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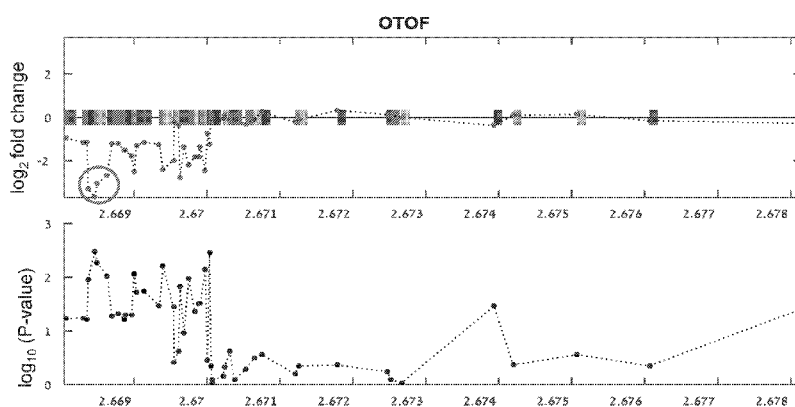
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(54) Title: ANALYZING RNA FOR DIAGNOSING INFECTION TYPE

FIG. 2A



(57) Abstract: A method of selecting an exon of an RNA whose expression level is informative with respect to infection type of a subject is disclosed. The method comprises comparing the expression level of the RNA in a sample derived from a bacterially- infected subject and a sample derived from a virally-infected subject at a plurality of exons, wherein the exon that provides a differential expression between the bacterially- infected subject and the virally-infected subject above a predetermined level is selected as the exon of the RNA whose expression is informative with respect to infection type.

ANALYZING RNA FOR DIAGNOSING INFECTION TYPE

FIELD AND BACKGROUND OF THE INVENTION

The present invention, in some embodiments thereof, relates to the identification
5 of signatures and determinants associated with bacterial and viral infections. More
specifically, the present invention relates to RNA determinants that are differentially
expressed in a statistically significant manner in subjects with bacterial and viral
infections.

Antibiotics (Abx) are the world's most prescribed class of drugs with a 25-30
10 billion \$US global market. Abx are also the world's most misused drug with a
significant fraction of all drugs (40-70%) being wrongly prescribed (Linder and Stafford
2001; Scott and Cohen 2001; Davey, P. and E. Brown, et al 2006; Cadieux, G. and R.
Tamblyn, et al. 2007; Pulcini, C. and E. Cua, et al. 2007) (“CDC - Get Smart: Fast Facts
About Antibiotic Resistance” 2011).

15 One type of Abx misuse is when the drug is administered in case of a non-
bacterial disease, such as a viral infection, for which Abx is ineffective. For example,
according to the USA center for disease control and prevention CDC, over 60 Million
wrong Abx prescriptions are given annually to treat flu in the US. The health-care and
economic consequences of the Abx over-prescription include: (i) the cost of antibiotics
20 that are unnecessarily prescribed globally, estimated at >\$10 billion annually; (ii) side
effects resulting from unnecessary Abx treatment are reducing quality of healthcare,
causing complications and prolonged hospitalization (e.g. allergic reactions, Abx
associated diarrhea, intestinal yeast etc.) and (iii) the emergence of resistant strains of
bacteria as a result of the overuse.

25 Resistance of microbial pathogens to antibiotics is increasing world-wide at an
accelerating rate (“CDC - Get Smart: Fast Facts About Antibiotic Resistance” 2013;
“European Surveillance of Antimicrobial Consumption Network (ESAC-Net)” 2014;
“CDC - About Antimicrobial Resistance” 2013; “Threat Report 2013 | Antimicrobial
Resistance | CDC” 2013), with a concomitant increase in morbidity and mortality
30 associated with infections caused by antibiotic resistant pathogens (“Threat Report 2013
| Antimicrobial Resistance | CDC” 2013). At least 2 million people are infected with
antibiotic resistant bacteria each year in the US alone, and at least 23,000 people die as

a direct result of these infections (“Threat Report 2013 | Antimicrobial Resistance | CDC” 2013). In the European Union, an estimated 400,000 patients present with resistant bacterial strains each year, of which 25,000 patients die (“WHO Europe -Data and Statistics” 2014). Consequently, the World Health Organization has warned that therapeutic coverage will be insufficient within 10 years, putting the world at risk of entering a “post-antibiotic era”, in which antibiotics will no longer be effective against infectious diseases (“WHO | Antimicrobial Resistance” 2013). The CDC considers this phenomenon “one of the world’s most pressing health problems in the 21st century” (“CDC - About Antimicrobial Resistance” 2013; Arias and Murray 2009).

Antibiotics under-prescription is not uncommon either. For example up to 15% of adult bacterial pneumonia hospitalized patients in the US receive delayed or no Abx treatment, even though in these instances early treatment can save lives and reduce complications (Houck, P.M. and D. W. Bratzler, et al 2002).

Technologies for infectious disease diagnostics have the potential to reduce the associated health and financial burden associated with Abx misuse. Ideally, such a technology should: (i) accurately differentiate between a bacterial and viral infections; (ii) be rapid (within minutes); (iii) be able to differentiate between pathogenic and non-pathogenic bacteria that are part of the body’s natural flora; (iv) differentiate between mixed co-infections and pure viral infections and (v) be applicable in cases where the pathogen is inaccessible (e.g. sinusitis, pneumonia, otitis-media, bronchitis, etc).

Current solutions (such as culture, PCR and immunoassays) do not fulfill all these requirements: (i) Some of the assays yield poor diagnostic accuracy (e.g. low sensitivity or specificity) (Uyeki et al. 2009), and are restricted to a limited set of bacterial or viral strains; (ii) they often require hours to days; (iii) they do not distinguish between pathogenic and non-pathogenic bacteria (Del Mar, C 1992), thus leading to false positives; (iv) they often fail to distinguish between a mixed and a pure viral infections and (v) they require direct sampling of the infection site in which traces of the disease causing agent are searched for, thus prohibiting the diagnosis in cases where the pathogen resides in an inaccessible tissue, which is often the case. Moreover, currently available diagnostic approaches often suffer from reduced clinical utility because they do not distinguish between pathogenic strains of microorganisms and potential colonizers, which can be present as part of the natural microbiota without

causing an infection (Kim, Shin, and Kim 2009; Shin, Han, and Kim 2009; Jung, Lee, and Chung 2010; Rhedin et al. 2014). For example, Rhedin and colleagues recently tested the clinical utility of qPCR for common viruses in acute respiratory illness (Rhedin et al. 2014). The authors concluded that qPCR detection of several respiratory
5 viruses including rhinovirus, enterovirus and coronavirus should be interpreted with caution due to high detection rates in asymptomatic children. Other studies reached similar conclusions after analyzing the detection rates of different bacterial strains in asymptomatic patients (Bogaert, De Groot, and Hermans 2004; Spuesens et al. 2013).

Consequently, there is still a diagnostic gap, which in turn often leads
10 physicians to either over-prescribe Abx (the “Just-in-case-approach”), or under-prescribe Abx (the “Wait-and-see-approach”) (Little, P.S. and I. Williamson 1994; Little, P. 2005; Spiro, D. M. and K. Y. Tay, et al 2006), both of which have far reaching health and financial consequences.

Accordingly, a need exists for a rapid method that accurately differentiates
15 between bacterial, viral, mixed and non-infectious disease patients that addresses these challenges. An approach that has the potential to address these challenges relies on monitoring the host's immune-response to infection, rather than direct pathogen detection (Cohen et al. 2015). Bacterial-induced host proteins such as procalcitonin, C-reactive protein (CRP), and Interleukin-6, are routinely used to support diagnosis of
20 infection. However, their performance is negatively affected by inter-patient variability, including time from symptom onset, clinical syndrome, and pathogen species (Tang et al. 2007; Limper et al. 2010; Engel et al. 2012; Quenot et al. 2013; van der Meer et al. 2005; Falk and Fahey 2009). Oved et al. 2015 has developed an immune signature, combining both bacterial- and viral-induced circulating host-proteins, which can aid in
25 the correct diagnosis of patients with acute infections.

Additional background art includes Ramilo et al., Blood, March 1 2007, Vol 109, No. 5, pages 2066-2077, Zaas et al., *Sci Transl Med.* 2013 September 18; 5(203) 203ra126. doi:10.1126/scitranslmed.3006280; US Patent Application No. 20080171323, WO2011/132086, WO2013/117746, WO2007011412 and WO2004108899 A2.

SUMMARY OF THE INVENTION

According to an aspect of the present invention there is provided a method of determining an infection type in a subject comprising measuring the expression of at least one RNA determinant in a sample of the subject, wherein the measuring is effected
5 at an exon or plurality of exons whose expression level distinguishes between a bacterial and viral infection with a degree of accuracy above a predetermined level, thereby determining the infection type of the subject.

According to an aspect of the present invention there is provided a method of selecting an exon of an RNA whose expression level is informative with respect to
10 infection type of a subject comprising comparing the expression level of the RNA in a sample derived from a bacterially-infected subject and a sample derived from a virally-infected subject at a plurality of exons, wherein the exon that provides a differential expression between the bacterially-infected subject and the virally-infected subject above a predetermined level is selected as the exon of the RNA whose expression is
15 informative with respect to infection type.

According to an aspect of the present invention there is provided a kit comprising at least two oligonucleotides, wherein the first of the at least two oligonucleotides specifically hybridizes to a first RNA at a first exon, and a second of the at least two oligonucleotides specifically hybridizes to the first RNA at a second
20 exon, the first and the second exon being selected such that the expression level from the first exon distinguishes between a bacterial and viral infection with a degree of accuracy above a predetermined level and the expression level from the second exon distinguishes between a bacterial and viral infection with a degree of accuracy above the predetermined level.

According to an aspect of the present invention there is provided a kit comprising at least two oligonucleotides, wherein the first of the at least two oligonucleotides specifically hybridizes to a first RNA at a first exon, and a second of the at least two oligonucleotides specifically hybridizes to a second RNA at a second
25 exon, the first and the second exon being selected such that the expression level from the first exon distinguishes between a bacterial and viral infection with a degree of accuracy above a predetermined level and the expression level from the second exon
30 the first exon distinguishes between a bacterial and viral infection with a degree of accuracy above a predetermined level and the expression level from the second exon

distinguishes between a bacterial and viral infection with a degree of accuracy above the predetermined level.

According to an aspect of the present invention there is provided a primer pair which hybridize to an RNA at an exon whose expression level distinguishes between a bacterial and viral infection with a degree of accuracy above a predetermined level.

According to an aspect of the present invention there is provided an array comprising a solid support and a polynucleotide that specifically hybridizes to a first RNA at a predetermined exon, the polynucleotide being attached to the solid support, the predetermined exon being selected such that the expression level therefrom distinguishes between a bacterial and viral infection with a degree of accuracy above a predetermined level, wherein the array comprises oligonucleotides that hybridize to no more than 3 exons of the first RNA.

According to an aspect of the present invention there is provided a array comprising a solid support, a first polynucleotide that specifically hybridizes to a first RNA at a first exon and a second polynucleotide that specifically hybridizes to a second exon of a second RNA, the first and second polynucleotide being attached to the solid support, the first exon being selected such that the expression level therefrom distinguishes between a bacterial and viral infection with a degree of accuracy above a predetermined level and the second exon being selected such that the expression level therefrom distinguishes between a bacterial and viral infection with a degree of accuracy above a predetermined level, wherein the array comprises oligonucleotides that hybridize to no more than 20 non-identical RNAs.

According to embodiments of the present invention, the exon provides a differential expression between a bacterially-infected subject and a virally-infected subject above a predetermined level.

According to embodiments of the present invention, the exon provides the highest degree of differential expression in a sample derived from a bacterially infected subject compared with a virally infected subject, compared to all the exons of the RNA.

According to embodiments of the present invention, the RNA is set forth in Tables 10A or 10B.

According to embodiments of the present invention, the exon of the RNA is selected as set forth in Table 10A or 10B.

According to embodiments of the present invention, the sample comprises RNA.

According to embodiments of the present invention, the sample comprises cDNA.

According to embodiments of the present invention, the comparing is effected
5 using a plurality of oligonucleotides.

According to embodiments of the present invention, the method comprises:

(a) analyzing the expression level of the RNA in a sample derived from the bacterially-infected subject using a plurality of oligonucleotides which hybridize to non-identical exons of the RNA or cDNA generated therefrom;

10 (b) analyzing the expression level of the RNA in a sample derived from the virally-infected subject using a plurality of oligonucleotides which hybridize to the non-identical exons, wherein the plurality of oligonucleotides of step (a) have the same binding stringency to the exons as the plurality of oligonucleotides of step (b) to the exons.

15 According to embodiments of the present invention, the nucleic acid sequence of the oligonucleotides of step (a) is identical to the nucleic acid sequence of the oligonucleotides of step (b).

According to embodiments of the present invention, the method further comprises comparing the expression level of the RNA across each exon of the RNA.

20 According to embodiments of the present invention, the exon that provides the highest degree of differential expression is selected as the exon of the RNA whose expression is informative with respect to infection type.

According to embodiments of the present invention, the comparing is performed under identical experimental conditions.

25 According to embodiments of the present invention, the sample is whole blood or a fraction thereof.

According to embodiments of the present invention, the blood fraction sample comprises cells selected from the group consisting of lymphocytes, monocytes and granulocytes.

30 According to embodiments of the present invention, the blood fraction sample comprises serum or plasma.

According to embodiments of the present invention, the plurality of exons comprise no more than 2 exons.

According to embodiments of the present invention, the plurality of exons comprise no more than 5 exons.

5 According to embodiments of the present invention, the oligonucleotides are attached to a detectable moiety.

According to embodiments of the present invention, the kit comprises oligonucleotides that hybridize to no more than 3 exons of the first RNA.

10 According to embodiments of the present invention, the kit comprises oligonucleotides that hybridize to no more than 20 RNAs.

According to embodiments of the present invention, the kit comprises oligonucleotides that hybridize to no more than 10 RNAs.

According to embodiments of the present invention, the kit comprises oligonucleotides that hybridize to no more than 3 RNAs.

15 According to embodiments of the present invention, the array comprises oligonucleotides that hybridize to no more than 20 non-identical RNAs.

According to embodiments of the present invention, the array comprises oligonucleotides that hybridize to no more than 3 exons of the first RNA and/or the second RNA.

20 According to embodiments of the present invention, the RNA is set forth in Table 10A or 10B.

According to embodiments of the present invention, at least one of the oligonucleotides hybridize to the exon of the RNA set forth in Table 10A or 10B.

25 Unless otherwise defined, all technical and/or scientific terms used herein have the same meaning as commonly understood by one of ordinary skill in the art to which the invention pertains. Although methods and materials similar or equivalent to those described herein can be used in the practice or testing of embodiments of the invention, exemplary methods and/or materials are described below. In case of conflict, the patent specification, including definitions, will control. In addition, the materials, methods, and
30 examples are illustrative only and are not intended to be necessarily limiting.

BRIEF DESCRIPTION OF THE SEVERAL VIEWS OF THE DRAWINGS

Some embodiments of the invention are herein described, by way of example only, with reference to the accompanying drawings. With specific reference now to the drawings in detail, it is stressed that the particulars shown are by way of example and for
5 purposes of illustrative discussion of embodiments of the invention. In this regard, the description taken with the drawings makes apparent to those skilled in the art how embodiments of the invention may be practiced.

In the drawings:

FIG. 1 is a flow-chart of the clinical study design.

10 FIGs. 2A-C illustrate that single exons are differentially expressed between bacterial and viral patients (A. OTOF gene; B. TREML4 gene; C. RGS1 gene). The x-axis represents genomic coordinates; exons are indicated in colored rectangles; broken line depict the log 2 fold change between bacterial and viral infections (with positive and negative numbers indicating over-expression of bacterial and viral infections
15 respectively). In the bottom part of the image the Wilcoxon rank sum log 10 (P-value) of the differential expression is depicted. Highly discriminative exons are marked by red circle.

FIGs. 3A-L illustrate that specific single exons are differentially expressed between bacterial and viral patients. The x-axis represents genomic coordinates; exons
20 are indicated in colored rectangles; broken line depict the fold change between bacterial and viral infections (with positive and negative numbers indicating over-expression of bacterial and viral infections respectively). In the bottom part of the image the -log10 (t-test P-value) of the differential expression is depicted. Data is based on experiments described in Example 2. Exemplary highly discriminative exons are marked by red
25 circles.

DESCRIPTION OF SPECIFIC EMBODIMENTS OF THE INVENTION

The present invention, in some embodiments thereof, relates to the identification of signatures and determinants associated with bacterial and viral infections. More
30 specifically, the present invention relates to RNA determinants that are differentially expressed in a statistically significant manner in subjects with bacterial and viral infections.

Before explaining at least one embodiment of the invention in detail, it is to be understood that the invention is not necessarily limited in its application to the details set forth in the following description or exemplified by the Examples. The invention is capable of other embodiments or of being practiced or carried out in various ways.

5 Methods of distinguishing between bacterial and viral infections by analyzing protein determinants have been disclosed in International Patent Application WO2013/117746, to the present inventors. Seeking to expand the number and type of determinants that can aid in accurate diagnosis, the present inventors have now carried out additional clinical experiments and have identified other determinants that can be
10 used for this aim.

The present inventors studied the gene expression profiles of blood leukocytes obtained from patients with acute infections. The results indicate there is a differential response of the immune system to bacterial and viral infections, which can potentially be used to classify acute infection patients. Initially, the present inventors identified 62
15 RNA determinants that were differentially expressed in the bacterial and viral patients tested (Table 11).

Whilst reducing the present invention to practice, the present inventors computed the exon-level differential expression of the 62 genes described in Table 11 and compared the median log fold change of each individual exon to its full length gene
20 (Table 12). Unexpectedly, the present inventors found that particular exons of the determinants showed a higher differential expression in samples derived from bacterial and virally infected subjects than the corresponding full length RNA.

Using a larger cohort of patients, the present inventors found additional RNA determinants of which particular exons could be used to accurately distinguish between
25 bacterial and viral infections. These are described in Tables 13 and 14 of the Examples section herein below.

All these exons have the potential to serve as diagnostic biomarkers or to enhance the performance of transcriptomic signatures composed of several full or partial RNA determinants. For example, the present inventors found the full length
30 OTOF gene to be a poor-moderate discriminator between bacterial and viral patients (log₂-fold change of -0.83; Table 11), while a subset of its exons was highly

discriminative ($\log_2$ -fold change between -2.3 and -3.9; Figure 2A) and could potentially serve as useful biomarkers.

Consequently, the present teachings suggest that in order to distinguish between bacterial and viral infections using RNA determinants it is important to select the location on the RNA which provides the most discriminative results.

Thus, according to a first aspect of the present invention, there is provided a method of selecting an exon of an RNA whose expression level is informative with respect to infection type of a subject comprising comparing the expression level of the RNA in a sample derived from a bacterially-infected subject and a sample derived from a virally-infected subject at a plurality of exons, wherein the exon that provides a differential expression between the bacterially-infected subject and the virally-infected subject above a predetermined level is selected as the exon of the RNA whose expression is informative with respect to infection type.

The term "RNA determinant" refers to an RNA whose expression level is informative with respect to infection type of a subject. The RNA may code for a polypeptide. In another embodiment, the RNA is a non-coding RNA.

The numbering of the exons of an RNA (i.e. gene annotation) may be found using the Affymetrix database and other public domains such as the UCSC genome browser. For each of the RNAs in the application, the position of the exon is annotated in the Tables of the Examples section herein below.

The term "sample" as used herein refers to a biological sample isolated from a subject and can include, by way of example and not limitation, whole blood, serum, plasma, saliva, mucus, breath, urine, CSF, sputum, sweat, stool, hair, seminal fluid, biopsy, rhinorrhea, tissue biopsy, cytological sample, platelets, reticulocytes, leukocytes, epithelial cells, or whole blood cells.

For measuring RNA determinants, preferably the sample is a blood sample comprising white blood cells such as lymphocytes, monocytes and granulocytes (which is depleted of red blood cells). In one embodiment, the sample is not a serum sample.

Methods of depleting red blood cells are known in the art and include for example hemolysis, centrifugation, sedimentation, filtration or combinations thereof.

In one embodiment, the sample of this aspect of the present invention comprises RNA.

The RNA sample of this aspect of the present invention may comprise RNA from a heterogeneous population of cells or from a single population of cells. The RNA may comprise total RNA, mRNA, mitochondrial RNA, chloroplast RNA, DNA-RNA hybrids, viral RNA, cell free RNA, and mixtures thereof. In one embodiment, the RNA sample is devoid of DNA.

The sample may be fresh or frozen.

Isolation, extraction or derivation of RNA may be carried out by any suitable method. Isolating RNA from a biological sample generally includes treating a biological sample in such a manner that the RNA present in the sample is extracted and made available for analysis. Any isolation method that results in extracted RNA may be used in the practice of the present invention. It will be understood that the particular method used to extract RNA will depend on the nature of the source.

Methods of RNA extraction are well-known in the art and further described herein under.

Phenol based extraction methods: These single-step RNA isolation methods based on Guanidine isothiocyanate (GITC)/phenol/chloroform extraction require much less time than traditional methods (e.g. CsCl_2 ultracentrifugation). Many commercial reagents (e.g. Trizol, RNazol, RNAWIZ) are based on this principle. The entire procedure can be completed within an hour to produce high yields of total RNA.

Silica gel - based purification methods: RNeasy is a purification kit marketed by Qiagen. It uses a silica gel-based membrane in a spin-column to selectively bind RNA larger than 200 bases. The method is quick and does not involve the use of phenol.

Oligo-dT based affinity purification of mRNA: Due to the low abundance of mRNA in the total pool of cellular RNA, reducing the amount of rRNA and tRNA in a total RNA preparation greatly increases the relative amount of mRNA. The use of oligo-dT affinity chromatography to selectively enrich poly (A)+ RNA has been practiced for over 20 years. The result of the preparation is an enriched mRNA population that has minimal rRNA or other small RNA contamination. mRNA enrichment is essential for construction of cDNA libraries and other applications where intact mRNA is highly desirable. The original method utilized oligo-dT conjugated resin column chromatography and can be time consuming. Recently more convenient formats such as spin-column and magnetic bead based reagent kits have become available.

The sample may also be processed prior to carrying out the diagnostic methods of the present invention. Processing of the sample may involve one or more of: filtration, distillation, centrifugation, extraction, concentration, dilution, purification, inactivation of interfering components, addition of reagents, and the like.

5 In another embodiment, the sample of this aspect of the present invention comprises cDNA.

For synthesis of cDNA, template mRNA may be obtained directly from lysed cells or may be purified from a total RNA or mRNA sample. The total RNA sample may be subjected to a force to encourage shearing of the RNA molecules such that the
10 average size of each of the RNA molecules is between 100-300 nucleotides, e.g. about 200 nucleotides. To separate the heterogeneous population of mRNA from the majority of the RNA found in the cell, various technologies may be used which are based on the use of oligo(dT) oligonucleotides attached to a solid support. Examples of such oligo(dT) oligonucleotides include: oligo(dT) cellulose/spin columns,
15 oligo(dT)/magnetic beads, and oligo(dT) oligonucleotide coated plates.

Generation of cDNA from RNA requires synthesis of an intermediate RNA-DNA hybrid. For this, a primer is required that hybridizes to the 3' end of the RNA. Annealing temperature and timing are determined both by the efficiency with which the primer is expected to anneal to a template and the degree of mismatch that is to be
20 tolerated.

The annealing temperature is usually chosen to provide optimal efficiency and specificity, and generally ranges from about 50 °C to about 80°C, usually from about 55 °C to about 70 °C, and more usually from about 60 °C to about 68 °C. Annealing conditions are generally maintained for a period of time ranging from about 15 seconds
25 to about 30 minutes, usually from about 30 seconds to about 5 minutes.

According to a specific embodiment, the primer comprises a polydT oligonucleotide sequence.

Preferably the polydT sequence comprises at least 5 nucleotides. According to another is between about 5 to 50 nucleotides, more preferably between about 5-25
30 nucleotides, and even more preferably between about 12 to 14 nucleotides.

Following annealing of the primer (e.g. polydT primer) to the RNA sample, an RNA-DNA hybrid is synthesized by reverse transcription using an RNA-dependent

DNA polymerase. Suitable RNA-dependent DNA polymerases for use in the methods and compositions of the invention include reverse transcriptases (RTs). Examples of RTs include, but are not limited to, Moloney murine leukemia virus (M-MLV) reverse transcriptase, human immunodeficiency virus (HIV) reverse transcriptase, rous sarcoma virus (RSV) reverse transcriptase, avian myeloblastosis virus (AMV) reverse transcriptase, rous associated virus (RAV) reverse transcriptase, and myeloblastosis associated virus (MAV) reverse transcriptase or other avian sarcoma-leukosis virus (ASLV) reverse transcriptases, and modified RTs derived therefrom. See e.g. U.S. Patent No. 7,056,716. Many reverse transcriptases, such as those from avian myeloblastosis virus (AMV-RT), and Moloney murine leukemia virus (MMLV-RT) comprise more than one activity (for example, polymerase activity and ribonuclease activity) and can function in the formation of the double stranded cDNA molecules.

Additional components required in a reverse transcription reaction include dNTPS (dATP, dCTP, dGTP and dTTP) and optionally a reducing agent such as Dithiothreitol (DTT) and $MnCl_2$.

A “subject” in the context of the present invention may be a mammal (e.g. human dog, cat, horse, cow, sheep, pig, goat). According to another embodiment, the subject is a bird (e.g. chicken, turkey, duck or goose). According to a particular embodiment, the subject is a human. The subject can be male or female.

A “virally-infected subject”, as used herein, refers to a subject who has been infected with a virus, preferably a pathogenic virus.

Exemplary pathogenic viruses may belong to the following families: Adenoviridae, Picornaviridae, Herpesviridae, Hepadnaviridae, Flaviviridae, Retroviridae, Orthomyxoviridae, Paramyxoviridae, Papovaviridae, Polyomavirus, Rhabdoviridae, Togaviridae. Particular pathogenic viruses contemplated by the present invention are those that cause smallpox, influenza, mumps, measles, chickenpox, ebola, or rubella.

According to a particular embodiment, the virus is one which brings about a respiratory infection (e.g. an upper respiratory tract infection and/or a lower respiratory tract infection).

Thus, according to a particular embodiment, the pathogenic virus is an influenza virus (e.g. influenza virus A - (e.g. H1N1, H2N2, H3N2, H5N1, H7N7, H1N2, H9N2, H7N2, H7N3, H10N7 and H7N9), influenza virus B or influenza virus C).

In another embodiment, the pathogenic virus is a parainfluenza virus (hPIV) including the human parainfluenza virus type 1 (hPIV-1) (causes croup); the human parainfluenza virus type 2 (hPIV-2) (causes croup and other upper and lower respiratory tract illnesses), the human parainfluenza virus type 3 (hPIV-3) (associated with bronchiolitis and pneumonia) and the human parainfluenza virus type 4 (hPIV-4).

In yet another embodiment, the pathogenic virus is a respiratory syncytial virus (RSV).

A “bacterially-infected subject”, as used herein, refers to a subject who has been infected with a bacteria, preferably a pathogenic bacteria.

Exemplary pathogenic bacteria include *Mycobacterium tuberculosis* which causes *tuberculosis*, *Streptococcus* and *Pseudomonas* which cause *pneumonia*, and *Shigella*, *Campylobacter* and *Salmonella* which cause foodborne illnesses. Other exemplary pathogenic bacteria contemplated by the present invention are those that cause infections such as tetanus, typhoid fever, diphtheria, syphilis and Hansen's disease.

As mentioned, this aspect of the present invention comprises comparing the expression level of an RNA in a sample derived from a bacterially infected subject at a plurality of exons with the expression level of the same RNA in a sample derived from a virally infected subject at the same plurality of exon.

For the comparison to be accurate, it is preferable that the sample type from the bacterially infected subject is the same as the sample type from the virally infected subject. Thus, for example, if the bacterial sample type is a blood sample, the viral sample type should also be a blood sample. As another example, if the bacterial sample comprises cDNA, then the viral sample should also comprise cDNA.

Preferably, the sample of the bacterial subject is prepared in the same way as the sample of the viral subject. In some embodiments, identical protocols are used for preparing the sample.

As mentioned, the expression level of the RNA is analyzed at a plurality of exons. According to this aspect of the present invention, the expression level of at least two exons of a particular RNA are analyzed per sample, the expression level of at least

three exons of a particular RNA are analyzed per sample, the expression level of at least four exons of a particular RNA are analyzed per sample, the expression level of at least five exons of a particular RNA are analyzed per sample. According to other embodiments at least 10 % of the exons of a particular RNA are analyzed per sample, at least 20 % of the exons of a particular RNA are analyzed per sample, at least 30 % of the exons of a particular RNA are analyzed per sample, at least 40 % of the exons of a particular RNA are analyzed per sample, at least 50 % of the exons of a particular RNA are analyzed per sample, at least 60 % of the exons of a particular RNA are analyzed per sample, at least 70 % of the exons of a particular RNA are analyzed per sample, at least 80 % of the exons of a particular RNA are analyzed per sample, at least 90 % of the exons of a particular RNA are analyzed per sample, 100 % of the exons of a particular RNA are analyzed per sample.

In one embodiment, at least one of the exons which is analyzed is the 3' exon. In another embodiment, at least one of the exons which is analyzed is the 5' exon.

In some embodiments, an oligonucleotide is used to analyze the expression level of an RNA at a particular exon. The oligonucleotide preferably hybridizes discriminately to the target exon over the other exons of the RNA.

Oligonucleotides (e.g. DNA or RNA oligonucleotides) typically comprises a region of complementary nucleotide sequence that hybridizes under stringent conditions to at least about 8, 10, 13, 16, 18, 20, 22, 25, 30, 40, 50, 55, 60, 65, 70, 80, 90, 100, 120 (or any other number in-between) or more consecutive nucleotides in a target nucleic acid molecule.

In order to identify an oligonucleotide specific for any of the determinant sequences, the gene/transcript of interest is typically examined using a computer algorithm which starts at the 5' or at the 3' end of the nucleotide sequence. Typical algorithms will then identify oligonucleotides of defined length that are unique to the gene, have a GC content within a range suitable for hybridization, lack predicted secondary structure that may interfere with hybridization, and/or possess other desired characteristics or that lack other undesired characteristics.

Following identification of the oligonucleotide it may be tested for specificity towards the determinant under wet or dry conditions. Thus, for example, in the case where the oligonucleotide is a primer, the primer may be tested for its ability to amplify

a sequence of the determinant using PCR to generate a detectable product and for its non ability to amplify other determinants in the sample. The products of the PCR reaction may be analyzed on a gel and verified according to presence and/or size.

5 Additionally, or alternatively, the sequence of the oligonucleotide may be analyzed by computer analysis to see if it is homologous (or is capable of hybridizing to) other known sequences. A BLAST 2.2.10 (Basic Local Alignment Search Tool) analysis may be performed on the chosen oligonucleotide (worldwideweb(dot)ncbi(dot)nml(dot)nih(dot)gov/blast/). The BLAST program finds regions of local similarity between sequences. It compares nucleotide or protein
10 sequences to sequence databases and calculates the statistical significance of matches thereby providing valuable information about the possible identity and integrity of the 'query' sequences.

According to additional embodiments, the oligonucleotide is about 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24 or 25 nucleotides in length. While the
15 maximal length of a probe can be as long as the target sequence to be detected, depending on the type of assay in which it is employed, it is typically less than about 50, 60, 65, or 70 nucleotides in length. In the case of a primer, it is typically less than about 30 nucleotides in length. In a specific preferred embodiment of the invention, a primer or a probe is within the length of about 18 and about 28 nucleotides. It will be appreciated
20 that when attached to a solid support, the probe may be of about 30-70, 75, 80, 90, 100, or more nucleotides in length.

The oligonucleotide of this aspect of the present invention need not reflect the exact sequence of the determinant exon nucleic acid sequence (i.e. need not be fully complementary), but must be sufficiently complementary to hybridize with the
25 determinant exon nucleic acid sequence under the particular experimental conditions. Accordingly, the sequence of the oligonucleotide typically has at least 70 % homology, preferably at least 80 %, 90 %, 95 %, 97 %, 99 % or 100 % homology, for example over a region of at least 13 or more contiguous nucleotides with the target determinant exon nucleic acid sequence. The conditions are selected such that hybridization of the
30 oligonucleotide to the determinant exon nucleic acid sequence is favored and hybridization to other determinant exon nucleic acid sequences is minimized.

By way of example, hybridization of short nucleic acids (below 200 bp in length, e.g. 13-50 bp in length) can be effected by the following hybridization protocols depending on the desired stringency; (i) hybridization solution of 6 x SSC and 1 % SDS or 3 M TMACl, 0.01 M sodium phosphate (pH 6.8), 1 mM EDTA (pH 7.6), 0.5 % SDS, 100 µg/ml denatured salmon sperm DNA and 0.1 % nonfat dried milk, hybridization temperature of 1 - 1.5 °C below the T_m, final wash solution of 3 M TMACl, 0.01 M sodium phosphate (pH 6.8), 1 mM EDTA (pH 7.6), 0.5 % SDS at 1 - 1.5 °C below the T_m (stringent hybridization conditions) (ii) hybridization solution of 6 x SSC and 0.1 % SDS or 3 M TMACl, 0.01 M sodium phosphate (pH 6.8), 1 mM EDTA (pH 7.6), 0.5 % SDS, 100 µg/ml denatured salmon sperm DNA and 0.1 % nonfat dried milk, hybridization temperature of 2 - 2.5 °C below the T_m, final wash solution of 3 M TMACl, 0.01 M sodium phosphate (pH 6.8), 1 mM EDTA (pH 7.6), 0.5 % SDS at 1 - 1.5 °C below the T_m, final wash solution of 6 x SSC, and final wash at 22 °C (stringent to moderate hybridization conditions); and (iii) hybridization solution of 6 x SSC and 1 % SDS or 3 M TMACl, 0.01 M sodium phosphate (pH 6.8), 1 mM EDTA (pH 7.6), 0.5 % SDS, 100 µg/ml denatured salmon sperm DNA and 0.1 % nonfat dried milk, hybridization temperature at 2.5-3 °C below the T_m and final wash solution of 6 x SSC at 22 °C (moderate hybridization solution).

It will be appreciated that the oligonucleotide which is used to analyze expression of a particular exon in the sample derived from the bacterially infected subject should have the same binding stringency as the oligonucleotide which is used to analyze the expression of that same exon in the sample derived from the virally infected subject.

In a particular embodiment, the oligonucleotide which is used to analyze expression of a particular exon in the sample derived from the bacterially infected subject is identical (i.e. has an identical sequence) to the oligonucleotide which is used to analyze the expression of that same exon in the sample derived from the virally infected subject.

According to one embodiment, the oligonucleotide is a probe.

As used herein, the term "probe" refers to an oligonucleotide which hybridizes to a particular exon of the determinant specific nucleic acid sequence to provide a detectable signal under experimental conditions and which does not hybridize to

additional exons of the RNA to provide a detectable signal under identical experimental conditions.

The probes of this embodiment of this aspect of the present invention may be, for example, affixed to a solid support (e.g., arrays or beads).

5 Solid supports are solid-state substrates or supports onto which the nucleic acid molecules of the present invention may be associated. The nucleic acids may be associated directly or indirectly. Solid-state substrates for use in solid supports can include any solid material with which components can be associated, directly or indirectly. This includes materials such as acrylamide, agarose, cellulose, nitrocellulose,
10 glass, gold, polystyrene, polyethylene vinyl acetate, polypropylene, polymethacrylate, polyethylene, polyethylene oxide, polysilicates, polycarbonates, teflon, fluorocarbons, nylon, silicon rubber, polyanhydrides, polyglycolic acid, polylactic acid, polyorthoesters, functionalized silane, polypropylfumerate, collagen, glycosaminoglycans, and polyamino acids. Solid-state substrates can have any useful form including thin film,
15 membrane, bottles, dishes, fibers, woven fibers, shaped polymers, particles, beads, microparticles, or a combination. Solid-state substrates and solid supports can be porous or non-porous. A chip is a rectangular or square small piece of material. Preferred forms for solid-state substrates are thin films, beads, or chips. A useful form for a solid-state substrate is a microtiter dish. In some embodiments, a multiwell glass slide can be
20 employed.

In one embodiment, the solid support is an array which comprises a plurality of nucleic acids of the present invention immobilized at identified or predefined locations on the solid support. Each predefined location on the solid support generally has one type of component (that is, all the components at that location are the same).
25 Alternatively, multiple types of components can be immobilized in the same predefined location on a solid support. Each location will have multiple copies of the given components. The spatial separation of different components on the solid support allows separate detection and identification.

According to particular embodiments, the array comprises nucleic acids that
30 specifically bind to no more than 10 % of the exons of one particular RNA determinant, no more than 20 % of the exons of one particular RNA determinant, no more than 30 % of the exons of one particular RNA determinant, no more than 40 % of the exons of one

particular RNA determinant, no more than 50 % of the exons of one particular RNA determinant. In some embodiments the array comprises a nucleic acid that specifically binds to only one exon of a particular RNA determinant, 2 exons of a particular RNA determinant, 3 exons of a particular RNA determinant, 4 exons of a particular RNA determinant, or 5 or more exons of a particular RNA determinant. It will be appreciated that the array may comprise more than one nucleic acid that specifically binds to the same exon – for example, two nucleic acids per exon or even three nucleic acids per exon.

Methods for immobilization of oligonucleotides to solid-state substrates are well established. Oligonucleotides, including address probes and detection probes, can be coupled to substrates using established coupling methods. For example, suitable attachment methods are described by Pease et al., *Proc. Natl. Acad. Sci. USA* 91(11):5022-5026 (1994), and Khrapko et al., *Mol Biol (Mosk) (USSR)* 25:718-730 (1991). A method for immobilization of 3'-amine oligonucleotides on casein-coated slides is described by Stimpson et al., *Proc. Natl. Acad. Sci. USA* 92:6379-6383 (1995). A useful method of attaching oligonucleotides to solid-state substrates is described by Guo et al., *Nucleic Acids Res.* 22:5456-5465 (1994).

According to another embodiment, the oligonucleotide is a primer of a primer pair. As used herein, the term "primer" refers to an oligonucleotide which acts as a point of initiation of a template-directed synthesis using methods such as PCR (polymerase chain reaction) or LCR (ligase chain reaction) under appropriate conditions (e.g., in the presence of four different nucleotide triphosphates and a polymerization agent, such as DNA polymerase, RNA polymerase or reverse-transcriptase, DNA ligase, etc, in an appropriate buffer solution containing any necessary co-factors and at suitable temperature(s)). Such a template directed synthesis is also called "primer extension". For example, a primer pair may be designed to amplify a region of DNA using PCR. Such a pair will include a "forward primer" and a "reverse primer" that hybridize to complementary strands of a DNA molecule and that delimit a region to be synthesized/amplified. A primer of this aspect of the present invention is capable of amplifying, together with its pair (e.g. by PCR) an exon-specific nucleic acid sequence to provide a detectable signal under experimental conditions and which does not amplify

other exons of the determinant nucleic acid sequence to provide a detectable signal under identical experimental conditions.

Oligonucleotides of the invention may be prepared by any of a variety of methods (see, for example, J. Sambrook et al., "Molecular Cloning: A Laboratory Manual", 1989, 2nd Ed., Cold Spring Harbour Laboratory Press: New York, N.Y.; "PCR Protocols: A Guide to Methods and Applications", 1990, M. A. Innis (Ed.), Academic Press: New York, N.Y.; P. Tijssen "Hybridization with Nucleic Acid Probes-Laboratory Techniques in Biochemistry and Molecular Biology (Parts I and II)", 1993, Elsevier Science; "PCR Strategies", 1995, M. A. Innis (Ed.), Academic Press: New York, N.Y.; and "Short Protocols in Molecular Biology", 2002, F. M. Ausubel (Ed.), 5th Ed., John Wiley & Sons: Secaucus, N.J.). For example, oligonucleotides may be prepared using any of a variety of chemical techniques well-known in the art, including, for example, chemical synthesis and polymerization based on a template as described, for example, in S. A. Narang et al., Meth. Enzymol. 1979, 68: 90-98; E. L. Brown et al., Meth. Enzymol. 1979, 68: 109-151; E. S. Belousov et al., Nucleic Acids Res. 1997, 25: 3440-3444; D. Guschin et al., Anal. Biochem. 1997, 250: 203-211; M. J. Blommers et al., Biochemistry, 1994, 33: 7886-7896; and K. Frenkel et al., Free Radic. Biol. Med. 1995, 19: 373-380; and U.S. Pat. No. 4,458,066.

For example, oligonucleotides may be prepared using an automated, solid-phase procedure based on the phosphoramidite approach. In such a method, each nucleotide is individually added to the 5'-end of the growing oligonucleotide chain, which is attached at the 3'-end to a solid support. The added nucleotides are in the form of trivalent 3'-phosphoramidites that are protected from polymerization by a dimethoxytriyl (or DMT) group at the 5'-position. After base-induced phosphoramidite coupling, mild oxidation to give a pentavalent phosphotriester intermediate and DMT removal provides a new site for oligonucleotide elongation. The oligonucleotides are then cleaved off the solid support, and the phosphodiester and exocyclic amino groups are deprotected with ammonium hydroxide. These syntheses may be performed on oligo synthesizers such as those commercially available from Perkin Elmer/Applied Biosystems, Inc. (Foster City, Calif.), DuPont (Wilmington, Del.) or Milligen (Bedford, Mass.). Alternatively, oligonucleotides can be custom made and ordered from a variety of commercial sources well-known in the art, including, for example, the Midland Certified Reagent Company

(Midland, Tex.), ExpressGen, Inc. (Chicago, Ill.), Operon Technologies, Inc. (Huntsville, Ala.), and many others.

Purification of the oligonucleotides of the invention, where necessary or desirable, may be carried out by any of a variety of methods well-known in the art.

5 Purification of oligonucleotides is typically performed either by native acrylamide gel electrophoresis, by anion-exchange HPLC as described, for example, by J. D. Pearson and F. E. Regnier (J. Chrom., 1983, 255: 137-149) or by reverse phase HPLC (G. D. McFarland and P. N. Borer, Nucleic Acids Res., 1979, 7: 1067-1080).

The sequence of oligonucleotides can be verified using any suitable sequencing
10 method including, but not limited to, chemical degradation (A. M. Maxam and W. Gilbert, Methods of Enzymology, 1980, 65: 499-560), matrix-assisted laser desorption ionization time-of-flight (MALDI-TOF) mass spectrometry (U. Piesles et al., Nucleic Acids Res., 1993, 21: 3191-3196), mass spectrometry following a combination of alkaline phosphatase and exonuclease digestions (H. Wu and H. Aboleneen, Anal.
15 Biochem., 2001, 290: 347-352), and the like.

As already mentioned above, modified oligonucleotides may be prepared using any of several means known in the art. Non-limiting examples of such modifications include methylation, "caps", substitution of one or more of the naturally occurring nucleotides with an analog, and internucleotide modifications such as, for example,
20 those with uncharged linkages (e.g., methyl phosphonates, phosphotriesters, phosphoroamidates, carbamates, etc), or charged linkages (e.g., phosphorothioates, phosphorodithioates, etc). Oligonucleotides may contain one or more additional covalently linked moieties, such as, for example, proteins (e.g., nucleases, toxins, antibodies, signal peptides, poly-L-lysine, etc), intercalators (e.g., acridine, psoralen,
25 etc), chelators (e.g., metals, radioactive metals, iron, oxidative metals, etc), and alkylators. The oligonucleotide may also be derivatized by formation of a methyl or ethyl phosphotriester or an alkyl phosphoramidate linkage. Furthermore, the oligonucleotide sequences of the present invention may also be modified with a label.

In certain embodiments, the detection probes or amplification primers or both
30 probes and primers are labeled with a detectable agent or moiety before being used in amplification/detection assays. In certain embodiments, the detection probes are labeled with a detectable agent. Preferably, a detectable agent is selected such that it generates a

signal which can be measured and whose intensity is related (e.g., proportional) to the amount of amplification products in the sample being analyzed.

The association between the oligonucleotide and detectable agent can be covalent or non-covalent. Labeled detection probes can be prepared by incorporation of
5 or conjugation to a detectable moiety. Labels can be attached directly to the nucleic acid sequence or indirectly (e.g., through a linker). Linkers or spacer arms of various lengths are known in the art and are commercially available, and can be selected to reduce steric hindrance, or to confer other useful or desired properties to the resulting labeled molecules (see, for example, E. S. Mansfield et al., *Mol. Cell. Probes*, 1995, 9: 145-
10 156).

Methods for labeling nucleic acid molecules are well-known in the art. For a review of labeling protocols, label detection techniques, and recent developments in the field, see, for example, L. J. Kricka, *Ann. Clin. Biochem.* 2002, 39: 114-129; R. P. van Gijlswijk et al., *Expert Rev. Mol. Diagn.* 2001, 1: 81-91; and S. Joos et al., *J. Biotechnol.* 1994, 35: 135-153. Standard nucleic acid labeling methods include: incorporation of radioactive agents, direct attachments of fluorescent dyes (L. M. Smith et al., *Nucl. Acids Res.*, 1985, 13: 2399-2412) or of enzymes (B. A. Connolly and O. Rider, *Nucl. Acids Res.*, 1985, 13: 4485-4502); chemical modifications of nucleic acid molecules making them detectable immunochemically or by other affinity reactions (T.
15 R. Broker et al., *Nucl. Acids Res.* 1978, 5: 363-384; E. A. Bayer et al., *Methods of Biochem. Analysis*, 1980, 26: 1-45; R. Langer et al., *Proc. Natl. Acad. Sci. USA*, 1981, 78: 6633-6637; R. W. Richardson et al., *Nucl. Acids Res.* 1983, 11: 6167-6184; D. J. Brigati et al., *Viol.* 1983, 126: 32-50; P. Tchen et al., *Proc. Natl. Acad. Sci. USA*, 1984, 81: 3466-3470; J. E. Landegent et al., *Exp. Cell Res.* 1984, 15: 61-72; and A. H.
20 Hopman et al., *Exp. Cell Res.* 1987, 169: 357-368); and enzyme-mediated labeling methods, such as random priming, nick translation, PCR and tailing with terminal transferase (for a review on enzymatic labeling, see, for example, J. Temsamani and S. Agrawal, *Mol. Biotechnol.* 1996, 5: 223-232). More recently developed nucleic acid labeling systems include, but are not limited to: ULS (Universal Linkage System),
25 which is based on the reaction of mono-reactive cisplatin derivatives with the N7 position of guanine moieties in DNA (R. J. Heetebrij et al., *Cytogenet. Cell. Genet.* 1999, 87: 47-52), psoralen-biotin, which intercalates into nucleic acids and upon UV

irradiation becomes covalently bonded to the nucleotide bases (C. Levenson et al., *Methods Enzymol.* 1990, 184: 577-583; and C. Pfannschmidt et al., *Nucleic Acids Res.* 1996, 24: 1702-1709), photoreactive azido derivatives (C. Neves et al., *Bioconjugate Chem.* 2000, 11: 51-55), and DNA alkylating agents (M. G. Sebestyen et al., *Nat. Biotechnol.* 1998, 16: 568-576).

Any of a wide variety of detectable agents can be used in the practice of the present invention. Suitable detectable agents include, but are not limited to, various ligands, radionuclides (such as, for example, ^{32}P , ^{35}S , ^3H , ^{14}C , ^{125}I , ^{131}I , and the like); fluorescent dyes (for specific exemplary fluorescent dyes, see below); chemiluminescent agents (such as, for example, acridinium esters, stabilized dioxetanes, and the like); spectrally resolvable inorganic fluorescent semiconductor nanocrystals (i.e., quantum dots), metal nanoparticles (e.g., gold, silver, copper and platinum) or nanoclusters; enzymes (such as, for example, those used in an ELISA, i.e., horseradish peroxidase, beta-galactosidase, luciferase, alkaline phosphatase); colorimetric labels (such as, for example, dyes, colloidal gold, and the like); magnetic labels (such as, for example, DynabeadsTM); and biotin, dioxigenin or other haptens and proteins for which antisera or monoclonal antibodies are available.

In certain embodiments, the inventive detection probes are fluorescently labeled. Numerous known fluorescent labeling moieties of a wide variety of chemical structures and physical characteristics are suitable for use in the practice of this invention. Suitable fluorescent dyes include, but are not limited to, fluorescein and fluorescein dyes (e.g., fluorescein isothiocyanine or FITC, naphthofluorescein, 4',5'-dichloro-2',7'-dimethoxyfluorescein, 6 carboxyfluorescein or FAM), carbocyanine, merocyanine, styryl dyes, oxonol dyes, phycoerythrin, erythrosin, eosin, rhodamine dyes (e.g., carboxytetramethylrhodamine or TAMRA, carboxyrhodamine 6G, carboxy-X-rhodamine (ROX), lissamine rhodamine B, rhodamine 6G, rhodamine Green, rhodamine Red, tetramethylrhodamine or TMR), coumarin and coumarin dyes (e.g., methoxycoumarin, dialkylaminocoumarin, hydroxycoumarin and aminomethylcoumarin or AMCA), Oregon Green Dyes (e.g., Oregon Green 488, Oregon Green 500, Oregon Green 514), Texas Red, Texas Red-X, Spectrum Red.TM., Spectrum Green.TM., cyanine dyes (e.g., Cy-3TM, Cy-5TM, Cy-3.5TM, Cy-5.5TM), Alexa Fluor dyes (e.g., Alexa Fluor 350, Alexa Fluor 488, Alexa Fluor 532, Alexa Fluor

546, Alexa Fluor 568, Alexa Fluor 594, Alexa Fluor 633, Alexa Fluor 660 and Alexa Fluor 680), BODIPY dyes (e.g., BODIPY FL, BODIPY R6G, BODIPY TMR, BODIPY TR, BODIPY 530/550, BODIPY 558/568, BODIPY 564/570, BODIPY 576/589, BODIPY 581/591, BODIPY 630/650, BODIPY 650/665), IRDyes (e.g.,
5 IRD40, IRD 700, IRD 800), and the like. For more examples of suitable fluorescent dyes and methods for linking or incorporating fluorescent dyes to nucleic acid molecules see, for example, "The Handbook of Fluorescent Probes and Research Products", 9th Ed., Molecular Probes, Inc., Eugene, Oreg. Fluorescent dyes as well as labeling kits are commercially available from, for example, Amersham Biosciences,
10 Inc. (Piscataway, N.J.), Molecular Probes Inc. (Eugene, Oreg.), and New England Biolabs Inc. (Beverly, Mass.).

Methods of analyzing the amount of RNA using oligonucleotides are known in the art and are summarized infra:

Northern Blot analysis: This method involves the detection of a particular RNA
15 in a mixture of RNAs. An RNA sample is denatured by treatment with an agent (e.g., formaldehyde) that prevents hydrogen bonding between base pairs, ensuring that all the RNA molecules have an unfolded, linear conformation. The individual RNA molecules are then separated according to size by gel electrophoresis and transferred to a nitrocellulose or a nylon-based membrane to which the denatured RNAs adhere. The
20 membrane is then exposed to labeled DNA probes. Probes may be labeled using radioisotopes or enzyme linked nucleotides. Detection may be using autoradiography, colorimetric reaction or chemiluminescence. This method allows both quantitation of an amount of particular RNA molecules and determination of its identity by a relative position on the membrane which is indicative of a migration distance in the gel during
25 electrophoresis.

Amplification reactions: Identification of the exon on the determinant may be carried out using an amplification reaction.

As used herein, the term "amplification" refers to a process that increases the representation of a population of specific nucleic acid sequences in a sample by
30 producing multiple (i.e., at least 2) copies of the desired sequences. Methods for nucleic acid amplification are known in the art and include, but are not limited to, polymerase chain reaction (PCR) and ligase chain reaction (LCR). In a typical PCR amplification

reaction, a nucleic acid sequence of interest is often amplified at least fifty thousand fold in amount over its amount in the starting sample. A "copy" or "amplicon" does not necessarily mean perfect sequence complementarity or identity to the template sequence. For example, copies can include nucleotide analogs such as deoxyinosine, intentional sequence alterations (such as sequence alterations introduced through a primer comprising a sequence that is hybridizable but not complementary to the template), and/or sequence errors that occur during amplification.

A typical amplification reaction is carried out by contacting a forward and reverse primer (a primer pair) to the sample DNA together with any additional amplification reaction reagents under conditions which allow amplification of the target sequence.

The terms "forward primer" and "forward amplification primer" are used herein interchangeably, and refer to a primer that hybridizes (or anneals) to the target (template strand). The terms "reverse primer" and "reverse amplification primer" are used herein interchangeably, and refer to a primer that hybridizes (or anneals) to the complementary target strand. The forward primer hybridizes with the target sequence 5' with respect to the reverse primer.

The term "amplification conditions", as used herein, refers to conditions that promote annealing and/or extension of primer sequences. Such conditions are well-known in the art and depend on the amplification method selected. Thus, for example, in a PCR reaction, amplification conditions generally comprise thermal cycling, i.e., cycling of the reaction mixture between two or more temperatures. In isothermal amplification reactions, amplification occurs without thermal cycling although an initial temperature increase may be required to initiate the reaction. Amplification conditions encompass all reaction conditions including, but not limited to, temperature and temperature cycling, buffer, salt, ionic strength, and pH, and the like.

As used herein, the term "amplification reaction reagents", refers to reagents used in nucleic acid amplification reactions and may include, but are not limited to, buffers, reagents, enzymes having reverse transcriptase and/or polymerase activity or exonuclease activity, enzyme cofactors such as magnesium or manganese, salts, nicotinamide adenine dinucleotide (NAD) and deoxynucleoside triphosphates (dNTPs), such as deoxyadenosine triphosphate, deoxyguanosine triphosphate, deoxycytidine

triphosphate and thymidine triphosphate. Amplification reaction reagents may readily be selected by one skilled in the art depending on the amplification method used.

According to this aspect of the present invention, the amplifying may be effected using techniques such as polymerase chain reaction (PCR), which includes, but is not limited to Allele-specific PCR, Assembly PCR or Polymerase Cycling Assembly (PCA), Asymmetric PCR, Helicase-dependent amplification, Hot-start PCR, Intersequence-specific PCR (ISSR), Inverse PCR, Ligation-mediated PCR, Methylation-specific PCR (MSP), Miniprimer PCR, Multiplex Ligation-dependent Probe Amplification, Multiplex-PCR, Nested PCR, Overlap-extension PCR, Quantitative PCR (Q-PCR), Reverse Transcription PCR (RT-PCR), Solid Phase PCR: encompasses multiple meanings, including Polony Amplification (where PCR colonies are derived in a gel matrix, for example), Bridge PCR (primers are covalently linked to a solid-support surface), conventional Solid Phase PCR (where Asymmetric PCR is applied in the presence of solid support bearing primer with sequence matching one of the aqueous primers) and Enhanced Solid Phase PCR (where conventional Solid Phase PCR can be improved by employing high T_m and nested solid support primer with optional application of a thermal 'step' to favour solid support priming), Thermal asymmetric interlaced PCR (TAIL-PCR), Touchdown PCR (Step-down PCR), PAN-AC and Universal Fast Walking.

The PCR (or polymerase chain reaction) technique is well-known in the art and has been disclosed, for example, in K. B. Mullis and F. A. Faloona, *Methods Enzymol.*, 1987, 155: 350-355 and U.S. Pat. Nos. 4,683,202; 4,683,195; and 4,800,159 (each of which is incorporated herein by reference in its entirety). In its simplest form, PCR is an in vitro method for the enzymatic synthesis of specific DNA sequences, using two oligonucleotide primers that hybridize to opposite strands and flank the region of interest in the target DNA. A plurality of reaction cycles, each cycle comprising: a denaturation step, an annealing step, and a polymerization step, results in the exponential accumulation of a specific DNA fragment ("PCR Protocols: A Guide to Methods and Applications", M. A. Innis (Ed.), 1990, Academic Press: New York; "PCR Strategies", M. A. Innis (Ed.), 1995, Academic Press: New York; "Polymerase chain reaction: basic principles and automation in PCR: A Practical Approach", McPherson et al. (Eds.), 1991, IRL Press: Oxford; R. K. Saiki et al., *Nature*, 1986, 324: 163-166). The termini of

the amplified fragments are defined as the 5' ends of the primers. Examples of DNA polymerases capable of producing amplification products in PCR reactions include, but are not limited to: *E. coli* DNA polymerase I, Klenow fragment of DNA polymerase I, T4 DNA polymerase, thermostable DNA polymerases isolated from *Thermus aquaticus* (Taq), available from a variety of sources (for example, Perkin Elmer), *Thermus thermophilus* (United States Biochemicals), *Bacillus stearothermophilus* (Bio-Rad), or *Thermococcus litoralis* ("Vent" polymerase, New England Biolabs). RNA target sequences may be amplified by reverse transcribing the mRNA into cDNA, and then performing PCR (RT-PCR), as described above. Alternatively, a single enzyme may be used for both steps as described in U.S. Pat. No. 5,322,770.

The duration and temperature of each step of a PCR cycle, as well as the number of cycles, are generally adjusted according to the stringency requirements in effect. Annealing temperature and timing are determined both by the efficiency with which a primer is expected to anneal to a template and the degree of mismatch that is to be tolerated. The ability to optimize the reaction cycle conditions is well within the knowledge of one of ordinary skill in the art. Although the number of reaction cycles may vary depending on the detection analysis being performed, it usually is at least 15, more usually at least 20, and may be as high as 60 or higher. However, in many situations, the number of reaction cycles typically ranges from about 20 to about 40.

The denaturation step of a PCR cycle generally comprises heating the reaction mixture to an elevated temperature and maintaining the mixture at the elevated temperature for a period of time sufficient for any double-stranded or hybridized nucleic acid present in the reaction mixture to dissociate. For denaturation, the temperature of the reaction mixture is usually raised to, and maintained at, a temperature ranging from about 85 °C to about 100 °C, usually from about 90 °C to about 98 °C, and more usually from about 93 °C to about 96 °C. for a period of time ranging from about 3 to about 120 seconds, usually from about 5 to about 30 seconds.

Following denaturation, the reaction mixture is subjected to conditions sufficient for primer annealing to template DNA present in the mixture. The temperature to which the reaction mixture is lowered to achieve these conditions is usually chosen to provide optimal efficiency and specificity, and generally ranges from about 50 °C to about 70 °C, usually from about 55 °C to about 70 °C, and more usually from about 60 °C to

about 68 °C. Annealing conditions are generally maintained for a period of time ranging from about 15 seconds to about 30 minutes, usually from about 30 seconds to about 5 minutes.

Following annealing of primer to template DNA or during annealing of primer to
5 template DNA, the reaction mixture is subjected to conditions sufficient to provide for polymerization of nucleotides to the primer's end in a such manner that the primer is extended in a 5' to 3' direction using the DNA to which it is hybridized as a template, (i.e., conditions sufficient for enzymatic production of primer extension product). To achieve primer extension conditions, the temperature of the reaction mixture is typically
10 raised to a temperature ranging from about 65°C to about 75 °C, usually from about 67 °C. to about 73 °C, and maintained at that temperature for a period of time ranging from about 15 seconds to about 20 minutes, usually from about 30 seconds to about 5 minutes.

The above cycles of denaturation, annealing, and polymerization may be
15 performed using an automated device typically known as a thermal cycler or thermocycler. Thermal cyclers that may be employed are described in U.S. Pat. Nos. 5,612,473; 5,602,756; 5,538,871; and 5,475,610 (each of which is incorporated herein by reference in its entirety). Thermal cyclers are commercially available, for example, from Perkin Elmer-Applied Biosystems (Norwalk, Conn.), BioRad (Hercules, Calif.),
20 Roche Applied Science (Indianapolis, Ind.), and Stratagene (La Jolla, Calif.).

Amplification products obtained using primers of the present invention may be detected using agarose gel electrophoresis and visualization by ethidium bromide staining and exposure to ultraviolet (UV) light or by sequence analysis of the amplification product.

25 According to one embodiment, the amplification and quantification of the amplification product may be effected in real-time (qRT-PCR). Typically, QRT-PCR methods use double stranded DNA detecting molecules to measure the amount of amplified product in real time.

As used herein the phrase "double stranded DNA detecting molecule" refers to a
30 double stranded DNA interacting molecule that produces a quantifiable signal (e.g., fluorescent signal). For example such a double stranded DNA detecting molecule can be a fluorescent dye that (1) interacts with a fragment of DNA or an amplicon and (2) emits

at a different wavelength in the presence of an amplicon in duplex formation than in the presence of the amplicon in separation. A double stranded DNA detecting molecule can be a double stranded DNA intercalating detecting molecule or a primer-based double stranded DNA detecting molecule.

5 A double stranded DNA intercalating detecting molecule is not covalently linked to a primer, an amplicon or a nucleic acid template. The detecting molecule increases its emission in the presence of double stranded DNA and decreases its emission when duplex DNA unwinds. Examples include, but are not limited to, ethidium bromide, YO-PRO-1, Hoechst 33258, SYBR Gold, and SYBR Green I. Ethidium bromide is a
10 fluorescent chemical that intercalates between base pairs in a double stranded DNA fragment and is commonly used to detect DNA following gel electrophoresis. When excited by ultraviolet light between 254 nm and 366 nm, it emits fluorescent light at 590 nm. The DNA-ethidium bromide complex produces about 50 times more fluorescence than ethidium bromide in the presence of single stranded DNA. SYBR Green I is excited
15 at 497 nm and emits at 520 nm. The fluorescence intensity of SYBR Green I increases over 100 fold upon binding to double stranded DNA against single stranded DNA. An alternative to SYBR Green I is SYBR Gold introduced by Molecular Probes Inc. Similar to SYBR Green I, the fluorescence emission of SYBR Gold enhances in the presence of DNA in duplex and decreases when double stranded DNA unwinds. However, SYBR
20 Gold's excitation peak is at 495 nm and the emission peak is at 537 nm. SYBR Gold reportedly appears more stable than SYBR Green I. Hoechst 33258 is a known bisbenzimidazole double stranded DNA detecting molecule that binds to the AT rich regions of DNA in duplex. Hoechst 33258 excites at 350 nm and emits at 450 nm. YO-PRO-1, exciting at 450 nm and emitting at 550 nm, has been reported to be a double stranded
25 DNA specific detecting molecule. In a particular embodiment of the present invention, the double stranded DNA detecting molecule is SYBR Green I.

 A primer-based double stranded DNA detecting molecule is covalently linked to a primer and either increases or decreases fluorescence emission when amplicons form a duplex structure. Increased fluorescence emission is observed when a primer-based
30 double stranded DNA detecting molecule is attached close to the 3' end of a primer and the primer terminal base is either dG or dC. The detecting molecule is quenched in the proximity of terminal dC-dG and dG-dC base pairs and dequenched as a result of duplex

formation of the amplicon when the detecting molecule is located internally at least 6 nucleotides away from the ends of the primer. The dequenching results in a substantial increase in fluorescence emission. Examples of these type of detecting molecules include but are not limited to fluorescein (exciting at 488 nm and emitting at 530 nm), FAM (exciting at 494 nm and emitting at 518 nm), JOE (exciting at 527 and emitting at 548), HEX (exciting at 535 nm and emitting at 556 nm), TET (exciting at 521 nm and emitting at 536 nm), Alexa Fluor 594 (exciting at 590 nm and emitting at 615 nm), ROX (exciting at 575 nm and emitting at 602 nm), and TAMRA (exciting at 555 nm and emitting at 580 nm). In contrast, some primer-based double stranded DNA detecting molecules decrease their emission in the presence of double stranded DNA against single stranded DNA. Examples include, but are not limited to, rhodamine, and BODIPY-FI (exciting at 504 nm and emitting at 513 nm). These detecting molecules are usually covalently conjugated to a primer at the 5' terminal dC or dG and emit less fluorescence when amplicons are in duplex. It is believed that the decrease of fluorescence upon the formation of duplex is due to the quenching of guanosine in the complementary strand in close proximity to the detecting molecule or the quenching of the terminal dC-dG base pairs.

According to one embodiment, the primer-based double stranded DNA detecting molecule is a 5' nuclease probe. Such probes incorporate a fluorescent reporter molecule at either the 5' or 3' end of an oligonucleotide and a quencher at the opposite end. The first step of the amplification process involves heating to denature the double stranded DNA target molecule into a single stranded DNA. During the second step, a forward primer anneals to the target strand of the DNA and is extended by Taq polymerase. A reverse primer and a 5' nuclease probe then anneal to this newly replicated strand.

In this embodiment, at least one of the primer pairs or 5' nuclease probe should hybridize with a unique determinant sequence. The polymerase extends and cleaves the probe from the target strand. Upon cleavage, the reporter is no longer quenched by its proximity to the quencher and fluorescence is released. Each replication will result in the cleavage of a probe. As a result, the fluorescent signal will increase proportionally to the amount of amplification product.

RNA in situ hybridization stain: In this method DNA or RNA probes are attached to the RNA molecules present in the cells. Generally, the cells are first fixed to

microscopic slides to preserve the cellular structure and to prevent the RNA molecules from being degraded and then are subjected to hybridization buffer containing the labeled probe. The hybridization buffer includes reagents such as formamide and salts (e.g., sodium chloride and sodium citrate) which enable specific hybridization of the DNA or RNA probes with their target mRNA molecules *in situ* while avoiding non-specific binding of probe. Those of skills in the art are capable of adjusting the hybridization conditions (*i.e.*, temperature, concentration of salts and formamide and the like) to specific probes and types of cells. Following hybridization, any unbound probe is washed off and the bound probe is detected using known methods. For example, if a radio-labeled probe is used, then the slide is subjected to a photographic emulsion which reveals signals generated using radio-labeled probes; if the probe was labeled with an enzyme then the enzyme-specific substrate is added for the formation of a colorimetric reaction; if the probe is labeled using a fluorescent label, then the bound probe is revealed using a fluorescent microscope; if the probe is labeled using a tag (e.g., digoxigenin, biotin, and the like) then the bound probe can be detected following interaction with a tag-specific antibody which can be detected using known methods.

In situ RT-PCR stain: This method is described in Nuovo GJ, et al. [Intracellular localization of polymerase chain reaction (PCR)-amplified hepatitis C cDNA. Am J Surg Pathol. 1993, 17: 683-90] and Komminoth P, et al. [Evaluation of methods for hepatitis C virus detection in archival liver biopsies. Comparison of histology, immunohistochemistry, *in situ* hybridization, reverse transcriptase polymerase chain reaction (RT-PCR) and *in situ* RT-PCR. Pathol Res Pract. 1994, 190: 1017-25]. Briefly, the RT-PCR reaction is performed on fixed cells by incorporating labeled nucleotides to the PCR reaction. The reaction is carried on using a specific *in situ* RT-PCR apparatus such as the laser-capture microdissection PixCell I LCM system available from Arcturus Engineering (Mountainview, CA).

DNA microarrays/DNA chips:

The expression of thousands of genes may be analyzed simultaneously using DNA microarrays, allowing analysis of the complete transcriptional program of an organism during specific developmental processes or physiological responses. DNA microarrays consist of thousands of individual gene sequences attached to closely packed areas on the surface of a support such as a glass microscope slide. Various

methods have been developed for preparing DNA microarrays. In one method, an approximately 1 kilobase segment of the coding region of each gene for analysis is individually PCR amplified. A robotic apparatus is employed to apply each amplified DNA sample to closely spaced zones on the surface of a glass microscope slide, which is subsequently processed by thermal and chemical treatment to bind the DNA sequences to the surface of the support and denature them. Typically, such arrays are about 2 x 2 cm and contain about individual nucleic acids 6000 spots. In a variant of the technique, multiple DNA oligonucleotides, usually 20 nucleotides in length, are synthesized from an initial nucleotide that is covalently bound to the surface of a support, such that tens of thousands of identical oligonucleotides are synthesized in a small square zone on the surface of the support. Multiple oligonucleotide sequences from a single gene are synthesized in neighboring regions of the slide for analysis of expression of that gene. Hence, thousands of genes can be represented on one glass slide. Such arrays of synthetic oligonucleotides may be referred to in the art as “DNA chips”, as opposed to “DNA microarrays”, as described above [Lodish et al. (eds.). Chapter 7.8: DNA Microarrays: Analyzing Genome-Wide Expression. In: Molecular Cell Biology, 4th ed., W. H. Freeman, New York. (2000)].

Oligonucleotide microarray – In this method oligonucleotide probes capable of specifically hybridizing with the polynucleotides of some embodiments of the invention are attached to a solid surface (e.g., a glass wafer). Each oligonucleotide probe is of approximately 20-25 nucleic acids in length. To detect the expression pattern of the polynucleotides of some embodiments of the invention in a specific cell sample (e.g., blood cells), RNA is extracted from the cell sample using methods known in the art (using e.g., a TRIZOL solution, Gibco BRL, USA). Hybridization can take place using either labeled oligonucleotide probes (e.g., 5'-biotinylated probes) or labeled fragments of complementary DNA (cDNA) or RNA (cRNA). Briefly, double stranded cDNA is prepared from the RNA using reverse transcriptase (RT) (e.g., Superscript II RT), DNA ligase and DNA polymerase I, all according to manufacturer's instructions (Invitrogen Life Technologies, Frederick, MD, USA). To prepare labeled cRNA, the double stranded cDNA is subjected to an *in vitro* transcription reaction in the presence of biotinylated nucleotides using e.g., the BioArray High Yield RNA Transcript Labeling Kit (Enzo, Diagnostics, Affymetix Santa Clara CA). For efficient hybridization the

labeled cRNA can be fragmented by incubating the RNA in 40 mM Tris Acetate (pH 8.1), 100 mM potassium acetate and 30 mM magnesium acetate for 35 minutes at 94 °C. Following hybridization, the microarray is washed and the hybridization signal is scanned using a confocal laser fluorescence scanner which measures fluorescence intensity emitted by the labeled cRNA bound to the probe arrays.

For example, in the Affymetrix microarray (Affymetrix™, Santa Clara, CA) each gene on the array is represented by a series of different oligonucleotide probes, of which, each probe pair consists of a perfect match oligonucleotide and a mismatch oligonucleotide. While the perfect match probe has a sequence exactly complimentary to the particular gene, thus enabling the measurement of the level of expression of the particular gene, the mismatch probe differs from the perfect match probe by a single base substitution at the center base position. The hybridization signal is scanned using the Agilent scanner, and the Microarray Suite software subtracts the non-specific signal resulting from the mismatch probe from the signal resulting from the perfect match probe.

It will be appreciated that the expression of an RNA from a particular exon can be analyzed without the use of exon-specific oligonucleotides – e.g. by RNA sequencing, as further described herein below.

RNA sequencing: Methods for RNA sequence determination are generally known to the person skilled in the art. Preferred sequencing methods are next generation sequencing methods or parallel high throughput sequencing methods. An example of an envisaged sequence method is pyrosequencing, in particular 454 pyrosequencing, e.g. based on the Roche 454 Genome Sequencer. This method amplifies DNA inside water droplets in an oil solution with each droplet containing a single DNA template attached to a single primer-coated bead that then forms a clonal colony. Pyrosequencing uses luciferase to generate light for detection of the individual nucleotides added to the nascent DNA, and the combined data are used to generate sequence read-outs. Yet another envisaged example is Illumina or Solexa sequencing, e.g. by using the Illumina Genome Analyzer technology, which is based on reversible dye-terminators. DNA molecules are typically attached to primers on a slide and amplified so that local clonal colonies are formed. Subsequently one type of nucleotide at a time may be added, and non-incorporated nucleotides are washed away. Subsequently, images of the

fluorescently labeled nucleotides may be taken and the dye is chemically removed from the DNA, allowing a next cycle. Yet another example is the use of Applied Biosystems' SOLiD technology, which employs sequencing by ligation. This method is based on the use of a pool of all possible oligonucleotides of a fixed length, which are labeled according to the sequenced position. Such oligonucleotides are annealed and ligated. Subsequently, the preferential ligation by DNA ligase for matching sequences typically results in a signal informative of the nucleotide at that position. Since the DNA is typically amplified by emulsion PCR, the resulting bead, each containing only copies of the same DNA molecule, can be deposited on a glass slide resulting in sequences of quantities and lengths comparable to Illumina sequencing. A further method is based on Helicos' Heliscope technology, wherein fragments are captured by polyT oligomers tethered to an array. At each sequencing cycle, polymerase and single fluorescently labeled nucleotides are added and the array is imaged. The fluorescent tag is subsequently removed and the cycle is repeated. Further examples of sequencing techniques encompassed within the methods of the present invention are sequencing by hybridization, sequencing by use of nanopores, microscopy-based sequencing techniques, microfluidic Sanger sequencing, or microchip-based sequencing methods. The present invention also envisages further developments of these techniques, e.g. further improvements of the accuracy of the sequence determination, or the time needed for the determination of the genomic sequence of an organism etc.

According to one embodiment, the sequencing method comprises deep sequencing.

As used herein, the term "deep sequencing" refers to a sequencing method wherein the target sequence is read multiple times in the single test. A single deep sequencing run is composed of a multitude of sequencing reactions run on the same target sequence and each, generating independent sequence readout.

Selection of the optimal exon or exons may be based fully or partially on the differential expression level between the bacterial and viral samples. In one embodiment, the exon which provides the highest differential expression is selected as the optimal exon. It will be appreciated that secondary considerations such as the GC content of the probe, the length of the probe, the two or three dimensional structure of the probe, the specificity of the probe etc. may also be taken into account when

selecting the optimal exon/exons. Thus, it is envisaged that due to these secondary considerations, the exon with the second or even third highest differential expression is selected as the optimal exon. So long as the differential expression is above a predetermined level, the secondary considerations may be deemed relevant and taken
5 into account.

Once the optimal exon has been selected, determining the expression therefrom in a sample of an infectious subject may enable diagnosis of infection type.

Thus, according to another aspect of the present invention there is provided a method of determining an infection type in a subject comprising measuring the
10 expression of at least one RNA determinant in a sample of the subject, wherein the measuring is effected at an exon or plurality of exons whose expression level distinguishes between a bacterial and viral infection with a degree of accuracy above a predetermined level, thereby determining the infection type of the subject.

As used herein, the term “analyzing” or “analysis”, “measuring” or
15 “measurement,” or alternatively “detecting” or “detection,” means assessing the presence, absence, quantity or amount (which can be an effective amount) of the determinant within a clinical or subject-derived sample, including the derivation of qualitative or quantitative concentration levels of such determinants.

It will be appreciated that the exon whose expression level distinguishes
20 between a bacterial and viral infection with a degree of accuracy above a predetermined level is based on differential expression analysis and may be selected according to the method described herein above.

In one embodiment, expression level of the exon which provides the highest differential expression between bacterial and viral samples out of all the exons of the
25 RNA is measured. In another embodiment, the expression level of the exon which provides a higher accuracy (based on differential expression analysis) than that provided when measuring expression of the full length RNA determinant is measured. As mentioned herein above, secondary considerations such as the GC content of the probe, the length of the probe, the two or three dimensional structure of the probe, the
30 specificity of the probe, identity of other probes in the assay etc. may also be taken into account when selecting the exon/exons from which to analyze expression. Thus, it is envisaged that due to these secondary considerations, expression level from the exon

with the second or even third highest differential expression (between bacterial and viral samples) is measured. So long as the differential expression is above a predetermined level, the secondary considerations may be deemed relevant and taken into account.

According to a particular embodiment, the exon is not the 3' exon.

5 The expression levels of full length RNA determinant can be differently calculated depending on the type of array used to measure it. Some arrays rely on averaging areas at the 3' end of the gene, for example 3'-based expression array that have probes localized to the extreme 3' end of the gene (such as Affymetrix U133A and B series), or classical 3' assays that typically rely on priming from a transcript's poly-A
10 tail .

Other arrays (including the Human Gene 1.0 ST Array (Affymetrix) described in the examples section) use probes that are distributed across the full length of the gene, providing a more complete and accurate picture of overall gene expression. In these arrays, the gene-level analysis of multiple probes on different exons is summarized into
15 an expression value representing all transcripts from the same gene.

The term "accuracy" refers to the degree of conformity of a measured or calculated quantity (a test reported value) to its actual (or true) value. Clinical accuracy relates to the proportion of true outcomes (true positives (TP) or true negatives (TN) versus misclassified outcomes (false positives (FP) or false negatives (FN)), and may be
20 stated as a sensitivity, specificity, positive predictive values (PPV) or negative predictive values (NPV), Matthews correlation coefficient (MCC), or as a likelihood, odds ratio, Receiver Operating Characteristic (ROC) curve, Area Under the Curve (AUC) among other measures.

In one embodiment, the expression level is measured at an exon which presents
25 the highest degree of differential expression as measured in a bacterial and viral sample as compared to all the other exons of the RNA determinant.

Exemplary RNA determinants that may be measured are set forth in Tables 1-4 herein below.

Table 1

<i>Gene symbol</i>	<i>REFSEQ NO.</i>	<i>Gene Name</i>
AIM2	NC_000001.11 NT_004487.20, NC_018912.2	Absent In Melanoma 2
ANKRD2	NC_000010.11	Ankyrin Repeat Domain 2

	NC_018921.2 NT_030059.14	
BMX	NC_000023.11 NT_167197.2, NC_018934.2	BMX Non-Receptor Tyrosine Kinase
C19orf59	NC_000019.10 NC_018930.2 NT_01129512	Mast Cell4-Expressed Membrane Protein 1
CD177	NC_000019.10 NC_018930.2, NT_011109.17	CD177 Molecule
CEACAM1	NC_000019.10 NT_011109.17, NC_018930.2	Carcinoembryonic Antigen-Related Cell Adhesion Molecule 1
CLEC4D	NC_000012.12 NT_009714.18, NC_018923.2	C-Type Lectin Domain Family 4, Member D
CMPK2	NC_000002.12 NT_005334.17, NC_018913.2	Cytidine/uridine monophosphate kinase 2
EIF1AY	NC_000024.10 NT_011875.13	Eukaryotic Translation Initiation Factor 1A, Y- Linked
EIF2AK2	NC_000002.12 NT_022184.16 NC_018913.2	Eukaryotic Translation Initiation Factor 2-Alpha Kinase 2
EPSTI1	NC_000013.11 NT_024524.15 NC_018924.2	Epithelial Stromal Interaction 1 (breast)
FFAR3	NC_000019.10 NT_011109.17 NC_018930.2	Free Fatty Acid Receptor 3
GALM	NC_000002.12 NT_022184.16 NC_018913.2	galactose mutarotase (aldose 1-epimerase)
IFITM3	NC_000011.10 NC_018922.2 NT_009237.19	interferon induced transmembrane protein 3
INCA	NC_000011.10 NT_033899.9 NC_018922.2	caspase recruitment domain family member 17
IRF7	NC_000011.10 NT_009237.19 NT_187586.1 NC_018922.2	interferon regulatory factor 7
JARID1D	NC_000024. NT_011875.13	lysine (K)-specific demethylase 5D
JUP	NC_000017.11 NT_010783.16 NC_018928.2	junction plakoglobin

MT2A	NC_000016. NC_018927.2 NT_010498.16	metallothionein 2A
OTOF	NC_000002.12 NT_022184.16 NC_018913.2	otoferlin
PLSCR1	NC_000003.12 NT_005612.17 NC_018914.2	phospholipid scramblase 1
PSTPIP2	NC_000018.10 NT_010966.15 NC_018929.2	proline-serine-threonine phosphatase interacting protein 2
RGS1	NC_000001.11 NC_018912.2 NT_004487.20	regulator of G-protein signaling 1
TREML4	NC_000006.12 NC_018917.2 NT_007592.16	triggering receptor expressed on myeloid cells like 4
UTY	NC_000024.10 NT_011875.13	ubiquitously transcribed tetratricopeptide repeat containing, Y-linked
PARP12	NC_000007.14 NC_018918.2	Poly(ADP-Ribose) Polymerase Family Member 12
PNPT1	NC_000002.12 NC_018913.2	Polyribonucleotide Nucleotidyltransferase 1
TRIB2	NC_000002.12 NC_018913.2	Tribbles Pseudokinase 2
uc003hrl.1	chr4: 89178768-89180508	N/A
USP41	NC_018933.2 NC_000022.11	Ubiquitin Specific Peptidase 41
ZCCHC2	NC_000018.10 NC_018929.2	Zinc Finger CCHC-Type Containing 2
TCONS_00003184- XLOC_001966	Affymetrix transcript ID: TC02004017.hg.1 chr2: 6968645-6973662	linc-RNASEH1-12

Table 2

Gene symbol	REFSEQ NO.	Gene Name
CYBRD1	NC_000002.12 NC_018913.2 NT_005403.18	Cytochrome B Reductase 1
CYP1B1	NC_000002.12	Cytochrome P450, Family

	NC_018913.2 NT_022184.16	1, Subfamily B, Polypeptide 1
F13A1	NC_000006.12 NT_007592.16 NC_018917.2	Coagulation factor XIII A chain
RASA4	NC_000007.14 NT_007933.16 NC_018918.2	RAS P21 Protein Activator 4 (clone name FLJ21767)
HLA- DQA1	NT_167247.2 NT_167245.2 NT_167246.2 NT_167249.2 NC_000006.12 NT_007592.16 NT_113891.3 NT_167248.2 NC_018917.2	major histocompatibility complex, class II, DQ alpha 1
LOC10013 2244	NC_000007.12	uncharacterized LOC100132244
PHOSPHO 1	NC_000017.11 NT_010783.16 NC_018928.2	phosphatase, orphan 1
PPBP	NC_000004.12 NC_018915.2 NT_016354.20	pro-platelet basic protein
SH3BGR1 2	NC_000006.12 NT_025741.16 NC_018917.2	SH3 domain binding glutamate-rich protein like 2
TMEM176 A	NC_000007.14 NT_007933.16 NC_018918.2	transmembrane protein 176A
CR1	NC_000001.11 NC_018912.2	Complement C3b/C4b Receptor 1 (Knops Blood Group)
DGAT2	NC_000011.10 ; NC_018922.2	Diacylglycerol O- Acyltransferase 2
PYGL	NC_000014.9 NC_018925.2	Phosphorylase, Glycogen, Liver
SULT1B1	NC_000004.12 NC_018915.2	Sulfotransferase Family 1B Member 1

Table 3

<i>Gene symbol</i>		<i>Gene name</i>
CCL2	NC_000017.11 NC_018928.2 NT_010783.16	chemokine (C-C motif) ligand 2
HERC5	NC_000004.12)	HECT and RLD domain

	NT_016354.20 NC_018915.2	containing E3 ubiquitin protein ligase 5
IFI44L	NC_000001.11 NT_032977.10 NC_018912.2	interferon induced protein 44 like
IFI6	NC_000001.11 NC_018912.2 NT_032977.10	interferon, alpha-inducible protein 6
IFIT1	NC_000010.11 NC_018921.2 NT_030059.14	interferon induced protein with tetratricopeptide repeats 1
ISG15	NC_000001.11 NC_018912.2 NT_032977.10	ISG15 ubiquitin-like modifier
LAMP3	NC_000003.12 NT_005612.17 NC_018914.2	lysosomal associated membrane protein 3
LOC26010 (SPATS2L)	NC_000002.12 NT_005403.18 NC_018913.2	spermatogenesis associated, serine rich 2 like
LY6E	NC_000008.11 NC_018919.2 NT_008046.17 NT_187573.1	lymphocyte antigen 6 complex, locus E
MX1	NC_000021.9 NT_011512.12 NC_018932.2	MX dynamin-like GTPase 1
OAS3	NC_000012.12 NT_029419.13 NC_018923.2	2'-5'-oligoadenylate synthetase 3
OAS1	NC_000012.12 NT_029419.13 NC_018923.2	2'-5'-Oligoadenylate Synthetase 1, 40/46kDa
RTP4	NC_000003.12 NC_018914.2 NT_005612.17	receptor (chemosensory) transporter protein 4
SERPING1	NC_000011.10 NC_018922.2 NT_167190.2	serpin peptidase inhibitor, clade G (C1 inhibitor), member 1
SIGLEC1	NC_000020.11 NT_011387.9 NC_018931.2	sialic acid binding Ig like lectin 1
TNFAIP6	NC_000002.12 NT_005403.18 NC_018913.2	TNF alpha induced protein 6
USP18	NC_000022.11 NT_187355.1 NC_018933.2	ubiquitin specific peptidase 18
XAF1	NC_000017.11	XIAP associated factor 1

	NT_010718.17 NC_018928.2	
CXCL10	NC_000004.12 NC_018915.2 NT_016354.20	chemokine (C-X-C motif) ligand 10
DDX60	NC_000004.12 NT_016354.20 NC_018915.2	DEXD/H-box helicase 60
HERC6	NC_000004.12 NT_016354.20 NC_018915.2	HECT and RLD domain containing E3 ubiquitin protein ligase family member 6
PPM1K	NC_000004.12, NC_018915.2	Protein Phosphatase, Mg2+/Mn2+ Dependent 1K
RSAD2	NC_000002.12 NT_005334.17 NC_018913.2	radical S-adenosyl methionine domain containing 2
OAS2	NC_000012.12 NT_029419.13 NC_018923.2	2'-5'-oligoadenylate synthetase 2
OASL	NC_000012.12 NC_018923.2 NT_029419.13	2'-5'-oligoadenylate synthetase-like
IFI27	NC_018925.2 NT_187601.1 NC_000014.9 NT_026437.13	interferon, alpha-inducible protein 27
IFI44	NC_000001.11 NT_032977.10 NC_018912.2	interferon induced protein 44
IFIT2	NC_000010.11 NC_018921.2 NT_030059.14	interferon induced protein with tetratricopeptide repeats 2
IFIT3	NC_000010.11 NC_018921.2 NT_030059.14	interferon induced protein with tetratricopeptide repeats 3

Table 4

Probe ID	Gene Name/mRNA accession number
TC01004260.hg	n363820 or TCONS_00000869-XLOC_000105
TC02002080.hg	ENST00000443397
TC02004398.hg	n336681
TC16001577.hg	n375375 or TCONS_00024856-XLOC_011736
TC16001578.hg	n406211
TC22000951.hg	n384079
TC22001004.hg	n387236 or n386315
TC22001243.hg	n332472
TC22001248.hg	n346241
TC17000386.hg	CCL8
TC09001536.hg	CDK5RAP2
TC04002928.hg	FAM200B
TC09000608.hg	GSN
TC02004983.hg	IGKV3D-15
TC02000720.hg	IL1RN
TC17002906.hg	KRT19
TC07000704.hg	LRRN3
TC22001450.hg	MIR650
TC16002035.hg	MT1A
TC16000470.hg	MT1DP
TC16000468.hg	MT1E
TC16000475.hg	MT1IP
TC16002074.hg	MT1M
TC06000961.hg	NCOA7
TC01000789.hg	NEXN
TC22000376.hg	PRR5
TC01001522.hg	RABGAP1L
TC09001730.hg	SDCCAG3
TC03000198.hg	TTC21A

Exemplary genomic sequences are provided in each of Tables 1-3 for particular determinants.

The present invention contemplates analyzing any number of exons per RNA determinant, wherein each of the exons selected show a degree of accuracy (based on differential expression analysis) above a predetermined level. Thus for example, in some embodiments expression level from only 1 exon is measured, from no more than 2 exons are measured, from no more than 3 exons are measured, from no more than four exons are measured or from no more than five exons are measured per RNA determinant. In some embodiments, no more than 75 % of the exons of a determinant are measured, no more than 50 % of the exons of a determinant are measured, no more than 40 % of the exons of a determinant are measured, no more than 30 % of the exons of a determinant are measured, no more than 20 % of the exons of a determinant are measured, no more than 10 % of the exons of a determinant are measured per RNA determinant.

In one embodiment, one exon per RNA determinant is analyzed, wherein the exon shows a degree of accuracy (based on differential expression analysis) above a predetermined level.

In another embodiment, two exons per RNA determinant are analyzed wherein at least one of the exons show a degree of accuracy (based on differential expression analysis) above a predetermined level. It is further considered that two exons per RNA determinant are analyzed wherein each of the exons show a degree of accuracy (based on differential expression analysis) above a predetermined level. Preferably, one of the exons of the two exons analysed presents the highest degree of differential expression in a bacterial and viral sample as compared to all the other exons of the RNA determinant.

In another embodiment, three exons per RNA determinant are analyzed wherein at least one of the exons show a degree of accuracy above a predetermined level. It is further considered that three exons per RNA determinant are analyzed wherein each of the exons show a degree of accuracy (based on differential expression analysis) above a predetermined level. Preferably, one of the exons of the three exons analyzed presents the highest degree of differential expression in a bacterial and viral sample as compared to all the other exons of the RNA determinant.

In another embodiment, four exons per RNA determinant are analyzed wherein at least one of the exons show a degree of accuracy above a predetermined level. It is further considered that four exons per RNA determinant are analyzed wherein each of

the exons show a degree of accuracy (based on differential expression analysis) above a predetermined level. Preferably, one of the exons of the four exons analyzed presents the highest degree of differential expression in a bacterial and viral sample as compared to all the other exons of the RNA determinant.

5 In another embodiment, five exons per RNA determinant are analyzed wherein at least one of the exons show a degree of accuracy above a predetermined level. It is further considered that four exons per RNA determinant are analyzed wherein each of the exons show a degree of accuracy (based on differential expression analysis) above a predetermined level. Preferably, one of the exons of the five exons analyzed presents
10 the highest degree of differential expression in a bacterial and viral sample as compared to all the other exons of the RNA determinant.

It will be appreciated that in order to enhance the accuracy of the diagnosis, more than 1 RNA determinant may be analyzed, wherein each RNA determinant may be measured at one or more exons as specified herein above. Thus, information
15 regarding two or more RNA determinants can be combined and made clinically useful through the use of various formulae, including statistical classification algorithms and others, combining and in many cases extending the performance characteristics of the combination beyond that of the individual RNA determinants. These specific combinations may show an acceptable level of diagnostic accuracy, and, when
20 sufficient information from multiple RNA determinants is combined in a trained formula, often reliably achieve a high level of diagnostic accuracy transportable from one population to another.

The general concept of how two less specific or lower performing RNA determinants are combined into novel and more useful combinations for the intended
25 indications, is a key aspect of the invention. Multiple biomarkers can often yield better performance than the individual components when proper mathematical and clinical algorithms are used; this is often evident in both sensitivity and specificity, and results in a greater AUC. Secondly, there is often novel unperceived information in the existing biomarkers, as such was necessary in order to achieve through the new formula an
30 improved level of sensitivity or specificity. This hidden information may hold true even for biomarkers which are generally regarded to have suboptimal clinical performance on their own. In fact, the suboptimal performance in terms of high false positive rates on a

single biomarker measured alone may very well be an indicator that some important additional information is contained within the biomarker results--information which would not be elucidated absent the combination with a second biomarker and a mathematical formula.

Several statistical and modeling algorithms known in the art can be used to both assist in RNA determinant selection choices and optimize the algorithms combining these choices. Statistical tools such as factor and cross-biomarker correlation/covariance analyses allow more rationale approaches to panel construction. Mathematical clustering and classification tree showing the Euclidean standardized distance between the RNA determinants can be advantageously used. Pathway informed seeding of such statistical classification techniques also may be employed, as may rational approaches based on the selection of individual RNA determinants based on their participation across in particular pathways or physiological functions.

Ultimately, formula such as statistical classification algorithms can be directly used to both select RNA determinants and to generate and train the optimal formula necessary to combine the results from multiple determinants into a single index. Often, techniques such as forward (from zero potential explanatory parameters) and backwards selection (from all available potential explanatory parameters) are used, and information criteria, such as AIC or BIC, are used to quantify the tradeoff between the performance and diagnostic accuracy of the panel and the number of RNA determinants used. The position of the individual RNA determinant on a forward or backwards selected panel can be closely related to its provision of incremental information content for the algorithm, so the order of contribution is highly dependent on the other constituent RNA determinants in the panel. Additional examples of statistical classification algorithms that could be used include Support Vector Machine (SVM), Logistic Regression (LogReg), Neural Network, Bayesian Network, and a Hidden Markov Model.

Exemplary pairs of RNA determinants that may be measured according to aspects of the present invention are set forth in Tables 5-7.

Table 5

RNA #1	RNA #2
BMX	CYP1B1
C19orf59	CYP1B1

CLEC4D	CYP1B1
CYP1B1	PLSCR1
CYP1B1	FFAR3
CYP1B1	PSTPIP2
FFAR3	LOC100132244
PLSCR1	TMEM176A
ANKRD22	CYP1B1
BMX	TMEM176A
CD177	CYP1B1
CD177	FFAR3
AIM2	CYP1B1
CLEC4D	TMEM176A
CYP1B1	TNFAIP6
CYP1B1	INCA
LOC100132244	PLSCR1
BMX	LOC100132244
CEACAM1	CYP1B1
CLEC4D	LOC100132244
PSTPIP2	TMEM176A
AIM2	CYBRD1
BMX	CYBRD1
C19orf59	FFAR3
CEACAM1	CYBRD1
CYBRD1	EIF2AK2
CYBRD1	EPSTI1
CYBRD1	HERC5
CYBRD1	IFI44
CYBRD1	IFI6
CYBRD1	IFIT2
CYBRD1	IFIT3
CYBRD1	IFITM3
CYBRD1	INCA
CYBRD1	OAS1
CYBRD1	PLSCR1
CYBRD1	PSTPIP2
CYBRD1	SERPING1
CYBRD1	TNFAIP6
CYP1B1	RASA4
CYP1B1	IRF7
FFAR3	TMEM176A
CEACAM1	TMEM176A
LOC100132244	PPBP
CCL2	CYBRD1

CD177	LOC26010 (SPATS2L)
CMPK2	CYBRD1
CYBRD1	LOC26010 (SPATS2L)
CYBRD1	MX1

Table 6

<i>RNA #1</i>	<i>RNA #2</i>
EIF1AY	OTOF
HLA-DQA1	OTOF
LAMP3	OTOF
OTOF	UTY
IFI6	OTOF
CXCL10	OTOF
JARID1D	OTOF
OTOF	RGS1
CCL2	OTOF
CEACAM1	OTOF
IFI44L	OTOF
CYP1B1	OTOF
F13A1	OTOF
IFI27	OTOF
IFI44	OTOF
IRF7	OTOF
ISG15	OTOF
OAS3	OTOF
OASL	OTOF
OTOF	PLSCR1
OTOF	PPBP
OTOF	PSTPIP2
OTOF	SIGLEC1
OTOF	TMEM176A
AIM2	OTOF
BMX	OTOF
CYBRD1	OTOF
EIF2AK2	OTOF
IFIT1	OTOF
IFIT2	OTOF
IFIT3	OTOF
JUP	OTOF
LY6E	OTOF
OAS1	OTOF

OTOF	RSAD2
OTOF	RTP4
OTOF	TNFAIP6
OTOF	USP18
HERC5	OTOF
OAS2	OTOF
OTOF	SERPING1
MX1	OTOF
HLA-DQA1	USP18

Table 7

<i>RNA 1</i>	<i>RNA 2</i>
LAMP3	USP18
CXCL10	USP18
IFI6	LY6E
CCL2	IFI27
IFI6	USP18

Other exemplary pairs are provided herein below:

- 5 CMPK2+CR1, CMPK2+CYP1B1, CMPK2+DDX60, CMPK2+DGAT2, CMPK2+PARP12, CMPK2+PNPT1, CMPK2+PYGL, CMPK2+SULT1B1, CMPK2+TRIB2, CMPK2+uc003hrl.1, CMPK2+USP41, CMPK2+ZCCHC2, CMPK2+n332762, CMPK2+n407780, CMPK2+n332510, CMPK2+n334829, CMPK2+n332456, CMPK2+n333319, CMPK2+TCONS_00003184-XLOC_001966,
- 10 CMPK2+TCONS_00013664-XLOC_006324, CMPK2+TCONS_12_00028242-XLOC_12_014551, CMPK2+TCONS_12_00001926-XLOC_12_000004, CMPK2+TCONS_12_00002386-XLOC_12_000726, CMPK2+TCONS_12_00002811-XLOC_12_001398, CMPK2+TCONS_12_00003949-XLOC_12_001561, CMPK2+TCONS_00019559-XLOC_009354, CMPK2+TCONS_12_00010440-
- 15 XLOC_12_005352, CMPK2+TCONS_12_00016828-XLOC_12_008724, CMPK2+TCONS_12_00021682-XLOC_12_010810, CMPK2+TCONS_12_00002367-XLOC_12_000720, CMPK2+FAM89A, CMPK2+MX1, CMPK2+RSAD2, CMPK2+IFI44L, CMPK2+USP18, CMPK2+IFI27, CR1+CYP1B1, CR1+DDX60, CR1+DGAT2, CR1+PARP12, CR1+PNPT1, CR1+PYGL, CR1+SULT1B1,
- 20 CR1+TRIB2, CR1+uc003hrl.1, CR1+USP41, CR1+ZCCHC2, CR1+n332762, CR1+n407780, CR1+n332510, CR1+n334829, CR1+n332456, CR1+n333319,

CR1+TCONS_00003184-XLOC_001966, CR1+TCONS_00013664-XLOC_006324,
 CR1+TCONS_12_00028242-XLOC_12_014551, CR1+TCONS_12_00001926-
 XLOC_12_000004, CR1+TCONS_12_00002386-XLOC_12_000726,
 CR1+TCONS_12_00002811-XLOC_12_001398, CR1+TCONS_12_00003949-
 5 XLOC_12_001561, CR1+TCONS_00019559-XLOC_009354,
 CR1+TCONS_12_00010440-XLOC_12_005352, CR1+TCONS_12_00016828-
 XLOC_12_008724, CR1+TCONS_12_00021682-XLOC_12_010810,
 CR1+TCONS_12_00002367-XLOC_12_000720, CR1+FAM89A, CR1+MX1,
 CR1+RSAD2, CR1+IFI44L, CR1+USP18, CR1+IFI27, CYP1B1+DDX60,
 10 CYP1B1+DGAT2, CYP1B1+PARP12, CYP1B1+PNPT1, CYP1B1+PYGL,
 CYP1B1+SULT1B1, CYP1B1+TRIB2, CYP1B1+uc003hrl.1, CYP1B1+USP41,
 CYP1B1+ZCCHC2, CYP1B1+n332762, CYP1B1+n407780, CYP1B1+n332510,
 CYP1B1+n334829, CYP1B1+n332456, CYP1B1+n333319,
 CYP1B1+TCONS_00003184-XLOC_001966, CYP1B1+TCONS_00013664-
 15 XLOC_006324, CYP1B1+TCONS_12_00028242-XLOC_12_014551,
 CYP1B1+TCONS_12_00001926-XLOC_12_000004, CYP1B1+TCONS_12_00002386-
 XLOC_12_000726, CYP1B1+TCONS_12_00002811-XLOC_12_001398,
 CYP1B1+TCONS_12_00003949-XLOC_12_001561, CYP1B1+TCONS_00019559-
 XLOC_009354, CYP1B1+TCONS_12_00010440-XLOC_12_005352,
 20 CYP1B1+TCONS_12_00016828-XLOC_12_008724, CYP1B1+TCONS_12_00021682-
 XLOC_12_010810, CYP1B1+TCONS_12_00002367-XLOC_12_000720,
 CYP1B1+FAM89A, CYP1B1+MX1, CYP1B1+RSAD2, CYP1B1+IFI44L,
 CYP1B1+USP18, CYP1B1+IFI27, DDX60+DGAT2, DDX60+PARP12,
 DDX60+PNPT1, DDX60+PYGL, DDX60+SULT1B1, DDX60+TRIB2,
 25 DDX60+uc003hrl.1, DDX60+USP41, DDX60+ZCCHC2, DDX60+n332762,
 DDX60+n407780, DDX60+n332510, DDX60+n334829, DDX60+n332456,
 DDX60+n333319, DDX60+TCONS_00003184-XLOC_001966,
 DDX60+TCONS_00013664-XLOC_006324, DDX60+TCONS_12_00028242-
 XLOC_12_014551, DDX60+TCONS_12_00001926-XLOC_12_000004,
 30 DDX60+TCONS_12_00002386-XLOC_12_000726, DDX60+TCONS_12_00002811-
 XLOC_12_001398, DDX60+TCONS_12_00003949-XLOC_12_001561,
 DDX60+TCONS_00019559-XLOC_009354, DDX60+TCONS_12_00010440-

XLOC_I2_005352, DDX60+TCONS_I2_00016828-XLOC_I2_008724,
 DDX60+TCONS_I2_00021682-XLOC_I2_010810, DDX60+TCONS_I2_00002367-
 XLOC_I2_000720, DDX60+FAM89A, DDX60+MX1, DDX60+RSAD2,
 DDX60+IFI44L, DDX60+USP18, DDX60+IFI27, DGAT2+PARP12,
 5 DGAT2+PNPT1, DGAT2+PYGL, DGAT2+SULT1B1, DGAT2+TRIB2,
 DGAT2+uc003hrl.1, DGAT2+USP41, DGAT2+ZCCHC2, DGAT2+n332762,
 DGAT2+n407780, DGAT2+n332510, DGAT2+n334829, DGAT2+n332456,
 DGAT2+n333319, DGAT2+TCONS_00003184-XLOC_001966,
 DGAT2+TCONS_00013664-XLOC_006324, DGAT2+TCONS_I2_00028242-
 10 XLOC_I2_014551, DGAT2+TCONS_I2_00001926-XLOC_I2_000004,
 DGAT2+TCONS_I2_00002386-XLOC_I2_000726, DGAT2+TCONS_I2_00002811-
 XLOC_I2_001398, DGAT2+TCONS_I2_00003949-XLOC_I2_001561,
 DGAT2+TCONS_00019559-XLOC_009354, DGAT2+TCONS_I2_00010440-
 XLOC_I2_005352, DGAT2+TCONS_I2_00016828-XLOC_I2_008724,
 15 DGAT2+TCONS_I2_00021682-XLOC_I2_010810, DGAT2+TCONS_I2_00002367-
 XLOC_I2_000720, DGAT2+FAM89A, DGAT2+MX1, DGAT2+RSAD2,
 DGAT2+IFI44L, DGAT2+USP18, DGAT2+IFI27, PARP12+PNPT1, PARP12+PYGL,
 PARP12+SULT1B1, PARP12+TRIB2, PARP12+uc003hrl.1, PARP12+USP41,
 PARP12+ZCCHC2, PARP12+n332762, PARP12+n407780, PARP12+n332510,
 20 PARP12+n334829, PARP12+n332456, PARP12+n333319,
 PARP12+TCONS_00003184-XLOC_001966, PARP12+TCONS_00013664-
 XLOC_006324, PARP12+TCONS_I2_00028242-XLOC_I2_014551,
 PARP12+TCONS_I2_00001926-XLOC_I2_000004, PARP12+TCONS_I2_00002386-
 XLOC_I2_000726, PARP12+TCONS_I2_00002811-XLOC_I2_001398,
 25 PARP12+TCONS_I2_00003949-XLOC_I2_001561, PARP12+TCONS_00019559-
 XLOC_009354, PARP12+TCONS_I2_00010440-XLOC_I2_005352,
 PARP12+TCONS_I2_00016828-XLOC_I2_008724, PARP12+TCONS_I2_00021682-
 XLOC_I2_010810, PARP12+TCONS_I2_00002367-XLOC_I2_000720,
 PARP12+FAM89A, PARP12+MX1, PARP12+RSAD2, PARP12+IFI44L,
 30 PARP12+USP18, PARP12+IFI27, PNPT1+PYGL, PNPT1+SULT1B1,
 PNPT1+TRIB2, PNPT1+uc003hrl.1, PNPT1+USP41, PNPT1+ZCCHC2,
 PNPT1+n332762, PNPT1+n407780, PNPT1+n332510, PNPT1+n334829,

PNPT1+n332456, PNPT1+n333319, PNPT1+TCONS_00003184-XLOC_001966,
 PNPT1+TCONS_00013664-XLOC_006324, PNPT1+TCONS_12_00028242-
 XLOC_12_014551, PNPT1+TCONS_12_00001926-XLOC_12_000004,
 PNPT1+TCONS_12_00002386-XLOC_12_000726, PNPT1+TCONS_12_00002811-
 5 XLOC_12_001398, PNPT1+TCONS_12_00003949-XLOC_12_001561,
 PNPT1+TCONS_00019559-XLOC_009354, PNPT1+TCONS_12_00010440-
 XLOC_12_005352, PNPT1+TCONS_12_00016828-XLOC_12_008724,
 PNPT1+TCONS_12_00021682-XLOC_12_010810, PNPT1+TCONS_12_00002367-
 XLOC_12_000720, PNPT1+FAM89A, PNPT1+MX1, PNPT1+RSAD2,
 10 PNPT1+IFI44L, PNPT1+USP18, PNPT1+IFI27, PYGL+SULT1B1, PYGL+TRIB2,
 PYGL+uc003hrl.1, PYGL+USP41, PYGL+ZCCHC2, PYGL+n332762,
 PYGL+n407780, PYGL+n332510, PYGL+n334829, PYGL+n332456,
 PYGL+n333319, PYGL+TCONS_00003184-XLOC_001966,
 PYGL+TCONS_00013664-XLOC_006324, PYGL+TCONS_12_00028242-
 15 XLOC_12_014551, PYGL+TCONS_12_00001926-XLOC_12_000004,
 PYGL+TCONS_12_00002386-XLOC_12_000726, PYGL+TCONS_12_00002811-
 XLOC_12_001398, PYGL+TCONS_12_00003949-XLOC_12_001561,
 PYGL+TCONS_00019559-XLOC_009354, PYGL+TCONS_12_00010440-
 XLOC_12_005352, PYGL+TCONS_12_00016828-XLOC_12_008724,
 20 PYGL+TCONS_12_00021682-XLOC_12_010810, PYGL+TCONS_12_00002367-
 XLOC_12_000720, PYGL+FAM89A, PYGL+MX1, PYGL+RSAD2, PYGL+IFI44L,
 PYGL+USP18, PYGL+IFI27, SULT1B1+TRIB2, SULT1B1+uc003hrl.1,
 SULT1B1+USP41, SULT1B1+ZCCHC2, SULT1B1+n332762, SULT1B1+n407780,
 SULT1B1+n332510, SULT1B1+n334829, SULT1B1+n332456, SULT1B1+n333319,
 25 SULT1B1+TCONS_00003184-XLOC_001966, SULT1B1+TCONS_00013664-
 XLOC_006324, SULT1B1+TCONS_12_00028242-XLOC_12_014551,
 SULT1B1+TCONS_12_00001926-XLOC_12_000004,
 SULT1B1+TCONS_12_00002386-XLOC_12_000726,
 SULT1B1+TCONS_12_00002811-XLOC_12_001398,
 30 SULT1B1+TCONS_12_00003949-XLOC_12_001561, SULT1B1+TCONS_00019559-
 XLOC_009354, SULT1B1+TCONS_12_00010440-XLOC_12_005352,
 SULT1B1+TCONS_12_00016828-XLOC_12_008724,

SULT1B1+TCONS_I2_00021682-XLOC_I2_010810,
 SULT1B1+TCONS_I2_00002367-XLOC_I2_000720, SULT1B1+FAM89A,
 SULT1B1+MX1, SULT1B1+RSAD2, SULT1B1+IFI44L, SULT1B1+USP18,
 SULT1B1+IFI27, TRIB2+uc003hrl.1, TRIB2+USP41, TRIB2+ZCCHC2,
 5 TRIB2+n332762, TRIB2+n407780, TRIB2+n332510, TRIB2+n334829,
 TRIB2+n332456, TRIB2+n333319, TRIB2+TCONS_00003184-XLOC_001966,
 TRIB2+TCONS_00013664-XLOC_006324, TRIB2+TCONS_I2_00028242-
 XLOC_I2_014551, TRIB2+TCONS_I2_00001926-XLOC_I2_000004,
 TRIB2+TCONS_I2_00002386-XLOC_I2_000726, TRIB2+TCONS_I2_00002811-
 10 XLOC_I2_001398, TRIB2+TCONS_I2_00003949-XLOC_I2_001561,
 TRIB2+TCONS_00019559-XLOC_009354, TRIB2+TCONS_I2_00010440-
 XLOC_I2_005352, TRIB2+TCONS_I2_00016828-XLOC_I2_008724,
 TRIB2+TCONS_I2_00021682-XLOC_I2_010810, TRIB2+TCONS_I2_00002367-
 XLOC_I2_000720, TRIB2+FAM89A, TRIB2+MX1, TRIB2+RSAD2, TRIB2+IFI44L,
 15 TRIB2+USP18, TRIB2+IFI27, uc003hrl.1+USP41, uc003hrl.1+ZCCHC2,
 uc003hrl.1+n332762, uc003hrl.1+n407780, uc003hrl.1+n332510, uc003hrl.1+n334829,
 uc003hrl.1+n332456, uc003hrl.1+n333319, uc003hrl.1+TCONS_00003184-
 XLOC_001966, uc003hrl.1+TCONS_00013664-XLOC_006324,
 uc003hrl.1+TCONS_I2_00028242-XLOC_I2_014551,
 20 uc003hrl.1+TCONS_I2_00001926-XLOC_I2_000004,
 uc003hrl.1+TCONS_I2_00002386-XLOC_I2_000726,
 uc003hrl.1+TCONS_I2_00002811-XLOC_I2_001398,
 uc003hrl.1+TCONS_I2_00003949-XLOC_I2_001561, uc003hrl.1+TCONS_00019559-
 XLOC_009354, uc003hrl.1+TCONS_I2_00010440-XLOC_I2_005352,
 25 uc003hrl.1+TCONS_I2_00016828-XLOC_I2_008724,
 uc003hrl.1+TCONS_I2_00021682-XLOC_I2_010810,
 uc003hrl.1+TCONS_I2_00002367-XLOC_I2_000720, uc003hrl.1+FAM89A,
 uc003hrl.1+MX1, uc003hrl.1+RSAD2, uc003hrl.1+IFI44L, uc003hrl.1+USP18,
 uc003hrl.1+IFI27, USP41+ZCCHC2, USP41+n332762, USP41+n407780,
 30 USP41+n332510, USP41+n334829, USP41+n332456, USP41+n333319,
 USP41+TCONS_00003184-XLOC_001966, USP41+TCONS_00013664-
 XLOC_006324, USP41+TCONS_I2_00028242-XLOC_I2_014551,

USP41+TCONS_I2_00001926-XLOC_I2_000004, USP41+TCONS_I2_00002386-
 XLOC_I2_000726, USP41+TCONS_I2_00002811-XLOC_I2_001398,
 USP41+TCONS_I2_00003949-XLOC_I2_001561, USP41+TCONS_00019559-
 XLOC_009354, USP41+TCONS_I2_00010440-XLOC_I2_005352,
 5 USP41+TCONS_I2_00016828-XLOC_I2_008724, USP41+TCONS_I2_00021682-
 XLOC_I2_010810, USP41+TCONS_I2_00002367-XLOC_I2_000720,
 USP41+FAM89A, USP41+MX1, USP41+RSAD2, USP41+IFI44L, USP41+USP18,
 USP41+IFI27, ZCCHC2+n332762, ZCCHC2+n407780, ZCCHC2+n332510,
 ZCCHC2+n334829, ZCCHC2+n332456, ZCCHC2+n333319,
 10 ZCCHC2+TCONS_00003184-XLOC_001966, ZCCHC2+TCONS_00013664-
 XLOC_006324, ZCCHC2+TCONS_I2_00028242-XLOC_I2_014551,
 ZCCHC2+TCONS_I2_00001926-XLOC_I2_000004,
 ZCCHC2+TCONS_I2_00002386-XLOC_I2_000726,
 ZCCHC2+TCONS_I2_00002811-XLOC_I2_001398,
 15 ZCCHC2+TCONS_I2_00003949-XLOC_I2_001561, ZCCHC2+TCONS_00019559-
 XLOC_009354, ZCCHC2+TCONS_I2_00010440-XLOC_I2_005352,
 ZCCHC2+TCONS_I2_00016828-XLOC_I2_008724,
 ZCCHC2+TCONS_I2_00021682-XLOC_I2_010810,
 ZCCHC2+TCONS_I2_00002367-XLOC_I2_000720, ZCCHC2+FAM89A,
 20 ZCCHC2+MX1, ZCCHC2+RSAD2, ZCCHC2+IFI44L, ZCCHC2+USP18,
 ZCCHC2+IFI27, n332762+n407780, n332762+n332510, n332762+n334829,
 n332762+n332456, n332762+n333319, n332762+TCONS_00003184-XLOC_001966,
 n332762+TCONS_00013664-XLOC_006324, n332762+TCONS_I2_00028242-
 XLOC_I2_014551, n332762+TCONS_I2_00001926-XLOC_I2_000004,
 25 n332762+TCONS_I2_00002386-XLOC_I2_000726, n332762+TCONS_I2_00002811-
 XLOC_I2_001398, n332762+TCONS_I2_00003949-XLOC_I2_001561,
 n332762+TCONS_00019559-XLOC_009354, n332762+TCONS_I2_00010440-
 XLOC_I2_005352, n332762+TCONS_I2_00016828-XLOC_I2_008724,
 n332762+TCONS_I2_00021682-XLOC_I2_010810, n332762+TCONS_I2_00002367-
 30 XLOC_I2_000720, n332762+FAM89A, n332762+MX1, n332762+RSAD2,
 n332762+IFI44L, n332762+USP18, n332762+IFI27, n407780+n332510,
 n407780+n334829, n407780+n332456, n407780+n333319,

n407780+TCONS_00003184-XLOC_001966, n407780+TCONS_00013664-
 XLOC_006324, n407780+TCONS_12_00028242-XLOC_12_014551,
 n407780+TCONS_12_00001926-XLOC_12_000004, n407780+TCONS_12_00002386-
 XLOC_12_000726, n407780+TCONS_12_00002811-XLOC_12_001398,
 5 n407780+TCONS_12_00003949-XLOC_12_001561, n407780+TCONS_00019559-
 XLOC_009354, n407780+TCONS_12_00010440-XLOC_12_005352,
 n407780+TCONS_12_00016828-XLOC_12_008724, n407780+TCONS_12_00021682-
 XLOC_12_010810, n407780+TCONS_12_00002367-XLOC_12_000720,
 n407780+FAM89A, n407780+MX1, n407780+RSAD2, n407780+IFI44L,
 10 n407780+USP18, n407780+IFI27, n332510+n334829, n332510+n332456,
 n332510+n333319, n332510+TCONS_00003184-XLOC_001966,
 n332510+TCONS_00013664-XLOC_006324, n332510+TCONS_12_00028242-
 XLOC_12_014551, n332510+TCONS_12_00001926-XLOC_12_000004,
 n332510+TCONS_12_00002386-XLOC_12_000726, n332510+TCONS_12_00002811-
 15 XLOC_12_001398, n332510+TCONS_12_00003949-XLOC_12_001561,
 n332510+TCONS_00019559-XLOC_009354, n332510+TCONS_12_00010440-
 XLOC_12_005352, n332510+TCONS_12_00016828-XLOC_12_008724,
 n332510+TCONS_12_00021682-XLOC_12_010810, n332510+TCONS_12_00002367-
 XLOC_12_000720, n332510+FAM89A, n332510+MX1, n332510+RSAD2,
 20 n332510+IFI44L, n332510+USP18, n332510+IFI27, n334829+n332456,
 n334829+n333319, n334829+TCONS_00003184-XLOC_001966,
 n334829+TCONS_00013664-XLOC_006324, n334829+TCONS_12_00028242-
 XLOC_12_014551, n334829+TCONS_12_00001926-XLOC_12_000004,
 n334829+TCONS_12_00002386-XLOC_12_000726, n334829+TCONS_12_00002811-
 25 XLOC_12_001398, n334829+TCONS_12_00003949-XLOC_12_001561,
 n334829+TCONS_00019559-XLOC_009354, n334829+TCONS_12_00010440-
 XLOC_12_005352, n334829+TCONS_12_00016828-XLOC_12_008724,
 n334829+TCONS_12_00021682-XLOC_12_010810, n334829+TCONS_12_00002367-
 XLOC_12_000720, n334829+FAM89A, n334829+MX1, n334829+RSAD2,
 30 n334829+IFI44L, n334829+USP18, n334829+IFI27, n332456+n333319,
 n332456+TCONS_00003184-XLOC_001966, n332456+TCONS_00013664-
 XLOC_006324, n332456+TCONS_12_00028242-XLOC_12_014551,

n332456+TCONS_I2_00001926-XLOC_I2_0000004, n332456+TCONS_I2_00002386-
 XLOC_I2_000726, n332456+TCONS_I2_00002811-XLOC_I2_001398,
 n332456+TCONS_I2_00003949-XLOC_I2_001561, n332456+TCONS_00019559-
 XLOC_009354, n332456+TCONS_I2_00010440-XLOC_I2_005352,
 5 n332456+TCONS_I2_00016828-XLOC_I2_008724, n332456+TCONS_I2_00021682-
 XLOC_I2_010810, n332456+TCONS_I2_00002367-XLOC_I2_000720,
 n332456+FAM89A, n332456+MX1, n332456+RSAD2, n332456+IFI44L,
 n332456+USP18, n332456+IFI27, n333319+TCONS_00003184-XLOC_001966,
 n333319+TCONS_00013664-XLOC_006324, n333319+TCONS_I2_00028242-
 10 XLOC_I2_014551, n333319+TCONS_I2_00001926-XLOC_I2_0000004,
 n333319+TCONS_I2_00002386-XLOC_I2_000726, n333319+TCONS_I2_00002811-
 XLOC_I2_001398, n333319+TCONS_I2_00003949-XLOC_I2_001561,
 n333319+TCONS_00019559-XLOC_009354, n333319+TCONS_I2_00010440-
 XLOC_I2_005352, n333319+TCONS_I2_00016828-XLOC_I2_008724,
 15 n333319+TCONS_I2_00021682-XLOC_I2_010810, n333319+TCONS_I2_00002367-
 XLOC_I2_000720, n333319+FAM89A, n333319+MX1, n333319+RSAD2,
 n333319+IFI44L, n333319+USP18, n333319+IFI27, TCONS_00003184-
 XLOC_001966+TCONS_00013664-XLOC_006324, TCONS_00003184-
 XLOC_001966+TCONS_I2_00028242-XLOC_I2_014551, TCONS_00003184-
 20 XLOC_001966+TCONS_I2_00001926-XLOC_I2_0000004, TCONS_00003184-
 XLOC_001966+TCONS_I2_00002386-XLOC_I2_000726, TCONS_00003184-
 XLOC_001966+TCONS_I2_00002811-XLOC_I2_001398, TCONS_00003184-
 XLOC_001966+TCONS_I2_00003949-XLOC_I2_001561, TCONS_00003184-
 XLOC_001966+TCONS_00019559-XLOC_009354, TCONS_00003184-
 25 XLOC_001966+TCONS_I2_00010440-XLOC_I2_005352, TCONS_00003184-
 XLOC_001966+TCONS_I2_00016828-XLOC_I2_008724, TCONS_00003184-
 XLOC_001966+TCONS_I2_00021682-XLOC_I2_010810, TCONS_00003184-
 XLOC_001966+TCONS_I2_00002367-XLOC_I2_000720, TCONS_00003184-
 XLOC_001966+FAM89A, TCONS_00003184-XLOC_001966+MX1,
 30 TCONS_00003184-XLOC_001966+RSAD2, TCONS_00003184-
 XLOC_001966+IFI44L, TCONS_00003184-XLOC_001966+USP18,
 TCONS_00003184-XLOC_001966+IFI27, TCONS_00013664-

XLOC_006324+TCONS_12_00028242-XLOC_12_014551, TCONS_00013664-
 XLOC_006324+TCONS_12_00001926-XLOC_12_000004, TCONS_00013664-
 XLOC_006324+TCONS_12_00002386-XLOC_12_000726, TCONS_00013664-
 XLOC_006324+TCONS_12_00002811-XLOC_12_001398, TCONS_00013664-
 5 XLOC_006324+TCONS_12_00003949-XLOC_12_001561, TCONS_00013664-
 XLOC_006324+TCONS_00019559-XLOC_009354, TCONS_00013664-
 XLOC_006324+TCONS_12_00010440-XLOC_12_005352, TCONS_00013664-
 XLOC_006324+TCONS_12_00016828-XLOC_12_008724, TCONS_00013664-
 XLOC_006324+TCONS_12_00021682-XLOC_12_010810, TCONS_00013664-
 10 XLOC_006324+TCONS_12_00002367-XLOC_12_000720, TCONS_00013664-
 XLOC_006324+FAM89A, TCONS_00013664-XLOC_006324+MX1,
 TCONS_00013664-XLOC_006324+RSAD2, TCONS_00013664-
 XLOC_006324+IFI44L, TCONS_00013664-XLOC_006324+USP18,
 TCONS_00013664-XLOC_006324+IFI27, TCONS_12_00028242-
 15 XLOC_12_014551+TCONS_12_00001926-XLOC_12_000004, TCONS_12_00028242-
 XLOC_12_014551+TCONS_12_00002386-XLOC_12_000726, TCONS_12_00028242-
 XLOC_12_014551+TCONS_12_00002811-XLOC_12_001398, TCONS_12_00028242-
 XLOC_12_014551+TCONS_12_00003949-XLOC_12_001561, TCONS_12_00028242-
 XLOC_12_014551+TCONS_00019559-XLOC_009354, TCONS_12_00028242-
 20 XLOC_12_014551+TCONS_12_00010440-XLOC_12_005352, TCONS_12_00028242-
 XLOC_12_014551+TCONS_12_00016828-XLOC_12_008724, TCONS_12_00028242-
 XLOC_12_014551+TCONS_12_00021682-XLOC_12_010810, TCONS_12_00028242-
 XLOC_12_014551+TCONS_12_00002367-XLOC_12_000720, TCONS_12_00028242-
 XLOC_12_014551+FAM89A, TCONS_12_00028242-XLOC_12_014551+MX1,
 25 TCONS_12_00028242-XLOC_12_014551+RSAD2, TCONS_12_00028242-
 XLOC_12_014551+IFI44L, TCONS_12_00028242-XLOC_12_014551+USP18,
 TCONS_12_00028242-XLOC_12_014551+IFI27, TCONS_12_00001926-
 XLOC_12_000004+TCONS_12_00002386-XLOC_12_000726, TCONS_12_00001926-
 XLOC_12_000004+TCONS_12_00002811-XLOC_12_001398, TCONS_12_00001926-
 30 XLOC_12_000004+TCONS_12_00003949-XLOC_12_001561, TCONS_12_00001926-
 XLOC_12_000004+TCONS_00019559-XLOC_009354, TCONS_12_00001926-
 XLOC_12_000004+TCONS_12_00010440-XLOC_12_005352, TCONS_12_00001926-

XLOC_I2_000004+TCONS_I2_00016828-XLOC_I2_008724, TCONS_I2_00001926-
 XLOC_I2_000004+TCONS_I2_00021682-XLOC_I2_010810, TCONS_I2_00001926-
 XLOC_I2_000004+TCONS_I2_00002367-XLOC_I2_000720, TCONS_I2_00001926-
 XLOC_I2_000004+FAM89A, TCONS_I2_00001926-XLOC_I2_000004+MX1,
 5 TCONS_I2_00001926-XLOC_I2_000004+RSAD2, TCONS_I2_00001926-
 XLOC_I2_000004+IFI44L, TCONS_I2_00001926-XLOC_I2_000004+USP18,
 TCONS_I2_00001926-XLOC_I2_000004+IFI27, TCONS_I2_00002386-
 XLOC_I2_000726+TCONS_I2_00002811-XLOC_I2_001398, TCONS_I2_00002386-
 XLOC_I2_000726+TCONS_I2_00003949-XLOC_I2_001561, TCONS_I2_00002386-
 10 XLOC_I2_000726+TCONS_00019559-XLOC_009354, TCONS_I2_00002386-
 XLOC_I2_000726+TCONS_I2_00010440-XLOC_I2_005352, TCONS_I2_00002386-
 XLOC_I2_000726+TCONS_I2_00016828-XLOC_I2_008724, TCONS_I2_00002386-
 XLOC_I2_000726+TCONS_I2_00021682-XLOC_I2_010810, TCONS_I2_00002386-
 XLOC_I2_000726+TCONS_I2_00002367-XLOC_I2_000720, TCONS_I2_00002386-
 15 XLOC_I2_000726+FAM89A, TCONS_I2_00002386-XLOC_I2_000726+MX1,
 TCONS_I2_00002386-XLOC_I2_000726+RSAD2, TCONS_I2_00002386-
 XLOC_I2_000726+IFI44L, TCONS_I2_00002386-XLOC_I2_000726+USP18,
 TCONS_I2_00002386-XLOC_I2_000726+IFI27, TCONS_I2_00002811-
 XLOC_I2_001398+TCONS_I2_00003949-XLOC_I2_001561, TCONS_I2_00002811-
 20 XLOC_I2_001398+TCONS_00019559-XLOC_009354, TCONS_I2_00002811-
 XLOC_I2_001398+TCONS_I2_00010440-XLOC_I2_005352, TCONS_I2_00002811-
 XLOC_I2_001398+TCONS_I2_00016828-XLOC_I2_008724, TCONS_I2_00002811-
 XLOC_I2_001398+TCONS_I2_00021682-XLOC_I2_010810, TCONS_I2_00002811-
 XLOC_I2_001398+TCONS_I2_00002367-XLOC_I2_000720, TCONS_I2_00002811-
 25 XLOC_I2_001398+FAM89A, TCONS_I2_00002811-XLOC_I2_001398+MX1,
 TCONS_I2_00002811-XLOC_I2_001398+RSAD2, TCONS_I2_00002811-
 XLOC_I2_001398+IFI44L, TCONS_I2_00002811-XLOC_I2_001398+USP18,
 TCONS_I2_00002811-XLOC_I2_001398+IFI27, TCONS_I2_00003949-
 XLOC_I2_001561+TCONS_00019559-XLOC_009354, TCONS_I2_00003949-
 30 XLOC_I2_001561+TCONS_I2_00010440-XLOC_I2_005352, TCONS_I2_00003949-
 XLOC_I2_001561+TCONS_I2_00016828-XLOC_I2_008724, TCONS_I2_00003949-
 XLOC_I2_001561+TCONS_I2_00021682-XLOC_I2_010810, TCONS_I2_00003949-

XLOC_I2_001561+TCONS_I2_00002367-XLOC_I2_000720, TCONS_I2_00003949-
 XLOC_I2_001561+FAM89A, TCONS_I2_00003949-XLOC_I2_001561+MX1,
 TCONS_I2_00003949-XLOC_I2_001561+RSAD2, TCONS_I2_00003949-
 XLOC_I2_001561+IFI44L, TCONS_I2_00003949-XLOC_I2_001561+USP18,
 5 TCONS_I2_00003949-XLOC_I2_001561+IFI27, TCONS_00019559-
 XLOC_009354+TCONS_I2_00010440-XLOC_I2_005352, TCONS_00019559-
 XLOC_009354+TCONS_I2_00016828-XLOC_I2_008724, TCONS_00019559-
 XLOC_009354+TCONS_I2_00021682-XLOC_I2_010810, TCONS_00019559-
 XLOC_009354+TCONS_I2_00002367-XLOC_I2_000720, TCONS_00019559-
 10 XLOC_009354+FAM89A, TCONS_00019559-XLOC_009354+MX1,
 TCONS_00019559-XLOC_009354+RSAD2, TCONS_00019559-
 XLOC_009354+IFI44L, TCONS_00019559-XLOC_009354+USP18,
 TCONS_00019559-XLOC_009354+IFI27, TCONS_I2_00010440-
 XLOC_I2_005352+TCONS_I2_00016828-XLOC_I2_008724, TCONS_I2_00010440-
 15 XLOC_I2_005352+TCONS_I2_00021682-XLOC_I2_010810, TCONS_I2_00010440-
 XLOC_I2_005352+TCONS_I2_00002367-XLOC_I2_000720, TCONS_I2_00010440-
 XLOC_I2_005352+FAM89A, TCONS_I2_00010440-XLOC_I2_005352+MX1,
 TCONS_I2_00010440-XLOC_I2_005352+RSAD2, TCONS_I2_00010440-
 XLOC_I2_005352+IFI44L, TCONS_I2_00010440-XLOC_I2_005352+USP18,
 20 TCONS_I2_00010440-XLOC_I2_005352+IFI27, TCONS_I2_00016828-
 XLOC_I2_008724+TCONS_I2_00021682-XLOC_I2_010810, TCONS_I2_00016828-
 XLOC_I2_008724+TCONS_I2_00002367-XLOC_I2_000720, TCONS_I2_00016828-
 XLOC_I2_008724+FAM89A, TCONS_I2_00016828-XLOC_I2_008724+MX1,
 TCONS_I2_00016828-XLOC_I2_008724+RSAD2, TCONS_I2_00016828-
 25 XLOC_I2_008724+IFI44L, TCONS_I2_00016828-XLOC_I2_008724+USP18,
 TCONS_I2_00016828-XLOC_I2_008724+IFI27, TCONS_I2_00021682-
 XLOC_I2_010810+TCONS_I2_00002367-XLOC_I2_000720, TCONS_I2_00021682-
 XLOC_I2_010810+FAM89A, TCONS_I2_00021682-XLOC_I2_010810+MX1,
 TCONS_I2_00021682-XLOC_I2_010810+RSAD2, TCONS_I2_00021682-
 30 XLOC_I2_010810+IFI44L, TCONS_I2_00021682-XLOC_I2_010810+USP18,
 TCONS_I2_00021682-XLOC_I2_010810+IFI27, TCONS_I2_00002367-
 XLOC_I2_000720+FAM89A, TCONS_I2_00002367-XLOC_I2_000720+MX1,

TCONS_I2_00002367-XLOC_I2_000720+RSAD2, TCONS_I2_00002367-XLOC_I2_000720+IFI44L, TCONS_I2_00002367-XLOC_I2_000720+USP18, TCONS_I2_00002367-XLOC_I2_000720+IFI27, FAM89A+MX1, FAM89A+RSAD2, FAM89A+IFI44L, FAM89A+USP18, FAM89A+IFI27, MX1+RSAD2, MX1+IFI44L, 5 MX1+USP18, MX1+IFI27, RSAD2+IFI44L, RSAD2+USP18, RSAD2+IFI27, IFI44L+USP18, IFI44L+IFI27, USP18+IFI27.

Exemplary triplets of RNA determinants that may be measured according to aspects of the present invention are set forth in Tables 8-9.

Table 8

RNA #1	RNA #2	RNA #3
EIF1AY	F13A1	OTOF
EIF1AY	HERC5	OTOF
EIF1AY	HLA-DQA1	OTOF
EIF1AY	OTOF	RGS1
EIF2AK2	LAMP3	USP18
HLA-DQA1	LAMP3	USP18
HLA-DQA1	OTOF	UTY
IFI44L	OTOF	UTY
IFI6	JARID1D	OTOF
IFI6	OTOF	UTY
LAMP3	OAS1	USP18
LAMP3	OAS3	USP18
OTOF	PLSCR1	UTY
OTOF	PSTPIP2	UTY
CCL2	EIF1AY	OTOF
EIF1AY	EIF2AK2	OTOF
EIF1AY	IFI44	OTOF
EIF1AY	IFI6	OTOF
EIF1AY	ISG15	OTOF
EIF1AY	LAMP3	OTOF
EIF1AY	OASL	OTOF
LAMP3	PSTPIP2	USP18
LAMP3	TMEM176A	USP18
AIM2	EIF1AY	OTOF
AIM2	LAMP3	USP18
CCL2	OTOF	UTY
CXCL10	EIF1AY	OTOF
CYBRD1	LAMP3	USP18

60

CYP1B1	EIF1AY	OTOF
EIF1AY	IFI44L	OTOF
EIF1AY	IFIT1	OTOF
EIF1AY	IFIT2	OTOF
EIF1AY	IFIT3	OTOF
EIF1AY	IRF7	OTOF
EIF1AY	JARID1D	OTOF
EIF1AY	JUP	OTOF
IFI44	Mx1	OTOF
IFI44	OTOF	RSAD2
IFI44L	Mx1	OTOF
IFI44	IFI44L	OTOF
IFI44L	OTOF	RSAD2
Mx1	OTOF	RSAD2

Table 9

RNA #1	RNA #2	RNA #3
HERC5	LAMP3	USP18
IFI44	LAMP3	USP18
IFI6	LAMP3	USP18
IFIT3	LAMP3	USP18
ISG15	LAMP3	USP18
LAMP3	MX1	USP18
LAMP3	PLSCR1	USP18
LAMP3	RSAD2	USP18
LAMP3	SERPING1	USP18
LAMP3	SIGLEC1	USP18
IRF7	LAMP3	USP18
LAMP3	OAS2	USP18
IFI44	IFI44L	RSAD2
IFI44	IFI44L	Mx1
IFI44L	Mx1	RSAD2
IFI44	Mx1	RSAD2

Other exemplary triplets which may be measured according to this aspect of the
5 present invention are provided herein below:

CMPK2+CR1+CYP1B1, CMPK2+CR1+DDX60, CMPK2+CR1+DGAT2,
CMPK2+CR1+PARP12, CMPK2+CR1+PNPT1, CMPK2+CR1+PYGL,

CMPK2+CR1+SULT1B1, CMPK2+CR1+TRIB2, CMPK2+CR1+uc003hrl.1,
 CMPK2+CR1+USP41, CMPK2+CR1+ZCCHC2, CMPK2+CYP1B1+DDX60,
 CMPK2+CYP1B1+DGAT2, CMPK2+CYP1B1+PARP12, CMPK2+CYP1B1+PNPT1,
 CMPK2+CYP1B1+PYGL, CMPK2+CYP1B1+SULT1B1, CMPK2+CYP1B1+TRIB2,
 5 CMPK2+CYP1B1+uc003hrl.1, CMPK2+CYP1B1+USP41,
 CMPK2+CYP1B1+ZCCHC2, CMPK2+DDX60+DGAT2, CMPK2+DDX60+PARP12,
 CMPK2+DDX60+PNPT1, CMPK2+DDX60+PYGL, CMPK2+DDX60+SULT1B1,
 CMPK2+DDX60+TRIB2, CMPK2+DDX60+uc003hrl.1, CMPK2+DDX60+USP41,
 CMPK2+DDX60+ZCCHC2, CMPK2+DGAT2+PARP12, CMPK2+DGAT2+PNPT1,
 10 CMPK2+DGAT2+PYGL, CMPK2+DGAT2+SULT1B1, CMPK2+DGAT2+TRIB2,
 CMPK2+DGAT2+uc003hrl.1, CMPK2+DGAT2+USP41,
 CMPK2+DGAT2+ZCCHC2, CMPK2+PARP12+PNPT1, CMPK2+PARP12+PYGL,
 CMPK2+PARP12+SULT1B1, CMPK2+PARP12+TRIB2,
 CMPK2+PARP12+uc003hrl.1, CMPK2+PARP12+USP41,
 15 CMPK2+PARP12+ZCCHC2, CMPK2+PNPT1+PYGL, CMPK2+PNPT1+SULT1B1,
 CMPK2+PNPT1+TRIB2, CMPK2+PNPT1+uc003hrl.1, CMPK2+PNPT1+USP41,
 CMPK2+PNPT1+ZCCHC2, CMPK2+PYGL+SULT1B1, CMPK2+PYGL+TRIB2,
 CMPK2+PYGL+uc003hrl.1, CMPK2+PYGL+USP41, CMPK2+PYGL+ZCCHC2,
 CMPK2+SULT1B1+TRIB2, CMPK2+SULT1B1+uc003hrl.1,
 20 CMPK2+SULT1B1+USP41, CMPK2+SULT1B1+ZCCHC2,
 CMPK2+TRIB2+uc003hrl.1, CMPK2+TRIB2+USP41, CMPK2+TRIB2+ZCCHC2,
 CMPK2+uc003hrl.1+USP41, CMPK2+uc003hrl.1+ZCCHC2,
 CMPK2+USP41+ZCCHC2, CR1+CYP1B1+DDX60, CR1+CYP1B1+DGAT2,
 CR1+CYP1B1+PARP12, CR1+CYP1B1+PNPT1, CR1+CYP1B1+PYGL,
 25 CR1+CYP1B1+SULT1B1, CR1+CYP1B1+TRIB2, CR1+CYP1B1+uc003hrl.1,
 CR1+CYP1B1+USP41, CR1+CYP1B1+ZCCHC2, CR1+DDX60+DGAT2,
 CR1+DDX60+PARP12, CR1+DDX60+PNPT1, CR1+DDX60+PYGL,
 CR1+DDX60+SULT1B1, CR1+DDX60+TRIB2, CR1+DDX60+uc003hrl.1,
 CR1+DDX60+USP41, CR1+DDX60+ZCCHC2, CR1+DGAT2+PARP12,
 30 CR1+DGAT2+PNPT1, CR1+DGAT2+PYGL, CR1+DGAT2+SULT1B1,
 CR1+DGAT2+TRIB2, CR1+DGAT2+uc003hrl.1, CR1+DGAT2+USP41,
 CR1+DGAT2+ZCCHC2, CR1+PARP12+PNPT1, CR1+PARP12+PYGL,

CR1+PARP12+SULT1B1, CR1+PARP12+TRIB2, CR1+PARP12+uc003hrl.1,
 CR1+PARP12+USP41, CR1+PARP12+ZCCHC2, CR1+PNPT1+PYGL,
 CR1+PNPT1+SULT1B1, CR1+PNPT1+TRIB2, CR1+PNPT1+uc003hrl.1,
 CR1+PNPT1+USP41, CR1+PNPT1+ZCCHC2, CR1+PYGL+SULT1B1,
 5 CR1+PYGL+TRIB2, CR1+PYGL+uc003hrl.1, CR1+PYGL+USP41,
 CR1+PYGL+ZCCHC2, CR1+SULT1B1+TRIB2, CR1+SULT1B1+uc003hrl.1,
 CR1+SULT1B1+USP41, CR1+SULT1B1+ZCCHC2, CR1+TRIB2+uc003hrl.1,
 CR1+TRIB2+USP41, CR1+TRIB2+ZCCHC2, CR1+uc003hrl.1+USP41,
 CR1+uc003hrl.1+ZCCHC2, CR1+USP41+ZCCHC2, CYP1B1+DDX60+DGAT2,
 10 CYP1B1+DDX60+PARP12, CYP1B1+DDX60+PNPT1, CYP1B1+DDX60+PYGL,
 CYP1B1+DDX60+SULT1B1, CYP1B1+DDX60+TRIB2,
 CYP1B1+DDX60+uc003hrl.1, CYP1B1+DDX60+USP41,
 CYP1B1+DDX60+ZCCHC2, CYP1B1+DGAT2+PARP12,
 CYP1B1+DGAT2+PNPT1, CYP1B1+DGAT2+PYGL, CYP1B1+DGAT2+SULT1B1,
 15 CYP1B1+DGAT2+TRIB2, CYP1B1+DGAT2+uc003hrl.1, CYP1B1+DGAT2+USP41,
 CYP1B1+DGAT2+ZCCHC2, CYP1B1+PARP12+PNPT1, CYP1B1+PARP12+PYGL,
 CYP1B1+PARP12+SULT1B1, CYP1B1+PARP12+TRIB2,
 CYP1B1+PARP12+uc003hrl.1, CYP1B1+PARP12+USP41,
 CYP1B1+PARP12+ZCCHC2, CYP1B1+PNPT1+PYGL,
 20 CYP1B1+PNPT1+SULT1B1, CYP1B1+PNPT1+TRIB2,
 CYP1B1+PNPT1+uc003hrl.1, CYP1B1+PNPT1+USP41, CYP1B1+PNPT1+ZCCHC2,
 CYP1B1+PYGL+SULT1B1, CYP1B1+PYGL+TRIB2, CYP1B1+PYGL+uc003hrl.1,
 CYP1B1+PYGL+USP41, CYP1B1+PYGL+ZCCHC2, CYP1B1+SULT1B1+TRIB2,
 CYP1B1+SULT1B1+uc003hrl.1, CYP1B1+SULT1B1+USP41,
 25 CYP1B1+SULT1B1+ZCCHC2, CYP1B1+TRIB2+uc003hrl.1,
 CYP1B1+TRIB2+USP41, CYP1B1+TRIB2+ZCCHC2, CYP1B1+uc003hrl.1+USP41,
 CYP1B1+uc003hrl.1+ZCCHC2, CYP1B1+USP41+ZCCHC2,
 DDX60+DGAT2+PARP12, DDX60+DGAT2+PNPT1, DDX60+DGAT2+PYGL,
 DDX60+DGAT2+SULT1B1, DDX60+DGAT2+TRIB2, DDX60+DGAT2+uc003hrl.1,
 30 DDX60+DGAT2+USP41, DDX60+DGAT2+ZCCHC2, DDX60+PARP12+PNPT1,
 DDX60+PARP12+PYGL, DDX60+PARP12+SULT1B1, DDX60+PARP12+TRIB2,
 DDX60+PARP12+uc003hrl.1, DDX60+PARP12+USP41,

DDX60+PARP12+ZCCHC2, DDX60+PNPT1+PYGL, DDX60+PNPT1+SULT1B1,
 DDX60+PNPT1+TRIB2, DDX60+PNPT1+uc003hrl.1, DDX60+PNPT1+USP41,
 DDX60+PNPT1+ZCCHC2, DDX60+PYGL+SULT1B1, DDX60+PYGL+TRIB2,
 DDX60+PYGL+uc003hrl.1, DDX60+PYGL+USP41, DDX60+PYGL+ZCCHC2,
 5 DDX60+SULT1B1+TRIB2, DDX60+SULT1B1+uc003hrl.1,
 DDX60+SULT1B1+USP41, DDX60+SULT1B1+ZCCHC2,
 DDX60+TRIB2+uc003hrl.1, DDX60+TRIB2+USP41, DDX60+TRIB2+ZCCHC2,
 DDX60+uc003hrl.1+USP41, DDX60+uc003hrl.1+ZCCHC2,
 DDX60+USP41+ZCCHC2, DGAT2+PARP12+PNPT1, DGAT2+PARP12+PYGL,
 10 DGAT2+PARP12+SULT1B1, DGAT2+PARP12+TRIB2,
 DGAT2+PARP12+uc003hrl.1, DGAT2+PARP12+USP41,
 DGAT2+PARP12+ZCCHC2, DGAT2+PNPT1+PYGL, DGAT2+PNPT1+SULT1B1,
 DGAT2+PNPT1+TRIB2, DGAT2+PNPT1+uc003hrl.1, DGAT2+PNPT1+USP41,
 DGAT2+PNPT1+ZCCHC2, DGAT2+PYGL+SULT1B1, DGAT2+PYGL+TRIB2,
 15 DGAT2+PYGL+uc003hrl.1, DGAT2+PYGL+USP41, DGAT2+PYGL+ZCCHC2,
 DGAT2+SULT1B1+TRIB2, DGAT2+SULT1B1+uc003hrl.1,
 DGAT2+SULT1B1+USP41, DGAT2+SULT1B1+ZCCHC2,
 DGAT2+TRIB2+uc003hrl.1, DGAT2+TRIB2+USP41, DGAT2+TRIB2+ZCCHC2,
 DGAT2+uc003hrl.1+USP41, DGAT2+uc003hrl.1+ZCCHC2,
 20 DGAT2+USP41+ZCCHC2, PARP12+PNPT1+PYGL, PARP12+PNPT1+SULT1B1,
 PARP12+PNPT1+TRIB2, PARP12+PNPT1+uc003hrl.1, PARP12+PNPT1+USP41,
 PARP12+PNPT1+ZCCHC2, PARP12+PYGL+SULT1B1, PARP12+PYGL+TRIB2,
 PARP12+PYGL+uc003hrl.1, PARP12+PYGL+USP41, PARP12+PYGL+ZCCHC2,
 PARP12+SULT1B1+TRIB2, PARP12+SULT1B1+uc003hrl.1,
 25 PARP12+SULT1B1+USP41, PARP12+SULT1B1+ZCCHC2,
 PARP12+TRIB2+uc003hrl.1, PARP12+TRIB2+USP41, PARP12+TRIB2+ZCCHC2,
 PARP12+uc003hrl.1+USP41, PARP12+uc003hrl.1+ZCCHC2,
 PARP12+USP41+ZCCHC2, PNPT1+PYGL+SULT1B1, PNPT1+PYGL+TRIB2,
 PNPT1+PYGL+uc003hrl.1, PNPT1+PYGL+USP41, PNPT1+PYGL+ZCCHC2,
 30 PNPT1+SULT1B1+TRIB2, PNPT1+SULT1B1+uc003hrl.1,
 PNPT1+SULT1B1+USP41, PNPT1+SULT1B1+ZCCHC2,
 PNPT1+TRIB2+uc003hrl.1, PNPT1+TRIB2+USP41, PNPT1+TRIB2+ZCCHC2,

PNPT1+uc003hrl.1+USP41, PNPT1+uc003hrl.1+ZCCHC2,
 PNPT1+USP41+ZCCHC2, PYGL+SULT1B1+TRIB2, PYGL+SULT1B1+uc003hrl.1,
 PYGL+SULT1B1+USP41, PYGL+SULT1B1+ZCCHC2, PYGL+TRIB2+uc003hrl.1,
 PYGL+TRIB2+USP41, PYGL+TRIB2+ZCCHC2, PYGL+uc003hrl.1+USP41,
 5 PYGL+uc003hrl.1+ZCCHC2, PYGL+USP41+ZCCHC2,
 SULT1B1+TRIB2+uc003hrl.1, SULT1B1+TRIB2+USP41,
 SULT1B1+TRIB2+ZCCHC2, SULT1B1+uc003hrl.1+USP41,
 SULT1B1+uc003hrl.1+ZCCHC2, SULT1B1+USP41+ZCCHC2,
 TRIB2+uc003hrl.1+USP41, TRIB2+uc003hrl.1+ZCCHC2, TRIB2+USP41+ZCCHC2,
 10 uc003hrl.1+USP41+ZCCHC2

Additional determinants that may be measured according to aspects of the present invention include pathogen (bacterial or viral) specific RNA determinants. This may be carried out in order to aid in identification of a specific pathogen. The measurements may be effected simultaneously with the above described measurements or
 15 consecutively. The measurement may be performed on the biological sample used to determine the patient immune response (as described herein above) or on a different biological patient-derived sample (e.g., blood sample; serum sample; saliva; nasopharyngeal sample; etc.). In one embodiment, the host immune RNA determinants are measured in a patient derived serum sample and analysis of the pathogen specific
 20 RNA determinants is performed on a nasopharyngeal sample.

The infection type may be a bacterial infection, a viral infection or a mixed infection (a combination of bacterial and viral infection).

The infection may be an acute or chronic infection.

A chronic infection is an infection that develops slowly and lasts a long time.
 25 Viruses that may cause a chronic infection include Hepatitis C and HIV. One difference between acute and chronic infection is that during acute infection the immune system often produces IgM+ antibodies against the infectious agent, whereas the chronic phase of the infection is usually characteristic of IgM-/IgG+ antibodies. In addition, acute infections cause immune mediated necrotic processes while chronic infections often
 30 cause inflammatory mediated fibrotic processes and scarring (e.g. Hepatitis C in the liver). Thus, acute and chronic infections may elicit different underlying immunological mechanisms.

In one embodiment, the level of the determinant may be used to rule in an infection type. In another embodiment, the level of the determinant may be used to rule out an infection type.

By “ruling in” an infection it is meant that the subject has that type of infection.

5 By “ruling out” an infection it is meant that the subject does not have that type of infection.

For all determinants that have been classified as increasing during bacterial infection (as specified in Tables 11 or 13), when the level of that determinant is above a predetermined level, it is indicative that the subject has a bacterial infection (e.g. when
10 measured by analyzing at the exon specified in Tables 10A or 10B; i.e. a bacterial infection is ruled in).

For all determinants that have been classified as increasing during a viral infection (as specified in Tables 11 or 13), when the level of that determinant is above a predetermined level, it is indicative that the subject has a viral infection (e.g. when
15 measured by analyzing at the exon specified in Tables 10A or 10B; i.e. a viral infection is ruled in).

The preset/predetermined level of any of the aspects of the present invention may be a reference value derived from population studies, including without limitation, such subjects having a known infection, subject having the same or similar age range,
20 subjects in the same or similar ethnic group, or relative to the starting sample of a subject undergoing treatment for an infection. Such reference values can be derived from statistical analyses and/or risk prediction data of populations obtained from mathematical algorithms and computed indices of infection. Reference determinant indices can also be constructed and used using algorithms and other methods of
25 statistical and structural classification.

In one embodiment of the present invention, the preset level is the amount (i.e. level) of determinants in a control sample derived from one or more subjects who do not have an infection (i.e., healthy, and or non-infectious individuals). In a further embodiment, such subjects are monitored and/or periodically retested for a
30 diagnostically relevant period of time (“longitudinal studies”) following such test to verify continued absence of infection. Such period of time may be one day, two days, two to five days, five days, five to ten days, ten days, or ten or more days from the

initial testing date for determination of the reference value. Furthermore, retrospective measurement of determinants in properly banked historical subject samples may be used in establishing these reference values, thus shortening the study time required.

A reference value can also comprise the amounts of determinants derived from subjects who show an improvement as a result of treatments and/or therapies for the infection. A reference value can also comprise the amounts of determinants derived from subjects who have confirmed infection by known techniques.

An example of a bacterially infected reference value is the mean or median concentrations of that determinant in a statistically significant number of subjects having been diagnosed as having a bacterial infection.

An example of a virally infected reference value is the mean or median concentrations of that determinant in a statistically significant number of subjects having been diagnosed as having a viral infection.

Tables 10A and 10B herein below provides a list of exons that present a higher degree of differential expression compared to its full length gene in exemplary RNA determinants. For Table 10A, the probe set ID and exon genomic coordinates are included in Table 12 in Example 1 herein below. For Table 10B, the probe set ID and exon genomic coordinates are included in Table 13 in Example 2, herein below.

Table 10A

20

<i>Gene Name/ RNA determinant</i>	<i>Exon #</i>
AIM2	4, 5, 7
ANKRD22	1, 3
BMX	5, 6, 7, 9, 12, 13, 14, 17, 18, 19, 21
C19orf59	6, 9, 10
CCL2	4, 5, 6
CD177	7, 8, 2
CEACAM1	1, 2, 6, 9, 13, 14, 16
CLEC4D	3, 4, 7, 8
CMPK2	1, 2, 3, 4, 5, 6
CXCL10	2, 3
CYBRD1	2, 3, 4, 5, 6
CYP1B1	4, 5
DDX60	3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 17, 18, 19, 24, 25, 29, 30, 31, 32, 33, 35

EIF1AY	3, 4, 5, 6, 7
EIF2AK2	1, 2, 3, 6, 8, 9, 14, 16, 17
EPSTI1	2, 5, 6, 7, 11, 12, 13
F13A1	1, 3, 8, 11, 12, 13
FFAR3	2
GALM	4, 5, 6, 7, 8, 9
HERC5	2, 3, 4, 5, 6, 8, 9, 10, 11, 13, 14, 16, 19, 21, 22
HLA-DQA1	2, 5, 7, 1, 2, 7, 8
IFI27	4, 6, 7
IFI44	2, 4, 5, 6, 8
IFI44L	1, 3, 5
IFI6	1, 4, 5
IFIT1	3, 4
IFIT2	4
IFIT3	2, 3, 4, 8
IFITM3	3, 4
IRF7	1, 2, 3, 7, 9, 12
ISG15	2, 3, 4
JUP	6, 7, 8, 9, 11, 15, 16
LAMP3	1, 2, 3
LY6E	4, 7
MT2A	1, 2
MX1	2, 4, 6, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17
OAS2	1, 3, 5, 9, 13, 17
OAS3	3, 4, 5, 7, 9, 10, 12, 14, 15
OASL	1, 2, 4, 5, 6
OTOF	2, 4, 5, 6, 7, 10, 13, 14, 16, 17, 18, 21, 23, 25, 26, 27, 28, 29
PHOSPHO1	2, 3
PLSCR1	4, 6, 8, 9, 10, 11
PPBP	1, 3, 5
PSTPIP2	7, 10, 12, 13
RGS1	4, 5
RSAD2	2, 3, 4, 5, 6, 8, 9
RTP4	2, 3, 4
SERPING1	4, 5, 6, 7, 9, 11, 12
SH3BGRL2	2, 3, 4
SIGLEC1	2, 3, 8, 10, 11, 14, 15, 16, 17, 18
TMEM176A	2, 3, 5
TNFAIP6	1, 2, 3
TREML4	2, 6, 7
USP18	5, 6, 9, 10, 11
UTY	5, 8, 9, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25
XAF1	4, 5, 6, 7, 9, 10

Thus, for example when said RNA is ISG15, said exon corresponds to exon 2, 3 and/or 4;

when said RNA is IFI44L, said exon corresponds to exons 1, 3 and/or 5;

when said RNA is IFI44, said exon corresponds to exons 2, 4, 5, 6 and/or 8;

5 when said RNA is RGS1, said exon corresponds to exons 4 and/or 5;

when said RNA is IFI6, said exon corresponds to exons 1, 4 and/or 5;

when said RNA is AIM2, said exon corresponds to exons 4, 5 and/or 7;

when said RNA is IFIT2, said exon corresponds to exon 4;

when said RNA is IFIT3, said exon corresponds to exons 2, 3, 4 and/or 8;

10 when said RNA is IFIT1, said exon corresponds to exons 3 or 4;

when said RNA is ANKRD22, said exon corresponds to exons 1 or 3;

when said RNA is SERPING1, said exon corresponds to exons 4, 5, 6, 7, 9, 11 or 12;

when said RNA is IFITM3, said exon corresponds to exons 3 and/or 4;

15 when said RNA is IRF7, said exon corresponds to exons 1, 2, 3, 7, 9 and/or 12;

when said RNA is CLEC4D, said exon corresponds to exons 3, 4, 7 and/or 8;

when said RNA is OAS3, said exon corresponds to exons 3, 4, 5, 7, 9, 10, 12, 14 and/or 15;

20 when said RNA is OAS2, said exon corresponds to exons 1, 3, 5, 9, 13 and/or 17;

when said RNA is OASL, said exon corresponds to exons 1, 2, 4, 5 and/or 6;

when said RNA is EPSTI1, said exon corresponds to exons 2, 5, 6, 7, 11, 12 and/or 13;

when said RNA is IFI27, said exon corresponds to exons 4, 6, and/or 7;

25 when said RNA is MT2A, said exon corresponds to exons 1 and/or 2;

when said RNA is XAF1, said exon corresponds to exons 4, 5, 6, 7, 9 and/or 10;

when said RNA is CCL2, said exon corresponds to exons 4, 5 and/or 6;

when said RNA is JUP, said exon corresponds to exons 6, 7, 8, 9, 11, 15 and/or 16;

30 when said RNA is PHOSPHO1, said exon corresponds to exons 2 and/or 3;

when said RNA is PSTPIP2, said exon corresponds to exons 7, 10, 12 and/or 13;

when said RNA is C19orf59, said exon corresponds to exons 6, 9 and/or 10;

when said RNA is FFAR3, said exon corresponds to exon 2;
when said RNA is CD177, said exon corresponds to exons 7 and/or 8;
when said RNA is CEACAM1, said exon corresponds to exons 1, 2, 6, 9, 13, 14
and/or 16;

- 5 when said RNA is CD177, said exon corresponds to exon 2;
when said RNA is RSAD2, said exon corresponds to exons 2-6, 8 and/or 9;
when said RNA is GALM, said exon corresponds to exons 4-8 and/or 9;
when said RNA is TNFAIP6, said exon corresponds to exons 1, 2 and/or 3;
when said RNA is CYBRD1, said exon corresponds to exons 2-5 and/or 6;
10 when said RNA is CMPK2, said exon corresponds to exons 1-5 and/or 6;
when said RNA is OTOF, said exon corresponds to exons 2, 4, 5, 6, 7, 10, 13,
14, 16, 17, 18, 21, 23, 25-28 and/or 29;
when said RNA is EIF2AK2, said exon corresponds to exons 1, 2, 3, 6, 8, 9, 14,
16 and/or 17;
- 15 when said RNA is CYP1B1, said exon corresponds to exons 4 and/or 5;
when said RNA is SIGLEC1, said exon corresponds to exons 2, 3, 8, 10, 11, 14-
17 and/or 18;
when said RNA is MX1, said exon corresponds to exons 2, 4, 6, 8-16 and/or 17;
when said RNA is USP18, said exon corresponds to exons 5, 6, 9, 10 and/or 11;
- 20 when said RNA is RTP4, said exon corresponds to exons 2, 3 and/or 4;
when said RNA is PLSCR1, said exon corresponds to exons 4, 6, 8, 9, 10 and/or
11;
when said RNA is LAMP3, said exon corresponds to exons 1, 2 and/or 3;
when said RNA is HERC5, said exon corresponds to exons 2-6, 8-11, 13, 14, 16,
25 19, 21 and/or 22;
when said RNA is PPBP, said exon corresponds to exons 1, 3 and/or 5;
when said RNA is CXCL10, said exon corresponds to exons 2 and/or 3;
when said RNA is DX60, said exon corresponds to exons 3-13, 17-19, 24, 25,
29, 30, 31-33 and/or 35;
- 30 when said RNA is HLA-DQA1, said exon corresponds to exons 2, 5 and/or 7;
when said RNA is TREML4, said exon corresponds to exons 2, 6 and/or 7;
when said RNA is SH3BGRL2, said exon corresponds to exons 2, 3 and/or 4;

when said RNA is F13A1, said exon corresponds to exons 1, 3, 8, 11, 12 and/or 13;

when said RNA is TREM176A, said exon corresponds to exons 2, 3 and/or 5;

when said RNA is LY6E, said exon corresponds to exons 4 and/or 7;

5 when said RNA is BMX, said exon corresponds to exons 5-7, 9, 12, 13, 14, 17-19 and/or 21;

when said RNA is EIF1AY, said exon corresponds to exons 3-6 and/or 7;

when said RNA is UTY, said exon corresponds to exons 5, 8, 9, 14 24 and/or 25; or

10 when said RNA is HLA-DQA1, said position corresponds to exons 1, 2, 7 and/or 8.

Table 10B

RNA determinant		Exon #
Gene Symbol	mRNA Accession	
PGD	NM_002631	2, 5, 7, 8, 9, 10, 11, 16, 17, 18, 26
ALPL	NM_000478	2, 4, 5, 6, 7, 8, 9, 10, 12, 13, 15, 17, 19
ZNF684	NM_152373	4, 5, 7, 9, 10, 11, 12
NEXN	NM_001172309	14, 17, 18, 19, 20, 21, 23, 24, 25, 27, 28
MOV10	NM_001130079	9, 11, 13, 15, 17, 18, 19, 20, 22, 25, 26, 28, 29, 30, 31, 33, 35, 36, 38, 39, 43, 46, 47, 49, 50, 52, 53, 54, 56, 58
RABGAP1L	NM_001035230	38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53, 54, 55, 56, 57, 58, 59, 60, 61, 62
SRGAP2	NM_001042758	1, 2, 3, 4, 5, 6, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 24, 25, 26, 27, 28, 30, 33, 34
CR1	NM_000573	2, 4, 5, 6, 8, 10, 19, 29, 38, 39, 44, 45, 46, 49, 50, 51, 54, 55, 56
CR1L	NM_175710	5, 6, 7, 11, 13, 14, 15, 16, 18, 22
chr1:16542404-16543823	ENST00000442385	3, 4
PADI2	NM_007365	7, 12, 13, 16, 17, 18, 19, 22, 23
MIR1182	NR_031593	1, 2, 3, 4, 5, 6
chr1:27364505-27391197	TCONS_0000869-XLOC_000105	1, 2, 3, 4
TRIB2	NM_021643	5, 6, 7, 9, 10, 11
PLB1	NM_001170585	6, 10, 11, 28, 32, 33, 34, 35, 36, 38, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53, 54, 55, 57, 58, 60, 61, 62, 64, 65, 66, 67, 68, 69, 70, 71, 72, 73, 74, 75
RASGRP3	NM_001139488	8, 11, 16, 17, 19, 20, 21, 24, 25, 26, 27, 28, 29, 30, 31, 34, 35, 43, 44, 45, 47, 48, 49, 50

IGKV3D-15	ENST00000417279	3
IL1RN	NM_173843	2, 3, 4, 5, 10, 11, 13, 16, 17, 18, 19, 20
chr2: 179278390- 179303866	ENST00000436616	2, 5, 6, 7, 8, 9, 12, 13, 14, 15, 16
SPATS2L	NM_001100422	14, 20, 22, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 39, 41, 42, 43, 44, 45, 46, 47, 48, 49
chr2: 6968645- 6973662	ENST00000366140	1, 3
GALNT14	NM_001253826	4, 5, 6, 7, 9, 10, 12, 13, 14, 15, 17, 21, 22, 23, 24, 25, 27, 31, 37, 38
NLRC4	NM_001199138	6, 8, 11, 13
PNPT1	NM_033109	9, 11, 14, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 29, 30, 31, 34, 35, 37
IGKC	ENST00000390237	5, 6, 7, 13, 16, 22, 28, 31, 32, 35
IGKV1-9	ENST00000493819	1
chr2: 90537799- 90538363	ENST00000443397	2
IFIH1	NM_022168	1, 2, 3, 4, 5, 6, 7, 9, 10
PGAP1	NM_024989	4, 7, 9, 12, 15, 18, 21, 22, 26, 29, 33, 35, 36, 37, 40
chr2: 12856998- 12882860	n407780	4, 5, 6, 7, 8
chr2: 179278390- 179303866	n383778	2, 5, 6, 7, 8, 9, 12, 13, 14, 15, 16
chr2: 243030784- 243102469	n346494	9, 10, 11, 12, 13, 14, 16, 17, 18, 19, 20, 21
chr2: 6968645- 6973662	TCONS_00003184- XLOC_001966	3, 4
chr2: 89109725- 89619842	n346551	32, 45, 52, 53
chr2: 89475774- 89476620	n336681	2
TTC21A	NM_001105513	4, 5, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 25, 26, 27, 29, 31, 32, 33, 34, 35, 36, 37, 40, 42, 44, 45, 48, 50, 51
TREX1	NM_016381	4, 7, 17, 23, 30, 32, 33, 34, 36, 37, 38, 39
PARP14	NM_017554	5, 12, 18, 19, 20, 21, 23, 24, 25, 27, 28, 30, 31, 32, 33, 35
HESX1	NM_003865	2, 3, 4, 5, 6, 7
ZDHHC19	NM_001039617	1, 2, 3, 4, 5, 8, 9, 14
FAM200B	NM_001145191	2, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23
NSUN7	NM_024677	4, 5, 6, 9, 10, 12, 14, 16, 17, 18, 19, 20, 21, 22, 23

STAP1	NM_012108	3, 4, 6, 7, 8, 9, 10
ANXA3	NM_005139	3, 4, 8, 10, 11, 12, 13, 14, 15, 16, 18, 20, 22, 23
HERC6	NM_001165136	11, 13, 15, 21, 22, 23, 24, 27, 28, 29, 30, 31, 34
SULT1B1	NM_014465	2, 3, 5, 6, 7
IGJ	NM_144646	4
PPM1K	NM_152542	1, 2, 3, 4, 5, 6, 7, 8, 13, 14, 16, 19, 22, 23
HPGD	NM_000860	2, 3, 4, 5, 6, 7, 8, 9, 10, 13, 16, 17, 18
ANKRD34B	NM_001004441	1, 2, 3, 4, 5, 6, 7, 8, 9
MAPK14	NM_001315	5, 6, 9, 10, 12, 13, 15, 17, 18, 20, 27, 28
FTSJD2	NM_015050	12, 13, 20, 22, 23, 24, 25, 26, 27, 28, 29, 31, 32, 33, 34, 35, 36, 38, 39
CD2AP	NM_012120	3, 4, 5, 6, 8, 9, 10, 11, 12, 15, 17, 18, 19, 21, 22, 24, 25, 26
NCOA7	NM_001122842	3, 10, 14, 15, 16, 17, 19, 21, 23, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36
ARG1	NM_000045	2, 6, 15, 17
VNN1	NM_004666	7
LRRN3	NM_001099658	4, 8, 9, 10, 12
MGAM	NM_004668	7, 10, 11, 14, 15, 17, 19, 20, 23, 27, 36, 37, 40, 41, 42, 45, 46, 48, 51, 55, 60, 64, 65, 66, 70, 71, 72, 73, 83, 85
PARP12	NM_022750	3, 5, 8, 11, 14, 16, 18, 28
AKAP2	NM_001004065	27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39
C9orf91	NM_153045	7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18
GSN	NM_198252	3, 4, 5, 6, 8, 9, 10, 13, 14, 15, 16, 20, 21, 24, 26, 27, 28, 29, 30, 32, 35, 37, 38, 39, 41, 42, 43, 44, 45, 46, 47, 51, 53, 55, 56, 58, 59, 61
CNTNAP3	NM_033655	1, 3, 5, 9, 10, 11, 12, 13, 14, 15, 17, 18, 20, 22, 23, 24, 30, 31, 32, 33, 34, 35, 36, 37, 38
chr9: 40498481- 40633261	uc004abr.1	2, 3, 4, 5, 6
chr9: 47295855- 47314322	ENST00000438517	2, 3, 10, 11, 12, 13, 16, 17, 18, 19
CDK5RAP2	NM_001011649	1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 30, 31, 33, 35, 36, 39, 40, 41, 42, 43, 46, 47, 48, 49, 50, 51, 53, 54, 55, 56, 57, 58, 59, 60, 61, 62
SDCCAG3	NM_001039707	1, 2, 3, 4, 6, 8, 9, 10, 11, 12, 14, 16, 17, 18, 19, 20
TMEM255A	NM_001104544	1, 2, 3, 4, 5, 8, 9, 10
IFIT5	NM_012420	5
CD44	NM_001001391	2, 3, 5, 10, 11, 13, 14, 15, 16, 17, 18, 19, 23, 24, 27, 28
DGAT2	NM_001253891	5, 6, 7, 8, 9, 10, 11
TMEM123	NM_052932	1, 3, 4, 8, 9, 10
MMP8	NM_002424	3, 4, 5, 7, 8, 9, 10, 11, 12, 13, 16
chr11: 57373517- 57381926	n333961	1, 3, 4

LTA4H	NM_000895	8, 9, 17, 18, 19, 21, 22, 23, 25
chr12: 113345433- 113455556	ENST000005 52784	1, 2
TDRD9	NM_153046	5, 6, 7, 9, 10, 11, 12, 14, 15, 16, 17, 18, 20, 22, 23, 25, 26, 29, 30, 35, 36, 37, 38
PYGL	NM_0011639 40	2, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 17, 18, 23
chr14: 94577084- 94582176	n334829	3
ATP10A	NM_024490	3, 4, 6, 7, 8, 10, 11, 16, 17, 19, 20, 22
chr15: 67457682- 67473649	n332456	1
MT1A	NM_005946	2
MT1M	NM_176870	3, 5
MT1E	NM_175617	3, 4, 6, 7
MT1JP	NR_036677	3, 4
MT1DP	NR_003658	3, 4
MT1B	NM_005947	2, 3
MT1F	NM_005949	2
MT1H	NM_005951	2, 3, 4
MT1IP	NR_003669	4, 6
MT1X	NM_005952	2, 3, 5, 6
HP	NM_0011261 02	6, 7, 8
HPR	NM_020995	1, 3, 4, 5
MT1G	NM_005950	2
chr16: 56669651- 56670998	n382996	3, 4
chr16: 56677385- 56678852	TCONS_000 24856- XLOC_0117 36	5, 6
chr16: 56709649- 56711789	n406211	4, 6
FBXO39	NM_153230	3, 4, 5
CCL8	NM_005623	3, 4, 5
CA4	NM_000717	4, 5, 6, 7, 8, 10
GAS7	NM_201433	1, 8, 9, 10, 11, 12, 14, 16, 21, 22, 26
KRT19	NM_002276	1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15
DHX58	NM_024119	1, 2, 8, 10, 11, 13, 14, 15, 16
LGALS3B P	NM_005567	1, 2, 3, 5, 7
chr17: 66531257-	n407998	3, 5, 6, 7

66554568		
IMPA2	NM_014214	4, 6, 7, 8, 10, 11, 12
ZCCHC2	NM_017742	12, 14, 15
RFX2	NM_000635	2, 3, 7, 9, 12, 13, 14, 16, 19
RIN2	NM_0012425 81	7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20
MMP9	NM_004994	1, 2, 3, 4, 5, 6, 9, 13, 17, 18
ATP9A	NM_006045	2, 4, 5, 6, 7, 8, 9, 13, 16, 19, 20, 21, 23, 25, 27, 28, 29, 30
ZBP1	NM_0011604 18	2, 3, 4, 5, 6, 8, 10, 12, 13, 14, 15, 17, 19
chr20: 19867165- 19981449	n339591	4, 5, 6, 7, 8, 10, 11, 12, 13
chr20: 24911303- 24912191	TCONS_000 28139- XLOC_0134 99	2
MIR650	NR_030755	20, 21, 22, 26, 27, 28, 30, 32, 34, 35, 36, 37, 38, 39, 42, 43, 45, 46, 47, 50, 51, 52, 53, 54, 55, 56, 57, 59, 61, 62, 63, 69, 71, 73, 74, 75, 77, 79, 80, 81
KREMEN1	NM_0010395 70	2, 3, 4, 5, 7, 8, 9, 10, 12, 13, 14, 15, 16
TSPO	NM_000714	5, 7, 8, 9
PRR5	NM_181333	2, 4, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 25, 26, 28, 29, 30, 32, 33, 34, 45, 47, 48, 49, 50, 53, 54, 61, 67, 68, 69
USP41	ENST000004 54608	2, 3, 4, 5, 6, 7, 10
chr22: 18840392- 18851914	n384079	6, 7, 10
chr22: 22652463- 22677324	n386315	3, 4, 5, 6, 7, 8, 10, 13, 15, 16, 17, 20
chr22: 22550382- 23248828	n332472	3
chr22: 23242926- 23265153	n346241	5

Particular RNA determinants which may be used to distinguish between bacterial and viral infection include for example:

Exons 38 and/or 42 of RABGAP1L;

5 Exons 11 and/or 21 of PNPT1;

Exons 34 and/or 30 of HERC6

Exons 4 and/or 7 of IMPA2;

Exon 1 of TMEM123;

Exons 17 and/or 18 of LTA4H;

Exons 13 and/or 14 of ENST00000436616;

Exons 2 and/or 3 of USP41;

Exons 13 and/or 15 of n383778;

Exons 5 and/or 6 of MIR1182/FAM89A;

5 Exons 14 and/or 16 of RSAD2;

Exons 33 and/or 39 of MX1;

Exons 26 and/or 27 of IFI44L;

Exons 3 and/or 7 of IFI27.

According to this aspect of the present invention mRNA is the biological precursor of proteins and changes in its expression levels are expected to precede those of its protein counterparts. Consequently, protein and RNA biomarkers may differ in their temporal dynamics patterns and can complement each other to detect infection prior to symptom onset or following convalescence. Therefore, it will be appreciated that as well as determining the level of the RNA determinants described herein, the present inventors also contemplate combining these measurements with measurements of polypeptide determinants that are known to be indicative of infection type. Examples of polypeptide determinants that are contemplated by the present invention include those that are described in WO 2013/117746, WO 2011/132086, PCT Application IL 2015/051024 and PCT Application IL 2015/051201, the contents of each are incorporated herein by reference. Other polypeptide determinants contemplated by the present inventors are the polypeptide counterparts of the RNA determinants described herein.

Examples of polypeptides contemplated by the present inventors include, but are not limited to: TRAIL, CRP, IP-10, MX1, RSAD2, PCT, OTOF, CYBRD1, EIF2AK2, NGAL and CMPK2.

Kits

Some aspects of the invention also include a determinant-detection reagent such as an oligonucleotide packaged together in the form of a kit for diagnosing infection type. The kit may contain in separate containers oligonucleotides (either already bound to a solid matrix or packaged separately with reagents for binding them to the matrix), control formulations (positive and/or negative), and/or a detectable label such as fluorescein, green fluorescent protein, rhodamine, cyanine dyes, Alexa dyes, luciferase,

radiolabels, among others. Instructions (e.g., written, tape, VCR, CD-ROM, etc.) for carrying out the assay may be included in the kit.

The kits of this aspect of the present invention may comprise additional components that aid in the detection of the determinants such as enzymes, salts, buffers
5 etc. necessary to carry out the detection reactions.

Thus, according to another aspect of the present invention, there is provided a kit comprising at least two oligonucleotides, wherein the first of said at least two oligonucleotides specifically hybridizes to a first RNA at a first exon, and a second of said at least two oligonucleotides specifically hybridizes to the first RNA at a second
10 exon, the first and said second exon being selected such that the expression level from the first exon distinguishes between a bacterial and viral infection with a degree of accuracy above a predetermined level (based on differential expression data, as described herein above) and the expression level from said second exon distinguishes between a bacterial and viral infection with a degree of accuracy above the
15 predetermined level (based on differential expression data, as described herein above).

In another aspect of the present invention there is provided a primer pair which hybridizes to an RNA at an exon whose expression level distinguishes between a bacterial and viral infection with a degree of accuracy above a predetermined level (based on differential expression data as described herein above).

According to still another aspect, there is provided a kit comprising at least two
20 oligonucleotides, wherein the first of the at least two oligonucleotides specifically hybridizes to a first RNA at a first exon, and a second of said at least two oligonucleotides specifically hybridizes to a second RNA at a second exon, the first exon being selected so as to distinguish between a bacterial and viral infection with a
25 degree of accuracy above a predetermined level (based on differential expression data between bacterial and viral samples as described herein above), and the second exon being selected so as to distinguish between a bacterial and viral infection with a degree of accuracy above the predetermined level (based on differential expression data between bacterial and viral samples, as described herein above).

According to still another aspect of the present invention there is provided a kit
30 comprising at least two oligonucleotides, wherein the at least two oligonucleotides

hybridize to one of the specified exons of the RNA determinants set forth in Table 10A or Table 10B:

The oligonucleotides may be attached to detectable moieties as described herein above.

5 Preferably, the kit contains a number of oligonucleotides such that no more than 20 determinants (e.g. RNAs) can be detected.

Preferably, the kit contains a number of oligonucleotides such that no more than 10 determinants (e.g. RNAs) can be detected.

10 Preferably, the kit contains a number of oligonucleotides such that no more than 5 determinants (e.g. RNAs) can be detected.

Preferably, the kit contains a number of oligonucleotides such that no more than 3 determinants (e.g. RNAs) can be detected.

Preferably, the kit contains a number of oligonucleotides such that no more than 2 determinants (e.g. RNAs) can be detected.

15 In one embodiment, the detection reagents in the kit are only capable of detecting determinants which appear in Tables 1-2.

In other embodiments, the detection reagents in the kit are only capable of analyzing expression of determinants which appear in one of Tables 1-4.

20 In still other embodiments, at least one of the detection reagents in the kit is capable of analyzing expression of a determinant which appears in one of Tables 1-4.

Additional RNA determinants which may be measured include for example pathogen specific RNA determinants.

25 According to further embodiments, the kits of the present invention comprise a number of oligonucleotides such that the expression level from no more than 1 exon per RNA determinant is measured.

According to further embodiments, the kits of the present invention comprise a number of oligonucleotides such that the expression level from no more than 2 exons per RNA determinant is measured. According to further embodiments, the kits of the present invention comprise a number of oligonucleotides such that the expression level
30 from no more than 3 exons per RNA determinant is measured. According to further embodiments, the kits of the present invention comprise a number of oligonucleotides such that the expression level from no more than 4 exons per RNA determinant is

measured. According to further embodiments, the kits of the present invention comprise a number of oligonucleotides such that the expression level from no more than 5 exons per RNA determinant is measured.

As mentioned, the present invention also contemplates use of arrays to
5 determine the expression level from particular exons of RNA.

Thus, according to another aspect of the present invention there is provided an array comprising a solid support, and a polynucleotide that specifically hybridizes to a first RNA at a predetermined exon, the polynucleotide being attached to the solid support, the predetermined exon being selected such that the expression level therefrom
10 distinguishes between a bacterial and viral infection with a degree of accuracy above a predetermined level, wherein the array comprises oligonucleotides that hybridize to no more than 3 exons of said first RNA.

According to still another aspect of the present invention there is provided an array comprising a solid support, a first polynucleotide that specifically hybridizes to a first RNA at a first exon and a second polynucleotide that specifically hybridizes to a
15 second exon of a second RNA, said first and second polynucleotide being attached to the solid support, said first exon being selected such that the expression level therefrom distinguishes between a bacterial and viral infection with a degree of accuracy above a predetermined level and said second exon being selected such that the expression level
20 therefrom distinguishes between a bacterial and viral infection with a degree of accuracy above a predetermined level, wherein said array comprises oligonucleotides that hybridize to no more than 20 non-identical RNAs.

Some aspects of the present invention can also be used to screen patients or subject populations in any number of settings. For example, a health maintenance
25 organization, public health entity or school health program can screen a group of subjects to identify those requiring interventions, as described above, or for the collection of epidemiological data. Insurance companies (e.g., health, life or disability) may screen applicants in the process of determining coverage or pricing, or existing clients for possible intervention. Data collected in such population screens, particularly
30 when tied to any clinical progression to conditions like infection, will be of value in the operations of, for example, health maintenance organizations, public health programs and insurance companies. Such data arrays or collections can be stored in machine-

readable media and used in any number of health-related data management systems to provide improved healthcare services, cost effective healthcare, improved insurance operation, etc. See, for example, U.S. Patent Application No. 2002/0038227; U.S. Patent Application No. US 2004/0122296; U.S. Patent Application No. US 2004/0122297; and U.S. Patent No. 5,018,067. Such systems can access the data directly from internal data storage or remotely from one or more data storage sites as further detailed herein.

A machine-readable storage medium can comprise a data storage material encoded with machine readable data or data arrays which, when using a machine programmed with instructions for using the data, is capable of use for a variety of purposes. Measurements of effective amounts of the biomarkers of the invention and/or the resulting evaluation of risk from those biomarkers can be implemented in computer programs executing on programmable computers, comprising, *inter alia*, a processor, a data storage system (including volatile and non-volatile memory and/or storage elements), at least one input device, and at least one output device. Program code can be applied to input data to perform the functions described above and generate output information. The output information can be applied to one or more output devices, according to methods known in the art. The computer may be, for example, a personal computer, microcomputer, or workstation of conventional design.

Each program can be implemented in a high level procedural or object oriented programming language to communicate with a computer system. However, the programs can be implemented in assembly or machine language, if desired. The language can be a compiled or interpreted language. Each such computer program can be stored on a storage media or device (e.g., ROM or magnetic diskette or others as defined elsewhere in this disclosure) readable by a general or special purpose programmable computer, for configuring and operating the computer when the storage media or device is read by the computer to perform the procedures described herein. The health-related data management system used in some aspects of the invention may also be considered to be implemented as a computer-readable storage medium, configured with a computer program, where the storage medium so configured causes a computer to operate in a specific and predefined manner to perform various functions described herein.

The determinants of the present invention, in some embodiments thereof, can be used to generate a “reference determinant profile” of those subjects who do not have an infection. The determinants disclosed herein can also be used to generate a “subject determinant profile” taken from subjects who have an infection. The subject
5 determinant profiles can be compared to a reference determinant profile to diagnose or identify subjects with an infection. The subject determinant profile of different infection types can be compared to diagnose or identify the type of infection. The reference and subject determinant profiles of the present invention, in some embodiments thereof, can be contained in a machine-readable medium, such as but not limited to, analog tapes
10 like those readable by a VCR, CD-ROM, DVD-ROM, USB flash media, among others. Such machine-readable media can also contain additional test results, such as, without limitation, measurements of clinical parameters and traditional laboratory risk factors. Alternatively or additionally, the machine-readable media can also comprise subject information such as medical history and any relevant family history. The machine-
15 readable media can also contain information relating to other disease-risk algorithms and computed indices such as those described herein.

The effectiveness of a treatment regimen can be monitored by detecting a determinant in an effective amount (which may be one or more) of samples obtained from a subject over time and comparing the amount of determinants detected. For
20 example, a first sample can be obtained prior to the subject receiving treatment and one or more subsequent samples are taken after or during treatment of the subject.

For example, the methods of the invention can be used to discriminate between bacterial and viral infections (i.e. bacterial and viral co-infections). This will allow patients to be stratified and treated accordingly.

25 In a specific embodiment of the invention a treatment recommendation (i.e., selecting a treatment regimen) for a subject is provided by identifying the type infection (i.e., bacterial or viral) in the subject according to the method of any of the disclosed methods and recommending that the subject receive an antibiotic treatment if the subject is identified as having bacterial infection; or an anti-viral treatment is if the
30 subject is identified as having a viral infection.

In another embodiment, the methods of the invention can be used to prompt additional targeted diagnosis such as pathogen specific PCRs, chest-X-ray, cultures etc.

For example, a diagnosis that indicates a viral infection according to embodiments of this invention, may prompt the usage of additional viral specific multiplex-PCRs, whereas a diagnosis that indicates a bacterial infection according to embodiments of this invention may prompt the usage of a bacterial specific multiplex-PCR. Thus, one can
5 reduce the costs of unwarranted expensive diagnostics.

In a specific embodiment, a diagnostic test recommendation for a subject is provided by identifying the infection type (i.e., bacterial or viral infection) in the subject according to any of the disclosed methods and recommending a test to determine the source of the bacterial infection if the subject is identified as having a bacterial infection
10 or a mixed infection; or a test to determine the source of the viral infection if the subject is identified as having a viral infection.

Performance and Accuracy Measures of the Invention.

The performance and thus absolute and relative clinical usefulness of the invention may be assessed in multiple ways as noted above. Amongst the various
15 assessments of performance, some aspects of the invention are intended to provide accuracy in clinical diagnosis and prognosis. The accuracy of a diagnostic or prognostic test, assay, or method concerns the ability of the test, assay, or method to distinguish between subjects having an infection is based on whether the subjects have, a “significant alteration” (e.g., clinically significant and diagnostically significant) in the
20 levels of a determinant. By “effective amount” it is meant that the measurement of an appropriate number of determinants (which may be one or more) to produce a “significant alteration” (e.g. level of expression or activity of a determinant) that is different than the predetermined cut-off point (or threshold value) for that determinant (s) and therefore indicates that the subject has an infection for which the determinant (s)
25 is an indication. The difference in the level of determinant is preferably statistically significant. As noted below, and without any limitation of the invention, achieving statistical significance, and thus the preferred analytical, diagnostic, and clinical accuracy, may require that combinations of several determinants be used together in panels and combined with mathematical algorithms in order to achieve a statistically
30 significant determinant index.

In the categorical diagnosis of a disease state, changing the cut-off point or threshold value of a test (or assay) usually changes the sensitivity and specificity, but in

a qualitatively inverse relationship. Therefore, in assessing the accuracy and usefulness of a proposed medical test, assay, or method for assessing a subject's condition, one should always take both sensitivity and specificity into account and be mindful of what the cut point is at which the sensitivity and specificity are being reported because sensitivity and specificity may vary significantly over the range of cut points. One way to achieve this is by using the Matthews correlation coefficient (MCC) metric, which depends upon both sensitivity and specificity. Use of statistics such as area under the ROC curve (AUC), encompassing all potential cut point values, is preferred for most categorical risk measures when using some aspects of the invention, while for continuous risk measures, statistics of goodness-of-fit and calibration to observed results or other gold standards, are preferred.

By predetermined level of predictability it is meant that the method provides an acceptable level of clinical or diagnostic accuracy. Using such statistics, an "acceptable degree of diagnostic accuracy", is herein defined as a test or assay (such as the test used in some aspects of the invention for determining the clinically significant presence of determinants, which thereby indicates the presence an infection type) in which the AUC (area under the ROC curve for the test or assay) is at least 0.60, desirably at least 0.65, more desirably at least 0.70, preferably at least 0.75, more preferably at least 0.80, and most preferably at least 0.85.

By a "very high degree of diagnostic accuracy", it is meant a test or assay in which the AUC (area under the ROC curve for the test or assay) is at least 0.75, 0.80, desirably at least 0.85, more desirably at least 0.875, preferably at least 0.90, more preferably at least 0.925, and most preferably at least 0.95.

Alternatively, the methods predict the presence or absence of an infection or response to therapy with at least 75% total accuracy, more preferably 80%, 85%, 90%, 95%, 97%, 98%, 99% or greater total accuracy.

Alternatively, the methods predict the presence of a bacterial infection or response to therapy with at least 75% sensitivity, more preferably 80%, 85%, 90%, 95%, 97%, 98%, 99% or greater sensitivity.

Alternatively, the methods predict the presence of a viral infection or response to therapy with at least 75% specificity, more preferably 80%, 85%, 90%, 95%, 97%, 98%, 99% or greater specificity. Alternatively, the methods predict the presence or

absence of an infection or response to therapy with an MCC larger than 0.2, 0.3, 0.4, 0.5, 0.6, 0.7, 0.8., 0.9 or 1.0.

In general, alternative methods of determining diagnostic accuracy are commonly used for continuous measures, when a disease category has not yet been clearly defined by the relevant medical societies and practice of medicine, where thresholds for therapeutic use are not yet established, or where there is no existing gold standard for diagnosis of the pre-disease. For continuous measures of risk, measures of diagnostic accuracy for a calculated index are typically based on curve fit and calibration between the predicted continuous value and the actual observed values (or a historical index calculated value) and utilize measures such as R squared, Hosmer- Lemeshow *P*-value statistics and confidence intervals. It is not unusual for predicted values using such algorithms to be reported including a confidence interval (usually 90% or 95% CI) based on a historical observed cohort's predictions, as in the test for risk of future breast cancer recurrence commercialized by Genomic Health, Inc. (Redwood City, California).

In general, by defining the degree of diagnostic accuracy, i.e., cut points on a ROC curve, defining an acceptable AUC value, and determining the acceptable ranges in relative concentration of what constitutes an effective amount of the determinants of the invention allows for one of skill in the art to use the determinants to identify, diagnose, or prognose subjects with a pre-determined level of predictability and performance.

Furthermore, other unlisted biomarkers will be very highly correlated with the determinants (for the purpose of this application, any two variables will be considered to be "very highly correlated" when they have a Coefficient of Determination (R^2) of 0.5 or greater). Some aspects of the present invention encompass such functional and statistical equivalents to the aforementioned determinants. Furthermore, the statistical utility of such additional determinants is substantially dependent on the cross-correlation between multiple biomarkers and any new biomarkers will often be required to operate within a panel in order to elaborate the meaning of the underlying biology.

One or more of the listed determinants can be detected in the practice of the present invention, in some embodiments thereof. For example, two (2), three (3), four (4), five (5), ten (10), fifteen (15), twenty (20), forty (40), or more determinants can be detected.

In some aspects, all determinants listed herein can be detected. Preferred ranges from which the number of determinants can be detected include ranges bounded by any minimum selected from between one and, particularly two, three, four, five, six, seven, eight, nine ten, twenty, or forty. Particularly preferred ranges include two to five (2-5),
5 two to ten (2-10), two to twenty (2-20), or two to forty (2-40).

Construction of Clinical Algorithms

Any formula may be used to combine determinant results into indices useful in the practice of the invention. As indicated above, and without limitation, such indices may indicate, among the various other indications, the probability, likelihood, absolute
10 or relative risk, time to or rate of conversion from one to another disease states, or make predictions of future biomarker measurements of infection. This may be for a specific time period or horizon, or for remaining lifetime risk, or simply be provided as an index relative to another reference subject population.

Although various preferred formula are described here, several other model and
15 formula types beyond those mentioned herein and in the definitions above are well known to one skilled in the art. The actual model type or formula used may itself be selected from the field of potential models based on the performance and diagnostic accuracy characteristics of its results in a training population. The specifics of the formula itself may commonly be derived from determinant results in the relevant
20 training population. Amongst other uses, such formula may be intended to map the feature space derived from one or more determinant inputs to a set of subject classes (e.g. useful in predicting class membership of subjects as normal, having an infection), to derive an estimation of a probability function of risk using a Bayesian approach, or to estimate the class-conditional probabilities, then use Bayes' rule to produce the class
25 probability function as in the previous case.

Preferred formulas include the broad class of statistical classification algorithms, and in particular the use of discriminant analysis. The goal of discriminant analysis is to predict class membership from a previously identified set of features. In the case of linear discriminant analysis (LDA), the linear combination of features is identified that
30 maximizes the separation among groups by some criteria. Features can be identified for LDA using an eigengene based approach with different thresholds (ELDA) or a stepping algorithm based on a multivariate analysis of variance (MANOVA). Forward,

backward, and stepwise algorithms can be performed that minimize the probability of no separation based on the Hotelling-Lawley statistic.

Eigengene-based Linear Discriminant Analysis (ELDA) is a feature selection technique developed by Shen et al. (2006). The formula selects features (e.g. biomarkers) in a multivariate framework using a modified eigen analysis to identify features associated with the most important eigenvectors. “Important” is defined as those eigenvectors that explain the most variance in the differences among samples that are trying to be classified relative to some threshold.

A support vector machine (SVM) is a classification formula that attempts to find a hyperplane that separates two classes. This hyperplane contains support vectors, data points that are exactly the margin distance away from the hyperplane. In the likely event that no separating hyperplane exists in the current dimensions of the data, the dimensionality is expanded greatly by projecting the data into larger dimensions by taking non-linear functions of the original variables (Venables and Ripley, 2002). Although not required, filtering of features for SVM often improves prediction. Features (e.g., biomarkers) can be identified for a support vector machine using a non-parametric Kruskal-Wallis (KW) test to select the best univariate features. A random forest (RF, Breiman, 2001) or recursive partitioning (RPART, Breiman et al., 1984) can also be used separately or in combination to identify biomarker combinations that are most important. Both KW and RF require that a number of features be selected from the total. RPART creates a single classification tree using a subset of available biomarkers.

Other formula may be used in order to pre-process the results of individual determinant measurements into more valuable forms of information, prior to their presentation to the predictive formula. Most notably, normalization of biomarker results, using either common mathematical transformations such as logarithmic or logistic functions, as normal or other distribution positions, in reference to a population’s mean values, etc. are all well known to those skilled in the art. Of particular interest are a set of normalizations based on clinical-determinants such as time from symptoms, gender, race, or sex, where specific formula are used solely on subjects within a class or continuously combining a clinical-determinants as an input. In other cases, analyte-based biomarkers can be combined into calculated variables which are subsequently presented to a formula.

In addition to the individual parameter values of one subject potentially being normalized, an overall predictive formula for all subjects, or any known class of subjects, may itself be recalibrated or otherwise adjusted based on adjustment for a population's expected prevalence and mean biomarker parameter values, according to the technique outlined in D'Agostino et al., (2001) JAMA 286:180-187, or other similar normalization and recalibration techniques. Such epidemiological adjustment statistics may be captured, confirmed, improved and updated continuously through a registry of past data presented to the model, which may be machine readable or otherwise, or occasionally through the retrospective query of stored samples or reference to historical studies of such parameters and statistics. Additional examples that may be the subject of formula recalibration or other adjustments include statistics used in studies by Pepe, M.S. et al., 2004 on the limitations of odds ratios; Cook, N.R., 2007 relating to ROC curves. Finally, the numeric result of a classifier formula itself may be transformed post-processing by its reference to an actual clinical population and study results and observed endpoints, in order to calibrate to absolute risk and provide confidence intervals for varying numeric results of the classifier or risk formula.

Some determinants may exhibit trends that depends on the patient age (e.g. the population baseline may rise or fall as a function of age). One can use an 'Age dependent normalization or stratification' scheme to adjust for age related differences. Performing age dependent normalization, stratification or distinct mathematical formulas can be used to improve the accuracy of determinants for differentiating between different types of infections. For example, one skilled in the art can generate a function that fits the population mean levels of each determinant as function of age and use it to normalize the determinant of individual subjects levels across different ages. Another example is to stratify subjects according to their age and determine age specific thresholds or index values for each age group independently.

It will be appreciated that if the determinant which is used to diagnose infection type is an RNA which is located on a sex chromosomes, the patient gender may influence the diagnostic accuracy of an RNA based diagnostic signature. Thus, it is proposed that when the RNA determinants EIF1AY and UTY (which are located on the Y chromosome) or the RNA determinant BMX (which is located on the X chromosome) are used, the sex of the subject is taken into account.

In the context of the present invention, the following statistical terms may be used:

“TP” is true positive, means positive test result that accurately reflects the tested-for activity. For example in the context of the present invention a TP, is for example but not limited to, truly classifying a bacterial infection as such.

“TN” is true negative, means negative test result that accurately reflects the tested-for activity. For example in the context of the present invention a TN, is for example but not limited to, truly classifying a viral infection as such.

“FN” is false negative, means a result that appears negative but fails to reveal a situation. For example in the context of the present invention a FN, is for example but not limited to, falsely classifying a bacterial infection as a viral infection.

“FP” is false positive, means test result that is erroneously classified in a positive category. For example in the context of the present invention a FP, is for example but not limited to, falsely classifying a viral infection as a bacterial infection.

“Sensitivity” is calculated by $TP/(TP+FN)$ or the true positive fraction of disease subjects.

“Specificity” is calculated by $TN/(TN+FP)$ or the true negative fraction of non-disease or normal subjects.

“Total accuracy” is calculated by $(TN + TP)/(TN + FP + TP + FN)$.

“Positive predictive value” or “PPV” is calculated by $TP/(TP+FP)$ or the true positive fraction of all positive test results. It is inherently impacted by the prevalence of the disease and pre-test probability of the population intended to be tested.

“Negative predictive value” or “NPV” is calculated by $TN/(TN + FN)$ or the true negative fraction of all negative test results. It also is inherently impacted by the prevalence of the disease and pre-test probability of the population intended to be tested. See, e.g., O’Marcaigh AS, Jacobson RM, “Estimating The Predictive Value Of A Diagnostic Test, How To Prevent Misleading Or Confusing Results,” Clin. Ped. 1993, 32(8): 485-491, which discusses specificity, sensitivity, and positive and negative predictive values of a test, e.g., a clinical diagnostic test.

“MCC” (Matthews Correlation coefficient) is calculated as follows: $MCC = (TP * TN - FP * FN) / \{(TP + FN) * (TP + FP) * (TN + FP) * (TN + FN)\}^{0.5}$ where TP, FP, TN, FN are true-positives, false-positives, true-negatives, and false-negatives,

respectively. Note that MCC values range between -1 to +1, indicating completely wrong and perfect classification, respectively. An MCC of 0 indicates random classification. MCC has been shown to be a useful for combining sensitivity and specificity into a single metric (Baldi, Brunak et al. 2000). It is also useful for measuring and optimizing classification accuracy in cases of unbalanced class sizes (Baldi, Brunak et al. 2000).

Often, for binary disease state classification approaches using a continuous diagnostic test measurement, the sensitivity and specificity is summarized by a Receiver Operating Characteristics (ROC) curve according to Pepe et al., "Limitations of the Odds Ratio in Gauging the Performance of a Diagnostic, Prognostic, or Screening Marker," *Am. J. Epidemiol* 2004, 159 (9): 882-890, and summarized by the Area Under the Curve (AUC) or c-statistic, an indicator that allows representation of the sensitivity and specificity of a test, assay, or method over the entire range of test (or assay) cut points with just a single value. See also, e.g., Shultz, "Clinical Interpretation Of Laboratory Procedures," chapter 14 in Teitz, *Fundamentals of Clinical Chemistry*, Burtis and Ashwood (eds.), 4th edition 1996, W.B. Saunders Company, pages 192-199; and Zweig et al., "ROC Curve Analysis: An Example Showing The Relationships Among Serum Lipid And Apolipoprotein Concentrations In Identifying Subjects With Coronary Artery Disease," *Clin. Chem.*, 1992, 38(8): 1425-1428. An alternative approach using likelihood functions, odds ratios, information theory, predictive values, calibration (including goodness-of-fit), and reclassification measurements is summarized according to Cook, "Use and Misuse of the Receiver Operating Characteristic Curve in Risk Prediction," *Circulation* 2007, 115: 928-935.

"Accuracy" refers to the degree of conformity of a measured or calculated quantity (a test reported value) to its actual (or true) value. Clinical accuracy relates to the proportion of true outcomes (true positives (TP) or true negatives (TN) versus misclassified outcomes (false positives (FP) or false negatives (FN)), and may be stated as a sensitivity, specificity, positive predictive values (PPV) or negative predictive values (NPV), Matthews correlation coefficient (MCC), or as a likelihood, odds ratio, Receiver Operating Characteristic (ROC) curve, Area Under the Curve (AUC) among other measures.

A “formula,” “algorithm,” or “model” is any mathematical equation, algorithmic, analytical or programmed process, or statistical technique that takes one or more continuous or categorical inputs (herein called “parameters”) and calculates an output value, sometimes referred to as an “index” or “index value”. Non-limiting examples of “formulas” include sums, ratios, and regression operators, such as coefficients or exponents, biomarker value transformations and normalizations (including, without limitation, those normalization schemes based on clinical-determinants, such as gender, age, or ethnicity), rules and guidelines, statistical classification models, and neural networks trained on historical populations. Of particular use in combining determinants are linear and non-linear equations and statistical classification analyses to determine the relationship between levels of determinants detected in a subject sample and the subject’s probability of having an infection or a certain type of infection. In panel and combination construction, of particular interest are structural and syntactic statistical classification algorithms, and methods of index construction, utilizing pattern recognition features, including established techniques such as cross-correlation, Principal Components Analysis (PCA), factor rotation, Logistic Regression (LogReg), Linear Discriminant Analysis (LDA), Eigengene Linear Discriminant Analysis (ELDA), Support Vector Machines (SVM), Random Forest (RF), Recursive Partitioning Tree (RPART), as well as other related decision tree classification techniques, Shrunken Centroids (SC), StepAIC, Kth-Nearest Neighbor, Boosting, Decision Trees, Neural Networks, Bayesian Networks, and Hidden Markov Models, among others. Other techniques may be used in survival and time to event hazard analysis, including Cox, Weibull, Kaplan-Meier and Greenwood models well known to those of skill in the art. Many of these techniques are useful either combined with a determinant selection technique, such as forward selection, backwards selection, or stepwise selection, complete enumeration of all potential panels of a given size, genetic algorithms, or they may themselves include biomarker selection methodologies in their own technique. These may be coupled with information criteria, such as Akaike’s Information Criterion (AIC) or Bayes Information Criterion (BIC), in order to quantify the tradeoff between additional biomarkers and model improvement, and to aid in minimizing overfit. The resulting predictive models may be validated in other studies, or cross-validated in the study they were originally trained in, using such techniques as

Bootstrap, Leave-One-Out (LOO) and 10-Fold cross-validation (10-Fold CV). At various steps, false discovery rates may be estimated by value permutation according to techniques known in the art. A “health economic utility function” is a formula that is derived from a combination of the expected probability of a range of clinical outcomes in an idealized applicable patient population, both before and after the introduction of a diagnostic or therapeutic intervention into the standard of care. It encompasses estimates of the accuracy, effectiveness and performance characteristics of such intervention, and a cost and/or value measurement (a utility) associated with each outcome, which may be derived from actual health system costs of care (services, supplies, devices and drugs, etc.) and/or as an estimated acceptable value per quality adjusted life year (QALY) resulting in each outcome. The sum, across all predicted outcomes, of the product of the predicted population size for an outcome multiplied by the respective outcome’s expected utility is the total health economic utility of a given standard of care. The difference between (i) the total health economic utility calculated for the standard of care with the intervention versus (ii) the total health economic utility for the standard of care without the intervention results in an overall measure of the health economic cost or value of the intervention. This may itself be divided amongst the entire patient group being analyzed (or solely amongst the intervention group) to arrive at a cost per unit intervention, and to guide such decisions as market positioning, pricing, and assumptions of health system acceptance. Such health economic utility functions are commonly used to compare the cost-effectiveness of the intervention, but may also be transformed to estimate the acceptable value per QALY the health care system is willing to pay, or the acceptable cost-effective clinical performance characteristics required of a new intervention.

For diagnostic (or prognostic) interventions of the invention, as each outcome (which in a disease classifying diagnostic test may be a TP, FP, TN, or FN) bears a different cost, a health economic utility function may preferentially favor sensitivity over specificity, or PPV over NPV based on the clinical situation and individual outcome costs and value, and thus provides another measure of health economic performance and value which may be different from more direct clinical or analytical performance measures. These different measurements and relative trade-offs generally will converge only in the case of a perfect test, with zero error rate (a.k.a., zero

predicted subject outcome misclassifications or FP and FN), which all performance measures will favor over imperfection, but to differing degrees.

“Analytical accuracy” refers to the reproducibility and predictability of the measurement process itself, and may be summarized in such measurements as coefficients of variation (CV), Pearson correlation, and tests of concordance and calibration of the same samples or controls with different times, users, equipment and/or reagents. These and other considerations in evaluating new biomarkers are also summarized in Vasan, 2006.

“Performance” is a term that relates to the overall usefulness and quality of a diagnostic or prognostic test, including, among others, clinical and analytical accuracy, other analytical and process characteristics, such as use characteristics (e.g., stability, ease of use), health economic value, and relative costs of components of the test. Any of these factors may be the source of superior performance and thus usefulness of the test, and may be measured by appropriate “performance metrics,” such as AUC and MCC, time to result, shelf life, etc. as relevant.

By “statistically significant”, it is meant that the alteration is greater than what might be expected to happen by chance alone (which could be a “false positive”). Statistical significance can be determined by any method known in the art. Commonly used measures of significance include the p-value, which presents the probability of obtaining a result at least as extreme as a given data point, assuming the data point was the result of chance alone. A result is often considered highly significant at a p-value of 0.05 or less.

In the context of the present invention the following abbreviations may be used: Antibiotics (Abx), Adverse Event (AE), Arbitrary Units (A.U.), Complete Blood Count (CBC), Case Report Form (CRF), Chest X-Ray (CXR), Electronic Case Report Form (eCRF), Food and Drug Administration (FDA), Good Clinical Practice (GCP), Gastrointestinal (GI), Gastroenteritis (GE), International Conference on Harmonization (ICH), Infectious Disease (ID), In vitro diagnostics (IVD), Lower Respiratory Tract Infection (LRTI), Myocardial infarction (MI), Polymerase chain reaction (PCR), Per-oss (P.O), Per-rectum (P.R), Standard of Care (SoC), Standard Operating Procedure (SOP), Urinary Tract Infection (UTI), Upper Respiratory Tract Infection (URTI).

As used herein the term “about” refers to $\pm 10\%$.

The terms "comprises", "comprising", "includes", "including", "having" and their conjugates mean "including but not limited to".

The term "consisting of" means "including and limited to".

The term "consisting essentially of" means that the composition, method or structure may include additional ingredients, steps and/or parts, but only if the additional ingredients, steps and/or parts do not materially alter the basic and novel characteristics of the claimed composition, method or structure.

As used herein, the singular form "a", "an" and "the" include plural references unless the context clearly dictates otherwise. For example, the term "a compound" or "at least one compound" may include a plurality of compounds, including mixtures thereof.

Throughout this application, various embodiments of this invention may be presented in a range format. It should be understood that the description in range format 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 numbers within that range, for example, 1, 2, 3, 4, 5, and 6. This applies regardless of the breadth of the range.

Whenever a numerical range is indicated herein, it is meant to include any cited numeral (fractional or integral) within the indicated range. The phrases "ranging/ranges between" a first indicate number and a second indicate number and "ranging/ranges from" a first indicate number "to" a second indicate number are used herein interchangeably and are meant to include the first and second indicated numbers and all the fractional and integral numerals there between.

As used herein the term "method" refers to manners, means, techniques and procedures for accomplishing a given task including, but not limited to, those manners, means, techniques and procedures either known to, or readily developed from known manners, means, techniques and procedures by practitioners of the chemical, pharmacological, biological, biochemical and medical arts.

As used herein, the term “treating” includes abrogating, substantially inhibiting, slowing or reversing the progression of a condition, substantially ameliorating clinical or aesthetical symptoms of a condition or substantially preventing the appearance of clinical or aesthetical symptoms of a condition.

5 It is appreciated that certain features of the invention, which are, for clarity, described in the context of separate embodiments, may also be provided in combination in a single embodiment. Conversely, various features of the invention, which are, for brevity, described in the context of a single embodiment, may also be provided separately or in any suitable subcombination or as suitable in any other described
10 embodiment of the invention. Certain features described in the context of various embodiments are not to be considered essential features of those embodiments, unless the embodiment is inoperative without those elements.

 Although the invention has been described in conjunction with specific embodiments thereof, it is evident that many alternatives, modifications and variations
15 will be apparent to those skilled in the art. Accordingly, it is intended to embrace all such alternatives, modifications and variations that fall within the spirit and broad scope of the appended claims.

 All publications, patents and patent applications mentioned in this specification are herein incorporated in their entirety by reference into the specification, to the same
20 extent as if each individual publication, patent or patent application was specifically and individually indicated to be incorporated herein by reference. In addition, citation or identification of any reference in this application shall not be construed as an admission that such reference is available as prior art to the present invention. To the extent that section headings are used, they should not be construed as necessarily limiting.

25 Various embodiments and aspects of the present invention as delineated hereinabove and as claimed in the claims section below find experimental support in the following examples.

EXAMPLES

30 Reference is now made to the following examples, which together with the above descriptions illustrate some embodiments of the invention in a non-limiting fashion.

Generally, the nomenclature used herein and the laboratory procedures utilized in the present invention include molecular, biochemical, microbiological and recombinant DNA techniques. Such techniques are thoroughly explained in the literature. See, for example, "Molecular Cloning: A laboratory Manual" Sambrook et al., (1989); "Current Protocols in Molecular Biology" Volumes I-III Ausubel, R. M., ed. (1994); Ausubel et al., "Current Protocols in Molecular Biology", John Wiley and Sons, Baltimore, Maryland (1989); Perbal, "A Practical Guide to Molecular Cloning", John Wiley & Sons, New York (1988); Watson et al., "Recombinant DNA", Scientific American Books, New York; Birren et al. (eds) "Genome Analysis: A Laboratory Manual Series", Vols. 1-4, Cold Spring Harbor Laboratory Press, New York (1998); methodologies as set forth in U.S. Pat. Nos. 4,666,828; 4,683,202; 4,801,531; 5,192,659 and 5,272,057; "Cell Biology: A Laboratory Handbook", Volumes I-III Cellis, J. E., ed. (1994); "Culture of Animal Cells - A Manual of Basic Technique" by Freshney, Wiley-Liss, N. Y. (1994), Third Edition; "Current Protocols in Immunology" Volumes I-III Coligan J. E., ed. (1994); Stites et al. (eds), "Basic and Clinical Immunology" (8th Edition), Appleton & Lange, Norwalk, CT (1994); Mishell and Shiigi (eds), "Selected Methods in Cellular Immunology", W. H. Freeman and Co., New York (1980); available immunoassays are extensively described in the patent and scientific literature, see, for example, U.S. Pat. Nos. 3,791,932; 3,839,153; 3,850,752; 3,850,578; 3,853,987; 3,867,517; 3,879,262; 3,901,654; 3,935,074; 3,984,533; 3,996,345; 4,034,074; 4,098,876; 4,879,219; 5,011,771 and 5,281,521; "Oligonucleotide Synthesis" Gait, M. J., ed. (1984); "Nucleic Acid Hybridization" Hames, B. D., and Higgins S. J., eds. (1985); "Transcription and Translation" Hames, B. D., and Higgins S. J., eds. (1984); "Animal Cell Culture" Freshney, R. I., ed. (1986); "Immobilized Cells and Enzymes" IRL Press, (1986); "A Practical Guide to Molecular Cloning" Perbal, B., (1984) and "Methods in Enzymology" Vol. 1-317, Academic Press; "PCR Protocols: A Guide To Methods And Applications", Academic Press, San Diego, CA (1990); Marshak et al., "Strategies for Protein Purification and Characterization - A Laboratory Course Manual" CSHL Press (1996); all of which are incorporated by reference as if fully set forth herein. Other general references are provided throughout this document. The procedures therein are believed to be well known in the art and are

provided for the convenience of the reader. All the information contained therein is incorporated herein by reference.

EXAMPLE 1

Single and multiple exons as potential biomarkers

Alternative splicing is a regulated process during gene expression that results in a single gene coding for multiple proteins. In this process, particular exons of a gene may be included within or excluded from the final, processed messenger RNA (mRNA) produced from that gene. Thus, certain exons may be differentially expressed in bacterial or viral patients even though the entire full length gene is not. Indeed, several genes have now been identified for which the expression patterns of specific exons provide stronger differential signal than the full length gene. These exons have the potential to serve as diagnostic biomarkers or to enhance the performance of transcriptomic signatures composed of several full or partial RNA determinants.

MATERIALS AND METHODS

Patient recruitment: Patients were prospectively recruited as part of the 'Curiosity' clinical study (NCT01917461; (Oved et al. 2015)). Informed consent was obtained from each participant or legal guardian, as applicable. Inclusion criteria for the infectious disease cohort included: clinical suspicion of an acute infectious disease, peak fever $>37.5^{\circ}\text{C}$ since symptoms onset, and duration of symptoms ≤ 12 days. Inclusion criteria for the control group included: clinical impression of a non-infectious disease (e.g. trauma, stroke and myocardial infarction), or healthy subjects. Exclusion criteria included: evidence of any episode of acute infectious disease in the two weeks preceding enrollment; diagnosed congenital immune deficiency; current treatment with immunosuppressive or immunomodulatory therapy; active malignancy, proven or suspected human immunodeficiency virus (HIV)-1, hepatitis B virus (HBV), or hepatitis C virus (HCV) infection. Importantly, in order to enable broad generalization, antibiotic treatment at enrollment did not cause exclusion from the study. An overview of study workflow is depicted in Figure 1.

Enrollment process and data collection: For each patient, the following baseline variables were recorded: demographics, physical examination, medical history (e.g. main complaints, underlying diseases, chronically-administered medications,

comorbidities, time of symptom onset, and peak temperature), complete blood count (CBC) obtained at enrollment, and chemistry panel (e.g. creatinine, urea, electrolytes, and liver enzymes). A nasal swab was obtained from each patient for further microbiological investigation, and a blood sample was obtained for protein screening and validation. Additional samples were obtained as deemed appropriate by the physician (e.g. urine and stool samples in cases of suspected urinary tract infection [UTI], and gastroenteritis [GI] respectively). Radiological tests were obtained at the discretion of the physician (e.g. chest X-ray for suspected lower respiratory tract infection [LRTI]). Thirty days after enrollment, disease course and response to treatment were recorded. All information was recorded in a custom electronic case report form (eCRF).

Microbiological investigation: Patients underwent two multiplex-PCR diagnostic assays from nasal swab samples: (i) Seeplex™ RV15, for detection of parainfluenza virus 1, 2, 3, and 4, coronavirus 229E/NL63, adenovirus A/B/C/D/E, bocavirus 1/2/3/4, influenza virus A and B, metapneumovirus, coronavirus OC43, rhinovirus A/B/C, respiratory syncytial virus A and B, and Enterovirus, and (ii) Seeplex™ PB6 for detection of *Streptococcus pneumoniae*, *Haemophilus influenzae*, *Chlamydomphila pneumoniae*, *Legionella pneumophila*, *Bordetella pertussis*, and *Mycoplasma pneumoniae*. Multiplex-PCR assays were performed by a certified service laboratory. Patients were also tested for additional pathogens according to their suspected clinical syndrome, including: blood culture, urine culture and stool culture for *Shigella* spp., *Campylobacter* spp. and *Salmonella* spp.; serological testing (IgM and/or IgG) for cytomegalovirus (CMV), Epstein-Barr virus (EBV), *Mycoplasma Pneumonia*, and *Coxiella burnetii* (Q-Fever).

Establishing the reference standard: Currently, no single reference standard exists for determining bacterial and viral infections in a wide range of clinical syndromes. Therefore, a rigorous reference standard was created following recommendations of the Standards for Reporting of Diagnostic Accuracy (STARD) (Bossuyt et al. 2003). First, a thorough clinical and microbiological investigation was performed for each patient as described above. Then, all the data collected throughout the disease course was reviewed by a panel of three physicians (the attending pediatrician, an infectious disease expert and a senior attending pediatrician). Each

panel member assigned one of the following diagnostic labels to each patient: (i) bacterial; (ii) viral; (iii) no apparent infectious disease or healthy (controls); and (iv) indeterminate. Final diagnosis was determined by consensus agreement of all three panel members. Importantly, the panel members were blinded to the labeling of their peers and to the results of the signature.

Samples, procedures and RNA purification: Nasal swabs and stool samples were stored at 4 °C for up to 72 hours and subsequently transported to a certified service laboratory for multiplex PCR-based assay. Venous blood samples were collected in EDTA contained CBC tube and stored at 4 °C for up to 5 hours on site and subsequently fractionated into plasma and cell pellet. Red cells were lysed using Red Cell Lysis Buffer (RCLB) at room temperature (RT) and total RNA was purified using RNeasy plus Mini Kit (QIAGEN, Cat. 74134) according to manufacturer recommended protocols.

Microarray experiments A total of 10µl of 200 ng/3µl (66.67ng/µl) RNA were transferred to microarray chip hybridization. Amplified cRNA was prepared from 200 ng total RNA using the WT cDNA Synthesis and WT cDNA Amplification Kits (900672, Affymetrix). Biotinylated single-stranded cDNA was generated from the amplified cRNA and then fragmented and labeled with the WT Terminal Labeling Kit (Affymetrix), following manufacturer protocol. Samples were hybridized to Human Gene 1.0 ST Arrays (Affymetrix) in which the probes are distributed across the full length of the gene, providing a more complete and accurate picture of overall gene expression. This array interrogates 28,869 well-annotated genes with 764,885 distinct probes. In addition, it contains a subset of probes from Exon 1.0 ST Arrays that focuses on well-annotated content. Arrays were scanned using the Affymetrix GeneChip Scanner 3000 7G. Partek Genomic Suite software was then used to extract raw data, perform mean probe summarization, RMA and quintile normalization and GC content correction (Downey 2006).

Statistical analysis Primary analysis was based on area under the receiver operating curve (AUC), Matthews correlation coefficient (MCC), sensitivity, specificity, and total accuracy. These measures are defined as follows:

98

$$\text{Sensitivity} = \frac{TP}{TP + FN}$$

$$\text{Specificity} = \frac{TN}{TN + FP}$$

$$\text{total accuracy} = \frac{TP + TN}{TP + FN + TN + FP}$$

$$\text{MCC} = \frac{TP \times TN - FP \times FN}{\sqrt{(TP + FP)(TP + FN)(TN + FP)(TN + FN)}}$$

P, N, TP, FP, TN, FN are positives, negatives, true-positives, false-positives, true-negatives, and false-negatives, respectively. Unless mentioned otherwise, positives and negatives refer to patients with bacterial and viral infections, respectively.

RESULTS

Patients characteristics The studied group of pediatric patients included 7 females (47%) and 8 males (53%) aged 7 months to 16 years. The patients presented with a variety of clinical syndromes affecting different physiological systems (e.g., respiratory, urinal, central nervous system, systemic). Detailed characterization of studied patients is summarized in Table 10C.

Table 10C. Detailed description of studied patients. UTI - Urinal tract infection; URTI – Upper respiratory tract infection; WBC – white blood count.

Patient number	Gender	Age (y)	Etiology	Clinical Syndrome	Maximal temperature (°C)	Time from symptoms (d)	Hospitalization Duration (d)	WBC (x1000)
390	Male	6	Bacterial	Pneumonia	38	3	4	8.3
392	Female	2	Bacterial	Acute otitis media	38.7	2	4	19.5
406	Female	16	Bacterial	Pharyngitis	39	6	3	7.5
417	Female	5	Bacterial	UTI	40	4	3	12.2

	le		al					
418	Male	2	Bacterial	Pneumonia	38.1	4	2	14.9
420	Male	3	Bacterial	Pneumonia	39.5	2	1	27.5
384	Male	3	Viral	Bronchitis	39.3	1	0	11.3
397	Female	2	Viral	Fever Without Source	38.4	4	1	15.3
404	Female	1	Viral	Fever Without Source	38.6	1	0	8.2
405	Female	0.7	Viral	Bronchitis	39.6	2	2	13.9
408	Male	1.1	Viral	Fever Without Source	39.7	2	1	6
416	Male	10.5	Viral	Meningitis	38.4	5	2	3.8
421	Male	3	Viral	URTI	39.9	2	0	9.4
422	Male	2	Viral	URTI	39	5	0	16.7
423	Female	1.8	Viral	Fever Without Source	39.5	3	2	9.1

RNA determinants can distinguish between bacterial and viral patients The gene expression profiles of blood leukocytes obtained from the described acute infection patients using the Human Gene 1.0 ST Array (Affymetrix) were studied. The results suggest a differential response of the immune system to bacterial and viral infections. 63 RNA determinants were identified that were differentially expressed in the bacterial and viral patients tested (Table 11; log₂-fold change was calculated compared to bacterial patients baseline. The present inventors further calculated for these RNA determinants the measures of accuracy in distinguishing between bacterial and viral patients including AUC, MCC, total accuracy, sensitivity, specificity and Wilcoxon ranksum P-value (Table 11).

Table 11. Differentially expressed RNA determinants and their measures of accuracy in differentiating between bacterial or mixed versus viral infected subjects. Changes in expression levels were calculated as $\log_2$ (fold change bacterial) - $\log_2$ (fold change viral).

Serial number	DETERMINANT	Bacterial or viral induced	$\log_2$ (fold change bacterial) - $\log_2$ (fold change viral)	AUC	MCC	Total accuracy	Sensitivity	Specificity	ranksum P-value
1	AIM2	Viral	-1.56	0.722	0.167	0.667	0.667	0.667	1.81E-01
2	ANKRD22	Viral	-2.13	0.648	0.444	0.8	0.667	0.889	3.88E-01
3	BMX	Viral	-1.53	0.667	0.444	0.733	0.667	0.778	3.28E-01
4	C19orf59	Viral	-1.51	0.611	0.167	0.533	0.5	0.556	5.29E-01
5	CCL2	Viral	-0.95	0.87	0.764	0.867	1	0.778	1.76E-02
6	CD177	Viral	-1.64	0.63	0.167	0.667	0.5	0.778	4.56E-01
7	CEACAM1	Viral	-1.88	0.796	0.444	0.8	0.833	0.778	6.63E-02
8	CLEC4D	Viral	-1.48	0.685	0.444	0.733	0.667	0.778	2.72E-01
9	CMPK2	Viral	-2.44	0.87	0.444	0.8	0.667	0.889	1.76E-02
10	CXCL10	Viral	-2.08	0.704	0.491	0.733	0.833	0.667	2.24E-01
11	CYBRD1	Bacterial	1.35	0.852	0.444	0.8	0.833	0.778	2.56E-02
12	CYP1B1	Bacterial	1.38	0.63	0.218	0.733	0.333	1	4.56E-01
13	DDX60	Viral	-1.79	0.889	0.327	0.8	0.667	0.889	1.20E-02
14	EIF1AY	Viral	-2.14	0.611	0.492	0.8	0.667	0.889	5.29E-01
15	EIF2AK2	Viral	-1.50	0.833	0.289	0.8	0.833	0.778	3.60E-02
16	EPSTI1	Viral	-2.32	0.833	0.577	0.867	0.667	1	3.60E-02
17	F13A1	Bacterial	1.03	0.87	0.6	0.933	0.833	1	1.76E-02
18	FFAR3	Viral	-1.57	0.741	0.491	0.8	1	0.667	1.81E-01
19	FLJ21767	Bacterial	0.44	0.722	0.389	0.733	0.667	0.778	2.72E-01
20	GALM	Viral	-1.46	0.944	0.6	0.933	0.833	1	2.80E-03
21	HERC5	Viral	-2.45	0.833	0.327	0.733	0.833	0.667	3.60E-02

22	HLA-DQA1	Bacteri al	0.40	0.6 11	0.38 9	0.6	0.833	0.444	6.07E- 01
23	IFI27	Viral	-2.96	1	0.87 3	0.933	1	0.889	4.00E- 04
24	IFI44	Viral	-2.42	0.8 52	0.32 7	0.733	0.833	0.667	2.56E- 02
25	IFI44L	Viral	-3.86	0.8 89	0.44 4	0.733	0.833	0.667	1.20E- 02
26	IFI6	Viral	-1.80	0.8 15	0.32 7	0.733	0.833	0.667	4.96E- 02
27	IFIT1	Viral	-2.28	0.8 89	0.6	0.8	0.833	0.778	1.20E- 02
28	IFIT2	Viral	-1.83	0.8 52	0.32 7	0.733	0.833	0.667	2.56E- 02
29	IFIT3	Viral	-2.26	0.7 96	0.44 4	0.8	0.667	0.889	6.63E- 02
30	IFITM3	Viral	-1.53	0.7 59	0.28 9	0.733	0.833	0.667	1.13E- 01
31	INCA	Viral	-1.92	0.7 41	0.44 4	0.8	0.833	0.778	1.45E- 01
32	IRF7	Viral	-1.69	0.7 41	0.28 9	0.733	0.667	0.778	1.45E- 01
33	ISG15	Viral	-1.22	0.9 07	0.6	0.867	0.833	0.889	7.59E- 03
34	JARID1D	Viral	-1.56	0.6 11	- 0.57 7	0.8	0.833	0.778	5.29E- 01
35	JUP	Viral	-1.47	0.7 96	0.21 8	0.733	0.667	0.778	6.63E- 02
36	LAMP3	Viral	-2.36	0.9 07	0.6	0.867	0.833	0.889	7.59E- 03
37	LOC1001322 44	Bacteri al	1.08	0.6 85	0.21 8	0.667	0.667	0.667	2.72E- 01
38	LOC26010	Viral	-2.23	0.8 7	0.44 4	0.867	1	0.778	1.76E- 02
39	LY6E	Viral	-1.86	0.8 89	0.6	0.8	0.833	0.778	1.20E- 02
40	MT2A	Viral	-1.56	0.8 89	0.72 2	0.867	0.833	0.889	4.80E- 03
41	MX1	Viral	-2.57	0.8 7	0.6	0.8	0.833	0.778	1.76E- 02
42	OAS1	Viral	-2.49	0.8 52	0.44 4	0.8	0.667	0.889	2.56E- 02
43	OAS2	Viral	-1.89	0.9 07	0.44 4	0.867	0.667	1	7.59E- 03
44	OAS3	Viral	-2.97	0.8 7	0.44 4	0.8	0.667	0.889	1.76E- 02
45	OASL	Viral	-2.22	0.8 89	0.49 1	0.733	0.833	0.667	1.20E- 02
46	OTOF	Viral	-0.83	0.9 07	0.6	0.867	1	0.778	7.59E- 03
47	PHOSPHO1	Bacteri al	1.01	0.7 22	0.32 7	0.733	0.833	0.667	1.81E- 01
48	PLSCR1	Viral	-1.68	0.7 04	0.28 9	0.733	0.5	0.889	2.24E- 01
49	PPBP	Bacteri al	1.01	0.7 96	0.44 4	0.8	0.833	0.778	6.63E- 02

50	PSTPIP2	Viral	-1.61	0.611	0.327	0.733	0.667	0.778	5.29E-01
51	RGS1	Viral	-0.53	0.944	0.491	0.933	0.833	1	2.80E-03
52	RSAD2	Viral	-3.93	0.889	0.444	0.8	0.667	0.889	1.20E-02
53	RTP4	Viral	-1.72	0.889	0.6	0.867	0.833	0.889	1.20E-02
54	SERPING1	Viral	-2.41	0.852	0.577	0.8	0.833	0.778	2.56E-02
55	SH3BGRL2	Bacterial	1.12	0.852	0.444	0.867	1	0.778	2.56E-02
56	SIGLEC1	Viral	-2.47	0.889	0.6	0.867	1	0.778	1.20E-02
57	TMEM176A	Bacterial	1.17	0.667	0.218	0.733	0.333	1	3.45E-01
58	TNFAIP6	Viral	-1.80	0.796	0.444	0.733	0.667	0.778	6.63E-02
59	TREML4	Viral	-1.64	0.833	0.6	0.8	0.833	0.778	3.60E-02
60	USP18	Viral	-3.12	0.926	0.6	0.867	1	0.778	7.99E-04
61	UTY	Viral	-1.86	0.611	0.492	0.867	0.833	0.889	5.29E-01
62	XAF1	Viral	-1.65	0.889	0.444	0.733	0.667	0.778	1.20E-02

The exon-level differential expression of the 62 genes described in Table 11 was then calculated and the median log fold change of each individual exon was compared to its full length gene (Table 12, herein below).

Table 12 - Exon level analysis of 62 genes differentially expressed in bacterial and viral patients. Expression levels data obtained from the 6 bacterial and 9 viral patients described in Table 11. Probest ID is based on Affymetrix chip data. Comparison to full gene was calculated as absolute median log fold change (exon_i) - absolute median log fold change (full length gene); "+" and "-" represent higher and lower degree of differential expression of the single exon compared to the full length gene.

Gene name	Exon #	Genomic location (start)	Genomic location (stop)	Probeset ID (Affymetrix)	Chromosome	Strand	Median log fold change	Comparison to full gene (improvement indicated by "+")
ISG15	1	948879	948916	7896818	1	+	-0.51	-
ISG15	2	948908	948948	7896819	1	+	-1.28	+
ISG15	3	949444	949822	7896820	1	+	-2.23	+
ISG15	4	949859	949914	7896821	1	+	-1.38	+

IFI44L	1	79086173	79086205	7902542	1	+	-4.40	+
IFI44L	2	79092813	79093150	7902543	1	+	-3.42	-
IFI44L	3	79093630	79093953	7902544	1	+	-4.38	+
IFI44L	4	79094251	79094549	7902545	1	+	-3.52	-
IFI44L	5	79094640	79094666	7902546	1	+	-4.39	+
IFI44L	6	79095443	79095586	7902547	1	+	-3.77	-
IFI44L	7	79101063	79101173	7902548	1	+	-3.82	-
IFI44L	8	79102723	79102849	7902549	1	+	-3.37	-
IFI44L	9	79106715	79106767	7902550	1	+	-3.15	-
IFI44L	10	79107138	79107271	7902551	1	+	-3.55	-
IFI44L	11	79107469	79107559	7902552	1	+	-3.54	-
IFI44	1	79115512	79115550	7902554	1	+	-1.90	-
IFI44	2	79115961	79116337	7902555	1	+	-2.99	+
IFI44	3	79119928	79119955	7902556	1	+	-2.12	-
IFI44	4	79120699	79120889	7902557	1	+	-2.43	+
IFI44	5	79121142	79121176	7902558	1	+	-2.45	+
IFI44	6	79125081	79125168	7902559	1	+	-3.07	+
IFI44	7	79126239	79126281	7902560	1	+	-2.29	-
IFI44	8	79128416	79128520	7902561	1	+	-2.84	+
IFI44	9	79129461	79129597	7902562	1	+	-1.60	-
RGS1	1	1.93E+08	1.93E+08	7908389	1	+	0.07	-
RGS1	2	1.93E+08	1.93E+08	7908390	1	+	-0.17	-
RGS1	3	1.93E+08	1.93E+08	7908391	1	+	-0.40	-
RGS1	4	1.93E+08	1.93E+08	7908392	1	+	-0.54	+
RGS1	5	1.93E+08	1.93E+08	7908393	1	+	-1.93	+
RGS1	6	1.93E+08	1.93E+08	7908394	1	+	-0.22	-
RGS1	7	1.93E+08	1.93E+08	7908395	1	+	-0.47	-
RGS1	8	1.93E+08	1.93E+08	7908396	1	+	-0.19	-
IFI6	1	27992621	27992865	7914128	1	-	-2.08	+
IFI6	2	27992902	27992978	7914129	1	-	-1.62	-
IFI6	3	27994775	27994883	7914130	1	-	-1.05	-
IFI6	4	27994995	27995045	7914131	1	-	-2.27	+
IFI6	5	27995771	27995810	7914132	1	-	-2.25	+
IFI6	6	27995832	27995857	7914133	1	-	-1.49	-
IFI6	7	27998687	27998711	7914134	1	-	-0.33	-
AIM2	1	1.59E+08	1.59E+08	7921435	1	-	-0.93	-
AIM2	2	1.59E+08	1.59E+08	7921436	1	-	-1.51	-
AIM2	3	1.59E+08	1.59E+08	7921437	1	-	-0.82	-
AIM2	4	1.59E+08	1.59E+08	7921438	1	-	-2.00	+
AIM2	5	1.59E+08	1.59E+08	7921439	1	-	-2.03	+
AIM2	6	1.59E+08	1.59E+08	7921440	1	-	-0.87	-
AIM2	7	1.59E+08	1.59E+08	7921441	1	-	-1.75	+
IFIT2	1	91061755	91061786	7929048	10	+	-0.03	-

IFIT2	2	91061839	91061863	7929049	10	+	-1.83	-
IFIT2	3	91065744	91067030	7929050	10	+	-1.81	-
IFIT2	4	91067134	91068336	7929051	10	+	-2.62	+
IFIT3	1	91087675	91087758	7929053	10	+	-0.18	-
IFIT3	2	91087785	91087813	7929054	10	+	-2.57	+
IFIT3	3	91092261	91092289	7929055	10	+	-2.34	+
IFIT3	4	91092277	91092301	7929056	10	+	-3.20	+
IFIT3	5	91092305	91092331	7929057	10	+	-2.06	-
IFIT3	6	91092346	91092370	7929058	10	+	-1.97	-
IFIT3	7	91098599	91099484	7929059	10	+	-2.22	-
IFIT3	8	91099985	91100009	7929060	10	+	-2.62	+
IFIT1	1	91152344	91152368	7929066	10	+	0.00	-
IFIT1	2	91152390	91152448	7929067	10	+	-1.86	-
IFIT1	3	91162071	91163418	7929068	10	+	-3.79	+
IFIT1	4	91163472	91163592	7929069	10	+	-3.10	+
ANKRD22	1	90582163	90582243	7934899	10	-	-2.79	+
ANKRD22	2	90582502	90582765	7934900	10	-	-2.07	-
ANKRD22	3	90583056	90583131	7934901	10	-	-2.46	+
ANKRD22	4	90585796	90585838	7934902	10	-	-2.12	-
ANKRD22	5	90588318	90588422	7934903	10	-	-1.62	-
ANKRD22	6	90591592	90591769	7934904	10	-	-1.73	-
ANKRD22	7	90611365	90611523	7934905	10	-	-1.95	-
SERPING1	1	57365088	57365168	7940029	11	+	0.00	-
SERPING1	2	57365744	57365774	7940030	11	+	-2.26	-
SERPING1	3	57367459	57367483	7940031	11	+	-2.25	-
SERPING1	4	57367477	57367501	7940032	11	+	-2.60	+
SERPING1	5	57367621	57367650	7940033	11	+	-3.35	+
SERPING1	6	57367674	57367699	7940034	11	+	-3.90	+
SERPING1	7	57367716	57367811	7940035	11	+	-2.75	+
SERPING1	8	57369524	57369615	7940036	11	+	-2.32	-
SERPING1	9	57373502	57373587	7940037	11	+	-2.55	+
SERPING1	10	57373958	57373995	7940038	11	+	-2.30	-
SERPING1	11	57379201	57379240	7940039	11	+	-3.27	+
SERPING1	12	57381815	57382029	7940040	11	+	-2.76	+
SERPING1	13	57382160	57382228	7940041	11	+	-1.88	-
IFITM3	1	319739	319795	7945372	11	-	-1.14	-
IFITM3	2	319838	319864	7945373	11	-	-1.51	-
IFITM3	3	320748	320772	7945374	11	-	-1.76	+
IFITM3	4	320786	320810	7945375	11	-	-2.08	+
IFITM3	5	320914	320947	7945376	11	-	-0.10	-
IRF7	1	612567	612591	7945463	11	-	-2.12	+
IRF7	2	612610	612707	7945464	11	-	-2.27	+
IRF7	3	613050	613078	7945465	11	-	-2.19	+

IRF7	4	613311	613595	7945466	11	-	-1.22	-
IRF7	5	613786	613835	7945467	11	-	-1.15	-
IRF7	6	613952	614022	7945468	11	-	-0.46	-
IRF7	7	614248	614370	7945469	11	-	-2.09	+
IRF7	8	614505	614530	7945470	11	-	-1.31	-
IRF7	9	614798	614918	7945471	11	-	-1.82	+
IRF7	10	615119	615168	7945472	11	-	-1.56	-
IRF7	11	615264	615344	7945473	11	-	0.04	-
IRF7	12	615386	615627	7945474	11	-	-2.01	+
CLEC4D	1	8666154	8666233	7953750	12	+	-0.72	-
CLEC4D	2	8666280	8666317	7953751	12	+	-1.40	-
CLEC4D	3	8667843	8667869	7953752	12	+	-1.88	+
CLEC4D	4	8670776	8670839	7953753	12	+	-1.73	+
CLEC4D	5	8671621	8671751	7953754	12	+	-1.44	-
CLEC4D	6	8672832	8672856	7953755	12	+	-1.43	-
CLEC4D	7	8672851	8672926	7953756	12	+	-1.97	+
CLEC4D	8	8672913	8672937	7953757	12	+	-1.79	+
CLEC4D	9	8673723	8673850	7953758	12	+	-1.37	-
CLEC4D	10	8673931	8673955	7953759	12	+	-1.24	-
CLEC4D	11	8674672	8674696	7953760	12	+	-1.38	-
OAS1	1	1.13E+08	1.13E+08	7958885	12	+	-2.20	-
OAS1	2	1.13E+08	1.13E+08	7958886	12	+	-2.15	-
OAS1	3	1.13E+08	1.13E+08	7958887	12	+	-1.75	-
OAS1	4	1.13E+08	1.13E+08	7958888	12	+	-1.79	-
OAS1	5	1.13E+08	1.13E+08	7958889	12	+	-2.02	-
OAS1	6	1.13E+08	1.13E+08	7958890	12	+	-1.77	-
OAS1	7	1.13E+08	1.13E+08	7958891	12	+	-1.61	-
OAS1	8	1.13E+08	1.13E+08	7958892	12	+	-1.26	-
OAS1	9	1.13E+08	1.13E+08	7958893	12	+	-1.17	-
OAS1	10	1.13E+08	1.13E+08	7958894	12	+	-2.49	-
OAS3	1	1.13E+08	1.13E+08	7958896	12	+	-2.05	-
OAS3	2	1.13E+08	1.13E+08	7958897	12	+	-2.48	-
OAS3	3	1.13E+08	1.13E+08	7958898	12	+	-3.18	+
OAS3	4	1.13E+08	1.13E+08	7958899	12	+	-3.03	+
OAS3	5	1.13E+08	1.13E+08	7958900	12	+	-4.10	+
OAS3	6	1.13E+08	1.13E+08	7958901	12	+	-2.79	-
OAS3	7	1.13E+08	1.13E+08	7958902	12	+	-3.31	+
OAS3	8	1.13E+08	1.13E+08	7958903	12	+	-2.56	-
OAS3	9	1.13E+08	1.13E+08	7958904	12	+	-3.67	+
OAS3	10	1.13E+08	1.13E+08	7958905	12	+	-3.09	+
OAS3	11	1.13E+08	1.13E+08	7958906	12	+	-2.76	-
OAS3	12	1.13E+08	1.13E+08	7958907	12	+	-3.72	+
OAS3	13	1.13E+08	1.13E+08	7958908	12	+	-2.42	-

OAS3	14	1.13E+08	1.13E+08	7958909	12	+	-3.01	+
OAS3	15	1.13E+08	1.13E+08	7958910	12	+	-3.30	+
OAS3	16	1.13E+08	1.13E+08	7958911	12	+	-2.31	-
OAS3	17	1.13E+08	1.13E+08	7958912	12	+	-2.70	-
OAS2	1	1.13E+08	1.13E+08	7958914	12	+	-2.00	+
OAS2	2	1.13E+08	1.13E+08	7958915	12	+	-1.65	-
OAS2	3	1.13E+08	1.13E+08	7958916	12	+	-2.50	+
OAS2	4	1.13E+08	1.13E+08	7958917	12	+	-0.72	-
OAS2	5	1.13E+08	1.13E+08	7958918	12	+	-2.63	+
OAS2	6	1.13E+08	1.13E+08	7958919	12	+	-1.24	-
OAS2	7	1.13E+08	1.13E+08	7958920	12	+	-1.26	-
OAS2	8	1.13E+08	1.13E+08	7958921	12	+	-1.43	-
OAS2	9	1.13E+08	1.13E+08	7958922	12	+	-2.92	+
OAS2	10	1.13E+08	1.13E+08	7958923	12	+	-1.69	-
OAS2	11	1.13E+08	1.13E+08	7958924	12	+	-1.51	-
OAS2	12	1.13E+08	1.13E+08	7958925	12	+	-1.70	-
OAS2	13	1.13E+08	1.13E+08	7958926	12	+	-2.20	+
OAS2	14	1.13E+08	1.13E+08	7958927	12	+	-1.50	-
OAS2	15	1.13E+08	1.13E+08	7958928	12	+	-1.77	-
OAS2	16	1.13E+08	1.13E+08	7958929	12	+	-0.77	-
OAS2	17	1.13E+08	1.13E+08	7958930	12	+	-2.07	+
OASL	1	1.21E+08	1.21E+08	7967118	12	-	-2.28	+
OASL	2	1.21E+08	1.21E+08	7967119	12	-	-3.56	+
OASL	3	1.21E+08	1.21E+08	7967120	12	-	-2.07	-
OASL	4	1.21E+08	1.21E+08	7967121	12	-	-2.36	+
OASL	5	1.21E+08	1.21E+08	7967122	12	-	-2.53	+
OASL	6	1.21E+08	1.21E+08	7967123	12	-	-2.35	+
OASL	7	1.21E+08	1.21E+08	7967124	12	-	-1.86	-
OASL	8	1.21E+08	1.21E+08	7967125	12	-	-0.27	-
OASL	9	1.21E+08	1.21E+08	7967126	12	-	-0.15	-
EPSTI1	1	43462266	43462452	7971298	13	-	-1.52	-
EPSTI1	2	43463349	43463375	7971299	13	-	-3.12	+
EPSTI1	3	43469178	43469236	7971300	13	-	-2.23	-
EPSTI1	4	43474446	43474471	7971301	13	-	-2.17	-
EPSTI1	5	43491727	43491753	7971302	13	-	-2.44	+
EPSTI1	6	43493437	43493468	7971303	13	-	-3.02	+
EPSTI1	7	43500509	43500534	7971304	13	-	-2.45	+
EPSTI1	8	43528084	43528108	7971305	13	-	-1.21	-
EPSTI1	9	43537406	43537459	7971306	13	-	-2.30	-
EPSTI1	10	43538213	43538240	7971307	13	-	-2.02	-
EPSTI1	11	43543239	43543266	7971308	13	-	-3.11	+
EPSTI1	12	43544773	43544806	7971309	13	-	-2.45	+
EPSTI1	13	43566128	43566296	7971310	13	-	-2.75	+

IFI27	1	94577158	94577309	7976444	14	+	-0.20	-
IFI27	2	94577977	94578004	7976445	14	+	-1.63	-
IFI27	3	94578063	94578119	7976446	14	+	-2.46	-
IFI27	4	94581198	94581225	7976447	14	+	-4.41	+
IFI27	5	94582163	94582259	7976448	14	+	-2.10	-
IFI27	6	94582782	94582840	7976449	14	+	-5.12	+
IFI27	7	94582887	94582955	7976450	14	+	-4.19	+
MT2A	1	56642511	56642544	7995784	16	+	-1.87	+
MT2A	2	56642915	56642942	7995785	16	+	-1.77	+
MT2A	3	56643280	56643368	7995786	16	+	-1.53	-
XAF1	1	6658886	6658910	8004185	17	+	0.18	-
XAF1	2	6659261	6659340	8004186	17	+	-0.18	-
XAF1	3	6659398	6659429	8004187	17	+	-1.18	-
XAF1	4	6661409	6661494	8004188	17	+	-2.06	+
XAF1	5	6662981	6663029	8004189	17	+	-2.07	+
XAF1	6	6663735	6663903	8004190	17	+	-1.84	+
XAF1	7	6665488	6665521	8004191	17	+	-1.83	+
XAF1	8	6673962	6674302	8004192	17	+	-1.48	-
XAF1	9	6676433	6676823	8004193	17	+	-1.71	+
XAF1	10	6678425	6678819	8004194	17	+	-1.93	+
CCL2	1	32582306	32582330	8006434	17	+	0.14	-
CCL2	2	32582321	32582368	8006435	17	+	-0.60	-
CCL2	3	32582369	32582441	8006436	17	+	-0.84	-
CCL2	4	32583269	32583358	8006437	17	+	-1.39	+
CCL2	5	32583749	32583846	8006438	17	+	-1.84	+
CCL2	6	32584004	32584109	8006439	17	+	-0.98	+
JUP	1	39910921	39911168	8015413	17	-	-0.38	-
JUP	2	39911325	39911456	8015414	17	-	-1.18	-
JUP	3	39911556	39911611	8015415	17	-	-0.62	-
JUP	4	39911740	39911944	8015416	17	-	-1.34	-
JUP	5	39911996	39912105	8015417	17	-	-0.71	-
JUP	6	39912431	39912456	8015418	17	-	-2.11	+
JUP	7	39913673	39913745	8015419	17	-	-1.60	+
JUP	8	39913996	39914036	8015420	17	-	-1.61	+
JUP	9	39914665	39914742	8015421	17	-	-1.86	+
JUP	10	39914971	39915122	8015422	17	-	-0.25	-
JUP	11	39919268	39919310	8015423	17	-	-1.62	+
JUP	12	39920966	39921003	8015424	17	-	-0.79	-
JUP	13	39921190	39921312	8015425	17	-	-0.88	-
JUP	14	39923755	39923823	8015426	17	-	-1.43	-
JUP	15	39925344	39925443	8015427	17	-	-2.13	+
JUP	16	39925740	39925925	8015428	17	-	-1.49	+
JUP	17	39927937	39928044	8015429	17	-	-1.03	-

JUP	18	39941202	39941451	8015430	17	-	0.04	-
JUP	19	39942899	39942931	8015431	17	-	-0.21	-
PHOSPHO1	1	47300933	47300957	8016541	17	-	-0.30	-
PHOSPHO1	2	47301244	47301555	8016542	17	-	1.74	+
PHOSPHO1	3	47301807	47302321	8016543	17	-	1.83	+
PHOSPHO1	4	47304009	47304089	8016544	17	-	0.97	-
PHOSPHO1	5	47307844	47308042	8016545	17	-	0.76	-
PSTPIP2	1	43564676	43565362	8023044	18	-	-1.13	-
PSTPIP2	2	43568676	43568705	8023045	18	-	-1.55	-
PSTPIP2	3	43570688	43570713	8023046	18	-	-1.10	-
PSTPIP2	4	43571868	43571899	8023047	18	-	-1.00	-
PSTPIP2	5	43572085	43572168	8023048	18	-	-1.43	-
PSTPIP2	6	43573572	43573637	8023049	18	-	-1.25	-
PSTPIP2	7	43577748	43577780	8023050	18	-	-2.13	+
PSTPIP2	8	43578761	43578786	8023051	18	-	-1.25	-
PSTPIP2	9	43579415	43579454	8023052	18	-	-1.17	-
PSTPIP2	10	43585459	43585485	8023053	18	-	-1.64	+
PSTPIP2	11	43591209	43591241	8023054	18	-	-1.16	-
PSTPIP2	12	43595872	43595899	8023055	18	-	-2.19	+
PSTPIP2	13	43604575	43604616	8023056	18	-	-1.69	+
PSTPIP2	14	43619939	43619996	8023057	18	-	-0.95	-
PSTPIP2	15	43652125	43652209	8023058	18	-	-1.26	-
C19orf59	1	7741577	7741818	8025286	19	+	-0.19	-
C19orf59	2	7741931	7741962	8025287	19	+	-0.62	-
C19orf59	3	7741977	7742047	8025288	19	+	-0.37	-
C19orf59	4	7742537	7742609	8025289	19	+	-1.24	-
C19orf59	5	7743000	7743123	8025290	19	+	-0.95	-
C19orf59	6	7743236	7743281	8025291	19	+	-1.84	+
C19orf59	7	7743386	7743488	8025292	19	+	-0.88	-
C19orf59	8	7743833	7743869	8025293	19	+	-1.06	-
C19orf59	9	7744046	7744070	8025294	19	+	-2.08	+
C19orf59	10	7744532	7744632	8025295	19	+	-2.38	+
FFAR3	1	35849505	35849550	8027857	19	+	-1.40	-
FFAR3	2	35849821	35850883	8027858	19	+	-1.60	+
FFAR3	3	35850944	35851301	8027859	19	+	-1.24	-
FFAR3	4	35862290	35863262	8027861	19	+	-1.57	-
CD177	1	43857842	43857866	8029281	19	+	-1.30	-
CD177	2	43857867	43857892	8029282	19	+	-1.05	-
CD177	3	43858043	43858142	8029283	19	+	-1.48	-
CD177	4	43858362	43858510	8029284	19	+	-1.53	-
CD177	5	43864436	43864557	8029285	19	+	-0.58	-
CD177	6	43866241	43866470	8029286	19	+	-1.21	-
CD177	7	43866648	43866672	8029287	19	+	-2.66	+

CD177	8	43866831	43866855	8029288	19	+	-1.91	+
CEACAM1	1	43011571	43012421	8037206	19	-	-3.05	+
CEACAM1	2	43012867	43013056	8037207	19	-	-2.82	+
CEACAM1	3	43013332	43013362	8037208	19	-	-1.31	-
CEACAM1	4	43015041	43015067	8037209	19	-	-1.49	-
CEACAM1	5	43015731	43015780	8037210	19	-	-1.50	-
CEACAM1	6	43016532	43016564	8037211	19	-	-1.91	+
CEACAM1	7	43023038	43023074	8037212	19	-	-0.60	-
CEACAM1	8	43023127	43023253	8037213	19	-	-1.84	-
CEACAM1	9	43023259	43023288	8037214	19	-	-2.17	+
CEACAM1	10	43024843	43025132	8037215	19	-	-0.88	-
CEACAM1	11	43025470	43025570	8037216	19	-	-1.80	-
CEACAM1	12	43026106	43026248	8037217	19	-	-1.16	-
CEACAM1	13	43031489	43031518	8037218	19	-	-2.14	+
CEACAM1	14	43032480	43032504	8037219	19	-	-2.82	+
CEACAM1	15	43032527	43032596	8037220	19	-	-1.52	-
CEACAM1	16	43032579	43032603	8037221	19	-	-3.09	+
CD177	1	43882867	43882899	8037299	19	-	-1.23	-
CD177	2	43883163	43883194	8037300	19	-	-1.68	+
RSAD2	1	7017857	7017911	8040081	2	+	-0.21	-
RSAD2	2	7017966	7018200	8040082	2	+	-4.18	+
RSAD2	3	7023529	7023638	8040083	2	+	-4.41	+
RSAD2	4	7027075	7027295	8040084	2	+	-4.16	+
RSAD2	5	7030307	7030452	8040085	2	+	-4.44	+
RSAD2	6	7033802	7033827	8040086	2	+	-5.25	+
RSAD2	7	7036012	7036238	8040087	2	+	-3.68	-
RSAD2	8	7037065	7037774	8040088	2	+	-5.24	+
RSAD2	9	7038184	7038208	8040089	2	+	-4.14	+
GALM	1	38893153	38893242	8041543	2	+	-0.15	-
GALM	2	38893237	38893261	8041544	2	+	0.14	-
GALM	3	38893380	38893443	8041545	2	+	-0.90	-
GALM	4	38903097	38903194	8041546	2	+	-2.63	+
GALM	5	38908461	38908560	8041547	2	+	-1.95	+
GALM	6	38916976	38917013	8041548	2	+	-2.07	+
GALM	7	38956715	38956818	8041549	2	+	-1.98	+
GALM	8	38958893	38959022	8041550	2	+	-2.21	+
GALM	9	38960661	38960955	8041551	2	+	-1.68	+
GALM	10	38961613	38961753	8041552	2	+	-1.32	-
TNFAIP6	1	1.52E+08	1.52E+08	8045689	2	+	-1.87	+
TNFAIP6	2	1.52E+08	1.52E+08	8045690	2	+	-2.31	+
TNFAIP6	3	1.52E+08	1.52E+08	8045691	2	+	-1.97	+
TNFAIP6	4	1.52E+08	1.52E+08	8045692	2	+	-1.50	-
TNFAIP6	5	1.52E+08	1.52E+08	8045693	2	+	-1.14	-

TNFAIP6	6	1.52E+08	1.52E+08	8045694	2	+	-1.71	-
CYBRD1	1	1.72E+08	1.72E+08	8046334	2	+	0.37	-
CYBRD1	2	1.72E+08	1.72E+08	8046335	2	+	1.39	+
CYBRD1	3	1.72E+08	1.72E+08	8046336	2	+	1.35	+
CYBRD1	4	1.72E+08	1.72E+08	8046337	2	+	1.50	+
CYBRD1	5	1.72E+08	1.72E+08	8046338	2	+	1.40	+
CYBRD1	6	1.72E+08	1.72E+08	8046339	2	+	1.43	+
CMPK2	1	6980702	6980805	8050103	2	-	-3.72	+
CMPK2	2	6988578	6990019	8050104	2	-	-3.41	+
CMPK2	3	6990079	6990104	8050105	2	-	-2.75	+
CMPK2	4	6991597	6991723	8050106	2	-	-3.25	+
CMPK2	5	7001489	7001515	8050107	2	-	-2.92	+
CMPK2	6	7003605	7003666	8050108	2	-	-3.38	+
CMPK2	7	7005192	7005814	8050109	2	-	-0.93	-
CMPK2	8	7005920	7005950	8050110	2	-	-0.93	-
OTOF	1	26680446	26680947	8050943	2	-	-0.29	-
OTOF	2	26682921	26683071	8050944	2	-	-0.95	+
OTOF	3	26683582	26683606	8050945	2	-	-0.17	-
OTOF	4	26683733	26683757	8050946	2	-	-4.65	+
OTOF	5	26684630	26684654	8050947	2	-	-4.21	+
OTOF	6	26684951	26684975	8050948	2	-	-3.80	+
OTOF	7	26686357	26686381	8050949	2	-	-2.12	+
OTOF	8	26686946	26686970	8050950	2	-	-0.76	-
OTOF	9	26687766	26687897	8050951	2	-	-0.65	-
OTOF	10	26688686	26688710	8050952	2	-	-0.88	+
OTOF	11	26688817	26688841	8050953	2	-	-0.41	-
OTOF	12	26689695	26689719	8050954	2	-	-0.47	-
OTOF	13	26690036	26690060	8050955	2	-	-2.40	+
OTOF	14	26690343	26690367	8050956	2	-	-1.06	+
OTOF	15	26691307	26691331	8050957	2	-	-0.82	-
OTOF	16	26693462	26693567	8050958	2	-	-1.31	+
OTOF	17	26693993	26694017	8050959	2	-	-2.47	+
OTOF	18	26695414	26695438	8050960	2	-	-1.73	+
OTOF	19	26695483	26695507	8050961	2	-	-0.23	-
OTOF	20	26696113	26696137	8050962	2	-	-0.35	-
OTOF	21	26696320	26696344	8050963	2	-	-2.79	+
OTOF	22	26696860	26696884	8050964	2	-	-0.81	-
OTOF	23	26697515	26697539	8050965	2	-	-1.96	+
OTOF	24	26698294	26698318	8050966	2	-	-0.45	-
OTOF	25	26698867	26698891	8050967	2	-	-1.27	+
OTOF	26	26699091	26699115	8050968	2	-	-1.38	+
OTOF	27	26699768	26699792	8050969	2	-	-2.23	+
OTOF	28	26700065	26700089	8050970	2	-	-1.17	+

OTOF	29	26700337	26700361	8050971	2	-	-1.21	+
OTOF	30	26700557	26700615	8050972	2	-	-0.13	-
OTOF	31	26700677	26700701	8050973	2	-	-0.13	-
OTOF	32	26700716	26700797	8050974	2	-	0.01	-
OTOF	33	26702204	26702228	8050975	2	-	-0.11	-
OTOF	34	26702412	26702436	8050976	2	-	0.15	-
OTOF	35	26703113	26703137	8050977	2	-	-0.09	-
OTOF	36	26703715	26703739	8050978	2	-	-0.02	-
OTOF	37	26705306	26705330	8050979	2	-	-0.22	-
OTOF	38	26706455	26706479	8050980	2	-	-0.07	-
OTOF	39	26707473	26707497	8050981	2	-	0.32	-
OTOF	40	26712092	26712116	8050982	2	-	-0.56	-
OTOF	41	26712572	26712596	8050983	2	-	-0.25	-
OTOF	42	26717886	26717910	8050984	2	-	0.53	-
OTOF	43	26724622	26724646	8050985	2	-	-0.02	-
OTOF	44	26725248	26725272	8050986	2	-	-0.12	-
OTOF	45	26726664	26726713	8050987	2	-	-0.01	-
OTOF	46	26739331	26739355	8050988	2	-	-0.51	-
OTOF	47	26741945	26741969	8050989	2	-	0.08	-
OTOF	48	26750711	26750788	8050990	2	-	0.13	-
OTOF	49	26760615	26760639	8050991	2	-	-0.30	-
OTOF	50	26781365	26781512	8050992	2	-	-0.26	-
EIF2AK2	1	37334374	37334411	8051502	2	-	-1.80	+
EIF2AK2	2	37334452	37334488	8051503	2	-	-1.76	+
EIF2AK2	3	37334643	37334668	8051504	2	-	-2.01	+
EIF2AK2	4	37336376	37336406	8051505	2	-	-1.37	-
EIF2AK2	5	37341890	37341929	8051506	2	-	-1.25	-
EIF2AK2	6	37347127	37347276	8051507	2	-	-1.80	+
EIF2AK2	7	37349686	37349750	8051508	2	-	-1.41	-
EIF2AK2	8	37353461	37353518	8051509	2	-	-1.74	+
EIF2AK2	9	37362655	37362685	8051510	2	-	-1.96	+
EIF2AK2	10	37364132	37364158	8051511	2	-	-1.34	-
EIF2AK2	11	37365413	37365490	8051512	2	-	-0.80	-
EIF2AK2	12	37365681	37365712	8051513	2	-	-0.77	-
EIF2AK2	13	37366795	37366859	8051514	2	-	-1.10	-
EIF2AK2	14	37368754	37368825	8051515	2	-	-2.11	+
EIF2AK2	15	37374001	37374053	8051516	2	-	-0.67	-
EIF2AK2	16	37374832	37374909	8051517	2	-	-1.52	+
EIF2AK2	17	37376018	37376125	8051518	2	-	-2.13	+
EIF2AK2	18	37376275	37376299	8051519	2	-	-0.27	-
CYP1B1	1	38295325	38296536	8051584	2	-	1.13	-
CYP1B1	2	38297455	38297824	8051585	2	-	1.36	-
CYP1B1	3	38297893	38298453	8051586	2	-	0.94	-

CYP1B1	4	38301504	38302295	8051587	2	-	1.40	+
CYP1B1	5	38302989	38303267	8051588	2	-	1.49	+
SIGLEC1	1	3667953	3668359	8064717	20	-	-2.45	-
SIGLEC1	2	3669232	3669256	8064718	20	-	-2.83	+
SIGLEC1	3	3669820	3669844	8064719	20	-	-4.01	+
SIGLEC1	4	3670322	3670346	8064720	20	-	-1.08	-
SIGLEC1	5	3670869	3670893	8064721	20	-	-2.34	-
SIGLEC1	6	3672040	3672064	8064722	20	-	-2.24	-
SIGLEC1	7	3672564	3672588	8064723	20	-	-2.29	-
SIGLEC1	8	3673299	3673323	8064724	20	-	-3.45	+
SIGLEC1	9	3673571	3673771	8064725	20	-	-1.71	-
SIGLEC1	10	3674167	3674191	8064726	20	-	-2.89	+
SIGLEC1	11	3674948	3674972	8064727	20	-	-3.17	+
SIGLEC1	12	3675460	3675484	8064728	20	-	-2.34	-
SIGLEC1	13	3677464	3677488	8064729	20	-	-1.85	-
SIGLEC1	14	3677732	3677935	8064730	20	-	-4.07	+
SIGLEC1	15	3678524	3678548	8064731	20	-	-3.46	+
SIGLEC1	16	3679992	3680016	8064732	20	-	-3.78	+
SIGLEC1	17	3682105	3682129	8064733	20	-	-2.78	+
SIGLEC1	18	3683919	3683943	8064734	20	-	-4.40	+
SIGLEC1	19	3684532	3684733	8064735	20	-	-1.83	-
SIGLEC1	20	3686400	3686424	8064736	20	-	-1.99	-
SIGLEC1	21	3687224	3687248	8064737	20	-	-0.81	-
SIGLEC1	22	3687750	3687774	8064738	20	-	-1.16	-
MX1	1	42798144	42798169	8068714	21	+	-0.22	-
MX1	2	42799159	42799188	8068715	21	+	-3.38	+
MX1	3	42799687	42799718	8068716	21	+	-2.42	-
MX1	4	42802470	42802496	8068717	21	+	-3.12	+
MX1	5	42803998	42804067	8068718	21	+	-1.91	-
MX1	6	42807923	42807948	8068719	21	+	-3.73	+
MX1	7	42808944	42809062	8068720	21	+	-2.26	-
MX1	8	42811658	42811715	8068721	21	+	-3.45	+
MX1	9	42812837	42812922	8068722	21	+	-2.70	+
MX1	10	42813649	42813729	8068723	21	+	-2.67	+
MX1	11	42815734	42815760	8068724	21	+	-3.01	+
MX1	12	42817432	42817474	8068725	21	+	-2.79	+
MX1	13	42817947	42818036	8068726	21	+	-3.32	+
MX1	14	42821077	42821222	8068727	21	+	-2.86	+
MX1	15	42823137	42823161	8068728	21	+	-2.59	+
MX1	16	42824621	42824786	8068729	21	+	-2.73	+
MX1	17	42830499	42830810	8068730	21	+	-2.90	+
USP18	1	18632822	18632955	8071156	22	+	-0.24	-
USP18	2	18640328	18640363	8071157	22	+	-2.78	-

USP18	3	18640431	18640587	8071158	22	+	-1.79	-
USP18	4	18650665	18650705	8071159	22	+	-2.95	-
USP18	5	18652646	18652670	8071160	22	+	-4.34	+
USP18	6	20717915	20717951	8074607	22	-	-3.27	+
USP18	7	20718484	20718566	8074608	22	-	-2.80	-
USP18	8	20720870	20721024	8074609	22	-	-2.65	-
USP18	9	20721861	20721932	8074610	22	-	-3.25	+
USP18	10	20724425	20724455	8074612	22	-	-3.85	+
USP18	11	20729874	20729899	8074613	22	-	-4.27	+
USP18	12	20731508	20731532	8074614	22	-	-1.94	-
RTP4	1	1.87E+08	1.87E+08	8084733	3	+	-0.13	-
RTP4	2	1.87E+08	1.87E+08	8084734	3	+	-2.14	+
RTP4	3	1.87E+08	1.87E+08	8084735	3	+	-2.39	+
RTP4	4	1.87E+08	1.87E+08	8084736	3	+	-2.10	+
PLSCR1	1	1.46E+08	1.46E+08	8091328	3	-	-1.47	-
PLSCR1	2	1.46E+08	1.46E+08	8091329	3	-	-1.55	-
PLSCR1	3	1.46E+08	1.46E+08	8091330	3	-	-1.30	-
PLSCR1	4	1.46E+08	1.46E+08	8091331	3	-	-1.79	+
PLSCR1	5	1.46E+08	1.46E+08	8091332	3	-	-1.67	-
PLSCR1	6	1.46E+08	1.46E+08	8091333	3	-	-1.77	+
PLSCR1	7	1.46E+08	1.46E+08	8091334	3	-	-1.33	-
PLSCR1	8	1.46E+08	1.46E+08	8091335	3	-	-1.87	+
PLSCR1	9	1.46E+08	1.46E+08	8091336	3	-	-1.81	+
PLSCR1	10	1.46E+08	1.46E+08	8091337	3	-	-2.06	+
PLSCR1	11	1.46E+08	1.46E+08	8091338	3	-	-1.74	+
PLSCR1	12	1.46E+08	1.46E+08	8091339	3	-	-0.39	-
LAMP3	1	1.83E+08	1.83E+08	8092349	3	-	-3.44	+
LAMP3	2	1.83E+08	1.83E+08	8092350	3	-	-2.70	+
LAMP3	3	1.83E+08	1.83E+08	8092351	3	-	-2.92	+
LAMP3	4	1.83E+08	1.83E+08	8092352	3	-	-1.88	-
LAMP3	5	1.83E+08	1.83E+08	8092353	3	-	-2.20	-
LAMP3	6	1.83E+08	1.83E+08	8092354	3	-	-1.89	-
LAMP3	7	1.83E+08	1.83E+08	8092355	3	-	0.00	-
HERC5	1	89378313	89378596	8096362	4	+	-0.77	-
HERC5	2	89380522	89380546	8096363	4	+	-3.69	+
HERC5	3	89381291	89381315	8096364	4	+	-4.45	+
HERC5	4	89383287	89383409	8096365	4	+	-2.56	+
HERC5	5	89384730	89384754	8096366	4	+	-2.78	+
HERC5	6	89385011	89385035	8096367	4	+	-2.88	+
HERC5	7	89388297	89388321	8096368	4	+	-2.44	-
HERC5	8	89389499	89389523	8096369	4	+	-2.78	+
HERC5	9	89390333	89390357	8096370	4	+	-3.67	+
HERC5	10	89391792	89391816	8096371	4	+	-3.41	+

HERC5	11	89393629	89393653	8096372	4	+	-2.65	+
HERC5	12	89396992	89397179	8096373	4	+	-1.61	-
HERC5	13	89400532	89400556	8096374	4	+	-3.84	+
HERC5	14	89407313	89407337	8096375	4	+	-2.76	+
HERC5	15	89408245	89408269	8096376	4	+	-2.24	-
HERC5	16	89410385	89410409	8096377	4	+	-2.94	+
HERC5	17	89414188	89414212	8096378	4	+	-1.48	-
HERC5	18	89415354	89415378	8096379	4	+	-1.92	-
HERC5	19	89421079	89421103	8096380	4	+	-3.46	+
HERC5	20	89422098	89422122	8096381	4	+	-2.24	-
HERC5	21	89425413	89425437	8096382	4	+	-2.54	+
HERC5	22	89425646	89425670	8096383	4	+	-3.30	+
HERC5	23	89426915	89427223	8096384	4	+	-1.55	-
PPBP	1	74852806	74852923	8100972	4	-	1.26	+
PPBP	2	74853017	74853072	8100973	4	-	0.76	-
PPBP	3	74853234	74853343	8100974	4	-	1.17	+
PPBP	4	74853674	74853816	8100975	4	-	0.80	-
PPBP	5	74853827	74853893	8100976	4	-	1.21	+
CXCL10	1	76942595	76943052	8101127	4	-	-1.77	-
CXCL10	2	76943521	76943583	8101128	4	-	-2.47	+
CXCL10	3	76943848	76943942	8101129	4	-	-2.90	+
CXCL10	4	76944524	76944637	8101130	4	-	-1.26	-
DDX60	1	1.69E+08	1.69E+08	8103564	4	-	-1.37	-
DDX60	2	1.69E+08	1.69E+08	8103565	4	-	-1.43	-
DDX60	3	1.69E+08	1.69E+08	8103566	4	-	-2.26	+
DDX60	4	1.69E+08	1.69E+08	8103567	4	-	-2.16	+
DDX60	5	1.69E+08	1.69E+08	8103568	4	-	-2.07	+
DDX60	6	1.69E+08	1.69E+08	8103569	4	-	-2.18	+
DDX60	7	1.69E+08	1.69E+08	8103570	4	-	-1.79	+
DDX60	8	1.69E+08	1.69E+08	8103571	4	-	-2.47	+
DDX60	9	1.69E+08	1.69E+08	8103572	4	-	-2.28	+
DDX60	10	1.69E+08	1.69E+08	8103573	4	-	-2.16	+
DDX60	11	1.69E+08	1.69E+08	8103574	4	-	-2.03	+
DDX60	12	1.69E+08	1.69E+08	8103575	4	-	-2.21	+
DDX60	13	1.69E+08	1.69E+08	8103576	4	-	-2.51	+
DDX60	14	1.69E+08	1.69E+08	8103577	4	-	-1.27	-
DDX60	15	1.69E+08	1.69E+08	8103578	4	-	-1.75	-
DDX60	16	1.69E+08	1.69E+08	8103579	4	-	-1.41	-
DDX60	17	1.69E+08	1.69E+08	8103580	4	-	-1.88	+
DDX60	18	1.69E+08	1.69E+08	8103581	4	-	-1.99	+
DDX60	19	1.69E+08	1.69E+08	8103582	4	-	-1.85	+
DDX60	20	1.69E+08	1.69E+08	8103583	4	-	-0.75	-
DDX60	21	1.69E+08	1.69E+08	8103584	4	-	-1.37	-

DDX60	22	1.69E+08	1.69E+08	8103585	4	-	-1.58	-
DDX60	23	1.69E+08	1.69E+08	8103586	4	-	-1.37	-
DDX60	24	1.69E+08	1.69E+08	8103587	4	-	-1.79	+
DDX60	25	1.69E+08	1.69E+08	8103588	4	-	-1.80	+
DDX60	26	1.69E+08	1.69E+08	8103589	4	-	-1.46	-
DDX60	27	1.69E+08	1.69E+08	8103590	4	-	-1.38	-
DDX60	28	1.69E+08	1.69E+08	8103591	4	-	-1.50	-
DDX60	29	1.69E+08	1.69E+08	8103592	4	-	-2.08	+
DDX60	30	1.69E+08	1.69E+08	8103593	4	-	-2.73	+
DDX60	31	1.69E+08	1.69E+08	8103594	4	-	-2.37	+
DDX60	32	1.69E+08	1.69E+08	8103595	4	-	-1.82	+
DDX60	33	1.69E+08	1.69E+08	8103596	4	-	-2.17	+
DDX60	34	1.69E+08	1.69E+08	8103597	4	-	-0.34	-
DDX60	35	1.69E+08	1.69E+08	8103598	4	-	-1.83	+
DDX60	36	1.69E+08	1.69E+08	8103599	4	-	-1.14	-
DDX60	37	1.69E+08	1.69E+08	8103600	4	-	-1.53	-
HLA-DQA1	1	32605263	32605291	8118557	6	+	0.01	-
HLA-DQA1	2	32609096	32609271	8118558	6	+	5.68	+
HLA-DQA1	3	32609791	32609815	8118559	6	+	0.11	-
HLA-DQA1	4	32610514	32610538	8118560	6	+	0.28	-
HLA-DQA1	5	32610776	32610970	8118561	6	+	3.59	+
HLA-DQA1	6	32611066	32611328	8118562	6	+	-0.14	-
HLA-DQA1	7	32611368	32611428	8118563	6	+	0.44	+
HLA-DQA1	8	32714096	32714153	8118569	6	+	-0.21	-
TREML4	1	41196075	41196210	8119428	6	+	-0.40	-
TREML4	2	41196468	41196729	8119429	6	+	-3.76	+
TREML4	3	41197268	41197299	8119430	6	+	-1.17	-
TREML4	4	41197803	41197857	8119431	6	+	-0.52	-
TREML4	5	41204262	41204345	8119432	6	+	-1.05	-
TREML4	6	41204804	41204828	8119433	6	+	-2.05	+
TREML4	7	41204938	41205826	8119434	6	+	-3.62	+
SH3BGRL2	1	80341010	80341219	8120834	6	+	0.45	-
SH3BGRL2	2	80383340	80383516	8120835	6	+	1.19	+
SH3BGRL2	3	80406252	80406282	8120836	6	+	1.35	+
SH3BGRL2	4	80409573	80413298	8120837	6	+	1.12	+
F13A1	1	6145383	6145951	8123745	6	-	1.04	+
F13A1	2	6152088	6152180	8123746	6	-	0.69	-
F13A1	3	6167699	6167793	8123747	6	-	1.05	+
F13A1	4	6175043	6175082	8123748	6	-	0.64	-
F13A1	5	6182262	6182345	8123749	6	-	1.02	-
F13A1	6	6196053	6196098	8123750	6	-	0.67	-
F13A1	7	6197519	6197544	8123751	6	-	0.87	-
F13A1	8	6222266	6222354	8123752	6	-	1.08	+

F13A1	9	6224953	6225079	8123753	6	-	0.71	-
F13A1	10	6248559	6248608	8123754	6	-	0.86	-
F13A1	11	6251086	6251162	8123755	6	-	1.21	+
F13A1	12	6266796	6266872	8123756	6	-	1.84	+
F13A1	13	6305584	6305762	8123757	6	-	1.38	+
F13A1	14	6318841	6318885	8123758	6	-	1.01	-
F13A1	15	6320842	6320883	8123759	6	-	0.06	-
TMEM176A	1	1.5E+08	1.5E+08	8137265	7	+	0.79	-
TMEM176A	2	1.5E+08	1.5E+08	8137266	7	+	1.65	+
TMEM176A	3	1.51E+08	1.51E+08	8137267	7	+	1.62	+
TMEM176A	4	1.51E+08	1.51E+08	8137268	7	+	1.11	-
TMEM176A	5	1.51E+08	1.51E+08	8137269	7	+	1.37	+
TMEM176A	6	1.51E+08	1.51E+08	8137270	7	+	0.76	-
LY6E	1	1.44E+08	1.44E+08	8148573	8	+	-0.88	-
LY6E	2	1.44E+08	1.44E+08	8148574	8	+	-1.78	-
LY6E	3	1.44E+08	1.44E+08	8148575	8	+	-1.70	-
LY6E	4	1.44E+08	1.44E+08	8148576	8	+	-2.35	+
LY6E	5	1.44E+08	1.44E+08	8148577	8	+	-1.39	-
LY6E	6	1.44E+08	1.44E+08	8148578	8	+	-1.79	-
LY6E	7	1.44E+08	1.44E+08	8148579	8	+	-2.79	+
BMX	1	15482386	15482545	8166158	X	+	-0.33	-
BMX	2	15518993	15519054	8166159	X	+	-0.93	-
BMX	3	15525500	15525532	8166160	X	+	-0.03	-
BMX	4	15526500	15526609	8166161	X	+	-0.39	-
BMX	5	15527459	15527548	8166162	X	+	-1.53	+
BMX	6	15529571	15529595	8166163	X	+	-2.36	+
BMX	7	15534268	15534330	8166164	X	+	-1.84	+
BMX	8	15536054	15536105	8166165	X	+	-1.01	-
BMX	9	15540469	15540618	8166166	X	+	-1.61	+
BMX	10	15543463	15543488	8166167	X	+	-1.04	-
BMX	11	15544170	15544195	8166168	X	+	-0.89	-
BMX	12	15548098	15548130	8166169	X	+	-1.82	+
BMX	13	15549471	15549510	8166170	X	+	-2.36	+
BMX	14	15552349	15552418	8166171	X	+	-2.06	+
BMX	15	15554511	15554544	8166172	X	+	-0.04	-
BMX	16	15555355	15555380	8166173	X	+	-0.70	-
BMX	17	15560230	15560306	8166174	X	+	-1.69	+
BMX	18	15561210	15561234	8166175	X	+	-2.39	+
BMX	19	15564985	15565044	8166176	X	+	-1.74	+
BMX	20	15567997	15568098	8166177	X	+	-1.30	-
BMX	21	15574229	15574539	8166178	X	+	-2.19	+
EIF1AY	1	22737617	22737641	8176720	Y	+	0.01	-
EIF1AY	2	22737673	22737697	8176721	Y	+	-1.98	-

EIF1AY	3	22737707	22737731	8176722	Y	+	-2.76	+
EIF1AY	4	22741510	22741541	8176723	Y	+	-2.50	+
EIF1AY	5	22744499	22744566	8176724	Y	+	-3.23	+
EIF1AY	6	22746370	22746410	8176725	Y	+	-2.16	+
EIF1AY	7	22749936	22749988	8176726	Y	+	-2.23	+
EIF1AY	8	22751413	22751442	8176727	Y	+	-1.43	-
EIF1AY	9	22754278	22754353	8176728	Y	+	-1.82	-
EIF1AY	10	22754633	22754904	8176729	Y	+	0.02	-
UTY	1	15360263	15360287	8177138	Y	-	-0.03	-
UTY	2	15360400	15361761	8177139	Y	-	-0.94	-
UTY	3	15362908	15362962	8177140	Y	-	-0.83	-
UTY	4	15409468	15409492	8177141	Y	-	0.99	-
UTY	5	15410879	15410903	8177142	Y	-	-2.35	+
UTY	6	15414804	15414828	8177143	Y	-	-0.67	-
UTY	7	15417280	15417304	8177144	Y	-	-0.54	-
UTY	8	15417319	15417343	8177145	Y	-	-2.47	+
UTY	9	15417925	15417949	8177146	Y	-	-2.36	+
UTY	10	15418069	15418093	8177147	Y	-	-1.76	-
UTY	11	15434960	15434984	8177148	Y	-	-0.25	-
UTY	12	15435036	15435060	8177149	Y	-	0.09	-
UTY	13	15435459	15435617	8177150	Y	-	-0.59	-
UTY	14	15438197	15438221	8177151	Y	-	-2.41	+
UTY	15	15447513	15447920	8177152	Y	-	-2.51	+
UTY	16	15467108	15467132	8177153	Y	-	-2.41	+
UTY	17	15467825	15467849	8177154	Y	-	-2.07	+
UTY	18	15469784	15469808	8177155	Y	-	-4.08	+
UTY	19	15471663	15471814	8177156	Y	-	-2.07	+
UTY	20	15478154	15478178	8177157	Y	-	-3.52	+
UTY	21	15481139	15481223	8177158	Y	-	-1.92	+
UTY	22	15505739	15505763	8177159	Y	-	-3.86	+
UTY	23	15508820	15508844	8177160	Y	-	-2.49	+
UTY	24	15526625	15526649	8177161	Y	-	-3.29	+
UTY	25	15560898	15560922	8177162	Y	-	-2.08	+
UTY	26	15582085	15582109	8177163	Y	-	0.02	-
UTY	27	15590323	15591106	8177164	Y	-	0.59	-
UTY	28	15591140	15591164	8177165	Y	-	-1.60	-
UTY	29	15591415	15591651	8177166	Y	-	-0.89	-
UTY	30	15591830	15591854	8177167	Y	-	-0.97	-
UTY	31	15592002	15592483	8177168	Y	-	-0.11	-
HLA-DQA1	1			8178200	6	---	-0.47	+
HLA-DQA1	2			8178201	6	---	0.46	+
HLA-DQA1	3			8178202	6	---	-0.11	-
HLA-DQA1	4			8178203	6	---	-0.27	-

HLA-DQA1	5			8178204	6	---	0.01	-
HLA-DQA1	6	32714096	32714153	8178209	6	+	-0.21	-
HLA-DQA1	7			8179490	6	---	-0.47	+
HLA-DQA1	8			8179491	6	---	0.46	+
HLA-DQA1	9			8179492	6	---	-0.11	-
HLA-DQA1	10			8179493	6	---	-0.27	-
HLA-DQA1	11			8179494	6	---	0.01	-

As can be seen from Tables 11 and 12, the full length OTOF gene was found to be a moderate discriminator between bacterial and viral patients (log₂-fold change of -0.83; Table 3), while a subset of its exons was highly discriminative (log₂-fold change between -2.3 and -3.9; Figure 2A, Table 12) and could potentially serve as useful biomarkers. Similarly, exons 2 and 7 of TREML4 are much more informative than the full length gene (log₂-fold change of -3.76 and -3.62 compared to -1.64; Figure 2B, Tables 11 and 12); exon 5 of RGS1 is much more informative than the full length gene (log₂-fold change of -1.93 compared to -0.53; Figure 2C, Tables 11 and 12).

EXAMPLE 2

Whole transcriptome expression analysis to identify single and multiple exons for discriminating between patients with bacterial and viral infections

To further identify exons that are differentially expressed in bacterial or viral patients even though the entire full length gene is not, the investors performed full transcriptome analysis on a large cohort of well characterized patients with bacterial and viral infections.

MATERIALS AND METHODS

Patient recruitment Patients were prospectively recruited as part of the 'Curiosity' and the 'Tailored-Treatment' clinical studies (NCT01917461 and NCT02025699). Informed consent was obtained from each participant or legal guardian, as applicable. Inclusion criteria for the infectious disease cohort included: clinical suspicion of an acute infectious disease, peak fever >37.5°C since symptoms onset, and duration of symptoms ≤12 days. Inclusion criteria for the control group included: clinical impression of a non-infectious disease (e.g. trauma, stroke and myocardial infarction), or healthy subjects. Exclusion criteria included: evidence of any episode of acute infectious disease in the two weeks preceding enrollment; diagnosed

congenital immune deficiency; current treatment with immunosuppressive or immunomodulatory therapy; active malignancy, proven or suspected human immunodeficiency virus (HIV)-1, hepatitis B virus (HBV), or hepatitis C virus (HCV) infection. Importantly, in order to enable broad generalization, antibiotic treatment at enrollment did not cause exclusion from the study. An overview of study workflow is depicted in Figure 1.

Enrollment process and data collection: as in Example 1.

Microbiological investigation: as in Example 1.

Establishing the reference standard: as in Example 1.

Samples, procedures and RNA purification: Venous blood samples were collected in EDTA contained CBC tube and stored at 4 °C for up to 5 hours on site and subsequently fractionated into plasma and cell pellet. Red cells were lysed using EL buffer (QIAGEN, Cat 79217) at room temperature (RT). Leukocytes were lysed in RLT buffer (QIAGEN, Cat 79216) and Homogenized via QIAshredder homogenizer (QIAGEN, Cat 79654). Total RNA was purified from 400µl lysed Leukocytes using RNeasy™ Micro Kit (QIAGEN, Cat. 74004) according to manufacturer recommended protocols.

Microarray experiments: A total of 3µl of 255 ng/3µl (85ng/µl) RNA were transferred and prepare for whole transcriptome expression analysis with GeneChip™ Whole Transcript (WT) Expression Arrays. Amplified ss-cDNA was prepared from 255 ng total RNA using GeneChip™ WT PLUS Reagent Kit (902310, Affymetrix), following manufacturer protocol. Samples were hybridized to GeneChip Human Transcriptome Arrays 2.0 (HTA-Affymetrix) which is the highest resolution microarray for gene expression profiling of all transcript isoforms. HTA display approximately ten probes per exon and four probes per exon-exon splice junction. This array interrogates >245,000 coding transcripts, >40,000 non coding transcripts and >339,000 probe sets covering exon-exon junctions. Arrays were scanned using the Affymetrix GeneChip Scanner 3000 7G.

Statistical analysis: Primary analysis was performed as in example 1.

RESULTS

Patient characteristics The studied group of patients included 71 children and 59 adults and was gender balanced (65 females and 65 males). The cohort included 51

patients with bacterial infection and 79 patients with viral infections as determined by the expert panel as described above. Additionally, 13 non-infectious patients were studied (as controls). The patients presented with a variety of clinical syndromes affecting different physiological systems (e.g., respiratory, urinal, central nervous system, systemic).

Single and multiple exons can distinguish between bacterial and viral patients

The gene expression profiles of blood leukocytes obtained from the described acute infection patients using the GeneChip Human Transcriptome Arrays 2.0 (HTA-Affymetrix) were studied. The inventors identified 140 additional coding and non-coding RNA determinants (in addition to the ones presented in Example 1) for which one or more individual exons presented improved differential expression as compared to their full gene. The present inventors further calculated for these exons the measures of accuracy in distinguishing between bacterial and viral patients including AUC, sensitivity, specificity and t-test P-value (Table 13).

Table 14 describes the expression levels of the whole genes included in Table 13, as well as their measures of accuracy in distinguishing between bacterial and viral patients.

Table 13 - Exon level analysis of 140 RNA determinants differentially expressed in bacterial and viral patients. Probe set ID is based on GeneChip Human Transcriptome Arrays 2.0 (HTA-Affymetrix) data. Comparison to full gene was calculated as absolute fold change (exon_i) - absolute fold change (full length gene); Only exons that presented higher of differential expression of the single exon compared to the full length gene were included.

Gene Symbol	mRNA Accession	Exon #	Probe Set ID	Chromosome	Strand	Start	Stop	Exon AUC	F C	T-Test	U p in B/V
PGD	NM_002631	2	PSR01002037.hg.1	1	+	10459138	10459168	0.88	6.5	9.5005E-16	B
PGD	NM_002631	5	PSR01002043.hg.1	1	+	10459689	10459748	0.88	4.3	1.6178E-15	B
PGD	NM_002631	7	PSR01002047.hg.1	1	+	10460450	10460503	0.83	2.4	1.9897E-10	B
PGD	NM_002631	8	PSR01002048.hg.1	1	+	10460504	10460598	0.89	4.8	2.7246E-16	B

PGD	NM_00263 1	9	PSR010020 49.hg.1	1	+	10460 599	1046 0629	0.89	2. 9	6.838 5E-17	B
PGD	NM_00263 1	10	PSR010020 50.hg.1	1	+	10463 128	1046 3193	0.89	2. 5	6.991 8E-17	B
PGD	NM_00263 1	11	PSR010020 51.hg.1	1	+	10464 218	1046 4333	0.89	3. 0	6.317 3E-16	B
PGD	NM_00263 1	16	PSR010020 58.hg.1	1	+	10475 349	1047 5449	0.79	2. 4	6.235 7E-09	B
PGD	NM_00263 1	17	PSR010020 59.hg.1	1	+	10477 044	1047 7089	0.89	2. 4	1.084 8E-16	B
PGD	NM_00263 1	18	PSR010020 61.hg.1	1	+	10477 102	1047 7174	0.89	2. 6	2.416 5E-16	B
PGD	NM_00263 1	26	PSR010020 72.hg.1	1	+	10480 202	1048 0233	0.82	2. 5	2.760 8E-11	B
ALPL	NM_00047 8	2	PSR010041 87.hg.1	1	+	21835 951	2183 6010	0.89	15 .2	5.308 7E-16	B
ALPL	NM_00047 8	4	PSR010041 90.hg.1	1	+	21880 471	2188 0574	0.90	8. 7	7.506 6E-13	B
ALPL	NM_00047 8	5	PSR010041 91.hg.1	1	+	21880 575	2188 0635	0.90	7. 8	4.211 E-11	B
ALPL	NM_00047 8	6	PSR010041 92.hg.1	1	+	21887 119	2188 7238	0.90	6. 5	1.332 8E-11	B
ALPL	NM_00047 8	7	PSR010041 93.hg.1	1	+	21887 590	2188 7630	0.90	12 .9	1.555 4E-13	B
ALPL	NM_00047 8	8	PSR010041 94.hg.1	1	+	21887 631	2188 7705	0.90	8. 7	2.23E- 15	B
ALPL	NM_00047 8	9	PSR010041 95.hg.1	1	+	21889 603	2188 9777	0.91	8. 0	4.549 6E-14	B
ALPL	NM_00047 8	10	PSR010041 96.hg.1	1	+	21890 534	2189 0704	0.90	7. 7	4.753 5E-12	B
ALPL	NM_00047 8	12	PSR010042 00.hg.1	1	+	21896 798	2189 6867	0.89	6. 7	3.828 E-13	B
ALPL	NM_00047 8	13	PSR010042 01.hg.1	1	+	21900 158	2190 0292	0.89	6. 4	5.726 7E-12	B
ALPL	NM_00047 8	15	PSR010042 03.hg.1	1	+	21902 226	2190 2417	0.90	6. 6	1.119 5E-12	B
ALPL	NM_00047 8	17	PSR010042 05.hg.1	1	+	21903 876	2190 4224	0.89	9. 3	1.674 6E-14	B
ALPL	NM_00047 8	19	PSR010042 07.hg.1	1	+	21904 506	2190 4817	0.87	6. 6	1.072 4E-11	B
ZNF6 84	NM_15237 3	4	PSR010080 35.hg.1	1	+	40998 815	4099 8853	0.84	- 4. 9	1.199 4E-10	V
ZNF6 84	NM_15237 3	5	PSR010080 36.hg.1	1	+	41006 258	4100 6384	0.84	- 4. 8	2.836 5E-11	V
ZNF6 84	NM_15237 3	7	PSR010080 38.hg.1	1	+	41007 287	4100 7382	0.84	- 3. 5	6.075 7E-10	V
ZNF6 84	NM_15237 3	9	PSR010080 41.hg.1	1	+	41012 234	4101 2380	0.84	- 4. 9	2.124 5E-11	V
ZNF6 84	NM_15237 3	10	PSR010080 42.hg.1	1	+	41012 381	4101 2437	0.85	- 5. 1	1.227 5E-11	V
ZNF6 84	NM_15237 3	11	PSR010080 43.hg.1	1	+	41012 438	4101 3457	0.85	- 4.	1.931 6E-11	V

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ZNF6 84	NM_15237 3	12	PSR010080 44.hg.1	1	+	41013 458	4101 3838	0.84	- 4. 1	1.077 6E-10	V
NEX N	NM_00117 2309	14	PSR010125 90.hg.1	1	+	78395 001	7839 5189	0.82	- 4. 4	1.114 5E-10	V
NEX N	NM_00117 2309	17	PSR010125 94.hg.1	1	+	78398 967	7839 9069	0.81	- 3. 5	2.152 4E-09	V
NEX N	NM_00117 2309	18	PSR010125 95.hg.1	1	+	78399 070	7839 9164	0.83	- 3. 4	1.046 7E-10	V
NEX N	NM_00117 2309	19	PSR010125 96.hg.1	1	+	78401 508	7840 1604	0.84	- 4. 9	1.368 8E-11	V
NEX N	NM_00117 2309	20	PSR010125 97.hg.1	1	+	78401 605	7840 1655	0.84	- 5. 4	3.496 8E-12	V
NEX N	NM_00117 2309	21	PSR010125 98.hg.1	1	+	78401 656	7840 1729	0.84	- 4. 4	1.308 6E-11	V
NEX N	NM_00117 2309	23	PSR010126 00.hg.1	1	+	78407 708	7840 7893	0.82	- 5. 2	4.008 6E-11	V
NEX N	NM_00117 2309	24	PSR010126 01.hg.1	1	+	78408 146	7840 8438	0.83	- 5. 0	1.223 4E-11	V
NEX N	NM_00117 2309	25	PSR010126 02.hg.1	1	+	78408 439	7840 8503	0.81	- 5. 0	2.988 9E-10	V
NEX N	NM_00117 2309	27	PSR010126 06.hg.1	1	+	78408 616	7840 8884	0.82	- 5. 5	1.043 7E-10	V
NEX N	NM_00117 2309	28	PSR010126 09.hg.1	1	+	78408 910	7840 9576	0.85	- 4. 2	3.416 1E-12	V
MOV 10	NM_00113 0079	9	PSR010157 78.hg.1	1	+	11321 7470	1132 1750 5	0.80	- 3. 4	1.073 6E-09	V
MOV 10	NM_00113 0079	11	PSR010157 80.hg.1	1	+	11321 7578	1132 1767 1	0.80	- 3. 6	2.567 9E-10	V
MOV 10	NM_00113 0079	13	PSR010157 82.hg.1	1	+	11322 9588	1132 2962 1	0.81	- 3. 6	2.167 5E-10	V
MOV 10	NM_00113 0079	15	PSR010157 84.hg.1	1	+	11323 0950	1132 3110 5	0.81	- 3. 2	8.862 4E-10	V
MOV 10	NM_00113 0079	17	PSR010157 86.hg.1	1	+	11323 1557	1132 3176 0	0.79	- 4. 1	4.298 9E-10	V
MOV 10	NM_00113 0079	18	PSR010157 87.hg.1	1	+	11323 2037	1132 3206 2	0.75	- 3. 6	1.508 9E-07	V
MOV 10	NM_00113 0079	19	PSR010157 89.hg.1	1	+	11323 2064	1132 3216	0.77	- 3.	2.048 4E-08	V

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MOV 10	NM_00113 0079	20	PSR010157 90.hg.1	1	+	11323 2168	1132 3227 2	0.74	- 3. 3	3.145 2E-07	V
MOV 10	NM_00113 0079	22	PSR010157 92.hg.1	1	+	11323 4287	1132 3442 1	0.75	- 2. 9	3.654 8E-07	V
MOV 10	NM_00113 0079	25	PSR010157 95.hg.1	1	+	11323 6640	1132 3679 4	0.78	- 3. 4	3.777 9E-09	V
MOV 10	NM_00113 0079	26	PSR010157 96.hg.1	1	+	11323 7075	1132 3720 6	0.79	- 3. 4	2.901 3E-09	V
MOV 10	NM_00113 0079	28	PSR010157 98.hg.1	1	+	11323 7371	1132 3744 9	0.80	- 4. 8	4.018 6E-10	V
MOV 10	NM_00113 0079	29	PSR010157 99.hg.1	1	+	11323 7450	1132 3751 8	0.80	- 4. 8	3.034 8E-10	V
MOV 10	NM_00113 0079	30	PSR010158 00.hg.1	1	+	11323 8038	1132 3819 6	0.80	- 5. 2	1.642 8E-10	V
MOV 10	NM_00113 0079	31	PSR010158 01.hg.1	1	+	11323 8770	1132 3887 3	0.80	- 4. 0	1.567 6E-10	V
MOV 10	NM_00113 0079	33	PSR010158 03.hg.1	1	+	11323 9059	1132 3915 6	0.79	- 3. 9	7.169 2E-10	V
MOV 10	NM_00113 0079	35	PSR010158 05.hg.1	1	+	11323 9361	1132 3944 0	0.80	- 4. 5	1.506 4E-10	V
MOV 10	NM_00113 0079	36	PSR010158 06.hg.1	1	+	11323 9441	1132 3946 8	0.80	- 4. 6	1.797 9E-10	V
MOV 10	NM_00113 0079	38	PSR010158 08.hg.1	1	+	11324 0616	1132 4073 3	0.79	- 3. 4	1.113 4E-09	V
MOV 10	NM_00113 0079	39	PSR010158 10.hg.1	1	+	11324 0930	1132 4098 9	0.80	- 3. 8	2.499 6E-10	V
MOV 10	NM_00113 0079	43	PSR010158 16.hg.1	1	+	11324 1337	1132 4141 1	0.80	- 4. 3	2.020 9E-10	V
MOV 10	NM_00113 0079	46	PSR010158 19.hg.1	1	+	11324 1815	1132 4207 9	0.79	- 4. 0	4.830 9E-09	V
MOV 10	NM_00113 0079	47	PSR010158 20.hg.1	1	+	11324 2080	1132 4224 5	0.79	- 3. 9	4.268 5E-09	V
MOV 10	NM_00113 0079	49	PSR010158 23.hg.1	1	+	11324 2309	1132 4238 3	0.81	- 4. 8	2.069 9E-10	V
MOV 10	NM_00113 0079	50	PSR010158 24.hg.1	1	+	11324 2384	1132 4243 2	0.81	- 4. 9	9.133 3E-11	V
MOV 10	NM_00113 0079	52	PSR010158 26.hg.1	1	+	11324 2516	1132 4260	0.81	- 5.	6.798 4E-11	V

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MOV 10	NM_00113 0079	53	PSR010158 27.hg.1	1	+	11324 2605	1132 4284 0	0.78	- 3. 1	1.224 9E-08	V
MOV 10	NM_00113 0079	54	PSR010158 28.hg.1	1	+	11324 2841	1132 4296 2	0.81	- 4. 3	8.042 7E-11	V
MOV 10	NM_00113 0079	56	PSR010158 30.hg.1	1	+	11324 3038	1132 4316 2	0.82	- 3. 8	3.327 2E-11	V
MOV 10	NM_00113 0079	58	PSR010158 33.hg.1	1	+	11324 3231	1132 4333 2	0.82	- 3. 0	1.165 2E-10	V
RAB GAP1 L	NM_00103 5230	38	PSR010235 27.hg.1	1	+	17484 3609	1748 4364 4	0.94	- 12 .8	2.493 6E-19	V
RAB GAP1 L	NM_00103 5230	39	PSR010235 28.hg.1	1	+	17484 4656	1748 4468 3	0.80	- 3. 3	3.15E- 08	V
RAB GAP1 L	NM_00103 5230	40	PSR010235 29.hg.1	1	+	17484 4684	1748 4485 1	0.76	- 2. 0	1.187 9E-06	V
RAB GAP1 L	NM_00103 5230	41	PSR010235 30.hg.1	1	+	17484 6530	1748 4657 7	0.93	- 17 .1	7.875 3E-20	V
RAB GAP1 L	NM_00103 5230	42	PSR010235 31.hg.1	1	+	17484 6578	1748 4674 3	0.94	- 10 .5	2.335 7E-18	V
RAB GAP1 L	NM_00103 5230	43	PSR010235 32.hg.1	1	+	17492 6594	1749 2668 6	0.90	- 5. 0	2.575 1E-16	V
RAB GAP1 L	NM_00103 5230	44	PSR010235 34.hg.1	1	+	17492 7028	1749 2731 0	0.92	- 4. 9	6.330 1E-17	V
RAB GAP1 L	NM_00103 5230	45	PSR010235 39.hg.1	1	+	17493 3915	1749 3409 5	0.77	- 1. 9	5.145 3E-09	V
RAB GAP1 L	NM_00103 5230	46	PSR010235 40.hg.1	1	+	17493 4096	1749 3412 2	0.70	- 1. 5	9.993 9E-05	V
RAB GAP1 L	NM_00103 5230	47	PSR010235 41.hg.1	1	+	17493 8414	1749 3852 4	0.86	- 2. 9	1.043 E-12	V
RAB GAP1 L	NM_00103 5230	48	PSR010235 42.hg.1	1	+	17494 5166	1749 4521 4	0.78	- 2. 3	3.240 1E-08	V
RAB GAP1 L	NM_00103 5230	49	PSR010235 43.hg.1	1	+	17494 5215	1749 4531 9	0.84	- 2. 7	4.599 9E-12	V
RAB GAP1 L	NM_00103 5230	50	PSR010235 44.hg.1	1	+	17494 7944	1749 4802 7	0.83	- 2. 6	2.829 6E-11	V
RAB GAP1 L	NM_00103 5230	51	PSR010235 45.hg.1	1	+	17495 1971	1749 5203 7	0.87	- 2. 2	9.671 7E-14	V
RAB GAP1	NM_00103 5230	52	PSR010235 47.hg.1	1	+	17495 7778	1749 5788	0.85	- 2.	1.004 2E-12	V

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RAB GAP1 L	NM_00103 5230	53	PSR010235 48.hg.1	1	+	17495 7882	1749 5794 4	0.86	- 2. 8	2.074 2E-13	V
RAB GAP1 L	NM_00103 5230	54	PSR010235 49.hg.1	1	+	17495 7945	1749 5797 5	0.88	- 3. 1	6.067 6E-15	V
RAB GAP1 L	NM_00103 5230	55	PSR010235 50.hg.1	1	+	17495 8986	1749 5947 8	0.84	- 2. 8	4.573 E-12	V
RAB GAP1 L	NM_00103 5230	56	PSR010235 51.hg.1	1	+	17495 9479	1749 5954 6	0.81	- 2. 7	3.807 9E-10	V
RAB GAP1 L	NM_00103 5230	57	PSR010235 52.hg.1	1	+	17495 9547	1749 5962 2	0.82	- 2. 5	4.186 E-10	V
RAB GAP1 L	NM_00103 5230	58	PSR010235 53.hg.1	1	+	17495 9623	1749 5965 0	0.78	- 2. 4	5.183 3E-08	V
RAB GAP1 L	NM_00103 5230	59	PSR010235 54.hg.1	1	+	17495 9651	1749 5973 0	0.81	- 2. 4	3.324 1E-09	V
RAB GAP1 L	NM_00103 5230	60	PSR010235 55.hg.1	1	+	17495 9731	1749 6272 3	0.83	- 2. 8	1.298 3E-11	V
RAB GAP1 L	NM_00103 5230	61	PSR010235 56.hg.1	1	+	17496 2724	1749 6301 7	0.87	- 3. 6	3.041 2E-13	V
RAB GAP1 L	NM_00103 5230	62	PSR010235 57.hg.1	1	+	17496 3018	1749 6443 8	0.86	- 3. 0	9.647 4E-13	V
SRG AP2	NM_00104 2758	1	PSR010268 04.hg.1	1	+	20651 6200	2065 1636 2	0.85	- 3. 5	1.672 4E-11	V
SRG AP2	NM_00104 2758	2	PSR010268 07.hg.1	1	+	20655 7369	2065 5743 1	0.86	- 3. 3	1.884 1E-11	V
SRG AP2	NM_00104 2758	3	PSR010268 08.hg.1	1	+	20656 6046	2065 6621 2	0.88	- 3. 5	9.559 9E-13	V
SRG AP2	NM_00104 2758	4	PSR010268 09.hg.1	1	+	20656 6213	2065 6626 1	0.84	- 3. 4	2.732 8E-11	V
SRG AP2	NM_00104 2758	5	PSR010268 10.hg.1	1	+	20656 6902	2065 6703 0	0.85	- 3. 6	1.247 7E-11	V
SRG AP2	NM_00104 2758	6	PSR010268 12.hg.1	1	+	20657 4783	2065 7500 4	0.87	- 3. 7	1.025 9E-12	V
SRG AP2	NM_00104 2758	8	PSR010268 14.hg.1	1	+	20657 8608	2065 7870 9	0.88	- 3. 7	1.519 4E-12	V
SRG AP2	NM_00104 2758	9	PSR010268 15.hg.1	1	+	20657 9736	2065 7993 3	0.88	- 3. 7	2.627 2E-12	V
SRG AP2	NM_00104 2758	10	PSR010268 16.hg.1	1	+	20657 9934	2065 8062	0.84	- 3.	3.016 5E-10	V

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SRG AP2	NM_00104 2758	11	PSR010268 17.hg.1	1	+	20658 0622	2065 8130 1	0.83	- 3. 2	1.731 4E-10	V
SRG AP2	NM_00104 2758	12	PSR010268 18.hg.1	1	+	20658 1302	2065 8139 1	0.81	- 3. 0	4.172 1E-09	V
SRG AP2	NM_00104 2758	13	PSR010268 19.hg.1	1	+	20658 9249	2065 8933 3	0.87	- 3. 8	7.159 6E-12	V
SRG AP2	NM_00104 2758	14	PSR010268 20.hg.1	1	+	20659 2725	2065 9275 2	0.88	- 5. 4	5.258 9E-13	V
SRG AP2	NM_00104 2758	15	PSR010268 22.hg.1	1	+	20660 3512	2066 0357 2	0.86	- 3. 8	1.725 5E-11	V
SRG AP2	NM_00104 2758	16	PSR010268 23.hg.1	1	+	20661 0315	2066 1039 2	0.88	- 4. 2	5.002 1E-13	V
SRG AP2	NM_00104 2758	17	PSR010268 24.hg.1	1	+	20661 1314	2066 1144 8	0.89	- 4. 0	5.918 5E-13	V
SRG AP2	NM_00104 2758	18	PSR010268 25.hg.1	1	+	20661 3326	2066 1343 1	0.90	- 4. 3	4.053 9E-14	V
SRG AP2	NM_00104 2758	19	PSR010268 26.hg.1	1	+	20661 9421	2066 1964 5	0.88	- 3. 8	8.203 1E-12	V
SRG AP2	NM_00104 2758	20	PSR010268 27.hg.1	1	+	20662 3731	2066 2378 3	0.86	- 3. 6	4.034 5E-11	V
SRG AP2	NM_00104 2758	21	PSR010268 28.hg.1	1	+	20662 3784	2066 2381 0	0.89	- 3. 8	1.218 4E-11	V
SRG AP2	NM_00104 2758	22	PSR010268 29.hg.1	1	+	20662 6546	2066 2669 0	0.87	- 2. 6	1.056 2E-09	V
SRG AP2	NM_00104 2758	24	PSR010268 31.hg.1	1	+	20662 7490	2066 2785 5	0.85	- 3. 0	2.255 5E-09	V
SRG AP2	NM_00104 2758	25	PSR010268 33.hg.1	1	+	20662 7875	2066 2804 6	0.83	- 2. 7	8.687 7E-09	V
SRG AP2	NM_00104 2758	26	PSR010268 34.hg.1	1	+	20662 8224	2066 2837 0	0.89	- 4. 2	1.947 2E-13	V
SRG AP2	NM_00104 2758	27	PSR010268 35.hg.1	1	+	20662 8371	2066 2911 8	0.88	- 4. 6	1.205 2E-12	V
SRG AP2	NM_00104 2758	28	PSR010268 36.hg.1	1	+	20662 9119	2066 2947 7	0.89	- 3. 6	4.766 E-11	V
SRG AP2	NM_00104 2758	30	PSR010268 39.hg.1	1	+	20663 1717	2066 3175 5	0.75	- 2. 5	4.821 2E-07	V
SRG AP2	NM_00104 2758	33	PSR010268 43.hg.1	1	+	20663 4382	2066 3524	0.85	- 3.	1.745 4E-12	V

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SRG AP2	NM_00104 2758	34	PSR010268 45.hg.1	1	+	20663 5248	2066 3619 1	0.82	- 2. 5	5.959 6E-10	V
CR1	NM_00057 3	2	PSR010271 85.hg.1	1	+	20766 9573	2076 6961 2	0.89	5. 9	2.824 8E-18	B
CR1	NM_00057 3	4	PSR010271 87.hg.1	1	+	20766 9686	2076 6973 3	0.90	5. 2	2.004 2E-17	B
CR1	NM_00057 3	5	PSR010271 88.hg.1	1	+	20767 9249	2076 7942 8	0.89	4. 5	7.886 4E-17	B
CR1	NM_00057 3	6	PSR010271 89.hg.1	1	+	20768 0059	2076 8015 8	0.90	4. 7	1.953 1E-17	B
CR1	NM_00057 3	8	PSR010271 91.hg.1	1	+	20768 4914	2076 8499 9	0.90	4. 2	2.232 9E-17	B
CR1	NM_00057 3	10	PSR010271 93.hg.1	1	+	20770 0098	2077 0027 4	0.90	4. 3	2.870 6E-17	B
CR1	NM_00057 3	19	PSR010272 03.hg.1	1	+	20771 8653	2077 1882 9	0.90	4. 2	5.243 2E-17	B
CR1	NM_00057 3	29	PSR010272 13.hg.1	1	+	20773 7209	2077 3738 5	0.89	4. 0	1.301 9E-16	B
CR1	NM_00057 3	38	PSR010272 22.hg.1	1	+	20775 3585	2077 5376 1	0.88	4. 8	9.108 2E-16	B
CR1	NM_00057 3	39	PSR010272 23.hg.1	1	+	20775 3856	2077 5395 8	0.90	4. 1	1.825 5E-16	B
CR1	NM_00057 3	44	PSR010272 28.hg.1	1	+	20778 0596	2077 8068 1	0.90	4. 1	3.789 1E-17	B
CR1	NM_00057 3	45	PSR010272 29.hg.1	1	+	20778 2635	2077 8303 3	0.89	4. 8	4.838 3E-17	B
CR1	NM_00057 3	46	PSR010272 30.hg.1	1	+	20778 5022	2077 8519 8	0.88	4. 7	8.689 E-16	B
CR1	NM_00057 3	49	PSR010272 33.hg.1	1	+	20778 9920	2077 9014 7	0.89	4. 1	6.443 3E-17	B
CR1	NM_00057 3	50	PSR010272 34.hg.1	1	+	20779 1416	2077 9159 2	0.89	4. 2	4.892 3E-16	B
CR1	NM_00057 3	51	PSR010272 35.hg.1	1	+	20779 3225	2077 9341 0	0.90	4. 4	9.772 8E-18	B
CR1	NM_00057 3	54	PSR010272 40.hg.1	1	+	20781 2755	2078 1355 3	0.91	3. 9	6.371 4E-17	B
CR1	NM_00057 3	55	PSR010272 41.hg.1	1	+	20781 3554	2078 1399	0.90	5. 8	3.148 7E-18	B

							2				
CR1	NM_000573	56	PSR01027242.hg.1	1	+	207813993	207815110	0.90	4.7	6.1068E-18	B
CR1L	NM_175710	5	PSR01027249.hg.1	1	+	207842790	207842910	0.90	4.4	1.1022E-18	B
CR1L	NM_175710	6	PSR01027250.hg.1	1	+	207850734	207850913	0.90	3.2	4.2921E-17	B
CR1L	NM_175710	7	PSR01027251.hg.1	1	+	207851543	207851612	0.90	5.2	9.6256E-18	B
CR1L	NM_175710	11	PSR01027255.hg.1	1	+	207867698	207868096	0.88	2.9	4.141E-16	B
CR1L	NM_175710	13	PSR01027257.hg.1	1	+	207871116	207871218	0.90	2.9	7.2171E-18	B
CR1L	NM_175710	14	PSR01027258.hg.1	1	+	207872534	207872619	0.89	3.4	1.0389E-16	B
CR1L	NM_175710	15	PSR01027259.hg.1	1	+	207874864	207874963	0.88	3.6	4.8142E-16	B
CR1L	NM_175710	16	PSR01027261.hg.1	1	+	207881523	207881608	0.88	3.2	3.5723E-16	B
CR1L	NM_175710	18	PSR01027263.hg.1	1	+	207888657	207888742	0.90	3.4	2.3018E-16	B
CR1L	NM_175710	22	PSR01027271.hg.1	1	+	207911749	207911885	0.90	4.6	2.4525E-16	B
---	ENST00000442385	3	PSR01034493.hg.1	1	-	16543622	16543655	0.86	7.7	5.1717E-12	V
---	ENST00000442385	4	PSR01034494.hg.1	1	-	16543656	16543823	0.86	2.6	1.8109E-09	V
PADI2	NM_007365	7	PSR01034860.hg.1	1	-	17401351	17401444	0.86	3.7	1.502E-13	B
PADI2	NM_007365	12	PSR01034865.hg.1	1	-	17405759	17405910	0.86	4.2	1.227E-13	B
PADI2	NM_007365	13	PSR01034866.hg.1	1	-	17409040	17409147	0.86	5.3	4.0981E-14	B
PADI2	NM_007365	16	PSR01034869.hg.1	1	-	17410221	17410332	0.87	4.8	7.2426E-14	B
PADI2	NM_007365	17	PSR01034870.hg.1	1	-	17411094	17411197	0.88	4.0	5.4975E-14	B
PADI2	NM_007365	18	PSR01034871.hg.1	1	-	17413016	17413194	0.87	3.9	1.6657E-13	B
PADI2	NM_007365	19	PSR01034872.hg.1	1	-	17418903	17419028	0.87	4.4	1.5149E-14	B
PADI2	NM_007365	22	PSR01034875.hg.1	1	-	17429482	17429554	0.88	4.7	1.02E-14	B

PADI 2	NM_00736 5	23	PSR010348 76.hg.1	1	-	17431 373	1743 1556	0.88	5. 0	3.424 1E-16	B
MIR1 182	NR_03159 3	1	PSR010600 37.hg.1	1	-	23115 4704	2311 5492 1	0.68	1. 4	0.000 16719	B
MIR1 182	NR_03159 3	2	PSR010600 39.hg.1	1	-	23115 4933	2311 5516 3	0.66	1. 7	0.000 39405	B
MIR1 182	NR_03159 3	3	PSR010600 40.hg.1	1	-	23115 5164	2311 5541 2	0.64	1. 4	0.000 92686	B
MIR1 182	NR_03159 3	4	PSR010600 42.hg.1	1	-	23115 5413	2311 5557 3	0.67	1. 4	0.000 39511	B
MIR1 182	NR_03159 3	5	PSR010600 43.hg.1	1	-	23115 5574	2311 5567 0	0.68	1. 5	0.000 18452	B
MIR1 182	NR_03159 3	6	PSR010600 44.hg.1	1	-	23115 5671	2311 5587 2	0.68	1. 4	3.017 3E-05	B
---	TCONS_00 000869- XLOC_000 105	1	PSR010623 77.hg.1	1	+	27371 709	2737 1806	0.83	- 6. 5	1.956 E-08	V
---	TCONS_00 000869- XLOC_000 105	2	PSR010623 78.hg.1	1	+	27384 889	2738 4983	0.82	- 5. 0	3.273 5E-08	V
---	TCONS_00 000869- XLOC_000 105	3	PSR010623 79.hg.1	1	+	27384 988	2738 5013	0.75	- 2. 4	5.772 1E-07	V
---	TCONS_00 000869- XLOC_000 105	4	PSR010623 80.hg.1	1	+	27386 505	2739 1197	0.78	- 1. 6	2.136 6E-06	V
TRIB 2	NM_02164 3	5	PSR020010 49.hg.1	2	+	12857 948	1285 8363	0.88	- 6. 1	5.857 6E-15	V
TRIB 2	NM_02164 3	6	PSR020010 50.hg.1	2	+	12858 364	1285 8703	0.88	- 6. 8	7.464 7E-16	V
TRIB 2	NM_02164 3	7	PSR020010 51.hg.1	2	+	12863 386	1286 3678	0.87	- 5. 6	6.66E- 15	V
TRIB 2	NM_02164 3	9	PSR020010 53.hg.1	2	+	12880 452	1288 1398	0.89	- 8. 6	6.5E- 17	V
TRIB 2	NM_02164 3	10	PSR020010 55.hg.1	2	+	12881 399	1288 1530	0.89	- 7. 3	1.187 3E-15	V
TRIB 2	NM_02164 3	11	PSR020010 56.hg.1	2	+	12881 531	1288 2858	0.87	- 5. 7	1.099 2E-14	V
PLB1	NM_00117 0585	6	PSR020025 74.hg.1	2	+	28742 572	2874 2630	0.77	3. 7	3.592 3E-08	B
PLB1	NM_00117	10	PSR020025	2	+	28752	2875	0.76	3.	1.866	B

	0585		78.hg.1			595	2646		4	8E-07	
PLB1	NM_00117 0585	11	PSR020025 79.hg.1	2	+	28754 975	2875 5061	0.78	3. 1	5.974 1E-08	B
PLB1	NM_00117 0585	28	PSR020025 99.hg.1	2	+	28802 494	2880 2574	0.76	2. 9	2.137 4E-07	B
PLB1	NM_00117 0585	32	PSR020026 03.hg.1	2	+	28808 628	2880 8709	0.76	3. 5	1.548 1E-07	B
PLB1	NM_00117 0585	33	PSR020026 04.hg.1	2	+	28812 317	2881 2421	0.82	2. 8	1.517 1E-10	B
PLB1	NM_00117 0585	34	PSR020026 05.hg.1	2	+	28812 542	2881 2637	0.81	3. 7	5.544 3E-11	B
PLB1	NM_00117 0585	35	PSR020026 06.hg.1	2	+	28812 872	2881 2943	0.81	3. 9	9.613 5E-11	B
PLB1	NM_00117 0585	36	PSR020026 07.hg.1	2	+	28814 000	2881 4025	0.82	4. 2	3.270 1E-11	B
PLB1	NM_00117 0585	38	PSR020026 10.hg.1	2	+	28815 528	2881 5586	0.81	2. 8	7.126 1E-10	B
PLB1	NM_00117 0585	41	PSR020026 13.hg.1	2	+	28816 839	2881 8924	0.78	3. 0	2.037 8E-09	B
PLB1	NM_00117 0585	42	PSR020026 16.hg.1	2	+	28820 872	2882 0915	0.83	3. 2	4.275 1E-12	B
PLB1	NM_00117 0585	43	PSR020026 17.hg.1	2	+	28821 519	2882 1627	0.84	4. 3	6.08E- 12	B
PLB1	NM_00117 0585	44	PSR020026 18.hg.1	2	+	28823 676	2882 3727	0.84	5. 2	5.1E- 12	B
PLB1	NM_00117 0585	45	PSR020026 19.hg.1	2	+	28824 119	2882 4199	0.84	4. 4	5.110 1E-12	B
PLB1	NM_00117 0585	46	PSR020026 22.hg.1	2	+	28824 786	2882 4831	0.86	6. 6	1.317 4E-13	B
PLB1	NM_00117 0585	47	PSR020026 23.hg.1	2	+	28825 688	2882 5788	0.86	6. 3	3.720 4E-15	B
PLB1	NM_00117 0585	48	PSR020026 24.hg.1	2	+	28826 833	2882 6914	0.87	6. 0	4.975 4E-16	B
PLB1	NM_00117 0585	49	PSR020026 25.hg.1	2	+	28827 522	2882 7593	0.86	5. 5	3.638 5E-15	B
PLB1	NM_00117 0585	50	PSR020026 26.hg.1	2	+	28827 594	2882 7626	0.85	5. 6	4.929 6E-14	B
PLB1	NM_00117 0585	51	PSR020026 27.hg.1	2	+	28828 720	2882 8815	0.86	6. 3	1.921 E-14	B
PLB1	NM_00117 0585	52	PSR020026 28.hg.1	2	+	28829 363	2882 9434	0.85	5. 0	1.406 2E-13	B
PLB1	NM_00117 0585	53	PSR020026 29.hg.1	2	+	28836 898	2883 6963	0.85	4. 9	7.768 9E-14	B
PLB1	NM_00117 0585	54	PSR020026 30.hg.1	2	+	28840 594	2884 0654	0.86	5. 7	8.598 7E-15	B
PLB1	NM_00117 0585	55	PSR020026 31.hg.1	2	+	28841 208	2884 1266	0.85	4. 6	1.378 E-14	B
PLB1	NM_00117 0585	57	PSR020026 33.hg.1	2	+	28843 132	2884 3199	0.86	5. 3	3.615 9E-14	B
PLB1	NM_00117 0585	58	PSR020026 34.hg.1	2	+	28843 467	2884 3510	0.86	4. 5	2.337 7E-14	B
PLB1	NM_00117 0585	60	PSR020026 36.hg.1	2	+	28843 746	2884 3845	0.86	5. 7	6.902 6E-15	B
PLB1	NM_00117 0585	61	PSR020026 37.hg.1	2	+	28847 924	2884 7975	0.86	4. 6	1.971 4E-14	B
PLB1	NM_00117	62	PSR020026	2	+	28849	2884	0.86	5.	9.146	B

	0585		38.hg.1			295	9375		0	3E-14	
PLB1	NM_00117 0585	64	PSR020026 40.hg.1	2	+	28851 430	2885 1495	0.86	5. 1	6.101 4E-14	B
PLB1	NM_00117 0585	65	PSR020026 41.hg.1	2	+	28851 961	2885 2052	0.84	5. 5	3.312 8E-13	B
PLB1	NM_00117 0585	66	PSR020026 42.hg.1	2	+	28853 453	2885 3531	0.84	4. 5	6.478 2E-13	B
PLB1	NM_00117 0585	67	PSR020026 43.hg.1	2	+	28854 903	2885 5007	0.85	4. 2	7.944 2E-13	B
PLB1	NM_00117 0585	68	PSR020026 44.hg.1	2	+	28855 811	2885 5906	0.84	5. 8	6.170 4E-13	B
PLB1	NM_00117 0585	69	PSR020026 45.hg.1	2	+	28863 793	2886 3867	0.83	4. 5	1.949 5E-13	B
PLB1	NM_00117 0585	70	PSR020026 46.hg.1	2	+	28865 724	2886 6018	0.83	3. 3	4.081 E-14	B
PLB1	NM_00117 0585	71	PSR020026 47.hg.1	2	+	28866 019	2886 6099	0.81	3. 1	3.078 2E-12	B
PLB1	NM_00117 0585	72	PSR020026 48.hg.1	2	+	28866 100	2886 6132	0.83	5. 9	3.180 5E-12	B
PLB1	NM_00117 0585	73	PSR020026 50.hg.1	2	+	28866 134	2886 6430	0.85	4. 2	1.483 1E-13	B
PLB1	NM_00117 0585	74	PSR020026 51.hg.1	2	+	28866 431	2886 6613	0.85	3. 5	4.390 8E-15	B
PLB1	NM_00117 0585	75	PSR020026 52.hg.1	2	+	28866 614	2886 6653	0.85	4. 0	1.340 6E-14	B
RAS GRP3	NM_00113 9488	8	PSR020032 98.hg.1	2	+	33701 321	3370 1663	0.81	- 2. 6	9.419 5E-08	V
RAS GRP3	NM_00113 9488	11	PSR020033 02.hg.1	2	+	33701 732	3370 1774	0.85	- 5. 3	2.784 9E-13	V
RAS GRP3	NM_00113 9488	16	PSR020033 07.hg.1	2	+	33736 777	3373 6878	0.82	- 3. 2	1.137 5E-10	V
RAS GRP3	NM_00113 9488	17	PSR020033 08.hg.1	2	+	33736 879	3373 6909	0.82	- 4. 3	4.611 5E-11	V
RAS GRP3	NM_00113 9488	19	PSR020033 10.hg.1	2	+	33740 077	3374 0273	0.83	- 4. 3	6.405 2E-12	V
RAS GRP3	NM_00113 9488	20	PSR020033 11.hg.1	2	+	33741 609	3374 1640	0.84	- 4. 9	1.481 8E-12	V
RAS GRP3	NM_00113 9488	21	PSR020033 12.hg.1	2	+	33741 641	3374 1711	0.83	- 4. 6	1.022 E-11	V
RAS GRP3	NM_00113 9488	24	PSR020033 16.hg.1	2	+	33745 019	3374 5076	0.84	- 4. 2	1.193 4E-11	V
RAS GRP3	NM_00113 9488	25	PSR020033 18.hg.1	2	+	33745 620	3374 5720	0.85	- 5. 6	2.084 E-13	V
RAS GRP3	NM_00113 9488	26	PSR020033 20.hg.1	2	+	33745 724	3374 5751	0.84	- 5. 7	9.778 5E-13	V
RAS GRP3	NM_00113 9488	27	PSR020033 21.hg.1	2	+	33747 022	3374 7169	0.86	- 4.	3.629 6E-13	V

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RAS GRP3	NM_00113 9488	28	PSR020033 22.hg.1	2	+	33748 946	3374 9119	0.85	- 4. 0	1.866 2E-12	V
RAS GRP3	NM_00113 9488	29	PSR020033 24.hg.1	2	+	33749 499	3374 9615	0.85	- 4. 8	3.327 8E-13	V
RAS GRP3	NM_00113 9488	30	PSR020033 25.hg.1	2	+	33752 204	3375 2247	0.85	- 2. 5	1.902 4E-11	V
RAS GRP3	NM_00113 9488	31	PSR020033 27.hg.1	2	+	33752 270	3375 2479	0.86	- 5. 0	1.071 3E-13	V
RAS GRP3	NM_00113 9488	34	PSR020033 30.hg.1	2	+	33759 390	3375 9467	0.86	- 4. 6	1.418 E-13	V
RAS GRP3	NM_00113 9488	35	PSR020033 32.hg.1	2	+	33764 164	3376 4277	0.85	- 3. 0	7.818 1E-12	V
RAS GRP3	NM_00113 9488	43	PSR020033 40.hg.1	2	+	33768 579	3376 8694	0.86	- 3. 3	1.226 6E-12	V
RAS GRP3	NM_00113 9488	44	PSR020033 41.hg.1	2	+	33774 671	3377 4818	0.84	- 3. 1	2.477 2E-11	V
RAS GRP3	NM_00113 9488	45	PSR020033 42.hg.1	2	+	33780 598	3378 0634	0.86	- 4. 9	9.474 8E-14	V
RAS GRP3	NM_00113 9488	47	PSR020033 44.hg.1	2	+	33783 739	3378 4097	0.84	- 2. 1	1.493 1E-10	V
RAS GRP3	NM_00113 9488	48	PSR020033 45.hg.1	2	+	33787 796	3378 7976	0.88	- 5. 3	3.570 6E-15	V
RAS GRP3	NM_00113 9488	49	PSR020033 47.hg.1	2	+	33787 981	3378 9658	0.87	- 5. 0	2.579 7E-14	V
RAS GRP3	NM_00113 9488	50	PSR020033 49.hg.1	2	+	33789 673	3378 9798	0.85	- 3. 4	7.997 2E-12	V
IGKV 3D-15	ENST0000 0417279	3	PSR020085 83.hg.1	2	+	90153 963	9015 4258	0.73	- 5. 2	5.523 2E-06	V
IL1R N	NM_17384 3	2	PSR020111 42.hg.1	2	+	11386 4791	1138 6496 2	0.78	- 2. 8	6.189 7E-07	V
IL1R N	NM_17384 3	3	PSR020111 43.hg.1	2	+	11386 8693	1138 6877 6	0.72	- 5. 3	4.959 7E-06	V
IL1R N	NM_17384 3	4	PSR020111 44.hg.1	2	+	11387 0577	1138 7069 1	0.77	- 4. 9	7.117 8E-07	V
IL1R N	NM_17384 3	5	PSR020111 45.hg.1	2	+	11387 3082	1138 7326 7	0.57	- 1. 6	0.002 54957	V
IL1R N	NM_17384 3	10	PSR020111 52.hg.1	2	+	11387 9025	1138 7919	0.75	- 4.	5.807 6E-06	V

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IL1R N	NM_17384 3	11	PSR020111 54.hg.1	2	+	11388 5153	1138 8526 5	0.67	- 1. 7	0.002 80923	V
IL1R N	NM_17384 3	13	PSR020111 56.hg.1	2	+	11388 7153	1138 8724 1	0.67	- 1. 6	0.005 45514	V
IL1R N	NM_17384 3	16	PSR020111 59.hg.1	2	+	11388 8622	1138 8873 4	0.67	- 1. 6	0.003 05058	V
IL1R N	NM_17384 3	17	PSR020111 60.hg.1	2	+	11389 0233	1138 9069 8	0.68	- 1. 7	0.001 11773	V
IL1R N	NM_17384 3	18	PSR020111 61.hg.1	2	+	11389 0699	1138 9103 7	0.68	- 1. 7	0.002 74478	V
IL1R N	NM_17384 3	19	PSR020111 62.hg.1	2	+	11389 1038	1138 9117 9	0.67	- 1. 7	0.001 72968	V
IL1R N	NM_17384 3	20	PSR020111 63.hg.1	2	+	11389 1180	1138 9159 0	0.66	- 2. 0	0.002 29078	V
---	ENST0000 0436616	2	PSR020159 41.hg.1	2	+	17927 8750	1792 7884 0	0.89	- 3. 4	1.208 4E-13	V
---	ENST0000 0436616	5	PSR020159 44.hg.1	2	+	17929 1093	1792 9123 2	0.88	- 4. 0	5.405 8E-13	V
---	ENST0000 0436616	6	PSR020159 45.hg.1	2	+	17929 1233	1792 9138 8	0.88	- 3. 3	5.292 5E-13	V
---	ENST0000 0436616	7	PSR020159 50.hg.1	2	+	17929 5422	1792 9549 6	0.91	- 4. 6	1.042 5E-14	V
---	ENST0000 0436616	8	PSR020159 51.hg.1	2	+	17929 5497	1792 9555 1	0.91	- 3. 9	2.330 3E-15	V
---	ENST0000 0436616	9	PSR020159 52.hg.1	2	+	17929 5552	1792 9561 6	0.88	- 4. 3	9.758 7E-14	V
---	ENST0000 0436616	12	PSR020159 55.hg.1	2	+	17929 8109	1792 9820 2	0.92	- 4. 8	2.766 7E-16	V
---	ENST0000 0436616	13	PSR020159 56.hg.1	2	+	17929 8203	1792 9824 2	0.92	- 4. 1	4.425 5E-16	V
---	ENST0000 0436616	14	PSR020159 57.hg.1	2	+	17929 8243	1792 9839 4	0.92	- 3. 8	3.255 8E-16	V
---	ENST0000 0436616	15	PSR020159 58.hg.1	2	+	17929 8395	1792 9871 6	0.90	- 3. 8	1.238 4E-14	V
---	ENST0000 0436616	16	PSR020159 59.hg.1	2	+	17930 3594	1793 0386 6	0.91	- 3. 8	2.634 1E-14	V
SPAT S2L	NM_00110 0422	14	PSR020175 02.hg.1	2	+	20119 4154	2011 9420	0.86	- 12	9.436 4E-14	V

							3		.5		
SPAT S2L	NM_00110 0422	20	PSR020175 08.hg.1	2	+	20124 2960	2012 4309 4	0.84	- 20 .0	6.134 3E-11	V
SPAT S2L	NM_00110 0422	22	PSR020175 10.hg.1	2	+	20125 3946	2012 5400 6	0.87	- 17 .3	1.769 E-15	V
SPAT S2L	NM_00110 0422	25	PSR020175 14.hg.1	2	+	20127 7034	2012 7706 5	0.87	- 17 .4	3.224 6E-15	V
SPAT S2L	NM_00110 0422	26	PSR020175 15.hg.1	2	+	20127 7066	2012 7714 2	0.88	- 16 .2	2.448 E-16	V
SPAT S2L	NM_00110 0422	27	PSR020175 16.hg.1	2	+	20128 1102	2012 8114 8	0.86	- 18 .4	9.385 5E-15	V
SPAT S2L	NM_00110 0422	28	PSR020175 18.hg.1	2	+	20128 3973	2012 8405 6	0.87	- 12 .5	5.456 4E-15	V
SPAT S2L	NM_00110 0422	29	PSR020175 19.hg.1	2	+	20128 4057	2012 8412 0	0.85	- 9. 4	2.235 5E-13	V
SPAT S2L	NM_00110 0422	30	PSR020175 21.hg.1	2	+	20128 4137	2012 8419 3	0.86	- 17 .7	3.316 6E-14	V
SPAT S2L	NM_00110 0422	31	PSR020175 22.hg.1	2	+	20128 4194	2012 8421 9	0.87	- 15 .1	6.770 8E-16	V
SPAT S2L	NM_00110 0422	32	PSR020175 24.hg.1	2	+	20130 3863	2013 0396 3	0.85	- 12 .7	1.038 7E-12	V
SPAT S2L	NM_00110 0422	33	PSR020175 25.hg.1	2	+	20130 3964	2013 0405 1	0.86	- 15 .1	1.305 6E-13	V
SPAT S2L	NM_00110 0422	34	PSR020175 26.hg.1	2	+	20130 5372	2013 0544 7	0.87	- 21 .5	9.177 8E-16	V
SPAT S2L	NM_00110 0422	35	PSR020175 27.hg.1	2	+	20130 5448	2013 0550 7	0.88	- 16 .1	2.880 7E-16	V
SPAT S2L	NM_00110 0422	36	PSR020175 28.hg.1	2	+	20132 4492	2013 2455 0	0.88	- 15 .7	2.101 2E-16	V
SPAT S2L	NM_00110 0422	39	PSR020175 31.hg.1	2	+	20133 2013	2013 3210 1	0.87	- 17 .5	2.663 8E-15	V
SPAT S2L	NM_00110 0422	41	PSR020175 34.hg.1	2	+	20133 4637	2013 3468 3	0.88	- 19 .7	1.507 E-16	V
SPAT S2L	NM_00110 0422	42	PSR020175 35.hg.1	2	+	20133 4684	2013 3473 9	0.89	- 19 .3	3.438 8E-17	V
SPAT S2L	NM_00110 0422	43	PSR020175 36.hg.1	2	+	20133 7555	2013 3771 5	0.89	- 16 .9	5.176 1E-17	V
SPAT S2L	NM_00110 0422	44	PSR020175 37.hg.1	2	+	20133 7716	2013 3777	0.87	- 9.	3.829 8E-13	V

							0		3		
SPAT S2L	NM_00110 0422	45	PSR020175 39.hg.1	2	+	20134 2359	2013 4260 5	0.88	- 12 .4	1.049 7E-15	V
SPAT S2L	NM_00110 0422	46	PSR020175 40.hg.1	2	+	20134 2606	2013 4282 5	0.87	- 11 .8	1.575 2E-14	V
SPAT S2L	NM_00110 0422	47	PSR020175 41.hg.1	2	+	20134 2826	2013 4286 9	0.86	- 13 .6	3.357 5E-14	V
SPAT S2L	NM_00110 0422	48	PSR020175 42.hg.1	2	+	20134 2870	2013 4293 2	0.86	- 13 .5	2.186 9E-13	V
SPAT S2L	NM_00110 0422	49	PSR020175 43.hg.1	2	+	20134 2933	2013 4325 2	0.88	- 18 .8	1.240 2E-15	V
---	ENST0000 0366140	1	PSR020249 45.hg.1	2	-	69686 45	6969 010	0.87	- 4. 9	1.279 1E-13	V
---	ENST0000 0366140	3	PSR020249 47.hg.1	2	-	69700 99	6970 237	0.89	- 14 .6	8.618 3E-19	V
GAL NT14	NM_00125 3826	4	PSR020275 78.hg.1	2	-	31133 663	3113 3925	0.84	4. 0	1.381 1E-13	B
GAL NT14	NM_00125 3826	5	PSR020275 79.hg.1	2	-	31135 089	3113 5208	0.83	3. 5	6.875 3E-13	B
GAL NT14	NM_00125 3826	6	PSR020275 80.hg.1	2	-	31146 985	3114 7063	0.84	4. 9	6.420 9E-13	B
GAL NT14	NM_00125 3826	7	PSR020275 81.hg.1	2	-	31147 064	3114 7129	0.83	6. 2	6.546 E-13	B
GAL NT14	NM_00125 3826	9	PSR020275 83.hg.1	2	-	31147 606	3114 7650	0.85	7. 9	5.203 8E-13	B
GAL NT14	NM_00125 3826	10	PSR020275 84.hg.1	2	-	31147 651	3114 7689	0.85	5. 7	2.469 9E-14	B
GAL NT14	NM_00125 3826	12	PSR020275 86.hg.1	2	-	31154 934	3115 4982	0.83	2. 9	8.953 4E-13	B
GAL NT14	NM_00125 3826	13	PSR020275 87.hg.1	2	-	31154 983	3115 5032	0.81	3. 3	1.496 8E-11	B
GAL NT14	NM_00125 3826	14	PSR020275 88.hg.1	2	-	31155 033	3115 5060	0.83	5. 2	1.102 8E-12	B
GAL NT14	NM_00125 3826	15	PSR020275 89.hg.1	2	-	31165 067	3116 5170	0.84	6. 8	2.273 1E-13	B
GAL NT14	NM_00125 3826	17	PSR020275 91.hg.1	2	-	31168 649	3116 8707	0.84	6. 3	1.077 6E-13	B
GAL NT14	NM_00125 3826	21	PSR020275 97.hg.1	2	-	31178 795	3117 8843	0.82	4. 1	4.857 5E-12	B
GAL NT14	NM_00125 3826	22	PSR020275 98.hg.1	2	-	31181 263	3118 1330	0.85	7. 8	3.730 1E-14	B
GAL NT14	NM_00125 3826	23	PSR020275 99.hg.1	2	-	31189 070	3118 9137	0.84	4. 3	2.012 1E-13	B
GAL NT14	NM_00125 3826	24	PSR020276 02.hg.1	2	-	31189 138	3118 9168	0.84	9. 4	1.695 4E-12	B
GAL NT14	NM_00125 3826	25	PSR020276 03.hg.1	2	-	31189 143	3118 9168	0.82	8. 2	9.995 9E-12	B
GAL NT14	NM_00125 3826	27	PSR020276 05.hg.1	2	-	31215 704	3121 5873	0.84	4. 8	3.686 7E-13	B

GAL NT14	NM_00125 3826	31	PSR020276 09.hg.1	2	-	31337 609	3133 7693	0.82	3. 2	8.401 4E-12	B
GAL NT14	NM_00125 3826	37	PSR020276 16.hg.1	2	-	31360 824	3136 0887	0.85	4. 4	1.147 9E-13	B
GAL NT14	NM_00125 3826	38	PSR020276 17.hg.1	2	-	31360 888	3136 0921	0.85	5. 8	1.190 9E-13	B
NLR C4	NM_00119 9138	6	PSR020277 88.hg.1	2	-	32474 676	3247 6670	0.86	3. 6	6.246 3E-14	B
NLR C4	NM_00119 9138	8	PSR020277 90.hg.1	2	-	32481 844	3248 1962	0.86	3. 6	2.868 9E-13	B
NLR C4	NM_00119 9138	11	PSR020277 97.hg.1	2	-	32490 690	3249 0801	0.86	5. 0	4.478 3E-15	B
NLR C4	NM_00119 9138	13	PSR020278 00.hg.1	2	-	32490 664	3249 0689	0.87	5. 2	1.988 8E-15	B
PNPT 1	NM_03310 9	9	PSR020298 40.hg.1	2	-	55863 361	5586 3504	0.93	- 7. 9	2.907 3E-18	V
PNPT 1	NM_03310 9	11	PSR020298 43.hg.1	2	-	55867 762	5586 7840	0.93	- 10 .5	1.055 9E-19	V
PNPT 1	NM_03310 9	14	PSR020298 47.hg.1	2	-	55871 772	5587 1855	0.93	- 6. 8	1.486 E-18	V
PNPT 1	NM_03310 9	16	PSR020298 49.hg.1	2	-	55872 484	5587 2567	0.92	- 8. 4	6.213 6E-18	V
PNPT 1	NM_03310 9	17	PSR020298 50.hg.1	2	-	55873 394	5587 3457	0.93	- 9. 4	2.145 3E-19	V
PNPT 1	NM_03310 9	18	PSR020298 51.hg.1	2	-	55873 550	5587 3621	0.92	- 9. 9	1.068 1E-18	V
PNPT 1	NM_03310 9	19	PSR020298 53.hg.1	2	-	55874 482	5587 4517	0.93	- 11 .6	7.689 1E-20	V
PNPT 1	NM_03310 9	20	PSR020298 55.hg.1	2	-	55874 536	5587 4588	0.93	- 8. 2	1.461 4E-18	V
PNPT 1	NM_03310 9	21	PSR020298 56.hg.1	2	-	55882 035	5588 2088	0.93	- 9. 8	7.704 2E-22	V
PNPT 1	NM_03310 9	22	PSR020298 57.hg.1	2	-	55883 266	5588 3355	0.91	- 8. 1	9.042 E-18	V
PNPT 1	NM_03310 9	23	PSR020298 58.hg.1	2	-	55883 440	5588 3506	0.92	- 8. 6	3.601 6E-18	V
PNPT 1	NM_03310 9	24	PSR020298 59.hg.1	2	-	55887 292	5588 7328	0.91	- 10 .2	1.262 4E-18	V
PNPT 1	NM_03310 9	25	PSR020298 60.hg.1	2	-	55889 091	5588 9161	0.91	- 7. 9	4.589 E-17	V
PNPT 1	NM_03310 9	26	PSR020298 61.hg.1	2	-	55894 126	5589 4228	0.92	- 8. 7	8.865 8E-19	V
PNPT	NM_03310	27	PSR020298	2	-	55894	5589	0.92	-	1.914	V

1	9		62.hg.1			997	5093		7. 6	7E-18	
PNPT 1	NM_03310 9	29	PSR020298 65.hg.1	2	-	55899 130	5589 9181	0.93	- 10 .4	2.286 2E-20	V
PNPT 1	NM_03310 9	30	PSR020298 66.hg.1	2	-	55900 028	5590 0214	0.93	- 9. 4	3.699 7E-20	V
PNPT 1	NM_03310 9	31	PSR020298 67.hg.1	2	-	55906 817	5590 6930	0.93	- 8. 2	9.539 1E-19	V
PNPT 1	NM_03310 9	34	PSR020298 70.hg.1	2	-	55907 990	5590 8053	0.92	- 8. 9	4.020 1E-18	V
PNPT 1	NM_03310 9	35	PSR020298 71.hg.1	2	-	55910 920	5591 0969	0.91	- 8. 8	6.919 7E-17	V
PNPT 1	NM_03310 9	37	PSR020298 73.hg.1	2	-	55913 505	5591 3579	0.92	- 8. 4	1.600 9E-18	V
IGKC	ENST0000 0390237	5	PSR020332 45.hg.1	2	-	89156 682	8915 6708	0.73	- 5. 9	5.977 E-06	V
IGKC	ENST0000 0390237	6	PSR020332 46.hg.1	2	-	89156 709	8915 6873	0.73	- 5. 1	3.383 5E-06	V
IGKC	ENST0000 0390237	7	PSR020332 47.hg.1	2	-	89156 874	8915 6991	0.73	- 4. 4	4.818 8E-06	V
IGKC	ENST0000 0390237	13	PSR020332 60.hg.1	2	-	89160 080	8916 0117	0.73	- 4. 6	6.843 8E-06	V
IGKC	ENST0000 0390237	16	PSR020332 70.hg.1	2	-	89160 733	8916 0767	0.72	- 5. 2	1.703 4E-05	V
IGKC	ENST0000 0390237	22	PSR020335 39.hg.1	2	-	89384 674	8938 4968	0.72	- 4. 6	9.900 3E-06	V
IGKC	ENST0000 0390237	28	PSR020335 78.hg.1	2	-	89442 059	8944 2353	0.72	- 4. 3	1.465 2E-05	V
IGKC	ENST0000 0390237	31	PSR020336 22.hg.1	2	-	89545 001	8954 5055	0.74	- 4. 5	5.698 3E-06	V
IGKC	ENST0000 0390237	32	PSR020336 27.hg.1	2	-	89567 766	8956 8053	0.71	- 4. 8	1.953 1E-05	V
IGKC	ENST0000 0390237	35	PSR020336 42.hg.1	2	-	89619 388	8961 9678	0.68	- 4. 4	0.000 18253	V
IGKV 1-9	ENST0000 0493819	1	PSR020334 98.hg.1	2	-	89309 479	8930 9774	0.72	- 5. 0	5.427 E-06	V
---	ENST0000 0443397	2	PSR020336 56.hg.1	2	-	90537 856	9053 8113	0.72	- 5. 0	9.994 2E-06	V
IFIH1	NM_02216	1	PSR020391	2	-	16312	1631	0.81	-	1.536	V

	8		38.hg.1			3612	2365 0		6. 4	E-10	
IFIH1	NM_02216 8	2	PSR020391 39.hg.1	2	-	16312 3651	1631 2388 9	0.82	- 5. 7	2.701 4E-11	V
IFIH1	NM_02216 8	3	PSR020391 40.hg.1	2	-	16312 3989	1631 2407 9	0.83	- 6. 0	5.924 4E-12	V
IFIH1	NM_02216 8	4	PSR020391 41.hg.1	2	-	16312 4597	1631 2478 7	0.83	- 6. 0	4.892 9E-12	V
IFIH1	NM_02216 8	5	PSR020391 42.hg.1	2	-	16312 8736	1631 2889 7	0.83	- 6. 2	2.532 4E-12	V
IFIH1	NM_02216 8	6	PSR020391 43.hg.1	2	-	16313 0305	1631 3045 4	0.84	- 5. 3	9.915 8E-13	V
IFIH1	NM_02216 8	7	PSR020391 44.hg.1	2	-	16313 3197	1631 3345 6	0.84	- 5. 2	1.375 9E-12	V
IFIH1	NM_02216 8	9	PSR020391 46.hg.1	2	-	16313 4715	1631 3483 8	0.82	- 5. 3	2.821 9E-11	V
IFIH1	NM_02216 8	10	PSR020391 47.hg.1	2	-	16313 6506	1631 3662 2	0.83	- 5. 2	8.500 8E-12	V
PGAP 1	NM_02498 9	4	PSR020423 71.hg.1	2	-	19770 2595	1977 0325 3	0.86	- 3. 3	3.075 E-13	V
PGAP 1	NM_02498 9	7	PSR020423 74.hg.1	2	-	19770 7445	1977 0754 9	0.87	- 3. 8	1.535 E-13	V
PGAP 1	NM_02498 9	9	PSR020423 76.hg.1	2	-	19770 9248	1977 0929 8	0.87	- 3. 7	1.133 7E-12	V
PGAP 1	NM_02498 9	12	PSR020423 79.hg.1	2	-	19771 1727	1977 1192 4	0.85	- 3. 5	9.278 1E-12	V
PGAP 1	NM_02498 9	15	PSR020423 82.hg.1	2	-	19771 2671	1977 1276 1	0.84	- 3. 2	1.284 3E-11	V
PGAP 1	NM_02498 9	18	PSR020423 85.hg.1	2	-	19773 7165	1977 3727 3	0.86	- 3. 0	2.504 2E-11	V
PGAP 1	NM_02498 9	21	PSR020423 88.hg.1	2	-	19773 8252	1977 3830 3	0.87	- 4. 3	2.760 7E-13	V
PGAP 1	NM_02498 9	22	PSR020423 89.hg.1	2	-	19773 8409	1977 3848 2	0.87	- 4. 5	1.475 4E-13	V
PGAP 1	NM_02498 9	26	PSR020423 93.hg.1	2	-	19774 4800	1977 4487 7	0.87	- 4. 3	2.594 6E-13	V
PGAP 1	NM_02498 9	29	PSR020423 98.hg.1	2	-	19775 5552	1977 5558 1	0.85	- 3. 0	1.905 9E-11	V
PGAP	NM_02498	33	PSR020424	2	-	19776	1977	0.86	-	1.111	V

1	9		03.hg.1			1855	6192 1		3. 7	6E-12	
PGAP 1	NM_02498 9	35	PSR020424 05.hg.1	2	-	19776 7309	1977 6746 6	0.88	- 5. 1	3.670 7E-14	V
PGAP 1	NM_02498 9	36	PSR020424 06.hg.1	2	-	19777 7606	1977 7777 7	0.87	- 3. 7	5.548 5E-13	V
PGAP 1	NM_02498 9	37	PSR020424 07.hg.1	2	-	19778 1142	1977 8131 7	0.86	- 3. 5	4.059 E-12	V
PGAP 1	NM_02498 9	40	PSR020424 10.hg.1	2	-	19779 1194	1977 9137 9	0.86	- 4. 7	8.948 3E-13	V
---	n407780	4	PSR020481 41.hg.1	2	+	12857 692	1285 8075	0.87	- 6. 0	7.093 1E-15	V
---	n407780	5	PSR020481 42.hg.1	2	+	12858 077	1285 8703	0.89	- 7. 2	3.656 8E-16	V
---	n407780	6	PSR020481 43.hg.1	2	+	12863 386	1286 3678	0.87	- 5. 7	7.093 8E-15	V
---	n407780	7	PSR020481 44.hg.1	2	+	12880 452	1288 1616	0.89	- 7. 8	2.012 5E-16	V
---	n407780	8	PSR020481 45.hg.1	2	+	12881 672	1288 2664	0.86	- 6. 3	3.029 8E-14	V
---	n383778	2	PSR020512 12.hg.1	2	+	17927 8750	1792 7884 0	0.90	- 4. 0	1.545 7E-15	V
---	n383778	5	PSR020512 15.hg.1	2	+	17929 1093	1792 9123 2	0.88	- 3. 8	4.916 1E-13	V
---	n383778	6	PSR020512 16.hg.1	2	+	17929 1233	1792 9138 8	0.88	- 2. 9	5.219 4E-12	V
---	n383778	7	PSR020512 17.hg.1	2	+	17929 5422	1792 9549 6	0.91	- 4. 5	1.184 1E-14	V
---	n383778	8	PSR020512 18.hg.1	2	+	17929 5497	1792 9555 1	0.89	- 4. 0	1.408 5E-14	V
---	n383778	9	PSR020512 19.hg.1	2	+	17929 5552	1792 9561 6	0.90	- 4. 4	1.579 4E-14	V
---	n383778	12	PSR020512 22.hg.1	2	+	17929 8109	1792 9820 2	0.91	- 4. 5	5.470 1E-15	V
---	n383778	13	PSR020512 23.hg.1	2	+	17929 8203	1792 9824 2	0.92	- 4. 1	4.425 5E-16	V
---	n383778	14	PSR020512 24.hg.1	2	+	17929 8243	1792 9839 4	0.92	- 4. 5	9.279 3E-17	V
---	n383778	15	PSR020512	2	+	17929	1792	0.92	-	6.386	V

			25.hg.1			8395	9871 6		4. 8	8E-17	
---	n383778	16	PSR020512 26.hg.1	2	+	17930 3594	1793 0386 6	0.91	- 5. 5	1.765 E-16	V
---	n346494	9	PSR020523 18.hg.1	2	+	24306 4444	2430 6450 4	0.81	2. 5	2.604 8E-10	B
---	n346494	10	PSR020523 19.hg.1	2	+	24306 4505	2430 6460 6	0.80	2. 4	2.539 E-10	B
---	n346494	11	PSR020523 20.hg.1	2	+	24306 4629	2430 6475 9	0.82	3. 5	3.902 3E-11	B
---	n346494	12	PSR020523 21.hg.1	2	+	24306 5559	2430 6756 2	0.82	1. 9	3.398 5E-11	B
---	n346494	13	PSR020523 22.hg.1	2	+	24307 2806	2430 7296 3	0.81	2. 9	9.546 7E-11	B
---	n346494	14	PSR020523 23.hg.1	2	+	24307 2964	2430 7301 7	0.82	3. 6	2.352 E-11	B
---	n346494	16	PSR020523 25.hg.1	2	+	24308 2385	2430 8278 9	0.74	2. 4	6.511 1E-07	B
---	n346494	17	PSR020523 26.hg.1	2	+	24310 1510	2431 0153 8	0.78	2. 8	1.995 3E-08	B
---	n346494	18	PSR020523 27.hg.1	2	+	24310 1539	2431 0156 9	0.79	3. 0	1.855 1E-09	B
---	n346494	19	PSR020523 28.hg.1	2	+	24310 1575	2431 0162 3	0.74	4. 8	6.379 8E-07	B
---	n346494	20	PSR020523 29.hg.1	2	+	24310 2107	2431 0214 7	0.77	2. 5	1.434 6E-08	B
---	n346494	21	PSR020523 30.hg.1	2	+	24310 2158	2431 0246 9	0.80	3. 1	9.658 1E-10	B
---	TCONS_00 003184- XLOC_001 966	3	PSR020526 79.hg.1	2	-	69700 99	6970 237	0.89	- 18 .7	1.520 8E-19	V
---	TCONS_00 003184- XLOC_001 966	4	PSR020526 80.hg.1	2	-	69702 38	6970 833	0.88	- 8. 2	1.766 6E-14	V
---	n346551	32	PSR020542 70.hg.1	2	-	89384 690	8938 4918	0.73	- 5. 2	8.446 6E-06	V
---	n346551	45	PSR020542 83.hg.1	2	-	89442 261	8944 2287	0.73	- 6. 4	1.146 E-05	V
---	n346551	52	PSR020542 90.hg.1	2	-	89521 185	8952 1340	0.73	- 5.	4.005 8E-06	V

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---	n346551	53	PSR020542 91.hg.1	2	-	89521 341	8952 1470	0.73	- 5. 4	6.639 E-06	V
---	n336681	2	PSR020543 04.hg.1	2	-	89476 567	8947 6595	0.74	- 4. 8	4.217 4E-06	V
TTC2 1A	NM_00110 5513	4	PSR030038 65.hg.1	3	+	39150 576	3915 0705	0.85	- 3. 3	1.059 6E-09	V
TTC2 1A	NM_00110 5513	5	PSR030038 66.hg.1	3	+	39151 520	3915 1630	0.85	- 2. 9	2.503 6E-09	V
TTC2 1A	NM_00110 5513	8	PSR030038 69.hg.1	3	+	39152 342	3915 2508	0.87	- 3. 7	2.746 2E-10	V
TTC2 1A	NM_00110 5513	9	PSR030038 71.hg.1	3	+	39153 949	3915 4071	0.91	- 4. 0	3.987 8E-12	V
TTC2 1A	NM_00110 5513	10	PSR030038 72.hg.1	3	+	39156 076	3915 6233	0.90	- 4. 4	1.863 6E-11	V
TTC2 1A	NM_00110 5513	11	PSR030038 73.hg.1	3	+	39159 560	3915 9644	0.91	- 7. 4	8.356 3E-15	V
TTC2 1A	NM_00110 5513	12	PSR030038 75.hg.1	3	+	39159 669	3916 1122	0.83	- 1. 8	3.472 6E-07	V
TTC2 1A	NM_00110 5513	13	PSR030038 79.hg.1	3	+	39161 413	3916 1459	0.87	- 4. 9	6.952 2E-12	V
TTC2 1A	NM_00110 5513	14	PSR030038 80.hg.1	3	+	39161 460	3916 1511	0.76	- 1. 7	3.691 E-06	V
TTC2 1A	NM_00110 5513	15	PSR030038 81.hg.1	3	+	39162 488	3916 2680	0.86	- 2. 5	4.018 9E-09	V
TTC2 1A	NM_00110 5513	16	PSR030038 82.hg.1	3	+	39166 554	3916 6591	0.87	- 4. 5	2.736 6E-11	V
TTC2 1A	NM_00110 5513	17	PSR030038 83.hg.1	3	+	39166 592	3916 6621	0.82	- 2. 8	3.41E- 08	V
TTC2 1A	NM_00110 5513	18	PSR030038 84.hg.1	3	+	39166 622	3916 6651	0.86	- 3. 0	4.599 6E-09	V
TTC2 1A	NM_00110 5513	19	PSR030038 85.hg.1	3	+	39166 823	3916 7023	0.89	- 3. 3	1.104 4E-10	V
TTC2 1A	NM_00110 5513	20	PSR030038 86.hg.1	3	+	39167 752	3916 7881	0.90	- 7. 5	3.923 9E-14	V
TTC2 1A	NM_00110 5513	21	PSR030038 88.hg.1	3	+	39169 825	3916 9979	0.83	- 2. 3	1.195 5E-08	V
TTC2 1A	NM_00110 5513	22	PSR030038 89.hg.1	3	+	39170 208	3917 0301	0.78	- 1.	7.239 2E-07	V

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TTC2 1A	NM_00110 5513	23	PSR030038 90.hg.1	3	+	39170 302	3917 0423	0.70	- 1. 7	1.618 8E-05	V
TTC2 1A	NM_00110 5513	25	PSR030038 93.hg.1	3	+	39170 583	3917 0801	0.88	- 3. 0	3.985 1E-10	V
TTC2 1A	NM_00110 5513	26	PSR030038 94.hg.1	3	+	39171 570	3917 1642	0.81	- 1. 6	1.609 E-06	V
TTC2 1A	NM_00110 5513	27	PSR030038 96.hg.1	3	+	39171 739	3917 1849	0.79	- 1. 6	4.427 6E-07	V
TTC2 1A	NM_00110 5513	29	PSR030038 98.hg.1	3	+	39172 192	3917 2330	0.82	- 2. 3	1.999 1E-08	V
TTC2 1A	NM_00110 5513	31	PSR030039 00.hg.1	3	+	39172 483	3917 2586	0.83	- 2. 2	6.446 6E-09	V
TTC2 1A	NM_00110 5513	32	PSR030039 01.hg.1	3	+	39173 012	3917 3137	0.77	- 2. 1	3.622 6E-07	V
TTC2 1A	NM_00110 5513	33	PSR030039 02.hg.1	3	+	39174 212	3917 4465	0.70	- 1. 6	3.145 7E-05	V
TTC2 1A	NM_00110 5513	34	PSR030039 03.hg.1	3	+	39174 466	3917 4542	0.81	- 2. 3	8.653 7E-08	V
TTC2 1A	NM_00110 5513	35	PSR030039 04.hg.1	3	+	39174 543	3917 4648	0.86	- 2. 5	1.861 5E-08	V
TTC2 1A	NM_00110 5513	36	PSR030039 05.hg.1	3	+	39174 649	3917 4731	0.89	- 4. 9	1.331 6E-12	V
TTC2 1A	NM_00110 5513	37	PSR030039 06.hg.1	3	+	39175 709	3917 5819	0.76	- 1. 9	1.743 4E-06	V
TTC2 1A	NM_00110 5513	40	PSR030039 09.hg.1	3	+	39176 584	3917 6665	0.89	- 3. 5	6.413 3E-11	V
TTC2 1A	NM_00110 5513	42	PSR030039 11.hg.1	3	+	39177 848	3917 7998	0.83	- 1. 9	5.035 4E-08	V
TTC2 1A	NM_00110 5513	44	PSR030039 13.hg.1	3	+	39178 390	3917 8518	0.71	- 1. 6	2.299 7E-05	V
TTC2 1A	NM_00110 5513	45	PSR030039 14.hg.1	3	+	39178 519	3917 8551	0.79	- 2. 4	9.744 9E-08	V
TTC2 1A	NM_00110 5513	48	PSR030039 17.hg.1	3	+	39178 977	3917 9201	0.87	- 2. 0	1.387 9E-08	V
TTC2 1A	NM_00110 5513	50	PSR030039 20.hg.1	3	+	39179 758	3917 9878	0.89	- 3. 7	6.073 3E-11	V
TTC2 1A	NM_00110 5513	51	PSR030039 21.hg.1	3	+	39180 047	3918 0114	0.86	- 3.	3.055 4E-11	V

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TRE X1	NM_01638 1	4	PSR030056 47.hg.1	3	+	48491 443	4849 1576	0.73	- 1. 3	1.800 2E-05	V
TRE X1	NM_01638 1	7	PSR030056 50.hg.1	3	+	48495 700	4849 5757	0.66	- 1. 2	0.001 63645	V
TRE X1	NM_01638 1	17	PSR030056 60.hg.1	3	+	48502 108	4850 2198	0.67	- 1. 2	9.449 6E-05	V
TRE X1	NM_01638 1	23	PSR030056 66.hg.1	3	+	48506 445	4850 6482	0.76	- 1. 3	3.932 E-07	V
TRE X1	NM_01638 1	30	PSR030056 78.hg.1	3	+	48507 669	4850 7708	0.71	- 1. 4	0.000 10235	V
TRE X1	NM_01638 1	32	PSR030056 80.hg.1	3	+	48507 890	4850 8028	0.77	- 1. 4	5.904 2E-07	V
TRE X1	NM_01638 1	33	PSR030056 82.hg.1	3	+	48508 041	4850 8066	0.87	- 2. 6	9.073 4E-12	V
TRE X1	NM_01638 1	34	PSR030056 83.hg.1	3	+	48508 067	4850 8138	0.88	- 4. 4	1.228 1E-13	V
TRE X1	NM_01638 1	36	PSR030056 85.hg.1	3	+	48508 177	4850 8463	0.89	- 6. 0	3.542 E-16	V
TRE X1	NM_01638 1	37	PSR030056 86.hg.1	3	+	48508 464	4850 8832	0.91	- 6. 7	3.287 4E-18	V
TRE X1	NM_01638 1	38	PSR030056 87.hg.1	3	+	48508 833	4850 9000	0.89	- 5. 6	3.616 1E-16	V
TRE X1	NM_01638 1	39	PSR030056 88.hg.1	3	+	48509 001	4850 9041	0.76	- 1. 5	1.479 6E-07	V
PARP 14	NM_01755 4	5	PSR030114 33.hg.1	3	+	12240 5606	1224 0592 6	0.70	- 2. 9	8.027 2E-05	V
PARP 14	NM_01755 4	12	PSR030114 40.hg.1	3	+	12241 8170	1224 1823 6	0.72	- 3. 6	7.063 7E-06	V
PARP 14	NM_01755 4	18	PSR030114 46.hg.1	3	+	12242 2589	1224 2282 5	0.75	- 2. 8	6.662 E-08	V
PARP 14	NM_01755 4	19	PSR030114 47.hg.1	3	+	12242 3374	1224 2359 5	0.78	- 2. 9	1.159 4E-08	V
PARP 14	NM_01755 4	20	PSR030114 48.hg.1	3	+	12242 7037	1224 2711 5	0.77	- 2. 9	2.145 E-08	V
PARP 14	NM_01755 4	21	PSR030114 49.hg.1	3	+	12243 2271	1224 3241 6	0.79	- 2. 8	3.562 2E-09	V
PARP 14	NM_01755 4	23	PSR030114 53.hg.1	3	+	12243 3109	1224 3327	0.77	- 2.	1.201 3E-08	V

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PARP 14	NM_01755 4	24	PSR030114 54.hg.1	3	+	12243 6918	1224 3712 4	0.78	- 2. 9	4.554 8E-09	V
PARP 14	NM_01755 4	25	PSR030114 55.hg.1	3	+	12243 7206	1224 3723 0	0.78	- 3. 4	8.209 8E-09	V
PARP 14	NM_01755 4	27	PSR030114 57.hg.1	3	+	12243 9102	1224 3923 5	0.79	- 2. 8	1.294 1E-09	V
PARP 14	NM_01755 4	28	PSR030114 58.hg.1	3	+	12243 9236	1224 3967 4	0.77	- 4. 6	1.716 5E-08	V
PARP 14	NM_01755 4	30	PSR030114 60.hg.1	3	+	12243 9774	1224 3981 5	0.79	- 4. 7	3.445 2E-09	V
PARP 14	NM_01755 4	31	PSR030114 61.hg.1	3	+	12243 9816	1224 4050 0	0.80	- 4. 8	7.717 7E-10	V
PARP 14	NM_01755 4	32	PSR030114 62.hg.1	3	+	12244 0501	1224 4149 4	0.76	- 3. 9	2.865 9E-07	V
PARP 14	NM_01755 4	33	PSR030114 63.hg.1	3	+	12244 6659	1224 4683 3	0.79	- 3. 1	1.653 2E-09	V
PARP 14	NM_01755 4	35	PSR030114 65.hg.1	3	+	12244 7444	1224 4968 6	0.78	- 3. 1	8.713 6E-09	V
HES X1	NM_00386 5	2	PSR030270 97.hg.1	3	-	57232 009	5723 2166	0.82	- 5. 6	2.357 2E-09	V
HES X1	NM_00386 5	3	PSR030270 98.hg.1	3	-	57232 167	5723 2224	0.87	- 3. 8	7.926 8E-11	V
HES X1	NM_00386 5	4	PSR030270 99.hg.1	3	-	57232 225	5723 2323	0.84	- 6. 7	2.678 5E-10	V
HES X1	NM_00386 5	5	PSR030271 00.hg.1	3	-	57232 419	5723 2520	0.83	- 7. 4	3.795 8E-10	V
HES X1	NM_00386 5	6	PSR030271 01.hg.1	3	-	57232 781	5723 2980	0.81	- 3. 7	1.332 9E-08	V
HES X1	NM_00386 5	7	PSR030271 02.hg.1	3	-	57233 790	5723 3966	0.87	- 4. 0	1.777 2E-09	V
ZDH HC19	NM_00103 9617	1	PSR030381 15.hg.1	3	-	19592 4325	1959 2459 6	0.81	4. 9	4.339 3E-11	B
ZDH HC19	NM_00103 9617	2	PSR030381 16.hg.1	3	-	19592 5147	1959 2526 4	0.80	2. 4	9.070 9E-10	B
ZDH HC19	NM_00103 9617	3	PSR030381 17.hg.1	3	-	19592 5265	1959 2532 2	0.82	6. 6	2.084 3E-12	B
ZDH HC19	NM_00103 9617	4	PSR030381 18.hg.1	3	-	19592 5323	1959 2546	0.76	1. 8	4.628 2E-08	B

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ZDH HC19	NM_00103 9617	5	PSR030381 19.hg.1	3	-	19592 5660	1959 2574 0	0.83	10 .6	1.875 6E-12	B
ZDH HC19	NM_00103 9617	8	PSR030381 23.hg.1	3	-	19592 6394	1959 2652 3	0.80	2. 0	3.108 2E-09	B
ZDH HC19	NM_00103 9617	9	PSR030381 24.hg.1	3	-	19593 4269	1959 3437 4	0.83	12 .0	1.802 2E-12	B
ZDH HC19	NM_00103 9617	14	PSR030381 30.hg.1	3	-	19593 7487	1959 3753 0	0.77	1. 9	1.384 8E-09	B
FAM 200B	NM_00114 5191	2	PSR040022 42.hg.1	4	+	15683 380	1568 3407	0.74	1. 4	1.443 1E-06	B
FAM 200B	NM_00114 5191	9	PSR040022 56.hg.1	4	+	15686 509	1568 6582	0.69	1. 4	0.000 37617	B
FAM 200B	NM_00114 5191	10	PSR040022 57.hg.1	4	+	15687 859	1568 8019	0.75	1. 5	6.563 3E-07	B
FAM 200B	NM_00114 5191	11	PSR040022 58.hg.1	4	+	15688 020	1568 8085	0.72	1. 4	1.591 4E-05	B
FAM 200B	NM_00114 5191	12	PSR040022 59.hg.1	4	+	15688 086	1568 8191	0.80	1. 7	9.005 7E-10	B
FAM 200B	NM_00114 5191	13	PSR040022 60.hg.1	4	+	15688 192	1568 8229	0.74	5. 0	5.217 1E-06	B
FAM 200B	NM_00114 5191	14	PSR040022 61.hg.1	4	+	15688 230	1568 8554	0.76	1. 5	8.580 6E-08	B
FAM 200B	NM_00114 5191	15	PSR040022 62.hg.1	4	+	15688 555	1568 8600	0.68	1. 4	0.000 36696	B
FAM 200B	NM_00114 5191	16	PSR040022 64.hg.1	4	+	15688 624	1568 8673	0.74	1. 6	4.959 2E-06	B
FAM 200B	NM_00114 5191	17	PSR040022 65.hg.1	4	+	15688 674	1568 8764	0.74	1. 6	4.421 3E-06	B
FAM 200B	NM_00114 5191	18	PSR040022 68.hg.1	4	+	15688 772	1568 8928	0.82	1. 6	4.884 9E-10	B
FAM 200B	NM_00114 5191	19	PSR040022 70.hg.1	4	+	15688 936	1568 9083	0.79	1. 6	7.019 2E-09	B
FAM 200B	NM_00114 5191	20	PSR040022 72.hg.1	4	+	15689 086	1569 0173	0.82	1. 7	5.323 5E-10	B
FAM 200B	NM_00114 5191	21	PSR040022 73.hg.1	4	+	15690 174	1569 0236	0.76	1. 6	1.959 E-06	B
FAM 200B	NM_00114 5191	22	PSR040022 75.hg.1	4	+	15690 243	1569 0317	0.76	1. 7	4.322 E-07	B
FAM 200B	NM_00114 5191	23	PSR040022 76.hg.1	4	+	15690 318	1569 0574	0.73	1. 6	1.052 3E-05	B
NSU N7	NM_02467 7	4	PSR040036 04.hg.1	4	+	40752 620	4075 3008	0.85	5. 0	3.284 E-13	B
NSU N7	NM_02467 7	5	PSR040036 05.hg.1	4	+	40762 451	4076 2509	0.86	4. 0	2.232 1E-13	B
NSU N7	NM_02467 7	6	PSR040036 06.hg.1	4	+	40763 188	4076 3318	0.86	4. 4	9.392 8E-14	B
NSU N7	NM_02467 7	9	PSR040036 09.hg.1	4	+	40776 282	4077 6434	0.85	4. 8	3.493 1E-13	B
NSU N7	NM_02467 7	10	PSR040036 10.hg.1	4	+	40776 784	4077 6967	0.85	4. 7	4.497 8E-13	B
NSU	NM_02467	12	PSR040036	4	+	40778	4077	0.86	3.	1.093	B

N7	7		12.hg.1			066	8091		8	4E-13	
NSU N7	NM_02467 7	14	PSR040036 14.hg.1	4	+	40778 206	4077 8276	0.84	4.	3.484 3E-13	B
NSU N7	NM_02467 7	16	PSR040036 16.hg.1	4	+	40792 619	4079 2762	0.85	4.	3.690 7E-13	B
NSU N7	NM_02467 7	17	PSR040036 17.hg.1	4	+	40796 392	4079 6493	0.84	4.	3.348 3E-12	B
NSU N7	NM_02467 7	18	PSR040036 18.hg.1	4	+	40800 804	4080 0890	0.84	3.	7.820 2E-13	B
NSU N7	NM_02467 7	19	PSR040036 19.hg.1	4	+	40800 891	4080 0921	0.82	3.	2.042 8E-11	B
NSU N7	NM_02467 7	20	PSR040036 20.hg.1	4	+	40809 078	4080 9201	0.86	4.	3.138 3E-13	B
NSU N7	NM_02467 7	21	PSR040036 22.hg.1	4	+	40810 324	4081 0520	0.85	4.	4.849 7E-13	B
NSU N7	NM_02467 7	22	PSR040036 23.hg.1	4	+	40810 521	4081 0560	0.85	5.	4.305 2E-13	B
NSU N7	NM_02467 7	23	PSR040036 24.hg.1	4	+	40810 561	4081 1743	0.85	4.	1.985 7E-13	B
STAP 1	NM_01210 8	3	PSR040049 45.hg.1	4	+	68436 802	6843 6873	0.84	- 7. 2	8.366 4E-13	V
STAP 1	NM_01210 8	4	PSR040049 46.hg.1	4	+	68441 103	6844 1216	0.85	- 7. 7	4.611 6E-14	V
STAP 1	NM_01210 8	6	PSR040049 48.hg.1	4	+	68447 023	6844 7189	0.85	- 8. 0	6.354 3E-14	V
STAP 1	NM_01210 8	7	PSR040049 49.hg.1	4	+	68449 292	6844 9420	0.86	- 7. 2	2.563 8E-14	V
STAP 1	NM_01210 8	8	PSR040049 50.hg.1	4	+	68456 602	6845 6671	0.85	- 6. 8	2.701 4E-13	V
STAP 1	NM_01210 8	9	PSR040049 51.hg.1	4	+	68458 978	6845 9074	0.86	- 8. 0	1.042 5E-14	V
STAP 1	NM_01210 8	10	PSR040049 52.hg.1	4	+	68472 014	6847 2107	0.86	- 6. 8	1.388 4E-14	V
ANX A3	NM_00513 9	3	PSR040062 72.hg.1	4	+	79472 924	7947 2980	0.80	3.	1.607 1E-09	B
ANX A3	NM_00513 9	4	PSR040062 73.hg.1	4	+	79472 981	7947 3013	0.80	5.	1.659 3E-09	B
ANX A3	NM_00513 9	8	PSR040062 77.hg.1	4	+	79475 590	7947 5642	0.81	2.	2.366 1E-08	B
ANX A3	NM_00513 9	10	PSR040062 79.hg.1	4	+	79494 334	7949 4421	0.80	3.	7.054 3E-09	B
ANX A3	NM_00513 9	11	PSR040062 80.hg.1	4	+	79500 181	7950 0275	0.81	3.	4.088 5E-09	B
ANX A3	NM_00513 9	12	PSR040062 81.hg.1	4	+	79503 331	7950 3444	0.80	3.	7.184 4E-09	B
ANX A3	NM_00513 9	13	PSR040062 83.hg.1	4	+	79503 446	7950 3575	0.73	2.	5.255 7E-06	B
ANX A3	NM_00513 9	14	PSR040062 84.hg.1	4	+	79507 414	7950 7504	0.80	3.	2.462 4E-08	B

ANX A3	NM_00513 9	15	PSR040062 85.hg.1	4	+	79512 698	7951 2757	0.81	3. 1	1.883 6E-08	B
ANX A3	NM_00513 9	16	PSR040062 87.hg.1	4	+	79516 535	7951 6591	0.81	3. 0	2.987 8E-08	B
ANX A3	NM_00513 9	18	PSR040062 89.hg.1	4	+	79518 227	7951 8472	0.74	3. 1	6.048 9E-07	B
ANX A3	NM_00513 9	20	PSR040062 91.hg.1	4	+	79522 664	7952 2722	0.79	2. 7	6.400 3E-08	B
ANX A3	NM_00513 9	22	PSR040062 93.hg.1	4	+	79525 431	7952 5553	0.79	3. 0	3.731 3E-08	B
ANX A3	NM_00513 9	23	PSR040062 94.hg.1	4	+	79531 210	7953 1517	0.79	3. 0	7.934 E-08	B
HER C6	NM_00116 5136	11	PSR040069 99.hg.1	4	+	89314 640	8931 4734	0.92	- 13 .0	6.664 1E-21	V
HER C6	NM_00116 5136	13	PSR040070 01.hg.1	4	+	89318 003	8931 8139	0.92	- 13 .4	8.505 5E-22	V
HER C6	NM_00116 5136	15	PSR040070 04.hg.1	4	+	89319 294	8931 9361	0.93	- 13 .4	3.361 3E-22	V
HER C6	NM_00116 5136	21	PSR040070 10.hg.1	4	+	89334 229	8933 4417	0.92	- 12 .2	1.241 5E-21	V
HER C6	NM_00116 5136	22	PSR040070 12.hg.1	4	+	89338 577	8933 8731	0.92	- 11 .3	7.875 6E-21	V
HER C6	NM_00116 5136	23	PSR040070 14.hg.1	4	+	89345 013	8934 5125	0.92	- 11 .4	3.779 9E-21	V
HER C6	NM_00116 5136	24	PSR040070 15.hg.1	4	+	89345 747	8934 5854	0.92	- 14 .6	6.595 1E-22	V
HER C6	NM_00116 5136	27	PSR040070 18.hg.1	4	+	89352 314	8935 2457	0.93	- 15 .3	6.985 6E-23	V
HER C6	NM_00116 5136	28	PSR040070 19.hg.1	4	+	89356 877	8935 7043	0.93	- 11 .9	7.577 E-22	V
HER C6	NM_00116 5136	29	PSR040070 20.hg.1	4	+	89358 057	8935 8123	0.92	- 14 .9	2.914 3E-22	V
HER C6	NM_00116 5136	30	PSR040070 21.hg.1	4	+	89358 863	8935 8933	0.93	- 14 .4	1.077 5E-22	V
HER C6	NM_00116 5136	31	PSR040070 23.hg.1	4	+	89361 026	8936 1209	0.93	- 14 .9	1.380 4E-22	V
HER C6	NM_00116 5136	34	PSR040070 26.hg.1	4	+	89363 386	8936 4248	0.93	- 13 .9	6.275 7E-22	V
SULT 1B1	NM_01446 5	2	PSR040172 58.hg.1	4	-	70592 699	7059 2918	0.88	3. 7	8.803 8E-16	B
SULT 1B1	NM_01446 5	3	PSR040172 59.hg.1	4	-	70596 219	7059 6399	0.88	3. 8	5.818 7E-16	B
SULT 1B1	NM_01446 5	5	PSR040172 61.hg.1	4	-	70599 856	7059 9890	0.88	3. 7	6.495 9E-16	B

SULT 1B1	NM_01446 5	6	PSR040172 62.hg.1	4	-	70599 891	7059 9982	0.89	4. 2	2.124 8E-16	B
SULT 1B1	NM_01446 5	7	PSR040172 63.hg.1	4	-	70615 439	7061 5536	0.88	3. 7	6.125 8E-16	B
IGJ	NM_14464 6	4	PSR040173 12.hg.1	4	-	71522 046	7152 2079	0.72	- 4. 8	9.235 2E-06	V
PPM1 K	NM_15254 2	1	PSR040191 96.hg.1	4	-	89181 532	8918 3022	0.90	- 5. 3	4.254 2E-18	V
PPM1 K	NM_15254 2	2	PSR040191 98.hg.1	4	-	89183 043	8918 3314	0.90	- 4. 9	1.309 7E-17	V
PPM1 K	NM_15254 2	3	PSR040191 99.hg.1	4	-	89183 315	8918 3427	0.90	- 6. 1	2.722 1E-18	V
PPM1 K	NM_15254 2	4	PSR040192 01.hg.1	4	-	89183 431	8918 3728	0.91	- 6. 6	2.855 9E-19	V
PPM1 K	NM_15254 2	5	PSR040192 02.hg.1	4	-	89183 729	8918 3878	0.91	- 5. 7	1.742 4E-18	V
PPM1 K	NM_15254 2	6	PSR040192 03.hg.1	4	-	89186 153	8918 6287	0.91	- 6. 2	1.12E- 19	V
PPM1 K	NM_15254 2	7	PSR040192 04.hg.1	4	-	89189 342	8918 9486	0.92	- 6. 2	1.477 3E-19	V
PPM1 K	NM_15254 2	8	PSR040192 08.hg.1	4	-	89189 914	8919 0058	0.90	- 4. 2	1.098 7E-17	V
PPM1 K	NM_15254 2	13	PSR040192 13.hg.1	4	-	89196 461	8919 8294	0.89	- 4. 3	7.024 6E-16	V
PPM1 K	NM_15254 2	14	PSR040192 14.hg.1	4	-	89198 295	8919 8395	0.90	- 5. 3	1.018 5E-18	V
PPM1 K	NM_15254 2	16	PSR040192 16.hg.1	4	-	89199 296	8919 9344	0.91	- 6. 1	1.191 4E-18	V
PPM1 K	NM_15254 2	19	PSR040192 19.hg.1	4	-	89199 719	8919 9794	0.90	- 5. 2	1.140 5E-16	V
PPM1 K	NM_15254 2	22	PSR040192 22.hg.1	4	-	89205 558	8920 5713	0.90	- 4. 2	1.270 5E-17	V
PPM1 K	NM_15254 2	23	PSR040192 26.hg.1	4	-	89205 748	8920 5783	0.90	- 6. 8	1.047 6E-18	V
HPG D	NM_00086 0	2	PSR040241 58.hg.1	4	-	17541 1380	1754 1225 4	0.82	4. 1	4.970 7E-11	B
HPG D	NM_00086 0	3	PSR040241 59.hg.1	4	-	17541 2255	1754 1260 8	0.81	6. 1	5.883 6E-10	B
HPG D	NM_00086 0	4	PSR040241 60.hg.1	4	-	17541 2609	1754 1272	0.80	5. 8	7.244 1E-10	B

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HPG D	NM_00086 0	5	PSR040241 61.hg.1	4	-	17541 2722	1754 1290 5	0.81	5. 7	7.387 E-10	B
HPG D	NM_00086 0	6	PSR040241 62.hg.1	4	-	17541 2906	1754 1293 5	0.79	5. 0	6.247 8E-09	B
HPG D	NM_00086 0	7	PSR040241 64.hg.1	4	-	17541 2945	1754 1302 0	0.81	7. 3	1.541 7E-10	B
HPG D	NM_00086 0	8	PSR040241 65.hg.1	4	-	17541 3021	1754 1308 3	0.81	6. 7	3.659 9E-10	B
HPG D	NM_00086 0	9	PSR040241 66.hg.1	4	-	17541 3084	1754 1324 5	0.81	7. 2	2.805 9E-10	B
HPG D	NM_00086 0	10	PSR040241 69.hg.1	4	-	17541 4310	1754 1446 5	0.82	7. 4	3.550 8E-11	B
HPG D	NM_00086 0	13	PSR040241 72.hg.1	4	-	17541 6699	1754 1677 5	0.82	6. 8	8.298 3E-11	B
HPG D	NM_00086 0	16	PSR040241 75.hg.1	4	-	17542 9847	1754 2994 3	0.82	7. 9	2.931 E-11	B
HPG D	NM_00086 0	17	PSR040241 76.hg.1	4	-	17543 9122	1754 3922 8	0.82	7. 3	6.325 8E-11	B
HPG D	NM_00086 0	18	PSR040241 77.hg.1	4	-	17544 3095	1754 4321 8	0.83	7. 7	1.586 E-11	B
ANK RD34 B	NM_00100 4441	1	PSR050209 72.hg.1	5	-	79852 577	7985 3364	0.78	2. 7	1.358 9E-09	B
ANK RD34 B	NM_00100 4441	2	PSR050209 74.hg.1	5	-	79853 366	7985 3614	0.78	2. 6	1.715 6E-08	B
ANK RD34 B	NM_00100 4441	3	PSR050209 75.hg.1	5	-	79853 615	7985 4293	0.79	3. 5	3.071 8E-10	B
ANK RD34 B	NM_00100 4441	4	PSR050209 76.hg.1	5	-	79854 294	7985 5787	0.79	4. 0	1.486 8E-10	B
ANK RD34 B	NM_00100 4441	5	PSR050209 77.hg.1	5	-	79855 788	7985 5838	0.82	3. 1	1.346 7E-11	B
ANK RD34 B	NM_00100 4441	6	PSR050209 79.hg.1	5	-	79859 554	7985 9634	0.83	5. 3	2.758 5E-12	B
ANK RD34 B	NM_00100 4441	7	PSR050209 80.hg.1	5	-	79860 203	7986 0288	0.78	2. 4	5.590 8E-09	B
ANK RD34 B	NM_00100 4441	8	PSR050209 81.hg.1	5	-	79862 508	7986 2590	0.82	3. 5	5.615 2E-12	B
ANK RD34	NM_00100 4441	9	PSR050209 83.hg.1	5	-	79864 779	7986 4896	0.83	2. 8	1.017 4E-11	B

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MAP K14	NM_00131 5	5	PSR060056 13.hg.1	6	+	35995 935	3599 5967	0.85	5. 3	2.426 7E-13	B
MAP K14	NM_00131 5	6	PSR060056 15.hg.1	6	+	35995 976	3599 6050	0.86	4. 1	1.028 2E-13	B
MAP K14	NM_00131 5	9	PSR060056 18.hg.1	6	+	36027 066	3602 7124	0.88	2. 9	1.227 1E-14	B
MAP K14	NM_00131 5	10	PSR060056 19.hg.1	6	+	36040 650	3604 0761	0.88	3. 1	7.859 9E-15	B
MAP K14	NM_00131 5	12	PSR060056 21.hg.1	6	+	36041 468	3604 1497	0.89	2. 7	4.909 9E-15	B
MAP K14	NM_00131 5	13	PSR060056 22.hg.1	6	+	36041 826	3604 1873	0.88	2. 9	5.371 8E-15	B
MAP K14	NM_00131 5	15	PSR060056 25.hg.1	6	+	36043 642	3604 3739	0.87	2. 8	1.288 1E-14	B
MAP K14	NM_00131 5	17	PSR060056 28.hg.1	6	+	36044 386	3604 4665	0.77	2. 9	8.241 4E-08	B
MAP K14	NM_00131 5	18	PSR060056 29.hg.1	6	+	36063 764	3606 3843	0.87	2. 6	2.045 E-14	B
MAP K14	NM_00131 5	20	PSR060056 31.hg.1	6	+	36067 965	3606 8044	0.85	2. 9	1.824 2E-13	B
MAP K14	NM_00131 5	27	PSR060056 39.hg.1	6	+	36076 448	3607 8531	0.86	3. 1	6.279 2E-14	B
MAP K14	NM_00131 5	28	PSR060056 41.hg.1	6	+	36078 533	3607 9013	0.82	2. 8	1.563 1E-12	B
FTSJ D2	NM_01505 0	12	PSR060060 01.hg.1	6	+	37421 016	3742 1088	0.81	- 3.	6.039 7E-11	V
FTSJ D2	NM_01505 0	13	PSR060060 02.hg.1	6	+	37426 388	3742 6465	0.81	- 3.	1.299 5E-10	V
FTSJ D2	NM_01505 0	20	PSR060060 11.hg.1	6	+	37429 849	3742 9878	0.81	- 3.	1.494 7E-11	V
FTSJ D2	NM_01505 0	22	PSR060060 13.hg.1	6	+	37430 647	3743 0784	0.83	- 3.	2.256 9E-11	V
FTSJ D2	NM_01505 0	23	PSR060060 14.hg.1	6	+	37438 797	3743 8853	0.83	- 3.	3.631 8E-12	V
FTSJ D2	NM_01505 0	24	PSR060060 15.hg.1	6	+	37439 623	3743 9680	0.84	- 3.	1.969 7E-12	V
FTSJ D2	NM_01505 0	25	PSR060060 16.hg.1	6	+	37440 195	3744 0263	0.84	- 3.	3.601 2E-12	V
FTSJ D2	NM_01505 0	26	PSR060060 17.hg.1	6	+	37441 246	3744 1343	0.85	- 3.	6.776 7E-14	V
FTSJ D2	NM_01505 0	27	PSR060060 18.hg.1	6	+	37441 344	3744 1377	0.85	- 4.	3.616 3E-13	V
FTSJ D2	NM_01505 0	28	PSR060060 19.hg.1	6	+	37442 300	3744 2422	0.85	- 3.	3.411 E-13	V
FTSJ D2	NM_01505 0	29	PSR060060 22.hg.1	6	+	37443 121	3744 3188	0.87	- 4.	5.448 3E-15	V

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FTSJ D2	NM_01505 0	31	PSR060060 24.hg.1	6	+	37443 902	3744 3970	0.88	- 4. 5	1.644 9E-16	V
FTSJ D2	NM_01505 0	32	PSR060060 25.hg.1	6	+	37445 368	3744 5415	0.87	- 3. 7	2.204 3E-15	V
FTSJ D2	NM_01505 0	33	PSR060060 26.hg.1	6	+	37446 185	3744 6297	0.89	- 5. 4	2.227 4E-17	V
FTSJ D2	NM_01505 0	34	PSR060060 27.hg.1	6	+	37446 923	3744 6971	0.88	- 4. 2	1.383 E-16	V
FTSJ D2	NM_01505 0	35	PSR060060 28.hg.1	6	+	37446 972	3744 7002	0.88	- 4. 4	6.265 1E-16	V
FTSJ D2	NM_01505 0	36	PSR060060 29.hg.1	6	+	37447 003	3744 7031	0.89	- 5. 2	1.264 8E-16	V
FTSJ D2	NM_01505 0	38	PSR060060 32.hg.1	6	+	37448 168	3744 8855	0.87	- 3. 6	1.496 3E-14	V
FTSJ D2	NM_01505 0	39	PSR060060 33.hg.1	6	+	37448 856	3744 8922	0.88	- 3. 4	1.793 4E-14	V
CD2 AP	NM_01212 0	3	PSR060076 87.hg.1	6	+	47471 016	4747 1176	0.88	- 4. 1	5.369 2E-17	V
CD2 AP	NM_01212 0	4	PSR060076 88.hg.1	6	+	47501 338	4750 1420	0.91	- 4. 3	1.054 4E-18	V
CD2 AP	NM_01212 0	5	PSR060076 89.hg.1	6	+	47501 421	4750 1491	0.89	- 4. 7	2.894 1E-18	V
CD2 AP	NM_01212 0	6	PSR060076 90.hg.1	6	+	47512 342	4751 2442	0.88	- 4. 0	5.199 2E-17	V
CD2 AP	NM_01212 0	8	PSR060076 92.hg.1	6	+	47522 382	4752 2502	0.89	- 3. 5	1.221 9E-16	V
CD2 AP	NM_01212 0	9	PSR060076 93.hg.1	6	+	47541 800	4754 1987	0.89	- 4. 3	7.308 3E-17	V
CD2 AP	NM_01212 0	10	PSR060076 95.hg.1	6	+	47544 260	4754 4338	0.90	- 4. 4	1.184 3E-17	V
CD2 AP	NM_01212 0	11	PSR060076 96.hg.1	6	+	47544 745	4754 4839	0.90	- 4. 6	1.100 4E-17	V
CD2 AP	NM_01212 0	12	PSR060076 98.hg.1	6	+	47547 130	4754 7225	0.90	- 4. 9	3.06E- 18	V
CD2 AP	NM_01212 0	15	PSR060077 01.hg.1	6	+	47549 739	4754 9801	0.88	- 3. 8	3.841 3E-15	V
CD2 AP	NM_01212 0	17	PSR060077 03.hg.1	6	+	47563 597	4756 3762	0.88	- 3.	2.179 4E-16	V

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CD2 AP	NM_01212 0	18	PSR060077 04.hg.1	6	+	47567 037	4756 7179	0.90	- 4. 2	2.345 9E-17	V
CD2 AP	NM_01212 0	19	PSR060077 05.hg.1	6	+	47573 901	4757 4013	0.89	- 4. 5	1.807 E-17	V
CD2 AP	NM_01212 0	21	PSR060077 07.hg.1	6	+	47575 663	4757 5764	0.89	- 3. 7	2.872 9E-17	V
CD2 AP	NM_01212 0	22	PSR060077 08.hg.1	6	+	47576 859	4757 7040	0.88	- 3. 7	3.322 5E-16	V
CD2 AP	NM_01212 0	24	PSR060077 10.hg.1	6	+	47580 209	4758 0272	0.89	- 3. 7	3.729 6E-17	V
CD2 AP	NM_01212 0	25	PSR060077 11.hg.1	6	+	47591 922	4759 2011	0.88	- 4. 2	2.778 1E-16	V
CD2 AP	NM_01212 0	26	PSR060077 12.hg.1	6	+	47592 012	4759 4996	0.88	- 4. 7	1.345 2E-16	V
NCO A7	NM_00112 2842	3	PSR060112 11.hg.1	6	+	12610 7283	1261 0735 9	0.52	1. 2	0.247 16264	B
NCO A7	NM_00112 2842	10	PSR060112 19.hg.1	6	+	12613 6437	1261 3655 0	0.60	1. 2	0.039 02208	B
NCO A7	NM_00112 2842	14	PSR060112 23.hg.1	6	+	12619 6035	1261 9611 4	0.64	1. 2	0.009 15867	B
NCO A7	NM_00112 2842	15	PSR060112 24.hg.1	6	+	12619 9409	1261 9951 6	0.65	1. 2	0.005 80473	B
NCO A7	NM_00112 2842	16	PSR060112 25.hg.1	6	+	12620 2236	1262 0234 9	0.62	1. 3	0.009 91852	B
NCO A7	NM_00112 2842	17	PSR060112 26.hg.1	6	+	12620 3572	1262 0369 7	0.65	1. 2	0.032 73458	B
NCO A7	NM_00112 2842	19	PSR060112 28.hg.1	6	+	12620 6305	1262 0648 9	0.65	1. 3	0.002 16239	B
NCO A7	NM_00112 2842	21	PSR060112 30.hg.1	6	+	12621 0085	1262 1011 7	0.61	1. 2	0.016 07899	B
NCO A7	NM_00112 2842	23	PSR060112 33.hg.1	6	+	12621 1801	1262 1195 6	0.60	1. 2	0.042 74364	B
NCO A7	NM_00112 2842	27	PSR060112 38.hg.1	6	+	12624 0370	1262 4045 0	0.75	- 1. 6	5.150 4E-07	V
NCO A7	NM_00112 2842	28	PSR060112 39.hg.1	6	+	12624 0451	1262 4057 7	0.82	- 9. 9	1.863 1E-11	V
NCO A7	NM_00112 2842	29	PSR060112 40.hg.1	6	+	12624 2089	1262 4221	0.80	- 4.	2.195 4E-09	V

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NCO A7	NM_00112 2842	30	PSR060112 41.hg.1	6	+	12624 3828	1262 4398 0	0.81	- 5. 3	5.056 6E-10	V
NCO A7	NM_00112 2842	31	PSR060112 42.hg.1	6	+	12624 8809	1262 4890 4	0.81	- 5. 1	6.684 9E-10	V
NCO A7	NM_00112 2842	32	PSR060112 44.hg.1	6	+	12624 9329	1262 4939 3	0.81	- 4. 2	5.633 9E-09	V
NCO A7	NM_00112 2842	33	PSR060112 45.hg.1	6	+	12624 9782	1262 4998 2	0.81	- 5. 0	2.824 5E-10	V
NCO A7	NM_00112 2842	34	PSR060112 46.hg.1	6	+	12624 9983	1262 5017 3	0.77	- 4. 1	6.879 E-08	V
NCO A7	NM_00112 2842	35	PSR060112 47.hg.1	6	+	12625 0174	1262 5225 7	0.81	- 4. 8	1.502 E-09	V
NCO A7	NM_00112 2842	36	PSR060112 49.hg.1	6	+	12625 2267	1262 5317 6	0.72	- 1. 6	0.000 10919	V
ARG 1	NM_00004 5	2	PSR060115 80.hg.1	6	+	13189 4392	1318 9441 7	0.78	6. 6	2.519 9E-08	B
ARG 1	NM_00004 5	6	PSR060115 85.hg.1	6	+	13190 0251	1319 0034 1	0.78	6. 6	1.890 6E-08	B
ARG 1	NM_00004 5	15	PSR060115 99.hg.1	6	+	13190 4200	1319 0424 5	0.76	6. 5	1.430 3E-07	B
ARG 1	NM_00004 5	17	PSR060116 02.hg.1	6	+	13190 4499	1319 0453 8	0.77	6. 6	3.548 3E-08	B
VNN 1	NM_00466 6	7	PSR060265 73.hg.1	6	-	13301 3362	1330 1372 3	0.84	10 .1	3.894 6E-12	B
LRR N3	NM_00109 9658	4	PSR070110 47.hg.1	7	+	11073 1183	1107 3156 0	0.73	- 3. 0	8.205 4E-06	V
LRR N3	NM_00109 9658	8	PSR070110 51.hg.1	7	+	11076 2471	1107 6282 8	0.73	- 4. 9	6.273 4E-06	V
LRR N3	NM_00109 9658	9	PSR070110 52.hg.1	7	+	11076 2829	1107 6364 9	0.72	- 3. 7	2.473 4E-05	V
LRR N3	NM_00109 9658	10	PSR070110 53.hg.1	7	+	11076 3650	1107 6495 5	0.72	- 3. 7	2.916 3E-05	V
LRR N3	NM_00109 9658	12	PSR070110 55.hg.1	7	+	11076 4989	1107 6546 2	0.71	- 2. 7	2.469 6E-05	V
MGA M	NM_00466 8	7	PSR070139 39.hg.1	7	+	14170 4190	1417 0428 8	0.85	5. 7	1.794 8E-13	B
MGA M	NM_00466 8	10	PSR070139 42.hg.1	7	+	14171 8999	1417 1904	0.88	5. 3	2.398 8E-15	B

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MGA M	NM_00466 8	11	PSR070139 43.hg.1	7	+	14171 9041	1417 1910 0	0.90	5. 5	1.766 9E-16	B
MGA M	NM_00466 8	14	PSR070139 48.hg.1	7	+	14172 2068	1417 2223 9	0.90	4. 4	1.343 5E-15	B
MGA M	NM_00466 8	15	PSR070139 49.hg.1	7	+	14172 4850	1417 2494 9	0.89	4. 3	1.211 1E-15	B
MGA M	NM_00466 8	17	PSR070139 51.hg.1	7	+	14172 7410	1417 2753 5	0.89	4. 4	1.161 2E-15	B
MGA M	NM_00466 8	19	PSR070139 53.hg.1	7	+	14173 0162	1417 3029 3	0.89	4. 5	3.087 3E-15	B
MGA M	NM_00466 8	20	PSR070139 54.hg.1	7	+	14173 0441	1417 3055 7	0.90	4. 6	5.743 4E-15	B
MGA M	NM_00466 8	23	PSR070139 58.hg.1	7	+	14173 4062	1417 3417 9	0.89	4. 6	1.440 5E-14	B
MGA M	NM_00466 8	27	PSR070139 63.hg.1	7	+	14173 8346	1417 3841 5	0.89	6. 4	8.036 8E-16	B
MGA M	NM_00466 8	36	PSR070139 72.hg.1	7	+	14175 4554	1417 5470 8	0.89	4. 3	5.846 9E-14	B
MGA M	NM_00466 8	37	PSR070139 73.hg.1	7	+	14175 5358	1417 5552 6	0.89	4. 4	3.242 8E-14	B
MGA M	NM_00466 8	40	PSR070139 76.hg.1	7	+	14175 8003	1417 5812 8	0.88	4. 7	1.216 6E-13	B
MGA M	NM_00466 8	41	PSR070139 77.hg.1	7	+	14175 9272	1417 5940 0	0.88	4. 7	9.715 6E-14	B
MGA M	NM_00466 8	42	PSR070139 78.hg.1	7	+	14175 9656	1417 5976 6	0.88	4. 9	1.455 2E-14	B
MGA M	NM_00466 8	45	PSR070139 81.hg.1	7	+	14176 3299	1417 6338 6	0.88	4. 8	1.005 6E-13	B
MGA M	NM_00466 8	46	PSR070139 82.hg.1	7	+	14176 4184	1417 6432 2	0.88	5. 7	3.112 6E-15	B
MGA M	NM_00466 8	48	PSR070139 84.hg.1	7	+	14176 5388	1417 6542 2	0.86	4. 7	1.756 6E-10	B
MGA M	NM_00466 8	51	PSR070139 87.hg.1	7	+	14176 7141	1417 6722 5	0.88	4. 4	8.314 7E-13	B
MGA M	NM_00466 8	55	PSR070139 92.hg.1	7	+	14177 6003	1417 7605 2	0.86	4. 5	1.456 1E-07	B
MGA M	NM_00466 8	60	PSR070139 97.hg.1	7	+	14178 0591	1417 8074	0.88	4. 3	9.967 1E-12	B

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MGA M	NM_00466 8	64	PSR070140 01.hg.1	7	+	14178 4319	1417 8444 4	0.87	4. 7	4.566 5E-12	B
MGA M	NM_00466 8	65	PSR070140 02.hg.1	7	+	14178 5633	1417 8576 1	0.88	4. 8	1.292 1E-12	B
MGA M	NM_00466 8	66	PSR070140 03.hg.1	7	+	14178 6018	1417 8612 8	0.87	4. 9	2.336 5E-12	B
MGA M	NM_00466 8	70	PSR070140 07.hg.1	7	+	14179 2321	1417 9240 8	0.87	4. 8	1.344 7E-12	B
MGA M	NM_00466 8	71	PSR070140 08.hg.1	7	+	14179 3212	1417 9335 0	0.85	5. 8	4.637 E-12	B
MGA M	NM_00466 8	72	PSR070140 09.hg.1	7	+	14179 4164	1417 9429 7	0.86	4. 6	1.209 4E-11	B
MGA M	NM_00466 8	73	PSR070140 10.hg.1	7	+	14179 4420	1417 9445 4	0.86	4. 4	1.180 2E-11	B
MGA M	NM_00466 8	83	PSR070140 20.hg.1	7	+	14180 2430	1418 0247 9	0.89	4. 8	8.536 2E-15	B
MGA M	NM_00466 8	85	PSR070140 22.hg.1	7	+	14180 5614	1418 0587 9	0.89	4. 7	5.935 3E-15	B
PARP 12	NM_02275 0	3	PSR070296 93.hg.1	7	-	13972 4334	1397 2438 0	0.88	- 8. 4	5.410 1E-16	V
PARP 12	NM_02275 0	5	PSR070296 96.hg.1	7	-	13972 4468	1397 2467 8	0.91	- 6. 7	1.123 E-19	V
PARP 12	NM_02275 0	8	PSR070297 02.hg.1	7	-	13972 7076	1397 2711 8	0.90	- 9. 3	1.113 2E-18	V
PARP 12	NM_02275 0	11	PSR070297 05.hg.1	7	-	13972 8413	1397 2848 8	0.89	- 7. 4	3.243 9E-18	V
PARP 12	NM_02275 0	14	PSR070297 08.hg.1	7	-	13973 4035	1397 3413 1	0.91	- 6. 7	4.323 7E-20	V
PARP 12	NM_02275 0	16	PSR070297 10.hg.1	7	-	13973 7515	1397 3765 6	0.90	- 6. 5	4.531 8E-19	V
PARP 12	NM_02275 0	18	PSR070297 12.hg.1	7	-	13974 1444	1397 4152 8	0.90	- 6. 8	1.847 1E-19	V
PARP 12	NM_02275 0	28	PSR070297 22.hg.1	7	-	13976 2322	1397 6235 1	0.89	- 11 .8	6.038 E-18	V
AKA P2	NM_00100 4065	27	PSR090061 38.hg.1	9	+	11289 8430	1128 9861 4	0.71	- 1. 3	3.011 7E-05	V
AKA P2	NM_00100 4065	28	PSR090061 39.hg.1	9	+	11289 8615	1129 0045	0.64	- 1.	0.008 87188	V

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AKA P2	NM_00100 4065	29	PSR090061 40.hg.1	9	+	11290 0451	1129 0070 6	0.69	- 1. 5	0.000 42177	V
AKA P2	NM_00100 4065	30	PSR090061 41.hg.1	9	+	11290 0707	1129 0081 9	0.73	- 1. 5	8.685 8E-06	V
AKA P2	NM_00100 4065	31	PSR090061 42.hg.1	9	+	11291 0808	1129 1098 3	0.90	- 2. 4	3.184 2E-16	V
AKA P2	NM_00100 4065	32	PSR090061 43.hg.1	9	+	11291 8599	1129 1877 7	0.89	- 5. 0	5.627 7E-16	V
AKA P2	NM_00100 4065	33	PSR090061 44.hg.1	9	+	11292 4374	1129 2441 2	0.79	- 1. 5	1.011 7E-08	V
AKA P2	NM_00100 4065	34	PSR090061 46.hg.1	9	+	11293 0687	1129 3077 7	0.88	- 5. 4	1.321 9E-16	V
AKA P2	NM_00100 4065	35	PSR090061 47.hg.1	9	+	11293 0778	1129 3091 3	0.89	- 6. 1	3.038 5E-16	V
AKA P2	NM_00100 4065	36	PSR090061 48.hg.1	9	+	11293 0914	1129 3109 1	0.89	- 5. 5	8.786 6E-17	V
AKA P2	NM_00100 4065	37	PSR090061 49.hg.1	9	+	11293 1092	1129 3116 9	0.88	- 5. 4	6.37E- 16	V
AKA P2	NM_00100 4065	38	PSR090061 50.hg.1	9	+	11293 1170	1129 3218 9	0.87	- 6. 5	3.311 3E-15	V
AKA P2	NM_00100 4065	39	PSR090061 51.hg.1	9	+	11293 2190	1129 3479 1	0.87	- 5. 7	9.740 1E-15	V
C9orf 91	NM_15304 5	7	PSR090066 72.hg.1	9	+	11738 6630	1173 8673 9	0.78	- 2. 7	1.581 3E-08	V
C9orf 91	NM_15304 5	8	PSR090066 74.hg.1	9	+	11738 9179	1173 8928 6	0.78	- 2. 3	1.351 1E-07	V
C9orf 91	NM_15304 5	9	PSR090066 75.hg.1	9	+	11739 0381	1173 9050 5	0.77	- 2. 4	3.328 3E-08	V
C9orf 91	NM_15304 5	10	PSR090066 77.hg.1	9	+	11739 6048	1173 9615 8	0.80	- 2. 2	1.267 6E-08	V
C9orf 91	NM_15304 5	11	PSR090066 78.hg.1	9	+	11739 9270	1173 9935 0	0.80	- 3. 4	5.716 2E-10	V
C9orf 91	NM_15304 5	12	PSR090066 79.hg.1	9	+	11740 0824	1174 0100 6	0.84	- 3. 4	1.996 4E-11	V
C9orf 91	NM_15304 5	13	PSR090066 80.hg.1	9	+	11740 5414	1174 0554 6	0.85	- 3. 3	2.800 5E-12	V
C9orf 91	NM_15304 5	14	PSR090066 81.hg.1	9	+	11740 5547	1174 0567	0.87	- 3.	1.449 3E-13	V

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C9orf 91	NM_15304 5	15	PSR090066 82.hg.1	9	+	11740 5680	1174 0633 5	0.88	- 4. 0	9.811 8E-15	V
C9orf 91	NM_15304 5	16	PSR090066 84.hg.1	9	+	11740 6347	1174 0644 1	0.88	- 4. 9	1.454 9E-15	V
C9orf 91	NM_15304 5	17	PSR090066 85.hg.1	9	+	11740 6442	1174 0698 4	0.88	- 4. 7	9.724 E-16	V
C9orf 91	NM_15304 5	18	PSR090066 86.hg.1	9	+	11740 6985	1174 0870 2	0.85	- 3. 1	3.310 2E-12	V
GSN	NM_19825 2	3	PSR090069 17.hg.1	9	+	12397 1574	1239 7167 5	0.83	- 3. 5	2.439 6E-10	V
GSN	NM_19825 2	4	PSR090069 18.hg.1	9	+	12397 2514	1239 7260 7	0.90	- 4. 2	4.256 9E-14	V
GSN	NM_19825 2	5	PSR090069 19.hg.1	9	+	12397 3062	1239 7314 5	0.90	- 14 .6	7.980 8E-15	V
GSN	NM_19825 2	6	PSR090069 20.hg.1	9	+	12399 3443	1239 9358 1	0.88	- 5. 7	1.053 6E-12	V
GSN	NM_19825 2	8	PSR090069 22.hg.1	9	+	12402 7432	1240 2746 4	0.83	- 5. 8	4.091 3E-11	V
GSN	NM_19825 2	9	PSR090069 23.hg.1	9	+	12402 7465	1240 2757 5	0.85	- 3. 6	2.503 2E-10	V
GSN	NM_19825 2	10	PSR090069 24.hg.1	9	+	12402 7939	1240 2803 2	0.86	- 6. 9	1.038 1E-12	V
GSN	NM_19825 2	13	PSR090069 29.hg.1	9	+	12403 0456	1240 3049 7	0.69	1. 2	0.000 15075	B
GSN	NM_19825 2	14	PSR090069 31.hg.1	9	+	12404 3750	1240 4378 8	0.68	1. 7	0.000 61361	B
GSN	NM_19825 2	15	PSR090069 32.hg.1	9	+	12404 3789	1240 4384 0	0.73	1. 8	8.288 4E-06	B
GSN	NM_19825 2	16	PSR090069 33.hg.1	9	+	12404 4153	1240 4423 1	0.59	- 1. 4	0.018 1671	V
GSN	NM_19825 2	20	PSR090069 37.hg.1	9	+	12404 8870	1240 4903 9	0.56	- 1. 2	0.075 41154	V
GSN	NM_19825 2	21	PSR090069 38.hg.1	9	+	12406 0044	1240 6012 0	0.63	- 1. 6	0.002 76838	V
GSN	NM_19825 2	24	PSR090069 43.hg.1	9	+	12406 2343	1240 6240 4	0.63	- 1. 6	0.002 31671	V
GSN	NM_19825 2	26	PSR090069 47.hg.1	9	+	12406 4249	1240 6432	0.80	1. 6	3.020 2E-09	B

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GSN	NM_19825 2	27	PSR090069 48.hg.1	9	+	12406 4326	1240 6437 3	0.82	3. 0	5.852 1E-11	B
GSN	NM_19825 2	28	PSR090069 49.hg.1	9	+	12406 4374	1240 6442 6	0.81	2. 5	4.950 1E-10	B
GSN	NM_19825 2	29	PSR090069 51.hg.1	9	+	12406 5189	1240 6525 5	0.79	1. 8	3.296 2E-09	B
GSN	NM_19825 2	30	PSR090069 52.hg.1	9	+	12406 5256	1240 6533 3	0.81	2. 6	2.913 8E-10	B
GSN	NM_19825 2	32	PSR090069 55.hg.1	9	+	12407 2962	1240 7312 3	0.82	2. 3	6.541 6E-10	B
GSN	NM_19825 2	35	PSR090069 58.hg.1	9	+	12407 4617	1240 7475 3	0.82	2. 1	1.932 5E-10	B
GSN	NM_19825 2	37	PSR090069 64.hg.1	9	+	12407 6212	1240 7630 1	0.82	2. 1	1.747 8E-10	B
GSN	NM_19825 2	38	PSR090069 65.hg.1	9	+	12407 9364	1240 7939 0	0.81	2. 5	5.009 E-10	B
GSN	NM_19825 2	39	PSR090069 66.hg.1	9	+	12407 9391	1240 7949 6	0.83	2. 2	7.935 9E-11	B
GSN	NM_19825 2	41	PSR090069 68.hg.1	9	+	12408 0684	1240 8077 2	0.82	2. 0	7.751 9E-10	B
GSN	NM_19825 2	42	PSR090069 69.hg.1	9	+	12408 0943	1240 8101 1	0.80	1. 7	7.342 2E-09	B
GSN	NM_19825 2	43	PSR090069 70.hg.1	9	+	12408 1012	1240 8115 8	0.81	1. 9	2.052 2E-09	B
GSN	NM_19825 2	44	PSR090069 71.hg.1	9	+	12408 3546	1240 8358 9	0.82	2. 4	4.267 2E-10	B
GSN	NM_19825 2	45	PSR090069 72.hg.1	9	+	12408 3590	1240 8367 9	0.83	2. 3	2.110 4E-10	B
GSN	NM_19825 2	46	PSR090069 73.hg.1	9	+	12408 6832	1240 8692 2	0.82	2. 2	3.047 E-10	B
GSN	NM_19825 2	47	PSR090069 74.hg.1	9	+	12408 8790	1240 8885 9	0.82	2. 0	5.240 8E-10	B
GSN	NM_19825 2	51	PSR090069 78.hg.1	9	+	12408 9586	1240 8976 0	0.81	1. 7	2.123 6E-09	B
GSN	NM_19825 2	53	PSR090069 80.hg.1	9	+	12409 1169	1240 9129 3	0.78	1. 8	1.063 1E-08	B
GSN	NM_19825 2	55	PSR090069 82.hg.1	9	+	12409 1516	1240 9159	0.80	2. 2	1.125 9E-09	B

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GSN	NM_19825 2	56	PSR090069 84.hg.1	9	+	12409 3666	1240 9372 6	0.78	1. 8	4.893 8E-08	B
GSN	NM_19825 2	58	PSR090069 86.hg.1	9	+	12409 4712	1240 9486 7	0.81	1. 8	1.000 1E-09	B
GSN	NM_19825 2	59	PSR090069 87.hg.1	9	+	12409 4868	1240 9493 4	0.80	1. 5	1.172 5E-08	B
GSN	NM_19825 2	61	PSR090069 90.hg.1	9	+	12409 5017	1240 9508 0	0.74	1. 7	5.024 4E-06	B
CNT NAP3	NM_03365 5	1	PSR090145 52.hg.1	9	-	39072 764	3907 3670	0.75	3. 9	2.613 4E-07	B
CNT NAP3	NM_03365 5	3	PSR090145 54.hg.1	9	-	39073 734	3907 4008	0.74	3. 3	1.466 6E-06	B
CNT NAP3	NM_03365 5	5	PSR090145 56.hg.1	9	-	39078 382	3907 8453	0.74	2. 7	9.848 2E-07	B
CNT NAP3	NM_03365 5	9	PSR090145 61.hg.1	9	-	39085 733	3908 5820	0.71	3. 3	1.512 E-05	B
CNT NAP3	NM_03365 5	10	PSR090145 62.hg.1	9	-	39085 821	3908 6045	0.76	4. 1	2.354 9E-07	B
CNT NAP3	NM_03365 5	11	PSR090145 63.hg.1	9	-	39086 046	3908 6145	0.75	3. 8	3.681 6E-07	B
CNT NAP3	NM_03365 5	12	PSR090145 64.hg.1	9	-	39086 146	3908 6712	0.74	3. 9	1.008 2E-06	B
CNT NAP3	NM_03365 5	13	PSR090145 65.hg.1	9	-	39086 713	3908 6846	0.74	3. 7	1.278 8E-06	B
CNT NAP3	NM_03365 5	14	PSR090145 66.hg.1	9	-	39088 420	3908 8470	0.74	3. 2	1.106 6E-06	B
CNT NAP3	NM_03365 5	15	PSR090145 68.hg.1	9	-	39088 473	3908 8644	0.74	4. 7	1.179 E-06	B
CNT NAP3	NM_03365 5	17	PSR090145 70.hg.1	9	-	39099 908	3910 0147	0.74	3. 7	1.255 4E-06	B
CNT NAP3	NM_03365 5	18	PSR090145 72.hg.1	9	-	39102 494	3910 2712	0.74	3. 3	1.391 E-06	B
CNT NAP3	NM_03365 5	20	PSR090145 77.hg.1	9	-	39103 741	3910 3905	0.76	4. 8	2.648 5E-07	B
CNT NAP3	NM_03365 5	22	PSR090145 80.hg.1	9	-	39109 157	3910 9284	0.75	3. 4	1.094 1E-06	B
CNT NAP3	NM_03365 5	23	PSR090145 83.hg.1	9	-	39117 924	3911 8099	0.77	3. 1	1.772 4E-07	B
CNT NAP3	NM_03365 5	24	PSR090145 84.hg.1	9	-	39118 100	3911 8256	0.75	3. 8	4.581 8E-07	B
CNT NAP3	NM_03365 5	30	PSR090145 92.hg.1	9	-	39149 803	3914 9974	0.75	2. 7	8.049 6E-07	B
CNT NAP3	NM_03365 5	31	PSR090145 93.hg.1	9	-	39165 930	3916 6073	0.76	3. 5	1.295 7E-07	B
CNT NAP3	NM_03365 5	32	PSR090145 94.hg.1	9	-	39171 366	3917 1627	0.73	5. 1	1.493 2E-06	B
CNT NAP3	NM_03365 5	33	PSR090145 95.hg.1	9	-	39172 783	3917 4537	0.72	2. 7	8.993 1E-06	B
CNT NAP3	NM_03365 5	34	PSR090145 96.hg.1	9	-	39175 946	3917 6089	0.75	5. 2	2.412 4E-07	B
CNT	NM_03365	35	PSR090145	9	-	39177	3917	0.74	4.	9.347	B

NAP3	5		97.hg.1			315	7499		5	E-07	
CNT NAP3	NM_03365 5	36	PSR090145 98.hg.1	9	-	39178 154	3917 8357	0.75	4. 7	1.863 5E-07	B
CNT NAP3	NM_03365 5	37	PSR090145 99.hg.1	9	-	39193 125	3919 3272	0.74	3. 5	3.658 6E-07	B
CNT NAP3	NM_03365 5	38	PSR090146 00.hg.1	9	-	39238 990	3923 9171	0.76	4. 3	8.965 1E-08	B
---	uc004abr.1	2	PSR090146 41.hg.1	9	-	40501 666	4050 1809	0.75	4. 9	2.399 1E-07	B
---	uc004abr.1	3	PSR090146 42.hg.1	9	-	40503 019	4050 3203	0.76	3. 4	1.298 7E-07	B
---	uc004abr.1	4	PSR090146 43.hg.1	9	-	40503 853	4050 4056	0.75	4. 4	1.987 5E-07	B
---	uc004abr.1	5	PSR090146 44.hg.1	9	-	40518 834	4051 8981	0.76	3. 7	1.308 7E-07	B
---	uc004abr.1	6	PSR090146 45.hg.1	9	-	40582 251	4058 2444	0.77	4. 5	5.095 1E-08	B
---	ENST0000 0438517	2	PSR090148 69.hg.1	9	-	47297 431	4729 9314	0.75	3. 2	8.307 1E-07	B
---	ENST0000 0438517	3	PSR090148 70.hg.1	9	-	47299 315	4729 9651	0.74	3. 1	2.132 8E-06	B
---	ENST0000 0438517	10	PSR090148 80.hg.1	9	-	47310 649	4731 1408	0.75	2. 3	4.014 6E-06	B
---	ENST0000 0438517	11	PSR090148 81.hg.1	9	-	47311 409	4731 1496	0.73	3. 0	4.170 7E-06	B
---	ENST0000 0438517	12	PSR090148 82.hg.1	9	-	47311 497	4731 1721	0.76	2. 3	1.850 3E-06	B
---	ENST0000 0438517	13	PSR090148 83.hg.1	9	-	47311 722	4731 1820	0.74	2. 6	1.888 5E-06	B
---	ENST0000 0438517	16	PSR090148 87.hg.1	9	-	47312 395	4731 2525	0.74	3. 6	1.064 3E-06	B
---	ENST0000 0438517	17	PSR090148 89.hg.1	9	-	47314 098	4731 4148	0.74	3. 2	1.106 6E-06	B
---	ENST0000 0438517	18	PSR090148 90.hg.1	9	-	47314 149	4731 4222	0.75	4. 9	6.819 6E-07	B
---	ENST0000 0438517	19	PSR090148 91.hg.1	9	-	47314 223	4731 4322	0.73	4. 5	1.824 8E-06	B
CDK 5RAP 2	NM_00101 1649	1	PSR090191 52.hg.1	9	-	12315 1154	1231 5147 2	0.82	3. 0	4.020 5E-12	B
CDK 5RAP 2	NM_00101 1649	2	PSR090191 57.hg.1	9	-	12315 1479	1231 5157 0	0.85	4. 2	2.754 6E-14	B
CDK 5RAP 2	NM_00101 1649	3	PSR090191 58.hg.1	9	-	12315 2019	1231 5206 5	0.85	5. 6	5.700 5E-14	B
CDK 5RAP 2	NM_00101 1649	4	PSR090191 59.hg.1	9	-	12315 2066	1231 5255 5	0.69	1. 4	3.857 3E-06	B
CDK 5RAP 2	NM_00101 1649	5	PSR090191 62.hg.1	9	-	12315 6812	1231 5687 2	0.84	5. 1	1.487 6E-13	B
CDK 5RAP 2	NM_00101 1649	6	PSR090191 63.hg.1	9	-	12315 6873	1231 5691 6	0.83	4. 5	6.723 E-12	B
CDK	NM_00101	7	PSR090191	9	-	12316	1231	0.85	5.	8.653	B

5RAP 2	1649		64.hg.1			3020	6316 3		4	1E-14	
CDK 5RAP 2	NM_00101 1649	8	PSR090191 65.hg.1	9	-	12316 3164	1231 6329 7	0.79	1. 6	1.962 E-08	B
CDK 5RAP 2	NM_00101 1649	9	PSR090191 66.hg.1	9	-	12316 5084	1231 6534 9	0.85	6. 9	1.467 5E-14	B
CDK 5RAP 2	NM_00101 1649	10	PSR090191 67.hg.1	9	-	12316 5350	1231 6552 0	0.87	4. 9	1.051 4E-16	B
CDK 5RAP 2	NM_00101 1649	11	PSR090191 68.hg.1	9	-	12316 5521	1231 6559 3	0.87	8. 8	2.406 5E-15	B
CDK 5RAP 2	NM_00101 1649	12	PSR090191 69.hg.1	9	-	12316 5594	1231 6573 0	0.86	8. 0	1.422 6E-14	B
CDK 5RAP 2	NM_00101 1649	13	PSR090191 70.hg.1	9	-	12316 5731	1231 6577 3	0.61	1. 1	0.038 79782	B
CDK 5RAP 2	NM_00101 1649	14	PSR090191 71.hg.1	9	-	12316 5774	1231 6594 0	0.56	1. 2	0.131 39395	B
CDK 5RAP 2	NM_00101 1649	15	PSR090191 72.hg.1	9	-	12316 6314	1231 6639 1	0.54	1. 1	0.429 33718	B
CDK 5RAP 2	NM_00101 1649	16	PSR090191 74.hg.1	9	-	12316 8425	1231 6928 9	0.63	1. 1	0.071 88673	B
CDK 5RAP 2	NM_00101 1649	18	PSR090191 77.hg.1	9	-	12316 9527	1231 7062 4	0.55	1. 1	0.396 42231	B
CDK 5RAP 2	NM_00101 1649	19	PSR090191 78.hg.1	9	-	12317 0625	1231 7074 6	0.53	1. 1	0.368 54206	B
CDK 5RAP 2	NM_00101 1649	20	PSR090191 79.hg.1	9	-	12317 1405	1231 7159 4	0.57	1. 1	0.177 04375	B
CDK 5RAP 2	NM_00101 1649	21	PSR090191 80.hg.1	9	-	12317 3636	1231 7375 2	0.63	1. 3	0.007 96222	B
CDK 5RAP 2	NM_00101 1649	22	PSR090191 81.hg.1	9	-	12317 7318	1231 7743 7	0.54	1. 1	0.325 22625	B
CDK 5RAP 2	NM_00101 1649	23	PSR090191 82.hg.1	9	-	12318 2066	1231 8223 8	0.58	1. 2	0.092 59396	B
CDK 5RAP 2	NM_00101 1649	24	PSR090191 83.hg.1	9	-	12318 4971	1231 8501 9	0.58	1. 2	0.119 23627	B
CDK 5RAP 2	NM_00101 1649	25	PSR090191 84.hg.1	9	-	12319 9573	1231 9980 5	0.55	1. 2	0.241 14559	B
CDK 5RAP 2	NM_00101 1649	26	PSR090191 85.hg.1	9	-	12320 1677	1232 0179 5	0.52	1. 1	0.455 87939	B
CDK	NM_00101	27	PSR090191	9	-	12320	1232	0.55	1.	0.238	B

162

5RAP 2	1649		86.hg.1			1796	0206 7		1	7649	
CDK 5RAP 2	NM_00101 1649	28	PSR090191 87.hg.1	9	-	12320 2068	1232 0225 0	0.53	1. 1	0.397 23802	B
CDK 5RAP 2	NM_00101 1649	30	PSR090191 89.hg.1	9	-	12320 5898	1232 0602 0	0.53	1. 1	0.412 58989	B
CDK 5RAP 2	NM_00101 1649	31	PSR090191 90.hg.1	9	-	12321 0173	1232 1035 0	0.59	- 1. 1	0.038 49942	V
CDK 5RAP 2	NM_00101 1649	33	PSR090191 92.hg.1	9	-	12321 5734	1232 1615 1	0.58	- 1. 1	0.222 40671	V
CDK 5RAP 2	NM_00101 1649	35	PSR090191 94.hg.1	9	-	12322 0801	1232 2090 0	0.58	- 1. 1	0.136 43044	V
CDK 5RAP 2	NM_00101 1649	36	PSR090191 98.hg.1	9	-	12322 2862	1232 2294 5	0.57	- 1. 1	0.207 09193	V
CDK 5RAP 2	NM_00101 1649	39	PSR090192 01.hg.1	9	-	12323 2389	1232 3249 5	0.67	- 1. 2	0.003 05452	V
CDK 5RAP 2	NM_00101 1649	40	PSR090192 03.hg.1	9	-	12323 4026	1232 3415 6	0.62	- 1. 1	0.068 49622	V
CDK 5RAP 2	NM_00101 1649	41	PSR090192 05.hg.1	9	-	12323 9633	1232 3972 8	0.73	- 1. 4	4.452 2E-05	V
CDK 5RAP 2	NM_00101 1649	42	PSR090192 06.hg.1	9	-	12324 9572	1232 4971 5	0.74	- 1. 4	2.797 9E-05	V
CDK 5RAP 2	NM_00101 1649	43	PSR090192 07.hg.1	9	-	12325 3585	1232 5375 5	0.76	- 1. 5	4.497 7E-07	V
CDK 5RAP 2	NM_00101 1649	46	PSR090192 10.hg.1	9	-	12328 0705	1232 8087 7	0.75	- 1. 4	2.320 2E-06	V
CDK 5RAP 2	NM_00101 1649	47	PSR090192 11.hg.1	9	-	12328 0878	1232 8092 3	0.76	- 1. 5	2.266 1E-06	V
CDK 5RAP 2	NM_00101 1649	48	PSR090192 12.hg.1	9	-	12328 7264	1232 8735 6	0.75	- 1. 5	1.537 4E-06	V
CDK 5RAP 2	NM_00101 1649	49	PSR090192 14.hg.1	9	-	12329 0104	1232 9018 3	0.71	- 1. 4	2.148 3E-05	V
CDK 5RAP 2	NM_00101 1649	50	PSR090192 16.hg.1	9	-	12329 1022	1232 9105 1	0.59	- 1. 2	0.157 30285	V
CDK 5RAP 2	NM_00101 1649	51	PSR090192 19.hg.1	9	-	12329 2256	1232 9241 8	0.70	- 1. 4	0.000 11244	V
CDK 5RAP 2	NM_00101 1649	53	PSR090192 21.hg.1	9	-	12329 8650	1232 9871 5	0.69	- 1. 3	0.000 69026	V
CDK	NM_00101	54	PSR090192	9	-	12329	1232	0.66	-	0.002	V

5RAP 2	1649		22.hg.1			8716	9880 4		1. 2	04243	
CDK 5RAP 2	NM_00101 1649	55	PSR090192 25.hg.1	9	-	12330 1319	1233 0139 8	0.70	- 1. 3	5.935 6E-05	V
CDK 5RAP 2	NM_00101 1649	56	PSR090192 26.hg.1	9	-	12330 1399	1233 0144 2	0.61	- 1. 1	0.026 61205	V
CDK 5RAP 2	NM_00101 1649	57	PSR090192 27.hg.1	9	-	12330 7992	1233 0806 8	0.66	- 1. 2	0.002 65048	V
CDK 5RAP 2	NM_00101 1649	58	PSR090192 28.hg.1	9	-	12331 3070	1233 1318 0	0.73	- 1. 3	1.800 7E-05	V
CDK 5RAP 2	NM_00101 1649	59	PSR090192 29.hg.1	9	-	12333 0599	1233 3066 6	0.76	- 1. 5	2.043 1E-06	V
CDK 5RAP 2	NM_00101 1649	60	PSR090192 30.hg.1	9	-	12333 4025	1233 3425 1	0.59	- 1. 1	0.093 70754	V
CDK 5RAP 2	NM_00101 1649	61	PSR090192 32.hg.1	9	-	12333 4255	1233 3431 9	0.74	- 1. 6	1.081 2E-05	V
CDK 5RAP 2	NM_00101 1649	62	PSR090192 33.hg.1	9	-	12334 2198	1233 4228 3	0.67	- 1. 2	0.002 62695	V
SDC CAG 3	NM_00103 9707	1	PSR090221 38.hg.1	9	-	13929 6377	1392 9640 2	0.82	- 5. 9	3.123 9E-11	V
SDC CAG 3	NM_00103 9707	2	PSR090221 39.hg.1	9	-	13929 6403	1392 9693 1	0.69	- 1. 2	0.000 58769	V
SDC CAG 3	NM_00103 9707	3	PSR090221 40.hg.1	9	-	13929 6932	1392 9709 5	0.66	- 1. 2	0.004 40647	V
SDC CAG 3	NM_00103 9707	4	PSR090221 43.hg.1	9	-	13929 7134	1392 9733 9	0.65	- 1. 2	0.020 27377	V
SDC CAG 3	NM_00103 9707	6	PSR090221 45.hg.1	9	-	13929 8507	1392 9856 0	0.64	- 1. 2	0.018 57021	V
SDC CAG 3	NM_00103 9707	8	PSR090221 48.hg.1	9	-	13929 9083	1392 9914 5	0.63	- 1. 2	0.031 34151	V
SDC CAG 3	NM_00103 9707	9	PSR090221 49.hg.1	9	-	13929 9146	1392 9923 2	0.64	- 1. 2	0.014 0932	V
SDC CAG 3	NM_00103 9707	10	PSR090221 50.hg.1	9	-	13929 9543	1392 9956 9	0.68	- 1. 3	0.000 52316	V
SDC CAG 3	NM_00103 9707	11	PSR090221 51.hg.1	9	-	13929 9570	1392 9965 4	0.64	- 1. 2	0.008 39152	V
SDC CAG 3	NM_00103 9707	12	PSR090221 52.hg.1	9	-	13929 9655	1392 9980 0	0.66	- 1. 4	0.002 24861	V
SDC	NM_00103	14	PSR090221	9	-	13930	1393	0.66	-	0.003	V

CAG 3	9707		54.hg.1			1398	0146 8		1. 4	31751	
SDC CAG 3	NM_00103 9707	16	PSR090221 56.hg.1	9	-	13930 1597	1393 0163 7	0.60	- 1. 2	0.131 46198	V
SDC CAG 3	NM_00103 9707	17	PSR090221 58.hg.1	9	-	13930 1661	1393 0201 3	0.65	- 1. 2	0.008 71798	V
SDC CAG 3	NM_00103 9707	18	PSR090221 59.hg.1	9	-	13930 2278	1393 0232 6	0.68	- 1. 3	0.001 18109	V
SDC CAG 3	NM_00103 9707	19	PSR090221 60.hg.1	9	-	13930 2327	1393 0239 0	0.67	- 1. 2	0.006 39845	V
SDC CAG 3	NM_00103 9707	20	PSR090221 61.hg.1	9	-	13930 2391	1393 0241 8	0.63	- 1. 4	0.020 46578	V
TME M255 A	NM_00110 4544	1	PSR0X017 751.hg.1	X	-	11939 2506	1193 9411 0	0.84	- 7. 3	5.720 2E-11	V
TME M255 A	NM_00110 4544	2	PSR0X017 753.hg.1	X	-	11939 4112	1193 9488 3	0.73	- 2. 1	3.330 8E-06	V
TME M255 A	NM_00110 4544	3	PSR0X017 754.hg.1	X	-	11940 2099	1194 0221 7	0.80	- 3. 6	5.437 9E-09	V
TME M255 A	NM_00110 4544	4	PSR0X017 756.hg.1	X	-	11941 0740	1194 1090 2	0.81	- 5. 1	8.972 3E-10	V
TME M255 A	NM_00110 4544	5	PSR0X017 757.hg.1	X	-	11941 8982	1194 1907 0	0.86	- 5. 3	8.226 2E-11	V
TME M255 A	NM_00110 4544	8	PSR0X017 760.hg.1	X	-	11942 1009	1194 2107 7	0.86	- 10. 0	2.963 3E-12	V
TME M255 A	NM_00110 4544	9	PSR0X017 761.hg.1	X	-	11942 5106	1194 2519 5	0.85	- 9. 2	4.779 1E-12	V
TME M255 A	NM_00110 4544	10	PSR0X017 762.hg.1	X	-	11942 7844	1194 2790 6	0.83	- 5. 4	1.587 5E-10	V
IFIT5	NM_01242 0	5	PSR100070 50.hg.1	10	+	91177 575	9117 8571	0.87	- 5. 2	9.405 3E-16	V
CD44	NM_00100 1391	2	PSR110042 61.hg.1	11	+	35160 735	3516 0832	0.89	3. 4	1.775 9E-15	B
CD44	NM_00100 1391	3	PSR110042 64.hg.1	11	+	35160 851	3516 0917	0.90	2. 6	2.531 9E-16	B
CD44	NM_00100 1391	5	PSR110042 66.hg.1	11	+	35198 288	3519 8684	0.72	2. 1	3.062 1E-06	B
CD44	NM_00100 1391	10	PSR110042 71.hg.1	11	+	35219 668	3521 9793	0.82	2. 3	2.398 E-11	B
CD44	NM_00100 1391	11	PSR110042 72.hg.1	11	+	35222 629	3522 2742	0.72	2. 1	2.324 4E-06	B
CD44	NM_00100 1391	13	PSR110042 75.hg.1	11	+	35226 059	3522 6187	0.77	2. 3	1.150 5E-08	B
CD44	NM_00100	14	PSR110042	11	+	35227	3522	0.81	2.	6.969	B

	1391		76.hg.1			659	7790		4	6E-11	
CD44	NM_00100 1391	15	PSR110042 77.hg.1	11	+	35229 652	3522 9753	0.86	3. 4	1.419 2E-13	B
CD44	NM_00100 1391	16	PSR110042 79.hg.1	11	+	35231 512	3523 1601	0.88	4. 2	7.446 5E-16	B
CD44	NM_00100 1391	17	PSR110042 80.hg.1	11	+	35232 793	3523 2996	0.91	5. 1	1.702 7E-19	B
CD44	NM_00100 1391	18	PSR110042 81.hg.1	11	+	35236 399	3523 6461	0.90	2. 6	1.003 2E-15	B
CD44	NM_00100 1391	19	PSR110042 82.hg.1	11	+	35240 863	3524 0934	0.88	2. 2	5.307 4E-15	B
CD44	NM_00100 1391	23	PSR110042 86.hg.1	11	+	35250 676	3525 0880	0.89	2. 1	6.664 1E-14	B
CD44	NM_00100 1391	24	PSR110042 87.hg.1	11	+	35250 881	3525 0916	0.88	2. 3	4.646 3E-14	B
CD44	NM_00100 1391	27	PSR110042 90.hg.1	11	+	35251 214	3525 1568	0.89	3. 1	1.010 3E-15	B
CD44	NM_00100 1391	28	PSR110042 92.hg.1	11	+	35251 575	3525 3949	0.91	3. 0	6.643 1E-18	B
DGA T2	NM_00125 3891	5	PSR110103 71.hg.1	11	+	75495 663	7549 5791	0.88	6. 1	1.369 9E-15	B
DGA T2	NM_00125 3891	6	PSR110103 72.hg.1	11	+	75501 233	7550 1340	0.89	5. 1	2.781 2E-15	B
DGA T2	NM_00125 3891	7	PSR110103 73.hg.1	11	+	75501 706	7550 1776	0.89	4. 8	7.340 7E-15	B
DGA T2	NM_00125 3891	8	PSR110103 74.hg.1	11	+	75507 373	7550 7577	0.89	5. 4	1.168 5E-15	B
DGA T2	NM_00125 3891	9	PSR110103 75.hg.1	11	+	75508 203	7550 8377	0.89	5. 0	2.935 2E-15	B
DGA T2	NM_00125 3891	10	PSR110103 76.hg.1	11	+	75509 272	7550 9474	0.89	5. 3	8.024 2E-15	B
DGA T2	NM_00125 3891	11	PSR110103 77.hg.1	11	+	75511 399	7551 1678	0.88	4. 9	1.715 5E-14	B
TME M123	NM_05293 2	1	PSR110265 96.hg.1	11	-	10226 7068	1022 6939 7	0.93	- 4. 4	1.879 9E-22	V
TME M123	NM_05293 2	3	PSR110265 99.hg.1	11	-	10226 9555	1022 6958 6	0.92	- 3. 4	9.570 5E-22	V
TME M123	NM_05293 2	4	PSR110266 00.hg.1	11	-	10226 9587	1022 6962 2	0.90	- 4. 4	5.639 3E-19	V
TME M123	NM_05293 2	8	PSR110266 05.hg.1	11	-	10232 1933	1023 2196 2	0.88	- 5. 9	6.760 5E-15	V
TME M123	NM_05293 2	9	PSR110266 06.hg.1	11	-	10232 2925	1023 2309 7	0.88	- 4. 0	9.409 E-14	V
TME M123	NM_05293 2	10	PSR110266 07.hg.1	11	-	10232 3255	1023 2345 2	0.90	- 4. 0	1.909 E-18	V
MMP 8	NM_00242 4	3	PSR110266 52.hg.1	11	-	10258 3861	1025 8405 7	0.74	4. 5	2.061 4E-06	B
MMP 8	NM_00242 4	4	PSR110266 53.hg.1	11	-	10258 4058	1025 8418 8	0.71	4. 9	1.217 9E-05	B

MMP 8	NM_00242 4	5	PSR110266 54.hg.1	11	-	10258 4485	1025 8452 5	0.71	4. 4	1.240 7E-05	B
MMP 8	NM_00242 4	7	PSR110266 57.hg.1	11	-	10258 5287	1025 8544 0	0.74	4. 2	3.513 3E-06	B
MMP 8	NM_00242 4	8	PSR110266 58.hg.1	11	-	10258 6035	1025 8616 8	0.73	4. 4	3.5E- 06	B
MMP 8	NM_00242 4	9	PSR110266 59.hg.1	11	-	10258 7033	1025 8715 0	0.72	4. 3	8.627 9E-06	B
MMP 8	NM_00242 4	10	PSR110266 60.hg.1	11	-	10258 9145	1025 8930 6	0.71	4. 2	1.352 6E-05	B
MMP 8	NM_00242 4	11	PSR110266 61.hg.1	11	-	10259 2132	1025 9225 7	0.70	4. 3	3.795 4E-05	B
MMP 8	NM_00242 4	12	PSR110266 62.hg.1	11	-	10259 2345	1025 9249 3	0.70	4. 1	3.952 1E-05	B
MMP 8	NM_00242 4	13	PSR110266 63.hg.1	11	-	10259 3160	1025 9340 4	0.70	4. 4	2.551 2E-05	B
MMP 8	NM_00242 4	16	PSR110266 68.hg.1	11	-	10259 5517	1025 9556 8	0.70	4. 9	3.264 1E-05	B
---	n333961	1	PSR110305 76.hg.1	11	+	57373 517	5737 3686	0.76	- 7. 2	7.519 3E-08	V
---	n333961	3	PSR110305 78.hg.1	11	+	57379 191	5737 9409	0.76	- 6. 5	1.591 8E-07	V
---	n333961	4	PSR110305 79.hg.1	11	+	57381 802	5738 1926	0.75	- 6. 0	1.934 1E-07	V
LTA4 H	NM_00089 5	8	PSR120242 52.hg.1	12	-	96405 073	9640 5530	0.86	4. 7	5.927 7E-14	B
LTA4 H	NM_00089 5	9	PSR120242 53.hg.1	12	-	96405 531	9640 5643	0.86	5. 0	2.146 2E-14	B
LTA4 H	NM_00089 5	17	PSR120242 62.hg.1	12	-	96412 541	9641 2681	0.92	4. 7	5.945 E-21	B
LTA4 H	NM_00089 5	18	PSR120242 63.hg.1	12	-	96412 946	9641 3018	0.93	4. 9	3.361 3E-21	B
LTA4 H	NM_00089 5	19	PSR120242 64.hg.1	12	-	96414 863	9641 4915	0.92	4. 9	2.177 E-19	B
LTA4 H	NM_00089 5	21	PSR120242 66.hg.1	12	-	96418 257	9641 8325	0.91	5. 1	7.219 1E-19	B
LTA4 H	NM_00089 5	22	PSR120242 67.hg.1	12	-	96421 222	9642 1281	0.92	5. 9	5.439 6E-21	B
LTA4 H	NM_00089 5	23	PSR120242 68.hg.1	12	-	96421 282	9642 1342	0.92	4. 5	9.643 6E-20	B
LTA4 H	NM_00089 5	25	PSR120242 70.hg.1	12	-	96429 139	9642 9345	0.92	5. 5	1.438 1E-18	B
---	ENST0000 0552784	1	PSR120260 10.hg.1	12	-	11334 5433	1133 4556 2	0.83	- 2. 5	5.765 2E-09	V

---	ENST0000 0552784	2	PSR120260 11.hg.1	12	-	11334 6392	1133 4648 3	0.88	- 7. 2	1.597 5E-15	V
TDR D9	NM_15304 6	5	PSR140087 73.hg.1	14	+	10442 2001	1044 2210 7	0.83	3. 6	5.817 2E-13	B
TDR D9	NM_15304 6	6	PSR140087 74.hg.1	14	+	10442 9416	1044 2951 3	0.83	5. 5	2.993 5E-13	B
TDR D9	NM_15304 6	7	PSR140087 75.hg.1	14	+	10443 1670	1044 3181 8	0.83	3. 4	1.446 4E-12	B
TDR D9	NM_15304 6	9	PSR140087 77.hg.1	14	+	10443 3046	1044 3316 5	0.83	5. 1	5.242 4E-13	B
TDR D9	NM_15304 6	10	PSR140087 79.hg.1	14	+	10443 6878	1044 3694 3	0.80	4. 6	2.333 9E-11	B
TDR D9	NM_15304 6	11	PSR140087 81.hg.1	14	+	10444 1726	1044 4189 0	0.83	4. 9	4.504 3E-13	B
TDR D9	NM_15304 6	12	PSR140087 82.hg.1	14	+	10445 2554	1044 5265 7	0.81	3. 9	3.542 9E-11	B
TDR D9	NM_15304 6	14	PSR140087 84.hg.1	14	+	10446 0669	1044 6072 3	0.83	4. 7	6.386 7E-13	B
TDR D9	NM_15304 6	15	PSR140087 85.hg.1	14	+	10446 0856	1044 6094 0	0.84	3. 8	3.131 3E-13	B
TDR D9	NM_15304 6	16	PSR140087 86.hg.1	14	+	10446 2087	1044 6214 4	0.82	4. 7	3.205 5E-12	B
TDR D9	NM_15304 6	17	PSR140087 87.hg.1	14	+	10446 4961	1044 6506 5	0.82	4. 2	2.761 1E-12	B
TDR D9	NM_15304 6	18	PSR140087 88.hg.1	14	+	10447 0575	1044 7067 2	0.83	5. 3	9.621 9E-13	B
TDR D9	NM_15304 6	20	PSR140087 90.hg.1	14	+	10447 1611	1044 7174 2	0.82	3. 9	2.489 4E-12	B
TDR D9	NM_15304 6	22	PSR140087 92.hg.1	14	+	10447 2983	1044 7304 6	0.83	4. 3	1.904 E-12	B
TDR D9	NM_15304 6	23	PSR140087 93.hg.1	14	+	10447 3119	1044 7318 2	0.83	4. 2	8.248 5E-13	B
TDR D9	NM_15304 6	25	PSR140087 97.hg.1	14	+	10447 4750	1044 7480 3	0.82	4. 6	1.140 1E-11	B
TDR D9	NM_15304 6	26	PSR140087 98.hg.1	14	+	10448 1062	1044 8117 8	0.80	4. 9	8.247 2E-11	B
TDR D9	NM_15304 6	29	PSR140088 01.hg.1	14	+	10448 8494	1044 8866 7	0.80	3. 4	5.122 3E-11	B

TDR D9	NM_15304 6	30	PSR140088 02.hg.1	14	+	10449 0906	1044 9101 7	0.80	3. 6	5.599 7E-11	B
TDR D9	NM_15304 6	35	PSR140088 07.hg.1	14	+	10449 8354	1044 9838 8	0.78	3. 3	4.612 2E-10	B
TDR D9	NM_15304 6	36	PSR140088 09.hg.1	14	+	10449 8390	1044 9842 4	0.81	4. 2	1.057 1E-11	B
TDR D9	NM_15304 6	37	PSR140088 10.hg.1	14	+	10450 0297	1045 0040 6	0.82	3. 4	1.319 9E-11	B
TDR D9	NM_15304 6	38	PSR140088 11.hg.1	14	+	10450 1297	1045 0139 3	0.81	3. 8	3.100 8E-11	B
PYG L	NM_00116 3940	2	PSR140127 87.hg.1	14	-	51371 939	5137 2274	0.90	3. 9	4.290 8E-17	B
PYG L	NM_00116 3940	6	PSR140127 92.hg.1	14	-	51376 744	5137 6820	0.91	4. 1	1.079 1E-17	B
PYG L	NM_00116 3940	7	PSR140127 93.hg.1	14	-	51378 448	5137 8589	0.91	4. 1	1.642 6E-17	B
PYG L	NM_00116 3940	8	PSR140127 94.hg.1	14	-	51378 696	5137 8754	0.91	4. 4	3.788 E-18	B
PYG L	NM_00116 3940	9	PSR140127 95.hg.1	14	-	51378 874	5137 9021	0.91	4. 0	1.226 4E-18	B
PYG L	NM_00116 3940	10	PSR140127 96.hg.1	14	-	51379 747	5137 9848	0.91	4. 9	2.091 3E-18	B
PYG L	NM_00116 3940	11	PSR140127 97.hg.1	14	-	51381 419	5138 1533	0.91	4. 6	6.828 5E-18	B
PYG L	NM_00116 3940	12	PSR140127 98.hg.1	14	-	51382 054	5138 2217	0.91	3. 7	6.768 E-18	B
PYG L	NM_00116 3940	13	PSR140127 99.hg.1	14	-	51382 543	5138 2689	0.92	4. 8	2.029 9E-19	B
PYG L	NM_00116 3940	14	PSR140128 01.hg.1	14	-	51383 360	5138 3452	0.92	4. 1	3.948 3E-19	B
PYG L	NM_00116 3940	15	PSR140128 02.hg.1	14	-	51383 680	5138 3823	0.90	3. 9	9.389 8E-18	B
PYG L	NM_00116 3940	17	PSR140128 04.hg.1	14	-	51387 674	5138 7785	0.91	3. 9	5.249 1E-18	B
PYG L	NM_00116 3940	18	PSR140128 05.hg.1	14	-	51389 969	5139 0686	0.87	4. 3	7.848 9E-15	B
PYG L	NM_00116 3940	23	PSR140128 10.hg.1	14	-	51410 879	5141 1174	0.92	4. 4	2.210 9E-20	B
---	n334829	3	PSR140237 00.hg.1	14	+	94581 198	9458 1226	0.89	- 84 .3	7.606 4E-19	V
ATP1 0A	NM_02449 0	3	PSR150097 82.hg.1	15	-	25925 268	2592 5455	0.87	3. 2	2.238 6E-14	V
ATP1 0A	NM_02449 0	4	PSR150097 83.hg.1	15	-	25925 957	2592 6061	0.90	- 5. 6	7.791 3E-18	V
ATP1 0A	NM_02449 0	6	PSR150097 85.hg.1	15	-	25928 433	2592 8633	0.91	- 2. 8	1.809 7E-18	V
ATP1 0A	NM_02449 0	7	PSR150097 86.hg.1	15	-	25932 850	2593 2975	0.89	- 5.	2.520 7E-16	V

									3		
ATP1 0A	NM_02449 0	8	PSR150097 87.hg.1	15	-	25936 862	2593 6938	0.89	- 3. 0	1.252 E-16	V
ATP1 0A	NM_02449 0	10	PSR150097 89.hg.1	15	-	25947 063	2594 7247	0.89	- 3. 1	7.273 9E-17	V
ATP1 0A	NM_02449 0	11	PSR150097 90.hg.1	15	-	25953 123	2595 3249	0.89	- 2. 7	1.617 9E-17	V
ATP1 0A	NM_02449 0	16	PSR150097 95.hg.1	15	-	25966 804	2596 7056	0.90	- 4. 6	2.625 3E-17	V
ATP1 0A	NM_02449 0	17	PSR150097 96.hg.1	15	-	25969 038	2596 9168	0.89	- 3. 8	5.075 9E-17	V
ATP1 0A	NM_02449 0	19	PSR150097 98.hg.1	15	-	25972 307	2597 2413	0.89	- 2. 9	3.403 7E-17	V
ATP1 0A	NM_02449 0	20	PSR150097 99.hg.1	15	-	25981 203	2598 1288	0.88	- 3. 7	1.689 3E-16	V
ATP1 0A	NM_02449 0	22	PSR150098 02.hg.1	15	-	26086 636	2608 6727	0.82	- 2. 6	6.169 7E-10	V
---	n332456	1	PSR150201 76.hg.1	15	+	67457 682	6745 7722	0.88	- 4. 3	1.053 9E-14	V
MT1 A	NM_00594 6	2	PSR160064 69.hg.1	16	+	56673 176	5667 3241	0.86	- 6. 8	3.229 5E-14	V
MT1 M	NM_17687 0	3	PSR160064 78.hg.1	16	+	56667 252	5666 7317	0.86	- 8. 7	9.424 9E-14	V
MT1 M	NM_17687 0	5	PSR160064 80.hg.1	16	+	56667 808	5666 7893	0.70	- 1. 3	8.603 5E-05	V
MT1 E	NM_17561 7	3	PSR160064 87.hg.1	16	+	56659 718	5665 9791	0.77	- 1. 9	8.231 E-07	V
MT1 E	NM_17561 7	4	PSR160064 88.hg.1	16	+	56660 378	5666 0443	0.85	- 8. 2	6.729 E-14	V
MT1 E	NM_17561 7	6	PSR160064 90.hg.1	16	+	56660 792	5666 0936	0.86	- 3. 5	1.113 1E-12	V
MT1 E	NM_17561 7	7	PSR160064 91.hg.1	16	+	56660 937	5666 1023	0.78	- 2. 0	1.652 9E-06	V
MT1J P	NR_03667 7	3	PSR160064 96.hg.1	16	+	56670 351	5667 0416	0.85	- 8. 1	7.666 4E-14	V
MT1J P	NR_03667 7	4	PSR160064 97.hg.1	16	+	56670 764	5667 0998	0.85	- 4. 0	1.041 4E-13	V
MT1 DP	NR_00365 8	3	PSR160065 00.hg.1	16	+	56678 023	5667 8088	0.86	- 6.	7.825 4E-14	V

									7		
MT1 DP	NR_00365 8	4	PSR160065 01.hg.1	16	+	56678 622	5667 8724	0.86	- 3. 1	9.353 8E-15	V
MT1 B	NM_00594 7	2	PSR160065 08.hg.1	16	+	56685 844	5668 5893	0.81	- 3. 6	8.909 E-11	V
MT1 B	NM_00594 7	3	PSR160065 09.hg.1	16	+	56686 483	5668 6548	0.85	- 6. 6	3.041 7E-13	V
MT1F	NM_00594 9	2	PSR160065 15.hg.1	16	+	56692 587	5669 2652	0.85	- 6. 4	1.310 8E-13	V
MT1 H	NM_00595 1	2	PSR160065 23.hg.1	16	+	56703 775	5670 3824	0.81	- 3. 0	1.478 9E-10	V
MT1 H	NM_00595 1	3	PSR160065 24.hg.1	16	+	56704 418	5670 4483	0.86	- 7. 5	6.050 9E-14	V
MT1 H	NM_00595 1	4	PSR160065 25.hg.1	16	+	56704 810	5670 4929	0.85	- 2. 4	6.123 6E-12	V
MT1I P	NR_00366 9	4	PSR160065 34.hg.1	16	+	56710 983	5671 1026	0.84	- 8. 7	8.244 9E-13	V
MT1I P	NR_00366 9	6	PSR160065 36.hg.1	16	+	56711 564	5671 1653	0.80	- 1. 9	3.318 E-09	V
MT1 X	NM_00595 2	2	PSR160065 42.hg.1	16	+	56716 397	5671 6480	0.81	- 2. 4	4.122 1E-08	V
MT1 X	NM_00595 2	3	PSR160065 43.hg.1	16	+	56717 077	5671 7142	0.87	- 6. 7	1.218 2E-14	V
MT1 X	NM_00595 2	5	PSR160065 45.hg.1	16	+	56717 870	5671 8015	0.84	- 2. 5	9.655 4E-10	V
MT1 X	NM_00595 2	6	PSR160065 48.hg.1	16	+	56718 022	5671 8108	0.79	- 2. 0	3.810 3E-07	V
HP	NM_00112 6102	6	PSR160086 50.hg.1	16	+	72091 291	7209 1365	0.83	9. 4	7.638 4E-12	B
HP	NM_00112 6102	7	PSR160086 51.hg.1	16	+	72092 153	7209 2254	0.83	10 .2	4.068 4E-12	B
HP	NM_00112 6102	8	PSR160086 52.hg.1	16	+	72093 013	7209 3087	0.83	10 .2	2.518 9E-12	B
HPR	NM_02099 5	1	PSR160086 62.hg.1	16	+	72097 125	7209 7154	0.83	3. 1	9.335 5E-12	B
HPR	NM_02099 5	3	PSR160086 66.hg.1	16	+	72107 791	7210 7876	0.81	2. 6	2.226 9E-10	B
HPR	NM_02099 5	4	PSR160086 67.hg.1	16	+	72108 183	7210 8284	0.84	3. 3	6.590 4E-11	B
HPR	NM_02099 5	5	PSR160086 68.hg.1	16	+	72109 044	7210 9118	0.83	9. 4	7.638 4E-12	B
MT1 G	NM_00595 0	2	PSR160158 18.hg.1	16	-	56701 224	5670 1289	0.86	- 7. 1	7.533 6E-14	V

---	n382996	3	PSR160198 85.hg.1	16	+	56670 351	5667 0416	0.85	- 8. 5	4.86E- 14	V
---	n382996	4	PSR160198 86.hg.1	16	+	56670 764	5667 0998	0.85	- 2. 6	1.164 4E-11	V
---	TCONS_00 024856- XLOC_011 736	5	PSR160198 91.hg.1	16	+	56678 023	5667 8088	0.85	- 6. 8	7.107 2E-14	V
---	TCONS_00 024856- XLOC_011 736	6	PSR160198 92.hg.1	16	+	56678 622	5667 8852	0.82	- 1. 3	4.790 8E-09	V
---	n406211	4	PSR160198 96.hg.1	16	+	56710 967	5671 1026	0.85	- 9. 9	7.109 7E-13	V
---	n406211	6	PSR160198 98.hg.1	16	+	56711 564	5671 1628	0.83	- 3. 9	4.174 2E-12	V
FBX O39	NM_15323 0	3	PSR170009 55.hg.1	17	+	66831 08	6684 210	0.81	- 6. 9	7.658 6E-11	V
FBX O39	NM_15323 0	4	PSR170009 56.hg.1	17	+	66900 99	6690 275	0.78	- 2. 3	3.721 8E-08	V
FBX O39	NM_15323 0	5	PSR170009 57.hg.1	17	+	66906 19	6690 853	0.80	- 2. 9	5.258 8E-09	V
CCL8	NM_00562 3	3	PSR170048 89.hg.1	17	+	32647 288	3264 7405	0.84	- 14 .4	7.563 8E-10	V
CCL8	NM_00562 3	4	PSR170048 90.hg.1	17	+	32647 821	3264 7992	0.78	- 4. 1	1.311 4E-06	V
CCL8	NM_00562 3	5	PSR170048 91.hg.1	17	+	32647 993	3264 8420	0.70	- 2. 3	0.000 12612	V
CA4	NM_00071 7	4	PSR170095 87.hg.1	17	+	58233 921	5823 4076	0.87	4. 3	7.166 6E-15	B
CA4	NM_00071 7	5	PSR170095 88.hg.1	17	+	58234 788	5823 4933	0.86	4. 9	4.263 8E-14	B
CA4	NM_00071 7	6	PSR170095 89.hg.1	17	+	58235 051	5823 5149	0.87	3. 9	1.577 6E-14	B
CA4	NM_00071 7	7	PSR170095 90.hg.1	17	+	58235 422	5823 5488	0.86	3. 8	8.293 1E-14	B
CA4	NM_00071 7	8	PSR170095 91.hg.1	17	+	58235 644	5823 5807	0.86	3. 3	1.021 9E-13	B
CA4	NM_00071 7	10	PSR170095 94.hg.1	17	+	58236 836	5823 6901	0.86	3. 4	9.793 1E-14	B
GAS7	NM_20143 3	1	PSR170151 99.hg.1	17	-	98139 26	9817 166	0.93	5. 1	1.765 7E-22	B
GAS7	NM_20143 3	8	PSR170152 07.hg.1	17	-	98205 20	9820 658	0.91	5. 2	7.391 1E-20	B
GAS7	NM_20143 3	9	PSR170152 08.hg.1	17	-	98213 18	9821 416	0.91	5. 1	2.542 4E-20	B
GAS7	NM_20143	10	PSR170152	17	-	98229	9823	0.91	5.	1.260	B

	3		09.hg.1			43	022		5	4E-20	
GAS7	NM_20143 3	11	PSR170152 10.hg.1	17	-	98287 93	9828 916	0.91	4. 9	9.991 3E-21	B
GAS7	NM_20143 3	12	PSR170152 11.hg.1	17	-	98299 58	9830 086	0.91	4. 9	3.790 6E-20	B
GAS7	NM_20143 3	14	PSR170152 13.hg.1	17	-	98434 43	9843 517	0.91	4. 9	1.748 5E-19	B
GAS7	NM_20143 3	16	PSR170152 15.hg.1	17	-	98502 11	9850 300	0.91	6. 1	7.006 5E-20	B
GAS7	NM_20143 3	21	PSR170152 20.hg.1	17	-	98851 21	9885 201	0.91	6. 0	1.076 4E-20	B
GAS7	NM_20143 3	22	PSR170152 21.hg.1	17	-	99230 94	9923 214	0.91	5. 9	3.187 4E-21	B
GAS7	NM_20143 3	26	PSR170152 26.hg.1	17	-	99397 51	9939 878	0.92	5. 4	5.739 E-22	B
KRT1 9	NM_00227 6	1	PSR170199 27.hg.1	17	-	39679 872	3967 9965	0.52	1. 0	0.907 51055	B
KRT1 9	NM_00227 6	2	PSR170199 28.hg.1	17	-	39679 966	3968 0249	0.59	1. 1	0.089 16123	B
KRT1 9	NM_00227 6	3	PSR170199 29.hg.1	17	-	39680 250	3968 0394	0.55	1. 0	0.259 80658	B
KRT1 9	NM_00227 6	4	PSR170199 31.hg.1	17	-	39680 400	3968 0520	0.56	1. 0	0.140 1154	B
KRT1 9	NM_00227 6	5	PSR170199 32.hg.1	17	-	39680 631	3968 0744	0.52	- 1. 0	0.806 02688	V
KRT1 9	NM_00227 6	6	PSR170199 33.hg.1	17	-	39680 745	3968 0770	0.57	- 1. 1	0.104 48473	V
KRT1 9	NM_00227 6	7	PSR170199 35.hg.1	17	-	39680 793	3968 0899	0.55	1. 0	0.502 50233	B
KRT1 9	NM_00227 6	8	PSR170199 36.hg.1	17	-	39681 095	3968 1229	0.50	- 1. 0	0.949 50467	V
KRT1 9	NM_00227 6	9	PSR170199 39.hg.1	17	-	39681 252	3968 1442	0.59	1. 1	0.100 31113	B
KRT1 9	NM_00227 6	10	PSR170199 40.hg.1	17	-	39681 443	3968 1473	0.87	- 6. 5	3.763 2E-14	V
KRT1 9	NM_00227 6	11	PSR170199 41.hg.1	17	-	39681 474	3968 1525	0.51	1. 0	0.700 57602	B
KRT1 9	NM_00227 6	12	PSR170199 42.hg.1	17	-	39681 526	3968 1924	0.61	1. 1	0.037 8847	B
KRT1 9	NM_00227 6	13	PSR170199 43.hg.1	17	-	39684 080	3968 4172	0.66	1. 1	0.002 42979	B
KRT1 9	NM_00227 6	14	PSR170199 44.hg.1	17	-	39684 173	3968 4543	0.56	1. 0	0.234 13563	B
KRT1 9	NM_00227 6	15	PSR170199 49.hg.1	17	-	39684 561	3968 4641	0.48	- 1. 0	0.602 8224	V
DHX 58	NM_02411 9	1	PSR170202 83.hg.1	17	-	40253 453	4025 3964	0.89	- 10 .6	3.579 7E-17	V
DHX 58	NM_02411 9	2	PSR170202 84.hg.1	17	-	40254 234	4025 4330	0.88	- 8. 3	9.947 3E-16	V

DHX 58	NM_02411 9	8	PSR170202 90.hg.1	17	-	40259 622	4025 9710	0.87	- 7. 8	6.817 9E-15	V
DHX 58	NM_02411 9	10	PSR170202 92.hg.1	17	-	40260 000	4026 0126	0.87	- 7. 7	2.049 E-15	V
DHX 58	NM_02411 9	11	PSR170202 93.hg.1	17	-	40261 288	4026 1404	0.87	- 7. 7	4.079 5E-14	V
DHX 58	NM_02411 9	13	PSR170202 95.hg.1	17	-	40262 834	4026 2905	0.86	- 8. 2	1.332 5E-14	V
DHX 58	NM_02411 9	14	PSR170202 98.hg.1	17	-	40263 314	4026 3399	0.87	- 6. 5	2.320 4E-13	V
DHX 58	NM_02411 9	15	PSR170202 99.hg.1	17	-	40263 400	4026 3515	0.87	- 10 .9	5.288 4E-15	V
DHX 58	NM_02411 9	16	PSR170203 01.hg.1	17	-	40263 764	4026 3911	0.86	- 8. 8	9.266 6E-15	V
LGA LS3B P	NM_00556 7	1	PSR170262 01.hg.1	17	-	76967 338	7696 7412	0.85	- 6. 2	7.550 2E-13	V
LGA LS3B P	NM_00556 7	2	PSR170262 02.hg.1	17	-	76967 413	7696 8786	0.84	- 8. 3	1.499 2E-12	V
LGA LS3B P	NM_00556 7	3	PSR170262 03.hg.1	17	-	76969 052	7696 9207	0.79	- 5. 7	4.160 9E-09	V
LGA LS3B P	NM_00556 7	5	PSR170262 05.hg.1	17	-	76970 770	7697 0844	0.77	- 3. 1	1.722 5E-07	V
LGA LS3B P	NM_00556 7	7	PSR170262 08.hg.1	17	-	76972 047	7697 2145	0.76	- 3. 0	5.220 4E-07	V
---	n407998	3	PSR170307 19.hg.1	17	-	66536 026	6653 6107	0.84	4. 4	4.354 1E-13	B
---	n407998	5	PSR170307 21.hg.1	17	-	66538 126	6653 8306	0.84	3. 7	2.835 3E-13	B
---	n407998	6	PSR170307 22.hg.1	17	-	66538 835	6653 8950	0.84	4. 2	2.381 6E-13	B
---	n407998	7	PSR170307 23.hg.1	17	-	66539 770	6653 9858	0.84	4. 9	5.463 4E-13	B
IMPA 2	NM_01421 4	4	PSR180006 28.hg.1	18	+	11999 061	1199 9186	0.93	5. 7	1.053 5E-22	B
IMPA 2	NM_01421 4	6	PSR180006 30.hg.1	18	+	12009 882	1200 9986	0.93	6. 0	5.067 6E-23	B
IMPA 2	NM_01421 4	7	PSR180006 31.hg.1	18	+	12012 169	1201 2214	0.93	5. 9	1.112 7E-22	B
IMPA 2	NM_01421 4	8	PSR180006 32.hg.1	18	+	12014 264	1201 4372	0.93	4. 4	6.735 8E-22	B
IMPA 2	NM_01421 4	10	PSR180006 35.hg.1	18	+	12028 042	1202 8150	0.92	5. 3	6.121 6E-22	B
IMPA 2	NM_01421 4	11	PSR180006 36.hg.1	18	+	12028 841	1202 8992	0.93	5. 4	2.600 8E-22	B
IMPA	NM_01421	12	PSR180006	18	+	12030	1203	0.93	4.	9.713	B

2	4		37.hg.1			342	0876		5	9E-23	
ZCC HC2	NM_01774 2	12	PSR180025 44.hg.1	18	+	60232 235	6023 2329	0.87	- 5. 2	8.649 7E-16	V
ZCC HC2	NM_01774 2	14	PSR180025 46.hg.1	18	+	60241 290	6024 2783	0.89	- 5. 3	1.746 E-17	V
ZCC HC2	NM_01774 2	15	PSR180025 47.hg.1	18	+	60243 745	6024 3885	0.88	- 5. 5	6.180 2E-17	V
RFX2	NM_00063 5	2	PSR190149 12.hg.1	19	-	59935 38	5994 961	0.84	2. 7	7.338 6E-13	B
RFX2	NM_00063 5	3	PSR190149 13.hg.1	19	-	59956 12	5995 654	0.84	2. 9	6.940 3E-13	B
RFX2	NM_00063 5	7	PSR190149 17.hg.1	19	-	60042 12	6004 309	0.86	4. 8	3.218 E-13	B
RFX2	NM_00063 5	9	PSR190149 19.hg.1	19	-	60077 01	6007 813	0.85	2. 8	1.311 2E-12	B
RFX2	NM_00063 5	12	PSR190149 22.hg.1	19	-	60129 97	6013 116	0.85	3. 2	3.787 9E-12	B
RFX2	NM_00063 5	13	PSR190149 23.hg.1	19	-	60161 01	6016 282	0.86	3. 6	4.403 5E-13	B
RFX2	NM_00063 5	14	PSR190149 24.hg.1	19	-	60261 74	6026 248	0.86	4. 3	1.756 5E-13	B
RFX2	NM_00063 5	16	PSR190149 26.hg.1	19	-	60420 55	6042 134	0.85	3. 7	7.253 E-13	B
RFX2	NM_00063 5	19	PSR190149 29.hg.1	19	-	61104 04	6110 545	0.86	3. 2	8.747 1E-13	B
RIN2	NM_00124 2581	7	PSR200017 02.hg.1	20	+	19915 743	1991 5768	0.80	- 5. 0	1.626 4E-09	V
RIN2	NM_00124 2581	8	PSR200017 03.hg.1	20	+	19915 769	1991 5843	0.83	- 5. 1	1.220 2E-10	V
RIN2	NM_00124 2581	9	PSR200017 04.hg.1	20	+	19916 083	1991 6194	0.85	- 8. 4	3.739 2E-12	V
RIN2	NM_00124 2581	10	PSR200017 05.hg.1	20	+	19916 195	1991 6251	0.85	- 7. 4	5.562 E-12	V
RIN2	NM_00124 2581	11	PSR200017 06.hg.1	20	+	19937 259	1993 7451	0.84	- 6. 4	2.557 5E-11	V
RIN2	NM_00124 2581	12	PSR200017 07.hg.1	20	+	19941 344	1994 1455	0.83	- 5. 5	7.548 7E-11	V
RIN2	NM_00124 2581	13	PSR200017 08.hg.1	20	+	19945 596	1994 5668	0.84	- 6. 1	5.825 3E-11	V
RIN2	NM_00124 2581	14	PSR200017 09.hg.1	20	+	19951 482	1995 1573	0.83	- 6. 1	3.841 2E-11	V
RIN2	NM_00124 2581	15	PSR200017 10.hg.1	20	+	19955 298	1995 6431	0.78	- 3. 3	4.741 6E-08	V
RIN2	NM_00124 2581	16	PSR200017 11.hg.1	20	+	19970 650	1997 0955	0.79	- 3.	4.026 6E-09	V

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RIN2	NM_00124 2581	17	PSR200017 12.hg.1	20	+	19972 812	1997 2943	0.80	- 4. 9	4.064 7E-09	V
RIN2	NM_00124 2581	18	PSR200017 13.hg.1	20	+	19977 323	1997 7486	0.80	- 4. 5	3.405 E-09	V
RIN2	NM_00124 2581	19	PSR200017 14.hg.1	20	+	19981 257	1998 1992	0.81	- 4. 0	5.480 3E-10	V
RIN2	NM_00124 2581	20	PSR200017 15.hg.1	20	+	19981 993	1998 3101	0.78	- 3. 6	2.106 7E-08	V
MMP 9	NM_00499 4	1	PSR200052 42.hg.1	20	+	44637 561	4463 7703	0.82	5. 0	1.066 8E-10	B
MMP 9	NM_00499 4	2	PSR200052 43.hg.1	20	+	44638 505	4463 8737	0.83	6. 3	5.043 8E-11	B
MMP 9	NM_00499 4	3	PSR200052 44.hg.1	20	+	44639 122	4463 9270	0.82	6. 9	7.265 E-11	B
MMP 9	NM_00499 4	4	PSR200052 45.hg.1	20	+	44639 561	4463 9689	0.82	5. 3	1.828 4E-10	B
MMP 9	NM_00499 4	5	PSR200052 46.hg.1	20	+	44639 782	4463 9955	0.81	5. 9	2.733 4E-10	B
MMP 9	NM_00499 4	6	PSR200052 47.hg.1	20	+	44640 213	4464 0386	0.81	5. 8	9.952 1E-10	B
MMP 9	NM_00499 4	9	PSR200052 50.hg.1	20	+	44640 856	4464 0909	0.80	5. 5	9.938 9E-10	B
MMP 9	NM_00499 4	13	PSR200052 54.hg.1	20	+	44641 994	4464 2173	0.82	6. 1	1.662 5E-10	B
MMP 9	NM_00499 4	17	PSR200052 58.hg.1	20	+	44643 010	4464 3113	0.80	5. 1	4.247 3E-09	B
MMP 9	NM_00499 4	18	PSR200052 59.hg.1	20	+	44644 889	4464 5199	0.82	5. 9	2.047 3E-10	B
ATP9 A	NM_00604 5	2	PSR200130 15.hg.1	20	-	50213 314	5021 7401	0.82	2. 7	2.836 E-09	B
ATP9 A	NM_00604 5	4	PSR200130 17.hg.1	20	-	50217 749	5021 7886	0.84	3. 0	1.284 E-09	B
ATP9 A	NM_00604 5	5	PSR200130 18.hg.1	20	-	50221 356	5022 1559	0.85	2. 9	1.281 1E-10	B
ATP9 A	NM_00604 5	6	PSR200130 19.hg.1	20	-	50224 066	5022 4123	0.80	2. 8	2.884 2E-09	B
ATP9 A	NM_00604 5	7	PSR200130 20.hg.1	20	-	50225 057	5022 5165	0.83	4. 6	2.665 5E-12	B
ATP9 A	NM_00604 5	8	PSR200130 21.hg.1	20	-	50226 640	5022 6704	0.83	2. 9	2.916 5E-09	B
ATP9 A	NM_00604 5	9	PSR200130 22.hg.1	20	-	50230 216	5023 0371	0.78	2. 4	1.333 E-07	B
ATP9 A	NM_00604 5	13	PSR200130 27.hg.1	20	-	50238 613	5023 8711	0.81	3. 0	5.826 4E-09	B
ATP9 A	NM_00604 5	16	PSR200130 30.hg.1	20	-	50245 519	5024 5611	0.82	2. 5	2.417 3E-10	B
ATP9 A	NM_00604 5	19	PSR200130 33.hg.1	20	-	50286 536	5028 6648	0.81	4. 3	3.145 2E-10	B
ATP9 A	NM_00604 5	20	PSR200130 34.hg.1	20	-	50287 654	5028 7796	0.85	5. 9	1.876 6E-12	B
ATP9	NM_00604	21	PSR200130	20	-	50290	5029	0.84	5.	1.178	B

A	5		35.hg.1			692	0852		9	1E-12	
ATP9 A	NM_00604 5	23	PSR200130 37.hg.1	20	-	50292 701	5029 2747	0.85	7. 7	2.593 6E-13	B
ATP9 A	NM_00604 5	25	PSR200130 39.hg.1	20	-	50307 278	5030 7358	0.85	6. 7	3.733 3E-13	B
ATP9 A	NM_00604 5	27	PSR200130 41.hg.1	20	-	50312 632	5031 2683	0.85	5. 9	2.951 2E-11	B
ATP9 A	NM_00604 5	28	PSR200130 42.hg.1	20	-	50313 963	5031 4021	0.85	7. 1	1.139 1E-12	B
ATP9 A	NM_00604 5	29	PSR200130 44.hg.1	20	-	50329 505	5032 9613	0.86	4. 2	5.001 7E-11	B
ATP9 A	NM_00604 5	30	PSR200130 45.hg.1	20	-	50342 358	5034 2471	0.86	6. 4	9.838 3E-13	B
ZBP1	NM_00116 0418	2	PSR200133 69.hg.1	20	-	56179 111	5617 9319	0.81	- 4. 7	7.854 8E-11	V
ZBP1	NM_00116 0418	3	PSR200133 70.hg.1	20	-	56179 320	5617 9432	0.82	- 4. 2	2.189 3E-11	V
ZBP1	NM_00116 0418	4	PSR200133 71.hg.1	20	-	56179 433	5617 9459	0.81	- 5. 2	2.766 5E-10	V
ZBP1	NM_00116 0418	5	PSR200133 72.hg.1	20	-	56179 460	5617 9802	0.81	- 4. 1	3.479 2E-10	V
ZBP1	NM_00116 0418	6	PSR200133 75.hg.1	20	-	56182 117	5618 2356	0.77	- 3. 3	2.836 7E-08	V
ZBP1	NM_00116 0418	8	PSR200133 77.hg.1	20	-	56185 322	5618 5423	0.80	- 4. 7	5.651 6E-10	V
ZBP1	NM_00116 0418	10	PSR200133 79.hg.1	20	-	56186 783	5618 6986	0.80	- 3. 4	1.118 4E-09	V
ZBP1	NM_00116 0418	12	PSR200133 82.hg.1	20	-	56188 219	5618 8383	0.81	- 3. 9	1.176 3E-10	V
ZBP1	NM_00116 0418	13	PSR200133 84.hg.1	20	-	56189 943	5619 0081	0.82	- 3. 9	3.517 1E-11	V
ZBP1	NM_00116 0418	14	PSR200133 85.hg.1	20	-	56190 082	5619 0116	0.80	- 4. 1	1.917 6E-09	V
ZBP1	NM_00116 0418	15	PSR200133 86.hg.1	20	-	56190 568	5619 0636	0.80	- 4. 8	5.947 9E-10	V
ZBP1	NM_00116 0418	17	PSR200133 88.hg.1	20	-	56191 300	5619 1524	0.80	- 5. 1	4.314 1E-10	V
ZBP1	NM_00116 0418	19	PSR200133 90.hg.1	20	-	56195 275	5619 5317	0.78	- 3. 4	4.118 1E-08	V
---	n339591	4	PSR200146 95.hg.1	20	+	19915 743	1991 5843	0.84	- 5. 1	6.251 8E-11	V
---	n339591	5	PSR200146 96.hg.1	20	+	19937 259	1993 7451	0.85	- 6.	1.037 7E-11	V

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---	n339591	6	PSR200146 97.hg.1	20	+	19941 344	1994 1455	0.84	- 5. 4	4.497 6E-11	V
---	n339591	7	PSR200146 98.hg.1	20	+	19945 596	1994 5668	0.84	- 6. 3	4.418 6E-11	V
---	n339591	8	PSR200146 99.hg.1	20	+	19951 482	1995 1573	0.84	- 6. 2	2.718 2E-11	V
---	n339591	10	PSR200147 01.hg.1	20	+	19970 650	1997 0955	0.79	- 3. 9	4.326 8E-09	V
---	n339591	11	PSR200147 02.hg.1	20	+	19972 812	1997 2943	0.80	- 5. 0	1.309 8E-09	V
---	n339591	12	PSR200147 03.hg.1	20	+	19977 323	1997 7486	0.81	- 4. 7	6.525 7E-10	V
---	n339591	13	PSR200147 04.hg.1	20	+	19981 257	1998 1449	0.81	- 5. 0	1.505 3E-09	V
---	TCONS_00 028139- XLOC_013 499	2	PSR200148 45.hg.1	20	+	24911 983	2491 2191	0.79	5. 1	7.686 7E-10	B
MIR6 50	NR_03075 5	20	PSR220015 52.hg.1	22	+	22676 832	2267 6909	0.74	- 3. 5	5.879 3E-06	V
MIR6 50	NR_03075 5	21	PSR220015 53.hg.1	22	+	22677 019	2267 7203	0.72	- 4. 6	1.753 7E-05	V
MIR6 50	NR_03075 5	22	PSR220015 54.hg.1	22	+	22677 204	2267 7324	0.72	- 5. 3	1.221 3E-05	V
MIR6 50	NR_03075 5	26	PSR220015 64.hg.1	22	+	22682 051	2268 2144	0.72	- 4. 0	6.791 3E-06	V
MIR6 50	NR_03075 5	27	PSR220015 65.hg.1	22	+	22682 145	2268 2172	0.68	- 3. 3	0.000 37604	V
MIR6 50	NR_03075 5	28	PSR220015 72.hg.1	22	+	22712 115	2271 2144	0.71	- 2. 9	8.572 8E-05	V
MIR6 50	NR_03075 5	30	PSR220015 74.hg.1	22	+	22712 304	2271 2606	0.69	- 3. 7	0.000 13314	V
MIR6 50	NR_03075 5	32	PSR220015 89.hg.1	22	+	22730 563	2273 0870	0.70	- 2. 9	0.000 14734	V
MIR6 50	NR_03075 5	34	PSR220015 93.hg.1	22	+	22735 225	2273 5294	0.71	- 3. 2	0.000 101	V
MIR6 50	NR_03075 5	35	PSR220015 95.hg.1	22	+	22735 410	2273 5598	0.69	- 4. 2	0.000 21656	V

MIR6 50	NR_03075 5	36	PSR220015 96.hg.1	22	+	22735 599	2273 5709	0.71	- 4. 8	1.590 4E-05	V
MIR6 50	NR_03075 5	37	PSR220016 19.hg.1	22	+	22764 131	2276 4194	0.72	- 3. 5	1.629 7E-05	V
MIR6 50	NR_03075 5	38	PSR220016 20.hg.1	22	+	22764 305	2276 4466	0.71	- 5. 1	1.027 2E-05	V
MIR6 50	NR_03075 5	39	PSR220016 22.hg.1	22	+	22764 472	2276 4597	0.72	- 4. 8	6.511 6E-06	V
MIR6 50	NR_03075 5	42	PSR220016 42.hg.1	22	+	22786 693	2278 6733	0.72	- 4. 0	8.956 E-06	V
MIR6 50	NR_03075 5	43	PSR220016 43.hg.1	22	+	22786 734	2278 6786	0.72	- 5. 0	1.326 6E-05	V
MIR6 50	NR_03075 5	45	PSR220017 70.hg.1	22	+	23040 406	2304 0481	0.68	- 3. 7	0.000 34489	V
MIR6 50	NR_03075 5	46	PSR220017 73.hg.1	22	+	23040 599	2304 0750	0.69	- 3. 8	0.000 30197	V
MIR6 50	NR_03075 5	47	PSR220017 75.hg.1	22	+	23040 763	2304 0892	0.70	- 4. 0	0.000 11229	V
MIR6 50	NR_03075 5	50	PSR220017 89.hg.1	22	+	23054 877	2305 4949	0.68	- 3. 2	0.000 93823	V
MIR6 50	NR_03075 5	51	PSR220017 92.hg.1	22	+	23055 385	2305 5677	0.68	- 3. 5	0.000 70466	V
MIR6 50	NR_03075 5	52	PSR220018 12.hg.1	22	+	23063 132	2306 3193	0.70	- 4. 2	0.000 15357	V
MIR6 50	NR_03075 5	53	PSR220018 13.hg.1	22	+	23063 340	2306 3630	0.69	- 4. 1	0.000 3853	V
MIR6 50	NR_03075 5	54	PSR220018 63.hg.1	22	+	23101 208	2310 1275	0.69	- 3. 8	0.000 16431	V
MIR6 50	NR_03075 5	55	PSR220018 65.hg.1	22	+	23101 393	2310 1686	0.70	- 4. 1	0.000 12115	V
MIR6 50	NR_03075 5	56	PSR220019 12.hg.1	22	+	23134 984	2313 5067	0.70	- 4. 3	5.679 7E-05	V
MIR6 50	NR_03075 5	57	PSR220019 14.hg.1	22	+	23135 192	2313 5489	0.70	- 4. 6	0.000 11571	V
MIR6 50	NR_03075 5	59	PSR220019 44.hg.1	22	+	23154 478	2315 4774	0.71	- 3. 1	0.000 56063	V
MIR6 50	NR_03075 5	61	PSR220019 74.hg.1	22	+	23165 285	2316 5360	0.71	- 4. 2	4.776 5E-05	V

MIR6 50	NR_03075 5	62	PSR220019 77.hg.1	22	+	23165 487	2316 5715	0.71	- 4. 1	3.488 8E-05	V
MIR6 50	NR_03075 5	63	PSR220019 78.hg.1	22	+	23165 716	2316 5755	0.72	- 3. 6	1.124 6E-05	V
MIR6 50	NR_03075 5	69	PSR220020 85.hg.1	22	+	23235 965	2323 5998	0.69	- 4. 6	0.000 15309	V
MIR6 50	NR_03075 5	71	PSR220020 89.hg.1	22	+	23237 555	2323 7984	0.71	- 3. 9	3.883 5E-05	V
MIR6 50	NR_03075 5	73	PSR220021 03.hg.1	22	+	23241 805	2324 1835	0.70	- 3. 5	9.114 9E-05	V
MIR6 50	NR_03075 5	74	PSR220021 09.hg.1	22	+	23243 156	2324 3489	0.73	- 3. 6	1.202 5E-05	V
MIR6 50	NR_03075 5	75	PSR220021 13.hg.1	22	+	23243 497	2324 3610	0.73	- 4. 5	4.328 5E-06	V
MIR6 50	NR_03075 5	77	PSR220021 27.hg.1	22	+	23247 172	2324 7205	0.70	- 2. 8	7.706 9E-05	V
MIR6 50	NR_03075 5	79	PSR220021 31.hg.1	22	+	23248 512	2324 8845	0.73	- 3. 0	8.181 6E-06	V
MIR6 50	NR_03075 5	80	PSR220021 35.hg.1	22	+	23248 853	2324 8930	0.73	- 3. 6	6.853 5E-06	V
MIR6 50	NR_03075 5	81	PSR220021 36.hg.1	22	+	23248 931	2324 8963	0.73	- 3. 7	1.948 4E-05	V
KRE MEN 1	NM_00103 9570	2	PSR220034 91.hg.1	22	+	29490 246	2949 0408	0.88	6. 1	2.542 1E-15	B
KRE MEN 1	NM_00103 9570	3	PSR220034 92.hg.1	22	+	29494 850	2949 4941	0.90	6. 4	1.089 7E-16	B
KRE MEN 1	NM_00103 9570	4	PSR220034 93.hg.1	22	+	29517 345	2951 7428	0.90	6. 4	4.111 6E-15	B
KRE MEN 1	NM_00103 9570	5	PSR220034 94.hg.1	22	+	29517 429	2951 7469	0.89	7. 3	1.713 1E-15	B
KRE MEN 1	NM_00103 9570	7	PSR220034 96.hg.1	22	+	29521 251	2952 1404	0.89	6. 9	2.945 6E-16	B
KRE MEN 1	NM_00103 9570	8	PSR220034 97.hg.1	22	+	29533 330	2953 3489	0.89	6. 2	2.508 9E-17	B
KRE MEN 1	NM_00103 9570	9	PSR220034 98.hg.1	22	+	29533 490	2953 3662	0.89	6. 7	1.606 6E-16	B
KRE MEN 1	NM_00103 9570	10	PSR220035 00.hg.1	22	+	29534 631	2953 4759	0.90	7. 2	9.072 5E-19	B

KRE MEN 1	NM_00103 9570	12	PSR220035 03.hg.1	22	+	29536 270	2953 6354	0.90	7. 8	2.626 6E-16	B
KRE MEN 1	NM_00103 9570	13	PSR220035 04.hg.1	22	+	29537 932	2953 8017	0.90	7. 8	1.049 5E-16	B
KRE MEN 1	NM_00103 9570	14	PSR220035 05.hg.1	22	+	29538 018	2953 8088	0.90	8. 5	2.038 3E-17	B
KRE MEN 1	NM_00103 9570	15	PSR220035 07.hg.1	22	+	29538 101	2953 9731	0.90	7. 7	2.062 2E-16	B
KRE MEN 1	NM_00103 9570	16	PSR220035 08.hg.1	22	+	29539 732	2954 2801	0.89	6. 5	2.063 2E-17	B
TSPO	NM_00071 4	5	PSR220069 44.hg.1	22	+	43555 216	4355 5426	0.89	3. 1	9.741 6E-18	B
TSPO	NM_00071 4	7	PSR220069 46.hg.1	22	+	43557 058	4355 7196	0.90	4. 9	1.729 4E-19	B
TSPO	NM_00071 4	8	PSR220069 47.hg.1	22	+	43558 809	4355 9216	0.91	2. 9	1.679 3E-19	B
TSPO	NM_00071 4	9	PSR220069 48.hg.1	22	+	43559 217	4355 9247	0.88	4. 2	9.403 8E-16	B
PRR5	NM_18133 3	2	PSR220071 58.hg.1	22	+	45064 593	4506 4685	0.71	1. 2	3.661 2E-05	B
PRR5	NM_18133 3	4	PSR220071 60.hg.1	22	+	45072 861	4507 2936	0.65	- 1. 1	0.004 16537	V
PRR5	NM_18133 3	11	PSR220071 76.hg.1	22	+	45110 471	4511 0551	0.80	- 1. 7	1.611 2E-07	V
PRR5	NM_18133 3	12	PSR220071 79.hg.1	22	+	45121 141	4512 1172	0.83	- 4. 9	1.045 2E-10	V
PRR5	NM_18133 3	13	PSR220071 81.hg.1	22	+	45122 457	4512 2514	0.85	- 4. 6	4.586 5E-11	V
PRR5	NM_18133 3	14	PSR220071 82.hg.1	22	+	45125 194	4512 5288	0.70	- 1. 4	2.755 4E-05	V
PRR5	NM_18133 3	15	PSR220071 83.hg.1	22	+	45126 490	4512 6683	0.66	- 1. 3	0.000 19082	V
PRR5	NM_18133 3	16	PSR220071 84.hg.1	22	+	45126 684	4512 6763	0.65	- 1. 1	0.009 29537	V
PRR5	NM_18133 3	17	PSR220071 85.hg.1	22	+	45126 764	4512 6812	0.82	- 1. 8	1.186 2E-07	V
PRR5	NM_18133 3	18	PSR220071 86.hg.1	22	+	45126 813	4512 6884	0.61	- 1. 1	0.044 62985	V
PRR5	NM_18133 3	19	PSR220071 87.hg.1	22	+	45126 885	4512 7558	0.76	- 1. 5	6.554 5E-06	V
PRR5	NM_18133 3	20	PSR220071 88.hg.1	22	+	45127 559	4512 7609	0.79	- 1.	1.428 5E-08	V

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PRR5	NM_18133 3	21	PSR220071 90.hg.1	22	+	45127 615	4512 7701	0.86	- 3. 4	8.260 5E-11	V
PRR5	NM_18133 3	22	PSR220071 91.hg.1	22	+	45128 131	4512 8197	0.86	- 2. 2	1.520 5E-10	V
PRR5	NM_18133 3	23	PSR220071 92.hg.1	22	+	45128 198	4512 8271	0.72	- 1. 2	0.000 10856	V
PRR5	NM_18133 3	25	PSR220071 94.hg.1	22	+	45130 907	4513 1042	0.85	- 2. 6	7.537 4E-10	V
PRR5	NM_18133 3	26	PSR220071 96.hg.1	22	+	45132 667	4513 2754	0.84	- 2. 1	1.063 9E-08	V
PRR5	NM_18133 3	28	PSR220071 98.hg.1	22	+	45132 790	4513 3095	0.80	- 1. 4	1.238 7E-06	V
PRR5	NM_18133 3	29	PSR220071 99.hg.1	22	+	45133 096	4513 3321	0.85	- 3. 0	4.434 7E-10	V
PRR5	NM_18133 3	30	PSR220072 00.hg.1	22	+	45133 322	4513 3512	0.84	- 1. 9	4.381 1E-09	V
PRR5	NM_18133 3	32	PSR220072 10.hg.1	22	+	45148 438	4514 8507	0.72	- 1. 1	2.512 3E-05	V
PRR5	NM_18133 3	33	PSR220072 11.hg.1	22	+	45148 454	4514 8507	0.70	- 1. 2	0.000 5654	V
PRR5	NM_18133 3	34	PSR220072 12.hg.1	22	+	45148 466	4514 8507	0.69	- 1. 1	0.000 16043	V
PRR5	NM_18133 3	45	PSR220072 23.hg.1	22	+	45204 187	4520 4318	0.61	- 1. 1	0.025 48305	V
PRR5	NM_18133 3	47	PSR220072 25.hg.1	22	+	45204 552	4520 4612	0.70	- 1. 2	0.000 13354	V
PRR5	NM_18133 3	48	PSR220072 26.hg.1	22	+	45204 613	4520 4689	0.73	- 1. 1	2.193 5E-05	V
PRR5	NM_18133 3	49	PSR220072 27.hg.1	22	+	45204 886	4520 4978	0.59	- 1. 1	0.126 19041	V
PRR5	NM_18133 3	50	PSR220072 28.hg.1	22	+	45204 979	4520 5681	0.67	1. 1	0.001 31627	B
PRR5	NM_18133 3	53	PSR220072 32.hg.1	22	+	45218 251	4521 8349	0.62	- 1. 1	0.011 80009	V
PRR5	NM_18133 3	54	PSR220072 33.hg.1	22	+	45221 363	4522 1431	0.65	- 1. 1	0.002 86712	V
PRR5	NM_18133 3	61	PSR220072 43.hg.1	22	+	45255 611	4525 5658	0.70	1. 1	0.000 10977	B

PRR5	NM_18133 3	67	PSR220072 50.hg.1	22	+	45258 552	4525 8586	0.60	- 1. 1	0.031 26075	V
PRR5	NM_18133 3	68	PSR220072 51.hg.1	22	+	45258 587	4525 8616	0.59	1. 1	0.109 33159	B
PRR5	NM_18133 3	69	PSR220072 52.hg.1	22	+	45258 617	4525 8664	0.61	1. 1	0.046 09827	B
USP4 1	ENST0000 0454608	2	PSR220095 17.hg.1	22	-	20717 915	2071 7964	0.92	- 58 .8	2.718 3E-21	V
USP4 1	ENST0000 0454608	3	PSR220095 18.hg.1	22	-	20718 476	2071 8607	0.92	- 68 .8	9.322 7E-22	V
USP4 1	ENST0000 0454608	4	PSR220095 19.hg.1	22	-	20720 857	2072 1024	0.92	- 43 .5	2.425 8E-20	V
USP4 1	ENST0000 0454608	5	PSR220095 20.hg.1	22	-	20721 838	2072 1933	0.91	- 16 .1	1.550 8E-17	V
USP4 1	ENST0000 0454608	6	PSR220095 21.hg.1	22	-	20723 719	2072 3865	0.91	- 14 .7	4.010 6E-17	V
USP4 1	ENST0000 0454608	7	PSR220095 22.hg.1	22	-	20724 410	2072 4489	0.92	- 28 .9	9.237 E-20	V
USP4 1	ENST0000 0454608	10	PSR220095 27.hg.1	22	-	20731 445	2073 1541	0.90	- 16 .4	6.849 8E-17	V
---	n384079	6	PSR220161 14.hg.1	22	+	18847 156	1884 7476	0.62	1. 1	0.047 55901	B
---	n384079	7	PSR220161 15.hg.1	22	+	18847 477	1884 8963	0.62	- 1. 1	0.039 00109	V
---	n384079	10	PSR220161 18.hg.1	22	+	18851 305	1885 1914	0.90	- 13 .4	6.573 3E-16	V
---	n386315	3	PSR220165 04.hg.1	22	+	22657 589	2265 7662	0.70	- 1. 6	0.000 34851	V
---	n386315	4	PSR220165 05.hg.1	22	+	22658 308	2265 8420	0.64	- 1. 4	0.002 83381	V
---	n386315	5	PSR220165 06.hg.1	22	+	22658 425	2265 8479	0.68	- 1. 6	0.000 43744	V
---	n386315	6	PSR220165 07.hg.1	22	+	22661 155	2266 1268	0.67	- 1. 6	0.000 79357	V
---	n386315	7	PSR220165 08.hg.1	22	+	22661 269	2266 1386	0.67	- 1. 4	0.000 86729	V
---	n386315	8	PSR220165 09.hg.1	22	+	22661 471	2266 1610	0.66	- 1. 7	0.000 99046	V
---	n386315	10	PSR220165 12.hg.1	22	+	22661 898	2266 1958	0.68	- 1. 4	0.000 82402	V

---	n386315	13	PSR220165 15.hg.1	22	+	22663 093	2266 3184	0.67	- 1. 5	0.000 59708	V
---	n386315	15	PSR220165 17.hg.1	22	+	22664 101	2266 4248	0.71	- 1. 4	9.960 1E-05	V
---	n386315	16	PSR220165 18.hg.1	22	+	22664 591	2266 4766	0.70	- 1. 4	0.000 33934	V
---	n386315	17	PSR220165 19.hg.1	22	+	22673 254	2267 3606	0.63	- 1. 4	0.014 71703	V
---	n386315	20	PSR220165 22.hg.1	22	+	22677 019	2267 7324	0.72	- 5. 3	1.178 8E-05	V
---	n332472	3	PSR220178 09.hg.1	22	-	23248 513	2324 8828	0.73	- 4. 9	1.497 8E-06	V
---	n346241	5	PSR220178 31.hg.1	22	-	23264 978	2326 5153	0.75	- 5. 0	1.226 7E-06	V

Table 14 – Differentially expressed RNA determinants (coding and non-coding) and their measures of accuracy in differentiating between bacterial ("B") versus viral ("V") infected subjects

Gene Symbol	mRNA Accession	AUC	Sensitivity	Specificity	Fold Change (linear) (Bacterial vs. Viral)	ANOVA p-value (Bacterial vs. Viral)	Up in B/V
ZNF684	NM_152373	0.84	0.77	0.86	-2.9	1.05E-09	V
ZDHHC19	NM_001039617	0.82	0.75	0.80	1.7	2.21E-12	B
ZCCHC2	NM_017742	0.87	0.80	0.76	-5.18	6.66E-16	V
ZBP1	NM_001160418	0.80	0.77	0.71	-3.25	7.7E-10	V
VNN1	NM_004666	0.84	0.73	0.81	8.7	3.45E-12	B
USP41	ENST00000454608	0.91	0.92	0.82	-13.84	3.33E-16	V
TTC21A	NM_001105513	0.89	0.88	0.80	-1.53	9.96E-09	V
TSPO	NM_000714	0.90	0.86	0.82	1.76	<10-17	B
TRIB2	NM_021643	0.88	0.77	0.91	-5.06	2.78E-15	V
TREX1	NM_016381	0.91	0.88	0.84	-1.21	<10-17	V
TMEM255A	NM_001104544	0.82	0.82	0.72	-1.93	2.92E-09	V
TMEM123	NM_052932	0.92	0.84	0.86	-3.21	<10-17	V
TDRD9	NM_153046	0.82	0.77	0.84	3.25	1.95E-12	B
SULT1B1	NM_014465	0.88	0.77	0.86	3.65	3.33E-16	B
STAP1	NM_012108	0.85	0.86	0.79	-6.54	7.46E-14	V
SRGAP2	NM_001042758	0.88	0.78	0.85	-2.41	6.08E-12	V
SPATS2L	NM_001100422	0.87	0.84	0.75	-6.94	1.78E-13	V
SLPI	NM_003064	0.81	0.73	0.82	8.19	4.89E-11	B

SDCCAG3	NM_001039707	0.68	0.59	0.75	-1.16	0.000961	V
RIN2	NM_001242581	0.82	0.80	0.73	-3	4.65E-10	V
RFX2	NM_000635	0.86	0.80	0.86	2.55	3.13E-14	B
RASGRP3	NM_001139488	0.86	0.80	0.79	-2.05	3.13E-11	V
RABGAP1L	NM_001035230	0.85	0.77	0.87	-1.36	2.39E-11	V
PYGL	NM_001163940	0.91	0.88	0.84	3.57	<10-17	B
PRR5	NM_181333	0.88	0.75	0.87	-1.08	1.44E-12	V
PPM1K	NM_152542	0.91	0.84	0.87	-4.03	<10-17	V
PNPT1	NM_033109	0.93	0.90	0.90	-6.81	<10-17	V
PLB1	NM_001170585	0.85	0.82	0.82	2.61	1.66E-12	B
PI3	NM_002638	0.80	0.67	0.82	16.12	9.9E-11	B
PGD	NM_002631	0.89	0.88	0.82	2.37	2.22E-16	B
PGAP1	NM_024989	0.88	0.77	0.84	-2.89	6.21E-12	V
PARP14	NM_017554	0.78	0.77	0.66	-2.75	1.19E-08	V
PARP12	NM_022750	0.89	0.78	0.89	-6.42	<10-17	V
PADI2	NM_007365	0.87	0.88	0.71	3.54	5.71E-14	B
NSUN7	NM_024677	0.86	0.77	0.87	3.62	1.67E-13	B
NLRC4	NM_001199138	0.87	0.77	0.89	3.54	1.39E-14	B
NEXN	NM_001172309	0.77	0.73	0.70	-1.6	4.16E-08	V
NCOA7	NM_001122842	0.62	0.53	0.76	-1.13	0.084484	V
MT1X	NM_005952	0.85	0.84	0.81	-1.93	5.82E-10	V
MT1M	NM_176870	0.84	0.75	0.79	-1.33	1.16E-11	V
MT1JP	NR_036677	0.84	0.82	0.75	-1.98	3.93E-12	V
MT1IP	NR_003669	0.76	0.77	0.76	-1.23	6.35E-07	V
MT1H	NM_005951	0.85	0.86	0.75	-2.37	4.13E-12	V
MT1G	NM_005950	0.82	0.77	0.80	-1.98	2.1E-10	V
MT1F	NM_005949	0.82	0.84	0.71	-3.22	8.19E-11	V
MT1E	NM_175617	0.83	0.80	0.77	-1.63	1.99E-10	V
MT1DP	NR_003658	0.83	0.82	0.77	-1.45	4.35E-12	V
MT1B	NM_005947	0.79	0.84	0.72	-1.7	8.61E-10	V
MT1A	NM_005946	0.83	0.86	0.77	-1.69	2.22E-12	V
MOV10	NM_001130079	0.80	0.61	0.84	-2.77	1.83E-09	V
MMP9	NM_004994	0.81	0.75	0.77	4.94	5.78E-10	B
MMP8	NM_002424	0.72	0.69	0.71	4.08	0.000012	B
MIR650	NR_030755	0.71	0.75	0.62	-2.75	0.000039	V
MIR1182	NR_031593	0.68	0.65	0.70	1.18	0.000057	B
MGAM	NM_004668	0.89	0.86	0.84	4.25	4.8E-14	B
MAPK14	NM_001315	0.88	0.77	0.82	2.6	1.89E-15	B
LTA4H	NM_000895	0.93	0.86	0.92	4.25	<10-17	B
LRRN3	NM_001099658	0.73	0.73	0.67	-2.53	0.000011	V
LGALS3BP	NM_005567	0.79	0.75	0.72	-2.76	1.88E-08	V
KRT19	NM_002276	0.51	0.63	0.51	1	0.686226	B
KREMEN1	NM_001039570	0.89	0.80	0.89	5.9	1.11E-16	B

IMPA2	NM_014214	0.93	0.88	0.85	3.58	<10-17	B
IL1RN	NM_173843	0.67	0.75	0.60	-1.55	0.000095	V
IGKV3D-15	ENST00000417279	0.73	0.73	0.72	-3.18	0.00002	V
IGKV2D-28	ENST00000453166	0.73	0.77	0.66	-6.14	0.000005	V
IGKV2-28	ENST00000482769	0.73	0.73	0.68	-7.47	0.000008	V
IGKV1D-33	ENST00000390265	0.72	0.69	0.76	-6.09	0.000023	V
IGKV1-9	ENST00000493819	0.72	0.73	0.68	-4.98	0.000014	V
IGKC	ENST00000390237	0.72	0.71	0.73	-4.18	0.000009	V
IGJ	NM_144646	0.72	0.71	0.71	-4.74	0.00001	V
IFIT5	NM_012420	0.84	0.77	0.82	-5.14	2.18E-13	V
IFIH1	NM_022168	0.82	0.80	0.71	-5.17	1.18E-11	V
HPR	NM_020995	0.84	0.77	0.82	2.38	1.68E-11	B
HPGD	NM_000860	0.82	0.65	0.89	3.86	4.36E-11	B
HP	NM_001126102	0.83	0.75	0.80	9.16	3.01E-12	B
HESX1	NM_003865	0.86	0.82	0.80	-2.25	5.8E-09	V
HERC6	NM_001165136	0.92	0.88	0.84	-11.16	<10-17	V
GSN	NM_198252	0.70	0.78	0.57	1.23	0.000294	B
GAS7	NM_201433	0.91	0.82	0.87	4.54	<10-17	B
GALNT14	NM_001253826	0.84	0.77	0.85	2.65	1.94E-13	B
FTSJD2	NM_015050	0.85	0.78	0.81	-3.14	4.23E-13	V
FBXO39	NM_153230	0.80	0.75	0.77	-2.03	1.34E-08	V
FAM200B	NM_001145191	0.78	0.71	0.73	1.42	2.56E-08	B
DHX58	NM_024119	0.87	0.84	0.81	-6.51	4.79E-14	V
DGAT2	NM_001253891	0.89	0.88	0.80	4.64	7.77E-16	B
CR1L	NM_175710	0.90	0.86	0.81	2.68	<10-17	B
CR1	NM_000573	0.90	0.88	0.81	3.91	<10-17	B
CNTNAP3	NM_033655	0.75	0.73	0.66	2.6	5.62E-07	B
CDK5RAP2	NM_001011649	0.55	0.61	0.56	1.06	0.277074	B
CD44	NM_001001391	0.90	0.84	0.82	2.05	7.77E-16	B
CD2AP	NM_012120	0.89	0.82	0.79	-3.46	<10-17	V
CD177P1	ENST00000378007	0.77	0.71	0.76	14.08	1.98E-07	B
CCL8	NM_005623	0.83	0.80	0.73	-1.45	0.000005	V
CA4	NM_000717	0.86	0.71	0.89	3.05	1.54E-13	B
C9orf91	NM_153045	0.84	0.71	0.89	-1.93	4.69E-11	V
ATP9A	NM_006045	0.84	0.84	0.79	2.33	3.92E-10	B
ATP10A	NM_024490	0.90	0.84	0.85	-2.42	<10-17	V
ARG1	NM_000045	0.78	0.67	0.77	6.41	2.25E-08	B
ANXA3	NM_005139	0.80	0.78	0.73	2.64	1.03E-08	B
ANKRD34B	NM_001004441	0.82	0.80	0.70	2.28	3.47E-11	B
ALPL	NM_000478	0.90	0.86	0.85	6.32	6.33E-13	B
AKAP2	NM_001004065	0.87	0.86	0.77	-1.24	7.77E-16	V
---	ENST00000442385	0.84	0.84	0.77	-2.05	1.72E-09	V
---	TCONS_00000869-	0.84	0.80	0.70	-1.5	9.01E-08	V

	XLOC_000105						
---	ENST00000436616	0.92	0.88	0.89	-2.51	9.95E-14	V
---	ENST00000366140	0.87	0.80	0.91	-3.2	2.34E-12	V
---	ENST00000443397	0.71	0.65	0.75	-2.47	0.000045	V
---	n332762	0.87	0.80	0.80	-35.99	2.22E-16	V
---	n407780	0.88	0.80	0.85	-4.41	6.55E-15	V
---	n335962	0.73	0.75	0.68	-6.93	0.000006	V
---	n334260	0.70	0.73	0.66	-9.02	0.000036	V
---	n336675	0.73	0.71	0.73	-6.86	0.000004	V
---	n383778	0.92	0.90	0.86	-2.67	3.91E-14	V
---	n346494	0.80	0.77	0.68	1.87	9.16E-11	B
---	TCONS_00003184- XLOC_001966	0.88	0.82	0.89	-8.05	5.22E-15	V
---	n332362	0.88	0.86	0.82	-9.82	1.15E-11	V
---	n346551	0.72	0.71	0.72	-5.1	0.000007	V
---	n336205	0.72	0.67	0.73	-5.46	0.000017	V
---	n336681	0.72	0.69	0.70	-3.25	0.00003	V
---	uc003hr1.1	0.89	0.90	0.79	-3.5	2.22E-16	V
---	n407800	0.82	0.67	0.85	8.21	2.48E-11	B
---	uc004abr.1	0.76	0.75	0.63	3.26	1.7E-07	B
---	ENST00000438517	0.75	0.67	0.72	2.16	0.000001	B
---	n333961	0.76	0.61	0.82	-5.67	1.11E-07	V
---	ENST00000552784	0.87	0.78	0.82	-2.31	3.22E-12	V
---	n332510	0.88	0.80	0.86	-10.97	<10-17	V
---	n334829	0.89	0.86	0.79	-79.45	<10-17	V
---	n332456	0.89	0.84	0.89	-3.73	3.11E-15	V
---	n382996	0.83	0.80	0.77	-1.74	8.34E-12	V
---	TCONS_00024856- XLOC_011736	0.82	0.82	0.76	-1.3	5.65E-11	V
---	n406211	0.76	0.80	0.71	-1.26	1.81E-07	V
---	n407998	0.84	0.73	0.81	3.21	3.11E-13	B
---	TCONS_12_00013127- XLOC_12_007062	0.76	0.67	0.81	15.56	2.88E-07	B
---	n339591	0.82	0.75	0.77	-3.5	4.95E-10	V
---	TCONS_00028139- XLOC_013499	0.77	0.69	0.75	2.1	6.96E-08	B
---	n333319	0.91	0.84	0.84	-15.47	<10-17	V
---	n384079	0.70	0.59	0.77	-1.08	0.0002	V
---	n386315	0.69	0.82	0.56	-1.36	0.000431	V
---	n332472	0.74	0.67	0.72	-3.15	0.000034	V
---	n346241	0.73	0.75	0.68	-1.81	0.000077	V

Although the invention has been described in conjunction with specific embodiments thereof, it is evident that many alternatives, modifications and variations will be apparent to those skilled in the art. Accordingly, it is intended to embrace all such alternatives, modifications and variations that fall within the spirit and broad scope of the appended claims.

All publications, patents and patent applications mentioned in this specification are herein incorporated in their entirety by reference into the specification, to the same extent as if each individual publication, patent or patent application was specifically and individually indicated to be incorporated herein by reference. In addition, citation or identification of any reference in this application shall not be construed as an admission that such reference is available as prior art to the present invention. To the extent that section headings are used, they should not be construed as necessarily limiting.

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WHAT IS CLAIMED IS:

1. A method of determining an infection type in a subject comprising measuring the expression of at least one RNA determinant in a sample of the subject, wherein said measuring is effected at an exon or plurality of exons whose expression level distinguishes between a bacterial and viral infection with a degree of accuracy above a predetermined level, thereby determining the infection type of the subject.

2. The method of claim 1, wherein said exon provides a differential expression between a bacterially-infected subject and a virally-infected subject above a predetermined level.

3. The method of claim 1, wherein said exon provides the highest degree of differential expression in a sample derived from a bacterially infected subject compared with a virally infected subject, compared to all the exons of the RNA.

4. The method of claim 1, wherein said RNA is set forth in Tables 10A or 10B.

5. The method of claim 4, wherein the exon of said RNA is selected as set forth in Table 10A or 10B.

6. A method of selecting an exon of an RNA whose expression level is informative with respect to infection type of a subject comprising comparing the expression level of the RNA in a sample derived from a bacterially-infected subject and a sample derived from a virally-infected subject at a plurality of exons, wherein the exon that provides a differential expression between the bacterially-infected subject and the virally-infected subject above a predetermined level is selected as the exon of the RNA whose expression is informative with respect to infection type.

7. The method of claim 6, wherein the sample comprises RNA.

8. The method of claim 6, wherein the sample comprises cDNA.

9. The method of claim 6, wherein the comparing is effected using a plurality of oligonucleotides.

10. The method of claim 6, comprising:

(a) analyzing the expression level of said RNA in a sample derived from said bacterially-infected subject using a plurality of oligonucleotides which hybridize to non-identical exons of said RNA or cDNA generated therefrom;

(b) analyzing the expression level of said RNA in a sample derived from said virally-infected subject using a plurality of oligonucleotides which hybridize to said non-identical exons, wherein said plurality of oligonucleotides of step (a) have the same binding stringency to said exons as the plurality of oligonucleotides of step (b) to said exons.

11. The method of claim 10, wherein the nucleic acid sequence of said oligonucleotides of step (a) is identical to the nucleic acid sequence of said oligonucleotides of step (b).

12. The method of claim 6, further comprising comparing the expression level of said RNA across each exon of said RNA.

13. The method of claims 1 or 6, wherein the exon that provides the highest degree of differential expression is selected as the exon of the RNA whose expression is informative with respect to infection type.

14. The method of claims 1 or 6, wherein the comparing is performed under identical experimental conditions.

15. The method of any one of claims 1-14, wherein the sample is whole blood or a fraction thereof.

16. The method of claim 15, wherein said blood fraction sample comprises cells selected from the group consisting of lymphocytes, monocytes and granulocytes.

17. The method of claim 15, wherein said blood fraction sample comprises serum or plasma.

18. The method of any one of claims 1-17, wherein said plurality of exons comprise no more than 2 exons.

19. The method of claim 18, wherein said plurality of exons comprise no more than 5 exons.

20. A kit comprising at least two oligonucleotides, wherein the first of said at least two oligonucleotides specifically hybridizes to a first RNA at a first exon, and a second of said at least two oligonucleotides specifically hybridizes to said first RNA at a second exon, said first and said second exon being selected such that the expression level from said first exon distinguishes between a bacterial and viral infection with a degree of accuracy above a predetermined level and the expression level from said second exon distinguishes between a bacterial and viral infection with a degree of accuracy above said predetermined level.

21. A kit comprising at least two oligonucleotides, wherein the first of said at least two oligonucleotides specifically hybridizes to a first RNA at a first exon, and a second of said at least two oligonucleotides specifically hybridizes to a second RNA at a second exon, said first and said second exon being selected such that the expression level from said first exon distinguishes between a bacterial and viral infection with a degree of accuracy above a predetermined level and the expression level from said second exon distinguishes between a bacterial and viral infection with a degree of accuracy above said predetermined level.

22. The kit of claims 20 or 21, wherein said oligonucleotides are attached to a detectable moiety.

23. The kit of claims 20 or 21, wherein said kit comprises oligonucleotides that hybridize to no more than 3 exons of said first RNA.

24. The kit of claims 20 or 21, wherein said kit comprises oligonucleotides that hybridize to no more than 20 RNAs.

25. The kit of claims 20 or 21, wherein said kit comprises oligonucleotides that hybridize to no more than 10 RNAs.

26. The kit of claims 20 or 21, wherein said kit comprises oligonucleotides that hybridize to no more than 3 RNAs.

27. A primer pair which hybridize to an RNA at an exon whose expression level distinguishes between a bacterial and viral infection with a degree of accuracy above a predetermined level.

28. An array comprising a solid support and a polynucleotide that specifically hybridizes to a first RNA at a predetermined exon, said polynucleotide being attached to the solid support, said predetermined exon being selected such that the expression level therefrom distinguishes between a bacterial and viral infection with a degree of accuracy above a predetermined level, wherein said array comprises oligonucleotides that hybridize to no more than 3 exons of said first RNA.

29. The array of claim 28, comprising oligonucleotides that hybridize to no more than 20 non-identical RNAs.

30. An array comprising a solid support, a first polynucleotide that specifically hybridizes to a first RNA at a first exon and a second polynucleotide that specifically hybridizes to a second exon of a second RNA, said first and second polynucleotide being attached to the solid support, said first exon being selected such that the expression level therefrom distinguishes between a bacterial and viral infection with a degree of accuracy above a predetermined level and said second exon being selected such that the expression level therefrom distinguishes between a bacterial and viral infection with a degree of accuracy above a predetermined level, wherein said array comprises oligonucleotides that hybridize to no more than 20 non-identical RNAs.

31. The array of claim 30, wherein said array comprises oligonucleotides that hybridize to no more than 3 exons of said first RNA and/or said second RNA.

32. The kit, primer pair or array of any one of claims 20-30, wherein said RNA is set forth in Table 10A or 10B.

33. The kit, primer pair or array of claim 32, wherein at least one of said oligonucleotides hybridize to the exon of the RNA set forth in Table 10A or 10B.

FIG. 1

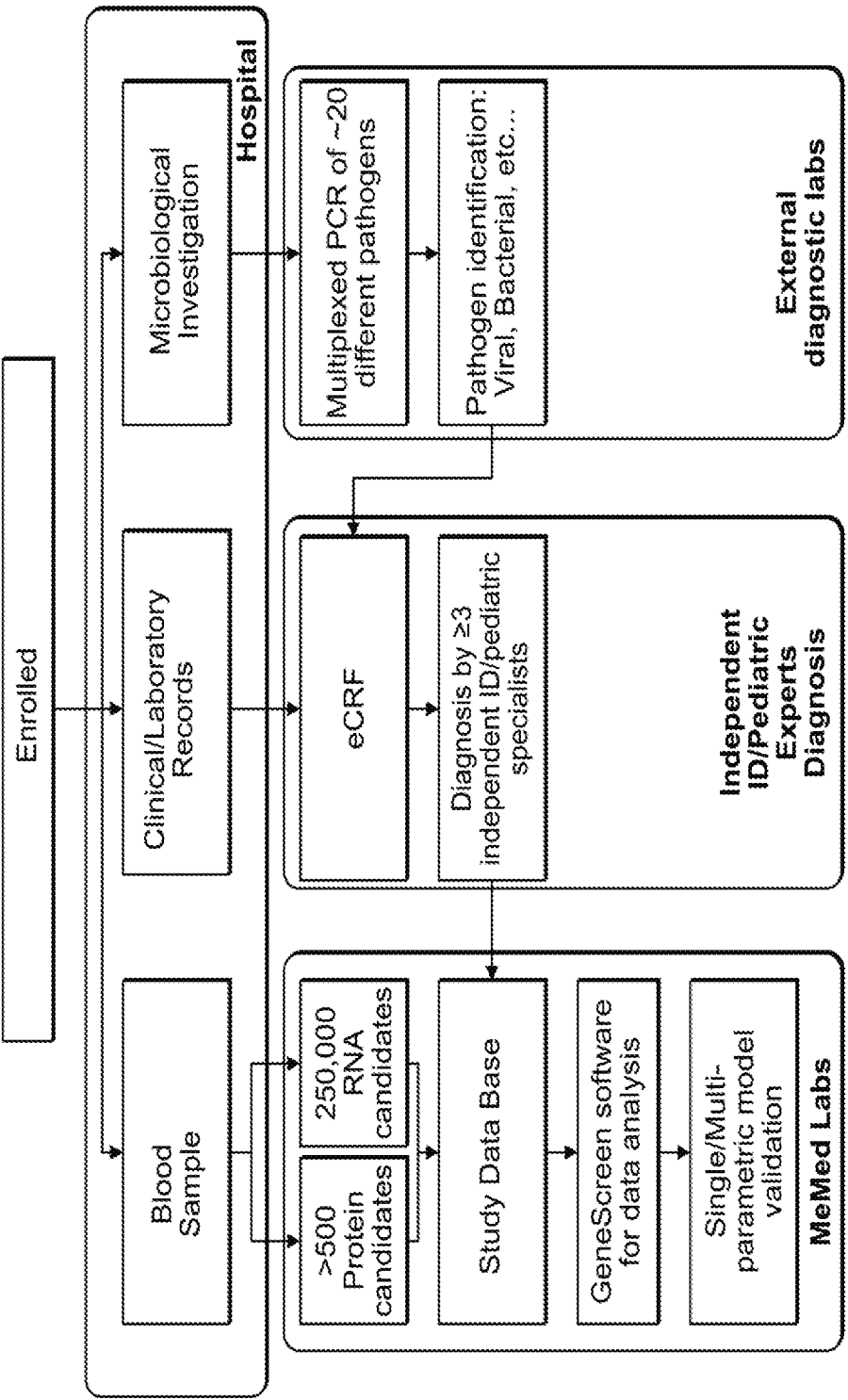


FIG. 2A

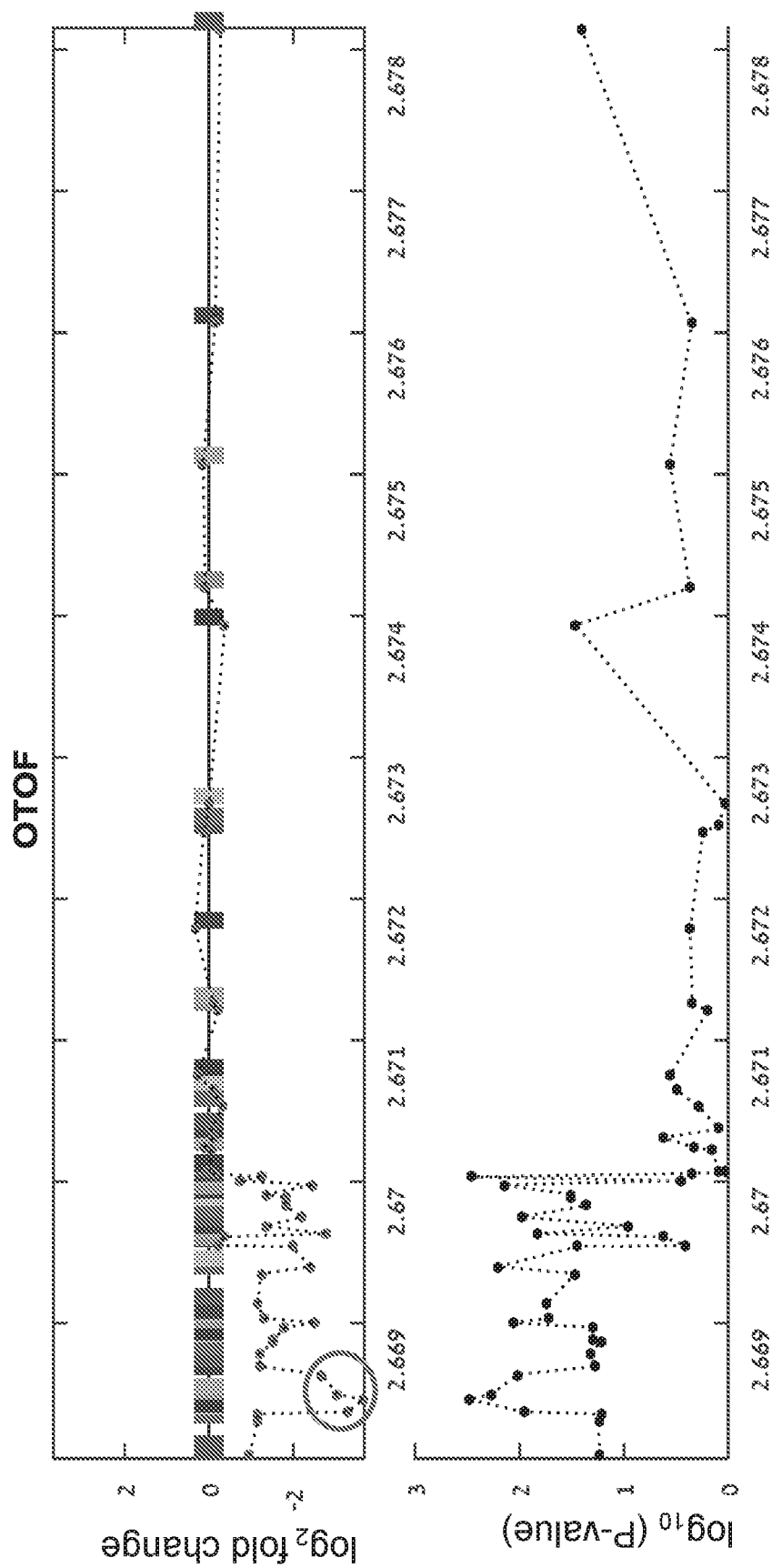


FIG. 2B

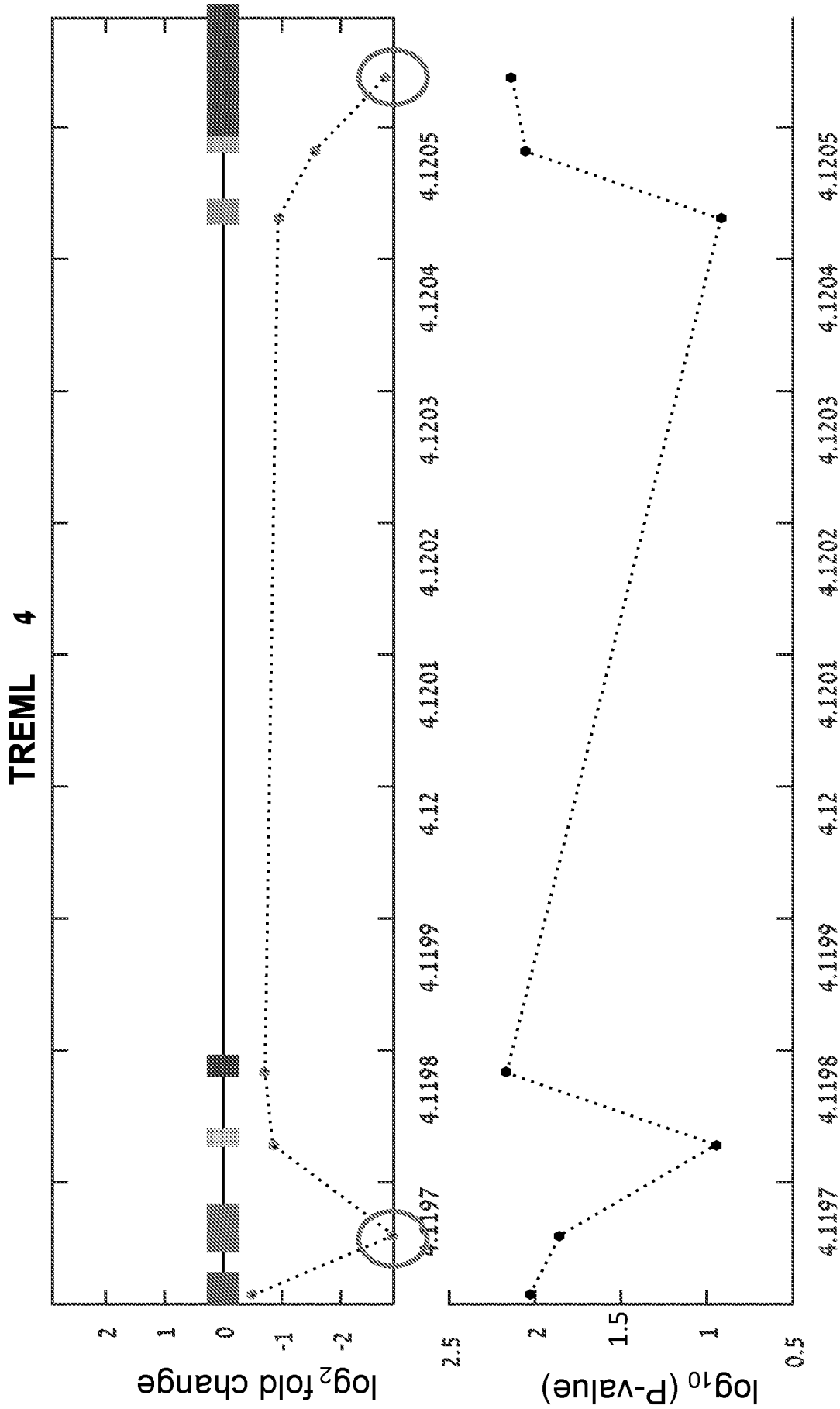


FIG. 2C

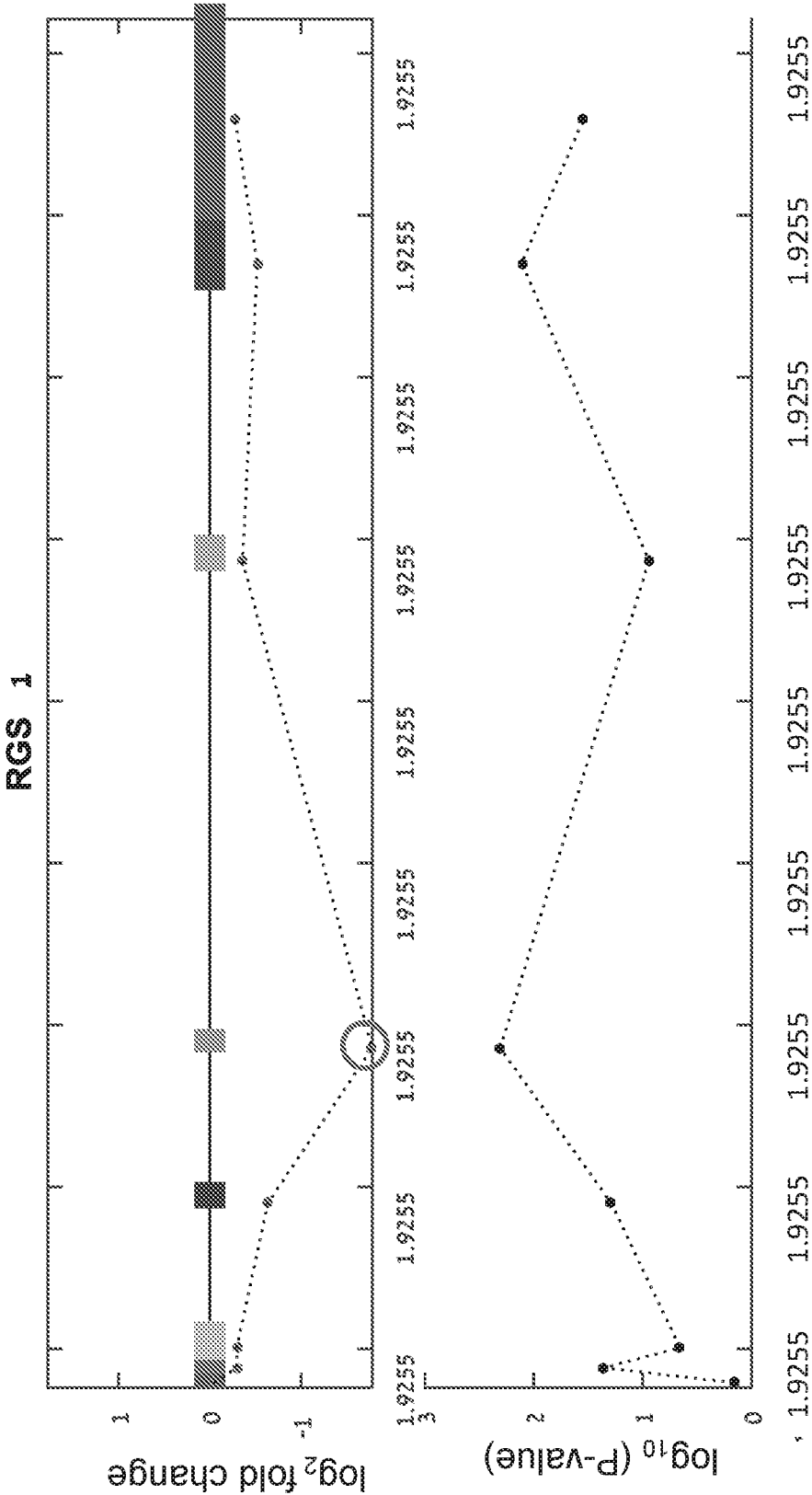


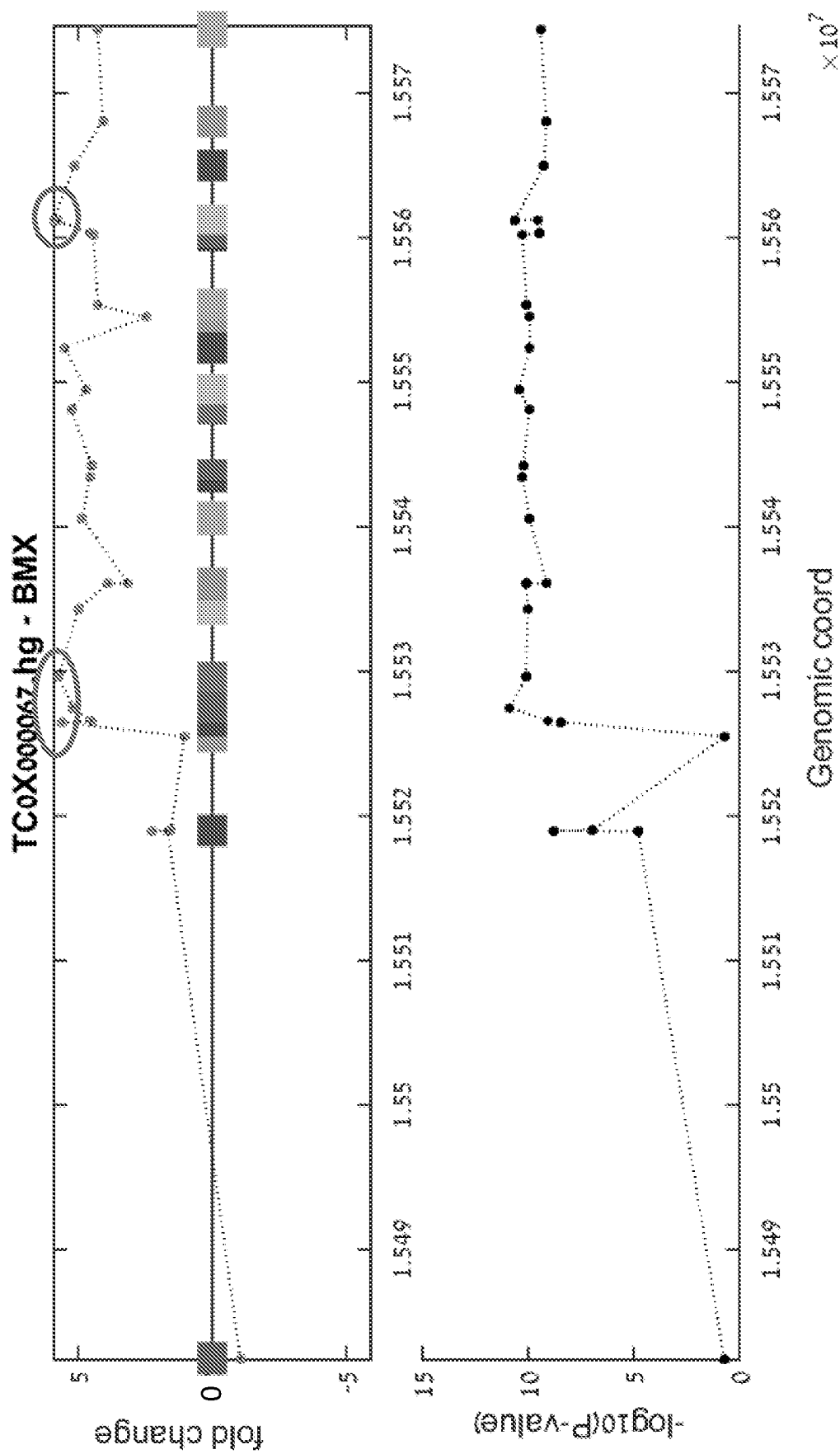
FIG. 3A

FIG. 3B

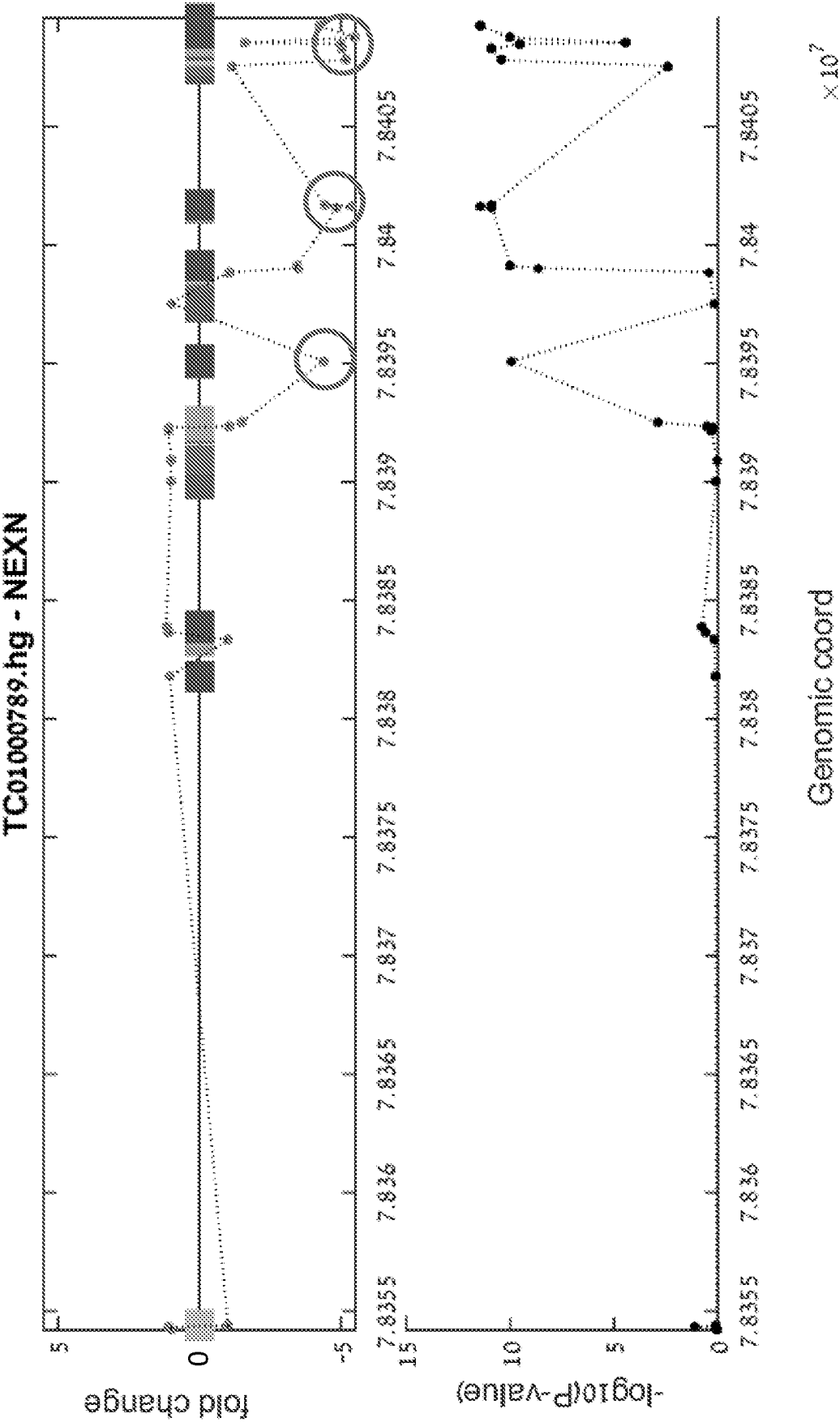


FIG. 3C

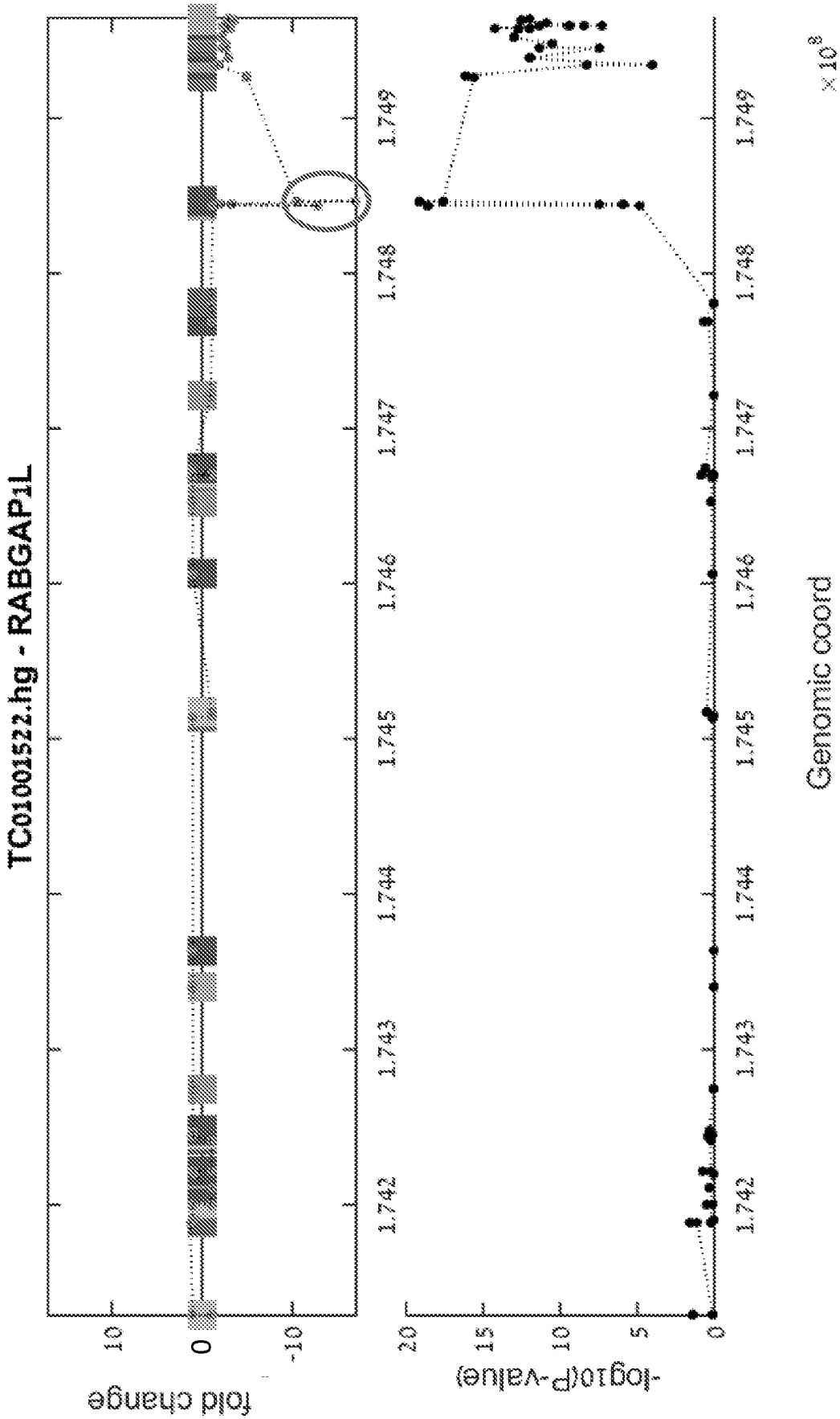


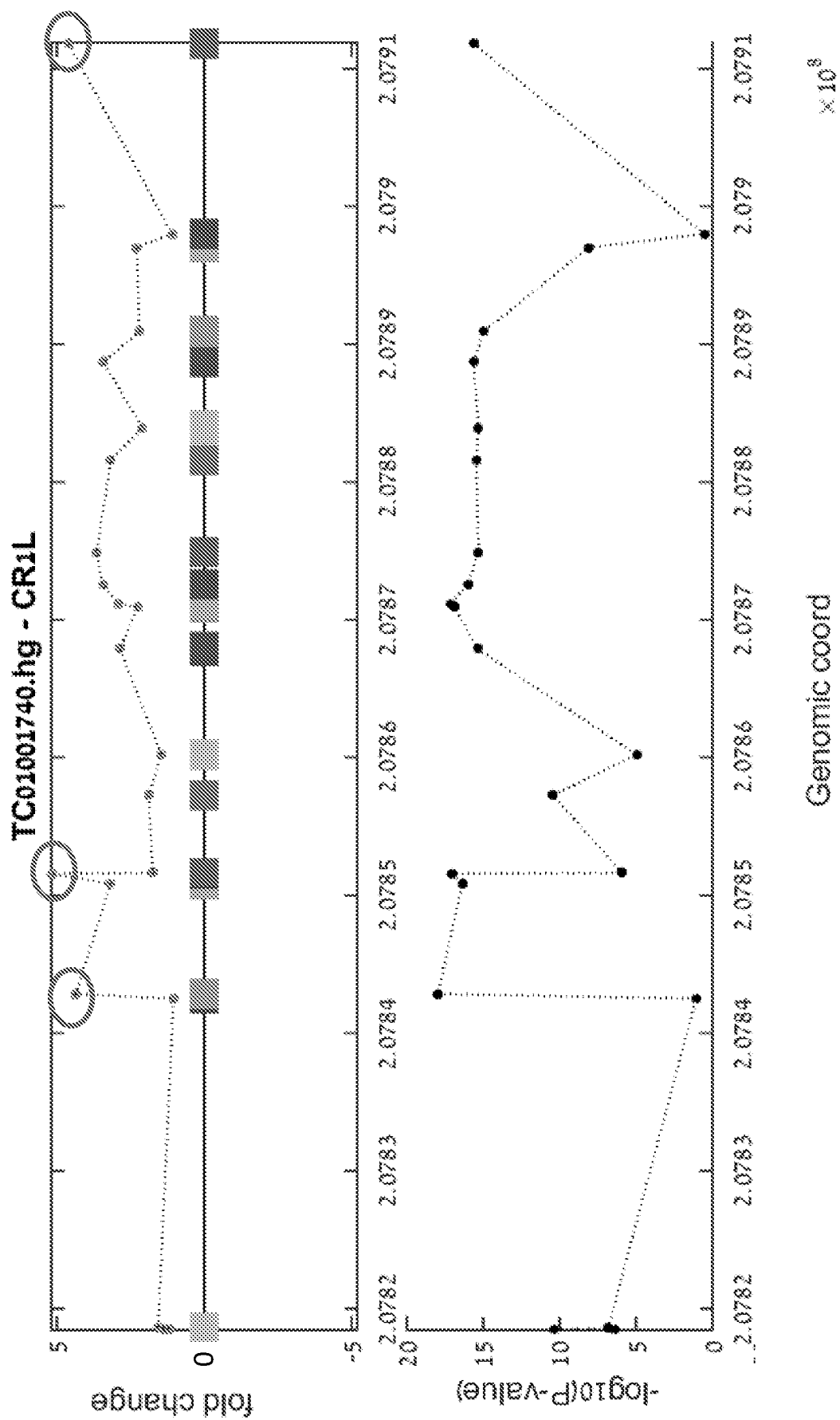
FIG. 3D

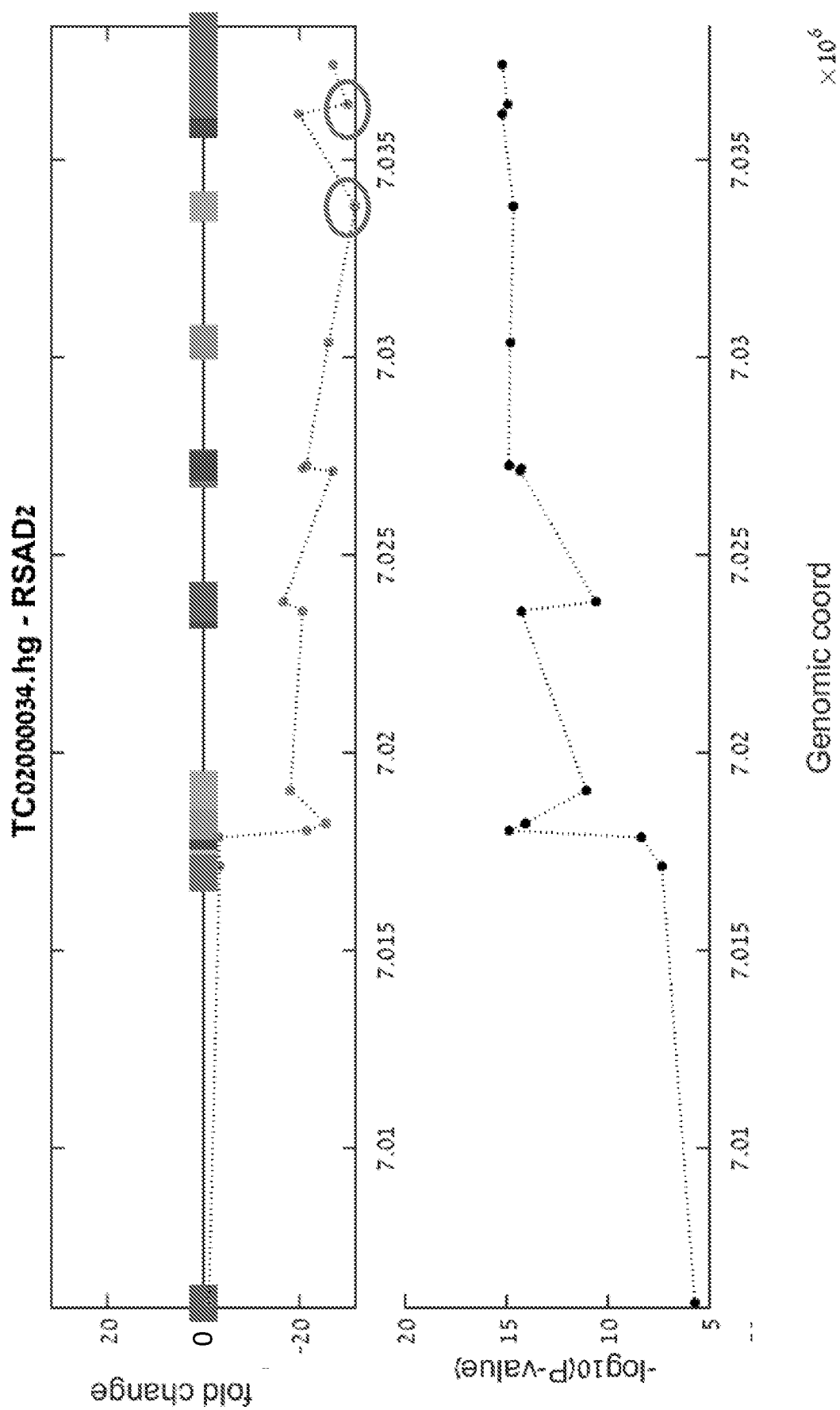
FIG. 3E

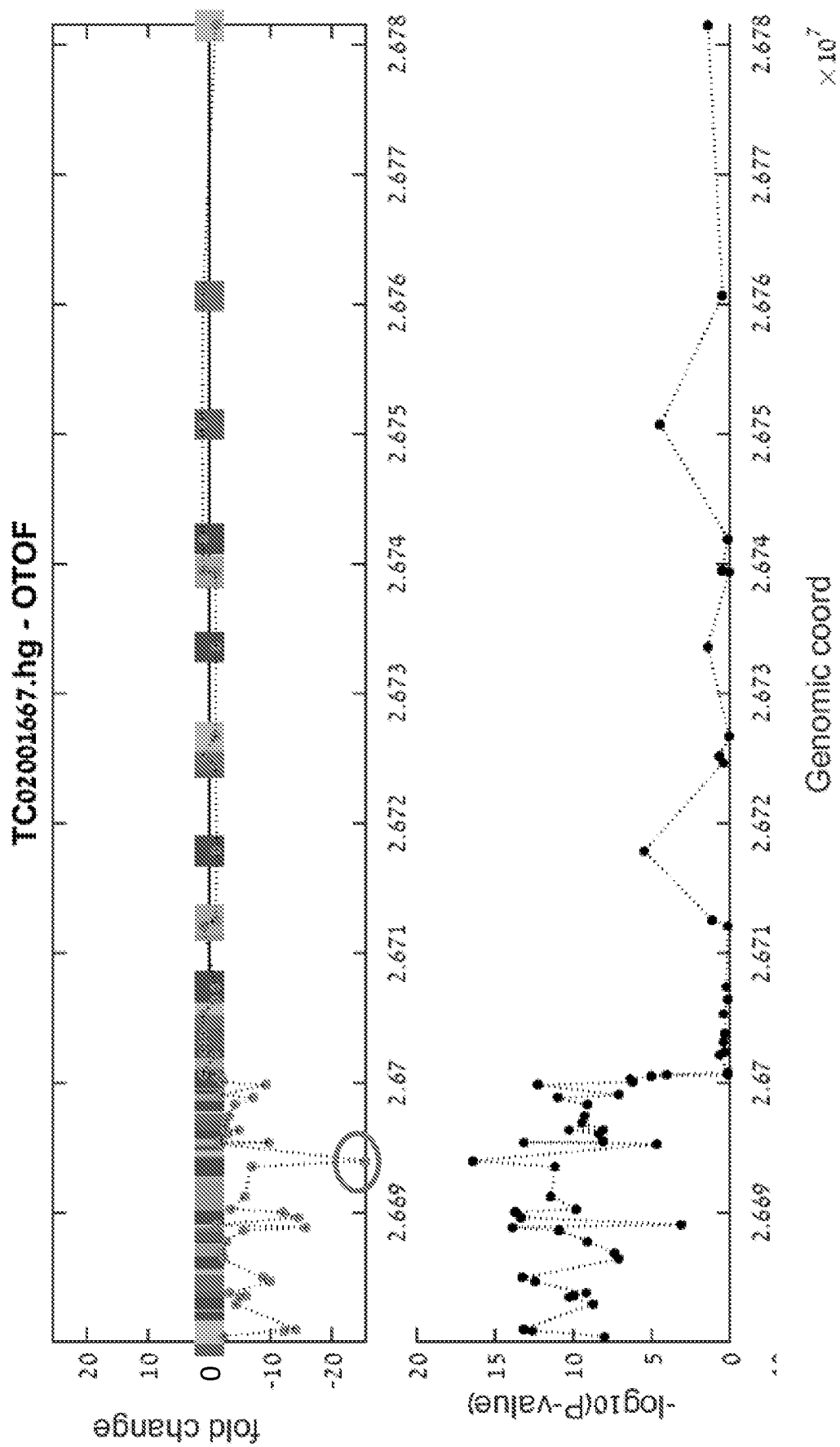
FIG. 3F

FIG. 3G

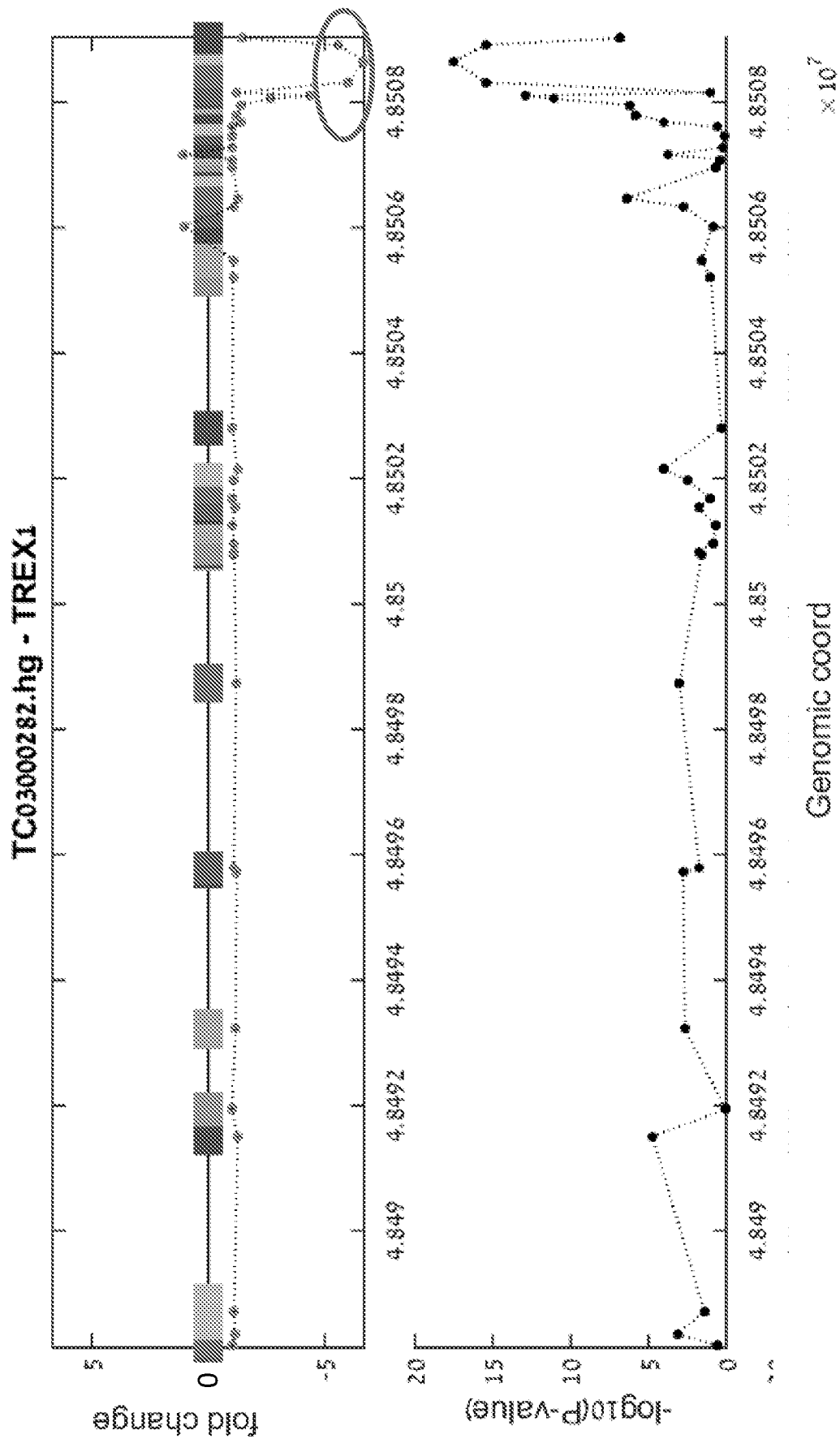


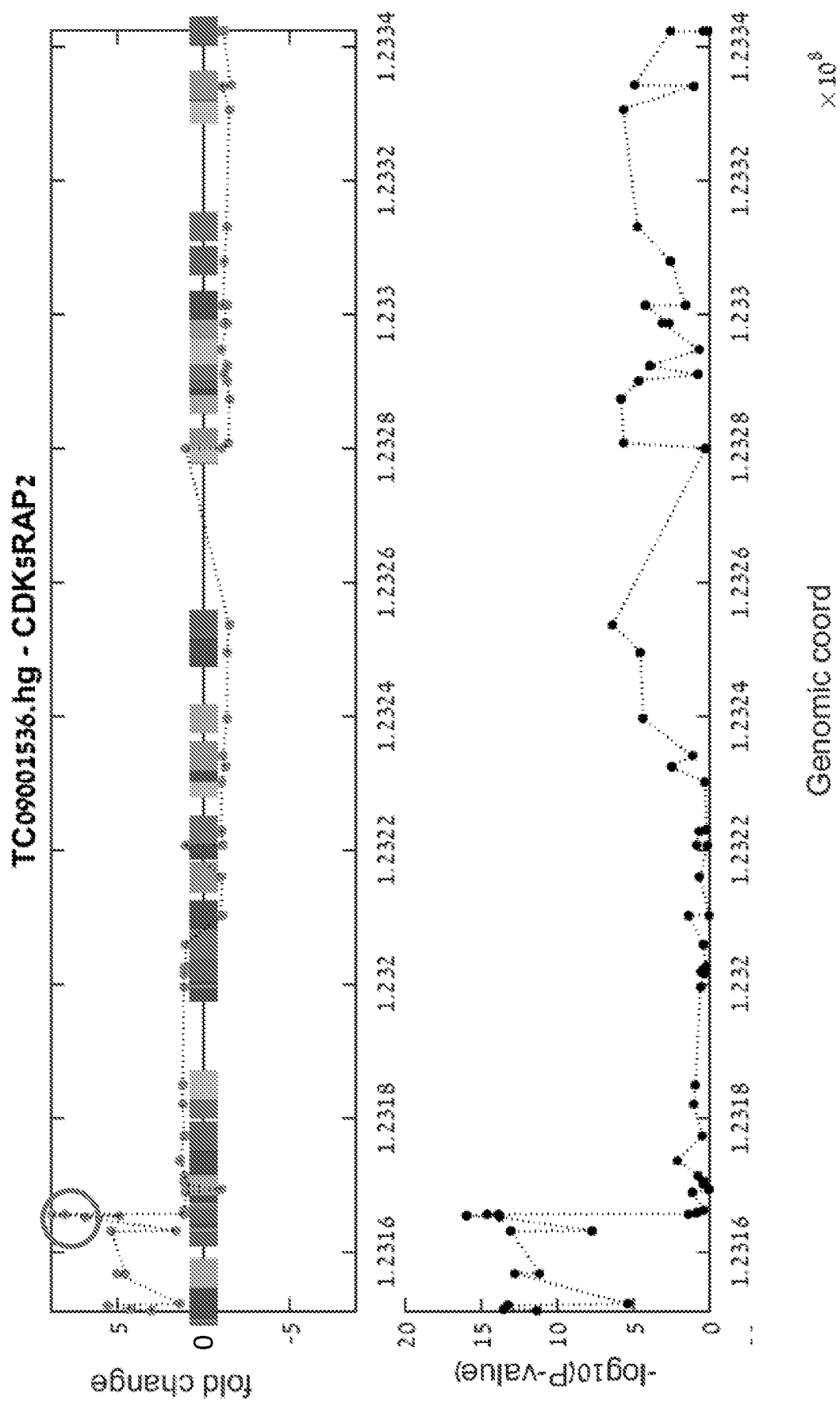
FIG. 3H

FIG. 3I

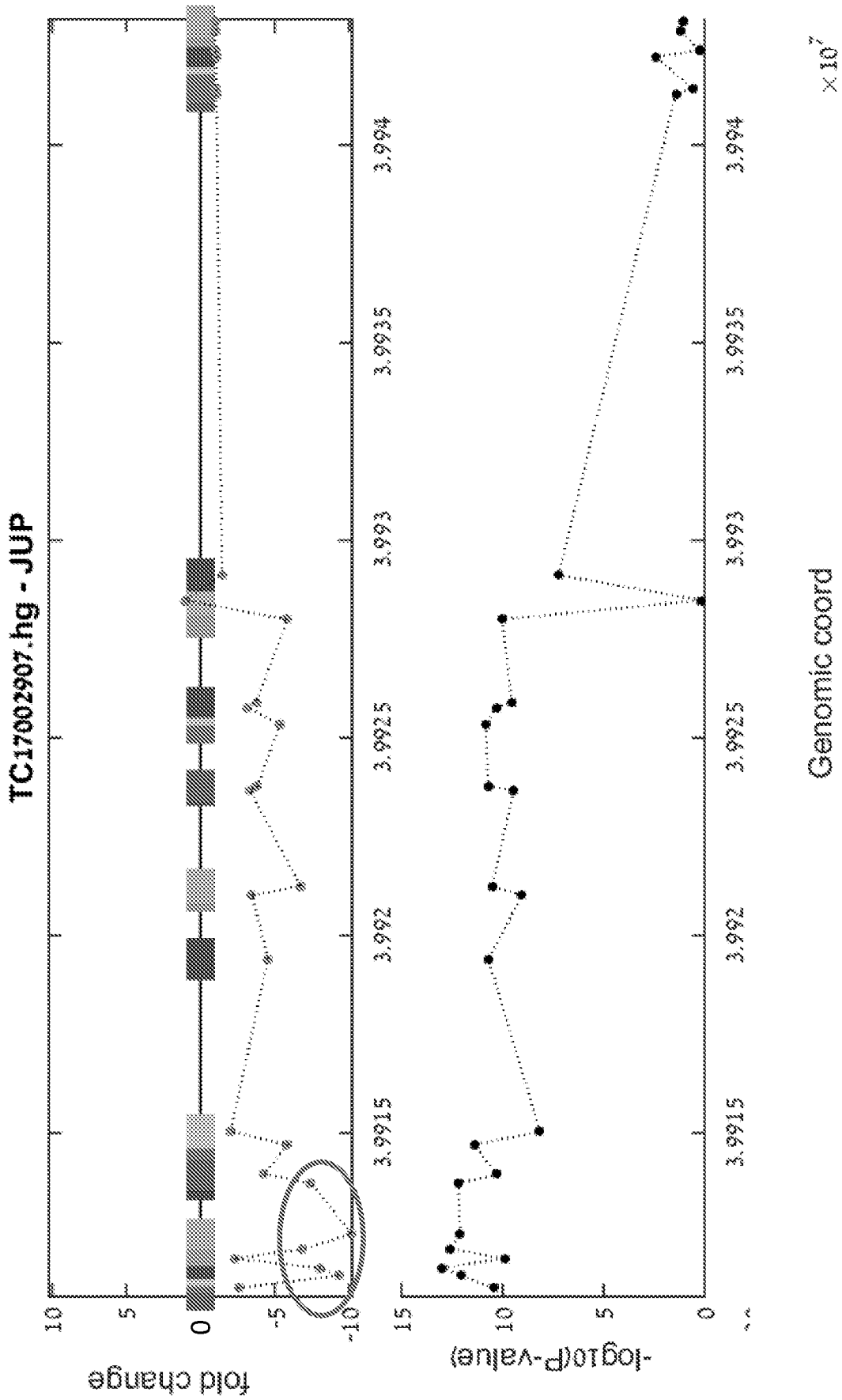


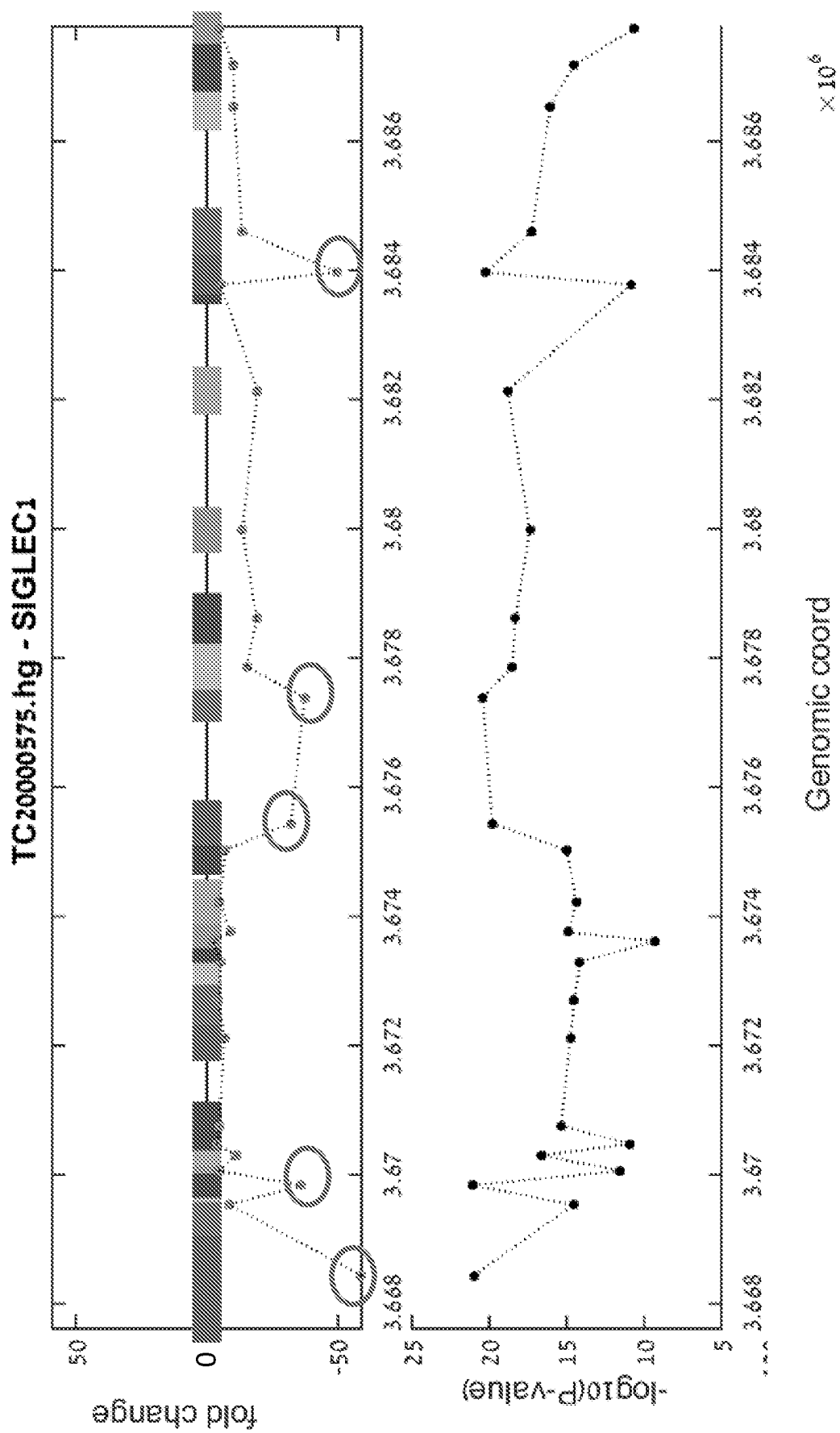
FIG. 3J

FIG. 3K

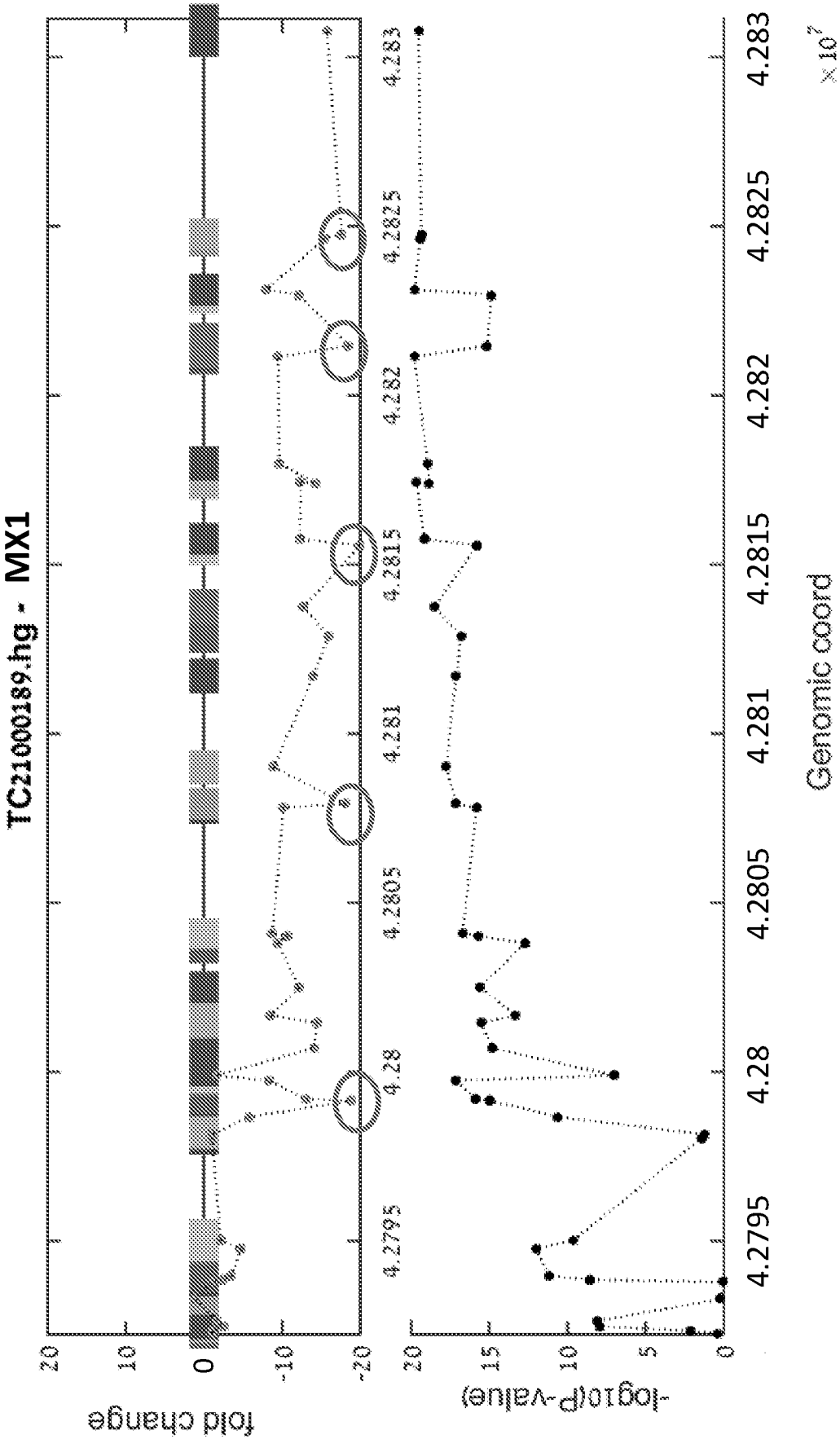
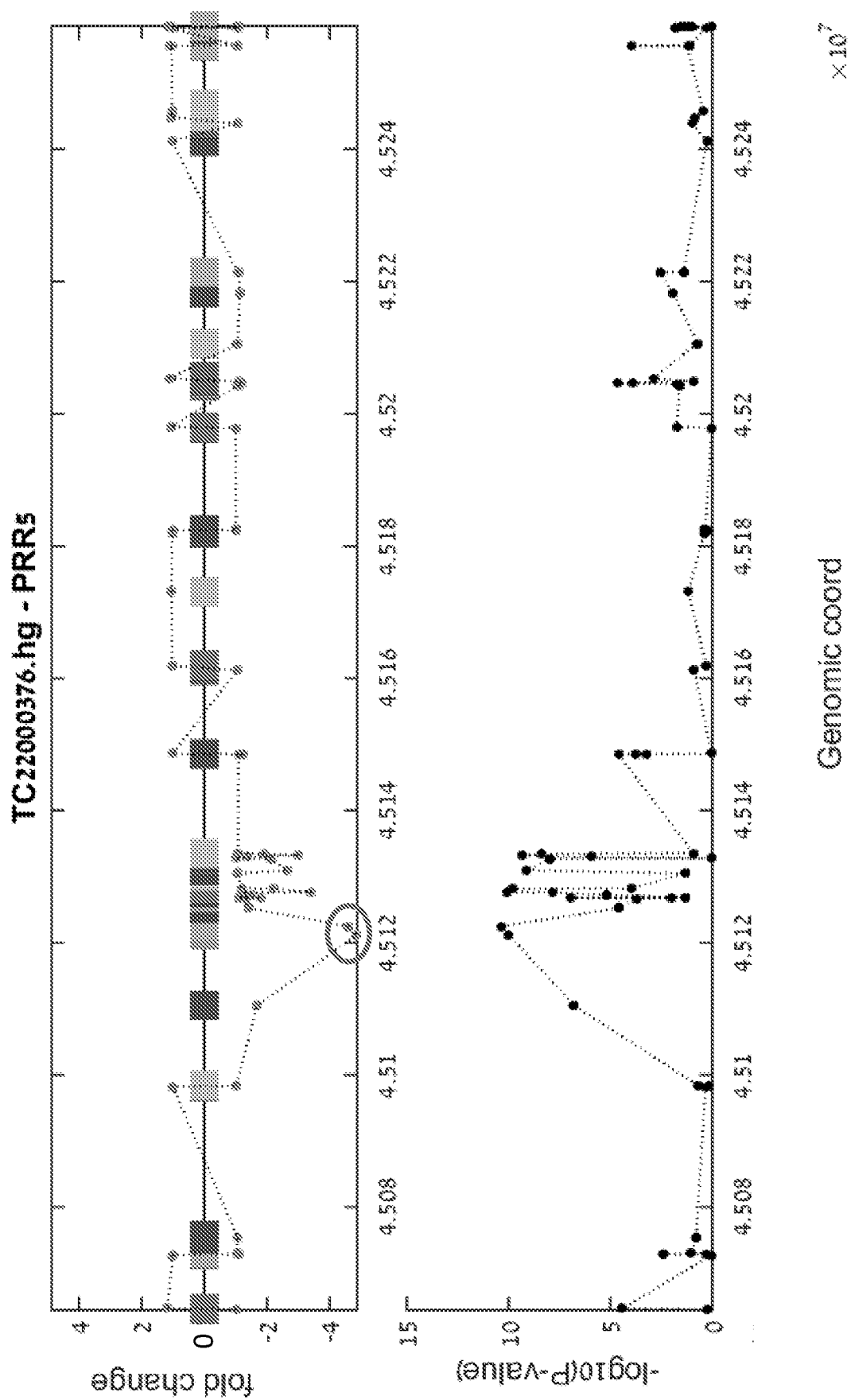


FIG. 3L

INTERNATIONAL SEARCH REPORT

International application No.

PCT/IL2017/050270

A. CLASSIFICATION OF SUBJECT MATTER IPC (2017.01) C12Q 1/00, C12Q 1/68, G01N 33/569 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) IPC (2017.01) C12Q 1/00, C12Q 1/68, G01N 33/569 Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched Electronic data base consulted during the international search (name of data base and, where practicable, search terms used) Databases consulted: PATENTSCOPE, Google Patents, Google Scholar, FamPat database		
C. DOCUMENTS CONSIDERED TO BE RELEVANT		
Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 2011183856 A1 THE GOVERNMENT OF THE UNITED STATES OF AMERICA, AS REPRESENTED BY THE SECRETARY OF THE NAVY, ; THE GOVERNMENT OF THE UNITED STATES OF AMERICA, AS REPRESENTED BY THE SECRETARY OF THE AIR FORCE 28 Jul 2011 (2011/07/28) the whole document	1-33
A	WO 2013117746 A1 MEMED DIAGNOSTICS LTD 15 Aug 2013 (2013/08/15) the whole document	1-33
☐ 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 "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 15 Jun 2017		Date of mailing of the international search report 15 Jun 2017
Name and mailing address of the ISA: Israel Patent Office Technology Park, Bldg.5, Malcha, Jerusalem, 9695101, Israel Facsimile No. 972-2-5651616		Authorized officer VILSKER Olga OlgaV@justice.gov.il Telephone No. 972-2-5651780

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