Strain HFH0082	NWP61	PRND
Clostridiales bacterium, Strain 3_1_39B/D5	NWP240	TMEM119
Klebsiella pneumoniae subsp. pneumoniae, Strain WGLW5	NWP55	PF4V1
Escherichia coli, Strain MS 115-1	NWP36	DEFB130A
Lactobacillus jensenii, Strain 208-1	NWP111	BTC
Staphylococcus warneri A11	warneriA11	SLC8B1
Bacillus sp., Strain DNF00233	NWP90	DEFB115
Streptococcus sp., Strain AS20	NWP116	CTRB1
Lactobacillus crispatus, Strain 125-2-CHN	NWP99	CTRB2
Staphylococcus warneri D9	warneriD9	RTBDN
Staphylococcus pasteurii C9	pasteuriiC9	MICB
Proteus mirabilis, Strain WGLW6	NWP59	LCN2
Streptococcus gallolyticus subsp. gallolyticus, Strain TX20005	NWP27	NKAI1_Epitope-2
Veillonella sp., Oral Taxon 780, Strain F0422	NWP268	KCMA1_Epitope-1
Fusobacterium nucleatum, Strain CTI-05	NWP188	IGFBP5
Staphylococcus hominis C10	hominisC10	LOC644613
Staphylococcus epidermidis C3	EpiC3	CLCC1
Staphylococcus saprophyticus E8	saprophyticusE8	TFPI2
Escherichia coli, Strain MS 115-1	NWP36	FGF17
Fusobacterium sp., Strain CM21	NWP166	FAM19A3
Prevotella buccae, Strain D17	NWP256	C6orf25
Propionibacterium acnes, Strain HL046PA2	NWP266	FAM174A
Staphylococcus pasteurii C9	pasteuriiC9	FAT2
Streptococcus sobrinus, Strain W1703	NWP85	PAP
Staphylococcus warneri E6	warneriE6	ADRA2C
Streptococcus downei, Oral Taxon 594, Strain F0415	NWP123	BTC
Streptococcus mitis, Strain F0392	NWP26	SEMG1
Staphylococcus warneri E4	warneriE4	SFRP4
Escherichia coli, Strain MS 115-1	NWP36	LECT2
Escherichia coli, Strain MS 196-1	NWP42	DEFB130A
Propionibacterium acnes, Strain HL002PA3	NWP219	CNGB3_Epitope-3
Staphylococcus warneri B9	warneriB9	CP
Proteus mirabilis, Strain WGLW6	NWP59	ADCYAP1R1
Arthrobacter albus, Strain DNF00011	NWP86	ALPP
Propionibacterium acnes, Strain HL043PA1	NWP303	FAM174A
Corynebacterium sp., Strain HFH0082	NWP61	MUC7
Prevotella veroralis, Oral Taxon 572, Strain F0319	NWP155	PDIA6
Corynebacterium amycolatum, Strain SK46	NWP07	C4A
Klebsiella pneumoniae subsp. pneumoniae, Strain WGLW1	NWP56	TMEM119
Staphylococcus warneri C5	warneriC5	LOC644613
Clostridium clostridioforme, Strain 2_1_49FAA	NWP228	TNFSF10

Hungatella hathewayi, Strain WAL-18680	NWP231	IL29
Eubacterium sp., Strain 3_1_31	NWP182	MUCL3
Peptoniphilus sp., Oral Taxon 836, Strain F0141	NWP313	ADM2
Staphylococcus capitis E12	capitisE12	PDGFB
Klebsiella oxytoca, Strain MIT 10-5250	NWP53	CHGA
Proteus mirabilis, Strain WGLW6	NWP59	SCN4A_Epitope-3
Lactobacillus gasseri, Strain JV-V03	NWP106	MUCL3
Bacteroides stercoris, Strain CC31F	NWP270	SCGB1C2
Propionibacterium acnes, Strain HL027PA2	NWP218	CNGB3_Epitope-3
Bacteroides stercoris, Strain CC31F	NWP270	LCN1
Propionibacterium acnes, Strain HL001PA1	NWP203	PROM2_Epitope-2
Blautia sp., Strain AAB30	AB30	FAM19A3
Streptococcus sp., Strain ACS2	NWP115	LINC00527
Megasphaera micronuciformis, Strain DNF00954	NWP307	COL10A1
Staphylococcus pasteurii F12	pasteuriiF12	SERPINA11
Streptococcus sp., Strain AS20	NWP116	PLA2G2E
Fusobacterium periodonticum, Strain 1_A_54/D10	NWP142	NGFR
Streptococcus anginosus, Strain F0211	NWP125	FGF17
Proteus mirabilis, Strain WGLW6	NWP59	CRELD2
Escherichia coli, Strain MS 85-1	NWP30	C2orf66
Proteus mirabilis, Strain WGLW6	NWP59	RGN3
Staphylococcus capitis A7	capitisA7	CNPY3
Blautia sp., Strain AAB31	AB31	COL10A1
Staphylococcus epidermidis G10	EpiG10	SMR3A
Bacteroides stercoris, Strain CC31F	NWP270	CLEC4M
Staphylococcus pasteurii G3	pasteuriiG3	FAT2
Escherichia coli, Strain 83972	NWP04	PRR27
Klebsiella oxytoca, Strain MIT 10-5249	NWP52	LCN2
Staphylococcus aureus, Strain MN8	NWP17	SHISA7
Staphylococcus warneri E6	warneriE6	PSG4
Corynebacterium sp., Strain HFH0082	NWP61	LECT2
Escherichia coli, Strain MS 119-7	NWP31	TMEM119
Fusobacterium nucleatum subsp. animalis, Oral Taxon 420, Strain F0419	NWP196	EPHA4
Enterococcus faecium, Strain ERV102	NWP80	NPPA
Staphylococcus epidermidis, Strain NIHLM031	NWP73	CCL2
Staphylococcus capitis A7	capitisA7	FGFR1
Peptostreptococcus sp., Strain CC14N	NWP290	SMR3A
Ruminococcus gnavus, Strain NWP326	RG109	CCL8
Erysipelotrichaceae sp., Strain 6_1_45	NWP174	CCL23
Staphylococcus warneri D11	warneriD12	OLR1
Bacteroides stercoris, Strain CC31F	NWP270	CSF3
Staphylococcus gallinarum E9	gallinarumE9	LOC644613
Staphylococcus pasteurii F11	pasteuriiF11	FAM174A
Deinococcus grandis, Strain SK125	NWP89	DEFB130B
Streptococcus sp., Strain OBRC6	NWP124	LOC644613
Propionibacterium acnes, Strain SK137	NWP309	PGLYRP1
Escherichia coli, Strain 83972	NWP04	TRPM5
Streptococcus parasanguinis, Strain F0449	NWP114	UNQ6190/PRO20217
Staphylococcus warneri , Strain SK66	NWP11	EPO
Bacillus sp., Strain DNF00233	NWP90	MUC7
Fusobacterium nucleatum, Strain CTI-03	NWP187	CCL5
Oscillibacter sp., Strain KLE-1728	NWP269	IL8RB
Staphylococcus warneri E6	warneriE6	CSMT1_Epitope-1
Propionibacterium acnes, Strain HL045PA1	NWP265	CNGB3_Epitope-3
Staphylococcus capitis A7	capitisA7	CSPG5
Enterococcus faecium, Strain TX1330	NWP19	CSN3
Propionibacterium acnes, Strain HL007PA1	NWP225	CNGB3_Epitope-3
Fusobacterium sp., Strain CM21	NWP166	CTRB1
Staphylococcus saprophyticus E8	saprophyticusE8	P2RX5
Prevotella sp., Oral Taxon 472, Strain F0295	NWP191	FAM174A
Propionibacterium acnes, Strain SK137	NWP309	FAM174A
Escherichia coli, Strain 83972	NWP04	NPPA
Sporosarcina sp., Strain 2681	NWP29	FGF17
Corynebacterium sp., Strain HFH0082	NWP61	CONA1_Epitope-1
Prevotella bivia, Strain GED7760C	NWP233	EPHA5
Klebsiella sp., Strain MS 92-3	NWP40	SPOCK1

Lachnospiraceae sp., Strain DNF00160	NWP150	LOC644613
Streptococcus parasanguinis, Strain F0449	NWP114	CTRB2
Streptococcus sp., Strain C150	NWP121	AGER
Staphylococcus capitis C4	capitisC4	COL10A1
Streptococcus salivarius, Strain SK126	NWP118	PF4V1
Klebsiella oxytoca, Strain MIT 10-5249	NWP52	A1BG
Bacteroides stercoris, Strain CC31F	NWP270	IFNA17
Streptococcus mitis, Strain F0392	NWP26	AGRP
Staphylococcus epidermidis, Strain NIHLM020	NWP74	FGF17
Staphylococcus capitis C4	capitisC4	DEFB130B
Prevotella histicola, Strain F0411	NWP144	NKAI1_Epitope-2
Staphylococcus warneri B9	warneriB9	FGFR2
Micrococcus luteus, Strain SK58	NWP08	SEMG1
Propionibacterium acnes, Strain HL050PA3	NWP249	TMEM119
Bacillus sp., Strain DNF00233	NWP90	RCN1
Bacillus sp., Strain DNF00233	NWP90	IGFBP5
Staphylococcus aureus, Strain MN8	NWP17	C1QL3
Escherichia coli, Strain MS 110-3	NWP35	LECT2
Fusobacterium nucleatum, Strain CTI-02	NWP186	CCL18
Blautia sp., Strain AAB30	AB30	CHRD12
Streptococcus mitis, Strain F0392	NWP26	DEFB130A
Staphylococcus lugdunensis F8	lugdunensisF8	BTC
Staphylococcus warneri E6	warneriE6	MTNR1B
Staphylococcus epidermidis, Strain NIH04008	NWP77	FAM19A3
Proteus mirabilis, Strain WGLW4	NWP58	SYCN
Prevotella histicola, Strain F0411	NWP144	MUCL3
Bacteroides sp., Strain 4_1_36	NWP312	COL10A1
Bacteroides eggerthii, Strain 1_2_48FAA	NWP180	RCN1
Staphylococcus capitis B8	capitisB8	NPPC
Lactobacillus gasseri, Strain JV-V03	NWP106	SLPI
Staphylococcus warneri , Strain SK66	NWP11	SLC6A9
Staphylococcus capitis A7	capitisA7	DKK4
Bacteroides sp., Strain D2	NWP192	MUC7
Sporosarcina sp., Strain 2681	NWP29	FAM19A2
Staphylococcus capitis C4	capitisC4	NPPC
Staphylococcus hominis D2	hominisD2	SLC8B1
Staphylococcus capitis A7	capitisA7	IL21
Escherichia coli, Strain MS 85-1	NWP30	FGF17
Staphylococcus warneri D11	warneriD12	EPHA6
Lactobacillus gasseri, Strain EX33690VC16	NWP113	TMEM119
Lactobacillus jensenii, Strain EX849587VC03	NWP108	LOC644613
Fusobacterium sp., Strain CM22	NWP167	CCR9
Lactobacillus jensenii, Strain 269-3	NWP110	COL26A1
Staphylococcus pasteurii E5	pasteuriiE5	MCDF2
Bacteroides sp., Strain AAB8	AB8	LILRA3
Staphylococcus warneri D4	warneriD4	DRAXIN
Megasphaera sp., Strain DNF00912	NWP296	PDIA3
Staphylococcus warneri E6	warneriE6	CSF2RA
Staphylococcus pasteurii F11	pasteuriiF11	MCDF2
Staphylococcus pasteurii F11	pasteuriiF11	FAT2
Lactobacillus parafarraginis, Strain F0439	NWP105	ASIP
Propionibacterium acnes, Strain HL060PA1	NWP239	GPR37
Lachnospiraceae sp., Strain ICM7	NWP241	IGFBP6
Prevotella disiens, Strain DNF00882	NWP177	PTPRR
Lactobacillus crispatus, Strain JV-V01	NWP107	FP248
Enterococcus faecalis, Strain S613	NWP119	AVP
Propionibacterium acnes, Strain HL038PA1	NWP235	SLC22A31
Enterococcus faecium, Strain ERV99	NWP82	TMEM119
Peptoniphilus sp., Oral Taxon 386, Strain F0131	NWP255	S28A1_Epitope-6
Plesiomonas sp., Strain HPP0020	NWP62	FAM19A2
Staphylococcus warneri E6	warneriE6	OLR1
Lactobacillus crispatus, Strain GED7749C	NWP104	INSL3
Escherichia sp., Strain 3_2_53FAA	NWP02	NPPA
Staphylococcus capitis A7	capitisA7	VSTM2B
Bacteroides sp., Strain D2	NWP192	DRAXIN
Micrococcus luteus, Strain SK58	NWP08	FGF19

Bacteroides sp., Strain D2	NWP192	DEFB130B
Streptococcus sp., Strain ACS2	NWP115	ACP4
Propionibacterium acnes, Strain HL013PA2	NWP217	PDCD1
Staphylococcus epidermidis D11	EpiD11	XG
Citrobacter freundii, Strain 4_7_47CFAA	NWP88	SPINK9
Enterococcus faecium, Strain ERV165	NWP81	RTBDN
Peptoniphilus lacrimalis, Strain DNF00528	NWP304	PLA2G2E
Propionibacterium acnes, Strain HL038PA1	NWP235	CNGB3_Epitope-3
Bacteroides sp., Strain D2	NWP192	COL10A1
Clostridium orbiscindens, Strain CC43_001K	NWP259	PDIA2
Staphylococcus aureus, Strain CM05	NWP83	IGF1
Prevotella sp., Oral Taxon 472, Strain F0295	NWP191	PSORS1C2
Propionibacterium acnes, Strain HL013PA2	NWP217	CNGB3_Epitope-3
Fusobacterium nucleatum, Strain CTI-06	NWP189	AGER
Fusobacterium nucleatum subsp. animalis, Oral Taxon 420, Strain F0419	NWP196	IL29
Bacteroides sp., Strain D2	NWP192	KLK10
Streptococcus salivarius, Strain SK126	NWP118	DEFB130B
Staphylococcus haemolyticus, Strain DNF00585	NWP87	TMEM119
Lachnospiraceae bacterium, Strain AAB25	AB25	MUCL3
Staphylococcus pasteurii F12	pasteuriiF12	FAT2
Fusobacterium sp., Oral Taxon 370, Strain F0437	NWP143	SIRPA
Fusobacterium periodonticum, Strain 2_1_31	NWP160	LAIR1
Eggerthella sp., Strain MVA1	NWP185	MUC7
Staphylococcus aureus, Strain MN8	NWP17	SLC8B1
Staphylococcus warneri D11	warneriD12	SLC8B1
Streptococcus anginosus, Strain F0211	NWP125	CCL17
Prevotella bivia, Strain GED7760C	NWP233	CCL17
Staphylococcus capitis A7	capitisA7	DCN
Streptococcus sp., Strain ACS2	NWP115	IFNA5
Peptoniphilus sp., Oral Taxon 836, Strain F0141	NWP313	SPINK9
Fusobacterium periodonticum, Strain 2_1_31	NWP160	FKBP2
Staphylococcus warneri D4	warneriD4	RTBDN
Staphylococcus epidermidis, Strain NIHLM018	NWP72	TMEM119
Escherichia coli, Strain MS 110-3	NWP35	CHRD12
Staphylococcus hominis, Strain C80	NWP25	FGF17
Staphylococcus warneri, Strain SK66	NWP11	CXCR4
Streptococcus parasanguinis, Strain F0449	NWP114	C1QL2
Propionibacterium acnes, Strain HL078PA1	NWP305	PGLYRP1
Proteus mirabilis, Strain WGLW6	NWP59	CXCR5
Corynebacterium amycolatum, Strain SK46	NWP07	DRAXIN
Corynebacterium sp., Strain HFH0082	NWP61	SEM62
Streptococcus sp., Strain OBRC6	NWP124	SHISA6
Streptococcus anginosus, Strain F0211	NWP125	UNQ6190/PRO20217
Staphylococcus aureus, Strain MN8	NWP17	KCNK4_Epitope-1
Lactobacillus jensenii, Strain 208-1	NWP111	CCL17
Fusobacterium sp., Strain CM22	NWP153	SLC29A4
Escherichia coli, Strain MS 16-3	NWP37	NPPA
Staphylococcus hominis B3	hominisB3	TNFRSF21
Staphylococcus warneri C5	warneriC5	MUCL3
Fusobacterium nucleatum, Strain CTI-02	NWP186	NPPC
Streptococcus sp., Strain SR4	NWP130	CTRB1
Staphylococcus warneri B9	warneriB9	TENM1
Streptococcus sp., Strain C150	NWP121	FGFR11
Staphylococcus pasteurii E5	pasteuriiE5	CSPG5
Citrobacter sp., Strain 30_2	NWP01	CCL5
Staphylococcus capitis B12	capitisB12	CSPG5
Corynebacterium amycolatum, Strain SK46	NWP07	KLK10
Hungatella hathewayi, Strain WAL-18680	NWP231	HTRA3
Enterococcus faecium, Strain TX0133a04	NWP44	PDGFB
Propionibacterium acnes, Strain HL053PA2	NWP236	CNGB3_Epitope-3
Streptococcus salivarius, Strain SK126	NWP118	ASIP
Propionibacterium acnes, Strain HL053PA1	NWP260	SLC22A31
Sporosarcina sp., Strain 2681	NWP29	C2orf66
Streptococcus parasanguinis, Strain F0449	NWP114	PEBP4
Escherichia coli, Strain MS 16-3	NWP37	PLA2G2E
Staphylococcus capitis E7	capitisE7	SMR3A

Klebsiella pneumoniae subsp. pneumoniae, Strain WGLW3	NWP54	TMEM119
Streptococcus parasanguinis, Strain F0449	NWP114	OTOL1
Allobaculum sp., Strain NWP324	Ery128	SLC22A4
Fusobacterium periodonticum, Strain 2_1_31	NWP160	AP00
Escherichia coli, Strain MS 110-3	NWP35	COL10A1
Clostridium cadaveris, Strain CC44_001G	NWP247	PF4V1
Staphylococcus pasteurii G7	pasteuriiG7	FAT2
Staphylococcus warneri B9	warneriB9	ADCY5
Propionibacterium acnes, Strain HL036PA1	NWP226	SLC22A31
Streptococcus sp., Strain OBRC6	NWP124	FAM19A3
Propionibacterium acnes, Strain HL036PA2	NWP227	CNGB3_Epitope-3
Klebsiella pneumoniae subsp. pneumoniae, Strain WGLW1	NWP56	PLA2G2E
Collinsella sp., Strain 4_8_47FAA	NWP198	CCL18
Propionibacterium acnes, Strain HL025PA1	NWP204	CNGB3_Epitope-3
Catabacter hongkongensis, Strain AB8_9	NWP299	RBP4
Prevotella disiens, Strain DNF00882	NWP177	GP6
Staphylococcus saprophyticus E8	saprophyticusE8	TNFRSF13B
Corynebacterium sp., Strain CMW7794	NWP98	LOC644613
Coprococcus sp., Strain AAb34	AB34	DEFB130B
Staphylococcus warneri C2	warneriC2	RTBDN
Staphylococcus warneri , Strain SK66	NWP11	PRRT1
Streptococcus gallolyticus subsp. gallolyticus, Strain TX20005	NWP27	INSL3
Bacteroides sp., Strain 2_1_16	NWP273	AVP
Staphylococcus pasteurii E1	pasteuriiE1	GYPA
Staphylococcus xylosum F2	xylosumF2	MUCL3
Staphylococcus cohnii G11	cohniiG11	XG
Staphylococcus epidermidis, Strain NIH04008	NWP77	CCL2
Proteus mirabilis, Strain WGLW6	NWP59	SLC39A14
Lactobacillus gasseri, Strain EX33690VC16	NWP113	TAS1R3
Staphylococcus capitis B8	capitisB8	LECT2
Staphylococcus capitis E7	capitisE7	NPPC
Shigella sp., Strain D9	NWP06	FAM19A3
Pseudomonas sp., Strain HPB0071	NWP65	CCL18
Staphylococcus capitis B1	capitisB1	MUCL3
Proteus mirabilis, Strain WGLW4	NWP58	UNQ6494/PRO21346
Staphylococcus saprophyticus D10	saprophyticusD10	LOC644613
Clostridium sp., Strain MSTE9	NWP253	CCL18
Streptococcus sp., Strain SR1	NWP122	TMEM119
Eubacterium sp., Strain 3_1_31	NWP182	CSAG1
Propionibacterium acnes, Strain HL005PA2	NWP215	PDCD1
Rhodococcus erythropolis, Strain SK121	NWP95	PIANP
Staphylococcus epidermidis, Strain NIH04008	NWP77	PIANP
Micrococcus luteus, Strain SK58	NWP08	S39A6_Epitope-1
Streptococcus sp., Strain AS20	NWP116	COL10A1
Veillonella sp., Oral Taxon 780, Strain F0422	NWP268	PDIA2
Bacteroides sp., Strain 2_1_16	NWP273	ENDOU
Streptococcus sp., Strain ACS2	NWP115	CTL4_Epitope-3
Fusobacterium sp., Strain CM22	NWP167	CLU
Escherichia coli, Strain MS 145-7	NWP33	CLEC4G
Propionibacterium acnes, Strain HL027PA1	NWP211	FAM174A
Staphylococcus pasteurii F11	pasteuriiF11	SERPINA11
Clostridium difficile, Strain 70-100-2010	NWP279	PF4V1
Escherichia coli, Strain MS 69-1	NWP39	PRR27
Sporosarcina sp., Strain 2681	NWP29	LECT2
Streptococcus anginosus, Strain F0211	NWP125	TMEM149
Weissella cibaria, Strain F16_1	NWP101	BTC
Staphylococcus warneri B9	warneriB9	PLA2G3
Staphylococcus warneri , Strain SK66	NWP11	LOC644613
Staphylococcus capitis A7	capitisA7	OR1L6_Epitope-1
Lactobacillus crispatus, Strain GED7749C	NWP104	TFF3
Streptococcus mitis, Strain F0392	NWP26	LECT2
Staphylococcus epidermidis, Strain NIH04008	NWP77	FLT3LG
Staphylococcus aureus, Strain TCH70	NWP12	SCGB1A1
Staphylococcus capitis A7	capitisA7	KCNMB2
Enterococcus faecium, Strain TX0133a04	NWP44	UNQ6190/PRO20217
Escherichia coli, Strain MS 196-1	NWP42	SMR3A

Streptococcus parasanguinis, Strain F0449	NWP114	CONA1_Epitope-1
Rothia mucilaginosa, Strain CC87LB	NWP84	TMEM119
Streptococcus gallolyticus subsp. gallolyticus, Strain TX20005	NWP27	SLC22A31
Proteus mirabilis, Strain WGLW6	NWP59	CHRNA9
Staphylococcus capitis A7	capitisA7	MTNR1B
Bacteroides stercoris, Strain CC31F	NWP270	SCGB1A1
Staphylococcus capitis A7	capitisA7	TMC3
Klebsiella pneumoniae subsp. pneumoniae, Strain WGLW1	NWP56	NPPA
Lachnospiraceae bacterium, Strain AAB23	AB23	COLEC12
Staphylococcus hominis C10	hominisC10	MUCL3
Megasphaera sp., Strain DNF00912	NWP296	PRR27
Staphylococcus capitis B8	capitisB8	NPPA
Fusobacterium nucleatum subsp. animalis, Oral Taxon 420, Strain F0419	NWP196	FGF1
Escherichia coli, Strain MS 110-3	NWP35	PRND
Escherichia sp., Strain 3_2_53FAA	NWP02	AGRP
Eggerthella sp., Strain MVA1	NWP185	CSAG1
Enterococcus faecium, Strain ERV165	NWP81	C4A
Staphylococcus saprophyticus D1	saprophyticusD1	ENDOU
Staphylococcus pasteurii G3	pasteuriiG3	TNMD
Fusobacterium nucleatum, Strain MJR7757B	NWP257	EPHA5
Staphylococcus epidermidis H11	EpiH11	XG
Lactobacillus jensenii, Strain 269-3	NWP110	KIR3DS1
Staphylococcus warneri B9	warneriB9	DQA2_Epitope-1
Klebsiella oxytoca, Strain MIT 10-5246	NWP50	CHGA
Lactobacillus gasseri, Strain 224-1	NWP112	SHISA2
Enterococcus faecium, Strain TX1330	NWP19	PF4V1
Staphylococcus pasteurii E5	pasteuriiE5	RTN4R
Streptococcus intermedius, Strain F0413	NWP128	TSLP
Staphylococcus haemolyticus B6	haemolyticusB6	PF4V1
Enterococcus faecalis, Strain TX2137	NWP117	AVP
Staphylococcus capitis B8	capitisB8	DEFB130B
Corynebacterium sp., Strain HFH0082	NWP61	FAM19A2
Staphylococcus capitis C4	capitisC4	PIANP
Fusobacterium nucleatum, Strain CTI-05	NWP188	LOC644613
Streptococcus mitis, Strain F0392	NWP26	MUC7
Escherichia coli, Strain MS 145-7	NWP33	GPR142
Lactobacillus jensenii, Strain 269-3	NWP110	SLC8B1
Corynebacterium amycolatum, Strain SK46	NWP07	SEMG2
Prevotella bivia, Strain DNF00650	NWP176	AGER
Staphylococcus warneri, Strain SK66	NWP11	IGFBP4
Streptococcus salivarius, Strain SK126	NWP118	RTBDN
Staphylococcus warneri D11	warneriD12	OR1L1_Epitope-1
Lactobacillus jensenii, Strain 208-1	NWP111	PEBP4
Fusobacterium sp., Strain CM22	NWP167	RCN3
Propionibacterium acnes, Strain HL005PA3	NWP216	CNGB3_Epitope-3
Staphylococcus epidermidis, Strain NIHLM070	NWP69	TMEM119
Propionibacterium acnes, Strain HL060PA1	NWP239	TMEM119
Staphylococcus saprophyticus D6	saprophyticusD6	PDGFB
Micrococcus luteus, Strain SK58	NWP08	CONA1_Epitope-1
Staphylococcus pasteurii E1	pasteuriiE1	HCG22
Staphylococcus aureus, Strain CM05	NWP83	SO1B7_Epitope-5
Fusobacterium nucleatum subsp. animalis, Oral Taxon 420, Strain F0419	NWP196	SLPI
Sporosarcina sp., Strain 2681	NWP29	SEMG2
Staphylococcus capitis A7	capitisA7	EPHA6
Streptococcus sp., Strain ACS2	NWP115	GPR151
Corynebacterium sp., Strain CMW7794	NWP98	FAM19A3
Escherichia coli, Strain MS 85-1	NWP30	IGFBP5
Blautia sp., Strain AAB30	AB30	FAM19A2
Prevotella sp., Oral Taxon 317, Strain F0108	NWP173	IBSP
Clostridium perfringens, Strain WAL-14572	NWP311	KISS1
Clostridium aldenense, Strain WAL-18727	NWP314	FAM19A3
Staphylococcus warneri, Strain SK66	NWP11	ADRA2C
Enterococcus faecium, Strain TX0133a04	NWP44	LOC644613
Klebsiella oxytoca, Strain MIT 10-5242	NWP46	DEFA6
Lactobacillus crispatus, Strain 125-2-CHN	NWP99	BTC
Enterococcus faecium, Strain TX1330	NWP19	SEMG2

Lactobacillus jensenii, Strain EX849587VC06	NWP109	SMR3A
Streptococcus sp., Strain AS20	NWP116	NPPC
Sporosarcina sp., Strain 2681	NWP29	TRPM5
Corynebacterium amycolatum, Strain SK46	NWP07	FGF17
Escherichia coli, Strain 83972	NWP04	C4A
Streptococcus gallolyticus subsp. gallolyticus, Strain TX20005	NWP27	PDCD1
Bacteroides eggerthii, Strain 1_2_48FAA	NWP180	CALU
Bacteroides dorei, Strain 5_1_36/D4	NWP244	RBPA
Prevotella sp., Oral Taxon 472, Strain F0295	NWP191	SLC10A4
Staphylococcus capitis E7	capitisE7	NPPA
Staphylococcus warneri E6	warneriE6	SPRN
Prevotella bivia, Strain DNF00188	NWP193	C2orf40
Staphylococcus warneri B9	warneriB9	CXCR4
Escherichia coli, Strain MS 145-7	NWP33	PIANP
Clostridiales bacterium, Strain 4_1_37FAA	NWP285	TXNDC12
Lactobacillus crispatus, Strain MV-3A-US	NWP103	P4HB
Enterococcus faecium, Strain ERV102	NWP80	RTBDN
Bacteroides fragilis, Strain CL07T12C05	NWP282	TSPAN8
Bacteroides sp., Strain D2	NWP192	FAM19A2
Fusobacterium nucleatum subsp. animalis, Oral Taxon 420, Strain F0419	NWP196	GNLY
Prevotella sp., Oral Taxon 472, Strain F0295	NWP191	SMR3B
Staphylococcus epidermidis, Strain NIHLM008	NWP70	TMEM119
Citrobacter sp., Strain 30_2	NWP01	AGER
Staphylococcus capitis B8	capitisB8	PIANP
Ruminococcus gnavus, Strain AAB28	AB28	CSAG1
Shigella sp., Strain D9	NWP06	YB043
Plesiomonas sp., Strain HPP0020	NWP62	C4A
Staphylococcus capitis E7	capitisE7	PIANP
Propionibacterium propionicum, Oral Taxon 739, Strain F0230	NWP301	CD151
Eubacterium infirmum, Strain F0142	NWP223	APOO
Staphylococcus warneri F1	warneriF1	F3
Streptococcus cristatus, Strain F0329	NWP126	PF4V1
Bacteroides sp., Strain AAB8	AB8	HFE
Parabacteroides sp., Strain D13	NWP172	AMY2A
Staphylococcus epidermidis C3	EpiC3	SMR3A
Sporosarcina sp., Strain 2681	NWP29	ADAMTS16
Shigella sp., Strain D9	NWP06	PLA2G2E
Clostridiales bacterium, Strain 4_1_37FAA	NWP285	MFSD2A
Propionibacterium acnes, Strain HLO25PA2	NWP210	CNGB3_Epitope-3
Escherichia coli, Strain MS 145-7	NWP33	AVP
Proteus mirabilis, Strain WGLW6	NWP59	NBL1
Staphylococcus pasteurii C9	pasteuriiC9	TNFSF6
Sporosarcina sp., Strain 2681	NWP29	CSN3
Staphylococcus capitis E11	capitisE11	CDSN
Streptococcus sp., Strain BS29a	NWP129	CRTAC1
Propionibacterium acnes, Strain HLO07PA1	NWP225	SLC22A31
Staphylococcus epidermidis, Strain NIHLM040	NWP76	PMCH
Corynebacterium sp., Strain CMW7794	NWP98	LECT2
Staphylococcus warneri E4	warneriE4	CRELD1
Propionibacterium acnes, Strain HLO25PA1	NWP204	SPINT3
Klebsiella pneumoniae subsp. pneumoniae, Strain WGLW1	NWP56	CHGA
Staphylococcus saprophyticus E8	saprophyticusE8	FCGR1A
Klebsiella sp., Strain MS 92-3	NWP40	FAM174A
Streptococcus sp., Strain OBRC6	NWP124	DEFB130B
Fusobacterium periodonticum, Strain 1_A_54/D10	NWP142	TNFRSF10B
Staphylococcus cohnii G11	cohniiG11	CD320
Prevotella bivia, Strain DNF00650	NWP176	RCN2
Streptococcus salivarius, Strain SK126	NWP118	PIANP
Staphylococcus intermedius F7	intermediusF7	KCMA1_Epitope-1
Lactobacillus crispatus, Strain JV-V01	NWP107	TMEM119
Enterococcus faecalis, Strain S613	NWP119	SYCN
Staphylococcus hominis B3	hominisB3	SOSTDC1
Enterococcus faecium, Strain E417	NWP79	AGER
Corynebacterium amycolatum, Strain SK46	NWP07	ADAMTS16
Arthrobacter albus, Strain DNF00011	NWP86	CTRB2
Propionibacterium acnes, Strain HLO37PA2	NWP205	PF4V1

Propionibacterium acnes, Strain HL056PA1	NWP267	PDCD1
Fusobacterium sp., Strain CM22	NWP167	NCKX2_Epitope-1
Peptostreptococcus sp., Strain CC14N	NWP290	FAM19A3
Klebsiella oxytoca, Strain MIT 10-5246	NWP50	DEFA6
Prevotella bivia, Strain DNF00188	NWP193	RCN2
Prevotella bivia, Strain DNF00650	NWP176	RTBDN
Prevotella timonensis, Strain CRIS 5C-B1	NWP156	KCMA1_Epitope-1
Escherichia coli, Strain MS 196-1	NWP42	PRR27
Staphylococcus epidermidis F6	EpiF6	MUCL3
Escherichia coli, Strain 83972	NWP04	ADAMTS16
Propionibacterium acnes, Strain HL027PA1	NWP211	TMEM119
Escherichia coli, Strain MS 110-3	NWP35	CONA1_Epitope-1
Streptococcus mitis, Strain F0392	NWP26	FGF19
Blautia sp., Strain KLE 1732	NWP292	CCL18
Lactobacillus jensenii, Strain EX849587VC06	NWP109	PIANP
Collinsella aerofaciens, Strain AAB3	AB3	PIANP
Clostridium orbiscindens, Strain CC43_001K	NWP259	TXNDC12
Erysipelotrichaceae sp., Strain 6_1_45	NWP181	NPPA
Streptococcus sp., Strain C150	NWP121	CSAG1
Fusobacterium nucleatum, Strain CTI-07	NWP190	S39A6_Epitope-1
Staphylococcus warneri C2	warneriC2	MUCL3
Deinococcus grandis, Strain SK125	NWP89	FAM19A3
Staphylococcus pasteurii G3	pasteuriiG3	SERPINA11
Shigella sp., Strain D9	NWP06	KIRREL
Streptococcus salivarius, Strain SK126	NWP118	CTRB2
Staphylococcus warneri B9	warneriB9	OPN3
Corynebacterium sp., Strain HFH0082	NWP61	ADAMTS16
Staphylococcus pasteurii F12	pasteuriiF12	TNMD
Clostridium cadaveris, Strain CC44_001G	NWP247	NKAI1_Epitope-2
Staphylococcus capitis C12	capitisC12	LOC644613
Streptococcus sobrinus, Strain W1703	NWP85	CCL17
Proteus mirabilis, Strain WGLW4	NWP58	DRAXIN
Corynebacterium sp., Strain CMW7794	NWP98	DEFB130B
Staphylococcus caprae, Strain C87	NWP24	LGALS7
Dermabacter sp., Strain HFH0086	NWP92	C3AR_Epitope-3
Enterococcus faecium, Strain E417	NWP79	TMEM119
Staphylococcus epidermidis F6	EpiF6	LOC644613
Fusobacterium nucleatum, Strain CTI-07	NWP190	DKK1
Erysipelotrichaceae sp., Strain 6_1_45	NWP174	AGRP
Proteus mirabilis, Strain WGLW6	NWP59	SCN9A_Epitope-3
Klebsiella oxytoca, Strain MIT 10-5246	NWP50	SLC22A4
Corynebacterium sp., Strain HFH0082	NWP61	FGF17
Lactobacillus jensenii, Strain EX849587VC06	NWP109	TNFSF9
Lactobacillus jensenii, Strain 208-1	NWP111	CSAG1
Escherichia coli, Strain MS 110-3	NWP35	LMBRD1
Streptococcus sp., Strain AS20	NWP116	ASIP
Clostridium bolteae, Strain CC43_001B	NWP245	APOO
Lactobacillus jensenii, Strain EX849587VC03	NWP108	DEFB130A
Citrobacter sp., Strain 30_2	NWP01	C1QTNF2
Eggerthella sp., Strain MVA1	NWP185	SMR3A
Staphylococcus warneri E4	warneriE4	EPO
Enterococcus faecium, Strain TX0133a04	NWP44	CTRB2
Propionibacterium acnes, Strain HL053PA2	NWP236	SPINT3
Klebsiella oxytoca, Strain MIT 10-5246	NWP50	SLC22A5
Blautia sp., Strain KLE 1732	NWP292	PRR27
Prevotella denticola, Strain DNF00960	NWP179	CTRB1
Fusobacterium nucleatum, Strain CTI-05	NWP188	ADAMTS16
Staphylococcus warneri D11	warneriD12	MEPE
Rhodococcus erythropolis, Strain SK121	NWP95	COL10A1
Enterococcus faecium, Strain ERV165	NWP81	ADAMTS16
Veillonella sp., Oral Taxon 780, Strain F0422	NWP268	TNFRSF10B
Proteus mirabilis, Strain WGLW4	NWP58	TMEM119
Anaerostipes sp., Strain 3_2_56FAA	NWP277	PDIA6
Blautia sp., Strain AAB30	AB30	PRR27
Corynebacterium amycolatum, Strain SK46	NWP07	TRPM5
Staphylococcus pasteurii F12	pasteuriiF12	MCFD2

Escherichia coli, Strain MS 145-7	NWP33	MMP9
Staphylococcus haemolyticus G2	haemolyticusG2	CD320
Staphylococcus epidermidis, Strain NIHLM067	NWP68	TMEM119
Staphylococcus warneri E6	warneriE6	MEPE
Enterococcus faecalis, Strain TX2137	NWP117	PF4V1
Fusobacterium sp., Strain CM22	NWP167	GRPR
Streptococcus sp., Strain SR1	NWP122	PEBP4
Prevotella disiens, Strain DNF00882	NWP177	IL22
Fusobacterium sp., Strain CM21	NWP166	CSAG1
Enterococcus faecalis, Strain R712	NWP120	AVP
Fusobacterium sp., Strain CM22	NWP167	CEACAM4
Staphylococcus pasteurii G3	pasteuriiG3	MCFD2
Fusobacterium sp., Oral Taxon 370, Strain F0437	NWP143	AJAP1
Staphylococcus epidermidis, Strain NIHLM015	NWP71	SCGB2B2
Lactobacillus jensenii, Strain 208-1	NWP111	MANF
Escherichia coli, Strain MS 145-7	NWP33	NPFF2_Epitope-1
Enterococcus faecium, Strain ERV165	NWP81	DRAXIN
Bacteroides bacterium, Strain KA00344	NWP302	IFNL2
Staphylococcus warneri E6	warneriE6	FGF1
Escherichia coli, Strain MS 200-1	NWP41	TMEM119
Klebsiella oxytoca, Strain MIT 10-5245	NWP49	PDZD11
Klebsiella oxytoca, Strain MIT 10-5245	NWP49	TRPM1_Epitope-2
Prevotella bivia, Strain DNF00650	NWP176	RCN3
Klebsiella oxytoca, Strain MIT 10-5249	NWP52	INSL4
Proteus mirabilis, Strain WGLW6	NWP59	CLU
Escherichia coli, Strain 83972	NWP04	IGFBP5
Staphylococcus pasteurii F12	pasteuriiF12	TNFRSF21
Lactobacillus gasseri, Strain JV-V03	NWP106	FAM19A2
Staphylococcus capitis A7	capitisA7	PTH1R
Escherichia coli, Strain 83972	NWP04	AHSG
Catabacter hongkongensis, Strain AB8_9	NWP299	SMR3A
Staphylococcus epidermidis, Strain NIHLM015	NWP71	CCL2
Propionibacterium acnes, Strain HL045PA1	NWP265	PDCD1
Lactobacillus crispatus, Strain JV-V01	NWP107	MFSD8_Epitope-5
Staphylococcus warneri B9	warneriB9	IGFBP4
Staphylococcus aureus, Strain TCH70	NWP12	IGF1
Propionibacterium acnes, Strain HL037PA1	NWP208	CNGB3_Epitope-3
Proteus mirabilis, Strain WGLW6	NWP59	EPHA5
Lactobacillus jensenii, Strain EX849587VC06	NWP109	TFF1
Shuttleworthia sp., Strain MSX8B	NWP149	OSTN
Bacteroides fragilis, Strain CL07T12C05	NWP282	SHISA2
Staphylococcus aureus, Strain CM05	NWP83	SCGB1A1
Plesiomonas sp., Strain HPP0020	NWP62	TRPM5
Citrobacter sp., Strain 30_2	NWP01	TMEM119
Fusobacterium sp., Oral Taxon 370, Strain F0437	NWP143	AGER
Staphylococcus capitis E7	capitisE7	DEFB130B
Enterococcus faecium, Strain TX1330	NWP19	PRND
Propionibacterium acnes, Strain HL043PA2	NWP264	CNGB3_Epitope-3
Parabacteroides merdae, Strain CL09T00C40	NWP184	CSAG1
Propionibacterium acnes, Strain HL030PA2	NWP207	SPINT3
Staphylococcus pasteurii F11	pasteuriiF11	TNFRSF21
Streptococcus sp., Strain BS21	NWP131	MUCL3
Lactobacillus parafarraginis, Strain F0439	NWP105	ENDOU
Staphylococcus aureus, Strain CM05	NWP83	MSMB
Escherichia coli, Strain MS 115-1	NWP36	IGFBP5
Actinomyces neuii, Strain MJR8396A	NWP258	NRG2
Actinomyces neuii, Strain MJR8396A	NWP258	EPHA5
Klebsiella oxytoca, Strain MIT 10-5249	NWP52	TMEM119
Proteus mirabilis, Strain WGLW4	NWP58	GFRA1
Propionibacterium acnes, Strain HL013PA2	NWP217	SPINK14
Lactobacillus parafarraginis, Strain F0439	NWP105	SHISA6
Proteus mirabilis, Strain WGLW6	NWP59	ITPR2_Epitope-3
Staphylococcus warneri B9	warneriB9	TUSC5
Streptococcus mitis, Strain F0392	NWP26	CONA1_Epitope-1
Lactobacillus gasseri, Strain SV-16A-US	NWP102	CCL5
Staphylococcus warneri D4	warneriD4	GRIA2_Epitope-2

Propionibacterium acnes, Strain HL001PA1	NWP203	NOG
Klebsiella oxytoca, Strain MIT 10-5248	NWP51	ACP4
Propionibacterium acnes, Strain HL002PA2	NWP214	CNGB3_Epitope-3
Fusobacterium periodonticum, Strain 1_A_54/D10	NWP142	BTN3A3
Bacteroides stercoris, Strain CC31F	NWP270	OTOR
Citrobacter freundii, Strain 4_7_47CFAA	NWP88	GNLY
Streptococcus sp., Strain ACC21	NWP134	PIANP
Propionibacterium sp., Strain 5_U_42AFAA	NWP300	TACSTD2
Escherichia coli, Strain MS 196-1	NWP42	TRPM5
Coprococcus sp., Strain AAb34	AB34	PIANP
Streptococcus gallolyticus subsp. gallolyticus, Strain TX20005	NWP27	GSG1L
Propionibacterium acnes, Strain HL046PA2	NWP266	PDCD1
Staphylococcus warneri B9	warneriB9	HRC
Bacteroides stercoris, Strain CC31F	NWP270	TXN
Propionibacterium acnes, Strain HL060PA1	NWP239	CNGB3_Epitope-3
Propionibacterium acnes, Strain HL005PA2	NWP215	CNGB3_Epitope-3
Staphylococcus caprae, Strain C87	NWP24	FGF17
Escherichia coli, Strain MS 145-7	NWP33	COL10A1
Klebsiella oxytoca, Strain MIT 10-5249	NWP52	ACVRL1
Escherichia coli, Strain MS 69-1	NWP39	AGRP
Staphylococcus warneri B9	warneriB9	CGREF1
Streptococcus sp., Strain ACS2	NWP115	AXL
Prevotella disiens, Strain DNF00882	NWP177	LUM
Klebsiella oxytoca, Strain MIT 10-5242	NWP46	LGALS7
Citrobacter sp., Strain 30_2	NWP01	PTHLH
Collinsella sp., Strain 4_8_47FAA	NWP198	IGFBP5
Staphylococcus epidermidis, Strain NIHLM031	NWP73	UNQ6190/PRO20217
Klebsiella pneumoniae subsp. pneumoniae, Strain WGLW3	NWP54	FAM19A3
Proteus mirabilis, Strain WGLW4	NWP58	NPPA
Streptococcus anginosus, Strain F0211	NWP125	AXL
Escherichia coli, Strain MS 110-3	NWP35	C4A
Enterococcus faecium, Strain TX1330	NWP19	CONA1_Epitope-1
Erysipelotrichaceae sp., Strain 6_1_45	NWP181	PRR27
Klebsiella pneumoniae subsp. pneumoniae, Strain WGLW5	NWP55	AVP
Lactobacillus jensenii, Strain EX849587VC06	NWP109	LECT2
Blautia sp., Strain AAB30	AB30	CCL18
Staphylococcus epidermidis, Strain NIH05001	NWP78	XG
Fusobacterium nucleatum subsp. animalis, Oral Taxon 420, Strain F0419	NWP196	TM9SF3
Propionibacterium acnes, Strain HL013PA1	NWP209	CNGB3_Epitope-3
Lachnospiraceae bacterium, Strain AAB19	AB19	ENDOU
Staphylococcus warneri C5	warneriC5	CTRB2
Streptococcus sobrinus, Strain W1703	NWP85	SSBP3-AS1
Escherichia coli, Strain MS 196-1	NWP42	SEMG1
Fusobacterium sp., Strain CM22	NWP167	FZD4
Plesiomonas sp., Strain HPP0020	NWP62	NPPC
Staphylococcus capitis A10	capitisA10	AMELX
Lachnospiraceae sp., Strain DNF00160	NWP150	CXCL9
Escherichia coli, Strain 83972	NWP04	LECT2
Staphylococcus warneri B9	warneriB9	CDSN
Escherichia coli, Strain MS 119-7	NWP31	SMOC2
Fusobacterium sp., Strain CM22	NWP167	GRM3
Escherichia coli, Strain 83972	NWP04	CONA1_Epitope-1
Propionibacterium acnes, Strain HL027PA2	NWP218	SLC22A31
Fusobacterium nucleatum subsp. animalis, Oral Taxon 420, Strain F0419	NWP196	ENDOU
Propionibacterium acnes, Strain HL046PA2	NWP266	CNGB3_Epitope-3
Hungatella hathewayi, Strain WAL-18680	NWP231	SPINK9
Parabacteroides merdae, Strain CL09T00C40	NWP184	MUCL3
Fusobacterium sp., Strain CM22	NWP153	ENDOU
Ruminococcus gnavus, Strain AAB28	AB28	COL10A1
Lactobacillus rhamnosus, Strain LMS2-1	NWP97	ENDOU
Sporosarcina sp., Strain 2681	NWP29	SEMA6C
Staphylococcus pasteurii F12	pasteuriiF12	CDSN
Plesiomonas sp., Strain HPP0020	NWP62	DEFB130A
Staphylococcus pasteurii G7	pasteuriiG7	TNFRSF21
Prevotella veroralis, Oral Taxon 572, Strain F0319	NWP155	CTRB1
Staphylococcus capitis B1	capitisB1	CCL2

Klebsiella pneumoniae subsp. pneumoniae, Strain WGLW2	NWP57	KISS1
Enterococcus faecalis, Strain TX2137	NWP117	PEBP4
Citrobacter freundii, Strain 4_7_47CFAA	NWP28	PGF
Staphylococcus aureus, Strain CM05	NWP83	SHISA2
Enterococcus faecium, Strain TX1330	NWP19	ADAMTS16
Collinsella sp., Strain 4_8_47FAA	NWP198	COL10A1
Klebsiella pneumoniae subsp. pneumoniae, Strain WGLW2	NWP57	CHGA
Staphylococcus capitis A7	capitisA7	SFRP4
Clostridium aldenense, Strain WAL-18727	NWP314	CCL18
Staphylococcus pasteurii E5	pasteuriiE5	TNMD
Staphylococcus epidermidis, Strain NIHLM020	NWP74	TMEM119
Enterococcus faecium, Strain TX0133a04	NWP44	PEBP4
Staphylococcus warneri B9	warneriB9	CD22
Staphylococcus pasteurii C9	pasteuriiC9	SFRP4
Escherichia coli, Strain 83972	NWP04	SEMG1
Lactobacillus jensenii, Strain EX849587VC06	NWP109	TMEM119
Propionibacterium acnes, Strain HL036PA1	NWP226	CNGB3_Epitope-3
Staphylococcus lugdunensis F8	lugdunensisF8	LOC644613
Lactobacillus crispatus, Strain JV-V01	NWP107	PDIA3
Streptococcus downei, Oral Taxon 594, Strain F0415	NWP123	PEBP4
Enterococcus faecalis, Strain TX2137	NWP117	ASIP
Staphylococcus saprophyticus F6	saprophyticusF6	ENDOU
Staphylococcus warneri D4	warneriD4	CTRB2
Staphylococcus hominis B3	hominisB3	RTBDN
Streptococcus sp., Strain OBR06	NWP124	FAM19A2
Staphylococcus pasteurii F11	pasteuriiF11	CDSN
Prevotella bivia, Strain GED7760C	NWP233	PF4V1
Shigella sp., Strain D9	NWP06	NPPA
Lactobacillus gasseri, Strain JV-V03	NWP106	NPPC
Corynebacterium sp., Strain HFH0082	NWP61	CSN3
Fusobacterium nucleatum, Strain CTI-07	NWP190	SPINK9
Klebsiella oxytoca, Strain MIT 10-5249	NWP52	CD69
Staphylococcus warneri B9	warneriB9	EPO
Staphylococcus capitis A7	capitisA7	OPN3
Corynebacterium sp., Strain HFH0082	NWP61	DRAXIN
Corynebacterium amycolatum, Strain SK46	NWP07	ALP1
Lactobacillus jensenii, Strain 269-3	NWP110	LCN2
Bacteroides stercoris, Strain CC31F	NWP270	SCRG1
Bifidobacterium breve, Strain HPH0326	NWP289	SHISA2
Propionibacterium acnes, Strain HL045PA1	NWP265	SLC22A31
Staphylococcus epidermidis H6	EpiH6	CSN3
Staphylococcus aureus, Strain TCH70	NWP12	SHISA2
Klebsiella oxytoca, Strain MIT 10-5246	NWP50	VSTM2B
Staphylococcus epidermidis C3	EpiC3	OTOS
Klebsiella sp., Strain 4_1_44FAA	NWP21	SHISA2
Staphylococcus pasteurii F12	pasteuriiF12	FAM174A
Propionibacterium acnes, Strain HL007PA1	NWP225	PDCD1
Escherichia coli, Strain 83972	NWP04	DRAXIN
Staphylococcus capitis C4	capitisC4	NPPA
Fusobacterium nucleatum subsp. animalis, Oral Taxon 420, Strain F0419	NWP196	GREM2
Staphylococcus warneri D3	warneriD3	CTRB2
Lachnospiraceae sp., Strain DNF00160	NWP150	FGF17
Staphylococcus epidermidis, Strain NIH04008	NWP77	BMP7
Staphylococcus warneri D11	warneriD12	SPRN
Escherichia coli, Strain MS 110-3	NWP35	ADAMTS16
Staphylococcus aureus, Strain MN8	NWP17	TMEM119
Lactobacillus jensenii, Strain 269-3	NWP110	TFF1
Klebsiella pneumoniae subsp. pneumoniae, Strain WGLW1	NWP56	GHRHR
Bacteroides fragilis, Strain CL07T12C05	NWP282	WNT11
Clostridium aldenense, Strain WAL-18727	NWP314	AGRP
Micrococcus luteus, Strain SK58	NWP08	DRAXIN
Proteus mirabilis, Strain WGLW6	NWP59	SHISA2
Staphylococcus warneri E6	warneriE6	CLEC18A
Staphylococcus pasteurii F12	pasteuriiF12	TMEFF2
Propionibacterium acnes, Strain HL027PA2	NWP218	PDCD1
Fusobacterium nucleatum subsp. polymorphum, Strain F0401	NWP199	ENDOU

Klebsiella pneumoniae subsp. pneumoniae, Strain WGLW1	NWP56	NPPC
Staphylococcus warneri D11	warneriD12	ADRA2C
Staphylococcus epidermidis C6	EpiC6	LOC644613
Micrococcus luteus, Strain SK58	NWP08	CSN3
Fusobacterium nucleatum subsp. animalis, Oral Taxon 420, Strain F0419	NWP196	SMOC2
Fusobacterium nucleatum, Strain CTI-07	NWP190	SEMG1
Citrobacter freundii, Strain 4_7_47CFAA	NWP88	TMEM119
Enterococcus faecalis, Strain TUSoD Ef11	NWP05	SCNAA_Epitope-3
Micrococcus luteus, Strain SK58	NWP08	C4A
Staphylococcus haemolyticus, Strain DNF00585	NWP87	MUCL3
Staphylococcus warneri C2	warneriC2	CTRB2
Staphylococcus epidermidis, Strain NIH04008	NWP77	SHISA6
Staphylococcus saprophyticus D6	saprophyticusD6	BTC
Staphylococcus warneri E6	warneriE6	PTH1R
Streptococcus parasanguinis, Strain F0449	NWP114	TMEM119
Klebsiella oxytoca, Strain MIT 09-7231	NWP45	GSG1L
Eubacterium sp., Strain 3_1_31	NWP182	VASN
Staphylococcus warneri E6	warneriE6	C1orf134
Citrobacter freundii, Strain 4_7_47CFAA	NWP88	CCL5
Bacteroides sp., Strain 1_1_30	NWP272	SLC8B1
Staphylococcus warneri E4	warneriE4	EPHA6
Propionibacterium acnes, Strain HL005PA1	NWP224	FAM19A4
Staphylococcus hominis, Strain C80	NWP25	CCL2
Citrobacter freundii, Strain 4_7_47CFAA	NWP28	UNQ6190/PRO20217
Streptococcus sp., Strain SR1	NWP122	FGF17
Pseudomonas sp., Strain HPB0071	NWP65	TMEM119
Staphylococcus epidermidis, Strain W23144	NWP15	MUCL3
Citrobacter sp., Strain 30_2	NWP01	MANF
Bacteroides stercoris, Strain CC31F	NWP270	IGLL5
Klebsiella oxytoca, Strain MIT 09-7231	NWP45	TSPAN9
Staphylococcus warneri A3	warneriA3	BTC
Enterococcus faecium, Strain TX1330	NWP19	ASIP
Streptococcus gallolyticus subsp. gallolyticus, Strain TX20005	NWP27	TACSTD2
Ruminococcus gnavus, Strain NWP327	RG151	CD7
Lactobacillus crispatus, Strain GED7749C	NWP104	IL17F
Bacteroides fragilis, Strain CL05T00C42	NWP287	LUM
Staphylococcus capitis C4	capitisC4	C4A
Streptococcus sp., Strain SR1	NWP122	CTRB1
Staphylococcus warneri C2	warneriC2	SHISA6
Escherichia coli, Strain MS 115-1	NWP36	TRPM5
Fusobacterium nucleatum, Strain CTI-03	NWP187	EPHA5
Citrobacter freundii, Strain 4_7_47CFAA	NWP28	TMEM119
Enterococcus faecium, Strain TX1330	NWP19	MUC7
Proteus mirabilis, Strain WGLW6	NWP59	IL1F10
Bacteroidales bacterium, Strain KA00344	NWP302	TMEM149
Streptococcus sp., Strain AS20	NWP116	UNQ6190/PRO20217
Streptococcus cristatus, Strain F0329	NWP126	SCN1A_Epitope-3
Lactobacillus crispatus, Strain JV-V01	NWP107	TNFSF9
Fusobacterium nucleatum, Strain CTI-03	NWP187	CCL18
Enterococcus faecium, Strain ERV102	NWP80	PRR27
Streptococcus gallolyticus subsp. gallolyticus, Strain TX20005	NWP27	SCNAA_Epitope-3
Staphylococcus hominis, Strain C80	NWP25	FAM19A3
Citrobacter freundii, Strain 4_7_47CFAA	NWP28	C1QTNF2
Enterococcus faecium, Strain ERV165	NWP81	AGRP
Fusobacterium nucleatum, Strain CTI-02	NWP186	IGFBP5
Fusobacterium sp., Strain CM22	NWP167	LYSMD3
Propionibacterium acnes, Strain HL036PA2	NWP227	SLC22A31
Escherichia sp., Strain 3_2_53FAA	NWP02	DEFB130B
Escherichia coli, Strain MS 85-1	NWP30	SEMG2
Escherichia coli, Strain MS 69-1	NWP39	WISP2
Propionibacterium acnes, Strain HL013PA1	NWP209	VSTM2A
Bifidobacterium breve, Strain EX336960VC19	NWP202	CALCR_Epitope-1
Enterococcus faecalis, Strain S613	NWP119	TACSTD2
Arthrobacter albus, Strain DNF00011	NWP86	DRAXIN
Propionibacterium acnes, Strain SK137	NWP309	CNGB3_Epitope-3
Deinococcus geandis, Strain SK125	NWP89	IGFBP2

Lachnospiraceae bacterium, Strain AAB23	AB23	SYCN
Lactobacillus jensenii, Strain 269-3	NWP110	SHISA2
Citrobacter sp., Strain 30_2	NWP01	SLPI
Catabacter hongkongensis, Strain AB8_9	NWP299	LYG2
Klebsiella pneumoniae subsp. pneumoniae, Strain WGLW5	NWP55	DEFA6
Fusobacterium nucleatum, Strain CTI-06	NWP189	MANF
Staphylococcus pasteurii E1	pasteuriiE1	PODXL2
Lachnospiraceae bacterium, Strain AAB19	AB19	LOC644613
Staphylococcus pasteurii G7	pasteuriiG7	CDSN
Corynebacterium amycolatum, Strain SK46	NWP07	TMEM204
Streptococcus sp., Strain C150	NWP121	SHISA6
Fusobacterium nucleatum, Strain CTI-02	NWP186	LOC644613
Klebsiella sp., Strain 1_1_55	NWP03	PEBP4
Streptococcus downei, Oral Taxon 594, Strain F0415	NWP123	FAM19A3
Streptococcus sp., Strain AS20	NWP116	PF4V1
Fusobacterium sp., Oral Taxon 370, Strain F0437	NWP143	SLC22A31
Proteus mirabilis, Strain WGLW6	NWP59	KCT2
Streptococcus sp., Strain AS20	NWP116	NPPA
Propionibacterium acnes, Strain HL060PA1	NWP239	KIR3DL3
Sporosarcina sp., Strain 2681	NWP29	FGF19
Enterococcus faecium, Strain ERV102	NWP80	DLK1
Staphylococcus warneri D11	warneriD12	GPHB5
Escherichia coli, Strain MS 200-1	NWP41	C4A
Fusobacterium nucleatum, Strain CTI-02	NWP186	COL10A1
Streptococcus sp., Strain AS20	NWP116	SHISA6
Collinsella aerofaciens, Strain AAB3	AB3	FAM19A2
Bacteroides dorei, Strain 5_1_36/D4	NWP244	IL10RB
Staphylococcus epidermidis H4	EpiH4	GZMA
Megasphaera micronuciformis, Strain DNF00954	NWP307	MUCL3
Lactobacillus gasseri, Strain JV-V03	NWP106	CCL18
Staphylococcus epidermidis, Strain NIHLM020	NWP74	MUCL3
Streptococcus salivarius, Strain SK126	NWP118	FAM19A2
Propionibacterium acnes, Strain HL059PA1	NWP250	SPINT3
Klebsiella oxytoca, Strain MIT 10-5246	NWP50	TACSTD2
Propionibacterium acnes, Strain HL002PA2	NWP214	DSA2D_Epitope-1
Staphylococcus epidermidis, Strain NIHLM001	NWP66	CTRB1
Enterococcus faecalis, Strain TX2137	NWP117	TFF3
Prevotella bivia, Strain DNF00188	NWP193	TMG2_Epitope-1
Propionibacterium acnes, Strain HL050PA1	NWP248	CNGB3_Epitope-3
Enterococcus faecium, Strain ERV99	NWP82	LOC644613
Dermabacter sp., Strain HFH0086	NWP92	SLCO4C1
Escherichia coli, Strain MS 196-1	NWP42	CONA1_Epitope-1
Streptococcus sp., Strain SR1	NWP122	CLU
Staphylococcus aureus, Strain MN8	NWP17	EMID1
Escherichia coli, Strain MS 145-7	NWP33	APOO
Staphylococcus aureus, Strain CM05	NWP83	EDAR
Staphylococcus warneri D11	warneriD12	FGF1
Staphylococcus epidermidis F6	EpiF6	CCL18
Collinsella sp., Strain 4_8_47FAA	NWP198	PIANP
Staphylococcus pasteurii E5	pasteuriiE5	SERPINA11
Staphylococcus saprophyticus E8	saprophyticusE8	FGFR1
Prevotella bivia, Strain GED7760C	NWP233	CXCL9
Sporosarcina sp., Strain 2681	NWP29	CSAG1
Propionibacterium acnes, Strain HL002PA3	NWP219	CST6
Staphylococcus warneri C2	warneriC2	C17orf67
Propionibacterium acnes, Strain HL046PA2	NWP266	UNQ9165/PRO28630
Bacteroides stercoris, Strain CC31F	NWP270	NRN1
Dorea formicigenerans, Strain AAB36	AB36	KAL1
Escherichia coli, Strain MS 69-1	NWP39	FAM19A2
Clostridium orbiscindens, Strain CC43_001K	NWP259	ADCY5
Klebsiella pneumoniae subsp. pneumoniae, Strain WGLW3	NWP54	AVP
Fusobacterium sp., Strain CM21	NWP152	MUCL3
Streptococcus sp., Strain ACS2	NWP115	APOO
Klebsiella pneumoniae subsp. pneumoniae, Strain WGLW5	NWP55	TACSTD2
Streptococcus intermedius, Strain F0413	NWP128	MUCL3
Plesiomonas sp., Strain HPP0020	NWP62	ADAMTS16

Rhodococcus erythropolis, Strain SK121	NWP95	FAM19A3
Clostridium cadaveris, Strain CC40_001C	NWP246	MINPP1
Escherichia coli, Strain MS 200-1	NWP41	CONA1_Epitope-1
Fusobacterium sp., Strain CM22	NWP167	SDF4
Fusobacterium periodonticum, Strain 1_A_54/D10	NWP142	ENDOU
Klebsiella oxytoca, Strain MIT 09-7231	NWP45	PTGDS
Prevotella sp., Oral Taxon 472, Strain F0295	NWP191	XG
Streptococcus sanguinis, Strain VMC66	NWP135	C1QL3
Escherichia coli, Strain MS 145-7	NWP33	TMEM149
Propionibacterium acnes, Strain HL043PA2	NWP264	SLC22A31
Lactobacillus crispatus, Strain GED7749C	NWP104	AGER
Klebsiella sp., Strain 4_1_44FAA	NWP21	IFNA17
Lactobacillus jensenii, Strain 269-3	NWP110	TMEM59L
Streptococcus mitis, Strain F0392	NWP26	RTBDN
Staphylococcus warneri F1	warneriF1	SSBP3-AS1
Streptococcus sobrinus, Strain W1703	NWP85	PEBP4
Plesiomonas sp., Strain HPP0020	NWP62	CHRD12
Enterococcus faecium, Strain E417	NWP79	ASIP
Escherichia coli, Strain MS 115-1	NWP36	NTRK1
Streptococcus sp., Strain CM7	NWP133	LOC644613
Streptococcus cristatus, Strain F0329	NWP126	TMEM119
Escherichia coli, Strain MS 115-1	NWP36	CONA1_Epitope-1
Streptococcus sp., Strain ACC21	NWP134	CTRB1
Klebsiella oxytoca, Strain MIT 10-5246	NWP50	PTGDS
Megasphaera sp., Strain DNF00872	NWP295	PDIA6
Lachnospiraceae bacterium, Strain AAB26	AB26	CC50C_Epitope-1
Klebsiella sp., Strain 1_1_55	NWP03	DQA2_Epitope-1
Propionibacterium acnes, Strain HL027PA2	NWP218	SPINK14
Lactobacillus jensenii, Strain EX849587VC03	NWP108	GPR17
Fusobacterium sp., Oral Taxon 370, Strain F0437	NWP143	TUSC5
Veillonella sp., Oral Taxon 780, Strain F0422	NWP268	NGFR
Escherichia coli, Strain MS 85-1	NWP30	LECT2
Capnocytophaga sputigena, Strain CC21_001D	NWP163	AMY2A
Streptococcus sp., Strain AS20	NWP116	CHRD12
Oscillibacter sp., Strain KLE-1728	NWP269	CCL18
Blautia sp., Strain KLE 1732	NWP292	PLA2G2E
Fusobacterium sp., Oral Taxon 370, Strain F0437	NWP143	TREML1
Escherichia coli, Strain MS 145-7	NWP33	DNASE1L2
Staphylococcus hominis, Strain SK119	NWP10	TMEM119
Corynebacterium sp., Strain CMW7794	NWP98	RCN1
Catabacter hongkongensis, Strain AB8_9	NWP299	PRR27
Staphylococcus warneri E4	warneriE4	ECE1
Corynebacterium sp., Strain CMW7794	NWP98	DEFB130A
Propionibacterium acnes, Strain HL020PA1	NWP221	PDCD1
Staphylococcus capitis C4	capitisC4	DEFB130A
Allobaculum sp., Strain NWP324	Ery128	SLC2A2
Streptococcus mitis, Strain F0392	NWP26	SEMG2
Streptococcus sp., Strain SR1	NWP122	LOC644613
Propionibacterium acnes, Strain HL005PA1	NWP224	PDCD1
Staphylococcus capitis C4	capitisC4	LECT2
Fusobacterium periodonticum, Strain 2_1_31	NWP160	PTGDS
Streptococcus anginosus, Strain F0211	NWP125	FAM19A2
Staphylococcus pasteurii G7	pasteuriiG7	TNMD
Prevotella buccae, Strain D17	NWP256	SLC22A14
Prevotella bivia, Strain DNF00188	NWP193	CXCL9
Streptococcus anginosus, Strain F0211	NWP125	CSAG1
Rothia mucilaginosa, Strain CC87LB	NWP84	NETO1
Staphylococcus warneri D11	warneriD12	CLEC18A
Enterococcus faecium, Strain ERV165	NWP81	CONA1_Epitope-1
Corynebacterium sp., Strain CMW7794	NWP98	NPPA
Staphylococcus xylosus F2	xylosusF2	CCL2
Staphylococcus epidermidis C3	EpiC3	C2orf40
Bacteroides stercoris, Strain CC31F	NWP270	IFNA6
Staphylococcus haemolyticus G9	haemolyticusG9	SLC8B1
Klebsiella oxytoca, Strain MIT 10-5249	NWP52	GP6
Escherichia coli, Strain MS 16-3	NWP37	TMEM119

Staphylococcus gallinarum E9	gallinarumE9	FAM3C
Staphylococcus pasteurii F11	pasteuriiF11	TNMD
Staphylococcus pasteurii G3	pasteuriiG3	CDSN
Escherichia coli, Strain MS 115-1	NWP36	SEMG2
Escherichia coli, Strain MS 57-2	NWP34	SDC3
Clostridiales bacterium, Strain 4_1_37FAA	NWP285	PDIA6
Staphylococcus warneri D9	warneriD9	CTRB2
Corynebacterium amycolatum, Strain SK46	NWP07	PROK1
Streptococcus salivarius, Strain SK126	NWP118	CTRB1
Enterococcus faecalis, Strain TUSoD Ef11	NWP05	LOC6444613
Propionibacterium acnes, Strain HL002PA2	NWP214	SLC22A31
Fusobacterium sp., Strain CM22	NWP167	LCN2
Megasphaera micronuciformis, Strain DNF00954	NWP307	PLA2G2E
Fusobacterium nucleatum, Strain CTI-03	NWP187	LOC6444613
Enterococcus faecalis, Strain TX2137	NWP117	INSL4
Staphylococcus capitis E12	capitisE12	SSBP3-A51
Streptococcus gallolyticus subsp. gallolyticus, Strain TX20005	NWP27	IGSF4B
Klebsiella pneumoniae subsp. pneumoniae, Strain WGLW2	NWP57	AVP
Escherichia coli, Strain MS 110-3	NWP35	TRPM5
Staphylococcus warneri B9	warneriB9	EPHB3
Streptococcus gallolyticus subsp. gallolyticus, Strain TX20005	NWP27	SLC8B1
Klebsiella oxytoca, Strain MIT 10-5249	NWP52	C5orf64
Escherichia coli, Strain MS 85-1	NWP30	RCN1
Staphylococcus epidermidis, Strain NIH04008	NWP77	CCL17
Enterococcus faecium, Strain TX1330	NWP19	LECT2
Lactobacillus crispatus, Strain JV-V01	NWP107	GPR25
Staphylococcus capitis A7	capitisA7	AT134_Epitope-2
Propionibacterium acnes, Strain HL001PA1	NWP203	SDC1
Escherichia coli, Strain MS 110-3	NWP35	SEMG2
Lactobacillus crispatus, Strain JV-V01	NWP107	MANF
Escherichia coli, Strain 83972	NWP04	AGRP
Bifidobacterium angulatum, Strain F16_22	NWP291	EPHA5
Propionibacterium acnes, Strain HL036PA2	NWP227	TMEM59L
Erysipelotrichaceae sp., Strain 6_1_45	NWP181	CONA1_Epitope-1
Dorea formicigenerans, Strain AAB36	AB36	CTRB2
Proteus mirabilis, Strain WGLW6	NWP59	TTYH1_Epitope-3
Propionibacterium acnes, Strain HL037PA2	NWP205	DAG1
Bacteroides fragilis, Strain 3_1_12	NWP271	LRFN1
Corynebacterium sp., Strain HFH0082	NWP61	CSAG1
Streptococcus sp., Strain OBRC6	NWP124	UNQ6190/PRO20217
Staphylococcus pasteurii E5	pasteuriiE5	FAT2
Propionibacterium acnes, Strain HL060PA1	NWP239	GYPA
Klebsiella oxytoca, Strain MIT 09-7231	NWP45	SCN1A_Epitope-3
Lactobacillus jensenii, Strain 269-3	NWP110	TNFRSF4
Allobaculum sp., Strain NWP324	Ery128	SLC6A13
Fusobacterium sp., Strain CM22	NWP167	RCN1
Klebsiella oxytoca, Strain MIT 10-5243	NWP47	CHGA
Fusobacterium periodonticum, Strain 2_1_31	NWP160	KCNK1
Staphylococcus capitis , Strain SK14	NWP09	GPR151
Enterococcus faecium, Strain ERV165	NWP81	IGFBP5
Klebsiella oxytoca, Strain MIT 10-5246	NWP50	FAM174A
Streptococcus vestibularis, Strain F0396	NWP132	PIANP
Staphylococcus capitis A7	capitisA7	PSG4
Enterococcus faecium, Strain TX0133a04	NWP44	PROK1
Megasphaera sp., Strain DNF00872	NWP295	TNFSF9
Dermabacter sp., Strain HFH0086	NWP92	SLC22A31
Prevotella buccae, Strain D17	NWP256	PF4V1
Propionibacterium acnes, Strain HL060PA1	NWP239	CXCR7
Bacillus sp., Strain DNF00233	NWP90	C2orf40
Staphylococcus epidermidis, Strain NIHLM040	NWP76	SMR3A
Enterococcus faecium, Strain TX1330	NWP19	KLK10
Rothia aeria, Oral Taxon 188, Strain F0474	NWP64	TRABD2B
Bacteroidales bacterium, Strain KA00344	NWP302	CD14
Staphylococcus warneri , Strain SK66	NWP11	CAC1I_Epitope-12
Dorea formicigenerans, Strain AAB36	AB36	CCL13
Enterococcus faecium, Strain E417	NWP79	LYVE1

Staphylococcus warneri A8	warneriA8	SLC8B1
Lactobacillus crispatus, Strain JV-V01	NWP107	RLN2
Streptococcus anginosus, Strain F0211	NWP125	SHISA6
Bacillus sp., Strain DNF00233	NWP90	SPINK9
Staphylococcus epidermidis, Strain NIHLM040	NWP76	CLU
Escherichia coli, Strain MS 16-3	NWP37	PRR27
Fusobacterium nucleatum, Strain CTI-02	NWP186	FGFRL1
Streptococcus salivarius, Strain SK126	NWP118	TMEM119
Staphylococcus capitis A5	capitisA5	LOC644613
Peptoniphilus lacrimalis, Strain UPII 315-B	NWP261	SLC8B1
Eggerthella sp., Strain MVA1	NWP185	DEFB130B
Corynebacterium sp., Strain HFH0082	NWP61	C2orf66
Erysipelotrichaceae sp., Strain 6_1_45	NWP174	PRR27
Deinococcus grandis, Strain SK125	NWP89	NPPC
Erysipelotrichaceae sp., Strain 6_1_45	NWP181	CSAG1
Klebsiella sp., Strain 4_1_44FAA	NWP21	DEFA6
Propionibacterium acnes, Strain HL053PA1	NWP260	CNGB3_Epitope-3
Erysipelotrichaceae sp., Strain 6_1_45	NWP174	DEFB130A
Staphylococcus cohnii G11	cohniiG11	SO1C1_Epitope-5
Staphylococcus capitis C12	capitisC12	FAM19A3
Fusobacterium nucleatum subsp. animalis, Strain D11	NWP141	PF4V1
Staphylococcus epidermidis F6	EpiF6	ADAMTS16
Streptococcus mitis, Strain F0392	NWP26	CSAG1
Bifidobacterium longum subsp. longum, Strain 44B	NWP308	PRR27
Fusobacterium nucleatum, Strain CTI-03	NWP187	IGFBP5
Hungatella hathewayi, Strain WAL-18680	NWP231	TFF1
Peptoniphilus lacrimalis, Strain DNF00528	NWP304	CD14
Sporosarcina sp., Strain 2681	NWP29	ASIP
Klebsiella sp., Strain 1_1_55	NWP03	PPY
Erysipelotrichaceae sp., Strain 6_1_45	NWP181	KLK10
Proteus mirabilis, Strain WGLW6	NWP59	IFNGR1
Fusobacterium sp., Strain CM21	NWP152	CTRB1
Lactobacillus gasseri, Strain JV-V03	NWP106	ASIP
Corynebacterium sp., Strain HFH0082	NWP61	RCN1
Staphylococcus epidermidis H4	EpiH4	LOC644613
Propionibacterium acnes, Strain HL030PA2	NWP207	CNGB3_Epitope-3
Micrococcus luteus, Strain SK58	NWP08	MUCL3
Streptococcus gallolyticus subsp. gallolyticus, Strain TX20005	NWP27	MYPR_Epitope-2
Lactobacillus jensenii, Strain EX849587VC06	NWP109	CSN3
Klebsiella oxytoca, Strain MIT 10-5243	NWP47	DQA2_Epitope-1
Fusobacterium nucleatum subsp. animalis, Oral Taxon 420, Strain F0419	NWP196	DEFB115
Streptococcus parasanguinis, Strain F0449	NWP114	RTBDN
Eubacterium infirmum, Strain F0142	NWP223	TXNDC12
Weissella cibaria, Strain F16_1	NWP101	CTRB1
Staphylococcus capitis A7	capitisA7	F3
Plesiomonas sp., Strain HPP0020	NWP62	SEMG1
Propionibacterium acnes, Strain HL005PA1	NWP224	SLC22A31
Lactobacillus jensenii, Strain EX849587VC06	NWP109	NPPC
Staphylococcus warneri, Strain SK66	NWP11	CONA1_Epitope-1
Klebsiella pneumoniae subsp. pneumoniae, Strain WGLW3	NWP54	DEFB130B
Micrococcus luteus, Strain SK58	NWP08	PF4V1
Ruminococcus gnavus, Strain NWP326	RG109	SPINK9
Propionibacterium acnes, Strain HL013PA2	NWP217	LAYN
Escherichia coli, Strain MS 16-3	NWP37	DEFB130A
Propionibacterium acnes, Strain HL002PA3	NWP219	PDCD1
Streptococcus salivarius, Strain SK126	NWP118	TFF3
Propionibacterium acnes, Strain HL030PA1	NWP212	TMEM119
Fusobacterium sp., Strain CM22	NWP167	EDDM3B
Peptoniphilus sp., Oral Taxon 836, Strain F0141	NWP313	PGLYRP1
Escherichia coli, Strain 83972	NWP04	DEFB130A
Staphylococcus capitis C11	capitisC11	P4HB
Staphylococcus aureus, Strain TCH70	NWP12	EDAR
Enterococcus faecium, Strain E417	NWP79	DEFB130B
Bacillus sp., Strain DNF00233	NWP90	DEFB130A
Staphylococcus capitis A7	capitisA7	OR1L1_Epitope-1
Lactobacillus gasseri, Strain EX33690VC16	NWP113	AGER

Proteus mirabilis, Strain WGLW6	NWP59	MCFD2
Streptococcus sp., Strain SR1	NWP122	BTC
Streptococcus sobrinus, Strain W1703	NWP85	GPR17
Staphylococcus hominis B3	hominisB3	CCL17
Bifidobacterium breve, Strain EX336960VC19	NWP202	CD300C
Proteus mirabilis, Strain WGLW4	NWP58	OPN4
Collinsella sp., Strain 4_8_47FAA	NWP198	CSAG1
Klebsiella pneumoniae subsp. pneumoniae, Strain WGLW5	NWP55	VSTM2B
Streptococcus gallolyticus subsp. gallolyticus, Strain TX20005	NWP27	CHGA
Bacteroides stercoris, Strain CC31F	NWP270	BST2
Escherichia sp., Strain 3_2_53FAA	NWP02	ANO8_Epitope-1
Staphylococcus capitis A7	capitisA7	GPHB5
Enterococcus faecalis, Strain TX2137	NWP117	FAM3A
Prevotella histicola, Strain F0411	NWP144	TMCO3
Propionibacterium acnes, Strain HL002PA3	NWP219	SLC22A31
Staphylococcus hominis, Strain SK119	NWP10	NAPSA
Staphylococcus aureus, Strain CM05	NWP83	C4orf48
Enterococcus faecium, Strain ERV99	NWP82	PDGFB
Staphylococcus haemolyticus, Strain DNF00585	NWP87	CCL2
Fusobacterium sp., Strain CM22	NWP167	SRGN
Fusobacterium nucleatum, Strain CTI-03	NWP187	NPPC
Propionibacterium acnes, Strain HL036PA2	NWP227	TGFA
Enterococcus faecium, Strain ERV102	NWP80	CCL17
Propionibacterium acnes, Strain HL002PA2	NWP214	PDCD1
Propionibacterium acnes, Strain HL020PA1	NWP221	CNGB3_Epitope-3
Veillonella sp., Oral Taxon 780, Strain F0422	NWP268	PDGFB
Propionibacterium acnes, Strain HL038PA1	NWP235	CS6
Shigella sp., Strain D9	NWP06	TACSTD2
Klebsiella oxytoca, Strain MIT 10-5249	NWP52	CXCR5
Oscillibacter sp., Strain KLE 1745	NWP252	NGFR
Streptococcus sp., Strain SR1	NWP122	SHISA6
Propionibacterium acnes, Strain HL036PA1	NWP226	UNQ9165/PRO28630
Staphylococcus hominis B3	hominisB3	CTRB1
Escherichia coli, Strain MS 85-1	NWP30	DRAXIN
Streptococcus gallolyticus subsp. gallolyticus, Strain TX20005	NWP27	SHISA2
Escherichia coli, Strain MS 145-7	NWP33	TMEM119
Staphylococcus warneri D11	warneriD11	C1orf134
Fusobacterium nucleatum, Strain CTI-05	NWP188	MUC7
Lactobacillus jensenii, Strain 269-3	NWP110	FCGR3B
Escherichia coli, Strain MS 119-7	NWP31	DEFA6
Enterococcus faecalis, Strain R712	NWP120	TACSTD2
Bacteroides sp., Strain 4_1_36	NWP312	PLA2G2E
Clostridium orbiscindens, Strain CC43_001K	NWP259	CFP
Staphylococcus epidermidis, Strain NIHLM031	NWP73	TMEM119
Staphylococcus epidermidis, Strain NIHLM040	NWP76	CLCC1
Escherichia coli, Strain MS 16-3	NWP37	NPPC
Klebsiella oxytoca, Strain MIT 10-5245	NWP49	AVP
Peptoniphilus sp., Oral Taxon 836, Strain F0141	NWP313	PLA2G2E
Staphylococcus pasteurii G7	pasteuriiG7	SERPINA11
Fusobacterium nucleatum, Strain CTI-05	NWP188	NPPC
Corynebacterium sp., Strain HFH0082	NWP61	PROK1
Eggerthella sp., Strain MVA1	NWP185	SEMG1
Prevotella denticola, Strain DNF00960	NWP179	LOC644613
Fusobacterium sp., Strain CM21	NWP152	EPHA5
Enterococcus faecium, Strain TX1330	NWP19	CSAG1
Lactobacillus jensenii, Strain 208-1	NWP111	PF4V1
Enterococcus faecium, Strain ERV102	NWP80	DEFB130A
Streptococcus sp., Strain BS29a	NWP129	SHISA6
Streptococcus downei, Oral Taxon 594, Strain F0415	NWP123	FAM19A5
Staphylococcus warneri B9	warneriB9	FAM174A
Staphylococcus warneri E4	warneriE4	CSF2RA
Staphylococcus epidermidis, Strain NIH04008	NWP77	CTSL
Lactobacillus jensenii, Strain 269-3	NWP110	CSPG5
Bacteroides sp., Strain 1_1_30	NWP272	CHGA
Klebsiella oxytoca, Strain MIT 10-5243	NWP47	VSTM2B
Bacteroides stercoris, Strain CC31F	NWP270	KCNK4_Epitope-1

Erysipelotrichaceae sp., Strain 6_1_45	NWP174	CCL22
Fusobacterium sp., Oral Taxon 370, Strain F0437	NWP143	P2RY13
Prevotella denticola, Strain DNF00960	NWP179	IER3
Bacillus sp., Strain DNF00233	NWP90	TMEM204
Streptococcus sp., Strain AS20	NWP116	DEFB130A
Fusobacterium sp., Strain CM21	NWP166	MUC7
Staphylococcus epidermidis H4	EpiH4	CCL2
Klebsiella oxytoca, Strain MIT 09-7231	NWP45	TMEM9B
Klebsiella pneumoniae subsp. pneumoniae, Strain WGLW1	NWP56	DEFB130B
Proteus mirabilis, Strain WGLW6	NWP59	CD248
Bacteroides sp., Strain 9_1_42FAA	NWP274	NPDC1
Staphylococcus epidermidis, Strain NIHLM001	NWP66	SHISA6
Staphylococcus warneri, Strain SK66	NWP11	TRPV1
Proteus mirabilis, Strain WGLW4	NWP58	KCNK4_Epitope-1
Arthrobacter albus, Strain DNF00011	NWP86	FAM174A
Escherichia coli, Strain MS 85-1	NWP30	PRND
Streptococcus sp., Strain ACS2	NWP115	NPDC1
Staphylococcus warneri, Strain SK66	NWP11	MMP24
Escherichia coli, Strain MS 85-1	NWP30	C4A
Streptococcus salivarius, Strain SK126	NWP118	FAM19A5
Klebsiella sp., Strain MS 92-3	NWP40	AVP
Lactobacillus crispatus, Strain JV-V01	NWP107	SGCA
Lachnospiraceae bacterium, Strain AAB19	AB19	AMELX
Klebsiella pneumoniae subsp. pneumoniae, Strain WGLW1	NWP56	PIANP
Staphylococcus warneri, Strain SK66	NWP11	PTPRG
Escherichia coli, Strain MS 196-1	NWP42	TMEM119
Streptococcus anginosus, Strain F0211	NWP125	PIANP
Streptococcus salivarius, Strain SK126	NWP118	SHISA6
Fusobacterium nucleatum subsp. animalis, Oral Taxon 420, Strain F0419	NWP196	CLU
Escherichia coli, Strain MS 200-1	NWP41	DRAXIN
Weissella cibaria, Strain F16_1	NWP101	CSAG1
Klebsiella pneumoniae subsp. pneumoniae, Strain WGLW3	NWP54	PLA2G2E
Bacillus sp., Strain DNF00233	NWP90	RARRES2
Citrobacter sp., Strain 30_2	NWP01	INSL4
Staphylococcus warneri D11	warneriD12	MTNR1B
Streptococcus downei, Oral Taxon 594, Strain F0415	NWP123	SOSTDC1
Enterococcus faecium, Strain E417	NWP79	PLA2G2E
Streptococcus sp., Strain AS20	NWP116	SEMG2
Streptococcus sobrinus, Strain W1703	NWP85	ASIP
Fusobacterium sp., Oral Taxon 370, Strain F0437	NWP143	MCAM
Pseudomonas sp., Strain HPB0071	NWP65	NCKX4_Epitope-1
Streptococcus sp., Strain C150	NWP121	ASIP
Staphylococcus capitis A7	capitisA7	C1orf134
Propionibacterium acnes, Strain HL005PA1	NWP224	CST6
Escherichia coli, Strain MS 115-1	NWP36	MUCL3
Propionibacterium acnes, Strain HL060PA1	NWP239	ITPR2_Epitope-3
Staphylococcus capitis D5	capitisD5	SGCA
Propionibacterium acnes, Strain HL013PA1	NWP209	SLC6A13
Propionibacterium acnes, Strain HL027PA1	NWP211	OPRK1
Plesiomonas sp., Strain HPP0020	NWP62	IGFBP5
Streptococcus sp., Strain SR1	NWP122	DRAXIN
Bacteroides salyersiae, Strain CL02T12C01	NWP276	AVP
Citrobacter freundii, Strain 4_7_47CFAA	NWP28	FGFR11
Enterococcus faecalis, Strain TX2137	NWP117	TACSTD2
Bacillus sp., Strain DNF00233	NWP90	GPR15L
Weissella cibaria, Strain F16_1	NWP101	PIANP
Fusobacterium nucleatum, Strain CTI-03	NWP187	PDIA6
Prevotella bivia, Strain DNF00650	NWP176	FGF17
Escherichia coli, Strain MS 110-3	NWP35	DRAXIN
Propionibacterium acnes, Strain HL030PA1	NWP212	OPRK1
Propionibacterium acnes, Strain HL044PA1	NWP237	OPRK1
Veillonella sp., Oral Taxon 780, Strain F0422	NWP268	P4HB
Bacteroides sp., Strain AAB9	AB9	EPHB2
Propionibacterium acnes, Strain HL043PA2	NWP264	PDCD1
Escherichia coli, Strain MS 115-1	NWP36	C4A
Bacteroides sp., Strain AAB9	AB9	PTPRJ

Propionibacterium acnes, Strain HL036PA1	NWP226	PDCD1
Streptococcus mitis, Strain F0392	NWP26	FAM19A2
Streptococcus salivarius, Strain SK126	NWP118	BTC
Staphylococcus epidermidis, Strain E13A	NWP63	HGFAC
Propionibacterium acnes, Strain HL044PA1	NWP237	TMEM119
Staphylococcus pasteurii E5	pasteuriiE5	TMEFF2
Erysipelotrichaceae sp., Strain 6_1_45	NWP181	AGRP
Enterococcus faecalis, Strain S613	NWP119	SCNAA_Epitope-3
Staphylococcus warneri, Strain SK66	NWP11	SL9A1_Epitope-1
Klebsiella oxytoca, Strain MIT 10-5250	NWP53	AVP
Staphylococcus capitis A7	capitisA7	CSMT1_Epitope-1
Escherichia coli, Strain MS 145-7	NWP33	QRFp
Streptococcus sp., Strain AS20	NWP116	SEMG1
Staphylococcus pasteurii G3	pasteuriiG3	CSPG5
Streptococcus sp., Strain SR1	NWP122	AGER
Eubacterium sp., Strain 3_1_31	NWP182	FGF17
Staphylococcus saprophyticus F6	saprophyticusF6	FAM3C
Klebsiella oxytoca, Strain MIT 09-7231	NWP45	COL26A1
Staphylococcus pasteurii E5	pasteuriiE5	TNFRSF21
Propionibacterium acnes, Strain HL036PA3	NWP222	SLC22A31
Lactobacillus jensenii, Strain EX849587VC03	NWP108	TFF1
Escherichia coli, Strain MS 69-1	NWP39	TMEM204
Staphylococcus aureus, Strain TCH70	NWP12	SO1B7_Epitope-5
Enterococcus faecium, Strain TX0133a04	NWP44	FGF17
Oscillibacter sp., Strain KLE-1728	NWP269	GPR25
Staphylococcus capitis B12	capitisB12	BMPR1B
Escherichia coli, Strain MS 57-2	NWP34	MCAM
Rothia mucilaginosa, Strain CC87LB	NWP84	CTRB1
Staphylococcus capitis A7	capitisA7	TMPRSS11D
Lactobacillus crispatus, Strain JV-V01	NWP107	SHISA2
Streptococcus sp., Strain AS20	NWP116	CCL18
Staphylococcus epidermidis G4	EpiG4	MUCL3
Staphylococcus capitis B8	capitisB8	CCL18
Enterococcus faecium, Strain TX1330	NWP19	RCN1
Streptococcus salivarius, Strain SK126	NWP118	CSAG1
Plesiomonas sp., Strain HPP0020	NWP62	APLP1
Allobaculum sp., Strain NWP324	Ery128	NPY4R
Eggerthella sp., Strain MVA1	NWP185	GNLY
Clostridium sp., Strain MSTE9	NWP253	DRAXIN
Escherichia coli, Strain MS 57-2	NWP34	TMEM119
Propionibacterium acnes, Strain HL060PA1	NWP239	C5orf64
Deinococcus grandis, Strain SK125	NWP89	LOC644613
Bifidobacterium sp., Strain MSTE12	NWP242	IFNA17
Blautia sp., Strain AAB30	AB30	LOC644613
Bacteroides stercoris, Strain CC31F	NWP270	RBP4
Proteus mirabilis, Strain WGLW6	NWP59	C6orf120
Propionibacterium acnes, Strain HL001PA1	NWP203	S12A6_Epitope-3
Escherichia coli, Strain MS 57-2	NWP34	ALPP
Lachnospiraceae bacterium, Strain AAB19	AB19	AGRP
Escherichia sp., Strain 3_2_53FAA	NWP02	NPPC
Clostridiales bacterium, Strain 4_1_37FAA	NWP285	PDIA2
Selenomonas noxia, Strain F0398	NWP213	PRR27
Corynebacterium amycolatum, Strain SK46	NWP07	CONA1_Epitope-1
Ruminococcus gnavus, Strain NWP325	RG74	PDIA6
Citrobacter sp., Strain 30_2	NWP01	BTC
Propionibacterium acnes, Strain HL050PA3	NWP249	SPINT3
Micrococcus luteus, Strain SK58	NWP08	DMKN
Corynebacterium amycolatum, Strain SK46	NWP07	RCN1
Arthrobacter albus, Strain DNF00011	NWP86	CRLF1
Blautia sp., Strain AAB30	AB30	CSN3
Streptococcus salivarius, Strain SK126	NWP118	SYCN
Proteus mirabilis, Strain WGLW4	NWP58	ZACN
Prevotella histicola, Strain F0411	NWP144	PDIA3
Propionibacterium acnes, Strain HL037PA1	NWP208	GPR37
Eggerthella sp., Strain MVA1	NWP185	DEFB130A
Corynebacterium sp., Strain HFH0082	NWP61	SEMA6C

Propionibacterium sp., Strain 5_U_42AFAA	NWP300	SLC22A31
Megasphaera micronuciformis, Strain DNF00954	NWP307	FAM19A3
Veillonella sp., Oral Taxon 780, Strain F0422	NWP268	CXCR4
Bifidobacterium longum subsp. longum, Strain 44B	NWP308	NPPC
Streptococcus gallolyticus subsp. gallolyticus, Strain TX20005	NWP27	LGALS7
Acidaminococcus sp., Strain HPA0509	NWP175	DEFB130B
Klebsiella sp., Strain MS 92-3	NWP40	DEFA6
Staphylococcus warneri D9	warneriD9	LOC644613
Staphylococcus warneri B9	warneriB9	SPACA6P
Fusobacterium sp., Strain CM22	NWP167	EPHA4
Escherichia coli, Strain MS 200-1	NWP41	COL10A1
Fusobacterium nucleatum, Strain CTI-06	NWP189	CTRB1
Escherichia coli, Strain 83972	NWP04	FAM19A2
Proteus mirabilis, Strain WGLW6	NWP59	SO1A2_Epitope-5
Klebsiella oxytoca, Strain MIT 10-5249	NWP52	TMEM149
Prevotella timonensis, Strain CRIS 5C-B1	NWP156	P4HB
Bacteroides sp., Strain D2	NWP192	NPPC
Propionibacterium acnes, Strain HL005PA2	NWP215	SLC22A31
Lactobacillus gasseri, Strain JV-V03	NWP106	CCL17
Citrobacter sp., Strain 30_2	NWP01	PGF
Streptococcus sobrinus, Strain W1703	NWP85	FGFRL1
Lactobacillus jensenii, Strain EX849587VC03	NWP108	CAC1I_Epitope-9
Propionibacterium acnes, Strain HL036PA3	NWP222	PDCD1
Citrobacter sp., Strain 30_2	NWP01	DKK1
Bacteroides sp., Strain 1_1_30	NWP272	PF4V1
Blautia sp., Strain AAB30	AB30	AGRP
Peptoniphilus sp., Strain CMW7756A	NWP162	AMY2A
Lactobacillus gasseri, Strain EX33690VC16	NWP113	TFF2
Sporosarcina sp., Strain 2681	NWP29	RARRES2
Propionibacterium acnes, Strain HL005PA2	NWP215	TGFA
Erysipelotrichaceae sp., Strain 6_1_45	NWP174	RARRES2
Bacillus sp., Strain DNF00233	NWP90	FAM19A3
Staphylococcus epidermidis F6	EpiF6	FAM19A3
Propionibacterium acnes, Strain HL037PA2	NWP205	GNRH2
Staphylococcus capitis B8	capitisB8	KLK10
Corynebacterium sp., Strain CMW7794	NWP98	DEFB115
Staphylococcus epidermidis, Strain NIHLM001	NWP66	PF4V1
Collinsella sp., Strain 4_8_47FAA	NWP198	PLA2G2E
Coprococcus sp., Strain AAb34	AB34	FAM19A2
Propionibacterium acnes, Strain HL005PA4	NWP220	C3AR_Epitope-3
Escherichia coli, Strain MS 145-7	NWP33	NAPSA
Escherichia coli, Strain 83972	NWP04	MUCL3
Staphylococcus warneri , Strain SK66	NWP11	MFAP3
Prevotella bivia, Strain DNF00650	NWP176	MANF
Streptococcus parasanguinis, Strain F0449	NWP114	ICAM3
Proteus mirabilis, Strain WGLW6	NWP59	SCGB2A2
Staphylococcus capitis C4	capitisC4	CCL18
Escherichia sp., Strain 3_2_53FAA	NWP02	ZACN
Collinsella sp., Strain 4_8_47FAA	NWP198	FGF17
Staphylococcus epidermidis D4	EpiD4	RNASE8
Erysipelotrichaceae sp., Strain 6_1_45	NWP174	MUC7
Coprococcus sp., Strain AAb34	AB34	PRR27
Escherichia sp., Strain 3_2_53FAA	NWP02	PRR27
Staphylococcus saprophyticus D10	saprophyticusD10	PIP
Escherichia coli, Strain MS 85-1	NWP30	CFD
Proteus mirabilis, Strain WGLW6	NWP59	PRRG1
Klebsiella oxytoca, Strain MIT 10-5242	NWP46	TACSTD2
Lactobacillus gasseri, Strain SV-16A-US	NWP102	GNLY
Lactobacillus gasseri, Strain 224-1	NWP112	DRAXIN
Escherichia coli, Strain MS 21-1	NWP38	KDEL1
Ruminococcus gnavus, Strain NWP326	RG109	CCL5
Bifidobacterium breve, Strain JCP7499	NWP310	IGFBP6
Escherichia coli, Strain MS 145-7	NWP33	S4A4_Epitope-3
Staphylococcus warneri E4	warneriE4	OLR1
Klebsiella pneumoniae subsp. pneumoniae, Strain WGLW5	NWP55	CHGA
Enterococcus faecalis, Strain TX2137	NWP117	SHISA2

Dorea formicigenerans, Strain AAB36	AB36	FAM19A2
Peptoniphilus lacrimalis, Strain UPII 315-B	NWP261	TMEM119
Citrobacter freundii, Strain 4_7_47CFAA	NWP28	LOC644613
Bacteroides sp., Strain D2	NWP192	SMR3A
Klebsiella sp., Strain 4_1_44FAA	NWP21	CHGA
Bacteroides sp., Strain 9_1_42FAA	NWP274	ACKR2
Staphylococcus haemolyticus B5	haemolyticusB5	KCNK4_Epitope-1
Fusobacterium sp., Strain CM22	NWP153	GRM3
Staphylococcus haemolyticus G2	haemolyticusG2	KCNK4_Epitope-1
Prevotella bivia, Strain DNF00650	NWP176	MUCL3
Plesiomonas sp., Strain HPP0020	NWP62	CONA1_Epitope-1
Staphylococcus hominis B3	hominisB3	CXCL9
Klebsiella sp., Strain MS 92-3	NWP40	SLC22A5
Fusobacterium periodonticum, Strain 2_1_31	NWP160	CLU
Streptococcus sp., Strain C150	NWP121	SFRP4
Eubacterium infirmum, Strain F0142	NWP223	MFSD2A
Staphylococcus warneri D11	warneriD12	KCNMB2
Klebsiella oxytoca, Strain MIT 10-5246	NWP50	PPY
Clostridium difficile, Strain 050-P50-2011	NWP278	MFSD2A
Allobaculum sp., Strain NWP324	Ery128	GPRI1_Epitope-1
Proteus mirabilis, Strain WGLW6	NWP59	TGOLN2
Peptoniphilus lacrimalis, Strain UPII 315-B	NWP261	NKAI1_Epitope-2
Escherichia coli, Strain MS 69-1	NWP39	ADAMTS16
Bacteroides sp., Strain D2	NWP192	AGRP
Staphylococcus warneri F1	warneriF1	SHISA6
Streptococcus salivarius, Strain SK126	NWP118	LMBRD2
Propionibacterium acnes, Strain HL002PA1	NWP206	CNGB3_Epitope-3
Enterococcus faecium, Strain ERV165	NWP81	CCL17
Enterococcus faecium, Strain ERV102	NWP80	FGFRL1
Escherichia coli, Strain MS 69-1	NWP39	CONA1_Epitope-1
Enterococcus faecium, Strain TX1330	NWP19	TMEM204
Streptococcus sp., Strain OBR6	NWP124	ARSA
Staphylococcus capitis A7	capitisA7	FGF1
Prevotella timonensis, Strain CRIS 5C-B1	NWP156	NGFR
Streptococcus salivarius, Strain SK126	NWP118	FGFRL1
Streptococcus downei, Oral Taxon 594, Strain F0415	NWP123	SFRP4
Propionibacterium acnes, Strain HL036PA2	NWP227	PDCD1
Proteus mirabilis, Strain WGLW6	NWP59	RCN1
Bacteroides bacterium, Strain KA00344	NWP302	SHISA9
Citrobacter freundii, Strain 4_7_47CFAA	NWP88	SMOC2
Escherichia coli, Strain MS 16-3	NWP37	SEMG1
Prevotella bivia, Strain DNF00650	NWP176	CLU
Sporosarcina sp., Strain 2681	NWP29	TMEM204
Staphylococcus capitis A7	capitisA7	FGF21
Citrobacter freundii, Strain 4_7_47CFAA	NWP88	PTHLH
Staphylococcus aureus, Strain TCH70	NWP12	IL5_sc
Enterococcus faecium, Strain ERV102	NWP80	SMR3A
Lactobacillus parafarraginis, Strain F0439	NWP105	LYVE1
Staphylococcus haemolyticus G9	haemolyticusG9	KCNK1
Lactobacillus parafarraginis, Strain F0439	NWP105	FAM19A3
Klebsiella pneumoniae subsp. pneumoniae, Strain WGLW2	NWP57	NGFR
Lactobacillus jensenii, Strain EX849587VC06	NWP109	LGALS3
Streptococcus intermedius, Strain F0413	NWP128	CTRB2
Staphylococcus epidermidis, Strain NIHLM067	NWP68	AVP
Arthrobacter albus, Strain DNF00011	NWP86	RCN1
Clostridiales sp., Oral Taxon 876, Strain F0540	NWP280	SHISA2
Actinomyces neuii, Strain MJR8396A	NWP258	CGA
Lactobacillus jensenii, Strain 269-3	NWP110	CD14
Proteus mirabilis, Strain WGLW6	NWP59	REG1A
Escherichia coli, Strain MS 200-1	NWP41	PRR27
Staphylococcus capitis C12	capitisC12	COL10A1
Staphylococcus warneri F1	warneriF1	CSAG1
Staphylococcus epidermidis, Strain NIH04008	NWP77	FGFRL1
Escherichia coli, Strain MS 57-2	NWP34	DPP7
Staphylococcus aureus, Strain MN8	NWP17	CCL5
Bacteroides sp., Strain D2	NWP192	ADAMTS16

Propionibacterium acnes, Strain HL036PA1	NWP226	SPINK14
Eubacterium sp., Strain 3_1_31	NWP182	CTRB1
Fusobacterium sp., Oral Taxon 370, Strain F0437	NWP143	TMEM149
Propionibacterium acnes, Strain HL027PA1	NWP211	IGSF4B
Staphylococcus warneri D11	warneriD12	CSF2RA
Corynebacterium sp., Strain HFH0082	NWP61	TMEM204
Arthrobacter albus, Strain DNF00011	NWP86	SDC3
Staphylococcus haemolyticus B6	haemolyticusB6	KCNK4_Epitope-1
Escherichia coli, Strain MS 145-7	NWP33	DPP7
Propionibacterium acnes, Strain HL030PA1	NWP212	SYCN
Streptococcus cristatus, Strain F0329	NWP126	CTRB2
Klebsiella oxytoca, Strain MIT 10-5245	NWP49	SLC6A19
Staphylococcus capitis A7	capitisA7	OLR1
Staphylococcus epidermidis, Strain NIHLM008	NWP70	AVP
Escherichia coli, Strain MS 16-3	NWP37	CONA1_Epitope-1
Staphylococcus intermedius F7	intermediusF7	LOC644613
Fusobacterium nucleatum, Strain CTI-07	NWP190	COL10A1
Erysipelotrichaceae sp., Strain 6_1_45	NWP174	NPPA
Lactobacillus jensenii, Strain 269-3	NWP110	AXL
Staphylococcus aureus, Strain CM05	NWP83	SCN7A_Epitope-3
Klebsiella pneumoniae subsp. pneumoniae, Strain WGLW2	NWP57	TACSTD2
Escherichia coli, Strain MS 145-7	NWP33	SDC3
Rhodococcus erythropolis, Strain SK121	NWP95	LOC644613
Proteus mirabilis, Strain WGLW6	NWP59	ITPR3_Epitope-3
Streptococcus mitis, Strain F0392	NWP26	C4A
Prevotella sp., Oral Taxon 472, Strain F0295	NWP191	MUC20
Staphylococcus epidermidis, Strain NIHLM001	NWP66	S28A1_Epitope-6
Propionibacterium acnes, Strain HL036PA2	NWP227	ADM2
Streptococcus sp., Strain OBRC6	NWP124	SDF2L1
Propionibacterium acnes, Strain HL005PA1	NWP224	GPR37
Deinococcus grandis, Strain SK125	NWP89	LECT2
Fusobacterium sp., Strain CM21	NWP166	SMR3A
Eubacterium sp., Strain AS15	NWP254	TMEM8B
Staphylococcus epidermidis D4	EpiD4	MUCL3
Staphylococcus epidermidis, Strain NIHLM031	NWP73	CCL24
Staphylococcus warneri B9	warneriB9	IL21
Staphylococcus pasteurii G3	pasteuriiG3	TMEFF2
Staphylococcus epidermidis, Strain NIH04008	NWP77	FAM19A5
Streptococcus sp., Strain OBRC6	NWP124	PF4V1
Staphylococcus capitis A7	capitisA7	RTN4R
Escherichia coli, Strain MS 200-1	NWP41	AGRP
Bacteroides stercoris, Strain CC31F	NWP270	CHRD1
Prevotella bivia, Strain DNF00650	NWP176	DEFB130B
Fusobacterium nucleatum, Strain CTI-07	NWP190	PIANP
Enterococcus faecium, Strain ERV165	NWP81	RCN1
Plesiomonas sp., Strain HPP0020	NWP62	TNFSF9
Streptococcus cristatus, Strain F0329	NWP126	SLC8B1
Klebsiella sp., Strain 4_1_44FAA	NWP21	AVP
Streptococcus mitis, Strain F0392	NWP26	ADAMTS16
Clostridium orbiscindens, Strain 1_3_50AFAA	NWP137	SGCA
Staphylococcus capitis B8	capitisB8	MUC7
Klebsiella pneumoniae subsp. pneumoniae, Strain WGLW3	NWP54	GHRHR
Streptococcus intermedius, Strain F0413	NWP128	LPAL2
Staphylococcus saprophyticus E8	saprophyticusE8	CRELD1
Staphylococcus warneri D11	warneriD12	FAT2
Collinsella sp., Strain 4_8_47FAA	NWP198	CTRB1
Collinsella aerofaciens, Strain AAB3	AB3	MUC7
Staphylococcus saprophyticus D6	saprophyticusD6	TNFRSF21
Escherichia coli, Strain MS 85-1	NWP30	CCL23
Citrobacter freundii, Strain 4_7_47CFAA	NWP28	DKK1
Fusobacterium sp., Strain CM21	NWP152	FAM19A3
Lachnospiraceae bacterium, Strain AAB26	AB26	SCGB1D4
Lactobacillus gasseri, Strain EX33690VC16	NWP113	DLK1
Escherichia coli, Strain MS 21-1	NWP38	SLC6A13
Escherichia coli, Strain MS 196-1	NWP42	ASIP
Escherichia coli, Strain MS 69-1	NWP39	IGFBP5

Dorea sp., Strain AAB35	AB35	FAM19A5
Catabacter hongkongensis, Strain AB8_9	NWP299	MIA
Proteus mirabilis, Strain WGLW4	NWP58	SLC22A31
Enterococcus faecium, Strain ERV102	NWP80	SHISA6
Propionibacterium acnes, Strain HL043PA2	NWP264	VSTM2A
Klebsiella pneumoniae subsp. pneumoniae, Strain WGLW3	NWP54	NPPA
Klebsiella sp., Strain OBRC7	NWP60	LGALS7
Fusobacterium nucleatum, Strain CTI-07	NWP190	IL29
Lactobacillus gasseri, Strain EX33690VC16	NWP113	TFF3
Fusobacterium nucleatum, Strain CTI-03	NWP187	DEFB115
Klebsiella pneumoniae subsp. pneumoniae, Strain WGLW3	NWP54	NPPC
Streptococcus sp., Strain CM7	NWP133	TSLP
Capnocytophaga sp., Oral Taxon 336, Strain F0502	NWP139	MUCL3
Klebsiella pneumoniae subsp. pneumoniae, Strain WGLW1	NWP56	AGRP
Escherichia coli, Strain MS 145-7	NWP33	CAC1G_Epitope-9
Staphylococcus warneri F1	warneriF1	RTBDN
Corynebacterium sp., Strain HFH0082	NWP61	C2orf40
Propionibacterium acnes, Strain HL005PA4	NWP220	SPINT3
Blautia sp., Strain AAB30	AB30	NPPC
Proteus mirabilis, Strain WGLW4	NWP58	LOC644613
Staphylococcus capitis A7	capitisA7	DPEP1
Streptococcus sp., Strain SR4	NWP130	LOC644613
Staphylococcus epidermidis F12	EpiF12	MUCL3
Micrococcus luteus, Strain SK58	NWP08	SEMG2
Fusobacterium sp., Strain OBRC1	NWP154	DEFA6
Corynebacterium amycolatum, Strain SK46	NWP07	HGFAC
Corynebacterium sp., Strain CMW7794	NWP98	NPPC
Micrococcus luteus, Strain SK58	NWP08	UNQ9165/PRO28630
Staphylococcus hominis, Strain C80	NWP25	SHISA6
Staphylococcus aureus, Strain MN8	NWP17	SO1C1_Epitope-5
Streptococcus sp., Strain OBRC6	NWP124	SSC4D
Klebsiella oxytoca, Strain MIT 10-5250	NWP53	SDC3
Staphylococcus aureus, Strain CM05	NWP83	SHISAL1
Erysipelotrichaceae sp., Strain 6_1_45	NWP181	IFNL2
Klebsiella oxytoca, Strain MIT 10-5248	NWP51	PTGDS
Klebsiella sp., Strain OBRC7	NWP60	CHGA
Bacteroides stercoris, Strain CC31F	NWP270	PTPRJ
Staphylococcus warneri D9	warneriD9	SOSTDC1
Bacteroides sp., Strain D2	NWP192	C4A
Staphylococcus epidermidis H12	EpiH12	PF4V1
Lachnospiraceae sp., Strain DNF00160	NWP150	PIANP
Enterococcus faecalis, Strain HH22	NWP18	AVP
Peptostreptococcus sp., Strain CC14N	NWP290	MUCL3
Staphylococcus warneri E4	warneriE4	MTNR1B
Staphylococcus epidermidis C6	EpiC6	CSAG1
Escherichia coli, Strain MS 57-2	NWP34	KISS1
Propionibacterium acnes, Strain HL005PA4	NWP220	CNGB3_Epitope-3
Streptococcus parasanguinis, Strain F0449	NWP114	AGER
Escherichia coli, Strain MS 85-1	NWP30	CSAG1
Propionibacterium acnes, Strain HL020PA1	NWP221	SLC22A31
Arthrobacter albus, Strain DNF00011	NWP86	DEFB130A
Staphylococcus pasteurii C9	pasteuriiC9	UNQ6190/PRO20217
Streptococcus sp., Strain CM6	NWP136	PTPRR
Propionibacterium acnes, Strain HL060PA1	NWP239	C3AR_Epitope-3
Prevotella bivia, Strain DNF00650	NWP176	RTN4RL1
Plesiomonas sp., Strain HPP0020	NWP62	KLK10
Escherichia coli, Strain MS 145-7	NWP33	PSG4
Escherichia coli, Strain MS 196-1	NWP42	FGF17
Achromobacter xylosoxidans, Strain C54	NWP22	AVP
Fusobacterium sp., Oral Taxon 370, Strain F0437	NWP143	CD55
Eggerthella sp., Strain MVA1	NWP185	MUCL3
Klebsiella oxytoca, Strain MIT 10-5246	NWP50	TMEM149
Bacteroidales bacterium, Strain KA00344	NWP302	EPHA5
Citrobacter freundii, Strain 4_7_47CFAA	NWP28	BTC
Escherichia coli, Strain MS 196-1	NWP42	COL10A1
Escherichia coli, Strain MS 200-1	NWP41	TMEM204

Escherichia coli, Strain 83972	NWP04	UNQ6190/PRO20217
Klebsiella oxytoca, Strain MIT 10-5250	NWP53	SFN
Streptococcus sp., Strain SR1	NWP122	MUCL3
Escherichia coli, Strain MS 145-7	NWP33	CAC1E_Epitope-12
Propionibacterium acnes, Strain HL036PA3	NWP222	CNGB3_Epitope-3
Streptococcus gallolyticus subsp. gallolyticus, Strain TX20005	NWP27	SYCN
Klebsiella sp., Strain 4_1_44FAA	NWP21	FAM174A
Enterococcus faecium, Strain TX1330	NWP19	MUCL3
Propionibacterium acnes, Strain SK137	NWP309	TACSTD2
Lactobacillus gasseri, Strain EX33690VC16	NWP113	CDH7
Staphylococcus epidermidis, Strain NIHLM001	NWP66	TMEM119
Staphylococcus capitis C4	capitisC4	MUC7
Staphylococcus hominis A9	hominisA9	MUCL3
Staphylococcus haemolyticus, Strain DNF00585	NWP87	CTRB2
Escherichia coli, Strain MS 200-1	NWP41	FAM19A2
Propionibacterium acnes, Strain HL050PA1	NWP248	PDCD1
Fusobacterium nucleatum, Strain CTI-02	NWP186	CCL17
Staphylococcus saprophyticus D6	saprophyticusD6	SHISA6
Clostridium bolteae, Strain CC43_001B	NWP245	LCN2
Staphylococcus warneri B9	warneriB9	PRRT1
Blautia sp., Strain AAB30	AB30	GNLY
Proteus mirabilis, Strain WGLW6	NWP59	TM9SF3
Escherichia coli, Strain MS 16-3	NWP37	CHGA
Streptococcus sp., Strain CM7	NWP133	PIANP
Streptococcus gallolyticus subsp. gallolyticus, Strain TX20005	NWP27	GHRHR
Escherichia coli, Strain MS 145-7	NWP33	FAM19A3
Staphylococcus epidermidis, Strain E13A	NWP63	TNFSF9
Escherichia coli, Strain MS 115-1	NWP36	FAM19A2
Staphylococcus aureus, Strain TCH70	NWP12	EMID1
Proteus mirabilis, Strain WGLW6	NWP59	SDC1
Corynebacterium sp., Strain CMW7794	NWP98	PRND
Proteus mirabilis, Strain WGLW4	NWP58	AVP
Bacteroides stercoris, Strain CC31F	NWP270	VSTM2L
Staphylococcus lugdunensis, Strain M23590	NWP14	DPP7
Escherichia coli, Strain MS 110-3	NWP35	MUC7
Lactobacillus jensenii, Strain EX849587VC06	NWP109	SPINK9
Bacteroides dorei, Strain 5_1_36/D4	NWP244	NCAM1
Lachnospiraceae sp., Strain DNF00160	NWP150	SHISA6
Staphylococcus haemolyticus B5	haemolyticusB5	SCGB1A1
Dorea formicigenerans, Strain AAB36	AB36	PRRT1
Streptococcus sp., Strain BS21	NWP131	CTRB2
Klebsiella sp., Strain 1_1_55	NWP03	DLK1
Staphylococcus epidermidis, Strain NIHLM001	NWP66	LYVE1
Propionibacterium acnes, Strain HL030PA2	NWP207	SLC6A13
Fusobacterium nucleatum, Strain CTI-05	NWP188	SEMGI
Citrobacter freundii, Strain 4_7_47CFAA	NWP88	AGER
Klebsiella sp., Strain 1_1_55	NWP03	AVP
Propionibacterium acnes, Strain HL002PA1	NWP206	TNFRSF7
Staphylococcus capitis E12	capitisE12	CSAG1
Streptococcus sp., Strain ACS2	NWP115	VASN
Staphylococcus warneri E4	warneriE4	OR1L1_Epitope-1
Staphylococcus epidermidis F6	EpiF6	PRR27
Staphylococcus saprophyticus E8	saprophyticusE8	F3
Staphylococcus aureus, Strain CM05	NWP83	IL5_sc
Streptococcus mitis, Strain F0392	NWP26	RARRES2
Clostridium sp., Strain MSTE9	NWP253	FGL1
Staphylococcus hominis, Strain SK119	NWP10	IL27RA
Enterococcus faecalis, Strain TUSoD Ef11	NWP05	GPR25
Streptococcus sp., Strain OBRC6	NWP124	CD97_1_2_5
Proteus mirabilis, Strain WGLW6	NWP59	CSHL1
Escherichia coli, Strain MS 85-1	NWP30	FAM19A2
Peptoniphilus sp., Oral Taxon 386, Strain F0131	NWP255	RARRES2
Erysipelotrichaceae sp., Strain 6_1_45	NWP174	C4A
Streptococcus cristatus, Strain F0329	NWP126	KLK1
Staphylococcus saprophyticus E8	saprophyticusE8	CSF2RA
Coprococcus sp., Strain AAb34	AB34	FAM19A3

Propionibacterium acidifaciens, Oral Taxon 191, Strain F0233	NWP263	YB043
Propionibacterium acnes, Strain HLO25PA1	NWP204	PDCD1
Escherichia coli, Strain MS 69-1	NWP39	LECT2
Veillonella sp., Oral Taxon 780, Strain F0422	NWP268	PDIA3
Streptococcus cristatus, Strain F0329	NWP126	NBL1
Staphylococcus warneri E6	warneriE6	TMC3
Fusobacterium sp., Strain CM22	NWP167	ACKR1
Lactobacillus parafarraginis, Strain F0439	NWP105	SSBP3-AS1
Lactobacillus jensenii, Strain EX849587VC06	NWP109	ACP4
Staphylococcus warneri B9	warneriB9	CXCR3
Escherichia coli, Strain MS 69-1	NWP39	C4A
Fusobacterium nucleatum, Strain CTI-05	NWP188	AGRP
Fusobacterium periodonticum, Strain 2_1_31	NWP160	SCGB1A1
Escherichia coli, Strain MS 145-7	NWP33	GFY_Epitope-1
Klebsiella pneumoniae subsp. pneumoniae, Strain WGLW3	NWP54	AGRP
Staphylococcus warneri D9	warneriD9	SHISA6
Proteus mirabilis, Strain WGLW4	NWP58	PROCR
Bacteroides fragilis, Strain 3_1_12	NWP271	CEACAM7
Staphylococcus epidermidis D4	EpiD4	FZD1_Epitope-1
Streptococcus sp., Strain OBRC6	NWP124	ADM2
Escherichia coli, Strain MS 110-3	NWP35	FGF19
Lactobacillus crispatus, Strain JV-V01	NWP107	SMOC2
Clostridium innocuum, Strain 6_1_30	NWP286	TMEM119
Propionibacterium acnes, Strain HLO38PA1	NWP235	SHISA7
Shigella sp., Strain D9	NWP06	DRAXIN
Fusobacterium nucleatum, Strain CTI-07	NWP190	SLPI
Staphylococcus warneri E4	warneriE4	MEPE
Enterococcus faecium, Strain E417	NWP79	BTC
Staphylococcus capitis D5	capitisD5	GPR25
Klebsiella oxytoca, Strain MIT 10-5246	NWP50	ADRA2C
Streptococcus gallolyticus subsp. gallolyticus, Strain TX20005	NWP27	VSTM2B
Fusobacterium nucleatum, Strain CTI-05	NWP188	RCN1
Bacillus sp., Strain DNF00233	NWP90	CXCL12
Staphylococcus pasteurii F12	pasteuriiF12	SHISA8
Lactobacillus gasseri, Strain EX33690VC16	NWP113	AVP
Proteus mirabilis, Strain WGLW4	NWP58	DQA2_Epitope-1
Ruminococcus gnavus, Strain AAB28	AB28	PIANP
Klebsiella oxytoca, Strain MIT 10-5248	NWP51	DEFA6
Peptoniphilus sp., Oral Taxon 386, Strain F0131	NWP255	CCL18
Staphylococcus warneri E6	warneriE6	FAT2
Staphylococcus capitis E7	capitisE7	CCL18
Lactobacillus reuteri, Strain CF48-3A	NWP100	SLC8B1
Clostridium cadaveris, Strain CC40_001C	NWP246	CXCR4
Eubacterium sp., Strain AS15	NWP254	RARRES2
Lactobacillus gasseri, Strain SV-16A-US	NWP102	BTC
Clostridium symbiosum, Strain WAL-14673	NWP201	SHISA2
Prevotella veroralis, Oral Taxon 572, Strain F0319	NWP155	TXN
Enterococcus faecium, Strain ERV99	NWP82	PEBP4
Allobaculum sp., Strain NWP324	Ery128	GPER
Corynebacterium amycolatum, Strain SK46	NWP07	RARRES2
Lactobacillus gasseri, Strain JV-V03	NWP106	PIANP
Klebsiella sp., Strain MS 92-3	NWP40	APOO
Finnegoldia magna, Strain SY01	NWP138	LCN2
Staphylococcus pasteurii E5	pasteuriiE5	CDSN
Micrococcus luteus, Strain SK58	NWP08	MUC7
Fusobacterium nucleatum, Strain CTI-07	NWP190	MUC7
Dorea sp., Strain AAB35	AB35	P4HB
Lachnospiraceae bacterium, Strain AAB19	AB19	S39A6_Epitope-1
Streptococcus gallolyticus subsp. gallolyticus, Strain TX20005	NWP27	ITPR2_Epitope-3
Fusobacterium sp., Strain CM22	NWP153	PDPN
Citrobacter freundii, Strain 4_7_47CFAA	NWP28	PTHLH
Pseudomonas sp., Strain HPB0071	NWP65	SMOC2
Propionibacterium acnes, Strain HLO38PA1	NWP235	PDCD1
Lactobacillus gasseri, Strain JV-V03	NWP106	SPINK9
Ruminococcus sp., Strain AAB27	AB27	MCAM
Streptococcus parasanguinis, Strain F0449	NWP114	COL9A3

Staphylococcus epidermidis, Strain NIH04008	NWP77	DEFB130B
Propionibacterium acnes, Strain HL025PA2	NWP210	CST6
Propionibacterium acidifaciens, Oral Taxon 191, Strain F0233	NWP263	IL29
Staphylococcus capitis B12	capitisB12	PLA2G12B
Klebsiella oxytoca, Strain MIT 10-5246	NWP50	PRLHR_Epitope-1
Streptococcus cristatus, Strain F0329	NWP126	GSG1L
Bacteroides sp., Strain D2	NWP192	CSAG1
Fusobacterium sp., Oral Taxon 370, Strain F0437	NWP143	HCG22
Klebsiella sp., Strain OBRC7	NWP60	DEFA6
Staphylococcus pasteurii G7	pasteuriiG7	MCFD2
Staphylococcus warneri F1	warneriF1	MMP24
Bacteroides sp., Strain 4_1_36	NWP312	IL29
Selenomonas noxia, Strain F0398	NWP213	COL10A1
Staphylococcus warneri, Strain SK66	NWP11	TMEFF2
Lactobacillus gasseri, Strain JV-V03	NWP106	PF4V1
Staphylococcus epidermidis, Strain NIHLM023	NWP75	BPHL
Coprococcus sp., Strain AAb34	AB34	NPPC
Lactobacillus gasseri, Strain JV-V03	NWP106	LECT2
Klebsiella oxytoca, Strain MIT 10-5243	NWP47	SCTR
Staphylococcus capitis E7	capitisE7	DEFB115
Staphylococcus epidermidis, Strain NIH04008	NWP77	ARSA
Propionibacterium acnes, Strain HL005PA2	NWP215	GPR37
Megasphaera micronuciformis, Strain DNFO0954	NWP307	CCL13
Staphylococcus capitis C11	capitisC11	GPR25
Staphylococcus warneri A2	warneriA2	SLC8B1
Lactobacillus gasseri, Strain JV-V03	NWP106	DRAXIN
Capnocytophaga sp., Oral Taxon 336, Strain F0502	NWP139	PDIA6
Propionibacterium acnes, Strain HL013PA1	NWP209	PDCD1
Staphylococcus warneri E4	warneriE4	CLEC18A
Enterococcus faecium, Strain ERV102	NWP80	CONA1_Epitope-1
Clostridiales bacterium, Strain 4_1_37FAA	NWP285	SHISA2
Clostridium boltea, Strain CC43_001B	NWP245	FAM19A2
Proteus mirabilis, Strain WGLW6	NWP59	CD97_1_2_5
Staphylococcus warneri D11	warneriD12	CSMT1_Epitope-1
Staphylococcus saprophyticus E8	saprophyticusE8	FCGR1B
Bifidobacterium breve, Strain HPH0326	NWP289	SMR3A
Propionibacterium acnes, Strain HL043PA1	NWP303	TMEM119
Staphylococcus saprophyticus E2	saprophyticusE2	PIANP
Fusobacterium sp., Strain CM22	NWP167	APOO
Staphylococcus caprae, Strain C87	NWP24	RAMP3
Propionibacterium acnes, Strain HL005PA1	NWP224	IFNA8
Proteus mirabilis, Strain WGLW4	NWP58	LRRC25
Allobaculum sp., Strain NWP324	Ery128	PRLHR_Epitope-1
Propionibacterium acnes, Strain HL005PA2	NWP215	GRM5
Corynebacterium sp., Strain HPH0082	NWP61	GNLY
Escherichia coli, Strain MS 115-1	NWP36	ADAMTS16
Fusobacterium sp., Strain CM21	NWP152	PIANP
Prevotella denticola, Oral Taxon 291, Strain F0289	NWP183	PODXL2
Escherichia coli, Strain MS 119-7	NWP31	NAAA
Escherichia coli, Strain MS 145-7	NWP33	FGL1
Bacteroides sp., Strain D2	NWP192	SEMG1
Erysipelotrichaceae sp., Strain 6_1_45	NWP174	CONA1_Epitope-1
Escherichia coli, Strain MS 119-7	NWP31	LTB
Klebsiella oxytoca, Strain MIT 10-5249	NWP52	BTN2A3P
Dorea formicigenerans, Strain AAB36	AB36	CCER2
Escherichia coli, Strain MS 145-7	NWP33	DEFB130B
Staphylococcus pasteurii F12	pasteuriiF12	SDC4
Streptococcus intermedius, Strain F0413	NWP128	ENDOU
Veillonella sp., Oral Taxon 780, Strain F0422	NWP268	PF4V1
Clostridium sp., Strain MSTE9	NWP253	IFNL2
Sporosarcina sp., Strain 2681	NWP29	GNLY
Lactobacillus gasseri, Strain JV-V03	NWP106	FGF17
Staphylococcus saprophyticus D6	saprophyticusD6	RTBDN
Escherichia coli, Strain MS 16-3	NWP37	AGRP
Escherichia coli, Strain MS 115-1	NWP36	MUC7
Klebsiella oxytoca, Strain MIT 10-5249	NWP52	TACSTD2

Klebsiella oxytoca, Strain MIT 10-5242	NWP46	PVRL2
Staphylococcus capitis C11	capitisC11	AMELY
Bacteroides sp., Strain AAB8	AB8	AZU1
Streptococcus salivarius, Strain SK126	NWP118	TFPI2
Streptococcus mitis, Strain F0392	NWP26	APLP1
Parabacteroides merdae, Strain CL09T00C40	NWP184	AMY2B
Klebsiella oxytoca, Strain MIT 10-5242	NWP46	PNLIPRP1
Escherichia coli, Strain MS 145-7	NWP33	O11G2_Epitope-1
Staphylococcus aureus, Strain MN8	NWP17	IL5_sc
Staphylococcus epidermidis, Strain NIHLM003	NWP67	XG
Lactobacillus crispatus, Strain GED7749C	NWP104	GP6
Escherichia coli, Strain MS 57-2	NWP34	AVP
Staphylococcus capitis C11	capitisC11	PDIA2
Prevotella histicola, Strain F0411	NWP144	TRPM6_Epitope-1
Plesiomonas sp., Strain HPP0020	NWP62	KCNK1
Enterococcus faecium, Strain ERV102	NWP80	SEMG1
Staphylococcus warneri D11	warneriD12	TMC3
Klebsiella oxytoca, Strain MIT 10-5246	NWP50	NPDC1
Oscillibacter sp., Strain KLE 1745	NWP252	TFF3
Dorea sp., Strain AAB35	AB35	TXNDC12
Peptostreptococcus sp., Strain CC14N	NWP290	PRR27
Staphylococcus aureus, Strain CM05	NWP83	OLR1
Fusobacterium periodonticum, Strain 2_1_31	NWP160	GPHB5
Staphylococcus hominis, Strain SK119	NWP10	CTRB1
Megasphaera micronuciformis, Strain DNFO0954	NWP307	PRR27
Erysipelotrichaceae sp., Strain 6_1_45	NWP181	CHRD12
Staphylococcus capitis, Strain SK14	NWP09	SHISA2
Escherichia coli, Strain MS 119-7	NWP31	MENT
Streptococcus sp., Strain OBRC6	NWP124	CSAG1
Erysipelotrichaceae sp., Strain 6_1_45	NWP174	CHRD12
Propionibacterium acnes, Strain HL013PA1	NWP209	SPINT3
Streptococcus sp., Strain C150	NWP121	TSLP
Clostridium sp., Strain HGF2	NWP293	EPHA5
Escherichia coli, Strain 83972	NWP04	SEMG2
Staphylococcus epidermidis, Strain NIHLM040	NWP76	AMELX
Streptococcus cristatus, Strain F0329	NWP126	CHODL
Klebsiella pneumoniae subsp. pneumoniae, Strain WGLW1	NWP56	SHISA2
Corynebacterium sp., Strain HFH0082	NWP61	CCL23
Citrobacter freundii, Strain 4_7_47CFAA	NWP28	CCL24
Fusobacterium nucleatum subsp. animalis, Oral Taxon 420, Strain F0419	NWP196	DDK2
Proteus mirabilis, Strain WGLW6	NWP59	SDF4
Klebsiella oxytoca, Strain MIT 10-5249	NWP52	IGFBP5
Propionibacterium acnes, Strain HL056PA1	NWP267	SLC22A31
Clostridium orbiscindens, Strain CC43_001K	NWP259	MFS02A
Streptococcus sp., Strain ACC21	NWP134	LOC644613
Propionibacterium acnes, Strain HL005PA4	NWP220	SSTR4
Prevotella oralis, Strain HGA0225	NWP147	GPR151
Staphylococcus epidermidis, Strain NIHLM067	NWP68	LTB
Streptococcus cristatus, Strain F0329	NWP126	MUCL3
Staphylococcus epidermidis, Strain NIHLM020	NWP74	UNQ6190/PRO20217
Eubacterium sp., Strain 3_1_31	NWP182	PIANP
Klebsiella sp., Strain 1_1_55	NWP03	DEFA6
Staphylococcus capitis B8	capitisB8	COL10A1
Plesiomonas sp., Strain HPP0020	NWP62	FGF17
Streptococcus downei, Oral Taxon 594, Strain F0415	NWP123	PF4V1
Staphylococcus capitis A7	capitisA7	CDSN
Veillonella sp., Oral Taxon 780, Strain F0422	NWP268	SLC8B1
Staphylococcus hominis B3	hominisB3	UNQ6190/PRO20217
Lactobacillus jensenii, Strain EX849587VC06	NWP109	SEMG2
Staphylococcus aureus, Strain CM05	NWP83	SLC2A10
Escherichia coli, Strain MS 145-7	NWP33	LPL
Staphylococcus capitis D5	capitisD5	FAM19A5
Klebsiella sp., Strain 4_1_44FAA	NWP21	NINJ1
Staphylococcus capitis E7	capitisE7	SEMA6C
Bacteroides stercoris, Strain CC31F	NWP270	ROBO4
Escherichia coli, Strain 83972	NWP04	FGF17

Fusobacterium periodonticum, Strain 2_1_31	NWP160	CNPY2
Proteus mirabilis, Strain WGLW6	NWP59	CNPY2
Streptococcus sp., Strain AS20	NWP116	FAM19A2
Bacillus sp., Strain DNF00233	NWP90	GNLY
Streptococcus sp., Strain C150	NWP121	BTC
Propionibacterium acnes, Strain HL045PA1	NWP265	TMEM59L
Escherichia coli, Strain MS 115-1	NWP36	CSN3
Klebsiella pneumoniae subsp. pneumoniae, Strain WGLW2	NWP57	IFNA5
Staphylococcus capitis B12	capitisB12	CXCR4
Streptococcus gallolyticus subsp. gallolyticus, Strain TX20005	NWP27	CLU
Clostridium cadaveris, Strain CC44_001G	NWP247	SLC8B1
Escherichia coli, Strain MS 57-2	NWP34	MENT
Pseudomonas sp., Strain HPB0071	NWP65	AGRP
Klebsiella sp., Strain MS 92-3	NWP40	GPR142
Oscillibacter sp., Strain KLE 1745	NWP252	4F2_Epitope-1
Fusobacterium periodonticum, Strain 2_1_31	NWP160	LCN15
Lactobacillus jensenii, Strain EX849587VC06	NWP109	GSG1L
Staphylococcus pasteurii C9	pasteuriiC9	CCL11
Propionibacterium acnes, Strain HL046PA2	NWP266	SLC22A31
Klebsiella oxytoca, Strain MIT 10-5249	NWP52	VSTM2B
Staphylococcus warneri , Strain SK66	NWP11	SFTPA1
Escherichia coli, Strain MS 16-3	NWP37	PTPRN2
Clostridium symbiosum, Strain WAL-14673	NWP201	LGALS7
Escherichia coli, Strain MS 115-1	NWP36	PROK1
Lactobacillus gasseri, Strain JV-V03	NWP106	IGFBP5
Staphylococcus capitis B1	capitisB1	LOC644613
Prevotella melaninogenica, Strain D18	NWP151	SMR3A
Staphylococcus epidermidis F6	Epif6	SMR3A
Bacteroides stercoris, Strain CC31F	NWP270	SO6A1_Epitope-5
Bacteroides sp., Strain D2	NWP192	DEFB130A
Propionibacterium acnes, Strain HL002PA2	NWP214	CST6
Klebsiella sp., Strain 4_1_44FAA	NWP21	SGCA
Enterococcus faecalis, Strain HH22	NWP18	PEBP4
Propionibacterium acnes, Strain HL013PA1	NWP209	C3AR_Epitope-3
Staphylococcus warneri B9	warneriB9	TMEM8
Weissella cibaria, Strain F16_1	NWP101	SOSTDC1
Enterococcus faecalis, Strain TX2137	NWP117	FAM174A
Lactobacillus jensenii, Strain 269-3	NWP110	IL25
Peptoniphilus sp., Oral Taxon 836, Strain F0141	NWP313	PRR27
Propionibacterium acnes, Strain HL002PA3	NWP219	TGFA
Staphylococcus warneri C5	warneriC5	SSBP3-AS1
Staphylococcus hominis B3	hominisB3	CSAG1
Dermabacter sp., Strain HFH0086	NWP92	KIR3DS1
Prevotella bivia, Strain DNF00650	NWP176	UNQ6190/PRO20217
Corynebacterium amycolatum, Strain SK46	NWP07	CSN3
Coprococcus sp., Strain AAb34	AB34	OTOS
Streptococcus gallolyticus subsp. gallolyticus, Strain TX20005	NWP27	SMR3B
Streptococcus vestibularis, Strain F0396	NWP132	SOSTDC1
Bacillus sp., Strain DNF00233	NWP90	S39A6_Epitope-1
Erysipelotrichaceae sp., Strain 6_1_45	NWP174	DRAXIN
Bacteroides stercoris, Strain CC31F	NWP270	SPINK1
Lactobacillus crispatus, Strain JV-V01	NWP107	DEFA6
Klebsiella oxytoca, Strain MIT 10-5243	NWP47	SMOC2
Lactobacillus jensenii, Strain EX849587VC06	NWP109	SEMG1
Enterococcus faecium, Strain E417	NWP79	DEFB130A
Staphylococcus hominis, Strain C80	NWP25	RTBDN
Bacillus sp., Strain DNF00233	NWP90	CHRD12
Enterococcus faecalis, Strain S613	NWP119	TFF3
Streptococcus sp., Strain BS21	NWP131	TSLP
Clostridium cadaveris, Strain CC44_001G	NWP247	LGALS7
Propionibacterium acnes, Strain HL059PA1	NWP250	PDCD1
Bacteroides bacterium, Strain KA00344	NWP302	MMP16
Streptococcus anginosus, Strain F0211	NWP125	TMEM59L
Clostridium difficile, Strain 002-P50-2011	NWP230	C3AR_Epitope-3
Enterococcus faecium, Strain TX0133a04	NWP44	ALPP
Streptococcus sp., Strain C150	NWP121	CCL17

Staphylococcus capitis C4	capitisC4	DEFB115
Prevotella bivia, Strain DNF00650	NWP176	SPAG11B
Enterococcus faecalis, Strain TX2137	NWP117	FGFRL1
Fusobacterium sp., Strain CM21	NWP152	IGFBP5
Propionibacterium acnes, Strain HL005PA1	NWP224	TGFA
Klebsiella pneumoniae subsp. pneumoniae, Strain WGLW3	NWP54	CCL18
Staphylococcus warneri D9	warneriD9	TNFRSF21
Escherichia coli, Strain MS 16-3	NWP37	CEACAM1
Propionibacterium acnes, Strain HL056PA1	NWP267	CST6
Proteus mirabilis, Strain WGLW6	NWP59	TFF1
Fusobacterium nucleatum, Strain CTI-05	NWP188	CHRD12
Capnocytophaga sputigena, Strain CC21_001D	NWP163	SYCN
Escherichia coli, Strain MS 145-7	NWP33	FSHB
Clostridium difficile, Strain 050-P50-2011	NWP278	TXNDC12
Propionibacterium acnes, Strain HL020PA1	NWP221	TMEM59L
Klebsiella oxytoca, Strain MIT 09-7231	NWP45	DUOXA2
Staphylococcus warneri E4	warneriE4	TMC3
Streptococcus sp., Strain OBRG6	NWP124	MCAM
Megasphaera sp., Strain DNF00872	NWP295	CXCR4
Staphylococcus warneri D4	warneriD4	CTRB1
Streptococcus sp., Strain C150	NWP121	ARSA
Eggerthella sp., Strain MVA1	NWP185	LECT2
Klebsiella sp., Strain MS 92-3	NWP40	CHGA
Lactobacillus gasseri, Strain EX33690VC16	NWP113	FGF17
Escherichia sp., Strain 3_2_53FAA	NWP02	DPP7
Staphylococcus epidermidis C3	EpiC3	TMG2_Epitope-1
Fusobacterium nucleatum, Strain CTI-06	NWP189	LOC644613
Streptococcus mitis, Strain F0392	NWP26	CCL23
Staphylococcus warneri E6	warneriE6	ELFN1
Staphylococcus capitis C12	capitisC12	PIANP
Klebsiella pneumoniae subsp. pneumoniae, Strain WGLW5	NWP55	PPY
Escherichia coli, Strain MS 16-3	NWP37	FZD3_Epitope-1
Staphylococcus simulans F10	simulansF10	KCMA1_Epitope-1
Staphylococcus pasteurii F11	pasteuriiF11	TMEFF2
Enterococcus faecium, Strain ERV102	NWP80	BTC
Staphylococcus caprae, Strain C87	NWP24	SHISA6
Streptococcus mitis, Strain F0392	NWP26	CTRB2
Propionibacterium acnes, Strain HL027PA1	NWP211	NINJ1
Staphylococcus hominis, Strain C80	NWP25	SMR3A
Prevotella bivia, Strain DNF00650	NWP176	AGRP
Propionibacterium acnes, Strain HL053PA2	NWP236	BKBR1
Prevotella melaninogenica, Strain D18	NWP151	XG
Finegoldia magna, Strain GED7760A	NWP200	EFEMP2
Staphylococcus warneri C2	warneriC2	AGRP
Escherichia coli, Strain MS 85-1	NWP30	CCL13
Klebsiella pneumoniae subsp. pneumoniae, Strain WGLW2	NWP57	APOO
Staphylococcus epidermidis, Strain NIHLM067	NWP68	SPOCK1
Arthrobacter albus, Strain DNF00011	NWP86	TNFRSF4
Klebsiella oxytoca, Strain MIT 10-5249	NWP52	AVP
Propionibacterium acnes, Strain HL053PA2	NWP236	CST6
Streptococcus sp., Strain ACS2	NWP115	SLC8B1
Enterococcus faecalis, Strain TX2137	NWP117	FGF17
Staphylococcus capitis B12	capitisB12	DKK3
Lactobacillus crispatus, Strain 125-2-CHN	NWP99	MUCL3
Propionibacterium acnes, Strain HL005PA2	NWP215	CST6
Staphylococcus warneri C2	warneriC2	SSBP3-AS1
Streptococcus gallolyticus subsp. gallolyticus, Strain TX20005	NWP27	GPA33
Bacteroides stercoris, Strain CC31F	NWP270	FKBP2
Enterococcus faecium, Strain E417	NWP79	TFF3
Lactobacillus jensenii, Strain 208-1	NWP111	SHISA6
Escherichia sp., Strain 3_2_53FAA	NWP02	AVP
Staphylococcus hominis, Strain C80	NWP25	PF4V1
Staphylococcus caprae, Strain C87	NWP24	FAM19A3
Bacteroides bacterium, Strain KA00344	NWP302	AXL
Erysipelotrichaceae sp., Strain 6_1_45	NWP181	MUC7
Klebsiella oxytoca, Strain MIT 10-5250	NWP53	DEFA6

Rothia mucilaginosa, Strain CC87LB	NWP84	MMP16
Proteus mirabilis, Strain WGLW6	NWP59	DKK3
Clostridiales bacterium, Strain 4_1_37FAA	NWP285	KCMA1_Epitope-1
Selenomonas noxia, Strain F0398	NWP213	SLC8B1
Klebsiella oxytoca, Strain MIT 09-7231	NWP45	TRPM6_Epitope-1
Staphylococcus warneri D11	warneriD12	PSG4
Proteus mirabilis, Strain WGLW6	NWP59	SCGB1C2
Streptococcus cristatus, Strain F0329	NWP126	IGHD-Fc-N
Weissella cibaria, Strain F16_1	NWP101	OTOS
Staphylococcus saprophyticus D6	saprophyticusD6	MUCL3
Streptococcus sp., Strain CM7	NWP133	SHISA6
Fusobacterium sp., Strain CM22	NWP153	MUCL3
Bacteroides stercoris, Strain CC31F	NWP270	EDDM3B
Proteus mirabilis, Strain WGLW6	NWP59	ASPRV1
Fusobacterium periodonticum, Strain 1_A_54/D10	NWP142	TXNDC12
Staphylococcus warneri E4	warneriE4	ADRA2C
Propionibacterium acnes, Strain HL043PA1	NWP303	SLC22A31
Enterococcus faecalis, Strain TX2137	NWP117	RTBDN
Hungatella hathewayi, Strain WAL-18680	NWP231	ENDOU
Deinococcus grandis, Strain SK125	NWP89	COL10A1
Staphylococcus warneri E6	warneriE6	SIGLEC6
Propionibacterium acnes, Strain HL053PA1	NWP260	MMP16
Streptococcus sp., Strain AS20	NWP116	C4A
Fusobacterium nucleatum subsp. animalis, Oral Taxon 420, Strain F0419	NWP196	INSL4
Citrobacter sp., Strain 30_2	NWP01	SMOC2
Lactobacillus gasseri, Strain EX33690VC16	NWP113	TMEM59L
Enterococcus faecium, Strain ERV165	NWP81	CSN3
Streptococcus mitis, Strain F0392	NWP26	ASIP
Staphylococcus pasteurii F11	pasteuriiF11	SDC4
Megasphaera sp., Strain DNF00912	NWP296	CCL18
Staphylococcus warneri D11	warneriD12	PTH1R
Propionibacterium acnes, Strain HL043PA1	NWP303	CNGB3_Epitope-3
Lactobacillus jensenii, Strain EX849587VC03	NWP108	GP9
Escherichia coli, Strain MS 119-7	NWP31	SYNDIG1L
Prevotella histicola, Strain F0411	NWP144	UNQ6190/PRO20217
Eggerthella sp., Strain MVA1	NWP185	IL29
Escherichia coli, Strain MS 85-1	NWP30	ADAMTS16
Peptoniphilus sp., Oral Taxon 836, Strain F0141	NWP313	FAM19A3
Staphylococcus capitis C11	capitisC11	SGCA
Proteus mirabilis, Strain WGLW6	NWP59	IFNA5
Streptococcus gallolyticus subsp. gallolyticus, Strain TX20005	NWP27	SLURP1
Enterococcus faecium, Strain ERV102	NWP80	LYVE1
Micrococcus luteus, Strain SK58	NWP08	ADAMTS16
Eubacterium sp., Strain 3_1_31	NWP182	TSLP
Klebsiella oxytoca, Strain MIT 10-5248	NWP51	LINC00527
Propionibacterium acnes, Strain HL027PA2	NWP218	SHISA7
Propionibacterium acnes, Strain HL053PA1	NWP260	EMID1
Klebsiella sp., Strain MS 92-3	NWP40	KISS1
Klebsiella oxytoca, Strain MIT 10-5246	NWP50	DLK1
Staphylococcus hominis A4	hominisA4	SLC8B1
Escherichia coli, Strain MS 85-1	NWP30	INSL4
Lactobacillus parafarraginis, Strain F0439	NWP105	DEFB130B
Weissella cibaria, Strain F16_1	NWP101	SHISA6
Klebsiella oxytoca, Strain MIT 10-5249	NWP52	DRAXIN
Escherichia coli, Strain MS 119-7	NWP31	LRRTM1
Escherichia coli, Strain MS 69-1	NWP39	SEMG2
Lactobacillus gasseri, Strain 224-1	NWP112	BMP7
Enterococcus faecium, Strain ERV102	NWP80	IGFBP5
Staphylococcus haemolyticus B5	haemolyticusB5	CD320
Propionibacterium acnes, Strain HL013PA1	NWP209	BDKBR1
Staphylococcus capitis E7	capitisE7	RARRES2
Streptococcus sp., Strain SR4	NWP130	CSAG1
Escherichia coli, Strain MS 16-3	NWP37	AGPAT2
Lactobacillus gasseri, Strain 224-1	NWP112	PINLYP
Bifidobacterium angulatum, Strain F16_22	NWP291	PRLR
Staphylococcus aureus, Strain CM05	NWP83	NRN1L

Blautia sp., Strain KLE 1732	NWP292	FAM19A3
Allobaculum sp., Strain NWP324	Ery128	SCGB1D1
Proteus mirabilis, Strain WGLW6	NWP59	VMO1
Propionibacterium acnes, Strain HL025PA2	NWP210	PDCD1
Lachnospiraceae sp., Strain DNF00160	NWP150	TSLP
Fusobacterium sp., Oral Taxon 370, Strain F0437	NWP143	TFF1
Oscillibacter sp., Strain KLE 1745	NWP252	CCL18
Proteus mirabilis, Strain WGLW6	NWP59	HCRTR2
Enterococcus faecium, Strain ERV102	NWP80	AGRP
Propionibacterium acnes, Strain HL025PA2	NWP210	FAM174A
Prevotella bivia, Strain DNF00188	NWP193	BTC
Escherichia coli, Strain MS 119-7	NWP31	TMEM59L
Staphylococcus capitis, Strain SK14	NWP09	SMOC2
Staphylococcus epidermidis, Strain W23144	NWP15	PEBP4
Streptococcus gallolyticus subsp. gallolyticus, Strain TX20005	NWP27	INSL4
Escherichia coli, Strain MS 119-7	NWP31	AVP
Fusobacterium sp., Strain CM22	NWP153	PSORS1C2
Staphylococcus epidermidis, Strain E13A	NWP63	SUSD6
Enterococcus faecium, Strain TX0133a04	NWP44	RTBDN
Enterococcus faecalis, Strain TX2137	NWP117	CTRB2
Erysipelotrichaceae sp., Strain 6_1_45	NWP181	ADAMTS16
Propionibacterium acnes, Strain HL078PA1	NWP305	TMEM119
Staphylococcus epidermidis, Strain NIHLM023	NWP75	INSL4
Streptococcus salivarius, Strain SK126	NWP118	DEFB130A
Propionibacterium acnes, Strain HL043PA2	NWP264	LAYN
Propionibacterium acnes, Strain HL060PA1	NWP239	ADRA2C
Clostridium difficile, Strain 050-P50-2011	NWP278	CXCR4
Rothia mucilaginosa, Strain CC87LB	NWP84	PEBP4
Erysipelotrichaceae sp., Strain 6_1_45	NWP174	IL29
Streptococcus mitis, Strain F0392	NWP26	TRPM5
Propionibacterium acnes, Strain HL005PA2	NWP215	SHISA7
Shigella sp., Strain D9	NWP06	ADAMTS16
Fusobacterium sp., Strain CM22	NWP167	IFITM10
Klebsiella oxytoca, Strain MIT 10-5245	NWP49	LGALS7
Escherichia sp., Strain 3_2_53FAA	NWP02	PGF
Staphylococcus warneri D3	warneriD3	SSBP3-AS1
Streptococcus sp., Strain OBRC6	NWP124	NPPC
Fusobacterium sp., Strain CM21	NWP152	ENDOU
Staphylococcus epidermidis G10	EpiG10	SGCA
Streptococcus sp., Strain B529a	NWP129	CTRB2
Fusobacterium sp., Oral Taxon 370, Strain F0437	NWP143	ROBO4
Staphylococcus epidermidis, Strain NIHLM031	NWP73	CCL8
Streptococcus sp., Strain ACS2	NWP115	LILRA3
Fusobacterium nucleatum, Strain CTI-02	NWP186	FAM19A2
Catabacter hongkongensis, Strain AB8_9	NWP299	SPINK9
Lachnospiraceae bacterium, Strain AAB23	AB23	CONA1_Epitope-1
Staphylococcus capitis B12	capitisB12	PDGFA
Staphylococcus haemolyticus B6	haemolyticusB6	SCGB1A1
Bifidobacterium longum subsp. longum, Strain 44B	NWP308	PLA2G2E
Staphylococcus warneri C5	warneriC5	BTC
Erysipelotrichaceae sp., Strain 6_1_45	NWP174	GNLY
Bacillus sp., Strain DNF00233	NWP90	FAM19A2
Weissella cibaria, Strain F16_1	NWP101	RTBDN
Clostridium sp., Strain HGF2	NWP293	PROM2_Epitope-1
Streptococcus gallolyticus subsp. gallolyticus, Strain TX20005	NWP27	AVP
Streptococcus sobrinus, Strain W1703	NWP85	CXCL9
Staphylococcus epidermidis, Strain NIHLM003	NWP67	CHGA
Streptococcus sp., Strain SR1	NWP122	MIA
Bacteroidales bacterium, Strain KA00344	NWP302	EPHA4
Clostridiales bacterium, Strain 3_1_39B/D5	NWP240	ENSP00000381830
Streptococcus mitis, Strain F0392	NWP26	CCL17
Staphylococcus warneri E6	warneriE6	KCNMB2
Lactobacillus jensenii, Strain 269-3	NWP110	MCAM
Escherichia coli, Strain MS 145-7	NWP33	NPDC1
Staphylococcus pasteurii G3	pasteuriiG3	FAM3B
Staphylococcus epidermidis, Strain NIHLM070	NWP69	AVP

Enterococcus faecium, Strain TX1330	NWP19	RARRES2
Staphylococcus capitis A7	capitisA7	MEPE
Staphylococcus warneri D11	warneriD12	AXL
Staphylococcus capitis B8	capitisB8	DEFB130A
Propionibacterium acnes, Strain HL027PA1	NWP211	SPINT3
Bacteroides sp., Strain D2	NWP192	CONA1_Epitope-1
Staphylococcus epidermidis, Strain NIH04008	NWP77	TMEM119
Streptococcus sp., Strain SR1	NWP122	AXL
Fusobacterium nucleatum, Strain MJR7757B	NWP257	MERTK
Escherichia coli, Strain MS 196-1	NWP42	ADAMTS16
Corynebacterium sp., Strain CMW7794	NWP98	MUC7
Propionibacterium acnes, Strain HL045PA1	NWP265	LAYN
Staphylococcus pasteurii E5	pasteuriiE5	SHISA8
Staphylococcus epidermidis, Strain NIHLM001	NWP66	FAM19A5
Proteus mirabilis, Strain WGLW6	NWP59	SPOCK2
Proteus mirabilis, Strain WGLW4	NWP58	FGF19
Escherichia coli, Strain MS 119-7	NWP31	SC5A3_Epitope-4
Klebsiella oxytoca, Strain MIT 10-5246	NWP50	LYSMD4
Micrococcus luteus, Strain SK58	NWP08	CCL22
Streptococcus sp., Strain C150	NWP121	PEBP4
Citrobacter sp., Strain 30_2	NWP01	CCL24
Escherichia coli, Strain MS 110-3	NWP35	MUCL3
Fusobacterium nucleatum subsp. animalis, Oral Taxon 420, Strain F0419	NWP196	MUCL3
Propionibacterium acidifaciens, Oral Taxon 191, Strain F0233	NWP263	TFF1
Streptococcus salivarius, Strain SK126	NWP118	VSTM2L
Streptococcus mitis, Strain F0392	NWP26	BTC
Streptococcus cristatus, Strain F0329	NWP126	CLDN11
Staphylococcus pasteurii G7	pasteuriiG7	TMEFF2
Clostridium sp., Strain MSTE9	NWP253	PRR27
Staphylococcus cohnii G11	cohniiG11	EPO
Propionibacterium acnes, Strain HL037PA1	NWP208	PDCD1
Deinococcus grandis, Strain SK125	NWP89	CCL18
Megasphaera micronuciformis, Strain DNF00954	NWP307	SPINK9
Lactobacillus parafarraginis, Strain F0439	NWP105	FAM19A5
Shuttleworthia sp., Strain MSX8B	NWP149	EDEM2
Klebsiella oxytoca, Strain MIT 10-5245	NWP49	SFN
Lachnospiraceae sp., Strain DNF00160	NWP150	CCL17
Fusobacterium sp., Oral Taxon 370, Strain F0437	NWP143	MADCAM1
Staphylococcus capitis A5	capitisA5	PIANP
Staphylococcus warneri, Strain SK66	NWP11	TUSC5
Staphylococcus epidermidis H3	EpiH3	XG
Lactobacillus jensenii, Strain EX849587VC06	NWP109	DPP7
Staphylococcus epidermidis, Strain NIH04008	NWP77	TSLP
Corynebacterium amycolatum, Strain SK46	NWP07	C6orf15
Staphylococcus capitis B8	capitisB8	DEFB115
Propionibacterium acnes, Strain HL007PA1	NWP225	CST6
Bacillus sp., Strain DNF00233	NWP90	PROK1
Prevotella nigrescens, Strain F0103	NWP145	SDC1
Propionibacterium acnes, Strain HL050PA1	NWP248	SPINT3
Prevotella bivia, Strain GED7760C	NWP233	IGFBP7
Streptococcus sp., Strain AS20	NWP116	LECT2
Coprococcus sp., Strain AAb34	AB34	COL10A1
Propionibacterium acnes, Strain HL038PA1	NWP235	SPINK14
Fusobacterium nucleatum, Strain CTI-05	NWP188	SMR3A
Klebsiella oxytoca, Strain MIT 09-7231	NWP45	NCKX4_Epitope-1
Capnocytophaga sputigena, Strain CC21_001D	NWP163	AMY2B
Escherichia coli, Strain MS 115-1	NWP36	RARRES2
Escherichia coli, Strain MS 57-2	NWP34	INSL4
Plesiomonas sp., Strain HPP0020	NWP62	SEMG2
Staphylococcus epidermidis, Strain NIH05001	NWP78	AJAP1
Propionibacterium acnes, Strain HL059PA1	NWP250	CNGB3_Epitope-3
Fusobacterium sp., Strain CM22	NWP167	IBSP
Blautia sp., Strain AAB30	AB30	PLA2G2E
Propionibacterium acnes, Strain HL037PA2	NWP205	PTPRN2
Escherichia sp., Strain 3_2_53FAA	NWP02	SMR3A
Escherichia coli, Strain MS 85-1	NWP30	CSN3

Escherichia coli, Strain MS 110-3	NWP35	PF4V1
Propionibacterium acnes, Strain HL002PA1	NWP206	BDKBR1
Staphylococcus aureus, Strain TCH70	NWP12	OPN3
Finnegoldia magna, Strain SY01	NWP138	CTRB1
Staphylococcus pasteurii G7	pasteuriiG7	SDC4
Staphylococcus capitis A7	capitisA7	FAT2
Propionibacterium acnes, Strain HL005PA4	NWP220	SPINK9
Staphylococcus warneri C5	warneriC5	SHISA6
Escherichia coli, Strain MS 145-7	NWP33	LINC00527
Citrobacter sp., Strain 30_2	NWP01	LOC644613
Prevotella melaninogenica, Strain D18	NWP151	SRGN
Fusobacterium nucleatum, Strain CTI-07	NWP190	LOC644613
Staphylococcus pasteurii F12	pasteuriiF12	BTC
Enterococcus faecalis, Strain TUSoD Ef11	NWP05	LRRC38
Streptococcus salivarius, Strain SK126	NWP118	SFRP4
Staphylococcus gallinarum E9	gallinarumE9	MUCL3
Shigella sp., Strain D9	NWP06	AGRP
Propionibacterium acnes, Strain HL110PA4	NWP298	SSC4D
Staphylococcus warneri D3	warneriD3	C2orf40
Prevotella histicola, Strain F0411	NWP144	PDIA6
Fusobacterium sp., Strain CM21	NWP152	LECT2
Clostridium sp., Strain MSTE9	NWP253	PIANP
Megasphaera sp., Strain DNF00912	NWP296	MUCL3

The disclosures of each and every patent, patent application, and publication cited herein are hereby incorporated herein by reference in their entirety. While this invention has

5 been disclosed with reference to specific embodiments, it is apparent that other embodiments and variations of this invention may be devised by others skilled in the art without departing from the true spirit and scope of the invention. The appended claims are intended to be construed to include all such embodiments and equivalent variations.

CLAIMS

What is claimed is:

1. A composition for modulating an interaction of a host protein with an associated microbial cell, wherein the host protein and microbial cell are interacting partners selected from the group consisting of host protein and microbial cell interacting partners as set forth in Table 1.

2. The composition of claim 1, wherein the modulator is an inhibitor of the host protein selected from the group consisting of the host protein listed in Table 1.

3. The composition of claim 2, wherein the inhibitor is selected from the group consisting of a small interfering RNA (siRNA), a microRNA, an antisense nucleic acid, a ribozyme, an expression vector encoding a transdominant negative mutant, an antibody, an antibody fragment, a peptide, a chemical compound and a small molecule.

4. The composition of claim 1, wherein the modulator is an activator of the host protein selected from the group consisting of the host protein listed in Table 1.

5. The composition of claim 4, wherein the activator increases one or more of transcription and translation of the host protein selected from the group consisting of the host protein listed in Table 1.

6. The composition of claim 4, wherein the activator is selected from the group consisting of a nucleic acid, a protein, a peptide, a peptidomimetic, a chemical compound and a small molecule.

7. The composition of claim 1, wherein the interaction of the host protein with the associated microbial cell is selected from the group consisting of:

a) the interaction of *Fusobacterium* with an immune-modulatory protein selected from the group consisting of AGER, BTN3A3, BTNL8, C3AR, CCL5, CCR9, CD55, CD99L2, CEACAM4, CSF3, DKK1, DKK2, IL15RA, LAIR1, MADCAM1, MCAM, MERTK, NPY5R, SIRPA, SOST, TMEM149, TNFRSF10B, TNFRSF4, and TREML1; and

b) the interaction of *Ruminococcus gnavus* with a protein selected from the group consisting of CD7, TFF1, TFF2, and TFF3.

8. A method of modulating an interaction of a host protein with an associated microbial cell, wherein the host protein and microbial cell are interacting partners selected from the group consisting of host protein and microbial cell interacting partners as set forth in Table 1, the method comprising contacting a host cell with a composition for modulating the interaction of the host protein and the microbial cell.

9. The method of claim 8, wherein the modulator is an inhibitor of the host protein selected from the group consisting of the host protein listed in Table 1.

10. The method of claim 9, wherein the inhibitor is selected from the group consisting of a small interfering RNA (siRNA), a microRNA, an antisense nucleic acid, a ribozyme, an expression vector encoding a transdominant negative mutant, an antibody, an antibody fragment, a peptide, a chemical compound and a small molecule.

11. The method of claim 8, wherein the modulator is an activator of the host protein selected from the group consisting of the host protein listed in Table 1.

12. The method of claim 11, wherein the activator increases one or more of transcription and translation of the host protein selected from the group consisting of the host protein listed in Table 1.

13. The method of claim 11, wherein the activator is selected from the group consisting of a nucleic acid, a protein, a peptide, a peptidomimetic, a chemical compound and a small molecule.

14. A method of treating or preventing a disease or disorder in a subject in need thereof, the method comprising administering a composition for modulating the interaction of a host protein and a microbial cell to the subject, wherein the host protein and microbial cell are interacting partners selected from the group consisting of host protein and microbial cell interacting partners as set forth in Table 1.

15. The method of claim 14, wherein the modulator is an inhibitor of the host protein selected from the group consisting of the host protein listed in Table 1.

16. The method of claim 15, wherein the inhibitor is selected from the group consisting of a small interfering RNA (siRNA), a microRNA, an antisense nucleic acid, a ribozyme, an expression vector encoding a transdominant negative mutant, an antibody, an antibody fragment, a peptide, a chemical compound and a small molecule.

17. The method of claim 14, wherein the modulator is an activator of the host protein selected from the group consisting of the host protein listed in Table 1.

18. The method of claim 17, wherein the activator increases one or more of transcription and translation of the host protein selected from the group consisting of the host protein listed in Table 1.

19. The method of claim 17, wherein the activator is selected from the group consisting of a nucleic acid, a protein, a peptide, a peptidomimetic, a chemical compound and a small molecule.

20. The method of claim 14, wherein the disease or disorder is selected from the group consisting of inflammatory diseases, inflammatory bowel disease (IBD), irritable bowel syndrome (IBS), obesity, type 2 diabetes, cardiovascular disease, Alzheimer's disease, Parkinson's disease, cancer and atopy.

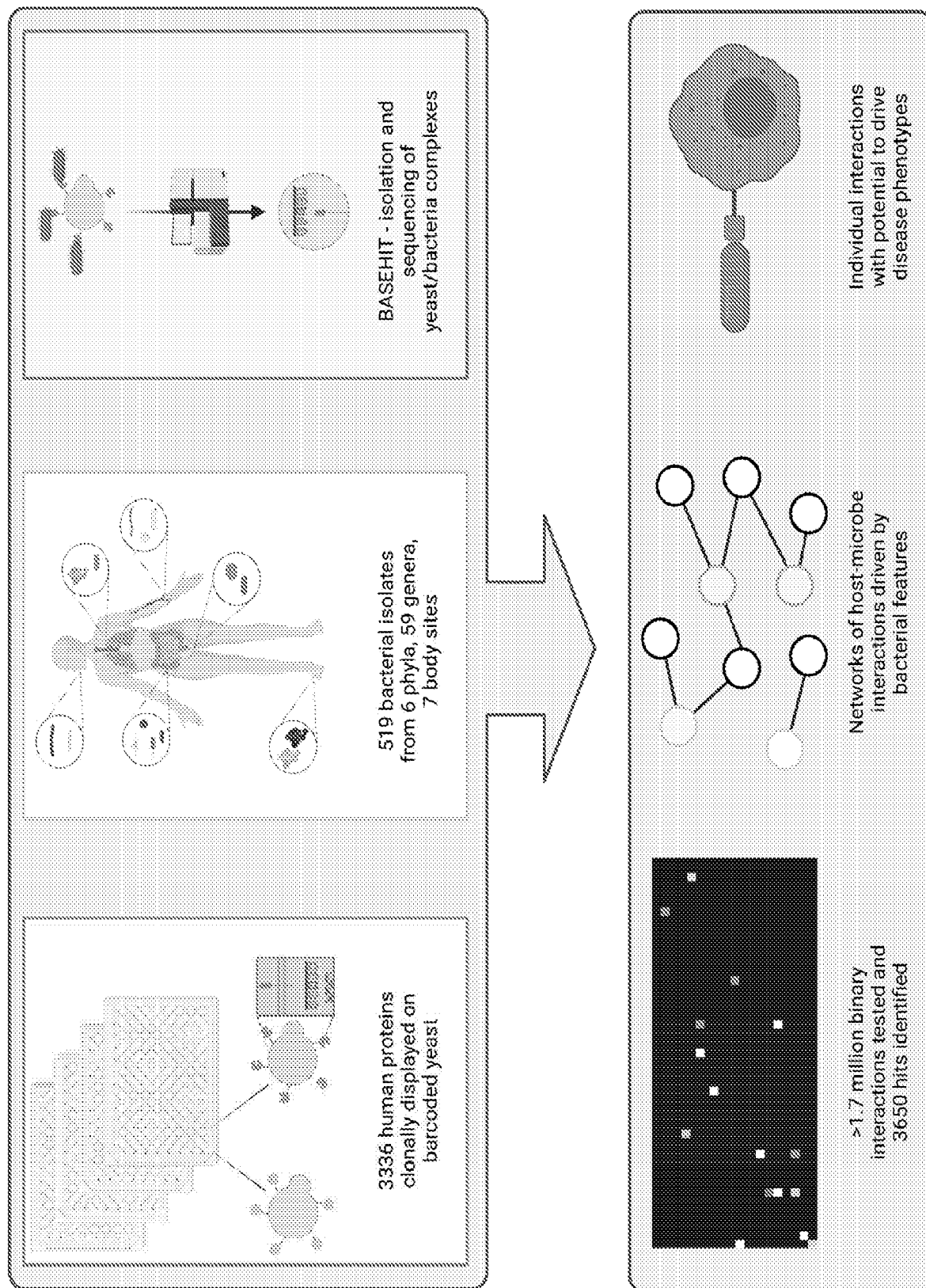


Fig. 1

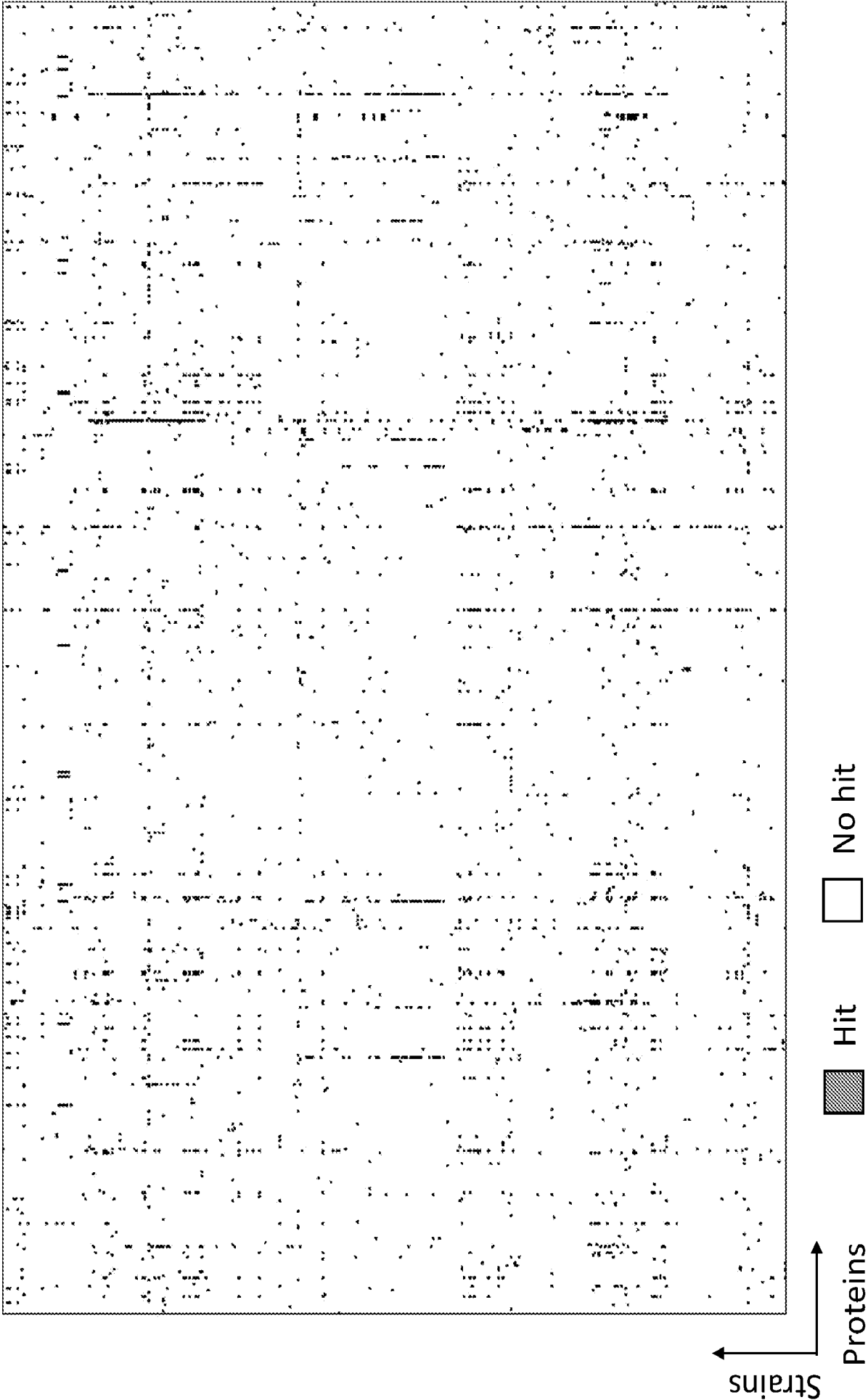


Fig. 2

Fig. 3A

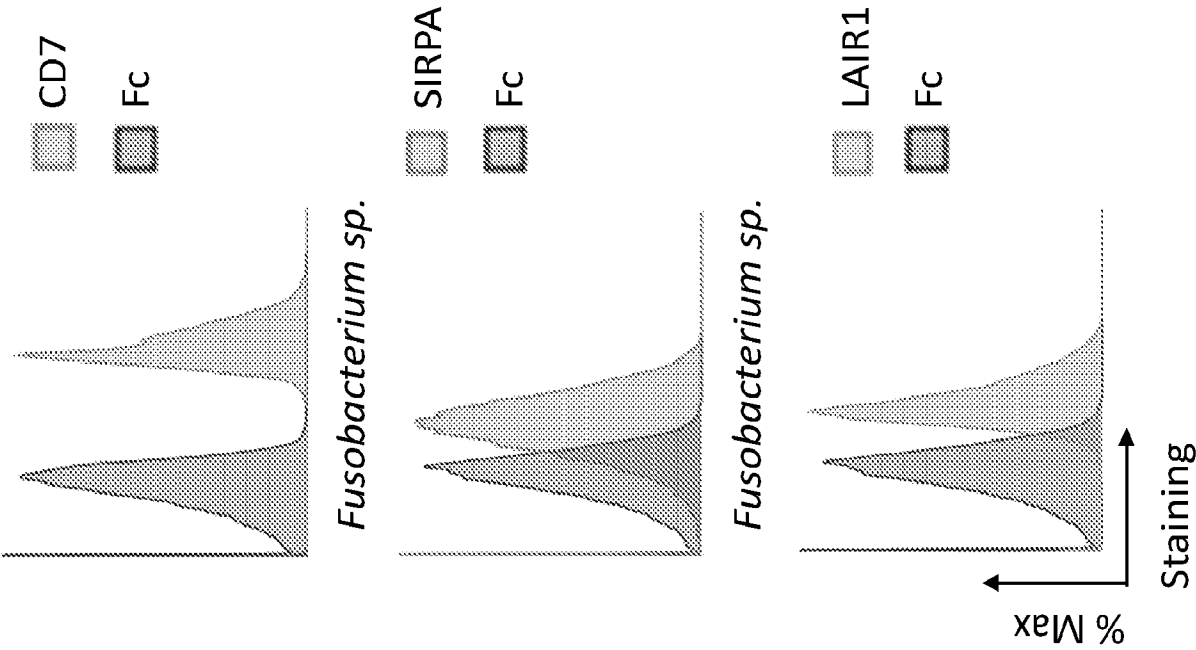


Fig. 3B

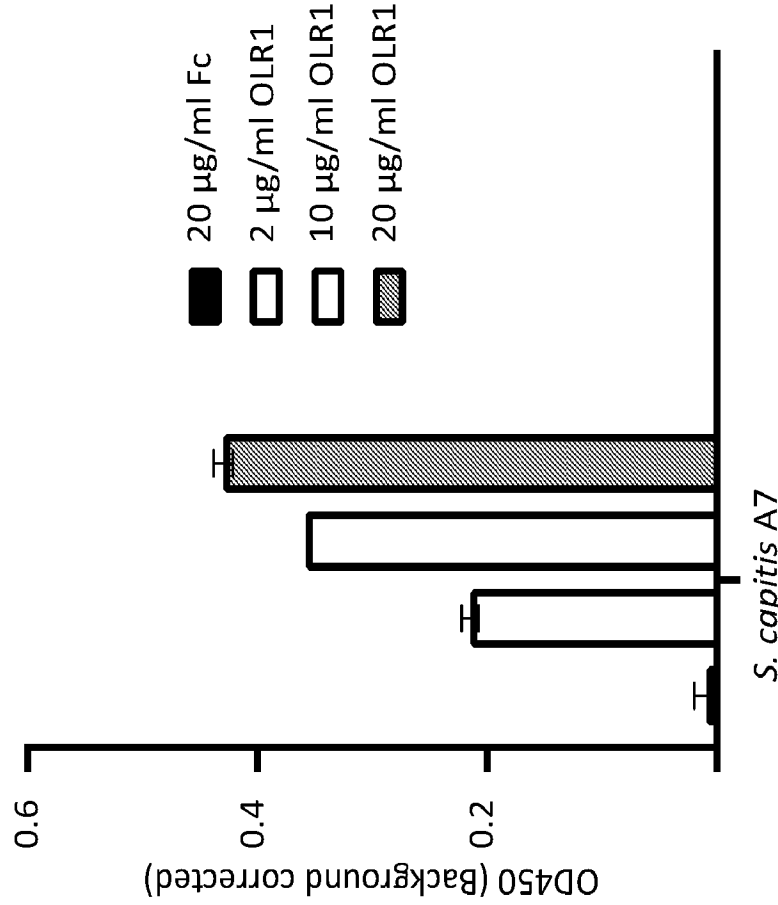


Fig. 3A – Fig. 3B

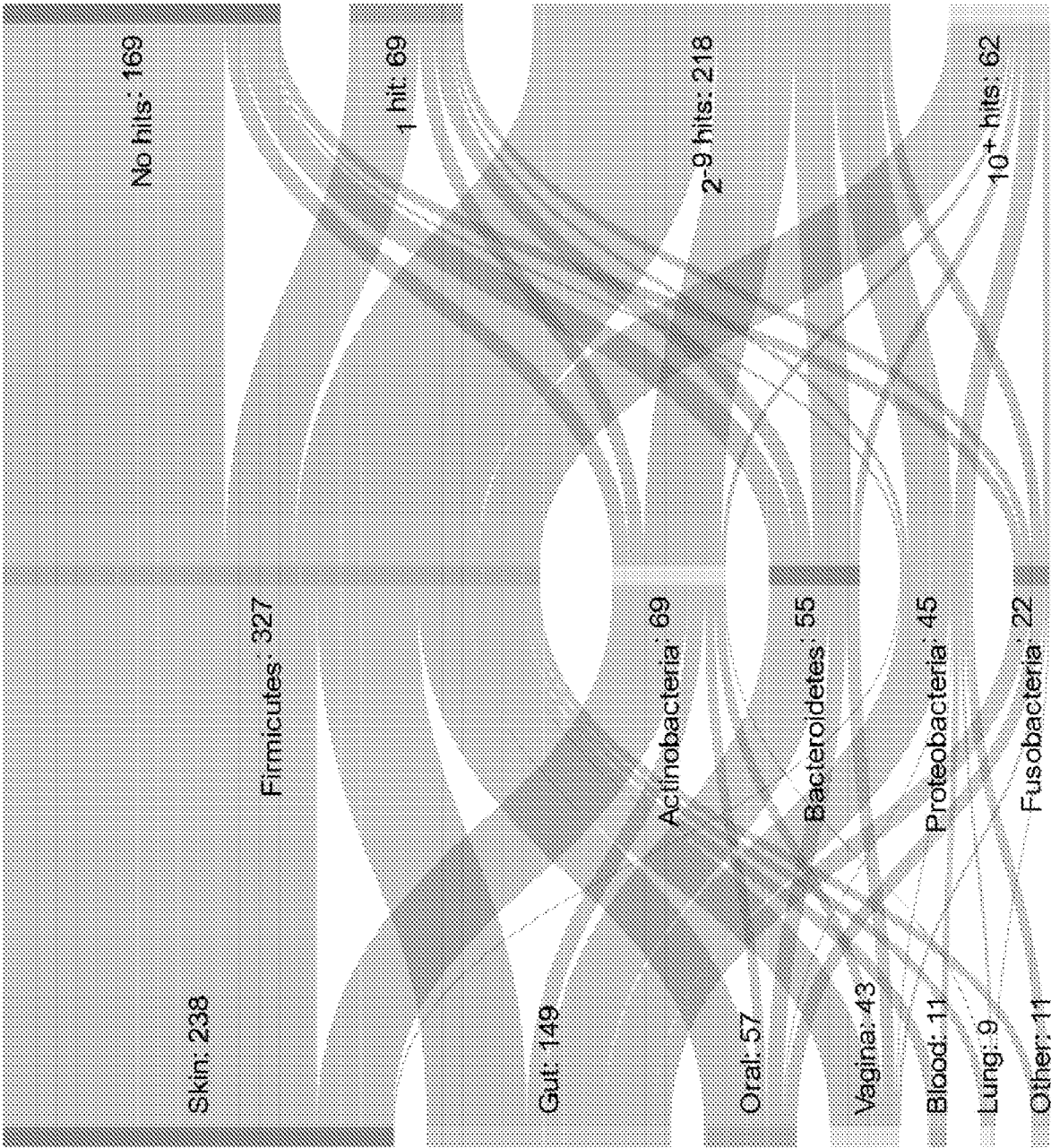


Fig. 4

Fig. 5A

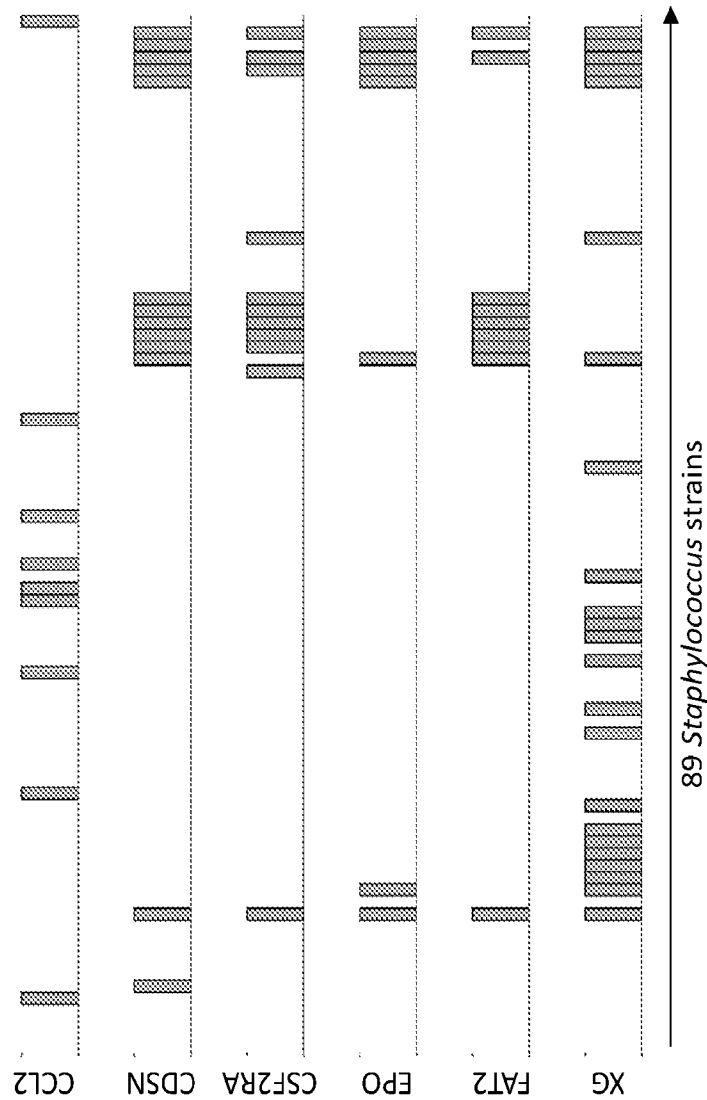


Fig. 5A

Fig. 5B

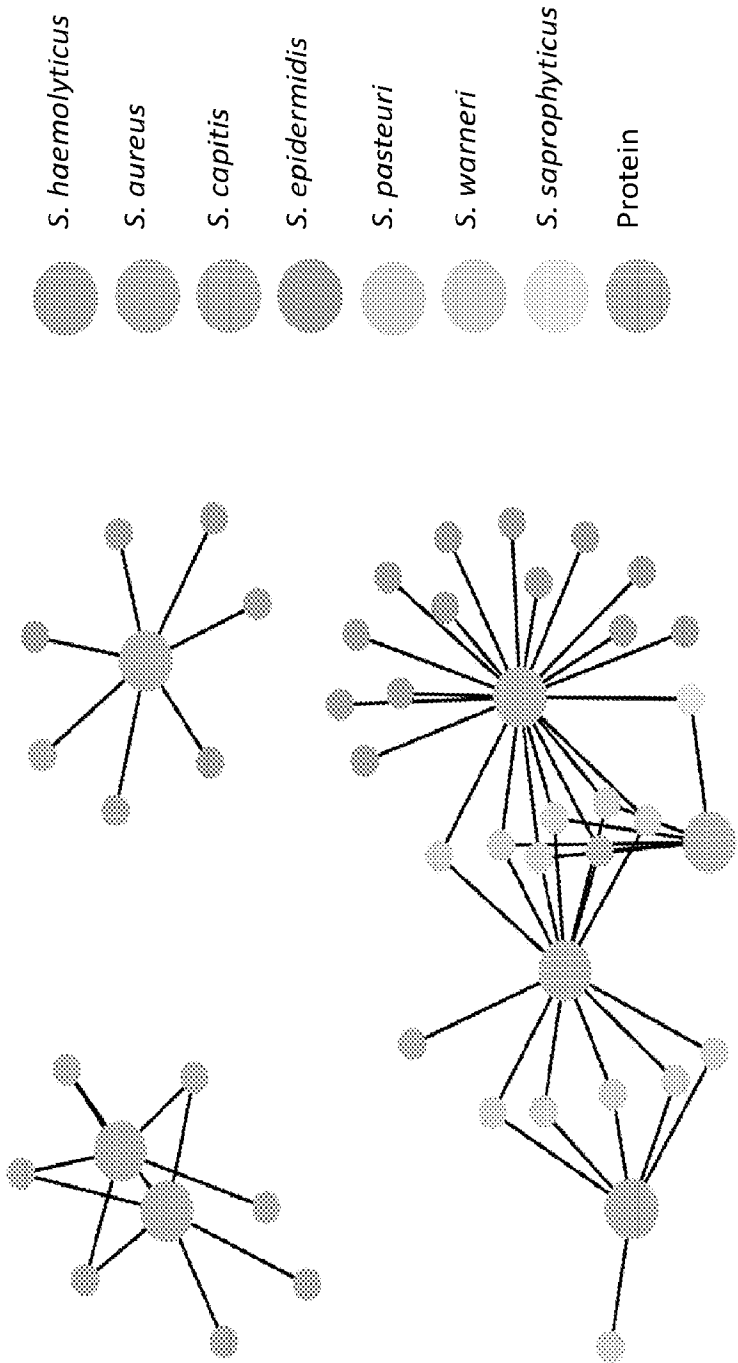


Fig. 5B

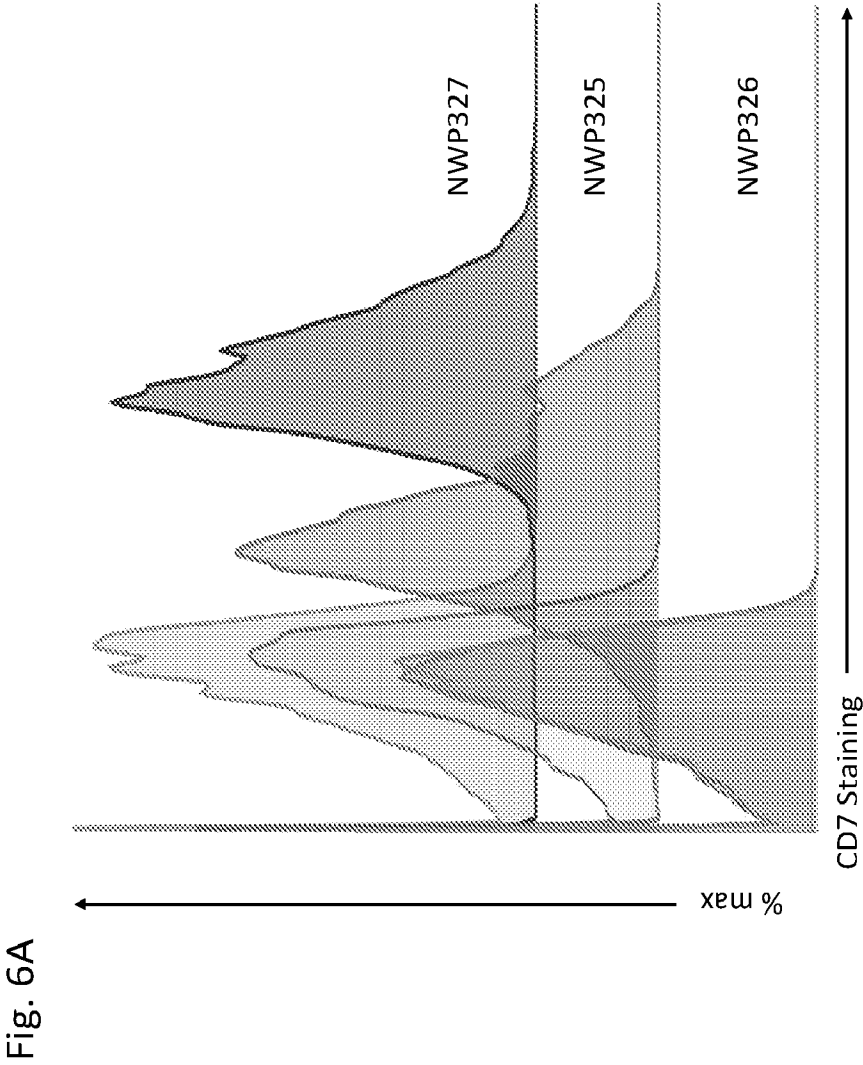


Fig. 6A

Fig. 6B

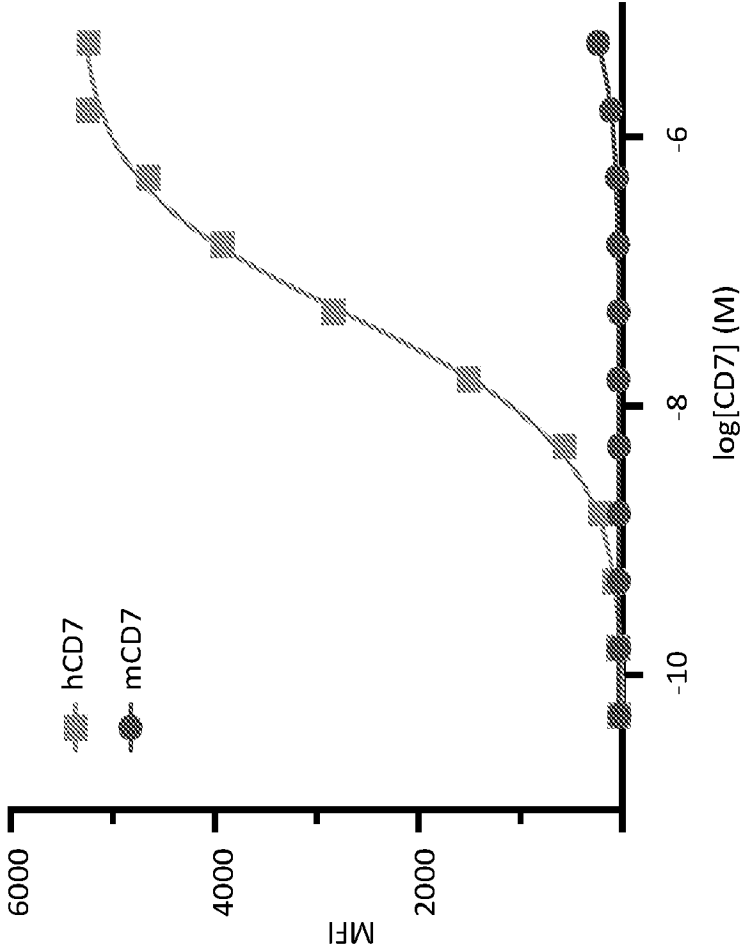


Fig. 6B

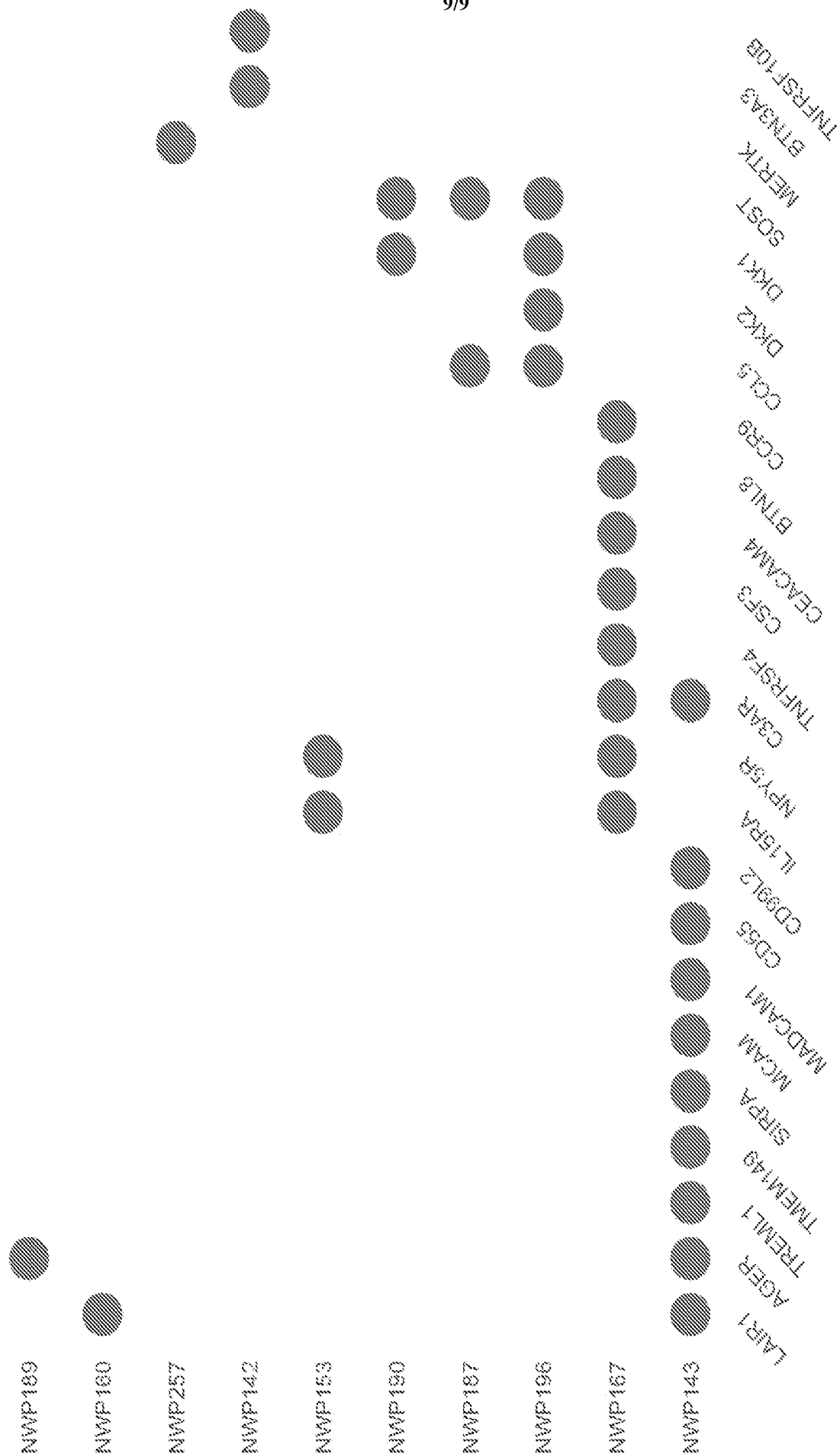


Fig. 7

INTERNATIONAL SEARCH REPORT

International application No.

PCT/US 21/59643

A. CLASSIFICATION OF SUBJECT MATTER

IPC - C12N 15/63, A61P 37/02, C12N 15/111 (2022.01)

CPC - A61K 39/3955, C12N 15/113, C12N 15/1138, C07K 2319/33, A61P 43/00

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.
Y	WO 2018/208877 A1 (YALE UNIVERSITY) 15 November 2018 (15.11.2018); Abstract; pg 31, ln 19-21; pg 32, ln 21-24; pg 34, ln 9-17	1-3
Y	US 2016/0040215 A1 (SERES THERAPEUTICS, INC) 11 February 2016 (11.02.2016); para [0077], Table 1	1-3
Y	GEYER et al., Cloning and Functional Characterization of Human Sodium-dependent Organic Anion Transporter (SLC10A6), The Journal of Biological Chemistry, 6 July 2007, Vol. 282, No. 27, p 19728-19741; p 19728, col 2, para 3	1-3
Y	US 2010/0221789 A1 (BROWN et al.) 2 September 2010 (02.09.2010); Abstract	3

☐ 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

1 February 2022

Date of mailing of the international search report

MAR 16 2022

Name and mailing address of the ISA/US

Mail Stop PCT, Attn: ISA/US, Commissioner for Patents

P.O. Box 1450, Alexandria, Virginia 22313-1450

Facsimile No. 571-273-8300

Authorized officer

Kari Rodriguez

Telephone No. PCT Helpdesk: 571-272-4300

INTERNATIONAL SEARCH REPORT

International application No.

PCT/US 21/59643

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.:
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:
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 searched, the appropriate additional search fees must be paid.

*****Continued in Supplemental Box*****

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

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/US 21/59643

Continuation of Box No. III (Observations where unity of invention is lacking):

Group I+: Claims 1-7 directed to a composition for modulating interacting partners comprising a host protein and an associated microbial cell. The host protein-microbial cell composition will be searched to the extent that the host protein is SLC10A4, the microbial cell is *Streptococcus* sp., Strain CM6 (applicant strain NWP136, instant specification Table 1), and the modulator is a siRNA targeting SLC10A4. It is believed that claims 1-3 encompass this first named invention, and thus these claims will be searched without fee to the extent that they encompass said host protein-microbial cell modulation composition. Additional host protein-microbial cell modulation compositions will be searched upon the payment of additional fees. Applicants must specify the claims that encompass any additionally elected host protein-microbial cell modulation compositions. Applicants must further indicate, if applicable, the claims which encompass 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. An exemplary election would be a composition for modulating the interaction between TFF2 and *Ruminococcus gnavus* strain NWP327(RG151) with an antibody or fragment thereof (claims 1-3 and 7).

Group II+: Claims 8-20, directed to a method of treating or preventing a disease or disorder in a subject by modulating an interaction of a host protein with an associated microbial cell. Group II+ will be searched upon payment of additional fees. The treatment method may be searched, for example, to the extent that the targeted disease is an inflammatory bowel disease, the host protein is TFF2, the microbial cell is *Ruminococcus gnavus* strain NWP327(RG151), and the modulator is an antibody targeting TFF2. It is believed that claims 8-10, 14-16 and 20 limited to said disease treatment method, read on this exemplary invention. Additional disease treatment methods will be searched upon the payment of additional fees. Applicants must specify the claims that encompass any additionally elected disease treatment methods. 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. An exemplary election would be a treatment method wherein the targeted disease is cancer, the host protein is IL15RA, the microbial cell is *Fusobacterium* sp., Strain CM22 (applicant strain NWP153), and the modulator is an antibody targeting IL15RA (Claims 8-10, 14-16 and 20).

The inventions listed as Groups I+ and II+ 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:

Special Technical Features

The technical feature of each of the inventions listed as Group I+ is a composition comprising a host protein, microbial cell, and modulator combination not required by any of the other inventions.

The technical feature of each of the inventions listed as Group II+ is a method of disease treatment comprising a host protein, microbial cell and modulator combination used to treat the disease, not required by any of the other inventions.

Groups I+ requires an isolated composition, not required by Group II+.

Group II+ requires a method of treating a disease, not required by Group I+.

Common Technical Features

The inventions of Group I+ and II+ share the technical feature of a host protein, a microbial cell that interacts with said protein, and a modulator of the interaction.

However, this shared technical feature does not represent a contribution over prior art, because the shared technical feature is taught by WO 2018/208877 A1 to Yale University (hereinafter 'Yale').

Yale teaches identifying host protein-microbial interactions and modulators of the interaction (abstract "The invention provides a BASEHIT screening method for identifying proteins that are involved in host-microbe interactions which may function as therapeutic targets", pg 32, ln 21-24 "In one embodiment, the screening method comprises screening a library of multiple display molecules against a single microbial organism. Such an embodiment is useful, for example, in identifying one or more host proteins ... that are bound by a single microbial organism", pg 34, ln 9-17 "the BASEHIT screen ..., identifies a molecule, such as a protein or peptide, that mediates a host-microbe interaction. Such a molecule (e.g., protein or peptide, etc.) and the encoding nucleic acid sequence may then serve as a target for modulating host- microbe interaction in the host organism. In one embodiment, an identified target can serve as a target for therapeutic or pharmaceutical development. In one embodiment, the target for therapeutic or pharmaceutical development may be the protein, mRNA, or DNA or an activator or inhibitor of an identified target.")

As the technical feature was known in the art at the time of the invention, this cannot be considered a special technical feature that would otherwise unify the inventions.

Groups I+ and II+ therefore lack unity under PCT Rule 13 because they do not share a same or corresponding special technical feature.