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(54) **Title:** DETECTING A CHROMOSOME CONFORMATION AS MARKER FOR FIBROSIS, E.G. SCLERODERMA

(57) **Abstract:** A process for analysing chromosome interactions, e.g. using EpiSwitch relating to fibrosis in particular systemic sclerosis and scleroderma.

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DETECTING A CHROMOSOME CONFORMATION AS MARKER FOR FIBROSIS, E.G. SCLERODERMA

Field of the Invention

The invention relates to disease processes.

Background of the Invention

Fibrosis, also known as fibrotic scarring, is a pathological wound healing in which connective tissue replaces normal parenchymal tissue to the extent that it goes unchecked, leading to considerable tissue remodelling and the formation of permanent scar tissue. Sclerosis is a type of fibrosis in which there is the stiffening of a tissue or anatomical feature, usually caused by a replacement of the normal organ-specific tissue with connective tissue. The structure may be said to have undergone sclerotic changes or display sclerotic lesions, which refers to the process of sclerosis. Fibrosis is a complex condition where the regulatory and causative aspects cannot be easily elucidated.

The outcome of scleroderma depends on the extent of disease. Those with localised disease generally have a normal life expectancy. In those with systemic disease typical life expectancy is about 11 years from onset. Death is often due to lung, gastrointestinal, or heart complications.

Summary of the Invention

The inventors have identified chromosome conformation signatures relevant to the presence of fibrosis or the stage of fibrosis. Accordingly the invention provides a process for detecting a chromosome state which represents a subgroup in a population comprising determining whether a chromosome interaction relating to that chromosome state is present or absent within a defined region of the genome; and

- wherein the subgroup relates to the stage of fibrosis and the chromosome interaction either:

(i) corresponds to any one of the chromosome interactions represented by any probe shown in Table 1, 3 or 4; and/or

(ii) is present in a 4,000 base region which comprises or which flanks (i);

and/or

- wherein the subgroup relates to the presence of fibrosis and the chromosome interaction either:

(a) corresponds to any one of the chromosome interactions represented by any probe shown in Table 2, 5 or 6; and/or

(b) is present in a 4,000 base region which comprises or which flanks (a).

Brief Description of the Drawings

Figure 1 shows the genetic locations and pathways for the early phenotype chromosome conformations. The top 35 pathways are shown for the genetic locations associated to significant chromosome conformations for the early phenotype.

Figure 2 shows the genetic locations and pathways for the late phenotype chromosome conformations. The top 35 pathways are shown for the genetic locations associated to significant chromosome conformations for the late phenotype.

Figure 3 shows an example of how the chromosome interaction typing may be carried out. The figure also shows how a probe (for example as described in the tables) corresponds to the ligated product generated by the method. The method steps are those of the 3C method.

Brief Description of the Tables

Table 1 shows 100 markers relating to early or late fibrosis, with 50 markers corresponding to each.

Table 2 shows 100 markers relating to presence of fibrosis, with 50 associated with disease and 50 associated with absence of disease.

Table 3 shows 100 markers associated with early fibrosis.

Table 4 shows 100 markers associated with late fibrosis.

Table 5 shows 100 markers associated with presence of fibrosis.

Table 6 shows 100 markers associated with the absence of fibrosis.

Table 7 shows SHAPLEY results for markers associated with early fibrosis.

Table 8 shows SHAPLEY results for markers associated with late fibrosis.

Table 9 shows SHAPLEY results for markers associated with presence of fibrosis.

Table 10 shows SHAPLEY results for markers associated with absence of fibrosis.

Detailed Description of the Invention

Terms Used Herein

The chromosome interactions which are typed may be referred to as 'markers', 'CCS', 'chromosome conformation signature', 'epigenetic interaction' or 'EpiSwitch markers' herein. Such interactions are recognised in the art as regions of the chromosome coming together in a stable manner and this represents a distinct mode of regulation. A chromosome interaction can also be referred to as a

'juxtaposition' of chromosomes, chromosome 'folding' or 'chromatin interaction'. Such interactions can be detected, for example, using the 3C (chromosome conformation capture) method.

The word 'type' will be interpreted as per the context, but will usually refer to detection of whether a specific chromosome interaction is present or absent.

Different subgroups are mentioned herein, but essentially the invention allows identification of groups relating to fibrosis, and in particular to early or late fibrosis, or to presence or absence of fibrosis. The invention therefore provides a method of diagnosis (or detecting) the stage of fibrosis or the presence or fibrosis.

The chromosome interactions which are typed in the method of the invention are defined in Tables 1 to 6. They are defined by means of the probe sequences which detect the ligated product made by an EpiSwitch method (see Figure 3). They are also defined by the position numbers of the interaction which are included within the probe name and they are also defined by the primer sequences which allow detection of the ligated sequence. The chromosome interaction can be defined by the 'probe location' given in the tables with reference to the chromosome number and the 'Start' and 'End' positions given for the chromosome regions which come together to form the interaction.

The word 'method' is used herein to refer to the 'process' of the invention, unless the context requires otherwise.

Aspects of the Invention

The invention relates to determining different aspects of fibrosis, particularly in respect to the presence or stage of fibrosis. This determining is by typing any of the relevant markers disclosed herein, for example in Table 1 or 2, or preferred combinations of markers, or markers in defined specific regions disclosed herein. The typing may be of any of the markers shown in Table 3, 4, 5 or 6 or selections (combinations) of markers from these tables.

Specific number of markers may be chosen from any group of markers which is specifically disclosed herein. Preferred numbers of markers are at least 3, 5, 8, 10, 15 and at least 20. Preferred groups of markers are those shown in each table, or each part of a table (for example Table 1.a1), or all the markers associated with a distinct characteristic of fibrosis.

The invention includes a process of typing a patient to identify whether they have fibrosis and/or the stage of fibrosis. The invention includes diagnosis of an individual for any condition or stage of disease as defined herein (i.e. prognosis), which can be thought of as determining the subgroup they belong to. The fibrosis may be a skin fibrotic condition, which may preferably be scleroderma.

The invention also concerns a panel of epigenetic markers which relates to fibrosis. The panel may have been optimised in some way, for example by GLMNET analysis.

The invention therefore allows personalised therapy to be given to the patient which accurately reflects the patient's needs.

Any therapy, for example drug, which is mentioned herein may be administered to an individual based on the result of the process.

Marker sets are disclosed in the Tables and Figures. In one embodiment at least 10 markers from any disclosed marker set are used in the invention. In another embodiment at least 20% of the markers from any disclosed marker set are used in the invention.

The Process of the Invention

The process of the invention comprises a typing system for detecting chromosome interactions relevant to fibrosis. This typing may be performed using the *EpiSwitch*™ system mentioned herein which is based on cross-linking regions of chromosome which have come together in the chromosome interaction, subjecting the chromosomal DNA to cleavage and then ligating the nucleic acids present in the cross-linked entity to derive a ligated nucleic acid with sequence from both the regions which formed the chromosomal interaction. Detection of this ligated nucleic acid allows determination of the presence or absence of a particular chromosome interaction. The ligated nucleic acid therefore acts as a marker for the presence of the chromosome interaction. Preferably the ligated nucleic acid is detected by PCR or a probe based method, including a qPCR method.

Any suitable typing method can be used for detecting the presence or absence of chromosome interactions, for example a method in which the proximity of the chromosomes in the interaction is detected and/or in which a marker that reflects chromosome interaction status is detected.

The chromosomal interactions may be identified using the process described herein in which populations of first and second nucleic acids are used. These nucleic acids can also be generated using *EpiSwitch*™ technology.

The Epigenetic Interactions Relevant to the Invention

As used herein, the term 'epigenetic' and 'chromosome' interactions typically refer to interactions between distal regions of a chromosome, said interactions being dynamic and altering, forming or breaking depending upon the state of the region of the chromosome. That state will typically reflect the presence or stage of fibrosis.

In particular processes of the invention chromosome interactions are typically detected by first generating a ligated nucleic acid that comprises sequence from both regions of the chromosomes that are part of the interactions. In such processes the regions can be cross-linked by any suitable means. In a preferred aspect, the interactions are cross-linked using formaldehyde, but may also be cross-linked by any aldehyde, or D-Biotinoyl-e- aminocaproic acid-N-hydroxysuccinimide ester or Digoxigenin-3-O-methylcarbonyl-e-aminocaproic acid-N-hydroxysuccinimide ester. Para-formaldehyde can cross link DNA chains which are 4 Angstroms apart. Preferably the chromosome interactions are on the same chromosome. Typically the chromosome interactions are 2 to 10 Angstroms apart.

The chromosome interaction may reflect the status of the region of the chromosome, for example, if it is being transcribed or repressed in response to change of the physiological conditions. Chromosome interactions which are specific to subgroups as defined herein have been found to be stable, thus providing a reliable means of measuring the differences between the two subgroups.

In addition, chromosome interactions specific to a fibrosis characteristic will normally occur early in a biological process, for example compared to other epigenetic markers such as methylation or changes to binding of histone proteins. Thus the process of the invention is able to detect early stages of a biological process. This allows early intervention (for example treatment) which may as a consequence be more effective. Chromosome interactions also reflect the current state of the individual and therefore can be used to assess changes to disease status. Furthermore there is little variation in the relevant chromosome interactions between individuals within the same subgroup. Detecting chromosome interactions is highly informative with up to 50 different possible interactions per gene, and so processes of the invention can for example interrogate 500,000 different interactions.

Preferred Marker Sets

Herein the term 'marker' or 'biomarker' refers to a specific chromosome interaction which can be detected (typed) in the invention. Specific markers are disclosed herein, any of which may be used in the invention. Further sets of markers may be used, for example in the combinations or numbers disclosed herein. The specific markers disclosed in the tables herein are preferred as well as markers presents in genes and regions mentioned in the tables herein are preferred. These may be typed by any suitable process, for example the PCR or probe based methods disclosed herein, including a qPCR method. The markers are defined herein by location or by probe and/or primer sequences.

Location and Causes of Epigenetic Interactions

Epigenetic chromosomal interactions may overlap and include the regions of chromosomes shown to encode relevant or undescribed genes, but equally may be in intergenic regions. It should further be

noted that the inventors have discovered that epigenetic interactions in all regions are equally important in determining the status of the chromosomal locus. These interactions are not necessarily in the coding region of a particular gene located at the locus and may be in intergenic regions.

The chromosome interactions which are detected in the invention could be caused by changes to the underlying DNA sequence, by environmental factors, DNA methylation, non-coding antisense RNA transcripts, non-mutagenic carcinogens, histone modifications, chromatin remodelling and specific local DNA interactions. The changes which lead to the chromosome interactions may be caused by changes to the underlying nucleic acid sequence, which themselves do not directly affect a gene product or the mode of gene expression. Such changes may be for example, SNPs within and/or outside of the genes, gene fusions and/or deletions of intergenic DNA, microRNA, and non-coding RNA. For example, it is known that roughly 20% of SNPs are in non-coding regions, and therefore the process as described is also informative in non-coding situation. In one aspect the regions of the chromosome which come together to form the interaction are less than 5 kb, 3 kb, 1 kb, 500 base pairs or 200 base pairs apart on the same chromosome.

The chromosome interaction which is detected is preferably within any of the genes in the regions defined by Table 1 or 2. The chromosome interaction which is detected is preferably within any of the genes in the regions defined by Table 3, 4, 5 or 6. However it may also be upstream or downstream of the gene, for example up to 50,000, up to 30,000, up to 20,000, up to 10,000 or up to 5000 bases upstream or downstream from the gene or from the coding sequence.

Subgroups, Time Points and Personalised Treatment

Typing according to the process of the invention may be carried out at multiple time points, for example to monitor the progression of the disease. This may be at one or more defined time points, for example at at least 1, 2, 5, 8 or 10 different time points. The durations between at least 1, 2, 5 or 8 of the time points may be at least 5, 10, 20, 50, 80 or 100 days. Typically there are 3 time points at least 50 days apart.

As used herein, a “subgroup” preferably refers to a population subgroup (a subgroup in a population), more preferably a subgroup in the population of a particular animal such as a particular eukaryote, or mammal. Most preferably, a “subgroup” refers to a subgroup in the human population. Therefore the most preferred type of individuals for all aspects of the inventions are humans.

The invention includes detecting and treating particular subgroups in a population. The inventors have discovered that chromosome interactions differ between subsets (for example at least two subsets) in the relevant population. Identifying these differences will allow physicians to categorize their patients as

a part of one subset of the population. The invention therefore provides physicians with a process of personalizing medicine for the patient based on their epigenetic chromosome interactions.

Such testing may be used to select how to subsequently treat the patient, for example the type of drug and/or its dose and/or its frequency of administration.

Generating Ligated Nucleic Acids

Certain aspects of the invention utilise ligated nucleic acids, in particular ligated DNA. These comprise sequences from both of the regions that come together in a chromosome interaction and therefore provide information about the interaction. The EpiSwitch™ process described herein uses generation of such ligated nucleic acids to detect chromosome interactions.

Thus a process of the invention may comprise a step of generating ligated nucleic acids (e.g. DNA) by the following steps (including a process comprising these steps):

(i) cross-linking of epigenetic chromosomal interactions present at the chromosomal locus, preferably *in vitro*;

(ii) optionally isolating the cross-linked DNA from said chromosomal locus;

(iii) subjecting said cross-linked DNA to cutting, for example by restriction digestion with an enzyme that cuts it at least once (in particular an enzyme that cuts at least once within said chromosomal locus);

(iv) ligating said cross-linked cleaved DNA ends (in particular to form DNA loops); and

(v) optionally identifying the presence of said ligated DNA and/or said DNA loops, in particular using techniques such as PCR (polymerase chain reaction), to identify the presence of a specific chromosomal interaction.

These steps may be carried out to detect the chromosome interactions for any aspect mentioned herein. The steps may also be carried out to generate the first and/or second set of nucleic acids mentioned herein.

PCR (polymerase chain reaction) may be used to detect or identify the ligated nucleic acid, for example the size of the PCR product produced may be indicative of the specific chromosome interaction which is present, and may therefore be used to identify the status of the locus. In preferred aspects the primers shown in Table 1 or 2 are used. In other preferred aspects the primers shown in Table 3, 4, 5 or 6 are used.

The skilled person will be aware of numerous restriction enzymes which can be used to cut the DNA within the chromosomal locus of interest. It will be apparent that the particular enzyme used will

depend upon the locus studied and the sequence of the DNA located therein. A non-limiting example of a restriction enzyme which can be used to cut the DNA as described in the present invention is TaqI.

EpiSwitch™ Technology

The EpiSwitch™ Technology also relates to the use of microarray EpiSwitch™ marker data in the detection of epigenetic chromosome conformation signatures specific for phenotypes. Aspects such as EpiSwitch™ which utilise ligated nucleic acids in the manner described herein have several advantages. They have a low level of stochastic noise, for example because the nucleic acid sequences from the first set of nucleic acids of the present invention either hybridise or fail to hybridise with the second set of nucleic acids. This provides a binary result permitting a relatively simple way to measure a complex mechanism at the epigenetic level. EpiSwitch™ technology also has fast processing time and low cost. In one aspect the processing time is 3 hours to 6 hours.

Samples and Sample Treatment

The process of the invention will normally be carried out on a sample. The sample may be obtained at a defined time point, for example at any time point defined herein. The sample will normally contain DNA from the individual. It will normally contain cells. In one aspect a sample is obtained by minimally invasive means, and may for example be a blood sample. DNA may be extracted and cut up with a standard restriction enzyme. This can pre-determine which chromosome conformations are retained and will be detected with the EpiSwitch™ platforms. Due to the synchronisation of chromosome interactions between tissues and blood, including horizontal transfer, a blood sample can be used to detect the chromosome interactions in tissues, such as tissues relevant to disease.

Properties of Nucleic Acids of the Invention

The invention relates to certain nucleic acids, such as the ligated nucleic acids which are described herein as being used or generated in the process of the invention. These may be the same as, or have any of the properties of, the first and second nucleic acids mentioned herein with reference to a screening method described below. The nucleic acids of the invention typically comprise two portions each comprising sequence from one of the two regions of the chromosome which come together in the chromosome interaction. Typically each portion is at least 8, 10, 15, 20, 30 or 40 nucleotides in length, for example 10 to 40 nucleotides in length. Preferred nucleic acids comprise sequence from any of the genes mentioned in any of the tables. Typically preferred nucleic acids comprise the specific probe sequences mentioned in Table 1, 2, 3, 4, 5 or 6; or fragments and/or homologues of such sequences.

Preferably the nucleic acids are DNA. It is understood that where a specific sequence is provided the invention may use the complementary sequence as required in the particular aspect. Preferably the nucleic acids are DNA. It is understood that where a specific sequence is provided the invention may use the complementary sequence as required in the particular aspect.

The primers shown in Table 1 and 2 may also be used in the invention as mentioned herein. In one aspect primers are used which comprise any of: the sequences shown in Table 1 or 2; or fragments and/or homologues of any sequence shown in Table 1 or 2. The primers shown in Table 3, 4, 5 or 6 may also be used in the invention as mentioned herein. In one aspect primers are used which comprise any of: the sequences shown in Table 3, 4, 5 or 6; or fragments and/or homologues of any sequence shown in Table 3, 4, 5 or 6.

The Second Set of Nucleic Acids – the 'Index' Sequences

The second set of nucleic acid sequences has the function of being a set of index sequences, and is essentially a set of nucleic acid sequences which are suitable for identifying subgroup specific sequence. They can represents the 'background' chromosomal interactions and might be selected in some way or be unselected. They are in general a subset of all possible chromosomal interactions.

The second set of nucleic acids may be derived by any suitable process. They can be derived computationally or they may be based on chromosome interaction in individuals. They typically represent a larger population group than the first set of nucleic acids. In one particular aspect, the second set of nucleic acids represents all possible epigenetic chromosomal interactions in a specific set of genes. In another particular aspect, the second set of nucleic acids represents a large proportion of all possible epigenetic chromosomal interactions present in a population described herein. In one particular aspect, the second set of nucleic acids represents at least 50% or at least 80% of epigenetic chromosomal interactions in at least 20, 50, 100 or 500 genes, for example in 20 to 100 or 50 to 500 genes.

The second set of nucleic acids typically represents at least 100 possible epigenetic chromosome interactions which modify, regulate or in any way mediate a phenotype in population. The second set of nucleic acids may represent chromosome interactions that affect a disease state (typically relevant to diagnosis or prognosis) in a species. The second set of nucleic acids typically comprises sequences representing epigenetic interactions both relevant and not relevant to a prognosis subgroup.

In one particular aspect the second set of nucleic acids derive at least partially from naturally occurring sequences in a population, and are typically obtained by *in silico* processes. Said nucleic acids may further comprise single or multiple mutations in comparison to a corresponding portion of nucleic acids

present in the naturally occurring nucleic acids. Mutations include deletions, substitutions and/or additions of one or more nucleotide base pairs. In one particular aspect, the second set of nucleic acids may comprise sequence representing a homologue and/or orthologue with at least 70% sequence identity to the corresponding portion of nucleic acids present in the naturally occurring species. In another particular aspect, at least 80% sequence identity or at least 90% sequence identity to the corresponding portion of nucleic acids present in the naturally occurring species is provided.

Properties of the Second Set of Nucleic Acids

In one particular aspect, there are at least 100 different nucleic acid sequences in the second set of nucleic acids, preferably at least 1000, 2000 or 5000 different nucleic acids sequences, with up to 100,000, 1,000,000 or 10,000,000 different nucleic acid sequences. A typical number would be 100 to 1,000,000, such as 1,000 to 100,000 different nucleic acids sequences. All or at least 90% or at least 50% or these would correspond to different chromosomal interactions.

In one particular aspect, the second set of nucleic acids represent chromosome interactions in at least 20 different loci or genes, preferably at least 40 different loci or genes, and more preferably at least 100, at least 500, at least 1000 or at least 5000 different loci or genes, such as 100 to 10,000 different loci or genes. The lengths of the second set of nucleic acids are suitable for them to specifically hybridise according to Watson Crick base pairing to the first set of nucleic acids to allow identification of chromosome interactions specific to subgroups. Typically the second set of nucleic acids will comprise two portions corresponding in sequence to the two chromosome regions which come together in the chromosome interaction. The second set of nucleic acids typically comprise nucleic acid sequences which are at least 10, preferably 20, and preferably still 30 bases (nucleotides) in length. In another aspect, the nucleic acid sequences may be at the most 500, preferably at most 100, and preferably still at most 50 base pairs in length. In a preferred aspect, the second set of nucleic acids comprises nucleic acid sequences of between 17 and 25 base pairs. In one aspect at least 100, 80% or 50% of the second set of nucleic acid sequences have lengths as described above. Preferably the different nucleic acids do not have any overlapping sequences, for example at least 100%, 90%, 80% or 50% of the nucleic acids do not have the same sequence over at least 5 contiguous nucleotides.

Given that the second set of nucleic acids acts as an 'index' then the same set of second nucleic acids may be used with different sets of first nucleic acids which represent subgroups for different characteristics, i.e. the second set of nucleic acids may represent a 'universal' collection of nucleic acids which can be used to identify chromosome interactions relevant to different characteristics.

The First Set of Nucleic Acids

The first set of nucleic acids are typically from subgroups relevant to fibrosis. The first nucleic acids may have any of the characteristics and properties of the second set of nucleic acids mentioned herein. The first set of nucleic acids is normally derived from samples from the individuals which have undergone treatment and processing as described herein, particularly the EpiSwitch™ cross-linking and cleaving steps. Typically the first set of nucleic acids represents all or at least 80% or 50% of the chromosome interactions present in the samples taken from the individuals.

Typically, the first set of nucleic acids represents a smaller population of chromosome interactions across the loci or genes represented by the second set of nucleic acids in comparison to the chromosome interactions represented by second set of nucleic acids, i.e. the second set of nucleic acids is representing a background or index set of interactions in a defined set of loci or genes.

Library of Nucleic Acids

Any of the types of nucleic acid populations mentioned herein may be present in the form of a library comprising at least 200, at least 500, at least 1000, at least 5000 or at least 10000 different nucleic acids of that type, such as 'first' or 'second' nucleic acids. Such a library may be in the form of being bound to an array. The library may comprise some or all of the probes or primer pairs shown in Table 1 or 2. The library may comprise some or all of the probes or primer pairs shown in Table 3, 4, 5 or 6. The library may comprise all of the probe sequence from any of the tables disclosed herein.

Hybridisation

The invention typically requires a means for allowing wholly or partially complementary nucleic acid sequences from the first set of nucleic acids and the second set of nucleic acids to hybridise. In one aspect all of the first set of nucleic acids is contacted with all of the second set of nucleic acids in a single assay, i.e. in a single hybridisation step. However any suitable assay can be used.

Labelled Nucleic Acids and Pattern of Hybridisation

The nucleic acids mentioned herein may be labelled, preferably using an independent label such as a fluorophore (fluorescent molecule) or radioactive label which assists detection of successful hybridisation. Certain labels can be detected under UV light. The pattern of hybridisation, for example on an array described herein, represents differences in epigenetic chromosome interactions between the two subgroups, and thus provides a process of comparing epigenetic chromosome interactions and determination of which epigenetic chromosome interactions are specific to a subgroup in the population of the present invention.

The term 'pattern of hybridisation' broadly covers the presence and absence of hybridisation between the first and second set of nucleic acids, i.e. which specific nucleic acids from the first set hybridise to which specific nucleic acids from the second set, and so it not limited to any particular assay or technique, or the need to have a surface or array on which a 'pattern' can be detected.

The Chromosome Interactions Which are Typed

The chromosome interactions which are typed are:

(i) those which specifically defined in any of Tables 1, 2, 3, 4, 5 or 6, for example either by probe sequence or by position numbers on the chromosome, and/or

(ii) those which are present in the genes or regions defined in any of Tables 1, 2, 3, 4 5 or 6, and/or

(iii) those present in a 4,000 base region which comprises or which flanks any specific chromosome interaction defined in any of Tables 1, 2, 3, 4, 5 or 6.

The chromosome interactions which are typed can be those mentioned in the subset shown in Figure 1 or 2.

Any preferred number of chromosome interactions can be typed as mentioned herein from (i), (ii) or (iii), but typically at least 5, 8, 10, 12, 15, 20, 30 or 40 interactions will be typed.

Selecting a Subgroup with Particular Characteristics

This section provides examples of the number of interactions that can be typed from any one table.

The invention includes a process in which a specific combination of chromosome interactions are typed comprising at least 3, 5, 8, 10 or 20 of the chromosome interactions represented by the probes in Table 1. In one embodiment at least 10 chromosome interactions represented by the probes in Table 1 are typed.

The invention also includes a process in which specific combination of chromosome interactions are typed comprising at least 3, 5, 8, 10 or 20 of the chromosome interactions represented by the probes in Table 2. In one embodiment at least 10 chromosome interactions represented by the probes in Table 2 are typed.

The invention provides a process in which all of the chromosome interactions represented by the probes in Table 1 are typed. In certain embodiments at least 30, 40, 50, 60 or 80 of the chromosome interactions represented by the probes in Table 1 are typed. In particular embodiments at least 10, 20, 30, 50 or 80 chromosome interactions are typed which are present in a 4,000 base region which comprises or which flanks the chromosome interactions represented by the probes in Table 1.

The invention provides a process in which all of the chromosome interactions represented by the probes in Table 2 are typed. In certain embodiments at least 30, 40, 50, 60 or 80 of the chromosome interactions represented by the probes in Table 2 are typed. In particular embodiments at least 10, 20, 30, 50 or 80 chromosome interactions are typed which are present in a 4,000 base region which comprises or which flanks the chromosome interactions represented by the probes in Table 2.

The invention includes a process in which a specific combination of chromosome interactions are typed comprising at least 3, 5, 8, 10 or 20 of the chromosome interactions represented by the probes in Table 3. In one embodiment at least 10 chromosome interactions represented by the probes in Table 3 are typed.

The invention provides a process in which all of the chromosome interactions represented by the probes in Table 3 are typed. In certain embodiments at least 30, 40, 50, 60 or 80 of the chromosome interactions represented by the probes in Table 3 are typed. In particular embodiments at least 10, 20, 30, 50 or 80 chromosome interactions are typed which are present in a 4,000 base region which comprises or which flanks the chromosome interactions represented by the probes in Table 3.

The invention includes a process in which a specific combination of chromosome interactions are typed comprising at least 3, 5, 8, 10 or 20 of the chromosome interactions represented by the probes in Table 4. In one embodiment at least 10 chromosome interactions represented by the probes in Table 4 are typed.

The invention provides a process in which all of the chromosome interactions represented by the probes in Table 4 are typed. In certain embodiments at least 30, 40, 50, 60 or 80 of the chromosome interactions represented by the probes in Table 5 are typed. In particular embodiments at least 10, 20, 30, 50 or 80 chromosome interactions are typed which are present in a 4,000 base region which comprises or which flanks the chromosome interactions represented by the probes in Table 4.

The invention includes a process in which a specific combination of chromosome interactions are typed comprising at least 3, 5, 8, 10 or 20 of the chromosome interactions represented by the probes in Table 5. In one embodiment at least 10 chromosome interactions represented by the probes in Table 5 are typed.

The invention provides a process in which all of the chromosome interactions represented by the probes in Table 5 are typed. In certain embodiments at least 30, 40, 50, 60 or 80 of the chromosome interactions represented by the probes in Table 5 are typed. In particular embodiments at least 10, 20, 30, 50 or 80 chromosome interactions are typed which are present in a 4,000 base region which comprises or which flanks the chromosome interactions represented by the probes in Table 5.

The invention includes a process in which a specific combination of chromosome interactions are typed comprising at least 3, 5, 8, 10 or 20 of the chromosome interactions represented by the probes in Table 6. In one embodiment at least 10 chromosome interactions represented by the probes in Table 6 are typed.

The invention provides a process in which all of the chromosome interactions represented by the probes in Table 6 are typed. In certain embodiments at least 30, 40, 50, 60 or 80 of the chromosome interactions represented by the probes in Table 6 are typed. In particular embodiments at least 10, 20, 30, 50 or 80 chromosome interactions are typed which are present in a 4,000 base region which comprises or which flanks the chromosome interactions represented by the probes in Table 6.

The invention provides a process which comprises detecting the presence or absence of chromosome interactions, typically 5 to 20 or 5 to 500 such interactions, preferably 20 to 300 or 50 to 100 interactions, in order to determine the presence or absence of a characteristic relating to a subgroup. Preferably the chromosome interactions are those in any of the genes mentioned herein or in which chromosome interactions of the invention are present within.

In one aspect all of the interactions of Table 1 are typed. In one aspect all of the interactions of Table 2 are typed. In one aspect all of the interactions of Table 3 are typed. In one aspect all of the interactions of Table 4 are typed. In one aspect all of the interactions of Table 5 are typed. In one aspect all of the interactions of Table 6 are typed. In one aspect all of the interactions of Tables 3 and 4 are typed. In one aspect all of the interactions of Tables 5 and 6 are typed. In one aspect all of the interactions of Tables 3, 4, 5 and 6 are typed.

The detection of certain interactions shows presence of the relevant characteristic, whilst the presence of other interactions shows absence of the relevant characteristic as described in the tables.

Selecting Markers from Different Tables

The chromosome interactions which are typed can be selected from a single table or from more than one of Tables 1, 2, 3, 4, 5 or 6. Typically at least 5, 8, 10, 12, 15, 20, 25, 30, 40, 50, 60, 70, 80 interactions are typed. This number of interactions can be selected from 1, 2, 3, 4, 5 of or all of the Tables 1, 2, 3, 4, 5 or 6. In one aspect at least 5, 8, 10, 12, 15, 20 interactions to be typed are selected from all of Tables 3, 4, 5 and 6. In one aspect at least 3, 5, 8 or 10 interactions are selected from each of Tables 3 and 4. In one aspect at least 3, 5, 8 or 10 interactions are selected from each of Tables 5 and 6. In one aspect at least 10 interactions to be typed are selected from each of Tables 3 and 4. In one aspect at least 10 interactions to be typed are selected from each of Tables 5 and 6.

Combinations of Markers Selected by SHAPLEY analysis

A SHAPLEY analysis provides one way of measuring the performance of an individual marker. Tables 7 to 10 show the results of such modelling. In one aspect the markers to be typed can be selected based on these results, example based on any of the parameters which are shown. In a preferred aspect the chromosome interactions which are typed represent the top 10, 20, 30, 40, 50 or 60 markers selected based on such a parameter.

In a preferred aspect the 'SHAPLEY_diff' column is used to provide an indication of the power of a marker, and so for example the marker ORF1_chr6_31267448_31269252_31531115_31534994_RF_1 in Table 7 could be seen as the most powerful marker, given that it has the highest value for 'SHAPLEY_diff'. Tables 7 to 10 list the markers in order of magnitude of 'SHAPLEY_diff', going from the most important to the less important as one goes down each table.

In one aspect at least 3 markers may be typed from the 5, 8, 10 or 20 markers shown at the top of Table 7. In one aspect at least 5 markers are typed from the 10 markers shown at the top of Table 7. In one aspect at least 5 markers may be typed from 20, 30, 40 or 50 markers shown at the top of Table 7. In one aspect at least 10 markers may be typed from the 30, 40 or 50 markers shown at the top of Table 7. In one aspect at least the 5, 8 or 10 markers shown at the top of Table 7 may be typed.

In one aspect at least 3 markers may be typed from the 5, 8, 10 or 20 markers shown at the top of Table 8. In one aspect at least 5 markers are typed from the 10 markers shown at the top of Table 8. In one aspect at least 5 markers may be typed from 20, 30, 40 or 50 markers shown at the top of Table 8. In one aspect at least 10 markers may be typed from the 30, 40 or 50 markers shown at the top of Table 8. In one aspect at least the 5, 8 or 10 markers shown at the top of Table 8 may be typed.

In one aspect at least 3 markers may be typed from the 5, 8, 10 or 20 markers shown at the top of Table 9. In one aspect at least 5 markers are typed from the 10 markers shown at the top of Table 9. In one aspect at least 5 markers may be typed from 20, 30, 40 or 50 markers shown at the top of Table 9. In one aspect at least 10 markers may be typed from the 30, 40 or 50 markers shown at the top of Table 9. In one aspect at least the 5, 8 or 10 markers shown at the top of Table 9 may be typed.

In one aspect at least 3 markers may be typed from the 5, 8, 10 or 20 markers shown at the top of Table 10. In one aspect at least 5 markers are typed from the 10 markers shown at the top of Table 10. In one aspect at least 5 markers may be typed from 20, 30, 40 or 50 markers shown at the top of Table 10. In one aspect at least 10 markers may be typed from the 30, 40 or 50 markers shown at the top of Table 10. In one aspect at least the 5, 8 or 10 markers shown at the top of Table 10 may be typed.

The Individual that is Tested

The individual that is tested in the process of the invention may have been selected in some way. The individual may be susceptible to any condition mentioned herein and/or may be in need of any therapy mentioned in. The individual may be receiving any therapy mentioned herein. In particular, the individual may have, or be suspected of having, fibrosis. The individual may have, or be suspected of having, a skin fibrotic condition, which may preferably be scleroderma.

The individual may have, or be suspected of having, a scleroderma condition that results in changes to the skin, blood vessels, muscles, and internal organs. The individual may have any one of the following symptoms: areas of thickened skin, stiffness, feeling tired, and poor blood flow to the fingers or toes with cold exposure. The individual may have, or be suspected of having, CREST syndrome, which may manifest as calcium deposits, Raynaud's syndrome, esophageal problems, thickening of the skin of the fingers and toes, and areas of small dilated blood vessels.

Types of Chromosome Interaction

In one aspect the locus (including the gene and/or place where the chromosome interaction is detected) may comprise a CTCF binding site. This is any sequence capable of binding transcription repressor CTCF. That sequence may consist of or comprise the sequence CCCTC which may be present in 1, 2 or 3 copies at the locus. The CTCF binding site sequence may comprise the sequence CCGCGNGGNGGCAG (in IUPAC notation). The CTCF binding site may be within at least 100, 500, 1000 or 4000 bases of the chromosome interaction or within any of the chromosome regions shown Table 1 or 2. The CTCF binding site may be within at least 100, 500, 1000 or 4000 bases of the chromosome interaction or within any of the chromosome regions shown Table 3, 4, 5 or 6.

When detection is performed using a probe, typically sequence from both regions of the probe (i.e. from both sites of the chromosome interaction) could be detected. In preferred aspects probes are used in the process which comprise or consist of the same or complementary sequence to a probe shown in any table. In some aspects probes are used which comprise sequence which is homologous to any of the probe sequences shown in the tables.

Tables Provided Herein

Tables 1 to 6 show specific markers represented by probes and relevant data. The probe sequences show sequence which can be used to detect a ligated product generated from both sites of gene regions that have come together in chromosome interactions, i.e. the probe will comprise sequence which is

complementary to sequence in the ligated product. The first two sets of Start-End positions show probe positions, and the second two sets of Start-End positions show the relevant 4kb region.

Table 1 shows 100 markers relating to early or late fibrosis (scleroderma), with 50 markers corresponding to each. Table 2 shows 100 markers relating to presence of fibrosis (scleroderma), with 50 associated with disease and 50 associated with absence of disease.

Table 3 shows 100 markers associated with early fibrosis (scleroderma).

Table 4 shows 100 markers associated with late fibrosis (scleroderma).

Table 5 shows 100 markers associated with presence of fibrosis (scleroderma).

Table 6 shows 100 markers associated with the absence of fibrosis (scleroderma).

The following information is provided in the probe data table:

RP - Rsum the Rank Product statistics evaluated per each chromosome interaction
FC - Interaction frequency (positive or negative)
Pfp - estimated percentage of false positive predictions (pfp), both considering positive and negative chromosome interactions
Pval - estimated pvalues per each CCSs being positive and negative
Adj.P.value(FDR) - False discovery rate adjusted p.value
Loop Detected - which state the loop is found in

Simple permutation-based estimation is used to determine how likely a given RP value or better is observed in a random experiment. This has the following steps:

1. Generate p permutations of k rank lists of length n.

2. Calculate the rank products of the n CCS in the p permutations.

3. Count (c) how many times the rank products of the CCS in the permutations are smaller or equal to the observed rank product. Set c to this value.

4. Calculate the average expected value for the rank product by: Erp(g)=c/p.

5. Calculate the percentage of false positives as: pfp (g)=Erp(g)/rank (g) where rank(g) is the rank of CCS g in a list of all n CCSs sorted by increasing RP.

The rank product statistic ranks chromosome interactions according to intensities within each microarray and calculates the product of these ranks across multiple microarrays. This technique can identify chromosome interactions that are consistently detected among the most differential chromosome interactions in a number of replicated microarrays. Where the p-value is 0 this indicates

that there is very little variation in the Rank Product of the CCS across the samples, this is a good example of the signal to noise and effect size of CCS. Where p value is 0 and pfp is 0 this means that permutated Rank Product doesn't differ from the actual observed Rank Product. These methods are described Breitling R and Herzyk P (2005) Rank-based methods as a non-parametric alternative of the t-test for the analysis of biological microarray data. J Bioinf Comp Biol 3, 1171–1189.

The FC indicates prevalence of marker in each comparison, 2 means twice over average test, 1.5 means 1.5 over the average test, etc., and so FC indicates the weight of a marker to phenotype/group. The FC value can be used to give an indication of how many markers are needed for a highly effective test.

The probes are designed to be 30bp away from the Taq1 site. In case of PCR, PCR primers are typically designed to detect ligated product but their locations from the Taq1 site vary. Probe locations:

Start 1 - 30 bases upstream of TaqI site on fragment 1
End 1 - TaqI restriction site on fragment 1
Start 2 - TaqI restriction site on fragment 2
End 2 - 30 bases downstream of TaqI site on fragment 2
4kb Sequence Location:
Start 1 - 4000 bases upstream of TaqI site on fragment 1
End 1 - TaqI restriction site on fragment 1
Start 2 - TaqI restriction site on fragment 2
End 2 - 4000 bases downstream of TaqI site on fragment 2

SHAPLEY analysis can show the importance of each marker. It related to the marginal contribution of the marker to the Random Forest Model. The Shapley value is a solution concept in cooperative game theory applied to Machine learning to explain the contribution of markers to models

Table 7 shows SHAPLEY results for markers associated with early fibrosis.

Table 8 shows SHAPLEY results for markers associated with late fibrosis.

Table 9 shows SHAPLEY results for markers associated with presence of fibrosis.

Table 10 shows SHAPLEY results for markers associated with absence of fibrosis.

In these tables the following information is provided:

HC_SHAPLEY - Health Control Class SHAPLEY value
SSc_SHAPLEY - SSc Class SHAPLEY value
E_SHAPLEY - Early Class SHAPLEY value
L_SHAPLEY - Late Class SHAPLEY value
SHAPLEY_diff - Difference between the two classes SHAPLEY Values
RPs_class1_class2 - Rank Product Difference
RPrank_class1_class2 - Rank Product Rank
pfp_class1_class2 - percentage of false predictions
pval_class1_class2 - Rank Product Pvalue
LogFC - Log Abundance Difference
FC - Linear Abundance Difference

The Approach Taken to Identify Markers and Panels of Markers

The invention described herein relates to chromosome conformation profile and 3D architecture as a regulatory modality in its own right, closely linked to the phenotype. The discovery of biomarkers was based on annotations through pattern recognition and screening on representative cohorts of clinical samples representing the differences in phenotypes. We annotated and screened significant parts of the genome, across coding and non-coding parts and over large sways of non-coding 5' and 3' of known genes for identification of statistically disseminating consistent conditional disseminating chromosome conformations, which for example anchor in the non-coding sites within (intronic) or outside of open reading frames.

In selection of the best markers we are driven by statistical data and p values for the marker leads. Selected and validated chromosome conformations within the signature are disseminating stratifying entities in their own right, irrespective of the expression profiles of the genes used in the reference. Further work may be done on relevant regulatory modalities, such as SNPs at the anchoring sites, changes in gene transcription profiles, changes at the level of H3K27ac.

We are taking the question of clinical phenotype differences and their stratification from the basis of fundamental biology and epigenetics controls over phenotype - including for example from the framework of network of regulation. As such, to assist stratification, one can capture changes in the network and it is preferably done through signatures of several biomarkers, for example through following a machine learning algorithm for marker reduction which includes evaluating the optimal number of markers to stratify the testing cohort with minimal noise. This may end with 3-20 markers. Selection of markers for panels may be done by cross-validation statistical performance (and not for example by the functional relevance of the neighbouring genes, used for the reference name).

A panel of markers (with names of adjacent genes) is a product of clustered selection from the screening across significant parts of the genome, in non-biased way analysing statistical disseminating powers over 14,000-60,000 annotated EpiSwitch sites across significant parts of the genome. It should not be perceived as a tailored capture of a chromosome conformation on the gene of know functional value for the question of stratification. The total number of sites for chromosome interaction are 1.2 million, and so the potential number of combinations is 1.2 million to the power 1.2 million. The approach that we have followed nevertheless allows the identifying of the relevant chromosome interactions.

The specific markers that are provided by this application have passed selection, being statistically (significantly) associated with the condition. This is what the data in the relevant table demonstrates. Each marker can be seen as representing an event of biological epigenetic as part of network deregulation that is manifested in the relevant condition. In practical terms it means that these markers

are prevalent across groups of patients when compared to controls. On average, as an example, an individual marker may typically be present in 80% of patients tested and in 10% of controls tested.

Simple addition of all markers would not represent the network interrelationships between some of the deregulations. This is where the standard multivariate biomarker analysis GLMNET (R package) is brought in. GLMNET package helps to identify interdependence between some of the markers, that reflect their joint role in achieving deregulations leading to disease phenotype. Modelling and then testing markers with highest GLMNET scores offers not only identify the minimal number of markers that accurately identifies the patient cohort, but also the minimal number that offers the least false positive results in the control group of patients, due to background statistical noise of low prevalence in the control group. Typically a group (combination) of selected markers (such as 3 to 10) offers the best balance between both sensitivity and specificity of detection, emerging in the context of multivariate analysis from individual properties of all the selected statistical significant markers for the condition.

The tables herein show the reference names for the array probes (60-mer) for array analysis that overlaps the juncture between the long range interaction sites, the chromosome number and the start and end of two chromosomal fragments that come into juxtaposition.

Preferred Aspects for Sample Preparation and Chromosome Interaction Detection

Methods of preparing samples and detecting chromosome conformations are described herein. Optimised (non-conventional) versions of these processes can be used, for example as described in this section.

Typically the sample will contain at least 2 $x10^5$ cells. The sample may contain up to 5 $x10^5$ cells. In one aspect, the sample will contain 2 $x10^5$ to 5.5 $x10^5$ cells

Crosslinking of epigenetic chromosomal interactions present at the chromosomal locus is described herein. This may be performed before cell lysis takes place. Cell lysis may be performed for 3 to 7 minutes, such as 4 to 6 or about 5 minutes. In some aspects, cell lysis is performed for at least 5 minutes and for less than 10 minutes.

Digesting DNA with a restriction enzyme is described herein. Typically, DNA restriction is performed at about 55°C to about 70°C, such as for about 65°C, for a period of about 10 to 30 minutes, such as about 20 minutes.

Preferably a frequent cutter restriction enzyme is used which results in fragments of ligated DNA with an average fragment size up to 4000 base pair. Optionally the restriction enzyme results in fragments of

ligated DNA have an average fragment size of about 200 to 300 base pairs, such as about 256 base pairs. In one aspect, the typical fragment size is from 200 base pairs to 4,000 base pairs, such as 400 to 2,000 or 500 to 1,000 base pairs.

In one aspect of the EpiSwitch process a DNA precipitation step is not performed between the DNA restriction digest step and the DNA ligation step.

DNA ligation is described herein. Typically the DNA ligation is performed for 5 to 30 minutes, such as about 10 minutes.

The protein in the sample may be digested enzymatically, for example using a proteinase, optionally Proteinase K. The protein may be enzymatically digested for a period of about 30 minutes to 1 hour, for example for about 45 minutes. In one aspect after digestion of the protein, for example Proteinase K digestion, there is no cross-link reversal or phenol DNA extraction step.

In one aspect PCR detection is capable of detecting a single copy of the ligated nucleic acid, preferably with a binary read-out for presence/absence of the ligated nucleic acid.

Figure 3 shows a preferred process of detecting chromosome interactions.

Processes and Uses of the Invention

The process of the invention can be described in different ways. It can be described as a process of making a ligated nucleic acid comprising (i) *in vitro* cross-linking of chromosome regions which have come together in a chromosome interaction; (ii) subjecting said cross-linked DNA to cutting or restriction digestion cleavage; and (iii) ligating said cross-linked cleaved DNA ends to form a ligated nucleic acid, wherein detection of the ligated nucleic acid may be used to determine the chromosome state at a locus, and wherein preferably:

- the locus may be any of the loci or regions mentioned in Table 1, 2, 3, 4, 5 or 6, and/or

- wherein the chromosomal interaction may be any of the chromosome interactions mentioned herein or corresponding to any of the probes disclosed in Table 1, 2, 3, 4, 5 or 6, and/or

- wherein the ligated product may have or comprise (i) sequence which is the same as or homologous to any of the probe sequences disclosed in Table 1, 2, 3, 4, 5 or 6; or (ii) sequence which is complementary to (ii).

The process of the invention can be described as a process for detecting chromosome states which represent different subgroups in a population comprising determining whether a chromosome

interaction is present or absent within a defined epigenetically active region of the genome, wherein preferably:

- the subgroup is defined by presence or stage of fibrosis, and/or
- the chromosome state may be at any locus or region mentioned in Table 1, 2, 3, 4, 5 or 6; and/or
- the chromosome interaction may be any of those mentioned in Table 1, 2, 3, 4, 5 or 6, or corresponding to any of the probes disclosed in those tables.

Use of the Process of the Invention to Identify New Treatments

Knowledge of chromosome interactions can be used to identify new treatments for conditions. The invention provides processes and uses of chromosome interactions defined herein to identify or design new therapeutic agents, for example relating to therapy of fibrosis or related sub-conditions.

Homologues

Homologues of polynucleotide / nucleic acid (e.g. DNA) sequences are referred to herein. Such homologues typically have at least 70% homology, preferably at least 80%, at least 85%, at least 90%, at least 95%, at least 97%, at least 98% or at least 99% homology, for example over a region of at least 10, 15, 20, 30, 100 or more contiguous nucleotides, or across the portion of the nucleic acid which is from the region of the chromosome involved in the chromosome interaction. The homology may be calculated on the basis of nucleotide identity (sometimes referred to as "hard homology").

Therefore, in a particular aspect, homologues of polynucleotide / nucleic acid (e.g. DNA) sequences are referred to herein by reference to percentage sequence identity. Typically such homologues have at least 70% sequence identity, preferably at least 80%, at least 85%, at least 90%, at least 95%, at least 97%, at least 98% or at least 99% sequence identity, for example over a region of at least 10, 15, 20, 30, 100 or more contiguous nucleotides, or across the portion of the nucleic acid which is from the region of the chromosome involved in the chromosome interaction.

For example the UWGCG Package provides the BESTFIT program which can be used to calculate homology and/or % sequence identity (for example used on its default settings) (Devereux *et al* (1984) Nucleic Acids Research 12, p387-395). The PILEUP and BLAST algorithms can be used to calculate homology and/or % sequence identity and/or line up sequences (such as identifying equivalent or corresponding sequences (typically on their default settings)), for example as described in Altschul S. F. (1993) J Mol Evol 36:290-300; Altschul, S, F *et al* (1990) J Mol Biol 215:403-10.

Software for performing BLAST analyses is publicly available through the National Center for Biotechnology Information. This algorithm involves first identifying high scoring sequence pair (HSPs) by identifying short words of length W in the query sequence that either match or satisfy some positive-valued threshold score T when aligned with a word of the same length in a database sequence. T is referred to as the neighbourhood word score threshold (Altschul *et al*, supra). These initial neighbourhood word hits act as seeds for initiating searches to find HSPs containing them. The word hits are extended in both directions along each sequence for as far as the cumulative alignment score can be increased. Extensions for the word hits in each direction are halted when: the cumulative alignment score falls off by the quantity X from its maximum achieved value; the cumulative score goes to zero or below, due to the accumulation of one or more negative-scoring residue alignments; or the end of either sequence is reached. The BLAST algorithm parameters W5 T and X determine the sensitivity and speed of the alignment. The BLAST program uses as defaults a word length (W) of 11 , the BLOSUM62 scoring matrix (see Henikoff and Henikoff (1992) Proc. Natl. Acad. Sci. USA 89: 10915-10919) alignments (B) of 50, expectation (E) of 10, M=5, N=4, and a comparison of both strands.

The BLAST algorithm performs a statistical analysis of the similarity between two sequences; see e.g., Karlin and Altschul (1993) Proc. Natl. Acad. Sci. USA 90: 5873-5787. One measure of similarity provided by the BLAST algorithm is the smallest sum probability (P(N)), which provides an indication of the probability by which a match between two polynucleotide sequences would occur by chance. For example, a sequence is considered similar to another sequence if the smallest sum probability in comparison of the first sequence to the second sequence is less than about 1, preferably less than about 0.1, more preferably less than about 0.01, and most preferably less than about 0.001.

The homologous sequence typically differs by 1, 2, 3, 4 or more bases, such as less than 10, 15 or 20 bases (which may be substitutions, deletions or insertions of nucleotides). These changes may be measured across any of the regions mentioned above in relation to calculating homology and/or % percentage sequence identity.

Homology of a 'pair of primers' can be calculated, for example, by considering the two sequences as a single sequence (as if the two sequences are joined together) for the purpose of then comparing against the another primer pair which again is considered as a single sequence.

Arrays

The second set of nucleic acids may be bound to an array, and in one aspect there are at least 15,000, 45,000, 100,000 or 250,000 different second nucleic acids bound to the array, which preferably represent at least 300, 900, 2000 or 5000 loci. In one aspect one, or more, or all of the different

populations of second nucleic acids are bound to more than one distinct region of the array, in effect repeated on the array allowing for error detection. The array may be based on an Agilent SurePrint G3 Custom CGH microarray platform. Detection of binding of first nucleic acids to the array may be performed by a dual colour system.

Therapeutic Agents

This section is relevant both to:

- therapeutic agents which are given to individuals selected by the process of the invention, and

- therapeutic agents which are selected based on the results of the process of the invention.

The invention provides therapeutic agents for use in preventing or treating a disease condition in certain individuals, for example those identified by a process of the invention. This may comprise administering to an individual in need a therapeutically effective amount of the agent. The invention provides use of the agent in the manufacture of a medicament to prevent or treat a condition in certain individuals. The disease or condition may be fibrosis, any type of fibrosis sub-condition or a stage of fibrosis.

The formulation of the agent will depend upon the nature of the agent. The agent will be provided in the form of a pharmaceutical composition containing the agent and a pharmaceutically acceptable carrier or diluent. Suitable carriers and diluents include isotonic saline solutions, for example phosphate-buffered saline. Typical oral dosage compositions include tablets, capsules, liquid solutions and liquid suspensions. The agent may be formulated for parenteral, intravenous, intramuscular, subcutaneous, transdermal or oral administration.

The dose of an agent may be determined according to various parameters, especially according to the substance used; the age, weight and condition of the individual to be treated; the route of administration; and the required regimen. A physician will be able to determine the required route of administration and dosage for any particular agent. A suitable dose may however be from 0.1 to 100 mg/kg body weight such as 1 to 40 mg/kg body weight, for example, to be taken from 1 to 3 times daily.

The therapeutic agent may be any such agent disclosed herein, or may target any 'target' disclosed herein, including any protein or gene disclosed herein in any table. It is understood that any agent that is disclosed in a combination should be seen as also disclosed for administration individually.

Therapeutic agents which can be used in the invention include:

- inflammation therapy, such as NSAIDs (e.g. ibuprofen) or corticosteroids (e.g. prednisone);

- immunosuppressive therapy, such astocilizumab, methotrexate, cyclosporine, antithymocyte globulin, mycophenolate mofetil or cyclophosphamide;

- vascular therapy, such as nifedipine, renin, endothelin, prostaglandins and nitric oxide, bosentan, epoprostenol (prostacyclin) or aspirin;

- anti-fibrotic agents, such as colchicine, para-aminobenzoic acid (PABA), dimethyl sulfoxide or D-penicillamine.

The therapeutic agent may be selected from the following:

- lenabasum
- IL 4/IL13 combination
- immunoglobin, preferably delivered intravenously
- ROCK inhibitor
- pirfenidone with MMF
- oncostatin M
- putotaxin inhibitor
- brentuximab vedotin
- teprotumumab
- a TGF beta trap, preferably a TGF beta 1,3 trap.

Astocilizumab is a preferred therapeutic agent.

Forms of the Substance Mentioned Herein

Any of the substances, such as nucleic acids or therapeutic agents, mentioned herein may be in purified or isolated form. They may be in a form which is different from that found in nature, for example they may be present in combination with other substance with which they do not occur in nature. The nucleic acids (including portions of sequences defined herein) may have sequences which are different to those found in nature, for example having at least 1, 2, 3, 4 or more nucleotide changes in the sequence as described in the section on homology. The nucleic acids may have heterologous sequence at the 5' or 3' end. The nucleic acids may be chemically different from those found in nature, for example they may be modified in some way, but preferably are still capable of Watson-Crick base pairing. Where appropriate the nucleic acids will be provided in double stranded or single stranded form. The invention provides all of the specific nucleic acid sequences mentioned herein in single or double stranded form, and thus includes the complementary strand to any sequence which is disclosed.

The invention provides a kit for carrying out any process of the invention, including detection of a chromosomal interaction relating to prognosis. Such a kit can include a specific binding agent capable of detecting the relevant chromosomal interaction, such as agents capable of detecting a ligated nucleic acid generated by processes of the invention. Preferred agents present in the kit include probes capable of hybridising to the ligated nucleic acid or primer pairs, for example as described herein, capable of amplifying the ligated nucleic acid in a PCR reaction. A kit of the invention may comprise means to detect a panel of markers, such as any number of combination of markers disclosed herein.

The invention provides use of a reagent for preparing kit for carrying out the process of the invention. Such a reagent may be any suitable substance mentioned herein, such as the agents which are capable of detection of products of detection processes, including reagents which are any of the probes or primers mentioned herein. The invention provides use of the reagent in the process of the invention. The invention provides use of the reagent in the preparing of a means for carrying out the invention. The invention also provides a process for detecting a characteristic of fibrosis, including any type of fibrosis mentioned here and including detecting the stage of fibrosis or the presence of fibrosis.

The invention provides a method of obtaining diagnostic information relating to fibrosis, such as the stage and/or presence of fibrosis. The invention provides a method of detecting a chromosome state defined by any number or combination of chromosome interactions disclosed herein. The invention provides a method of detecting a specific pattern of chromosome interactions, for example as defined by any number or combination of chromosome interactions disclosed herein.

The invention provides a device that is capable of detecting the relevant chromosome interactions. The device preferably comprises any specific binding agents, probe or primer pair capable of detecting the chromosome interaction, such as any such agent, probe or primer pair described herein.

The invention provides use of detection of chromosome interactions as defined herein (for example by number or specific combination) to detect a characteristic of fibrosis, for example as defined herein. The invention provides use of a reagent (for example a probe, primer, label, device or array) in any method of the invention.

The Threshold of Detection

The markers which are disclosed herein have been found to be 'disseminating markers' capable of determining the relevant subgroup and Tables 1 to 6 show which subgroup each marker is present in.

In practical terms it means that these markers are prevalent across the relevant subgroup when compared to controls (as is shown by the FC value, for example). On average, as an example, an

individual marker may typically be present in 80% of the relevant subgroup and in 10% of controls (for the subgroup). When testing an individual the result will be a combination of 'present' and 'absent' chromosome interactions for each of the markers shown in Tables 1 to 6 allowing determination of the subgroup for the individual. Typically presence/absence of at least 8 markers out of 10 compared to the 'ideal' result shown in the table can be used to assign the individual to a subgroup.

Types of Method

The invention relates to markers which are effective detecting a characteristic relating to fibrosis as described herein. Clearly different numbers of markers can be used as the basis of a test. In one aspect the invention provides a process for detecting a chromosome state which represents a subgroup in a population comprising determining whether a chromosome interaction relating to that chromosome state is present or absent within a defined region of the genome; wherein:

(i) one or more chromosome interactions are typed which are associated with early stage fibrosis from Tables 1 and 3 and if at least 70% or 80% of these are present the individual is classed as have early stage fibrosis, and/or

(ii) one or more chromosome interactions are typed which are associated with early stage fibrosis from Tables 1 and 3 and if at least 70% or 80% of these are absent the individual is classed as not having early stage fibrosis, and/or

(iii) one or more chromosome interactions are typed which are associated with late stage fibrosis from Tables 1 and 4 and if at least 70% or 80% of these are present the individual is classed as have late stage fibrosis, and/or

(iv) one or more chromosome interactions are typed which are associated with late stage fibrosis from Tables 1 and 4 and if at least 70% or 80% of these are absent the individual is classed as not having late stage fibrosis, and/or

(v) one or more chromosome interactions are typed which are associated with presence of fibrosis from Tables 2 and 5 and if at least 70% or 80% of these are present the individual is classed as having fibrosis, and/or

(vi) one or more chromosome interactions are typed which are associated with presence of fibrosis from Tables 2 and 5 and if at least 70% or 80% of these are absent the individual is classed as not having fibrosis, and/or

(vii) one or more chromosome interactions are typed which are associated with absence of fibrosis from Tables 2 and 6 and if at least 70% or 80% of these are present the individual is classed as having absence of fibrosis, and/or

(viii) one or more chromosome interactions are typed which are associated with absence of fibrosis from Tables 2 and 6 and if at least 70% or 80% of these are absent the individual is classed as having fibrosis.

In this aspect any number and combination of markers may be typed, for example as disclosed herein.

Detection Process

In one aspect quantitative detection of the ligated sequence which is relevant to a chromosome interaction is carried out using a probe which is detectable upon activation during a PCR reaction, wherein said ligated sequence comprises sequences from two chromosome regions that come together in an epigenetic chromosome interaction, wherein said process comprises contacting the ligated sequence with the probe during a PCR reaction, and detecting the extent of activation of the probe, and wherein said probe binds the ligation site. The process typically allows particular interactions to be detected in a MIQE compliant manner using a dual labelled fluorescent hydrolysis probe.

The probe is generally labelled with a detectable label which has an inactive and active state, so that it is only detected when activated. The extent of activation will be related to the extent of template (ligation product) present in the PCR reaction. Detection may be carried out during all or some of the PCR, for example for at least 50% or 80% of the cycles of the PCR.

The probe can comprise a fluorophore covalently attached to one end of the oligonucleotide, and a quencher attached to the other end of the nucleotide, so that the fluorescence of the fluorophore is quenched by the quencher. In one aspect the fluorophore is attached to the 5'end of the oligonucleotide, and the quencher is covalently attached to the 3' end of the oligonucleotide. Fluorophores that can be used in the process of the invention include FAM, TET, JOE, Yakima Yellow, HEX, Cyanine3, ATTO 550, TAMRA, ROX, Texas Red, Cyanine 3.5, LC610, LC 640, ATTO 647N, Cyanine 5, Cyanine 5.5 and ATTO 680. Quenchers that can be used with the appropriate fluorophore include TAM, BHQ1, DAB, Eclip, BHQ2 and BBQ650, optionally wherein said fluorophore is selected from HEX, Texas Red and FAM. Preferred combinations of fluorophore and quencher include FAM with BHQ1 and Texas Red with BHQ2.

Use of the Probe in a qPCR Assay

Hydrolysis probes of the invention are typically temperature gradient optimised with concentration matched negative controls. Preferably single-step PCR reactions are optimized. More preferably a standard curve is calculated. An advantage of using a specific probe that binds across the junction of the ligated sequence is that specificity for the ligated sequence can be achieved without using a nested PCR approach. The processes described herein allow accurate and precise quantification of low copy number targets. The target ligated sequence can be purified, for example gel-purified, prior to temperature gradient optimization. The target ligated sequence can be sequenced. Preferably PCR reactions are performed using about 10ng, or 5 to 15 ng, or 10 to 20ng, or 10 to 50ng, or 10 to 200ng template DNA. Forward and reverse primers are designed such that one primer binds to the sequence of one of the chromosome regions represented in the ligated DNA sequence, and the other primer binds to other chromosome region represented in the ligated DNA sequence, for example, by being complementary to the sequence.

Choice of Ligated DNA Target

The invention includes selecting primers and a probe for use in a PCR process as defined herein comprising selecting primers based on their ability to bind and amplify the ligated sequence and selecting the probe sequence based properties of the target sequence to which it will bind, in particular the curvature of the target sequence.

Probes are typically designed/chosen to bind to ligated sequences which are juxtaposed restriction fragments spanning the restriction site. In one aspect of the invention, the predicted curvature of possible ligated sequences relevant to a particular chromosome interaction is calculated, for example using a specific algorithm referenced herein. The curvature can be expressed as degrees per helical turn, e.g. 10.5° per helical turn. Ligated sequences are selected for targeting where the ligated sequence has a curvature propensity peak score of at least 5° per helical turn, typically at least 10°, 15° or 20° per helical turn, for example 5° to 20° per helical turn. Preferably the curvature propensity score per helical turn is calculated for at least 20, 50, 100, 200 or 400 bases, such as for 20 to 400 bases upstream and/or downstream of the ligation site. Thus in one aspect the target sequence in the ligated product has any of these levels of curvature. Target sequences can also be chosen based on lowest thermodynamic structure free energy.

Particular Aspects

In one aspect only intrachromosomal interactions are typed/detected, and no extrachromosomal interactions (between different chromosomes) are typed/detected.

In particular aspects certain chromosome interactions are not typed, for example any specific interaction mentioned herein (for example as defined by any probe or primer pair mentioned herein). In some aspects chromosome interactions are not typed in any of the genes relevant to chromosome interactions mentioned herein.

The data provided herein shows that the markers are 'disseminating' ones able to differentiate cases and non-cases for the relevant disease situation. Therefore when carrying out the invention the skilled person will be able to determine by detection of the interactions which subgroup the individual is in. In one embodiment a threshold value of detection of at least 70% of the tested markers in the form they are associated with the relevant subgroup situation may be used to determine whether the individual is in the relevant subgroup.

In one aspect any single marker disclosed in any table might be typed together any other number or combination of markers disclosed herein (for example from the same table or one or more other tables).

In one aspect 1, 2, 3, 4, or more groups of markers may be typed which are each a number or combination of markers disclosed herein.

In one aspect 200 or less markers are typed, for example 100 or less markers, 50 or less, 25 or less, or 20 or less markers are typed. In one aspect 200 or less of the specific markers shown in the tables are typed, for example 100 or less, 50 or less, 25 or less, or 20 or less such markers are typed.

Screening process

The invention provides a process of determining which chromosomal interactions are relevant to a chromosome state corresponding to an prognosis subgroup of the population, comprising contacting a first set of nucleic acids from subgroups with different states of the chromosome with a second set of index nucleic acids, and allowing complementary sequences to hybridise, wherein the nucleic acids in the first and second sets of nucleic acids represent a ligated product comprising sequences from both the chromosome regions that have come together in chromosomal interactions, and wherein the pattern of hybridisation between the first and second set of nucleic acids allows a determination of which chromosomal interactions are specific to an prognosis subgroup. The subgroup may be any of the specific subgroups defined herein, for example with reference to particular conditions or therapies.

Publications

The contents of all publications mentioned herein are incorporated by reference into the present specification and may be used to further define the features relevant to the invention. The contents of

all priority applications are incorporated by reference into the present specification and may be used to define the features relevant to the invention.

Use of a Classifier

The method of the invention may include analysis of the chromosome interactions identified in the individual, for example using a classifier, which may increase performance, such as sensitivity or specificity. The classifier is typically one that has been 'trained' on samples from the population and such training may assist the classifier to detect any subgroup mentioned herein.

Specific Embodiments

Certain embodiments will be described with reference to numbered paragraphs:

Paragraph 1. A process for detecting a chromosome state which represents a subgroup in a population comprising determining whether a chromosome interaction relating to that chromosome state is present or absent within a defined region of the genome; and

- wherein said chromosome interaction has optionally been identified by a process of determining which chromosomal interactions are relevant to a chromosome state corresponding to the subgroup of the population, comprising contacting a first set of nucleic acids from subgroups with different states of the chromosome with a second set of index nucleic acids, and allowing complementary sequences to hybridise, wherein the nucleic acids in the first and second sets of nucleic acids represent a ligated product comprising sequences from both the chromosome regions that have come together in chromosomal interactions, and wherein the pattern of hybridisation between the first and second set of nucleic acids allows a determination of which chromosomal interactions are specific to the subgroup; and

- wherein the subgroup relates to the stage of fibrosis and the chromosome interaction either:

(i) is present in any one of the regions or genes listed in Table 1; and/or

(ii) corresponds to any one of the chromosome interactions represented by any probe shown in Table 1; and/or

(iii) is present in a 4,000 base region which comprises or which flanks (i) or (ii);

or

- wherein the subgroup relates to the presence of fibrosis and the chromosome interaction either:

(a) is present in any one of the regions or genes listed in Table 2; and/or

(b) corresponds to any one of the chromosome interactions represented by any probe shown in Table 2, and/or

(c) is present in a 4,000 base region which comprises or which flanks (a) or (b).

Paragraph 2. A process according to Paragraph 1 wherein the subgroup relates to the stage of sclerosis or the presence of sclerosis.

Paragraph 3. A process according to Paragraph 1 or 2 wherein a specific combination of chromosome interactions are typed comprising at least 3, 5, 8, 10 or 20 of the chromosome interactions represented by the probes in Table 1.

Paragraph 4. A process according to any one of the preceding Paragraphs wherein a specific combination of chromosome interactions are typed comprising at least 3, 5, 8, 10 or 20 of the chromosome interactions represented by the probes in Table 2.

Paragraph 5. A process according to any one of the preceding Paragraphs which is carried out to detect the whether the fibrosis is early stage or late stage fibrosis.

Paragraph 6. A process according to any one of the preceding Paragraphs which is carried out to determine the stage of fibrosis in an individual and wherein at least 10 chromosome interactions represented by the probes of Table 1 are typed.

Paragraph 7. A process according to any one of Paragraphs 1 to 4 which is carried out to determine the stage of presence of fibrosis in an individual and wherein at least 10 chromosome interactions represented by the probes of Table 2 are typed.

Paragraph 8. A process according to any one of the preceding Paragraphs in which the chromosome interactions are typed:

- in a sample from an individual, and/or

- by detecting the presence or absence of a DNA loop at the site of the chromosome interactions, and/or

- detecting the presence or absence of distal regions of a chromosome being brought together in a chromosome conformation, and/or

- by detecting the presence of a ligated nucleic acid which is generated during said typing and whose sequence comprises two regions each corresponding to the regions of the chromosome which come together in the chromosome interaction, wherein detection of the ligated nucleic acid is preferably by:

(i) by a probe that has at least 70% identity to any of the specific probe sequences mentioned in Table 1 or 2, and/or

(ii) by a primer pair which has at least 70% identity to any primer pair in Table 1 or 2.

Paragraph 9. A process according to any one of the preceding Paragraphs, wherein:

- the second set of nucleic acids is from a larger group of individuals than the first set of nucleic acids; and/or

- the first set of nucleic acids is from at least 8 individuals; and/or

- the first set of nucleic acids is from at least 4 individuals from a first subgroup and at least 4 individuals from a second subgroup which is preferably non-overlapping with the first subgroup.

Paragraph 10. A process according to any one of the preceding Paragraphs wherein:

- the second set of nucleic acids represents an unselected group; and/or

- wherein the second set of nucleic acids is bound to an array at defined locations; and/or

- wherein the second set of nucleic acids represents chromosome interactions in least 100 different genes; and/or

- wherein the second set of nucleic acids comprises at least 1,000 different nucleic acids representing at least 1,000 different chromosome interactions; and/or

- wherein the first set of nucleic acids and the second set of nucleic acids comprise at least 100 nucleic acids with length 10 to 100 nucleotide bases.

Paragraph 11. A process according to any one of the preceding Paragraphs, wherein the first set of nucleic acids is obtainable in a process comprising the steps of: -

(i) cross-linking of chromosome regions which have come together in a chromosome interaction;

(ii) subjecting said cross-linked regions to cleavage, optionally by restriction digestion cleavage with an enzyme; and

(iii) ligating said cross-linked cleaved DNA ends to form the first set of nucleic acids (in particular comprising ligated DNA).

Paragraph 12. A process according to any one of the preceding Paragraphs wherein said defined region of the genome:

(i) comprises a single nucleotide polymorphism (SNP); and/or

(ii) expresses a microRNA (miRNA); and/or

(iii) expresses a non-coding RNA (ncRNA); and/or

(iv) expresses a nucleic acid sequence encoding at least 10 contiguous amino acid residues; and/or

(v) expresses a regulating element; and/or

(vii) comprises a CTCF binding site.

Paragraph 13. A process according to any one of the preceding Paragraphs wherein:

- the result of the process is provided in a report; and/or

- the result of the process is used to select a treatment schedule; and/or

- the result of the process is used to select a specific therapy for the individual; and/or

- the process is carried out to select an individual for a medical treatment.

Paragraph 14. A process according to any one of Paragraphs 1 to 12 which is carried out to identify or design a therapeutic agent for fibrosis;

- wherein preferably said process is used to detect whether a candidate agent is able to cause a change to a chromosome state which is associated with fibrosis;

- wherein the chromosomal interaction is represented by any probe in Table 1 or 2; and/or

- the chromosomal interaction is present in any region or gene listed in Table 1 or 2;

and wherein optionally:

- the chromosomal interaction has been identified by the process of determining which chromosomal interactions are relevant to a subgroup as defined in Paragraph 1 or 2, and/or

- the change in chromosomal interaction is monitored using (i) a probe that has at least 70% identity to any of the probe sequences mentioned in Table 1 or 2, and/or (ii) by a primer pair which has at least 70% identity to any primer pair in Table 1 or 2.

Paragraph 15. A process according to Paragraph 14 which comprises selecting a target based on detection of the chromosome interactions, and preferably screening for a modulator of the target to identify a therapeutic agent for fibrosis, wherein said target is optionally a protein.

Paragraph 16. A process according to any one of the preceding claims, wherein the typing or detecting comprises specific detection of the ligated product by quantitative PCR (qPCR) which uses primers capable of amplifying the ligated product and a probe which binds the ligation site during the PCR reaction, wherein said probe comprises sequence which is complementary to sequence from each of the chromosome regions that have come together in the chromosome interaction, wherein preferably said probe comprises:

an oligonucleotide which specifically binds to said ligated product, and/or

a fluorophore covalently attached to the 5' end of the oligonucleotide, and/or

a quencher covalently attached to the 3' end of the oligonucleotide, and

optionally

said fluorophore is selected from HEX, Texas Red and FAM; and/or

said probe comprises a nucleic acid sequence of length 10 to 40 nucleotide bases, preferably a length of 20 to 30 nucleotide bases.

Paragraph 17. A therapeutic agent for use in a method of treating fibrosis in an individual that has been identified as being in need of the therapeutic agent by a process according to any one of Paragraphs 1 to 12 and 16.

Specific Aspects

The EpiSwitch™ platform technology detects epigenetic regulatory signatures of regulatory changes between normal and abnormal conditions at loci. The EpiSwitch™ platform identifies and monitors the fundamental epigenetic level of gene regulation associated with regulatory high order structures of human chromosomes also known as chromosome conformation signatures. Chromosome signatures are a distinct primary step in a cascade of gene deregulation. They are high order biomarkers with a unique set of advantages against biomarker platforms that utilize late epigenetic and gene expression biomarkers, such as DNA methylation and RNA profiling.

EpiSwitch™ Array Assay

The custom EpiSwitch™ array-screening platforms come in 4 densities of, 15K, 45K, 100K, and 250K unique chromosome conformations, each chimeric fragment is repeated on the arrays 4 times, making the effective densities 60K, 180K, 400K and 1 Million respectively.

Custom Designed EpiSwitch™ Arrays

The 15K EpiSwitch™ array can screen the whole genome including around 300 loci interrogated with the EpiSwitch™ Biomarker discovery technology. The EpiSwitch™ array is built on the Agilent SurePrint G3 Custom CGH microarray platform; this technology offers 4 densities, 60K, 180K, 400K and 1 Million probes. The density per array is reduced to 15K, 45K, 100K and 250K as each EpiSwitch™ probe is presented as a quadruplicate, thus allowing for statistical evaluation of the reproducibility. The average number of potential EpiSwitch™ markers interrogated per genetic loci is 50, as such the numbers of loci that can be investigated are 300, 900, 2000, and 5000.

EpiSwitch™ Custom Array Pipeline

The EpiSwitch™ array is a dual colour system with one set of samples, after EpiSwitch™ library generation, labelled in Cy5 and the other of sample (controls) to be compared/ analyzed labelled in Cy3. The arrays are scanned using the Agilent SureScan Scanner and the resultant features extracted using the Agilent Feature Extraction software. The data is then processed using the EpiSwitch™ array processing scripts in R. The arrays are processed using standard dual colour packages in Bioconductor in R: Limma *. The normalisation of the arrays is done using the normalisedWithinArrays function in Limma * and this is done to the on chip Agilent positive controls and EpiSwitch™ positive controls. The data is filtered based on the Agilent Flag calls, the Agilent control probes are removed and the technical replicate probes are averaged, in order for them to be analysed using Limma*. The probes are modelled based on their difference between the 2 scenarios being compared and then corrected by using False Discovery Rate. Probes with Coefficient of Variation (CV) <=30% that are <=-1.1 or =>1.1 and pass the p<=0.1 FDR p-value are used for further screening. To reduce the probe set further Multiple Factor Analysis is performed using the FactorMineR package in R.

* Note: LIMMA is Linear Models and Empirical Bayes Processes for Assessing Differential Expression in Microarray Experiments. Limma is an R package for the analysis of gene expression data arising from microarray or RNA-Seq.

The pool of probes is initially selected based on adjusted p-value, FC and CV <30% (arbitrary cut off point) parameters for final picking. Further analyses and the final list are drawn based only on the first two parameters (adj. p-value; FC).

Statistical Pipeline

EpiSwitch™ screening arrays are processed using the EpiSwitch™ Analytical Package in R in order to select high value EpiSwitch™ markers for translation on to the EpiSwitch™ PCR platform.

Step 1

Probes are selected based on their corrected p-value (False Discovery Rate, FDR), which is the product of a modified linear regression model. Probes below p-value <= 0.1 are selected and then further reduced by their Epigenetic ratio (ER), probes ER have to be <=-1.1 or =>1.1 in order to be selected for further analysis. The last filter is a coefficient of variation (CV), probes have to be below <=0.3.

Step 2

The top 40 markers from the statistical lists are selected based on their ER for selection as markers for PCR translation. The top 20 markers with the highest negative ER load and the top 20 markers with the highest positive ER load form the list.

Step 3

The resultant markers from step 1, the statistically significant probes form the bases of enrichment analysis using hypergeometric enrichment (HE). This analysis enables marker reduction from the significant probe list, and along with the markers from step 2 forms the list of probes translated on to the EpiSwitch™ PCR platform.

The statistical probes are processed by HE to determine which genetic locations have an enrichment of statistically significant probes, indicating which genetic locations are hubs of epigenetic difference.

The most significant enriched loci based on a corrected p-value are selected for probe list generation. Genetic locations below p-value of 0.3 or 0.2 are selected. The statistical probes mapping to these genetic locations, with the markers from step 2, form the high value markers for EpiSwitch™ PCR translation.

Array design and processing

Array Design

1. Genetic loci are processed using the SII software (currently v3.2) to:
    a. Pull out the sequence of the genome at these specific genetic loci (gene sequence with 50kb upstream and 20kb downstream)
    b. Define the probability that a sequence within this region is involved in CCs
    c. Cut the sequence using a specific RE
    d. Determine which restriction fragments are likely to interact in a certain orientation
    e. Rank the likelihood of different CCs interacting together.
2. Determine array size and therefore number of probe positions available (x)
3. Pull out x/4 interactions.
4. For each interaction define sequence of 30bp to restriction site from part 1 and 30bp to restriction site of part 2. Check those regions that are not repeats, if so exclude and take next interaction down on the list. Join both 30bp to define probe.

5. Create list of x/4 probes plus defined control probes and replicate 4 times to create list to be created on array
6. Upload list of probes onto Agilent Sure design website for custom CGH array.
7. Use probe group to design Agilent custom CGH array.

Array Processing

1. Process samples using EpiSwitch™ Standard Operating Procedure (SOP) for template production.
2. Clean up with ethanol precipitation by array processing laboratory.
3. Process samples as per Agilent SureTag complete DNA labelling kit - Agilent Oligonucleotide Array-based CGH for Genomic DNA Analysis Enzymatic labelling for Blood, Cells or Tissues
4. Scan using Agilent C Scanner using Agilent feature extraction software.

EpiSwitch™ biomarker signatures demonstrate high robustness, sensitivity and specificity in the stratification of complex disease phenotypes. This technology takes advantage of the latest breakthroughs in the science of epigenetics, monitoring and evaluation of chromosome conformation signatures as a highly informative class of epigenetic biomarkers. Current research methods deployed in academic environment require from 3 to 7 days for biochemical processing of cellular material in order to detect CCSs. Those procedures have limited sensitivity, and reproducibility; and furthermore, do not have the benefit of the targeted insight provided by the *EpiSwitch™ Analytical Package* at the design stage.

EpiSwitch™ Array in silico marker identification

CCS sites across the genome are directly evaluated by the EpiSwitch™ Array on clinical samples from testing cohorts for identification of all relevant stratifying lead biomarkers. The EpiSwitch™ Array platform is used for marker identification due to its high-throughput capacity, and its ability to screen large numbers of loci rapidly. The array used was the Agilent custom-CGH array, which allows markers identified through the *in silico* software to be interrogated.

EpiSwitch™ PCR

Potential markers identified by *EpiSwitch™ Array* are then validated either by *EpiSwitch™ PCR* or DNA sequencers (i.e. Roche 454, Nanopore MinION, etc.). The top PCR markers which are statistically significant and display the best reproducibility are selected for further reduction into the final *EpiSwitch™* Signature Set, and validated on an independent cohort of samples. *EpiSwitch™ PCR* can be

performed by a trained technician following a standardised operating procedure protocol established. All protocols and manufacture of reagents are performed under ISO 13485 and 9001 accreditation to ensure the quality of the work and the ability to transfer the protocols. *EpiSwitch™ PCR* and *EpiSwitch™ Array* biomarker platforms are compatible with analysis of both whole blood and cell lines. The tests are sensitive enough to detect abnormalities in very low copy numbers using small volumes of blood.

Annotations Used in The Tables

The tables give names to particular sets of probes and primers to be used in aspects of the invention. Alternative primer names for the following PCR marker sets are shown below:

For OBD168-669.671: OBD168-013.015
For OBD168-1729.1731: OBD168-265.267
For OBD168-1841.1843: OBD168-353.355
For OBD168-1361.1363: OBD168-97.99
For OBD168-1529.1531: OBD168-645.647
For OBD168-681.683: OBD168-661.663
For OBD168-921.923: OBD168-717.719
For OBD168-893.895: OBD168-705.707
For OBD168-1273.1275: OBD168-749.751
For OBD168-1629.1631: OBD168-737.739
For OBD168-885.887: OBD168-733.735
For OBD168-1741.1743: OBD168-781.783

The invention is illustrated by the following Examples:

Chromatin Conformation Signature Analysis in Early vs Late Fibrosis/Scleroderma Phenotypes

In this work systemic sclerosis is being used as a model disease to investigate the chromatin conformation signature relevant to fibrosis.

Systemic sclerosis (scleroderma, SSc) is a heterogeneous fibrosis disease in which clinical outcomes vary widely. Predicting outcomes on an individual basis remains challenging despite progress made through autoantibody analysis and gene expression profiling. Effective targeted therapies are evolving and accurately predicting outcomes is important to enable patient stratification for therapy.

Scleroderma (systemic sclerosis, SSc) is a severe connective tissue disease in which an autoimmune process at onset is associated with downstream fibrosis of the skin and internal organs, as well as vascular damage. In general, SSc is difficult to treat and patients continue to suffer a disabling, progressive and potentially lethal disease. Comprehensive genetic studies have indicated association of

scleroderma susceptibility with genes involved in innate and adaptive immunity. Activated macrophages are seen to infiltrate into the perivascular tissue at an early stage of the disease, expressing markers of the profibrotic M2 phenotype, such as CD206 and secreting growth factors such as TGFβ which drive fibrosis. Macrophages derived from SSc patients display an activation signature characterised by high CD206 and elevated arginase1, highest in patients with severe disease. Soluble CD206 is elevated in plasma and tissue fluid of patients as a biomarker of the M2 activation state. In co-culture, SSc macrophages secrete factors which stimulate fibroblasts to increase collagen I production.

In the present work, through profiling of blood derived macrophages a mixed activation state of macrophages has been identified in this disease. This includes identifying a macrophage activation signature which indicates a combined pro-inflammatory as well as M2-like pro-fibrotic state. Macrophages form patients release inflammatory proteins characteristic of this disease including IL-6, but are also pro-fibrotic, stimulating fibroblasts in co-culture. Using a signature across 3 markers (IFN¥, CD206 and Arg1) an activation signature present in 50% of patients has been identified, which is not seen in healthy control samples. These characteristics persist in tissue culturing implying that the signature results from an epigenetic change which fundamentally alters the macrophage state. Likely initiating factors including Th2 cytokines encountered in the disease microenvironment, tissue stiffness in the disease microenvironment, or stimulation by antibody/antigen complexes carried into the cells systemically.

Chromatin Conformation Signature (CCS) profiling of peripheral blood for systemic epigenetic deregulations was used in this work. The EpiSwitch platform offering high throughput and resolution chromosome conformation (3C) capture detects significant regulatory changes in 3D genome architecture and maps long range interaction between distant genomic locations. This, in turn, reveals the spatial disposition and physical properties of the chromosome, such as chromatin loops and inter-chromosomal connections, which have a role in network organization and genetic epistasis controlling gene expression.

This methodology was applied to patients with SSc to identify CCS associated with different phenotypes and can be used to stratify and identify patients into pathogenic subtypes.

We aimed to determine significant chromatin conformation signatures associated with presence of scleroderma and also detection of early and late phenotypes of scleroderma.

The EpiSwitch - based chromosome conformation capture (3C) method was applied to blood samples from early phenotype, and late phenotype SSc patients. Intact nuclei were isolated from peripheral blood mononuclear cells and subjected to formaldehyde fixation resulting in crosslinking between

physically touching segments of the genome via contacts between their DNA bound proteins. For quantification of cross-linking frequencies, the cross-linked DNA was digested and then subjected to ligation. Cross-linking was then reversed and individual ligation products detected and quantified by EpiSwitch custom oligo array annotated across the whole genome to the anchoring sites of 3D genome architecture.

The UK sample cohort consisted of 4 Healthy Controls and 6 Scleroderma patient samples. The 6 Scleroderma patients were split between Early and Late stage disease. EpiSwitch libraries were generated from the received sample cohort (n=8) using the Robotic Delta9.1 with Qiagen column purification protocols. A pooled control was created from the 4 extracted Healthy control samples. These libraries were processed for using on the custom designed Agilent CGH array.

Results

7 significant CCSs were found over the HLA-C, HLA-B and TNF regions on Chromosome 6 in the early phenotype. The top 10 pathways for genetic locations associated to the CCSs are shown in the table below for the early phenotype.

	GeneSet
1	Natural Killer cell mediated cytotoxicity
2	Immunoregulatory interactions between a lymphoid cell and a non-lymphoid cell
3	Antigen Processing & presentation
4	Phagosome
5	Graft versus host disease
6	Type 1 diabetes mellitus
7	Osteoclast differentiation
8	Class 1 MHC mediated antigen processing & presentation
9	Rheumatoid Arthritis
10	GnRH signalling pathway

2 significant CCSs were found centred around the IFNG region of chromosome 12 in the late phenotype. The top 10 pathways for genetic locations associated to significant CCSs are shown in the table below for the late phenotype.

	GeneSet
1	Surfactant metabolism

2	IL12 signalling mediated by STAT4
3	Protein digestion and absorption
4	Calcineruin regulated NFAT dependent transcription in lymphocytes
5	Transcriptional mis-regulation in cancer
6	Kaposi's sarcoma associated herpes virus infection
7	IL2 mediated signalling events
8	Inflammatory bowel disease
9	Interleukin-20 Family signalling
10	AP-1 transcription factor network

Table 1 and Table 2 show the markers that were identified by this work. They represent part of the 3D genomic regulatory control. There were distinct CCSs in the early phenotype compared to the late showing the CCSs change as the disease progresses and varies between phenotypes. The CCSs can be linked to each clinically defined subgroup to be used as a biomarker tool to predict outcome and progression in patients. The present work therefore provides both diagnostic and prognostic markers. Subsequent work done in the same way identified the markers shown in Tables 3 to 6. The data provided in Tables 1 to 6 show the efficacy of these markers in identifying the subgroups they are associated with.

It must be appreciated that identifying the markers shown in the tables required the testing of many potential markers. A total of 170229 markers were studied in an array. In the first analysis, they were shortlisted to 100 diagnostic (HC VS SSc) and prognostic (late SSc VS early SSc) markers, (170029 dropped out). In the second analysis, a shortlist of top 200 prognostic (unique markers present in early and late SSc) and 200 diagnostic (unique markers present in SSc and HC) markers prepared (169829 dropped out).

For the second set of markers of Tables 3 to 6 additional modelling values has been provided based on a SHAPLEY analysis. The markers were used to build a Random Forest model and the markers contribution to the models was calculated using SHAPLEY. The results are shown in Tables 7 to 10, where the SHAPLEY difference column in each tab is the variable to rank importance, the larger the difference the more important it is in the model.

The top 100 markers for either early v late disease or SSc v pHC (healthy control), generate an average model accuracy of 94%, this is compared to a mean average of 45% when you randomly select 100

markers and do this 100 times. This difference in classifying accuracy clearly demonstrates the power of the statistically selected markers.

In conclusion, the present work has led to the identification of markers which each have a powerful association with a distinct characteristic of fibrosis, and therefore individual markers or small numbers of these markers can be the basis of an effective test for the stage or presence of fibrosis.

	probe	gene.index	RP/Rsum	FC:(class1/class2)
1	ORF1_chr9_117652733_117662476_117782539_117784298_FF_1	27640	66.27	0.1915
2	ORF1_chr21_21135567_21136687_21190498_21197349_RR_1	17045	79.99	0.3925
3	ORF1_chr12_108190915_108198003_108364371_108366987_FR_1	41612	75.78	0.3598
4	ORF1_chr8_138185388_138192430_138316302_138317782_FF_1	101290	88.9	0.3921
5	ORF1_chr6_104807984_104813896_104858263_104859297_FR_1	123015	60.98	0.3632
6	ORF1_chr7_73838719_73840112_73998797_74003463_FF_1	88433	52.65	0.3224
7	ORF1_chr6_1490191_1492799_1612178_1614243_FR_1	109136	40.25	0.2393
8	ORF1_chr13_109624423_109630621_109869387_109876529_RF_1	116786	103.6	0.4592
9	ORF1_chr3_171788979_171791691_171971435_171976171_RF_1	38725	162	0.2839
10	ORF1_chr13_102842718_102847079_102927740_102931657_FR_1	65746	168.2	0.4991
11	ORF1_chrX_40971005_40973842_41006985_41010257_RF_1	93949	159.5	0.3908
12	ORF1_chr4_26084879_26086604_26290850_26293788_FR_1	33330	173.8	0.476
13	ORF1_chr13_109869387_109876529_109901846_109907608_FF_1	60814	196.5	0.5216
14	ORF1_chr11_21505657_21511320_21625659_21628201_FR_1	69339	180.6	0.5138
15	ORF1_chr13_102842718_102847079_102867709_102871733_FF_1	62134	157.6	0.4919
16	ORF1_chr13_102842718_102847079_102952727_102953846_FF_1	57139	194.4	0.5129
17	ORF1_chr3_179490429_179499685_179696553_179701788_RF_1	32920	153.2	0.1938
18	ORF1_chr13_109869387_109876529_109994965_109996722_FR_1	130780	191.1	0.5202
19	ORF1_chr13_42949707_42958335_43086110_43092272_RF_1	34008	188.2	0.1628
20	ORF1_chr10_93375413_93378505_93410956_93413925_FR_1	97132	137.7	0.4814
21	ORF1_chr1_182254591_182258498_182271295_182272617_RR_1	106543	144.6	0.4902
22	ORF1_chr6_104807984_104813896_104859297_104866639_FF_1	135912	150.5	0.4555
23	ORF1_chr3_35637910_35639568_35705745_35720206_RF_1	28231	206.9	0.524
24	ORF1_chr8_81130626_81134961_81156168_81161109_RF_1	33879	135.9	0.3518
25	ORF1_chr11_61243450_61246026_61388261_61391790_FR_1	117098	242	0.5319
26	ORF1_chr4_107675768_107680919_107825397_107833109_FF_1	63807	246.5	0.5419
27	ORF1_chr1_193456875_193464580_193519461_193528788_RR_1	11362	262.4	0.501
28	ORF1_chr11_79134716_79152601_79219225_79225698_FR_1	33877	277.3	0.1144
29	ORF1_chr6_15282103_15283199_15362212_15366665_RR_1	33469	294.6	0.2127
30	ORF1_chr11_35101113_35109487_35250591_35252942_RR_1	70719	292.6	0.5615
31	ORF1_chr11_111144097_111148048_111222819_111226135_FF_1	26876	289	0.5585
32	ORF1_chr18_62522952_62526928_62633916_62637110_RR_1	73540	305.3	0.5596
33	ORF1_chr18_63796182_63806119_63902371_63912126_RF_1	46660	312.7	0.5488
34	ORF1_chr4_59658576_59668116_59701046_59706041_RF_1	34142	320.9	0.4449
35	ORF1_chr2_68857299_68862999_68948041_68951799_RF_1	26296	348.7	0.482
36	ORF1_chr14_61751727_61758003_61810071_61812335_FR_1	139473	344.4	0.5737
37	ORF1_chr21_33072222_33074551_33276086_33283169_RF_1	38327	398.6	0.4507
38	ORF1_chr11_111222819_111226135_111261363_111265949_FR_1	43619	383.4	0.5574
39	ORF1_chr4_38671979_38673590_38888275_38891480_RF_1	36577	389.3	0.2779
40	ORF1_chr3_114010550_114016075_114047949_114051357_RF_1	33335	405.1	0.2532
41	ORF1_chr14_61490070_61495640_61751727_61758003_RF_1	53496	398.1	0.5138
42	ORF1_chr15_67887204_67889122_68052888_68053975_FR_1	38981	434.3	0.2186
43	ORF1_chr14_96740036_96741996_96820569_96823739_RF_1	129511	447.6	0.5956
44	ORF1_chr8_116637960_116642220_116837668_116843681_FR_1	87182	461.1	0.3976
45	ORF1_chr7_43764036_43765883_43792676_43795674_RR_1	37245	487.1	0.3162
46	ORF1_chr11_78798294_78806874_79036088_79041510_RF_1	40619	486.4	0.6055
47	ORF1_chr12_103575776_103578331_103663674_103664970_FR_1	32922	505.5	0.2152
48	ORF1_chr6_13375878_13378557_13523152_13526281_FF_1	33742	556.4	0.2342
49	ORF1_chr11_21505657_21511320_21751405_21757053_FR_1	131989	552.9	0.4888
50	ORF1_chr5_54531220_54532270_54669234_54674643_FF_1	22667	574.6	0.4734

Table 1.a1

				Probe sequence
	pfp	P.value	CCSs	60 mer
1	0.06903	0.000001957	Late	ACAAAACTGATGATGCCTTGCAACAAACTCGATAGAAGAGAAAAACAAGCTCAGAGCAAC
2	0.0699	0.000002972	Late	CCAACGGCATATAAAACTGAGAAGAGCTTCGACTCTGAGTCTTCTTCTTCAGTGTTCTGG
3	0.07439	0.000002635	Late	TCCTTTCCTTCAAGTCTTTAATCAAACCTCGATGCAGAACCTGAATGGACAACTTCTGGA
4	0.0757	0.000003755	Late	TGTAAGACTATCAAATTAGCCAAAATCTTCGAAAGCAGAAAATAAAAAGATAGATTTGGT
5	0.07646	0.000001625	Late	ACAAAAATTAGAAAAGTAACTGATAACCTCGACTACGAAAAATAAGTAAGAGTAGCACTT
6	0.08262	0.000001171	Late	ACTGAGGGCACCGACTATCAGCACCGCGTCGAAAATCATAATCTGGGGCCCTCTCTCCTC
7	0.09039	6.404E-07	Late	ATATCCAATCAGAGTGGAAATATCAGAGTCGAAACTAAAAAAAAAAAAATCCAATTAAAAA
8	0.09278	0.000005259	Late	GGGTAGGGAAGTAAAAGAAAATGGTGCTTCGATTCCCATTGAAGCTAAGTCTGCAGTTTA
9	0.1239	0.00001404	Late	TTCAGTTCAATGAGGAAAAGTCTCATAATCGAGGATGAATAAAACAGACATTGTCCTCAA
10	0.1267	0.00001526	Late	GAGGTCAGTAAGGAGAGCAGAGTAGACTTCGATTCTCCTCTTATCACTCCCTTCCTTGAA
11	0.1278	0.00001358	Late	ATGCGGTGCTGAGTTGTGCTATGGCAACTCGAACTCCTAACCTCAAATGGTCTTCCCGCC
12	0.1284	0.00001638	Late	AGCCATCAAACAGAACCGGAAAAGTGGCTCGAGAAGAGAATCGTAAATGAAATACATAAA
13	0.1314	0.00002142	Late	GGGTAGGGAAGTAAAAGAAAATGGTGCTTCGATCCTCTCCATCAAGTCTCCTCTCTCTAG
14	0.1323	0.00001781	Late	CCTACAACTTTCTTATTTGTACTTTTCCTCGATAAATTTATGTTTATTTAAAAAAATTTG
15	0.1333	0.00001322	Late	GAGGTCAGTAAGGAGAGCAGAGTAGACTTCGAAGAATATTTAATAAAATGTAAATATGCC
16	0.1343	0.00002094	Late	GAGGTCAGTAAGGAGAGCAGAGTAGACTTCGAATTTCTTTATTGACATGTTCTCACTCAT
17	0.135	0.00001243	Late	CCTTCTCTTTTCTTCCTTTTCCTTTCTTTCGATAGATAGAGACATATATGAGAGGGGATT
18	0.1354	0.00002015	Late	GGGTAGGGAAGTAAAAGAAAATGGTGCTTCGAGTTAAGACTGTTCTGAGTCCTGTAAAAA
19	0.1376	0.0000195	Late	ACTGCTTTTTGCCATAAAGCCTACCTTATCGAGAAAATTCTTAAAAGAACACTTTTTCCT
20	0.1389	0.00000984	Late	ACATAAAATGATATTTCAGATTTTGCCGTCGAGCTATGTGAGTCTGAGTAAGTTTCTTAA
21	0.1405	0.00001095	Late	GCGGAGATCTTTCAAGAAATTTATTTAATCGATAGTATGTACCCTTGATATGATATGATG
22	0.1406	0.00001195	Late	ACAAAAATTAGAAAAGTAACTGATAACCTCGAGTCATCTATTTGATATCTCCACTTCAGT
23	0.1409	0.00002397	Late	CACTGAGTATTTTCATCTAATCTTTCACTCGAATAGTTGGAAAATAATTACCTACTCATC
24	0.1499	0.000009559	Late	ATGGAAATCTGAGTAAAGAAATTCATGGTCGAGCCAAGAGGAAGGAAGAAACGGCGGTGG
25	0.1903	0.0000337	Late	CCTGGCTCCTTCCTGTATTATGCTCCCTTCGAGAAGTAGAATATCTGAATGTTCTTATAT
26	0.1904	0.00003508	Late	AAATACAAAGAAAAACATCAGAGCAGTATCGACCATGCACTCAGAAGCTTTTACAGGGAA
27	0.2102	0.00004021	Late	CACCTCATCAGCACTCAGAAGAGAACAGTCGACAGTTAAGAGATCCTGGTTAAGGGATGG
28	0.2284	0.00004531	Late	TACAACAATTTATTTTTGGTTTAAAAGCTCGAGCTCAGCTTTCCAGCATGTGTAAGCTGT
29	0.2352	0.00005166	Late	TGGTCTCTACTTAAAATACAGAAATTGGTCGAAAATATATCAGTTTAAGTGTTATTGAGG
30	0.2395	0.00005091	Late	ACATACCCCTAAGAATGCTCAGAAATACTCGAGAAATGATATGTTTGTATACTATCCTTT
31	0.2413	0.00004958	Late	CTGTTCTAAGCCTAAAAAGAATATATATTCGACTACTGTGAATAGGGCTGCAATAAGCAT
32	0.2462	0.00005582	Late	CCTCACCTCCGCCAATCAGCACCGCGAATCGATCCCTTTGGATTCTCAGGTCCCCATCTT
33	0.2515	0.00005881	Late	ATATAGAAATGGTACTGATTTTTGTACGTCGAAATTAAAAGTTCAAAAATACATTTCTTA
34	0.2583	0.00006222	Late	GGGGAAGATAAGTGATCATATTTCTACTTCGATCAAGCATACATAATAGACATCTACAGA
35	0.2919	0.00007446	Late	AGTCTAAAATAGTGGTTTGAACAAGTAGTCGAGGAGGAAAGAAAAACCTCTCAGGTCCAT
36	0.2922	0.00007247	Late	ATGCAAGAGAAATTACATAACAGAGGGCTCGATGTTTACCTTGAACTGAGTAAAATCAAA
37	0.3459	0.00009803	Late	AGCCATGGACAACTTATTGTGTTCAAGTTCGATTTGTTACAGACGTTAACAAATTCCTTT
38	0.3469	0.00009095	Late	ATGCTTATTGCAGCCCTATTCACAGTAGTCGAATTATTTTCAAATAACATCATAAAATTC
39	0.3479	0.00009367	Late	TCCCTGTCTTCTAAATAATAAGAGAGAATCGACACTAGACTTGTTTAGAAGACCTCACTG
40	0.348	0.0001011	Late	GATATGCAGCTACTATCTTACTGCATCCTCGATATTAAATCCCTACTAACTTCCAATGAT
41	0.3539	0.00009779	Late	ATGCAAGAGAAATTACATAACAGAGGGCTCGACTCATGAGTCTGACTGCTTTGTGCCTTA
42	0.3878	0.0001154	Late	AGCTGACTTATGTACCAGATACTTTGTTTCGATCAGGGTAGACTGAGAAGTGAATGTGAA
43	0.401	0.0001222	Late	GCAGATCTCTAGAACTTAATTTGCAAATTCGATTAAATGCTTATTATGTGTTTATTTAGC
44	0.4147	0.0001293	Late	TAACATTCTGATACCACTACACCTGAGTTCGACTAATTATGATGGTGAAGGAGCAGAAGA
45	0.44	0.0001434	Late	TCTAGAGAGAACATCTTTCTTCAGCAGATCGAAGTGTTCTTTCTCTGTATTTGTCTCGTT
46	0.4485	0.000143	Late	CATTGGAGGCACTCAAAAAAAAAAAAAAATCGATTGTGACCTAATTTGATAACAGGGCTTT
47	0.4617	0.0001537	Late	AAATTATATTTTCTTAGGTTAATCGTCCTCGATCATTATATTTAAGGCCCACACTAATTC
48	0.5196	0.0001841	Late	ACCTGCTGGGACAACTGAAAGATTATTATCGAGTCTAAACATCTACATGGGATTAGTAAT
49	0.524	0.0001819	Late	CCTACAACTTTCTTATTTGTACTTTTCCTCGAGGAAATAATTCACTAGGTAAAGGGAGTA
50	0.5305	0.0001954	Late	TACAGATATGCTTGTTGTATGTCACGTGTCGACATAAATATTTGTTGAACAAGTAAATGA

Table 1.a2

	Probe Location					4 kb Sequence Location				
	Chr	Start1	End1	Start2	End2	Chr	Start1	End1	Start2	End2
1	chr9	117662445	117662474	117784267	117784296	chr9	117658475	117662474	117780297	117784296
2	chr21	21135569	21135598	21190500	21190529	chr21	21135569	21139568	21190500	21194499
3	chr12	108197972	108198001	108364373	108364402	chr12	108194002	108198001	108364373	108368372
4	chr8	138192399	138192428	138317751	138317780	chr8	138188429	138192428	138313781	138317780
5	chr6	104813865	104813894	104858265	104858294	chr6	104809895	104813894	104858265	104862264
6	chr7	73840081	73840110	74003432	74003461	chr7	73836111	73840110	73999462	74003461
7	chr6	1492768	1492797	1612180	1612209	chr6	1488798	1492797	1612180	1616179
8	chr13	109624425	109624454	109876498	109876527	chr13	109624425	109628424	109872528	109876527
9	chr3	171788981	171789010	171976140	171976169	chr3	171788981	171792980	171972170	171976169
10	chr13	102847048	102847077	102927742	102927771	chr13	102843078	102847077	102927742	102931741
11	chrX	40971007	40971036	41010226	41010255	chrX	40971007	40975006	41006256	41010255
12	chr4	26086573	26086602	26290852	26290881	chr4	26082603	26086602	26290852	26294851
13	chr13	109876498	109876527	109907577	109907606	chr13	109872528	109876527	109903607	109907606
14	chr11	21511289	21511318	21625661	21625690	chr11	21507319	21511318	21625661	21629660
15	chr13	102847048	102847077	102871702	102871731	chr13	102843078	102847077	102867732	102871731
16	chr13	102847048	102847077	102953815	102953844	chr13	102843078	102847077	102949845	102953844
17	chr3	179490431	179490460	179701757	179701786	chr3	179490431	179494430	179697787	179701786
18	chr13	109876498	109876527	109994967	109994996	chr13	109872528	109876527	109994967	109998966
19	chr13	42949709	42949738	43092241	43092270	chr13	42949709	42953708	43088271	43092270
20	chr10	93378474	93378503	93410958	93410987	chr10	93374504	93378503	93410958	93414957
21	chr1	182254593	182254622	182271297	182271326	chr1	182254593	182258592	182271297	182275296
22	chr6	104813865	104813894	104866608	104866637	chr6	104809895	104813894	104862638	104866637
23	chr3	35637912	35637941	35720175	35720204	chr3	35637912	35641911	35716205	35720204
24	chr8	81130628	81130657	81161078	81161107	chr8	81130628	81134627	81157108	81161107
25	chr11	61245995	61246024	61388263	61388292	chr11	61242025	61246024	61388263	61392262
26	chr4	107680888	107680917	107833078	107833107	chr4	107676918	107680917	107829108	107833107
27	chr1	193456877	193456906	193519463	193519492	chr1	193456877	193460876	193519463	193523462
28	chr11	79152570	79152599	79219227	79219256	chr11	79148600	79152599	79219227	79223226
29	chr6	15282105	15282134	15362214	15362243	chr6	15282105	15286104	15362214	15366213
30	chr11	35101115	35101144	35250593	35250622	chr11	35101115	35105114	35250593	35254592
31	chr11	111148017	111148046	111226104	111226133	chr11	111144047	111148046	111222134	111226133
32	chr18	62522954	62522983	62633918	62633947	chr18	62522954	62526953	62633918	62637917
33	chr18	63796184	63796213	63912095	63912124	chr18	63796184	63800183	63908125	63912124
34	chr4	59658578	59658607	59706010	59706039	chr4	59658578	59662577	59702040	59706039
35	chr2	68857301	68857330	68951768	68951797	chr2	68857301	68861300	68947798	68951797
36	chr14	61757972	61758001	61810073	61810102	chr14	61754002	61758001	61810073	61814072
37	chr21	33072224	33072253	33283138	33283167	chr21	33072224	33076223	33279168	33283167
38	chr11	111226104	111226133	111261365	111261394	chr11	111222134	111226133	111261365	111265364
39	chr4	38671981	38672010	38891449	38891478	chr4	38671981	38675980	38887479	38891478
40	chr3	114010552	114010581	114051326	114051355	chr3	114010552	114014551	114047356	114051355
41	chr14	61490072	61490101	61757972	61758001	chr14	61490072	61494071	61754002	61758001
42	chr15	67889091	67889120	68052890	68052919	chr15	67885121	67889120	68052890	68056889
43	chr14	96740038	96740067	96823708	96823737	chr14	96740038	96744037	96819738	96823737
44	chr8	116642189	116642218	116837670	116837699	chr8	116638219	116642218	116837670	116841669
45	chr7	43764038	43764067	43792678	43792707	chr7	43764038	43768037	43792678	43796677
46	chr11	78798296	78798325	79041479	79041508	chr11	78798296	78802295	79037509	79041508
47	chr12	103578300	103578329	103663676	103663705	chr12	103574330	103578329	103663676	103667675
48	chr6	13378526	13378555	13526250	13526279	chr6	13374556	13378555	13522280	13526279
49	chr11	21511289	21511318	21751407	21751436	chr11	21507319	21511318	21751407	21755406
50	chr5	54532239	54532268	54674612	54674641	chr5	54528269	54532268	54670642	54674641

Table 1.a3

	probe	Primer ID
1	ORF1_9_117652733_117662476_117782539_117784298_FF	OBD168-001
2	ORF1_21_21135567_21136687_21190498_21197349_RR	OBD168-005
3	ORF1_12_108190915_108198003_108364371_108366987_FR	OBD168-009
4	ORF1_8_138185388_138192430_138316302_138317782_FF	OBD168-013
5	ORF1_6_104807984_104813896_104858263_104859297_FR	OBD168-017
6	ORF1_7_73838719_73840112_73998797_74003463_FF	OBD168-021
7	ORF1_6_1490191_1492799_1612178_1614243_FR	OBD168-025
8	ORF1_13_109624423_109630621_109869387_109876529_RF	OBD168-029
9	ORF1_3_171788979_171791691_171971435_171976171_RF	OBD168-033
10	ORF1_13_102842718_102847079_102927740_102931657_FR	OBD168-037
11	ORF1_X_40971005_40973842_41006985_41010257_RF	OBD168-041
12	ORF1_4_26084879_26086604_26290850_26293788_FR	OBD168-045
13	ORF1_13_109869387_109876529_109901846_109907608_FF	OBD168-049
14	ORF1_11_21505657_21511320_21625659_21628201_FR	OBD168-053
15	ORF1_13_102842718_102847079_102867709_102871733_FF	OBD168-057
16	ORF1_13_102842718_102847079_102952727_102953846_FF	OBD168-061
17	ORF1_3_179490429_179499685_179696553_179701788_RF	OBD168-065
18	ORF1_13_109869387_109876529_109994965_109996722_FR	OBD168-069
19	ORF1_13_42949707_42958335_43086110_43092272_RF	OBD168-073
20	ORF1_10_93375413_93378505_93410956_93413925_FR	OBD168-077
21	ORF1_1_182254591_182258498_182271295_182272617_RR	OBD168-081
22	ORF1_6_104807984_104813896_104859297_104866639_FF	OBD168-085
23	ORF1_3_35637910_35639568_35705745_35720206_RF	OBD168-089
24	ORF1_8_81130626_81134961_81156168_81161109_RF	OBD168-093
25	ORF1_11_61243450_61246026_61388261_61391790_FR	OBD168-097
26	ORF1_4_107675768_107680919_107825397_107833109_FF	OBD168-101
27	ORF1_1_193456875_193464580_193519461_193528788_RR	OBD168-105
28	ORF1_11_79134716_79152601_79219225_79225698_FR	OBD168-109
29	ORF1_6_15282103_15283199_15362212_15366665_RR	OBD168-113
30	ORF1_11_35101113_35109487_35250591_35252942_RR	OBD168-117
31	ORF1_11_111144097_111148048_111222819_111226135_FF	OBD168-121
32	ORF1_18_62522952_62526928_62633916_62637110_RR	OBD168-125
33	ORF1_18_63796182_63806119_63902371_63912126_RF	OBD168-129
34	ORF1_4_59658576_59668116_59701046_59706041_RF	OBD168-133
35	ORF1_2_68857299_68862999_68948041_68951799_RF	OBD168-137
36	ORF1_14_61751727_61758003_61810071_61812335_FR	OBD168-141
37	ORF1_21_33072222_33074551_33276086_33283169_RF	OBD168-145
38	ORF1_11_111222819_111226135_111261363_111265949_FR	OBD168-149
39	ORF1_4_38671979_38673590_38888275_38891480_RF	OBD168-153
40	ORF1_3_114010550_114016075_114047949_114051357_RF	OBD168-157
41	ORF1_14_61490070_61495640_61751727_61758003_RF	OBD168-161
42	ORF1_15_67887204_67889122_68052888_68053975_FR	OBD168-165
43	ORF1_14_96740036_96741996_96820569_96823739_RF	OBD168-169
44	ORF1_8_116637960_116642220_116837668_116843681_FR	OBD168-173
45	ORF1_7_43764036_43765883_43792676_43795674_RR	OBD168-177
46	ORF1_11_78798294_78806874_79036088_79041510_RF	OBD168-181
47	ORF1_12_103575776_103578331_103663674_103664970_FR	OBD168-185
48	ORF1_6_13375878_13378557_13523152_13526281_FF	OBD168-189
49	ORF1_11_21505657_21511320_21751405_21757053_FR	OBD168-193
50	ORF1_5_54531220_54532270_54669234_54674643_FF	OBD168-197

Table 1.a4

	Primer Sequence	Primer ID	Primer Sequence
1	CATCTGACCTCCTCCAGCCTCTG	OBD168-003	CTCTGAAGCCACACCCACACTTG
2	CTTGGAGTCCCAGTGGAAAAGGTTGA	OBD168-007	CCAAGTGTATTGTTAGCACCAGCGGT
3	ATGCTCTGCCCCACTGTCCTTGC	OBD168-011	GTGATTTCAGTGGGTCTCCAGGG
4	CCATACTACCTTTAGGAGGAACTTGC	OBD168-015	TGGAGAAAACGCAAACGCCTACAGGG
5	CAGTAAAGGGAACCAAAGAAAACAAC	OBD168-019	CAACTTCCACCTTTGAATCCATTTCT
6	GGCTGCTCCTCACCTGGCTTGGT	OBD168-023	TCCCAACCCCTTCCAGAATCTTC
7	GCAATGCTAACAGCCTTGACAGC	OBD168-027	TTTTCTTCGTGCTGGTGCTGGTGAGC
8	CCTGGAAGGATGTCAGATGAGTCT	OBD168-031	AAGCAATGATAGTTGGCGATACAT
9	GGGTGAGGTAGAAGTATGAAGGAAAG	OBD168-035	CCTTCCTCCCTTGTCTGCCTGTAGAT
10	CACAGGATTGGAATGAGGAATAAAGA	OBD168-039	CCAATGAGGGTTCCAGGGTTCAA
11	TCCTTCCTACAACACCCTGCCAG	OBD168-043	AGTGGCAGGTAACGGCTGGGCAT
12	TGTTGAATGAATGAGCAGGAGCCAGC	OBD168-047	CACAGCCAGTAAACAGCATTCAAGGG
13	GGCTCTGCTGGGACTTGGGACTT	OBD168-051	AGAGTGGCTTGACCAGAGTGTGG
14	GAAGAGTGCTTGGCAGAGTGTGTGCT	OBD168-055	TTGTTCCTGGTTTACAGCCCCTACTA
15	CTACACACAGGATTGGAATGAGGAAT	OBD168-059	GCACACAGCGAAATAATAGTTGTTAG
16	CACAGGATTGGAATGAGGAATAAAGA	OBD168-063	CCACAGTGTTTCCATCAGCCTGG
17	CTCCACTGCTGAAACAATAGCGACGC	OBD168-067	CATAAGCCAACTCCCCTAATGAATCC
18	AGATGAGTCTGCCCATTGCTCCTGAG	OBD168-071	CTCAGAAGTCAGTTCATCCATTTCCT
19	CCTCCTACAGTGATTGTGGATTTGTC	OBD168-075	GGGTAGGAATGTGAGTGAAGCAGGAC
20	CATCCTGTCCAGATTAGGCAGCC	OBD168-079	CCAGATACTGTGCTAAAGGCTTCGCC
21	CAGGGAGAAGGAGAAGGAGATTTC	OBD168-083	TGACCTTGACAGTTTTGAGGAGTA
22	GCTTCCAGCCAACATTTGAGTGCCTC	OBD168-087	CCAGGTATGGAAAAGGAGATTGTGTC
23	CCTGGTCATTGGTGAAGGTCTGGCAT	OBD168-091	GACACCCAACCATAATGACAGAGATT
24	GGATGTGTGAGAGAAAGGGCATTGGC	OBD168-095	TTTACACTTTCGCCTTCTCTTCCAGC
25	TGGAGGCATCTCTGACACCAATCA	OBD168-099	GAAAGAATACACTGATGAAGCCAT
26	ACCTCCTGGGATGTCTCAGTGGC	OBD168-103	GAGGCAGATGTGGGAGGTTTGCT
27	GCTGGGTATGGCTGGTTTGTGTTTTA	OBD168-107	CCTGCTTTCCATAAACCTCTGCTTCT
28	AGAGGTTCATCGTCTCCAGGTCATAG	OBD168-111	TTGTTGGGTGTGATGTCCTCCACTTC
29	GACCAGGAGTTCAAGACCAGCCT	OBD168-115	ATGTAACCCTGAGAGAAGACCTC
30	GGCAAGGGCTTATTTAGGAGCAT	OBD168-119	GATTCACAGGAAGAAAACTGGAACTA
31	GCATAGATGGGTTAGTCAGAGACCAC	OBD168-123	GGTCTCACAATCACACTGCTGGGAAT
32	TGGGTGAGGAGGTGGAGCAGCCG	OBD168-127	AAATACGCCAGGACACAGGCAGC
33	GTAGTCTTGAGTTGGCTCCCTGTTTG	OBD168-131	CAACTCGCTCCACTTTGGCATCGTAT
34	GCAGTAGATTTCTGTTGAGGTGATTA	OBD168-135	CAGTTTTAGAATAAGTGCTATGTGGC
35	CTACTTCCCTTTCCATCCCACCC	OBD168-139	CCCCAAACATTCTGCCAGGGTCC
36	GGGTCTAAGGAAGGTCAAGGCTGC	OBD168-143	GCCCAAGCCCCTATTAGACCCAT
37	GCACCTGCTACCTGCTCCTTCCTATT	OBD168-147	AACTGCGGAAAGGTCATAGCATAACC
38	GGTCTCACAATCACACTGCTGGG	OBD168-151	CGACACTTCCCCATCTCCCCAAC
39	TTTTCAAATCCCTCTTGTGCCCTCAT	OBD168-155	CCACAATCATCTCCCTTTCCCTCTGA
40	TCCTTCCTTTCCTACTCAGTGTGGAT	OBD168-159	AGTCTACCTGAGGAGGCAACAGCCAT
41	CACTAAAGCACTCCAGTCAAGTCAGT	OBD168-163	GGATGGCGAAATACCACGGGAAGCAT
42	GGGTAGGGAGAGGAAGGAAACGGATA	OBD168-167	CAATAGTGCTTGTTCCTACCTCTCAC
43	GATTCTGTAGTCATCAGGAACACG	OBD168-171	CAGGAGAGTGTGAGAGAGCCCGA
44	GTCTGCTTTGGAACATCAAGAGTGCT	OBD168-175	GCTGACCTCCTCATCTTCACCCACAA
45	TGATTTCTGCCCAGCCGAGTGCTACA	OBD168-179	ATACATTACCTTTCTGCTCAGCCAGC
46	GGACCATTGAGAGAATAACAGATA	OBD168-183	GAAAGAGAATCACAAAGCATAAATA
47	GAGATGGATGGTGGCAATGGTTG	OBD168-187	ATCTTGTTGGGAAATAAGGTCTTTGC
48	AACACAGTGGCTCTTCTCTTTGAA	OBD168-191	CCCTGTCTCAAAACAAAACAAATA
49	GAGTGCTTGGCAGAGTGTGTGCT	OBD168-195	GGTAGGTGATGGTCTGCCCTTCC
50	CCTTGCCTTGGCTTCTCTCGTAAAGA	OBD168-199	CAACAGCCGCACACTCATTCACTCAT

Table 1.a5

	probe	Marker
1	ORF1_9_117652733_117662476_117782539_117784298_FF	OBD168-001.003
2	ORF1_21_21135567_21136687_21190498_21197349_RR	OBD168-005.007
3	ORF1_12_108190915_108198003_108364371_108366987_FR	OBD168-009.011
4	ORF1_8_138185388_138192430_138316302_138317782_FF	OBD168-013.015
5	ORF1_6_104807984_104813896_104858263_104859297_FR	OBD168-017.019
6	ORF1_7_73838719_73840112_73998797_74003463_FF	OBD168-021.023
7	ORF1_6_1490191_1492799_1612178_1614243_FR	OBD168-025.027
8	ORF1_13_109624423_109630621_109869387_109876529_RF	OBD168-029.031
9	ORF1_3_171788979_171791691_171971435_171976171_RF	OBD168-033.035
10	ORF1_13_102842718_102847079_102927740_102931657_FR	OBD168-037.039
11	ORF1_X_40971005_40973842_41006985_41010257_RF	OBD168-041.043
12	ORF1_4_26084879_26086604_26290850_26293788_FR	OBD168-045.047
13	ORF1_13_109869387_109876529_109901846_109907608_FF	OBD168-049.051
14	ORF1_11_21505657_21511320_21625659_21628201_FR	OBD168-053.055
15	ORF1_13_102842718_102847079_102867709_102871733_FF	OBD168-057.059
16	ORF1_13_102842718_102847079_102952727_102953846_FF	OBD168-061.063
17	ORF1_3_179490429_179499685_179696553_179701788_RF	OBD168-065.067
18	ORF1_13_109869387_109876529_109994965_109996722_FR	OBD168-069.071
19	ORF1_13_42949707_42958335_43086110_43092272_RF	OBD168-073.075
20	ORF1_10_93375413_93378505_93410956_93413925_FR	OBD168-077.079
21	ORF1_1_182254591_182258498_182271295_182272617_RR	OBD168-081.083
22	ORF1_6_104807984_104813896_104859297_104866639_FF	OBD168-085.087
23	ORF1_3_35637910_35639568_35705745_35720206_RF	OBD168-089.091
24	ORF1_8_81130626_81134961_81156168_81161109_RF	OBD168-093.095
25	ORF1_11_61243450_61246026_61388261_61391790_FR	OBD168-097.099
26	ORF1_4_107675768_107680919_107825397_107833109_FF	OBD168-101.103
27	ORF1_1_193456875_193464580_193519461_193528788_RR	OBD168-105.107
28	ORF1_11_79134716_79152601_79219225_79225698_FR	OBD168-109.111
29	ORF1_6_15282103_15283199_15362212_15366665_RR	OBD168-113.115
30	ORF1_11_35101113_35109487_35250591_35252942_RR	OBD168-117.119
31	ORF1_11_111144097_111148048_111222819_111226135_FF	OBD168-121.123
32	ORF1_18_62522952_62526928_62633916_62637110_RR	OBD168-125.127
33	ORF1_18_63796182_63806119_63902371_63912126_RF	OBD168-129.131
34	ORF1_4_59658576_59668116_59701046_59706041_RF	OBD168-133.135
35	ORF1_2_68857299_68862999_68948041_68951799_RF	OBD168-137.139
36	ORF1_14_61751727_61758003_61810071_61812335_FR	OBD168-141.143
37	ORF1_21_33072222_33074551_33276086_33283169_RF	OBD168-145.147
38	ORF1_11_111222819_111226135_111261363_111265949_FR	OBD168-149.151
39	ORF1_4_38671979_38673590_38888275_38891480_RF	OBD168-153.155
40	ORF1_3_114010550_114016075_114047949_114051357_RF	OBD168-157.159
41	ORF1_14_61490070_61495640_61751727_61758003_RF	OBD168-161.163
42	ORF1_15_67887204_67889122_68052888_68053975_FR	OBD168-165.167
43	ORF1_14_96740036_96741996_96820569_96823739_RF	OBD168-169.171
44	ORF1_8_116637960_116642220_116837668_116843681_FR	OBD168-173.175
45	ORF1_7_43764036_43765883_43792676_43795674_RR	OBD168-177.179
46	ORF1_11_78798294_78806874_79036088_79041510_RF	OBD168-181.183
47	ORF1_12_103575776_103578331_103663674_103664970_FR	OBD168-185.187
48	ORF1_6_13375878_13378557_13523152_13526281_FF	OBD168-189.191
49	ORF1_11_21505657_21511320_21751405_21757053_FR	OBD168-193.195
50	ORF1_5_54531220_54532270_54669234_54674643_FF	OBD168-197.199

Table 1.a6

51	ORF1_chr1_161526936_161530260_161592992_161600164_RF_1	54097	99.6	2.682
52	ORF1_chr17_59610792_59618647_59742829_59746633_FF_1	2321	88.77	3.732
53	ORF1_chr1_59019583_59021645_59133061_59141815_RR_1	5747	77.65	2.939
54	ORF1_chr1_59019583_59021645_59122227_59127200_RR_1	14439	167.9	2.225
55	ORF1_chr8_2179427_2182848_2282002_2287140_RF_1	82548	140.9	2.302
56	ORF1_chr12_31765908_31770394_31832455_31836936_RF_1	76089	135.3	3.146
57	ORF1_chr7_127571782_127576218_127652961_127655625_RF_1	196	167.8	2.332
58	ORF1_chr6_53297611_53301525_53330606_53336135_RF_1	4276	161.1	3.961
59	ORF1_chr8_6544838_6545849_6690336_6691879_RR_1	10831	75.34	2.967
60	ORF1_chr15_74848287_74855121_74957951_74959166_FR_1	2428	305.6	2.602
61	ORF1_chr17_27180736_27185386_27333521_27337305_RR_1	25171	296	2.03
62	ORF1_chr16_72743677_72746653_72988436_72990339_FR_1	110054	304.9	2.847
63	ORF1_chr17_36180872_36185095_36216401_36221747_RR_1	20739	347.5	4.862
64	ORF1_chr7_96316940_96320226_96464673_96468301_RR_1	1300	321	3.527
65	ORF1_chr6_31267448_31269252_31345648_31347228_RF_1	51004	291.8	1.889
66	ORF1_chr10_133409387_133412825_133526816_133529614_RF_1	40699	284.9	1.887
67	ORF1_chr1_26201425_26205480_26333363_26336159_FR_1	121592	389.5	1.79
68	ORF1_chr5_782236_785121_920775_927647_RF_1	110906	338	1.81
69	ORF1_chr9_70567738_70570528_70702891_70712644_RF_1	4875	364.1	1.917
70	ORF1_chr15_64931692_64934068_65028347_65030549_RF_1	82247	332.5	1.829
71	ORF1_chr22_24772075_24777926_24949355_24952491_RR_1	12733	399	1.858
72	ORF1_chr11_10637008_10641060_10653098_10661130_FR_1	136402	347	1.803
73	ORF1_chr15_50065156_50069400_50125985_50128841_RR_1	2553	386.6	2.404
74	ORF1_chr19_54789678_54792948_55035514_55037195_RF_1	99528	232.6	2.001
75	ORF1_chr6_1571374_1573462_1612178_1614243_RR_1	1633	243.1	2.249
76	ORF1_chr12_8943814_8945391_9117075_9121539_RR_1	77436	281.9	1.924
77	ORF1_chr20_62682975_62688983_62704898_62706446_FF_1	112187	363.7	2.386
78	ORF1_chr17_13014484_13018600_13163660_13166024_RF_1	128130	378	1.782
79	ORF1_chr3_71509295_71510710_71611738_71613935_FF_1	130292	256.1	11.74
80	ORF1_chr2_144423688_144428542_144476252_144486305_RF_1	4532	386.3	2.799
81	ORF1_chr1_66194325_66201588_66444381_66456052_RR_1	130547	277.6	11.36
82	ORF1_chr20_31723515_31724864_31865584_31867866_RR_1	1057	591.9	1.716
83	ORF1_chr20_37222567_37225275_37490771_37494248_RR_1	119165	590.8	1.67
84	ORF1_chr14_92536539_92540967_92697902_92700362_FR_1	29947	586.5	1.616
85	ORF1_chr10_61891351_61894307_62056179_62058893_RR_1	104482	583.9	1.621
86	ORF1_chr3_171803475_171808332_171888052_171894907_RF_1	17545	274.5	1.916
87	ORF1_chr21_38766076_38770672_38858093_38859288_FR_1	25700	583.6	1.622
88	ORF1_chr17_43300561_43304860_43323475_43325945_FF_1	91767	579.6	1.642
89	ORF1_chr15_74686122_74687597_74772372_74779791_FR_1	107590	565.5	1.632
90	ORF1_chr16_87389518_87390661_87484414_87491902_RF_1	106302	576.8	1.69
91	ORF1_chr12_127036933_127040040_127282483_127288002_FR_1	90080	573.9	1.64
92	ORF1_chr11_10637008_10641060_10723633_10730683_FF_1	115334	564.3	1.63
93	ORF1_chr6_36408988_36410120_36693657_36702286_FF_1	104999	639.2	2.657
94	ORF1_chr4_186172696_186175767_186190828_186192765_FF_1	132933	637.1	1.82
95	ORF1_chr22_35115503_35116970_35401039_35404538_RF_1	108441	563.1	2.82
96	ORF1_chr16_56676662_56679108_56730378_56735303_FR_1	107625	628.4	2.81
97	ORF1_chr11_73240092_73243799_73403994_73408090_RR_1	115685	548.5	2.096
98	ORF1_chr2_203737190_203742853_203893081_203899008_RF_1	134375	636.7	1.6
99	ORF1_chr2_203893081_203899008_203933311_203940057_FR_1	97021	560.3	1.641
100	ORF1_chr17_27180736_27185386_27282892_27289008_RR_1	90989	627.7	1.71

Table 1.b1

51	0.1703	0.000004825	Early	AAAAAACAATTATGTAATTGAAAACCCATCGAAGTACAAAAGTACCCAAAGGCTTTCAGA
52	0.176	0.000003742	Early	AAGAAAGTACCAGAAAGGTTATTATTAATCGATTTACAAAACTTGATGGTTAGTAATTTT
53	0.1963	0.000002782	Early	CTGGTTGACAATAACTATACAAAGAGTGTCGAAATATGTTCCTAAAATATTCAAAGTATT
54	0.2382	0.00001519	Early	CTGGTTGACAATAACTATACAAAGAGTGTCGACAGAGCTTAACAGCTGTTTCAAAGTCTT
55	0.2433	0.00001034	Early	CCAGACACAGGTAGTTCCTAAAATCTTCTCGAAGGCTTTTATTTAATTTGAGAATCATCA
56	0.2671	0.000009462	Early	GAACCCAGGAGACGGAGCTTGCAGTGAGTCGAGTATTATTTAGTCATAAAAAGGAATGAA
57	0.2676	0.00001517	Early	GTCTTCTATCAAATCAGATTTTATTTTCTCGAATCAGTTCTTGATTCTAATCTCCAATGT
58	0.28	0.00001389	Early	GTAGTATAATAATAAACTACCTGTTGATTCGATTTAATTATTAGTTATTGTTGTTAATCT
59	0.3672	0.000002602	Early	AATGACATAATTGGCCTCAAAACATATTTCGAGAGTTGGCTAGATTCATACACATAATTA
60	0.3948	0.00005595	Early	TCCTCTTTTTTTATATTTTTTTATTTTTTCGAAAAATGAATAAATTAATTAATTAAATAA
61	0.4093	0.0000522	Early	GGATCTAGAAAAGAGTATTTTCAATGTGTCGAATGTGTTGCAAATATTTTTCTAAGCTTA
62	0.4135	0.00005567	Early	GAGGCGGGTGGATCATGAGGTCGGAAGATCGATATGCAGGCTGGAACCCGCCAAACATTT
63	0.4173	0.00007391	Early	AATAAAGCACACAATAAATGTAATGGGCTCGACATTTTGAATATGTGGGATCCAAATCTG
64	0.4183	0.00006225	Early	TAAAAAAGATCGGATAATTAGGAAATTATCGATGATAAAATATATGTACCCCACTTAGAG
65	0.4204	0.00005064	Early	CCCTAAAGTCTGGGAAGGAAAGAGAGGCTCGATTCCTGTTTTCCCTTCTGCCTCCCTCGT
66	0.4238	0.00004804	Early	CAGCGTACATTTCTGAACATTGTGAACGTCGAGTCAGAAAAGATACTCAATAAGATTTTG
67	0.4269	0.00009376	Early	GGGTTTCACCATGTTGGTCAGGCTGGTCTCGAGGCCAGCCTGACCAACATGAAGAAACCC
68	0.427	0.00006958	Early	GAGAATCTGCTCAGAGCTGATTTCGTTATCGAGCAGTAGGAACTAGGCGTGTGTAGATTC
69	0.4273	0.00008175	Early	AGTTTGCCTATATTGGAATCATTAGCATTCGAATTGTGAAACAAAAACTGTTTGCTGGGC
70	0.4309	0.00006717	Early	GTTACTTGTCTGCAGTTACTTTCTTGAATCGAGGCAGCAGACAAGGTTCTGATCTTGGCT
71	0.433	0.00009819	Early	TGGTGCATTTATGATATACACTGTGTTATCGAAAAAAATTAAGTAATAATAATAATAGAG
72	0.4333	0.00007369	Early	GGACATAACTGTATTCTCTCTCTCTCTCGATGAGCTTAAAGTGGTGTTCTAGGACCAG
73	0.4349	0.00009244	Early	AATATGTATAAATTACAAAATGGCTAAATCGATATCTGCCCTAACAAGAATCCTTCTAGT
74	0.4363	0.00003092	Early	ATTCTGAAGAAATCAGGAAATAATGCATTCGATAGATAATAGATAGAAATATGCAGAAAG
75	0.4368	0.00003404	Early	ATAGTATATTATCTAAAATGTCAAATTTTCGAAACTAAAAAAAAAAAAATCCAATTAAAAA
76	0.4419	0.00004696	Early	GTCGTGCAGTGGTGATGATCTCCTGCAATCGAAGAACAAAGAGATGAAAAGAGCTTTCTA
77	0.4427	0.00008155	Early	GCTGGAAAATCAGGCTCATCACAAAAGCTCGAGACCCCCACAAAGAGGAAGTCCACAGCA
78	0.4463	0.00008854	Early	CCTCAGTCTTTCTTTGTTTTCCAAGACCTCGAGGTATTTTTCCTAATGAAAAACAAAGAA
79	0.4485	0.00003814	Early	CTGCAATGTTCAACTAAGCTCTGTCCAATCGAGGTTGTTAGTTTTGAAGATTGAGGAAGG
80	0.4492	0.00009229	Early	AAAAATGTGTATTTCTACATTTTTTTGGTCGAATGAATAGAATGACAATAGGTTTTTATT
81	0.4579	0.00004543	Early	AACATAGCATATTCAACTAAGCAATTCATCGAAGTATCCTTATATTTTAGATTAACATAT
82	0.4628	0.0002066	Early	GGCTCGGCGGGTACCCGGCCTAGTGAGCTCGAGAAACTGTCTTAACATTTTTATATTCAA
83	0.4687	0.0002059	Early	AGCTCTGGCAGTTTTCTGAAATACCATATCGAGCTGTGGTGATTACTTTCTCCCTGAAAC
84	0.4699	0.0002031	Early	TCACTAGCAGATTCCTGCATTCTTTCAGTCGAAGAGTGAACCTTGATGTATGCAGATTTT
85	0.4738	0.0002014	Early	ATGTCTTAATATTATTATAATCATTGTTTCGATATGCCAAGTTCCCTGTCTGCCTACAGT
86	0.4814	0.00004434	Early	GGTCGTTGAGGACAATTTACAAATTGGCTCGATGGTGTAAATATTCCTGGAAGGCCAAGG
87	0.4814	0.0002012	Early	CACTTTTTACACATGAGAGGTGAGGATATCGACCAAGAGATCGCGAGATGGGAGCAGAGA
88	0.4833	0.0001986	Early	AACAACTGCTGCAAGAGGGGCCGTTTGTTCGATGCTACTTTTAATCCCAGAACAAGTATT
89	0.4868	0.0001897	Early	GGGTTTCACCATGTTGGCCAGACTGATCTCGAGACGATCCCGGCCAACATGGTGAAACCC
90	0.4874	0.0001969	Early	CTGCAGCCCGTAGTTGTGGATGATGGAGTCGATTTTTTCCCTTCTTCTTGCATTTGGAAC
91	0.4915	0.000195	Early	GAGAGAGAGAGAGAAAGAGACGAAGATTTCGACCACTCTTGAGCTGTGTGATGTTGATCT
92	0.4938	0.000189	Early	GGACATAACTGTATTCTCTCTCTCTCTCTCGAGGAAGGTTCTGAGGAATTGAAGCCCACT
93	0.4948	0.0002384	Early	GGCAGGTGGCTCACCTGAGGTCGGGAGTTCGAAGTCTGTTTCAGATGAAGTTTTAAGATC
94	0.499	0.0002369	Early	ACGGAGTGGAAGGAGCTGCAACTTTCCATCGAGTTCGCCCTCCCTGACAGGGAGTTGTAA
95	0.5011	0.0001882	Early	AAGTTAGATGCAAAGGCCTGACTGTGTTTCGAGCATAGATCCCAGCCCCAGATCCCACAG
96	0.5015	0.000231	Early	TCCAGCTATCTGCTCAGGGAATTGTTATTCGAGCCGCCCCCGAGGCTTGGAGTCGGGCTG
97	0.5057	0.0001792	Early	AGGAGTGGCCAGGCAGAGCCAAGTCCTATCGAGTGGCTCTGTCACTTATTAGCAAGTCAC
98	0.506	0.0002366	Early	AATCTGTCTCTCTCTTACTCCCTCTCTCTCGAAAATACTGTACTTTGGTTGATTTTTAAG
99	0.5062	0.0001865	Early	AATCTGTCTCTCTCTTACTCCCTCTCTCTCGATGGGTATGGAAGCAAAGGCCTGAAGAAT
100	0.5082	0.0002305	Early	GGATCTAGAAAAGAGTATTTTCAATGTGTCGACACAGATGATTAGGGCATCTTCTGCTCT

Table 1.b2

51	chr1	161526938	161526967	161600133	161600162	chr1	161526938	161530937	161596163	161600162
52	chr17	59618616	59618645	59746602	59746631	chr17	59614646	59618645	59742632	59746631
53	chr1	59019585	59019614	59133063	59133092	chr1	59019585	59023584	59133063	59137062
54	chr1	59019585	59019614	59122229	59122258	chr1	59019585	59023584	59122229	59126228
55	chr8	2179429	2179458	2287109	2287138	chr8	2179429	2183428	2283139	2287138
56	chr12	31765910	31765939	31836905	31836934	chr12	31765910	31769909	31832935	31836934
57	chr7	127571784	127571813	127655594	127655623	chr7	127571784	127575783	127651624	127655623
58	chr6	53297613	53297642	53336104	53336133	chr6	53297613	53301612	53332134	53336133
59	chr8	6544840	6544869	6690338	6690367	chr8	6544840	6548839	6690338	6694337
60	chr15	74855090	74855119	74957953	74957982	chr15	74851120	74855119	74957953	74961952
61	chr17	27180738	27180767	27333523	27333552	chr17	27180738	27184737	27333523	27337522
62	chr16	72746622	72746651	72988438	72988467	chr16	72742652	72746651	72988438	72992437
63	chr17	36180874	36180903	36216403	36216432	chr17	36180874	36184873	36216403	36220402
64	chr7	96316942	96316971	96464675	96464704	chr7	96316942	96320941	96464675	96468674
65	chr6	31267450	31267479	31347197	31347226	chr6	31267450	31271449	31343227	31347226
66	chr10	133409389	133409418	133529583	133529612	chr10	133409389	133413388	133525613	133529612
67	chr1	26205449	26205478	26333365	26333394	chr1	26201479	26205478	26333365	26337364
68	chr5	782238	782267	927616	927645	chr5	782238	786237	923646	927645
69	chr9	70567740	70567769	70712613	70712642	chr9	70567740	70571739	70708643	70712642
70	chr15	64931694	64931723	65030518	65030547	chr15	64931694	64935693	65026548	65030547
71	chr22	24772077	24772106	24949357	24949386	chr22	24772077	24776076	24949357	24953356
72	chr11	10641029	10641058	10653100	10653129	chr11	10637059	10641058	10653100	10657099
73	chr15	50065158	50065187	50125987	50126016	chr15	50065158	50069157	50125987	50129986
74	chr19	54789680	54789709	55037164	55037193	chr19	54789680	54793679	55033194	55037193
75	chr6	1571376	1571405	1612180	1612209	chr6	1571376	1575375	1612180	1616179
76	chr12	8943816	8943845	9117077	9117106	chr12	8943816	8947815	9117077	9121076
77	chr20	62688952	62688981	62706415	62706444	chr20	62684982	62688981	62702445	62706444
78	chr17	13014486	13014515	13165993	13166022	chr17	13014486	13018485	13162023	13166022
79	chr3	71510679	71510708	71613904	71613933	chr3	71506709	71510708	71609934	71613933
80	chr2	144423690	144423719	144486274	144486303	chr2	144423690	144427689	144482304	144486303
81	chr1	66194327	66194356	66444383	66444412	chr1	66194327	66198326	66444383	66448382
82	chr20	31723517	31723546	31865586	31865615	chr20	31723517	31727516	31865586	31869585
83	chr20	37222569	37222598	37490773	37490802	chr20	37222569	37226568	37490773	37494772
84	chr14	92540936	92540965	92697904	92697933	chr14	92536966	92540965	92697904	92701903
85	chr10	61891353	61891382	62056181	62056210	chr10	61891353	61895352	62056181	62060180
86	chr3	171803477	171803506	171894876	171894905	chr3	171803477	171807476	171890906	171894905
87	chr21	38770641	38770670	38858095	38858124	chr21	38766671	38770670	38858095	38862094
88	chr17	43304829	43304858	43325914	43325943	chr17	43300859	43304858	43321944	43325943
89	chr15	74687566	74687595	74772374	74772403	chr15	74683596	74687595	74772374	74776373
90	chr16	87389520	87389549	87491871	87491900	chr16	87389520	87393519	87487901	87491900
91	chr12	127040009	127040038	127282485	127282514	chr12	127036039	127040038	127282485	127286484
92	chr11	10641029	10641058	10730652	10730681	chr11	10637059	10641058	10726682	10730681
93	chr6	36410089	36410118	36702255	36702284	chr6	36406119	36410118	36698285	36702284
94	chr4	186175736	186175765	186192734	186192763	chr4	186171766	186175765	186188764	186192763
95	chr22	35115505	35115534	35404507	35404536	chr22	35115505	35119504	35400537	35404536
96	chr16	56679077	56679106	56730380	56730409	chr16	56675107	56679106	56730380	56734379
97	chr11	73240094	73240123	73403996	73404025	chr11	73240094	73244093	73403996	73407995
98	chr2	203737192	203737221	203898977	203899006	chr2	203737192	203741191	203895007	203899006
99	chr2	203898977	203899006	203933313	203933342	chr2	203895007	203899006	203933313	203937312
100	chr17	27180738	27180767	27282894	27282923	chr17	27180738	27184737	27282894	27286893

Table 1.b3

51	ORF1_1_161526936_161530260_161592992_161600164_RF	OBD168-201
52	ORF1_17_59610792_59618647_59742829_59746633_FF	OBD168-205
53	ORF1_1_59019583_59021645_59133061_59141815_RR	OBD168-209
54	ORF1_1_59019583_59021645_59122227_59127200_RR	OBD168-213
55	ORF1_8_2179427_2182848_2282002_2287140_RF	OBD168-217
56	ORF1_12_31765908_31770394_31832455_31836936_RF	OBD168-221
57	ORF1_7_127571782_127576218_127652961_127655625_RF	OBD168-225
58	ORF1_6_53297611_53301525_53330606_53336135_RF	OBD168-229
59	ORF1_8_6544838_6545849_6690336_6691879_RR	OBD168-233
60	ORF1_15_74848287_74855121_74957951_74959166_FR	OBD168-237
61	ORF1_17_27180736_27185386_27333521_27337305_RR	OBD168-241
62	ORF1_16_72743677_72746653_72988436_72990339_FR	OBD168-245
63	ORF1_17_36180872_36185095_36216401_36221747_RR	OBD168-249
64	ORF1_7_96316940_96320226_96464673_96468301_RR	OBD168-253
65	ORF1_6_31267448_31269252_31345648_31347228_RF	OBD168-257
66	ORF1_10_133409387_133412825_133526816_133529614_RF	OBD168-261
67	ORF1_1_26201425_26205480_26333363_26336159_FR	OBD168-265
68	ORF1_5_782236_785121_920775_927647_RF	OBD168-269
69	ORF1_9_70567738_70570528_70702891_70712644_RF	OBD168-273
70	ORF1_15_64931692_64934068_65028347_65030549_RF	OBD168-277
71	ORF1_22_24772075_24777926_24949355_24952491_RR	OBD168-281
72	ORF1_11_10637008_10641060_10653098_10661130_FR	OBD168-285
73	ORF1_15_50065156_50069400_50125985_50128841_RR	OBD168-289
74	ORF1_19_54789678_54792948_55035514_55037195_RF	OBD168-293
75	ORF1_6_1571374_1573462_1612178_1614243_RR	OBD168-297
76	ORF1_12_8943814_8945391_9117075_9121539_RR	OBD168-301
77	ORF1_20_62682975_62688983_62704898_62706446_FF	OBD168-305
78	ORF1_17_13014484_13018600_13163660_13166024_RF	OBD168-309
79	ORF1_3_71509295_71510710_71611738_71613935_FF	OBD168-313
80	ORF1_2_144423688_144428542_144476252_144486305_RF	OBD168-317
81	ORF1_1_66194325_66201588_66444381_66456052_RR	OBD168-321
82	ORF1_20_31723515_31724864_31865584_31867866_RR	OBD168-325
83	ORF1_20_37222567_37225275_37490771_37494248_RR	OBD168-329
84	ORF1_14_92536539_92540967_92697902_92700362_FR	OBD168-333
85	ORF1_10_61891351_61894307_62056179_62058893_RR	OBD168-337
86	ORF1_3_171803475_171808332_171888052_171894907_RF	OBD168-341
87	ORF1_21_38766076_38770672_38858093_38859288_FR	OBD168-345
88	ORF1_17_43300561_43304860_43323475_43325945_FF	OBD168-349
89	ORF1_15_74686122_74687597_74772372_74779791_FR	OBD168-353
90	ORF1_16_87389518_87390661_87484414_87491902_RF	OBD168-357
91	ORF1_12_127036933_127040040_127282483_127288002_FR	OBD168-361
92	ORF1_11_10637008_10641060_10723633_10730683_FF	OBD168-365
93	ORF1_6_36408988_36410120_36693657_36702286_FF	OBD168-369
94	ORF1_4_186172696_186175767_186190828_186192765_FF	OBD168-373
95	ORF1_22_35115503_35116970_35401039_35404538_RF	OBD168-377
96	ORF1_16_56676662_56679108_56730378_56735303_FR	OBD168-381
97	ORF1_11_73240092_73243799_73403994_73408090_RR	OBD168-385
98	ORF1_2_203737190_203742853_203893081_203899008_RF	OBD168-389
99	ORF1_2_203893081_203899008_203933311_203940057_FR	OBD168-393
100	ORF1_17_27180736_27185386_27282892_27289008_RR	OBD168-397

Table 1.b4

51	CCAGCCAATCACAAGCAGCCTAC	OBD168-203	CTCCTTCAGCACCCACCCCAACA
52	CTTTCATCCTTTATTGTATTGGTGCG	OBD168-207	GGATTACAGGCGTGAGCCAACAT
53	TCCTCACTCTCCTGCCACTCCCT	OBD168-211	CCAAGTAAGTGGAGGCTGGCTCT
54	CTCACTCTCCTGCCACTCCCTGC	OBD168-215	CAAGAAAATCCAGATGCTCAAAACAC
55	TGTGGACAGATGCTGAGACCCTC	OBD168-219	GAGACAGGGCTTCAGAGTCACAGG
56	TACTCGGGAGGCTGAGGCAGAAT	OBD168-223	CTCTGTGGATTTACCTATTTTGGACA
57	GGAGGAAGTGGACAGTAAGTTGATAC	OBD168-227	ATGGACAGGCAGAGGTGGTGACAATG
58	CCATCCACCCTGCCTTTCATAAGAGA	OBD168-231	GGCAGGAAAGTGGCTTAGGACCAAAA
59	AGTGAGACTACTGACCAAAGAATC	OBD168-235	GCTGAAACCCCAAGATAAAACTAT
60	GGGTGGTGAGGGTAGAGACTTAC	OBD168-239	CCCAGGGCTTCAACTCCCCATCT
61	CAATGGGCTCTGAAATGTCACTTC	OBD168-243	CATCAAAATGTCGTGTGGTGTATCAA
62	GGAGGTATGAGAAGGCTATTGTAGGA	OBD168-247	TCAGAGGAAGGCTGGAGTGAATCCCT
63	CTGATTCTATGTTATGGTGAGTTGTG	OBD168-251	CCATCATCGGTTGAATCCACAGAT
64	GCCTGGGTGACAGAGCAAGACTC	OBD168-255	AACCTTAGCCCCACAATCAGAGC
65	AGGATTGGAACTGTTAGCCCCAT	OBD168-259	CTCTGATGGCTGTGCTGAGGACA
66	GCCTGCCCTGCGGTTTCAAAGTAGAT	OBD168-263	GCAAAACACACATTCTTCTCATCGGC
67	AGCCTTCCGAGTAGGTGGGAGTA	OBD168-267	ACTCTCCTGCCTCAGCCTCTTGA
68	TTTTCTGGCAGCCTCTCCTTCCG	OBD168-271	AACCCTCAGCCAGGAGCCAGGAT
69	GTGCCAGAACACGAGAGACACATAGG	OBD168-275	AAACTCCCTAAGTCCGTAAATACCCC
70	AGGACAGAGCAGAGGTGGGACTC	OBD168-279	TCACAGGGCTCAGCAGTGGAGAA
71	TGTCCTGTTGCTCATAGAAGTTGCTA	OBD168-283	CACGGTAATGATACTAATGAAGGCTA
72	GGATAAAGCACAGGATGCCCCAG	OBD168-287	CACACTCCACCACTCAGAGCAGG
73	CCAAATGGTCTGGTTCTGGGAATCTT	OBD168-291	GAAGCCTGTTTGGACAAGGGACACCT
74	GATGCTGTCCCTTTAGTGGTCAA	OBD168-295	CACTTTGTGTCCTGTTCATAACTTTC
75	GGGCTTCAGGGAAAATCAGTATTCTG	OBD168-299	TTTTCTTCGTGCTGGTGCTGGTGAGC
76	CATTTTCCTTGTCCCTCCTCAGGTAA	OBD168-303	TGCCGTGATTCTTCTCCCTCCTTTGC
77	CAGGCTGGTGGGAAGGAGACATT	OBD168-307	TGGCAGAGGGACAGACTCCAGTG
78	TGTCTCTTTAGTCCCCTGTGGTCTGT	OBD168-311	TGTTTCCTTTTGTCTCCTCCACTGGC
79	TAGTGTCCTCCCAGTGCTGTAGTGAG	OBD168-315	TCAGGGAGAACGCTTTTCCTTGATTC
80	TATTTGGCTGAAAAGCACTCTTGC	OBD168-319	ACTACTTCTACTCAACTCATCCAT
81	GGCGATGGACACCCTTGTAACCTTTC	OBD168-323	CCCCACACTTTCAGATGTCAGTAGTA
82	GCTGGGCTCGCTGATTGGCTGCG	OBD168-327	GCCCCTGAAAAGAGCCATTTGAA
83	GGAATAGAGATAACGGGCTGGGC	OBD168-331	GGGTGGGTGACAAAGGAGAGAGG
84	GCCAAGGGTCGGTTGAGTCACAG	OBD168-335	GTAGTCTGCGTTCCACCTTGGGA
85	GAAACATAGTGAGAAGACAGGCATTG	OBD168-339	CTCCAGATGTTCTTCCTTCCACACTG
86	CACCAGTTACCACCAACATACATTAT	OBD168-343	GGTCAGGCTGGTCTTGAACTCCT
87	GACCGATTGCTCCTCTTTAGCCC	OBD168-347	TCCCCTCATCACTGCGGTCCCTA
88	GGGATTTGGACGAGAGACACAGGATG	OBD168-351	CGGTTTGAACAGAGTTGTGGATAGCA
89	CCTCCCAGGTTCAATCAGGCAAT	OBD168-355	CTCCTACCTCATCCTCCCGAGTA
90	CAGGAACTCATCGCCCGTGCGGC	OBD168-359	TTCTCTTGCTGGACAACTGTTCC
91	GAGCGAGAGCAGGAGTGAGTGAG	OBD168-363	AGACAGGCTGAGAGGTTTGGCTG
92	GGATAAAGCACAGGATGCCCCAG	OBD168-367	CTCCACCTTCCCCACTCAAGCAG
93	TGCCTGTAATCCCAGCACTTTGG	OBD168-371	CACCACTGCGGTTTTACATTTATGAT
94	AAGAAACAAAGCGAGGCAAGGTGACG	OBD168-375	AGGCAGACTTCTTTGGAGGGTGTCAA
95	GTGGTTACAACATACCCCTTCCCC	OBD168-379	CCTGCGGGACAAATCCAACCCAC
96	GCGAAGTGTCCAGCATCGTCCTG	OBD168-383	AGTGGACGAATGAAAGGCACCCC
97	CAAGACAGAGGCAAGCCCAGGAA	OBD168-387	TCCCAGAACCCTGCTGCCTCCAT
98	GCCTCCAAAAGTGTATGAGCCAA	OBD168-391	CAACAGTTCTTCAGCACCCAAGTA
99	GCCTCCAAAAGTGTATGAGCCAA	OBD168-395	TGCTTCCCCTCCTCACCACTCTA
100	CCGCATCGCAAAGGATTTTCTCAAAG	OBD168-399	GAAAGTGGGATGGGAGAACAGAGCCA

Table 1.b5

51	ORF1_1_161526936_161530260_161592992_161600164_RF	OBD168-201.203
52	ORF1_17_59610792_59618647_59742829_59746633_FF	OBD168-205.207
53	ORF1_1_59019583_59021645_59133061_59141815_RR	OBD168-209.211
54	ORF1_1_59019583_59021645_59122227_59127200_RR	OBD168-213.215
55	ORF1_8_2179427_2182848_2282002_2287140_RF	OBD168-217.219
56	ORF1_12_31765908_31770394_31832455_31836936_RF	OBD168-221.223
57	ORF1_7_127571782_127576218_127652961_127655625_RF	OBD168-225.227
58	ORF1_6_53297611_53301525_53330606_53336135_RF	OBD168-229.231
59	ORF1_8_6544838_6545849_6690336_6691879_RR	OBD168-233.235
60	ORF1_15_74848287_74855121_74957951_74959166_FR	OBD168-237.239
61	ORF1_17_27180736_27185386_27333521_27337305_RR	OBD168-241.243
62	ORF1_16_72743677_72746653_72988436_72990339_FR	OBD168-245.247
63	ORF1_17_36180872_36185095_36216401_36221747_RR	OBD168-249.251
64	ORF1_7_96316940_96320226_96464673_96468301_RR	OBD168-253.255
65	ORF1_6_31267448_31269252_31345648_31347228_RF	OBD168-257.259
66	ORF1_10_133409387_133412825_133526816_133529614_RF	OBD168-261.263
67	ORF1_1_26201425_26205480_26333363_26336159_FR	OBD168-265.267
68	ORF1_5_782236_785121_920775_927647_RF	OBD168-269.271
69	ORF1_9_70567738_70570528_70702891_70712644_RF	OBD168-273.275
70	ORF1_15_64931692_64934068_65028347_65030549_RF	OBD168-277.279
71	ORF1_22_24772075_24777926_24949355_24952491_RR	OBD168-281.283
72	ORF1_11_10637008_10641060_10653098_10661130_FR	OBD168-285.287
73	ORF1_15_50065156_50069400_50125985_50128841_RR	OBD168-289.291
74	ORF1_19_54789678_54792948_55035514_55037195_RF	OBD168-293.295
75	ORF1_6_1571374_1573462_1612178_1614243_RR	OBD168-297.299
76	ORF1_12_8943814_8945391_9117075_9121539_RR	OBD168-301.303
77	ORF1_20_62682975_62688983_62704898_62706446_FF	OBD168-305.307
78	ORF1_17_13014484_13018600_13163660_13166024_RF	OBD168-309.311
79	ORF1_3_71509295_71510710_71611738_71613935_FF	OBD168-313.315
80	ORF1_2_144423688_144428542_144476252_144486305_RF	OBD168-317.319
81	ORF1_1_66194325_66201588_66444381_66456052_RR	OBD168-321.323
82	ORF1_20_31723515_31724864_31865584_31867866_RR	OBD168-325.327
83	ORF1_20_37222567_37225275_37490771_37494248_RR	OBD168-329.331
84	ORF1_14_92536539_92540967_92697902_92700362_FR	OBD168-333.335
85	ORF1_10_61891351_61894307_62056179_62058893_RR	OBD168-337.339
86	ORF1_3_171803475_171808332_171888052_171894907_RF	OBD168-341.343
87	ORF1_21_38766076_38770672_38858093_38859288_FR	OBD168-345.347
88	ORF1_17_43300561_43304860_43323475_43325945_FF	OBD168-349.351
89	ORF1_15_74686122_74687597_74772372_74779791_FR	OBD168-353.355
90	ORF1_16_87389518_87390661_87484414_87491902_RF	OBD168-357.359
91	ORF1_12_127036933_127040040_127282483_127288002_FR	OBD168-361.363
92	ORF1_11_10637008_10641060_10723633_10730683_FF	OBD168-365.367
93	ORF1_6_36408988_36410120_36693657_36702286_FF	OBD168-369.371
94	ORF1_4_186172696_186175767_186190828_186192765_FF	OBD168-373.375
95	ORF1_22_35115503_35116970_35401039_35404538_RF	OBD168-377.379
96	ORF1_16_56676662_56679108_56730378_56735303_FR	OBD168-381.383
97	ORF1_11_73240092_73243799_73403994_73408090_RR	OBD168-385.387
98	ORF1_2_203737190_203742853_203893081_203899008_RF	OBD168-389.391
99	ORF1_2_203893081_203899008_203933311_203940057_FR	OBD168-393.395
100	ORF1_17_27180736_27185386_27282892_27289008_RR	OBD168-397.399

Table 1.b6

	probe	gene.index	RP/Rsum	FC:(class1/class2)
1	ORF1_chr15_94287688_94292746_94340208_94346941_FR_1	92819	39.39	3.235
2	ORF1_chr4_102312731_102315549_102386632_102391817_FR_1	109353	95.41	2.368
3	ORF1_chr8_38716162_38718294_38738341_38742581_RR_1	122864	89.18	2.377
4	ORF1_chr5_132458507_132464714_132517598_132521351_RF_1	83272	94.59	2.287
5	ORF1_chr12_96463989_96466636_96618278_96624162_RR_1	108826	87.53	2.328
6	ORF1_chr11_79036088_79041510_79269569_79271288_FF_1	124955	81.79	2.53
7	ORF1_chr1_11226037_11228251_11272812_11274518_RR_1	93778	112.6	2.208
8	ORF1_chr2_159283360_159285194_159326592_159328925_FR_1	75100	149	2.024
9	ORF1_chr8_90002099_90011473_90148439_90150313_FR_1	104201	153.5	2.132
10	ORF1_chr3_113947063_113952443_113975285_113978229_RR_1	137463	160.9	2.052
11	ORF1_chr3_149818709_149821071_150005759_150009319_FR_1	87373	148.9	2.093
12	ORF1_chr5_60597760_60604069_60738056_60741292_FR_1	107779	160.8	2.049
13	ORF1_chr6_53534187_53536920_53639583_53651122_RF_1	132284	183.6	2.105
14	ORF1_chr5_88269888_88274763_88365192_88376199_FR_1	114376	192.3	1.96
15	ORF1_chr9_76572019_76577216_76769644_76771052_RF_1	3234	181.2	1.994
16	ORF1_chr18_68711389_68714330_68911644_68918950_RF_1	101101	203.8	1.951
17	ORF1_chr5_134464509_134469933_134674132_134676030_RR_1	65542	191.6	1.946
18	ORF1_chr8_92469388_92478361_92510934_92515600_RR_1	89074	203	1.92
19	ORF1_chr10_54058576_54060371_54213283_54215754_FR_1	121042	200.8	2.123
20	ORF1_chr1_109159473_109163477_109318126_109321152_RF_1	132421	199.6	1.915
21	ORF1_chr12_9614159_9624874_9729793_9733228_FF_1	85149	211.9	1.939
22	ORF1_chr14_89417652_89420597_89636182_89641783_RF_1	113983	214.7	1.908
23	ORF1_chr1_155206612_155209922_155288575_155290398_FR_1	6515	248.8	1.853
24	ORF1_chr5_173450236_173452725_173479240_173485435_RF_1	129576	244.7	1.907
25	ORF1_chr3_43246875_43252830_43297212_43303273_FR_1	2491	241.1	2.104
26	ORF1_chr2_118090940_118096647_118214615_118218048_RR_1	106991	247.9	1.981
27	ORF1_chr5_96799181_96801649_96813450_96815948_RF_1	85793	244.4	1.855
28	ORF1_chr3_43094298_43105527_43246875_43252830_RF_1	24515	257.1	2.065
29	ORF1_chr9_16574863_16577692_16721839_16729333_FF_1	91315	267.3	1.816
30	ORF1_chr3_107414954_107426087_107525934_107527641_RF_1	59128	278.4	1.804
31	ORF1_chr12_13090807_13095110_13190440_13193042_FR_1	35176	283.4	1.815
32	ORF1_chr5_35271024_35276749_35319374_35321203_RR_1	93369	321.1	1.766
33	ORF1_chr13_109649213_109651298_109745462_109746722_RR_1	73079	329.8	2.135
34	ORF1_chr16_10044778_10047306_9907142_9911562_RF_1	94051	346.3	1.772
35	ORF1_chr9_71446407_71452706_71476978_71478030_FF_1	129153	352.3	1.737
36	ORF1_chr2_37666390_37670759_37879290_37884290_RF_1	101904	369.6	1.741
37	ORF1_chr5_50708409_50716050_50726245_50731870_FR_1	130047	382.9	1.775
38	ORF1_chr5_122311763_122314967_122350193_122356927_FF_1	133785	385.8	1.812
39	ORF1_chr4_85761047_85763139_85952092_85960583_FR_1	73396	388.6	1.79
40	ORF1_chr15_44713197_44715317_44756695_44758842_RR_1	91402	396.4	1.707
41	ORF1_chr9_71446407_71452706_71550704_71559890_FR_1	78244	399.3	1.7
42	ORF1_chrX_45661991_45664592_45739643_45748032_RF_1	120043	405.2	1.736
43	ORF1_chr4_73629979_73638181_73831449_73839428_FF_1	59006	404.4	1.749
44	ORF1_chr18_68711389_68714330_68797123_68798463_RF_1	50615	422.1	1.705
45	ORF1_chr14_65076556_65085228_65194791_65198794_FR_1	109799	441.4	1.674
46	ORF1_chr14_53106017_53108105_53223270_53229326_RF_1	104855	437	1.713
47	ORF1_chr9_127166323_127173810_127226000_127228604_RF_1	65446	434.9	1.734
48	ORF1_chr1_98050628_98053768_98164665_98171570_RR_1	25472	439.8	1.728
49	ORF1_chr4_153219867_153224675_153242666_153249857_FR_1	55153	444.5	1.865
50	ORF1_chr2_233064861_233067168_233261787_233264668_RR_1	91626	433.6	1.828

Table 2.a1

				Probe sequence
	pfp	P.value	Type	60 mer
1	5.687E-07	4.03E-12	SSc	CAATCAAAATGTTGCAGTATCTTTTTAATCGAGATTTAACCACATCTGATTTCATGGGTT
2	0.000004995	2.123E-10	SSc	CCAAATACTTTCAAAATATAAGTATTATTCGAGTCTTCACAACAAAAGATAGAGGACCCA
3	0.00000558	1.582E-10	SSc	TTCCACAAAGTTTATTTTTTGTTTCATTTCGAGGCTACAGTGGAGCCTCGGCTTCCCAAA
4	0.000005773	2.045E-10	SSc	TAAGACAGTGATTCCATTCGTAATAGTATCGAGTTGTTATTTATAATTCGGAACTATTCT
5	0.000006857	1.457E-10	SSc	AGTTCAATGGACAAATAAATGAAATAAATCGACATACTCCAAAACATTGAAATATTGATG
6	0.000007637	1.082E-10	SSc	CATTGGAGGCACTCAAAAAAAAAAAAAAATCGATGATCTCTTCAAAGACATAACCCTTTGG
7	0.000008788	4.359E-10	SSc	CACCTTGGTTATAATGTATTTTTAAATTTCGAGTTCTTATGATGCTAAGAGAGGCTGATT
8	0.00002258	1.44E-09	SSc	ATAAATATAAGTTGAATATTTATTTTGTTCGAAGGATATGAATTCCAGCTATGGCTCTGC
9	0.00002307	1.635E-09	SSc	TTTTCAAAACAATTTTAGGATAAGCTTGTCGAGGTTATCCCTATTGGTTGAAGGTGGGAA
10	0.00002343	1.992E-09	SSc	TTAGTCTTAATTTATAAAGCAACTTACTTCGATGTTATTGCAGCTTAAAGGTCAGGCTTA
11	0.00002535	1.437E-09	SSc	TATATCAGTTTGTTTATCCATTTATCCATCGAATCAAAATATTGTTTCTACTTCTTTGGA
12	0.00002554	1.99E-09	SSc	CCTAGTTAGCTTATTTTCTCTAGGATTTTCGATATGTTATTTAATCATCAACTAATTACA
13	0.00003265	3.47E-09	SSc	AGAATTAAATCTTAAGTCTTTATGGAGATCGACTTTGAAACTAATTGTGTTTTTACCAAA
14	0.00003301	4.211E-09	SSc	TTCTTGAAGGACATACTTTAATATTTCTTCGACACTGTCTCCAACTTACTTTATCTGATT
15	0.00003313	3.286E-09	SSc	AGCTAAAGTAGATATGCTTCTTGAGAAATCGACACAAGGGTTTGTTAAAAAAAAAAGAAA
16	0.00003443	5.367E-09	SSc	ATAGCAAGTTGCATTTAGTTTTTAGCTATCGATTTTCTTTAAACCTAAAAAACAAGAAAA
17	0.00003446	4.151E-09	SSc	CAAAAAAAAAAAAAAAAAAAAAAGGTAGTCGAAAAATAAAATGATAAATAAAATAAAATA
18	0.00003545	5.275E-09	SSc	GGTTTTCTTTGTTTTGTTTAAAATCATTTCGAATCTTTAATTCACATTGAATATGTGTAC
19	0.00003559	5.043E-09	SSc	GCAAATGCAAGAGTGCAACTACCGTATTTCGAAATTAATTAGAAGAATATCTGCATTTTT
20	0.0000365	4.914E-09	SSc	AGCTGCTATCATGATTACTATATTATTATCGAACAGATTAGATATTTTAACACCAATTCT
21	0.00003869	6.306E-09	SSc	TATTTATGACAGTTTAAAAAATTCCTTGTCGAGAAATCTGCTACCTTGATTAGTAAGACT
22	0.00003915	6.657E-09	SSc	GCAGATAAAATAATACTCCAATAACTGATCGAAAGTAAAAATAAAAAGAATTACGATGCG
23	0.00005949	1.222E-08	SSc	AAAGATGAATAAAATTTGGTTCCTCCCTTCGACCCTGTGCGGACATTCCGCATACTGCCA
24	0.00005968	1.142E-08	SSc	GAGGTTTTCAAAAAGAATTATTTAAAAGTCGATTAACCATTTCTGCCATGTATGAAGGAT
25	0.00006062	1.074E-08	SSc	TATCCACCTACCAAATTATCACCCATCCTCGAAAATCTTAGCTTTGTAAAGAACTGTTAA
26	0.00006065	1.203E-08	SSc	GTTTAAAGGACAATATGTCAATAGATTCTCGAAACTATTTTGTTTGTAACTAATAAGTGA
27	0.00006162	1.135E-08	SSc	GATGGATAGATAAATGGAAAGATAGAGATCGAGTTGTGTTAATTATTAGGAAAATAACCT
28	0.00006576	1.398E-08	SSc	TATCCACCTACCAAATTATCACCCATCCTCGAAATGTTCCTGGATAATAAACACACAATT
29	0.00007459	1.638E-08	SSc	AAAGTAATAATGTAAAACTATCTTTTCCTCGATATTTGTAGGTGGTTGAAGATTAATGTT
30	0.00008535	1.935E-08	SSc	ACTTTAGATAATCTGTATATGTTTTGCATCGAAGAATATAATGGTATATGCCATGTTAAA
31	0.00008899	2.081E-08	SSc	ACCTCATTCAAAAATCATCTTCTTGATATCGAACAGTAAAAGGACTTCCTCTTTTTTTGG
32	0.0001431	3.448E-08	SSc	ATTTACTTATTTATTCATGGAATGTTTATCGAGGCTGATTTAGACAGGACTTTGTGTGCA
33	0.0001549	3.842E-08	SSc	GCCAGATATTTGGTGCGCAGATATTTGGTCGATAAATGTTTATTGCCCTTTACTGTGTGA
34	0.0001833	4.676E-08	SSc	TTTGTCATGAGTATAAAATGAGAATTCATCGAATCTGATTCCTCTTTTAGACTGTAAGTT
35	0.0001909	5.005E-08	SSc	CAAGTTCTCCCAACTAATAATTGGAAGTTCGAAATTCCAAATATGGAAACACATACTGAA
36	0.0002251	6.062E-08	SSc	ATTCCACTGTAACAAGTAAAGAAAATATTCGAGGTACACTTTAGGCGGTACCCTGTTACC
37	0.0002526	6.979E-08	SSc	GCAAGAATCCAAAATTTACTGTGCTTTATCGACTATACAATAACAGTGAATTTATGGTGT
38	0.0002538	7.192E-08	SSc	CCCATGGAAAATTAAATGATACTAAACATCGATTTAATAAGGTCAGACAGGAGCTAGGTA
39	0.0002549	7.405E-08	SSc	ATATTTTATAGTTGCAGGAAGCTACTATTCGACACTCCAGAGAGCTCTTTCTATACATAG
40	0.0002691	8.007E-08	SSc	ATTTTCTCATGATCAAAACATTCTGCTTTCGATAGTTCAGTCACCAGGTGACTGTCGTGG
41	0.0002705	8.242E-08	SSc	CAAGTTCTCCCAACTAATAATTGGAAGTTCGAATGGCTTTATTCTAAAATATATAAATTA
42	0.000274	8.735E-08	SSc	AATGAAACAGTTAAGAGGAATGCTATTTTCGACCTTCTATAGTTCTCTCATTTTCAGTAT
43	0.0002782	8.673E-08	SSc	AACAGTCAAAAAACAATAGATATTGGTATCGATGTTCTAGGAGAGCTCTTAATACAGTTA
44	0.0003151	1.027E-07	SSc	TATACTAAGCAAAACTCAGGTAAGAATTTCGATTTTCTTTAAACCTAAAAAACAAGAAAA
45	0.0003391	1.225E-07	SSc	ACCTGTTTAACTTTTTAATTGGTTCTACTCGATAAAGAATCACAAATCTCCATCTTGCGA
46	0.0003392	1.178E-07	SSc	TATTTCACTTAGCATAATATCTTCAAGGTCGACTTTTTGCCTACTTTACCTTTTATTATC
47	0.0003396	1.155E-07	SSc	TTTATGAAATATAGATGCATACACTTTGTCGAGCATCAAACATGTACTAGATCCTTTTAT
48	0.0003408	1.207E-07	SSc	TTACAAGTGGAATAGAATTTATTGGCTATCGAATTAAATTTATAATTATTTTCTTTTAGA
49	0.0003416	1.259E-07	SSc	TGCCTTTATTTTCCTGGAAAATTCTATGTCGACAGAACTACTGAAATTGTAAAGAAACTC
50	0.000343	1.142E-07	SSc	AATTAACAGTGTCTATTTTACTGAAGCTTCGAACTATAAATCCACAGTTCTAGTTGTCTT

Table 2.a2

	Probe Location					4 kb Sequence Location				
	Chr	Start1	End1	Start2	End2	Chr	Start1	End1	Start2	End2
1	chr15	94292715	94292744	94340210	94340239	chr15	94288745	94292744	94340210	94344209
2	chr4	102315518	102315547	102386634	102386663	chr4	102311548	102315547	102386634	102390633
3	chr8	38716164	38716193	38738343	38738372	chr8	38716164	38720163	38738343	38742342
4	chr5	132458509	132458538	132521320	132521349	chr5	132458509	132462508	132517350	132521349
5	chr12	96463991	96464020	96618280	96618309	chr12	96463991	96467990	96618280	96622279
6	chr11	79041479	79041508	79271257	79271286	chr11	79037509	79041508	79267287	79271286
7	chr1	11226039	11226068	11272814	11272843	chr1	11226039	11230038	11272814	11276813
8	chr2	159285163	159285192	159326594	159326623	chr2	159281193	159285192	159326594	159330593
9	chr8	90011442	90011471	90148441	90148470	chr8	90007472	90011471	90148441	90152440
10	chr3	113947065	113947094	113975287	113975316	chr3	113947065	113951064	113975287	113979286
11	chr3	149821040	149821069	150005761	150005790	chr3	149817070	149821069	150005761	150009760
12	chr5	60604038	60604067	60738058	60738087	chr5	60600068	60604067	60738058	60742057
13	chr6	53534189	53534218	53651091	53651120	chr6	53534189	53538188	53647121	53651120
14	chr5	88274732	88274761	88365194	88365223	chr5	88270762	88274761	88365194	88369193
15	chr9	76572021	76572050	76771021	76771050	chr9	76572021	76576020	76767051	76771050
16	chr18	68711391	68711420	68918919	68918948	chr18	68711391	68715390	68914949	68918948
17	chr5	134464511	134464540	134674134	134674163	chr5	134464511	134468510	134674134	134678133
18	chr8	92469390	92469419	92510936	92510965	chr8	92469390	92473389	92510936	92514935
19	chr10	54060340	54060369	54213285	54213314	chr10	54056370	54060369	54213285	54217284
20	chr1	109159475	109159504	109321121	109321150	chr1	109159475	109163474	109317151	109321150
21	chr12	9624843	9624872	9733197	9733226	chr12	9620873	9624872	9729227	9733226
22	chr14	89417654	89417683	89641752	89641781	chr14	89417654	89421653	89637782	89641781
23	chr1	155209891	155209920	155288577	155288606	chr1	155205921	155209920	155288577	155292576
24	chr5	173450238	173450267	173485404	173485433	chr5	173450238	173454237	173481434	173485433
25	chr3	43252799	43252828	43297214	43297243	chr3	43248829	43252828	43297214	43301213
26	chr2	118090942	118090971	118214617	118214646	chr2	118090942	118094941	118214617	118218616
27	chr5	96799183	96799212	96815917	96815946	chr5	96799183	96803182	96811947	96815946
28	chr3	43094300	43094329	43252799	43252828	chr3	43094300	43098299	43248829	43252828
29	chr9	16577661	16577690	16729302	16729331	chr9	16573691	16577690	16725332	16729331
30	chr3	107414956	107414985	107527610	107527639	chr3	107414956	107418955	107523640	107527639
31	chr12	13095079	13095108	13190442	13190471	chr12	13091109	13095108	13190442	13194441
32	chr5	35271026	35271055	35319376	35319405	chr5	35271026	35275025	35319376	35323375
33	chr13	109649215	109649244	109745464	109745493	chr13	109649215	109653214	109745464	109749463
34	chr16	10044780	10044809	9911531	9911560	chr16	10044780	10048779	9907561	9911560
35	chr9	71452675	71452704	71477999	71478028	chr9	71448705	71452704	71474029	71478028
36	chr2	37666392	37666421	37884259	37884288	chr2	37666392	37670391	37880289	37884288
37	chr5	50716019	50716048	50726247	50726276	chr5	50712049	50716048	50726247	50730246
38	chr5	122314936	122314965	122356896	122356925	chr5	122310966	122314965	122352926	122356925
39	chr4	85763108	85763137	85952094	85952123	chr4	85759138	85763137	85952094	85956093
40	chr15	44713199	44713228	44756697	44756726	chr15	44713199	44717198	44756697	44760696
41	chr9	71452675	71452704	71550706	71550735	chr9	71448705	71452704	71550706	71554705
42	chrX	45661993	45662022	45748001	45748030	chrX	45661993	45665992	45744031	45748030
43	chr4	73638150	73638179	73839397	73839426	chr4	73634180	73638179	73835427	73839426
44	chr18	68711391	68711420	68798432	68798461	chr18	68711391	68715390	68794462	68798461
45	chr14	65085197	65085226	65194793	65194822	chr14	65081227	65085226	65194793	65198792
46	chr14	53106019	53106048	53229295	53229324	chr14	53106019	53110018	53225325	53229324
47	chr9	127166325	127166354	127228573	127228602	chr9	127166325	127170324	127224603	127228602
48	chr1	98050630	98050659	98164667	98164696	chr1	98050630	98054629	98164667	98168666
49	chr4	153224644	153224673	153242668	153242697	chr4	153220674	153224673	153242668	153246667
50	chr2	233064863	233064892	233261789	233261818	chr2	233064863	233068862	233261789	233265788

Table 2.a3

	probe	Primer ID
1	ORF1_chr15_94287688_94292746_94340208_94346941_FR_1	OBD168-401
2	ORF1_chr4_102312731_102315549_102386632_102391817_FR_1	OBD168-405
3	ORF1_chr8_38716162_38718294_38738341_38742581_RR_1	OBD168-409
4	ORF1_chr5_132458507_132464714_132517598_132521351_RF_1	OBD168-413
5	ORF1_chr12_96463989_96466636_96618278_96624162_RR_1	OBD168-417
6	ORF1_chr11_79036088_79041510_79269569_79271288_FF_1	OBD168-421
7	ORF1_chr1_11226037_11228251_11272812_11274518_RR_1	OBD168-425
8	ORF1_chr2_159283360_159285194_159326592_159328925_FR_1	OBD168-429
9	ORF1_chr8_90002099_90011473_90148439_90150313_FR_1	OBD168-433
10	ORF1_chr3_113947063_113952443_113975285_113978229_RR_1	OBD168-437
11	ORF1_chr3_149818709_149821071_150005759_150009319_FR_1	OBD168-441
12	ORF1_chr5_60597760_60604069_60738056_60741292_FR_1	OBD168-445
13	ORF1_chr6_53534187_53536920_53639583_53651122_RF_1	OBD168-449
14	ORF1_chr5_88269888_88274763_88365192_88376199_FR_1	OBD168-453
15	ORF1_chr9_76572019_76577216_76769644_76771052_RF_1	OBD168-457
16	ORF1_chr18_68711389_68714330_68911644_68918950_RF_1	OBD168-461
17	ORF1_chr5_134464509_134469933_134674132_134676030_RR_1	OBD168-465
18	ORF1_chr8_92469388_92478361_92510934_92515600_RR_1	OBD168-469
19	ORF1_chr10_54058576_54060371_54213283_54215754_FR_1	OBD168-473
20	ORF1_chr1_109159473_109163477_109318126_109321152_RF_1	OBD168-477
21	ORF1_chr12_9614159_9624874_9729793_9733228_FF_1	OBD168-481
22	ORF1_chr14_89417652_89420597_89636182_89641783_RF_1	OBD168-485
23	ORF1_chr1_155206612_155209922_155288575_155290398_FR_1	OBD168-489
24	ORF1_chr5_173450236_173452725_173479240_173485435_RF_1	OBD168-493
25	ORF1_chr3_43246875_43252830_43297212_43303273_FR_1	OBD168-497
26	ORF1_chr2_118090940_118096647_118214615_118218048_RR_1	OBD168-501
27	ORF1_chr5_96799181_96801649_96813450_96815948_RF_1	OBD168-505
28	ORF1_chr3_43094298_43105527_43246875_43252830_RF_1	OBD168-509
29	ORF1_chr9_16574863_16577692_16721839_16729333_FF_1	OBD168-513
30	ORF1_chr3_107414954_107426087_107525934_107527641_RF_1	OBD168-517
31	ORF1_chr12_13090807_13095110_13190440_13193042_FR_1	OBD168-521
32	ORF1_chr5_35271024_35276749_35319374_35321203_RR_1	OBD168-525
33	ORF1_chr13_109649213_109651298_109745462_109746722_RR_1	OBD168-529
34	ORF1_chr16_10044778_10047306_9907142_9911562_RF_1	OBD168-533
35	ORF1_chr9_71446407_71452706_71476978_71478030_FF_1	OBD168-537
36	ORF1_chr2_37666390_37670759_37879290_37884290_RF_1	OBD168-541
37	ORF1_chr5_50708409_50716050_50726245_50731870_FR_1	OBD168-545
38	ORF1_chr5_122311763_122314967_122350193_122356927_FF_1	OBD168-549
39	ORF1_chr4_85761047_85763139_85952092_85960583_FR_1	OBD168-553
40	ORF1_chr15_44713197_44715317_44756695_44758842_RR_1	OBD168-557
41	ORF1_chr9_71446407_71452706_71550704_71559890_FR_1	OBD168-561
42	ORF1_chrX_45661991_45664592_45739643_45748032_RF_1	OBD168-565
43	ORF1_chr4_73629979_73638181_73831449_73839428_FF_1	OBD168-569
44	ORF1_chr18_68711389_68714330_68797123_68798463_RF_1	OBD168-573
45	ORF1_chr14_65076556_65085228_65194791_65198794_FR_1	OBD168-577
46	ORF1_chr14_53106017_53108105_53223270_53229326_RF_1	OBD168-581
47	ORF1_chr9_127166323_127173810_127226000_127228604_RF_1	OBD168-585
48	ORF1_chr1_98050628_98053768_98164665_98171570_RR_1	OBD168-589
49	ORF1_chr4_153219867_153224675_153242666_153249857_FR_1	OBD168-593
50	ORF1_chr2_233064861_233067168_233261787_233264668_RR_1	OBD168-597

Table 2.a4

	Primer Sequence	Primer ID	Primer Sequence
1	GCTTGTATTGGAGACTAAACATAG	OBD168-403	CCTCTAAAACTCATCAATAACAAT
2	TCTCTTATCTCTTCATTGGTAACTGC	OBD168-407	TAGTCCTCAGGTTTAGGCAAGTTG
3	ACTGTTCTGTTGATTGGTTGGTGATA	OBD168-411	AGGGACACAGAAGCCAAATGAGAGAG
4	CATCAAGTTTTCAGAATAGTAAATC	OBD168-415	CACCTGGGAACATTATTTGGCATA
5	CCTGGGCAACAGAGTGAGATTCT	OBD168-419	CCTTTCCTGGTCCCTCCTCATCA
6	CAGGACCATTGAGAGAATAACAGATA	OBD168-423	GTTCCTGAGCCGCCCGATAAAGC
7	CACCTTGGTTATAGGACATC	OBD168-427	GAGTTCTTATGATGCTAAGA
8	TGCTCATTTCTGTATCCACACCAT	OBD168-431	TATGTGGCTTGTCATCCTTATTTT
9	GGCTATGTCCCCTAAGGAAACACACA	OBD168-435	CACCAGGTTGACATCTTTTCAGTGGG
10	GAAACTGCCCTGAGATGAGAGTCCTT	OBD168-439	GCTGTGGATGAAAGGAAGGAGAGACA
11	TAAGCAGTCATTCCCTGATGCCCCTA	OBD168-443	CACCTGAGCAATGCGGATAAAGCAGA
12	ATGCCTCAACCATTACATCTTTTCCT	OBD168-447	AGTAGACAGATGGGTGGGATTCTTCC
13	GAGGAAGAGGAATGTCCGCTAACACA	OBD168-451	GCCAGCACCCAAGATTTAGCCAAGTT
14	TTCTATTGTGTTTCGTGGTTCCTGGA	OBD168-455	ATACCTGAGTAGGAGTTAGCGTCTA
15	TCAACTATCAATGCGAAAGTAAAT	OBD168-459	CACATTTCCCATCTCATTATTATTA
16	TTGGATTCATAGCAGTTCTAAAAT	OBD168-463	TATCAATGTATTATCTCTGCCTAT
17	GGCAACAGAGCGAGACTCCTTCT	OBD168-467	AGGCTGGGATTACAGGCGTAGGC
18	TATCCTTCCAGTCTACCTTCTTTT	OBD168-471	GTTCTGTGGTCTCCTATCTACATA
19	CTGACTGACTATGATTGTTTGTAG	OBD168-475	ATTTGGCATTTCACTTTTGGTTTA
20	TGGGCTCTGGAGTTGGGATGCCA	OBD168-479	TGTTGGTTGTGTGCCAGCAGCCA
21	CAAGTCTGCTATTGAACCCCTCT	OBD168-483	ATTTCCTTCTGCTCCCCAAGTGG
22	GCTGAGAGAGTCAAGGGAAAACCC	OBD168-487	CGTGGAATCTCCTCTTCTCACCCC
23	GACCAAACGACTCACAGCCAGGC	OBD168-491	CTTGGCAGTGGAGACATACAGCG
24	CCCAAGCAGGGCAACCATCAAGG	OBD168-495	ACAATCAGTGGGCTGGATGTGGC
25	AAAATGTCTGTCCCCACCATCCCAGG	OBD168-499	TGACTTCTCATCAGGTCCGAGTGTA
26	CAGAGGAGTGGGTTATTTTCAAGGGA	OBD168-503	TTGATTTGCCCTCAGTAACCTCGCTG
27	ATGTATGTGTGGATAGACGGATGGAT	OBD168-507	CCCTTTGGACGGGAATACCTCTCACT
28	CCCACCATCCCAGGCAATCCCAA	OBD168-511	GGAAATCACTGGGTCTGTTGCCC
29	AAAATCAGGAGTTTGGAGAAAATA	OBD168-515	TCATAAAAGTAGTCAGCAGGAAAA
30	GAGACCTCATCTGTGGTGTTTCCTGG	OBD168-519	CTTGTTGAAGTGAGGGATTTTGTCCT
31	TCCACCAGGGAGAGACACAAGGA	OBD168-523	TCCCCTGGATTGTGTGCTGGGCA
32	TAACCCCAGCCTAAGACAAAATAG	OBD168-527	CCATTTTGTTTGGTTTTGCTTTGC
33	GGAAGGGAAGATACAGAGGGTTTCT	OBD168-531	AAACAAGCGGCGGCAGGACCCCT
34	TAAAATGGGCATAATCATAGCAGCCA	OBD168-535	GGTCATTGATTAGGGAATAGTAACAC
35	GAGAGGGAGGGTGAGAGAGAACCT	OBD168-539	GGGCTTGGTGTTTCCTTGGTTCC
36	CCATCCAAAAGAGTCATACACAGGAA	OBD168-543	GTTTGCTTAGTCCTTACTGCTTGCCT
37	GCTTCTGTCTCCTTCTTTTCAGTCTC	OBD168-547	TAGATTACACATACATCCTCCATTGG
38	GCATTTACTTTGTGCTTATTTGTA	OBD168-551	TTACTCTAAACAAGCCACTGAAGT
39	CTTTTGGACTATTGATTTTCCTAT	OBD168-555	AAAGCACAGGCAGATGTATGAATA
40	GAGGAGGAAAATAGACCTTCAGAGGC	OBD168-559	AAGACCAGACACATTTCAACGCCACG
41	GAGGGAGGGTGAGAGAGAACCTATCT	OBD168-563	GGAGTATGATTGTCCATCTTCTGCCT
42	TACTTCTGCGTGCTTTATTCCAGGCA	OBD168-567	CCAGAGGATGACTTGATTTGGAGTGG
43	CAACATCACTAATCATCAGAGATA	OBD168-571	TTGGTGTTCTCATAGCATCTTCTA
44	GCTGGGAAGCAGAAGGATTTGGAGTT	OBD168-575	TCAGTCCTCTGCTTTTATCTTTGAGA
45	GGAGGCAGGTTTCTTTTCACATCCAC	OBD168-579	TGTTATTTACGAAGAGTGTTGTGAGC
46	CGTCATTCTACTTTCTGTCTCCAT	OBD168-583	GTAATAAGTGAGAGTCATACAATA
47	TTTCTTTGTTTCATAGTGAGGTGA	OBD168-587	GTAATACAGAAATAGTAACACCTA
48	TCAGTGTTCAAATGGATGACAAAA	OBD168-591	AGAACTACATCTGAAAATCAAAGT
49	GTTTGTTTAGATGACTGTCTCTTATCAG	OBD168-595	CTTTACAGGCAGACCCAGGGAGC
50	GGGCACATACCCCTTCCTGGTCT	OBD168-599	GTGCCTAAAGCCACAGGAGTGAG

Table 2.a5

	probe	Marker
1	ORF1_chr15_94287688_94292746_94340208_94346941_FR_1	OBD168-401.403
2	ORF1_chr4_102312731_102315549_102386632_102391817_FR_1	OBD168-405.407
3	ORF1_chr8_38716162_38718294_38738341_38742581_RR_1	OBD168-409.411
4	ORF1_chr5_132458507_132464714_132517598_132521351_RF_1	OBD168-413.415
5	ORF1_chr12_96463989_96466636_96618278_96624162_RR_1	OBD168-417.419
6	ORF1_chr11_79036088_79041510_79269569_79271288_FF_1	OBD168-421.423
7	ORF1_chr1_11226037_11228251_11272812_11274518_RR_1	OBD168-425.427
8	ORF1_chr2_159283360_159285194_159326592_159328925_FR_1	OBD168-429.431
9	ORF1_chr8_90002099_90011473_90148439_90150313_FR_1	OBD168-433.435
10	ORF1_chr3_113947063_113952443_113975285_113978229_RR_1	OBD168-437.439
11	ORF1_chr3_149818709_149821071_150005759_150009319_FR_1	OBD168-441.443
12	ORF1_chr5_60597760_60604069_60738056_60741292_FR_1	OBD168-445.447
13	ORF1_chr6_53534187_53536920_53639583_53651122_RF_1	OBD168-449.451
14	ORF1_chr5_88269888_88274763_88365192_88376199_FR_1	OBD168-453.455
15	ORF1_chr9_76572019_76577216_76769644_76771052_RF_1	OBD168-457.459
16	ORF1_chr18_68711389_68714330_68911644_68918950_RF_1	OBD168-461.463
17	ORF1_chr5_134464509_134469933_134674132_134676030_RR_1	OBD168-465.467
18	ORF1_chr8_92469388_92478361_92510934_92515600_RR_1	OBD168-469.471
19	ORF1_chr10_54058576_54060371_54213283_54215754_FR_1	OBD168-473.475
20	ORF1_chr1_109159473_109163477_109318126_109321152_RF_1	OBD168-477.479
21	ORF1_chr12_9614159_9624874_9729793_9733228_FF_1	OBD168-481.483
22	ORF1_chr14_89417652_89420597_89636182_89641783_RF_1	OBD168-485.487
23	ORF1_chr1_155206612_155209922_155288575_155290398_FR_1	OBD168-489.491
24	ORF1_chr5_173450236_173452725_173479240_173485435_RF_1	OBD168-493.495
25	ORF1_chr3_43246875_43252830_43297212_43303273_FR_1	OBD168-497.499
26	ORF1_chr2_118090940_118096647_118214615_118218048_RR_1	OBD168-501.503
27	ORF1_chr5_96799181_96801649_96813450_96815948_RF_1	OBD168-505.507
28	ORF1_chr3_43094298_43105527_43246875_43252830_RF_1	OBD168-509.511
29	ORF1_chr9_16574863_16577692_16721839_16729333_FF_1	OBD168-513.515
30	ORF1_chr3_107414954_107426087_107525934_107527641_RF_1	OBD168-517.519
31	ORF1_chr12_13090807_13095110_13190440_13193042_FR_1	OBD168-521.523
32	ORF1_chr5_35271024_35276749_35319374_35321203_RR_1	OBD168-525.527
33	ORF1_chr13_109649213_109651298_109745462_109746722_RR_1	OBD168-529.531
34	ORF1_chr16_10044778_10047306_9907142_9911562_RF_1	OBD168-533.535
35	ORF1_chr9_71446407_71452706_71476978_71478030_FF_1	OBD168-537.539
36	ORF1_chr2_37666390_37670759_37879290_37884290_RF_1	OBD168-541.543
37	ORF1_chr5_50708409_50716050_50726245_50731870_FR_1	OBD168-545.547
38	ORF1_chr5_122311763_122314967_122350193_122356927_FF_1	OBD168-549.551
39	ORF1_chr4_85761047_85763139_85952092_85960583_FR_1	OBD168-553.555
40	ORF1_chr15_44713197_44715317_44756695_44758842_RR_1	OBD168-557.559
41	ORF1_chr9_71446407_71452706_71550704_71559890_FR_1	OBD168-561.563
42	ORF1_chrX_45661991_45664592_45739643_45748032_RF_1	OBD168-565.567
43	ORF1_chr4_73629979_73638181_73831449_73839428_FF_1	OBD168-569.571
44	ORF1_chr18_68711389_68714330_68797123_68798463_RF_1	OBD168-573.575
45	ORF1_chr14_65076556_65085228_65194791_65198794_FR_1	OBD168-577.579
46	ORF1_chr14_53106017_53108105_53223270_53229326_RF_1	OBD168-581.583
47	ORF1_chr9_127166323_127173810_127226000_127228604_RF_1	OBD168-585.587
48	ORF1_chr1_98050628_98053768_98164665_98171570_RR_1	OBD168-589.591
49	ORF1_chr4_153219867_153224675_153242666_153249857_FR_1	OBD168-593.595
50	ORF1_chr2_233064861_233067168_233261787_233264668_RR_1	OBD168-597.599

Table 2.a6

51	ORF1_chr18_62330039_62332469_62410773_62412005_FR_1	65192	239.5	-1.875
52	ORF1_chr1_97723527_97730826_97845524_97850752_RF_1	50784	228.9	-1.885
53	ORF1_chr5_165127546_165128761_165171328_165175416_FR_1	19637	216.9	-2.379
54	ORF1_chr2_26077134_26081726_26188355_26191067_RF_1	69487	178.6	-1.995
55	ORF1_chr5_165127546_165128761_165223844_165225058_FF_1	64468	215.5	-2.376
56	ORF1_chr18_62240628_62243651_62330039_62332469_RF_1	133666	346.6	-1.762
57	ORF1_chr18_35525412_35527471_35609926_35611497_FF_1	82154	326.1	-1.904
58	ORF1_chr10_93741396_93744278_93870079_93871714_FR_1	18832	373.7	-1.721
59	ORF1_chr2_186622411_186639782_186682119_186696186_RR_1	60297	398.7	-2.055
60	ORF1_chr12_52217955_52219158_52307864_52312912_RR_1	94808	645.1	-1.637
61	ORF1_chr4_168499900_168503445_168627683_168631715_RR_1	19017	638.6	-1.749
62	ORF1_chr19_56561558_56564720_56759775_56765600_RF_1	104682	688.2	-1.605
63	ORF1_chr18_62330039_62332469_62555999_62562221_FR_1	50516	672	-1.631
64	ORF1_chr20_44492930_44498158_44629984_44632053_RF_1	124521	685.8	-1.717
65	ORF1_chr6_15591030_15592334_15658715_15661455_FR_1	337	714.7	-1.592
66	ORF1_chr15_69599001_69607474_69822688_69824653_FF_1	62666	745.6	-1.585
67	ORF1_chr3_194783856_194786305_194878644_194884153_RR_1	17829	770.7	-1.677
68	ORF1_chr2_29059303_29063818_29079780_29082596_FR_1	40095	763.6	-1.742
69	ORF1_chr1_97845524_97850752_97969457_97975300_FR_1	50177	785.2	-1.6
70	ORF1_chr10_93674996_93683570_93741396_93744278_RF_1	47914	862.8	-1.578
71	ORF1_chr8_125289724_125291437_125304189_125311876_RR_1	102207	885.4	-1.562
72	ORF1_chr5_77084813_77086498_77232748_77239462_RR_1	51608	913	-1.636
73	ORF1_chr17_68654144_68657529_68785810_68796098_FR_1	41397	984.6	-1.724
74	ORF1_chr1_112396884_112399115_112478496_112485740_RR_1	98481	1020	-1.678
75	ORF1_chr1_207314651_207319651_207566031_207567951_RR_1	51534	1088	-1.97
76	ORF1_chr3_194783856_194786305_194980518_194987236_RR_1	16693	1145	-1.542
77	ORF1_chr4_24971631_24973362_25125726_25129421_RR_1	21906	1155	-1.541
78	ORF1_chr1_117925651_117930301_117977839_117981106_FF_1	60395	1120	-1.555
79	ORF1_chr18_62330039_62332469_62459933_62463601_FF_1	79455	1142	-1.521
80	ORF1_chr1_16764579_16768424_17044824_17050263_RR_1	35783	1173	-1.58
81	ORF1_chr3_42701255_42712462_42763077_42767575_RR_1	96660	1137	-1.56
82	ORF1_chr2_200711316_200714252_200861419_200863026_RR_1	37379	1120	-1.47
83	ORF1_chr10_119537441_119541197_119587019_119594844_RR_1	102190	1191	-1.523
84	ORF1_chr8_57997832_57999789_58156560_58160085_FF_1	97562	1274	-1.49
85	ORF1_chr5_54687073_54701690_54895820_54899919_RF_1	84406	1298	-1.495
86	ORF1_chr22_37276476_37281194_37296506_37298053_FF_1	89194	1268	-1.533
87	ORF1_chr9_27616981_27624076_27731177_27739077_RR_1	19905	1332	-1.487
88	ORF1_chr13_57155089_57159703_57172839_57181375_RR_1	118355	1298	-1.539
89	ORF1_chr2_127388555_127395831_127512403_127514497_RR_1	125959	1266	-1.633
90	ORF1_chr14_61568474_61572943_61720413_61722720_FR_1	105496	1233	-1.987
91	ORF1_chr11_104153980_104160882_104179897_104181773_FF_1	18635	1291	-1.85
92	ORF1_chr4_15897457_15905803_15999719_16002207_RR_1	19816	1244	-1.501
93	ORF1_chr17_17631398_17633309_17824119_17825835_RR_1	73392	1264	-1.608
94	ORF1_chr17_18194373_18201018_18300185_18301934_FF_1	43770	1320	-1.552
95	ORF1_chr5_169694390_169702047_169742878_169747823_FF_1	15015	1359	-1.527
96	ORF1_chr1_224094766_224099331_224328317_224334418_FF_1	46944	1354	-1.479
97	ORF1_chr19_51484258_51487562_51764536_51772179_RR_1	27427	1262	-1.555
98	ORF1_chr9_92152672_92155419_92403506_92407832_FR_1	104212	1388	-1.947
99	ORF1_chr1_117925651_117930301_118024887_118028035_FR_1	17564	1467	-1.49
100	ORF1_chr16_87246411_87247863_87484414_87491902_RF_1	65474	1403	-1.601

Table 2.b1

51	0.0002952	1.046E-08	pHC	GAGAATCAATTCCATTTTTAAAGCTTAGTCGAGTCCCTTACAGAAAATGATGTAGTATTT
52	0.0003058	8.667E-09	pHC	GTCACCTATTTTTTCCAACTTAATTTGATCGATTCATTACACTTTATATTAAGTAGTTTT
53	0.0003268	6.947E-09	pHC	TTTGTAACAATAGCAAAAGTTCAGTTCTTCGAGCTAATAGAAGGATGGTGAAGTAAATTT
54	0.0004359	3.089E-09	pHC	TACCTTCCAACAGGAAGTGCAAACTAATTCGAAATAATTCAGACATGATTGTGTTTTACT
55	0.0004767	6.755E-09	pHC	TTTGTAACAATAGCAAAAGTTCAGTTCTTCGATAAACATTTATTCAAAGGCATGAATGAC
56	0.0008269	4.687E-08	pHC	GAGAATCAATTCCATTTTTAAAGCTTAGTCGAATGCTAATCCTCTTCTATTAATGAATTC
57	0.0008633	3.67E-08	pHC	GTCACAGAGATCATGGTAAAGAGAAAATTCGATTACATAAATATTTCTCTAAGGTTGCTG
58	0.0009938	6.338E-08	pHC	AGAAATGAACAACACATTGTAATATACATCGAAAAGAACTAATAATGCTAAGGATTCTGA
59	0.001157	8.195E-08	pHC	AGAAGACTCACCAAAATTTTATCCTGTTTCGAACCTTATAATGGTGATAAATCATTAATG
60	0.005398	5.355E-07	pHC	AAATCAAGACGGAGGAACTATTTCAGATTCGAGGTAGTGGCAGCTAATAGCTCTTAAGGG
61	0.005591	0.000000515	pHC	TTGAAGTCTGTTTGTGAAATACTTTGAGTCGAAAGACAAACGGCAAAATGAGAAAACAAT
62	0.005695	6.859E-07	pHC	CGCGTGATGTGTTTGAAGGTGTGTTTGTTCGAAAAAGACTTGCATTTATGCAGAGTGAGG
63	0.005892	6.262E-07	pHC	GAGAATCAATTCCATTTTTAAAGCTTAGTCGATTCTTGCAAATGAATTTTGTTAAATGTT
64	0.00597	6.768E-07	pHC	AAATTATTTTGCTTTCTATTTCTCCTCTTCGATCTTTCATATTTCATCCTGGTTTCACAA
65	0.006212	7.923E-07	pHC	AGTTTTCTCAGTTATTGAAATGAATCTCTCGAAGTATGTACTTTGGTATGTCCAAAAGTC
66	0.00691	9.303E-07	pHC	AATGAAGTCCCAGGCTTTCGTCTCACGTTCGAATAACAACCAGTTTAAAAACATACTAAA
67	0.007091	0.000001055	pHC	TTTCTAAATTTCCAAGGTTCTTTCCAGTTCGACCAATGAAACTGATTAAGACCATACAAG
68	0.007188	0.000001019	pHC	GCATGAACAACTGTTTTTCACTTTGATTTCGAATTTCTTGACTTTTGACTGGTTGTTTAT
69	0.007265	0.000001132	pHC	GTCACCTATTTTTTCCAACTTAATTTGATCGATTTCTGCATTTCCTTGAACTGAATCTTA
70	0.009917	0.000001616	pHC	AGAAATGAACAACACATTGTAATATACATCGAAACTGTCACTACATTTTACCTAATTTAG
71	0.01048	0.000001781	pHC	CTCAAGAAAGAAAACCTAAGCTTTAAATTCGACTCTAATCTATAAAACTAAGATACTTAA
72	0.01128	0.000001998	pHC	CAACTGAGGAACTGGAACTTCATTAGAGTCGAAGTGCTCTGTGGTGATGCAGCAGGTTGA
73	0.01439	0.00000265	pHC	AGAAGCTGTATGATTTGTAGTAATTCATTCGAATAGTCAGTAGCTGCCTTTGCAAAGATG
74	0.01577	0.000003017	pHC	CCAAAACAGTCCCAAAACAGGAGAGCTCTCGATGGGACTATTGGAAGATTTCTCAGAAGA
75	0.01867	0.000003836	pHC	TGGTGCATAATGAAGACTAAAGCGTTCCTCGATTTAAAAATAGTTTATTTTAATAATGTT
76	0.01927	0.000004641	pHC	TTTCTAAATTTCCAAGGTTCTTTCCAGTTCGAGGCAATTCTAAAGAACAATAAGAGATTA
77	0.01932	0.00000479	pHC	GGTGAGTGGCAGATAGCTGGGAAAACATTCGAGCCAAGCTGAGTGACAGCTTTGTCACGG
78	0.01947	0.000004276	pHC	GCAAGTTGTATGGGAGGTAGTTTAAATATCGAAGTATCTCAAATAACATTTTTGAGAATG
79	0.01965	0.000004594	pHC	GAGAATCAATTCCATTTTTAAAGCTTAGTCGATTAGGATGATGGCAATGGAAATAACAAG
80	0.01985	0.000005064	pHC	AGCTCAGGCAATCCATGCTTGGAGAAAGTCGATAGATGGCAAATTTCTTGATACGGGGAG
81	0.01997	0.000004527	pHC	TTGTGAGGAGCTAAGGGAGACTCACTGATCGAAAAAGATTTATGAACAGAAAAAGGAAAG
82	0.02009	0.00000427	pHC	CAACAAGAACGACTTTCTTTTTTCTTCTTCGACTATGATAATCTTTCTCATTTATAGACC
83	0.02046	0.000005365	pHC	ACTAGCTTGCAAGGATTGTTGCAAAGTTTCGATGAAAGCACAAATAAATAATTAAAGGCA
84	0.02204	0.000006872	pHC	AGCGAATTTAAGGCAGTAATAAGTGCAGTCGAGGCAGTGGGAGTTGAATCCTCTCCCCTC
85	0.0221	0.000007358	pHC	ATTAGGAGTGGGGGCCTTGAGAGGTAATTCGATCTTTTCAAAGAACCACATTTTAGTTTT
86	0.02217	0.000006755	pHC	GAGCTGCAAGGCCTTTTAAAGCTCAGCCTCGATTTGTATTCCACAGAGCTTATCATTCTC
87	0.02237	0.000008085	pHC	AATACTACTTTGCATATATAATAAAGTTTCGAGAATGGACTAATAAACACATGTTTCTGA
88	0.02256	0.000007354	pHC	TCAGTCTAGAACATAACAGAAAATGTCTTCGACTCTTTTTACAAAAGGCCACTTGACATC
89	0.02258	0.000006718	pHC	AATGTACACAACCAGTCATAACCAAGTATCGAAAAGATTTTTACAGAGTTTTCCCCCTTC
90	0.0226	0.000006085	pHC	GGCAGATGGATCACTTGAGGTCAAGAGTTCGAGATGCAGCCAGATCTCGGCGAAGTAAAG
91	0.02263	0.000007217	pHC	CTTATAATGGGTAGAAGCAGACTATCATTCGATAAGAAAAAGAGAGATATCCAAATAAAA
92	0.02278	0.000006294	pHC	TTGGTTAGAGATAAAAACCCTGTAAATGTCGACCAGTGAAATAACTAAAATACTGTGACA
93	0.02297	0.000006673	pHC	AGGCTGATATTTGTTCTTTAGCTGTGTGTCGAATGGTAGAAGGGAGATAATATGGGTGCA
94	0.023	0.000007821	pHC	GCTTACTTGGTCATTAGATCCACAGAGTTCGACTCTTTAACCACACGGCTTGCCTAGTTC
95	0.02313	0.000008685	pHC	GAGGATGAAAATTAAATGACTTTTAATGTCGAGAATTAAACTCAGTTTAAGAGACTGCTA
96	0.02328	0.000008577	pHC	GGCAGGTGGATTGCTTGAGCTCAGGAGTTCGAAAAAGAAAAGAAAAGAACATAACAGAAC
97	0.0234	0.000006633	pHC	GTAGTCCAGGGGAAGAGAAAAATGTGAATCGATAATTGTGAAAGTCACTTCCGCTCTCTG
98	0.02457	0.0000094	pHC	GTACAGTTCCAACGAGCGGAGTGGTGGGTCGAAGCAATATTTAAAAGCTTAGAGGATGTT
99	0.02494	0.00001149	pHC	GCAAGTTGTATGGGAGGTAGTTTAAATATCGAAATCTTCTGATCTATTATTGATGACATG
100	0.02507	0.00000977	pHC	CTGCAGCCCGTAGTTGTGGATGATGGAGTCGATCGTGCAGACAGGAGACAAACAGCAAGA

Table 2.b2

51	chr18	62332438	62332467	62410775	62410804	chr18	62328468	62332467	62410775	62414774
52	chr1	97723529	97723558	97850721	97850750	chr1	97723529	97727528	97846751	97850750
53	chr5	165128730	165128759	165171330	165171359	chr5	165124760	165128759	165171330	165175329
54	chr2	26077136	26077165	26191036	26191065	chr2	26077136	26081135	26187066	26191065
55	chr5	165128730	165128759	165225027	165225056	chr5	165124760	165128759	165221057	165225056
56	chr18	62240630	62240659	62332438	62332467	chr18	62240630	62244629	62328468	62332467
57	chr18	35527440	35527469	35611466	35611495	chr18	35523470	35527469	35607496	35611495
58	chr10	93744247	93744276	93870081	93870110	chr10	93740277	93744276	93870081	93874080
59	chr2	186622413	186622442	186682121	186682150	chr2	186622413	186626412	186682121	186686120
60	chr12	52217957	52217986	52307866	52307895	chr12	52217957	52221956	52307866	52311865
61	chr4	168499902	168499931	168627685	168627714	chr4	168499902	168503901	168627685	168631684
62	chr19	56561560	56561589	56765569	56765598	chr19	56561560	56565559	56761599	56765598
63	chr18	62332438	62332467	62556001	62556030	chr18	62328468	62332467	62556001	62560000
64	chr20	44492932	44492961	44632022	44632051	chr20	44492932	44496931	44628052	44632051
65	chr6	15592303	15592332	15658717	15658746	chr6	15588333	15592332	15658717	15662716
66	chr15	69607443	69607472	69824622	69824651	chr15	69603473	69607472	69820652	69824651
67	chr3	194783858	194783887	194878646	194878675	chr3	194783858	194787857	194878646	194882645
68	chr2	29063787	29063816	29079782	29079811	chr2	29059817	29063816	29079782	29083781
69	chr1	97850721	97850750	97969459	97969488	chr1	97846751	97850750	97969459	97973458
70	chr10	93674998	93675027	93744247	93744276	chr10	93674998	93678997	93740277	93744276
71	chr8	125289726	125289755	125304191	125304220	chr8	125289726	125293725	125304191	125308190
72	chr5	77084815	77084844	77232750	77232779	chr5	77084815	77088814	77232750	77236749
73	chr17	68657498	68657527	68785812	68785841	chr17	68653528	68657527	68785812	68789811
74	chr1	112396886	112396915	112478498	112478527	chr1	112396886	112400885	112478498	112482497
75	chr1	207314653	207314682	207566033	207566062	chr1	207314653	207318652	207566033	207570032
76	chr3	194783858	194783887	194980520	194980549	chr3	194783858	194787857	194980520	194984519
77	chr4	24971633	24971662	25125728	25125757	chr4	24971633	24975632	25125728	25129727
78	chr1	117930270	117930299	117981075	117981104	chr1	117926300	117930299	117977105	117981104
79	chr18	62332438	62332467	62463570	62463599	chr18	62328468	62332467	62459600	62463599
80	chr1	16764581	16764610	17044826	17044855	chr1	16764581	16768580	17044826	17048825
81	chr3	42701257	42701286	42763079	42763108	chr3	42701257	42705256	42763079	42767078
82	chr2	200711318	200711347	200861421	200861450	chr2	200711318	200715317	200861421	200865420
83	chr10	119537443	119537472	119587021	119587050	chr10	119537443	119541442	119587021	119591020
84	chr8	57999758	57999787	58160054	58160083	chr8	57995788	57999787	58156084	58160083
85	chr5	54687075	54687104	54899888	54899917	chr5	54687075	54691074	54895918	54899917
86	chr22	37281163	37281192	37298022	37298051	chr22	37277193	37281192	37294052	37298051
87	chr9	27616983	27617012	27731179	27731208	chr9	27616983	27620982	27731179	27735178
88	chr13	57155091	57155120	57172841	57172870	chr13	57155091	57159090	57172841	57176840
89	chr2	127388557	127388586	127512405	127512434	chr2	127388557	127392556	127512405	127516404
90	chr14	61572912	61572941	61720415	61720444	chr14	61568942	61572941	61720415	61724414
91	chr11	104160851	104160880	104181742	104181771	chr11	104156881	104160880	104177772	104181771
92	chr4	15897459	15897488	15999721	15999750	chr4	15897459	15901458	15999721	16003720
93	chr17	17631400	17631429	17824121	17824150	chr17	17631400	17635399	17824121	17828120
94	chr17	18200987	18201016	18301903	18301932	chr17	18197017	18201016	18297933	18301932
95	chr5	169702016	169702045	169747792	169747821	chr5	169698046	169702045	169743822	169747821
96	chr1	224099300	224099329	224334387	224334416	chr1	224095330	224099329	224330417	224334416
97	chr19	51484260	51484289	51764538	51764567	chr19	51484260	51488259	51764538	51768537
98	chr9	92155388	92155417	92403508	92403537	chr9	92151418	92155417	92403508	92407507
99	chr1	117930270	117930299	118024889	118024918	chr1	117926300	117930299	118024889	118028888
100	chr16	87246413	87246442	87491871	87491900	chr16	87246413	87250412	87487901	87491900

Table 2.b3

51	ORF1_chr18_62330039_62332469_62410773_62412005_FR_1	OBD168-601
52	ORF1_chr1_97723527_97730826_97845524_97850752_RF_1	OBD168-605
53	ORF1_chr5_165127546_165128761_165171328_165175416_FR_1	OBD168-609
54	ORF1_chr2_26077134_26081726_26188355_26191067_RF_1	OBD168-613
55	ORF1_chr5_165127546_165128761_165223844_165225058_FF_1	OBD168-617
56	ORF1_chr18_62240628_62243651_62330039_62332469_RF_1	OBD168-621
57	ORF1_chr18_35525412_35527471_35609926_35611497_FF_1	OBD168-625
58	ORF1_chr10_93741396_93744278_93870079_93871714_FR_1	OBD168-629
59	ORF1_chr2_186622411_186639782_186682119_186696186_RR_1	OBD168-633
60	ORF1_chr12_52217955_52219158_52307864_52312912_RR_1	OBD168-637
61	ORF1_chr4_168499900_168503445_168627683_168631715_RR_1	OBD168-641
62	ORF1_chr19_56561558_56564720_56759775_56765600_RF_1	OBD168-645
63	ORF1_chr18_62330039_62332469_62555999_62562221_FR_1	OBD168-649
64	ORF1_chr20_44492930_44498158_44629984_44632053_RF_1	OBD168-653
65	ORF1_chr6_15591030_15592334_15658715_15661455_FR_1	OBD168-657
66	ORF1_chr15_69599001_69607474_69822688_69824653_FF_1	OBD168-661
67	ORF1_chr3_194783856_194786305_194878644_194884153_RR_1	OBD168-665
68	ORF1_chr2_29059303_29063818_29079780_29082596_FR_1	OBD168-669
69	ORF1_chr1_97845524_97850752_97969457_97975300_FR_1	OBD168-673
70	ORF1_chr10_93674996_93683570_93741396_93744278_RF_1	OBD168-677
71	ORF1_chr8_125289724_125291437_125304189_125311876_RR_1	OBD168-681
72	ORF1_chr5_77084813_77086498_77232748_77239462_RR_1	OBD168-685
73	ORF1_chr17_68654144_68657529_68785810_68796098_FR_1	OBD168-689
74	ORF1_chr1_112396884_112399115_112478496_112485740_RR_1	OBD168-693
75	ORF1_chr1_207314651_207319651_207566031_207567951_RR_1	OBD168-697
76	ORF1_chr3_194783856_194786305_194980518_194987236_RR_1	OBD168-701
77	ORF1_chr4_24971631_24973362_25125726_25129421_RR_1	OBD168-705
78	ORF1_chr1_117925651_117930301_117977839_117981106_FF_1	OBD168-709
79	ORF1_chr18_62330039_62332469_62459933_62463601_FF_1	OBD168-713
80	ORF1_chr1_16764579_16768424_17044824_17050263_RR_1	OBD168-717
81	ORF1_chr3_42701255_42712462_42763077_42767575_RR_1	OBD168-721
82	ORF1_chr2_200711316_200714252_200861419_200863026_RR_1	OBD168-725
83	ORF1_chr10_119537441_119541197_119587019_119594844_RR_1	OBD168-729
84	ORF1_chr8_57997832_57999789_58156560_58160085_FF_1	OBD168-733
85	ORF1_chr5_54687073_54701690_54895820_54899919_RF_1	OBD168-737
86	ORF1_chr22_37276476_37281194_37296506_37298053_FF_1	OBD168-741
87	ORF1_chr9_27616981_27624076_27731177_27739077_RR_1	OBD168-745
88	ORF1_chr13_57155089_57159703_57172839_57181375_RR_1	OBD168-749
89	ORF1_chr2_127388555_127395831_127512403_127514497_RR_1	OBD168-753
90	ORF1_chr14_61568474_61572943_61720413_61722720_FR_1	OBD168-757
91	ORF1_chr11_104153980_104160882_104179897_104181773_FF_1	OBD168-761
92	ORF1_chr4_15897457_15905803_15999719_16002207_RR_1	OBD168-765
93	ORF1_chr17_17631398_17633309_17824119_17825835_RR_1	OBD168-769
94	ORF1_chr17_18194373_18201018_18300185_18301934_FF_1	OBD168-773
95	ORF1_chr5_169694390_169702047_169742878_169747823_FF_1	OBD168-777
96	ORF1_chr1_224094766_224099331_224328317_224334418_FF_1	OBD168-781
97	ORF1_chr19_51484258_51487562_51764536_51772179_RR_1	OBD168-785
98	ORF1_chr9_92152672_92155419_92403506_92407832_FR_1	OBD168-789
99	ORF1_chr1_117925651_117930301_118024887_118028035_FR_1	OBD168-793
100	ORF1_chr16_87246411_87247863_87484414_87491902_RF_1	OBD168-797

Table 2.b4

51	GCCCCTGTCTTCTCTCAACTTCATAG	OBD168-603	CCGAATGGATGGTTGTGTCTGTGTTG
52	TCAGCCTCAGAATGCCAGAGTGACTG	OBD168-607	CGAAGACTCTGACAAACACAGTGGTA
53	GCTGCTATGAGGCATTGTAGAGGAGA	OBD168-611	GAACAGCAGACTTGTGGACCTTATCA
54	AACAGGCAGAGAGGTGGCTTCAGATG	OBD168-615	GAGAAGCAACACCACAAAAGCAGGAA
55	GCTGCTATGAGGCATTGTAGAGGAGA	OBD168-619	GCTCTCTGTCCATTCCTCAGTTTCTC
56	CCCTGTCTTCTCTCAACTTCATAGTC	OBD168-623	TAGCAGGAACTATGTGCCACTGTGCC
57	CCCACTGCTTGGCTTTGGAGGAA	OBD168-627	GCAGAGACTTTCCACCCTGTGCC
58	GCCCCTTTCTGGGAACAACAACG	OBD168-631	GGAGCAAGTAGGGAAGCAGTGGTC
59	ACCCTGTGCCCTTGAGCATACTGAAT	OBD168-635	TGCCTTGTTTCCCCTTTGCCTTTAGC
60	ACCTCGGAGAAGCCTGGCAGACA	OBD168-639	GTGCTTAGTGCCTGGCTCATAGC
61	AGAAAGTGGCAGACTCAGGGTGGAAG	OBD168-643	CCCTTTGCGTTAGGAGTTTCAGATTG
62	GCGAATGTCCCTACAAGTGTGGG	OBD168-647	ACTGGAAGCAAAGGTGCCTGGGC
63	GCCCCTGTCTTCTCTCAACTTCATAG	OBD168-651	CTGATACTGTGTAGGGAGTCTGATGA
64	TACGGCTCCTCCATCTACCCAGC	OBD168-655	CTCCTAAGATAAGTGACTCCTTGTG
65	CGGTAAATCTAAAGGACAATGCTGGT	OBD168-659	GCCACAGACTGAAGAGGATTGGTTCT
66	CCGTTGCTCAAGAACCATCCAGAGTC	OBD168-663	GCAAACTTCAGGCTGTATTGTTCTCG
67	GGTAGATTCCAACTCTGATTCCATTT	OBD168-667	CTTTCCTTCTCTCTTCCTTATTGAGC
68	GCTCATTGGCAGAAGCAGGTTTT	OBD168-671	TGGCAAAGCAACACCCTAAGGAT
69	TCAGCCTCAGAATGCCAGAGTGACTG	OBD168-675	TGAGAAACCACAGCCACAGCAGAAAT
70	CTTTACCCTCAGTTTCCTTATCGGGA	OBD168-679	GCAGAGAGGGAGATGTTGATGGAGGT
71	TAACAACTGCTAACTGGAGACACCA	OBD168-683	ACTTGCTGTCTCGTTTCCTTGCCCC
72	GCAACACTACTCTCTCTCCTTCCTTG	OBD168-687	GCAGTATTCCCTTTACAGTTATTGGT
73	GAGGCAGGCTTTTCGTTCCAGCA	OBD168-691	GAGACATCTTCCCCACTTGCTCGC
74	TACAAAGGGTGAAGGAGAGGAGGTCC	OBD168-695	CCCTATTTTCTCCTGGTCAGCAAGTT
75	CACCTTCCATTGATACTCTCACTTTG	OBD168-699	GCACAAGACCAAAGGATTTATCGCAC
76	CCACGCCTCAGCCAATCACTCCAAAA	OBD168-703	GAAAGCCATTGTCCCAACACCAAGTA
77	CAGTAGTTCTAAAAGAGAGGATGGTA	OBD168-707	GCCAGTAAACCAAGGCTTATTAGGAT
78	GGTTTGGTCGTGAACTGTCAGAAAGG	OBD168-711	CTTTGTATTTCTTTCCTTCAGTCTGG
79	GGGTTCGCATCACATCCCACAGA	OBD168-715	CCCACTCACAGTTTGCTGACCCC
80	TTATCCCCTGTCTGACTTGTTCCCCG	OBD168-719	GCGTTACATCTGTTGTGCCAGCAAAA
81	GGAGTGGGAGTCAGAGAAAGGGTCTT	OBD168-723	CCTCACTTGTGCTTTCTGTTCATCAC
82	CTGAAGCAGACTCTCACTGGAATACA	OBD168-727	ACATAGCAGTGCCCAGGAGAACAAGC
83	GCTCATCCACTTCCTTGCTTGCTTCT	OBD168-731	GATGGCAGGAGTTTATGGAAAGGGCT
84	AACATCAGTCAGGAAAGACAAGGTTC	OBD168-735	TGGTGTGTCCTGGGTTTTGTGGAGCA
85	CTTGTTATGGACCAAATGTCTGGC	OBD168-739	CAGCAGAAGGAAAGAAATAATAAAA
86	GTCCTCCGTCTTCCAACAGGCTA	OBD168-743	AGGCACCATCCTAAGCCCTGGGT
87	GTGTTATTTGTATCTCCTCCTGGC	OBD168-747	ATTATGTGCTTACCCAAAAGAAAT
88	TCAGACATCTCAAAAGCAGCAGTTC	OBD168-751	CTTTTGAACTGCCAAGTGAGGATGT
89	GGAGATGAGGAGCGAAAGAAAGGGTT	OBD168-755	TGTGGTAGGACAGATAGGGAAGAAGG
90	GCCTCAGGGAACGCTTCTTAGGG	OBD168-759	GGAAGTGGCAACTGATGAGCAAGC
91	AGAATACCCTATGATGGAGAGTTCCG	OBD168-763	CCACCTCCCCTACTTTCCCATAACAT
92	CAGATGAGGGCAGTCTTGGGAGA	OBD168-767	CTCTCAGTCCAACTCCCACCGAC
93	GAGATAAAGGTGTGAGCCACTGT	OBD168-771	CATCCCAGACCATCAGCCCCGCT
94	GGAGTGGAGGACTTGATACACCG	OBD168-775	TGGGAGTGGTTTGGGAGGTGTGC
95	TCTATTCTGCTCCTACACAGTGAAAT	OBD168-779	GCAAACTTGTATCCAGTGAAGGC
96	GTAATCCCAGCACTTTGGTAGGC	OBD168-783	GAGGCTTCCTGCTTGCTGGGAGC
97	GCCTGGGCAACAGAGCGAGACTC	OBD168-787	ATTACAATACCCTTGCTTTGGGACAA
98	GTATTCCAAGGCAGTCAATCCTGGGA	OBD168-791	ATTAGTATGTCTGCTGAAGGCACTTA
99	TGAACTGTCAGAAAGGAGGCGAAAGC	OBD168-795	GGAATGACACCTTCAAATGACAAATG
100	CAGGAACTCATCGCCCGTGCGGC	OBD168-799	TGAGACCATTCCAAAGCAGAGGG

Table 2.b5

51	ORF1_chr18_62330039_62332469_62410773_62412005_FR_1	OBD168-601.603
52	ORF1_chr1_97723527_97730826_97845524_97850752_RF_1	OBD168-605.607
53	ORF1_chr5_165127546_165128761_165171328_165175416_FR_1	OBD168-609.611
54	ORF1_chr2_26077134_26081726_26188355_26191067_RF_1	OBD168-613.615
55	ORF1_chr5_165127546_165128761_165223844_165225058_FF_1	OBD168-617.619
56	ORF1_chr18_62240628_62243651_62330039_62332469_RF_1	OBD168-621.623
57	ORF1_chr18_35525412_35527471_35609926_35611497_FF_1	OBD168-625.627
58	ORF1_chr10_93741396_93744278_93870079_93871714_FR_1	OBD168-629.631
59	ORF1_chr2_186622411_186639782_186682119_186696186_RR_1	OBD168-633.635
60	ORF1_chr12_52217955_52219158_52307864_52312912_RR_1	OBD168-637.639
61	ORF1_chr4_168499900_168503445_168627683_168631715_RR_1	OBD168-641.643
62	ORF1_chr19_56561558_56564720_56759775_56765600_RF_1	OBD168-645.647
63	ORF1_chr18_62330039_62332469_62555999_62562221_FR_1	OBD168-649.651
64	ORF1_chr20_44492930_44498158_44629984_44632053_RF_1	OBD168-653.655
65	ORF1_chr6_15591030_15592334_15658715_15661455_FR_1	OBD168-657.659
66	ORF1_chr15_69599001_69607474_69822688_69824653_FF_1	OBD168-661.663
67	ORF1_chr3_194783856_194786305_194878644_194884153_RR_1	OBD168-665.667
68	ORF1_chr2_29059303_29063818_29079780_29082596_FR_1	OBD168-669.671
69	ORF1_chr1_97845524_97850752_97969457_97975300_FR_1	OBD168-673.675
70	ORF1_chr10_93674996_93683570_93741396_93744278_RF_1	OBD168-677.679
71	ORF1_chr8_125289724_125291437_125304189_125311876_RR_1	OBD168-681.683
72	ORF1_chr5_77084813_77086498_77232748_77239462_RR_1	OBD168-685.687
73	ORF1_chr17_68654144_68657529_68785810_68796098_FR_1	OBD168-689.691
74	ORF1_chr1_112396884_112399115_112478496_112485740_RR_1	OBD168-693.695
75	ORF1_chr1_207314651_207319651_207566031_207567951_RR_1	OBD168-697.699
76	ORF1_chr3_194783856_194786305_194980518_194987236_RR_1	OBD168-701.703
77	ORF1_chr4_24971631_24973362_25125726_25129421_RR_1	OBD168-705.707
78	ORF1_chr1_117925651_117930301_117977839_117981106_FF_1	OBD168-709.711
79	ORF1_chr18_62330039_62332469_62459933_62463601_FF_1	OBD168-713.715
80	ORF1_chr1_16764579_16768424_17044824_17050263_RR_1	OBD168-717.719
81	ORF1_chr3_42701255_42712462_42763077_42767575_RR_1	OBD168-721.723
82	ORF1_chr2_200711316_200714252_200861419_200863026_RR_1	OBD168-725.727
83	ORF1_chr10_119537441_119541197_119587019_119594844_RR_1	OBD168-729.731
84	ORF1_chr8_57997832_57999789_58156560_58160085_FF_1	OBD168-733.735
85	ORF1_chr5_54687073_54701690_54895820_54899919_RF_1	OBD168-737.739
86	ORF1_chr22_37276476_37281194_37296506_37298053_FF_1	OBD168-741.743
87	ORF1_chr9_27616981_27624076_27731177_27739077_RR_1	OBD168-745.747
88	ORF1_chr13_57155089_57159703_57172839_57181375_RR_1	OBD168-749.451
89	ORF1_chr2_127388555_127395831_127512403_127514497_RR_1	OBD168-753.755
90	ORF1_chr14_61568474_61572943_61720413_61722720_FR_1	OBD168-757.759
91	ORF1_chr11_104153980_104160882_104179897_104181773_FF_1	OBD168-761.763
92	ORF1_chr4_15897457_15905803_15999719_16002207_RR_1	OBD168-765.767
93	ORF1_chr17_17631398_17633309_17824119_17825835_RR_1	OBD168-769.771
94	ORF1_chr17_18194373_18201018_18300185_18301934_FF_1	OBD168-773.775
95	ORF1_chr5_169694390_169702047_169742878_169747823_FF_1	OBD168-777.779
96	ORF1_chr1_224094766_224099331_224328317_224334418_FF_1	OBD168-781.783
97	ORF1_chr19_51484258_51487562_51764536_51772179_RR_1	OBD168-785.787
98	ORF1_chr9_92152672_92155419_92403506_92407832_FR_1	OBD168-789.791
99	ORF1_chr1_117925651_117930301_118024887_118028035_FR_1	OBD168-793.795
100	ORF1_chr16_87246411_87247863_87484414_87491902_RF_1	OBD168-797.799

Table 2.b6

	Probe	gene.index	RP/Rsum
1	ORF1_8_143363265_143368758_143397073_143399812_RR	137	1022.182606
2	ORF1_X_48750795_48754365_48796124_48801821_FF	136	1020.280557
3	ORF1_4_186172696_186175767_186190828_186192765_FF	56	567.5154132
4	ORF1_1_26201425_26205480_26333363_26336159_FR	26	367.3594761
5	ORF1_2_70887659_70889000_70979229_70981565_FF	218	1455.232994
6	ORF1_2_112539682_112540702_112816387_112823836_RR	414	2408.255424
7	ORF1_12_52037813_52040902_52237944_52243119_FR	269	1762.228575
8	ORF1_11_10562525_10569392_10617125_10621846_RR	40	489.4037173
9	ORF1_2_43086424_43092123_43178166_43179822_FF	43	493.6790445
10	ORF1_17_67419703_67421985_67604580_67609081_RR	47	520.8353844
11	ORF1_19_2777060_2780381_2901738_2905384_RF	45	519.5921477
12	ORF1_17_43300561_43304860_43444308_43448547_RR	436	2506.508269
13	ORF1_15_74686122_74687597_74772372_74779791_FR	58	576.6524083
14	ORF1_10_62056179_62058893_62096285_62100217_RR	63	590.6246291
15	ORF1_15_76885704_76887654_76983002_76985852_RF	533	2890.294194
16	ORF1_11_10637008_10641060_10678778_10685244_FR	81	693.4429129
17	ORF1_3_122768838_122771609_122793452_122794847_FR	563	2999.066738
18	ORF1_5_140242642_140251155_140386390_140387430_FF	83	702.8036709
19	ORF1_2_143119651_143128757_143274179_143284059_FR	528	2861.529024
20	ORF1_7_1769382_1772142_1917082_1921849_RF	223	1465.773343
21	ORF1_13_28585301_28589104_28625877_28627714_FR	112	886.7494008
22	ORF1_11_10637008_10641060_10826892_10830503_FR	110	877.5566621
23	ORF1_17_43300561_43304860_43353578_43358798_RR	133	1018.405989
24	ORF1_18_63921019_63923125_64068334_64074049_RR	474	2662.422604
25	ORF1_20_31989698_31994926_32038678_32045816_RF	554	2973.092177
26	ORF1_11_35040602_35047084_35078579_35084103_FR	290	1888.328908
27	ORF1_18_45762052_45766373_45829537_45837293_FF	477	2676.14117
28	ORF1_22_42713609_42716051_42864112_42866876_FR	127	993.9971762
29	ORF1_21_29039171_29043861_29092829_29094361_FF	119	954.7111896
30	ORF1_X_101616906_101623004_101715574_101717864_FF	622	3249.214339
31	ORF1_16_85533210_85536278_85655930_85660237_FR	259	1702.530556
32	ORF1_16_57546345_57549019_57808053_57811713_RF	138	1026.72489
33	ORF1_20_50192390_50194162_50280026_50281924_RF	326	2050.835647
34	ORF1_2_25155910_25160743_25292182_25293890_FR	640	3317.320304
35	ORF1_7_151781262_151783710_151930364_151932111_RR	350	2142.221032
36	ORF1_2_74503923_74507137_74519716_74521847_RF	164	1139.344398
37	ORF1_6_52573576_52576507_52715481_52719514_FR	307	1975.310453
38	ORF1_10_104325690_104332059_104442837_104447074_RR	383	2255.373656
39	ORF1_11_10376885_10382511_10637008_10641060_RF	154	1086.637744
40	ORF1_19_7270757_7273737_7367544_7370291_FR	160	1122.566671
41	ORF1_6_15165975_15168155_15248586_15249747_RF	266	1736.571207
42	ORF1_1_158181667_158187628_158243613_158252050_FF	162	1130.926813
43	ORF1_11_65044650_65046952_65060361_65063993_FF	234	1538.948472
44	ORF1_6_31267448_31269252_31531115_31534994_RF	157	1095.305893

45	ORF1_17_81104538_81109597_81345804_81351809_RR	602	3166.187603
46	ORF1_3_101887192_101889071_101943010_101950739_RF	388	2281.449083
47	ORF1_4_2639345_2642002_2800083_2804902_RR	233	1534.145351
48	ORF1_9_123259504_123263022_123339568_123345302_FR	181	1242.495673
49	ORF1_3_51243406_51244925_51388915_51391864_FF	355	2161.353049
50	ORF1_8_73772858_73775783_73991731_73996964_RF	172	1188.857634
51	ORF1_7_1901148_1902503_2033188_2038434_RF	362	2193.315447

Table 3.a1

	FC:(class1/class2)	pfp	P.value	Type
1	2.254198009	0.582954788	0.000565875	Early SSC
2	1.926442523	0.585246077	0.000563953	Early SSC
3	1.819576685	0.481315009	0.000190978	Early SSC
4	1.789862545	0.452448159	8.33504E-05	Early SSC
5	1.786660212	0.696259246	0.001075456	Early SSC
6	1.731351133	0.906180999	0.002658157	Early SSC
7	1.72782494	0.79699158	0.001519047	Early SSC
8	1.684693818	0.510408273	0.000144658	Early SSC
9	1.679467596	0.48264036	0.000147047	Early SSC
10	1.665042972	0.488329576	0.000162621	Early SSC
11	1.66364181	0.507750192	0.000161893	Early SSC
12	1.646347341	0.924029095	0.002854548	Early SSC
13	1.632056892	0.478789454	0.00019676	Early SSC
14	1.623263928	0.460927015	0.000205749	Early SSC
15	1.61294807	0.97372438	0.003677295	Early SSC
16	1.579010636	0.483049755	0.000277231	Early SSC
17	1.57167124	0.984233204	0.003926193	Early SSC
18	1.57069125	0.483257957	0.000284199	Early SSC
19	1.560692362	0.965656771	0.003612618	Early SSC
20	1.542279296	0.689591095	0.001089587	Early SSC
21	1.535126946	0.549667601	0.000436198	Early SSC
22	1.527885593	0.549057283	0.000427933	Early SSC
23	1.526693744	0.59643941	0.000562061	Early SSC
24	1.518323432	0.946326887	0.003178226	Early SSC
25	1.513503028	0.984923145	0.003866138	Early SSC
26	1.503017029	0.837079106	0.001720005	Early SSC
27	1.500622056	0.949008348	0.003207404	Early SSC
28	1.497953885	0.597522112	0.000537679	Early SSC
29	1.496480575	0.592329774	0.000499431	Early SSC
30	1.489761392	1.026554835	0.004524158	Early SSC
31	1.487826891	0.777966877	0.001427664	Early SSC
32	1.482472871	0.583437831	0.000570478	Early SSC
33	1.478605452	0.863503709	0.00199456	Early SSC
34	1.477688489	1.034924223	0.004693035	Early SSC
35	1.477264434	0.869597722	0.002156511	Early SSC
36	1.475249588	0.593584457	0.00068975	Early SSC

37	1.475130467	0.857292939	0.001864803	Early SSC
38	1.469690742	0.871292473	0.002364438	Early SSC
39	1.467937731	0.579847865	0.000632703	Early SSC
40	1.467830037	0.592200913	0.000671358	Early SSC
41	1.466878812	0.784983374	0.001479474	Early SSC
42	1.465675235	0.592850241	0.000680496	Early SSC
43	1.465342374	0.717660029	0.001189871	Early SSC
44	1.463447732	0.577069248	0.000641938	Early SSC
45	1.459551418	1.013212781	0.004321778	Early SSC
46	1.458144163	0.877911423	0.002413502	Early SSC
47	1.45177916	0.716682261	0.001183172	Early SSC
48	1.449946912	0.629677907	0.000807537	Early SSC
49	1.449756998	0.871099423	0.002191096	Early SSC
50	1.449681428	0.611542481	0.000745282	Early SSC
51	1.447185412	0.876984215	0.002249394	Early SSC

Table 3.a2

	60 mer
1	GGGTCTCCCCATATTGCCTAGGCTGGTCTCGAGGGAACTCCCTCCCCGCACCCCCAGCAT
2	CAGTCCAGTCTGAGTGACTCTAGCGATGTCGACTGCCCGCCCAGATCCCGCCTCCAGAGG
3	ACGGAGTGGAAGGAGCTGCAACTTTCCATCGAGTTCGCCCTCCCTGACAGGGAGTTGTAA
4	GGGTTTCACCATGTTGGTCAGGCTGGTCTCGAGGCCAGCCTGACCAACATGAAGAAACCC
5	CGCGGCCGTCAGAGGGCGCGGCCTACACTCGATCTTATCCTTTGACCTTGCCCACTCTTT
6	AATGCGCAGTCTTCTTTCCTTCCTTTTGTCGAACTCCTAACCTTGTGATCTACCCGCCTC
7	CTGGTCCTGCCCTCACTCTGGTGCGTAGTCGAGCCAGCATGAGCTCTCTGTTCCTGCAGA
8	ATACACAGGATAGATTTCAAGATCATTCTCGATGTACTTCTCTGCCTCAGCCTACGTGTC
9	GGATTTCTCCGTGTTGGCCAGGCTGGTCTCGAGACGACCCTGGCCAACAAGGAGAAACCC
10	GGGTTTCGCCATGTTGGCCAAGCTGGTCTCGAGACCAGCCTTGCCAACATGGTGAAACCC
11	GGGTTTCATCATGTTGGCCAGGCTGGTCTCGAGACCAGCCTGACCAACAGGTGAAACCCA
12	TCTCTTCCGGTTCTGTCTTTTCGCTGGCTCGAACAACAAATTGTTAAGTGAATGGAATGC
13	GGGTTTCACCATGTTGGCCAGACTGATCTCGAGACGATCCCGGCCAACATGGTGAAACCC
14	ACTGTAGGCAGACAGGGAACTTGGCATATCGAGGTGGTCCCACAAAAATATTTTATGTAG
15	TGGAGAAAACTGGTGGACACTACTTTAATCGAACTATTGGGCTCAAGCAATCCACCCACC
16	GGACATAACTGTATTCTCTCTCTCTCTCTCGAAGCTTTTTCCTGGGGCAGATTCTGCCTG
17	CATGATGCATAAACTCTAAACAGGTCTTTCGAGAAATGCCACGCTCACTAGAAAATATAG
18	GGGTTTCACCATGTTGGCCAGGCTGGTCTCGAGACCAGACTGGCCAACATAGTGAAACCC
19	CAGTCACAGCAAATGCCACAGGGTGTGTTCGAGGAAAAGTGGCAAATGTCTCTCTACTCC
20	TGATCTGGAAAAAAAATCAATTTAGATCTCGAAGCTGTCATCTGTGGGCGCGGGTTGAGC
21	GGATTTATCCGTGTTGGTCAGGCTGGTCTCGAGACAAGCCTGACTAACATGGTAAAACCC
22	GGACATAACTGTATTCTCTCTCTCTCTCTCGAGCAGGATGTGGAACAGACATCATGAGCC
23	TCTCTTCCGGTTCTGTCTTTTCGCTGGCTCGAGATAAGTGGACCCAGCTGTTTATTCCCA
24	CAGACTTTGGAACTAAGCTGACTTATATTCGAGATGGAGTTTTGCTCTTTTTGCCCAGGC
25	GGCAGGTGGACCACCTGAGGTCAGGAGTTCGAACTCCTGGACTCAAGTGATCTTCCCACC
26	GTAACAGCAGCAATGGCAGTGGTGGTGATCGAAATGCCCATGAAGTGAGCCAAAACTTTG
27	ACAACAACAAAAAAGAACCAAATAGTGATCGACTTGGGAGTGCCTGCGTTCCCGCGGCTC
28	GGGTTTCTCCATGTTGGTCAGGCTGGTCTCGAGACCAGTCTGACCAACATGGTGAAACCC

29	TTTGTAGTAAGTTTAATTAACTTAATTTTCGATACTTCCCCTGGGTGACTCTGACAGATG
30	GAAACACAACTACAAGGTGATGAGATTATCGATGGGGAGAGTCCAAGGATTTTAGCTGTG
31	TAGGGAAGTGGGTGGTGCTCAGGAGGTGTCGAGCCGAGGAGCCCCTCTGCCCTCCCTGTC
32	GGCAGGTGGATCATTTGAGGTCAGGAGTTCGAATTCCTGAGCTCAAATGATCCTCCTGCC
33	CACACCACCGTTGGGATGAAAGATGGCCTCGAAGTTGATGCAATCGGTTTAAACATGGCT
34	TGTGCCTTCACCCAAACTATCTGATCCCTCGACCCTTAAAAAAAAAAAATTAGCCAGGCAT
35	CCTACCAGGAGTCCCCGCCACGCTCCCCTCGACGATGACACCATAACCCTGGCAACAAAA
36	TCCCTTGCTCTCTCTCTGTCTCTCAGATTCGAGCTCTTCTTCGGCGTCTGCAGCCTCTTC
37	AAGCCATGGTGGCAGCGCGGCGGTTGGTTCGAGTATCAGATAAATGAAAATGCTGAGACT
38	TGGACTCGGGGTGCCCGGTTCCACCCACTCGAAGTGATGGAACTCATAGGACCAGCTCAA
39	GGACATAACTGTATTCTCTCTCTCTCTCTCGAATTCCTGACCTCGGCCTTCCAAAGTGCT
40	GGATTTCATCATGTTGGCCAGGCTGGTCTCGAGACCAGTCTGGCCAACATGGTAAAACCC
41	TAGCAAAGCAGAGTTGGGGGTGCGATTGTCGAGGCCTAACAATTTTCCAGGGTCCAAAGG
42	AGGTTTCACCATGTTGGCCAGGCTGGTCTCGAGACCAACCTGGCCAACATGGTGCAACCC
43	CAACGCTCACGCCAATGGTCTGAGTTAATCGAATGCATCCTGGCCATGGTTCTGCAGCTC
44	TGGTGAGCAGAAGGCTCCAGCTGTACGCTCGATTCCTGTTTTCCCTTCTGCCTCCCTCGT
45	TTGCGCTCCAGGCCGGCTGCCATGGAGCTCGACCGCCAGGGCCCGCGTCCTCTCCCCGGC
46	AACAAGGACTTAAGTGTGTCCACTTATGTCGAGCAATCCTTCTGCCTCAGCCTCCTGAGT
47	TTCAAACAGTTTAGATACATCAAGTCCCTCGAGGCTGCAGAAGGCTGGGTGGGAGTGGAG
48	CTCTCAATAAAGTTTTCTAAAATTAGACTCGATGGTTCCCTATTACCCTCTGCCCGCAGC
49	GATGTCTTGGTTTTTCCATGAGAAACATTCGAGGTGCTCGGCGGGCAGCGCGGGGCTCAA
50	GGGTTTCACCATGTTGGTCAGGCTGGTCTCGAGACCAGCCTGAGCAACATGAAGAAACCC
51	TAGGGCTTTTACAGTTACAGAGGAGAAGTCGACGGAGTCGGTTCAGTTTGGGGCAGATCA

Table 3.a3

		Probe Location			
		Start1	End1	Start2	End2
1	8	143363267	143363296	143397075	143397104
2	X	48754334	48754363	48801790	48801819
3	4	186175736	186175765	186192734	186192763
4	1	26205449	26205478	26333365	26333394
5	2	70888969	70888998	70981534	70981563
6	2	112539684	112539713	112816389	112816418
7	12	52040871	52040900	52237946	52237975
8	11	10562527	10562556	10617127	10617156
9	2	43092092	43092121	43179791	43179820
10	17	67419705	67419734	67604582	67604611
11	19	2777062	2777091	2905353	2905382
12	17	43300563	43300592	43444310	43444339
13	15	74687566	74687595	74772374	74772403
14	10	62056181	62056210	62096287	62096316
15	15	76885706	76885735	76985821	76985850
16	11	10641029	10641058	10678780	10678809
17	3	122771578	122771607	122793454	122793483
18	5	140251124	140251153	140387399	140387428
19	2	143128726	143128755	143274181	143274210

20	7	1769384	1769413	1921818	1921847
21	13	28589073	28589102	28625879	28625908
22	11	10641029	10641058	10826894	10826923
23	17	43300563	43300592	43353580	43353609
24	18	63921021	63921050	64068336	64068365
25	20	31989700	31989729	32045785	32045814
26	11	35047053	35047082	35078581	35078610
27	18	45766342	45766371	45837262	45837291
28	22	42716020	42716049	42864114	42864143
29	21	29043830	29043859	29094330	29094359
30	X	101622973	101623002	101717833	101717862
31	16	85536247	85536276	85655932	85655961
32	16	57546347	57546376	57811682	57811711
33	20	50192392	50192421	50281893	50281922
34	2	25160712	25160741	25292184	25292213
35	7	151781264	151781293	151930366	151930395
36	2	74503925	74503954	74521816	74521845
37	6	52576476	52576505	52715483	52715512
38	10	104325692	104325721	104442839	104442868
39	11	10376887	10376916	10641029	10641058
40	19	7273706	7273735	7367546	7367575
41	6	15165977	15166006	15249716	15249745
42	1	158187597	158187626	158252019	158252048
43	11	65046921	65046950	65063962	65063991
44	6	31267450	31267479	31534963	31534992
45	17	81104540	81104569	81345806	81345835
46	3	101887194	101887223	101950708	101950737
47	4	2639347	2639376	2800085	2800114
48	9	123262991	123263020	123339570	123339599
49	3	51244894	51244923	51391833	51391862
50	8	73772860	73772889	73996933	73996962
51	7	1901150	1901179	2038403	2038432

Table 3.a4

		4 kb Sequence Location			
		Start1	**End1**	**Start2**	**End2**
1	8	143363267	143367266	143397075	143401074
2	X	48750364	48754363	48797820	48801819
3	4	186171766	186175765	186188764	186192763
4	1	26201479	26205478	26333365	26337364
5	2	70884999	70888998	70977564	70981563
6	2	112539684	112543683	112816389	112820388
7	12	52036901	52040900	52237946	52241945
8	11	10562527	10566526	10617127	10621126
9	2	43088122	43092121	43175821	43179820
10	17	67419705	67423704	67604582	67608581

11	19	2777062	2781061	2901383	2905382
12	17	43300563	43304562	43444310	43448309
13	15	74683596	74687595	74772374	74776373
14	10	62056181	62060180	62096287	62100286
15	15	76885706	76889705	76981851	76985850
16	11	10637059	10641058	10678780	10682779
17	3	122767608	122771607	122793454	122797453
18	5	140247154	140251153	140383429	140387428
19	2	143124756	143128755	143274181	143278180
20	7	1769384	1773383	1917848	1921847
21	13	28585103	28589102	28625879	28629878
22	11	10637059	10641058	10826894	10830893
23	17	43300563	43304562	43353580	43357579
24	18	63921021	63925020	64068336	64072335
25	20	31989700	31993699	32041815	32045814
26	11	35043083	35047082	35078581	35082580
27	18	45762372	45766371	45833292	45837291
28	22	42712050	42716049	42864114	42868113
29	21	29039860	29043859	29090360	29094359
30	X	101619003	101623002	101713863	101717862
31	16	85532277	85536276	85655932	85659931
32	16	57546347	57550346	57807712	57811711
33	20	50192392	50196391	50277923	50281922
34	2	25156742	25160741	25292184	25296183
35	7	151781264	151785263	151930366	151934365
36	2	74503925	74507924	74517846	74521845
37	6	52572506	52576505	52715483	52719482
38	10	104325692	104329691	104442839	104446838
39	11	10376887	10380886	10637059	10641058
40	19	7269736	7273735	7367546	7371545
41	6	15165977	15169976	15245746	15249745
42	1	158183627	158187626	158248049	158252048
43	11	65042951	65046950	65059992	65063991
44	6	31267450	31271449	31530993	31534992
45	17	81104540	81108539	81345806	81349805
46	3	101887194	101891193	101946738	101950737
47	4	2639347	2643346	2800085	2804084
48	9	123259021	123263020	123339570	123343569
49	3	51240924	51244923	51387863	51391862
50	8	73772860	73776859	73992963	73996962
51	7	1901150	1905149	2034433	2038432

Table 3.a5

	Probe	Primer ID
1	ORF1_8_143363265_143368758_143397073_143399812_RR	OBD168-989
2	ORF1_X_48750795_48754365_48796124_48801821_FF	OBD168-2109

3	ORF1_4_186172696_186175767_186190828_186192765_FF	OBD168-669
4	ORF1_1_26201425_26205480_26333363_26336159_FR	OBD168-1729
5	ORF1_2_70887659_70889000_70979229_70981565_FF	OBD168-701
6	ORF1_2_112539682_112540702_112816387_112823836_RR	OBD168-889
7	ORF1_12_52037813_52040902_52237944_52243119_FR	OBD168-1141
8	ORF1_11_10562525_10569392_10617125_10621846_RR	OBD168-1221
9	ORF1_2_43086424_43092123_43178166_43179822_FF	OBD168-1905
10	ORF1_17_67419703_67421985_67604580_67609081_RR	OBD168-1465
11	ORF1_19_2777060_2780381_2901738_2905384_RF	OBD168-1873
12	ORF1_17_43300561_43304860_43444308_43448547_RR	OBD168-1437
13	ORF1_15_74686122_74687597_74772372_74779791_FR	OBD168-1841
14	ORF1_10_62056179_62058893_62096285_62100217_RR	OBD168-905
15	ORF1_15_76885704_76887654_76983002_76985852_RF	OBD168-705
16	ORF1_11_10637008_10641060_10678778_10685244_FR	OBD168-865
17	ORF1_3_122768838_122771609_122793452_122794847_FR	OBD168-1609
18	ORF1_5_140242642_140251155_140386390_140387430_FF	OBD168-1641
19	ORF1_2_143119651_143128757_143274179_143284059_FR	OBD168-1061
20	ORF1_7_1769382_1772142_1917082_1921849_RF	OBD168-2053
21	ORF1_13_28585301_28589104_28625877_28627714_FR	OBD168-1393
22	ORF1_11_10637008_10641060_10826892_10830503_FR	OBD168-569
23	ORF1_17_43300561_43304860_43353578_43358798_RR	OBD168-1433
24	ORF1_18_63921019_63923125_64068334_64074049_RR	OBD168-1481
25	ORF1_20_31989698_31994926_32038678_32045816_RF	OBD168-1953
26	ORF1_11_35040602_35047084_35078579_35084103_FR	OBD168-1085
27	ORF1_18_45762052_45766373_45829537_45837293_FF	OBD168-757
28	ORF1_22_42713609_42716051_42864112_42866876_FR	OBD168-1965
29	ORF1_21_29039171_29043861_29092829_29094361_FF	OBD168-697
30	ORF1_X_101616906_101623004_101715574_101717864_FF	OBD168-977
31	ORF1_16_85533210_85536278_85655930_85660237_FR	OBD168-1117
32	ORF1_16_57546345_57549019_57808053_57811713_RF	OBD168-1861
33	ORF1_20_50192390_50194162_50280026_50281924_RF	OBD168-849
34	ORF1_2_25155910_25160743_25292182_25293890_FR	OBD168-557
35	ORF1_7_151781262_151783710_151930364_151932111_RR	OBD168-765
36	ORF1_2_74503923_74507137_74519716_74521847_RF	OBD168-1541
37	ORF1_6_52573576_52576507_52715481_52719514_FR	OBD168-773
38	ORF1_10_104325690_104332059_104442837_104447074_RR	OBD168-1353
39	ORF1_11_10376885_10382511_10637008_10641060_RF	OBD168-573
40	ORF1_19_7270757_7273737_7367544_7370291_FR	OBD168-1489
41	ORF1_6_15165975_15168155_15248586_15249747_RF	OBD168-737
42	ORF1_1_158181667_158187628_158243613_158252050_FF	OBD168-1325
43	ORF1_11_65044650_65046952_65060361_65063993_FF	OBD168-837
44	ORF1_6_31267448_31269252_31531115_31534994_RF	OBD168-805
45	ORF1_17_81104538_81109597_81345804_81351809_RR	OBD168-1869
46	ORF1_3_101887192_101889071_101943010_101950739_RF	OBD168-1981
47	ORF1_4_2639345_2642002_2800083_2804902_RR	OBD168-1997
48	ORF1_9_123259504_123263022_123339568_123345302_FR	OBD168-529
49	ORF1_3_51243406_51244925_51388915_51391864_FF	OBD168-1605

50	ORF1_8_73772858_73775783_73991731_73996964_RF	OBD168-2089
51	ORF1_7_1901148_1902503_2033188_2038434_RF	OBD168-1677

Table 3.a6

	Sequence	Primer ID	Sequence
1	CAGGCTGTCTCATTCTGTTGCCC	OBD168-991	GCCACATACAGTCAGGGTCCAGC
2	TTAGGAGTGTCCCAAACCCCC	OBD168-2111	TTTACGTAGGCGCAGCACAGC
3	AAGAAACAAAGCGAGGCAAGGTGACG	OBD168-671	AGGCAGACTTCTTTGGAGGGTGTCAA
4	ATCTTGGCTCACTGCAACCTCC	OBD168-1731	GCTGGAGTGCAATGGCGCAATC
5	TCGCTCATTCCTCCCGACCAAGG	OBD168-703	CTGAAGACAGAGTGAGCCAGCCA
6	TCATCATACTTCTCCCTTTCCAATCT	OBD168-891	TCTGCCAGCCCTAATCCCTCTGAATA
7	CCTCCTCCTCTTTGCCCCTCCTA	OBD168-1143	GGTGAAGATGGTGTCTGAGCCTC
8	GACACCTGGAGGGCAGCACTGAT	OBD168-1223	GGTAGTTGGCTATCTGGACCTGG
9	TGGCACAGTCTCAGCTCACTG	OBD168-1907	TCTCGTTCTGTTGCCCAGGCT
10	CTGGGTCTCCAGCCTCACTCAGG	OBD168-1467	CTGGAGTGCAGTGGCAAGTTCTC
11	GTCTTGCTTTGTTGCTCAGGTTGGAG	OBD168-1875	GCGCCTGGTCTTTTTTTTTTTTCTG
12	CGGGTACGGGGCCGGTCTCCCCGCCC	OBD168-1439	AAACGAAGACATGAGTCACTAGTAAG
13	CTCACTGCAACTTCTGCCTCCCAG	OBD168-1843	ATCCTTTTTTTTTTTTTCTGAGAC
14	TTGCCACCCAAGAGTGATGCGGG	OBD168-907	GGCTGACCACCACCAAATGTGAC
15	CTCAAAGGATTTCCCCACAAGATACT	OBD168-707	GCTTTTCTTTGTTTGGTAGGGTTATG
16	GGATAAAGCACAGGATGCCCCAGTTA	OBD168-867	GAAGGTGACAGAAGACCCAGAAAAGG
17	CTGAGCTTGCTTTTAATTATTATAAA	OBD168-1611	CCTGAGTACAAACCCAATGCCAGTTG
18	ATGATCTAGGCTCACTGCAAACT	OBD168-1643	TGCCTCCTGGGTTCAAGCGATTC
19	TGGACACATCCGTATGAGAGCCACAG	OBD168-1063	AACAGCCAGGCACCATTGAACATTTC
20	TAAATGAAATTAAAAAAAACAAA	OBD168-2055	CTCGGCTCCGCAAAGACATTCTG
21	GAGTTTCACTCTTGTTGCCCA	OBD168-1395	CGCTCTGTCATGCAGGCTGAA
22	GGATAAAGCACAGGATGCCCCAGTTA	OBD168-571	TACACTGTCTCACATTTCTCCCTGGC
23	CGTCCCCTCGTCCCCTCGGGT	OBD168-1435	AGAGACTCTTGTTACAACCCA
24	TCATTAATATTCATTAATGAC	OBD168-1483	ACTGGAGCATGCCTGTAATCC
25	AGCCAGACAGATCCTGTGAAAAGAT	OBD168-1955	ATGCCTGGAATCCCAACATTTTGGG
26	GACTGGAGTGCTCTGCTCATCTC	OBD168-1087	CACCCAAAGTCCCCACCTGCTCA
27	CCTACCATTGCCCACTTGAGAGGG	OBD168-759	TCCACAGGGCAGGTTTTGATGGG
28	CCTGCGTTCAAGCGATTCTTCTG	OBD168-1967	TGGGTTCAAGCGATTCTCCTGCC
29	GCTATTGAGTTTGTAGTCTGAATGAC	OBD168-699	GCAGTGGGTTCTCAAATGTTAGCATC
30	CGTCCCTTTCTGGTAATCGGTGGAAG	OBD168-979	CTTCATTTCCATTTCCTGACACACAG
31	GGTCACCAACAAGGCTTCTGTGG	OBD168-1119	AGTCCAGTCAGGTTCCAGCCCAG
32	GGGTATGGAGTGCATACCTATGGTC	OBD168-1863	AGACAAGAGCTGATTTTCCCATTAT
33	CTTGAAGGCGGATTCCTCCAGGT	OBD168-851	GTGGGTTGCGTCAGTCCCGTGTA
34	TCAGTGGAGTGTGTGGAAAATACGGC	OBD168-559	CCCTTCTTACCAAACCTGTCACCCTA
35	GCTCTCCCAAAACCGTGTTCCCG	OBD168-767	CCCTGTTTCTGTCCTCCTCCACT
36	GCTCTCTCTCTCTCCCTCTCTTTCCC	OBD168-1543	AGAGTGAGTACAGCGAAGGCGGCCTC
37	TGGACGCCAGAAAGGGAACCCCA	OBD168-775	AGAATCACTCAGCCGAGCCCTTC
38	GCATCCCACTCAGTCAGTCTGGGC	OBD168-1355	AACTATGCCCATCGTATTTTACCA
39	GGATAAAGCACAGGATGCCCCAGTTA	OBD168-575	GTCACACAACAGAGACAGACTTGATA
40	GGTTCAAGCAATTCTCCTGCCTCAG	OBD168-1491	TCCTGGGTTCAAGTGAGTCTCCTGC
41	CGGGATGCCTGCTGAGTTGCCAT	OBD168-739	CCGCTGAGGTCTAAGGGTTTCCA

42	GGCGTGGTCTCGGCTCACTGCA	OBD168-1327	CGGCTCACTGCAACCTCCGCCT
43	GCATCAAACAGGGAGGTGCCAGC	OBD168-839	CCTCAGGACAGCCAGTGAAGGAT
44	TGTCCCTCTCTTGCTCTCCTGCC	OBD168-807	CTCTGATGGCTGTGCTGAGGACA
45	CCCCCGAGAAACACTCACATCTTGG	OBD168-1871	CCCCGGGGCTCCTGCCCGGACGGCG
46	TCTCAGTAACTTACATTTTCAGTTTG	OBD168-1983	AATCCCAACACTTTGGGAGGCCGAGG
47	CTAAAATGGCAAGTTTAGAAGGGC	OBD168-1999	GTCTGCCAGAAAAGCCAGCCAAGG
48	CACTTGGTCACCTCACTATTCAATGC	OBD168-531	CGGTTCGCTTTCCCCTGGTTATGC
49	TTCTGATCTTAGAGGAAATGCTTTC	OBD168-1607	GACGCGGCGGCAAGGCCTCGGGGGA
50	CCTCAGCCTTCTGAGTAGCAGGGATT	OBD168-2091	TTCTTTTGACAGAATCTCACTCTTAC
51	ACCAATGAAGGTGGCCACACTAAAC	OBD168-1679	CCAGAGGAACCCCGGGCTCTTGGCT

Table 3.a7

	qPCR Primer ID	Sequence	qPCR Primer ID
1	OBD168-q989	GGAGGAGGCTGGTGGAGACCCTGTTGGA	OBD168-q991
2	OBD168-q2109	GTGTGATTTCAGGGGTGCCTGCC	OBD168-q2111
3	OBD168-q669	TGAAGAAACAAAGCGAGGCAAGGTGACG	OBD168-q671
4	OBD168-q1729	GATCTTGGCTCACTGCAACCT	OBD168-q1731
5	OBD168-q701	TCGCCCCTCGCTCATTCCTCCCGACCAA	OBD168-q703
6	OBD168-q889	TCATCATACTTCTCCCTTTCCAATCTGA	OBD168-q891
7	OBD168-q1141	GGCAAAGGTCAGGTGGGTGAGGAAGCCC	OBD168-q1143
8	OBD168-q1221	GGAGGGCAGCACTGATTTGTTCGTGGTC	OBD168-q1223
9	OBD168-q1905	GGCCTCCCGAGTAGCTGGGATTACAA	OBD168-q1907
10	OBD168-q1465	TGCCTCAGCCTCCCGAGTAGCT	OBD168-q1467
11	OBD168-q1873	TTCAAGCGATTCTTCTGCCTCAGCCT	OBD168-q1875
12	OBD168-q1437	GCGGGCGGCGAAGTAAAGGCCCA	OBD168-q1439
13	OBD168-q1841	TCTCCTTCCTCAGCCTCCTGAG	OBD168-q1843
14	OBD168-q905	GCTGTTTGCCACCCAAGAGTGATGCGGG	OBD168-q907
15	OBD168-q705	ATAACAGAAGGGAACAGAAGCCACCC	OBD168-q707
16	OBD168-q865	CACACGCATCCCTGCTCCCATTCTGAG	OBD168-q867
17	OBD168-q1609	TATAAAAAGGGGTCCTAAAATAGTT	OBD168-q1611
18	OBD168-q1641	CAATTCTCCCATCTCAGCCTCCCGAG	OBD168-q1643
19	OBD168-q1061	CCAGAGTGGACACATCCGTATGAGAGCC	OBD168-q1063
20	OBD168-q2053	AATACAGACCCGATTTTGCCT	OBD168-q2055
21	OBD168-q1393	TCTTCTGCCTCGGCCTCTGGA	OBD168-q1395
22	OBD168-q569	CACACGCATCCCTGCTCCCATTCTGAG	OBD168-q571
23	OBD168-q1433	GTACGGGGCCGGTCTCCCCGCCCG	OBD168-q1435
24	OBD168-q1481	AATTAATCTTCATTAAGTCATG	OBD168-q1483
25	OBD168-q1953	AGATCCTGTGAAAAGATAAGCCAGTT	OBD168-q1955
26	OBD168-q1085	CCCACCTCCTAACCATCACCTCCTCTCC	OBD168-q1087
27	OBD168-q757	CTTTGCGTGTCTGTGGCTCTGTGGCTCC	OBD168-q759
28	OBD168-q1965	TTTCGCTCTTTTTGCCCAGGCTGGA	OBD168-q1967
29	OBD168-q697	GCTATTGAGTTTGTAGTCTGAATGACAT	OBD168-q699
30	OBD168-q977	TGCCGTCCCTTTCTGGTAATCGGTGGAA	OBD168-q979
31	OBD168-q1117	CTGACGGGCATTCATTGGGCACCTGCTG	OBD168-q1119
32	OBD168-q1861	CTGGGTATGGAGTGCATACCTAT	OBD168-q1863
33	OBD168-q849	GCTTGCTTGAAGGCGGATTCCTCCAGG	OBD168-q851

34	OBD168-q557	GACAGTCCAGAGCACTCCCAGGCGTGG	OBD168-q559
35	OBD168-q765	TACAGGGCAGGAGGCAGCGTGTCCAGAG	OBD168-q767
36	OBD168-q1541	TCCCTCTCTTTCCCTCTCCCTCTCTC	OBD168-q1543
37	OBD168-q773	ACTGCGGGTCTGGGAGTCTCTGGGCTT	OBD168-q775
38	OBD168-q1353	ACAGGCCTTACTCTAATACCAAGCGC	OBD168-q1355
39	OBD168-q573	GATTTCTGGATAAAGCACAGGATGCCCC	OBD168-q575
40	OBD168-q1489	TCTGGGGTTCAAGCAATTCTCCTG	OBD168-q1491
41	OBD168-q737	CGGGATGCCTGCTGAGTTGCCATTTAGT	OBD168-q739
42	OBD168-q1325	CAACCTCCACCTCCTGGGTTCAAGT	OBD168-q1327
43	OBD168-q837	GGCTTGGGATGGGAAGTGGGAGAAGGTG	OBD168-q839
44	OBD168-q805	CGCTGCCGCCATCCACCGCTGGGT	OBD168-q807
45	OBD168-q1869	TAATGAGGTCACCCTCCTTGAA	OBD168-q1871
46	OBD168-q1981	GACCTTCTCAGTAACTTACATTT	OBD168-q1983
47	OBD168-q1997	AGACAGGGTGACAGGTGTGCA	OBD168-q1999
48	OBD168-q529	GTGGAGAGTCTGTTGTGAGGCAGGCAC	OBD168-q531
49	OBD168-q1605	ATTTCTGATCTTAGAGGAAATGCT	OBD168-q1607
50	OBD168-q2089	ATCTTGGCTCACAGCAGTCTCTG	OBD168-q2091
51	OBD168-q1677	GTCCCCATCACATAAAAGTAC	OBD168-q1679

Table 3.a8

	Sequence	qPCR Probe
1	AAGAGCAGGGCTGGAGGCAGGCG	OBD168-p989
2	GAGCTCGCGGTGTGGCTCAGCCC	OBD168-p2109
3	GCCGCCCTCCTCTCGCTGCCACT	OBD168-p669
4	CTCTTGTTGCCTAGGCTGGAG	OBD168-p1729
5	GGAACCTGAAGACAGAGTGAGCCAGCC	OBD168-p701
6	TTCTGCCAGCCCTAATCCCTCTGAATAC	OBD168-p889
7	CCAGCCCCGCTCCCAGAGATGGA	OBD168-p1141
8	GGCTATCTGGACCTGGATTTTGAGGGAC	OBD168-p1221
9	GCAGTGGGGCAATCTTGGCTTACTGC	OBD168-p1905
10	CGCCTCCTGGGTTCAAGTGATT	OBD168-p1465
11	CTCTTATTGCCCAGGCTGGAGTACAG	OBD168-p1873
12	GAAGACATGAGTCACTAGTAAGG	OBD168-p1437
13	ATATCAGCTCACTGCAACCTCT	OBD168-p1841
14	CCAGATGCGACTTGGCTGACCACCACC	OBD168-p905
15	GCTTTTCTTTGTTTGGTAGGGTTATGAT	OBD168-p705
16	CAGAAGGTGACAGAAGACCCAGAAAAGG	OBD168-p865
17	GGAGGAAGGTAGGTGCCAGGCTGAG	OBD168-p1609
18	AGCTCACTGTAACCTCTGCCTCCTGG	OBD168-p1641
19	GCTTGTGTGGAACAGCCAGGCACCATTG	OBD168-p1061
20	CACAGACACCGACCGGAACGG	OBD168-p2053
21	GTGTGGTGGCGCCATCTCAGC	OBD168-p1393
22	GTTACACTGTCTCACATTTCTCCCTGGC	OBD168-p569
23	TGGAAACCAAAGACTCCCTTCCCC	OBD168-p1433
24	GAGTTCAAGACCAGCCTGACCA	OBD168-p1481
25	TGTGGCGGCTCATGCCTGGAATCCCA	OBD168-p1953

26	GTCACCCAAAGTCCCCACCTGCTCATAC	OBD168-p1085
27	ACGGAGAACTTGCTCAACACAGAGGTGC	OBD168-p757
28	CCTGGGTTCAAGCGATTCTCCTGCC	OBD168-p1965
29	CAGCAGTGGGTTCTCAAATGTTAGCATC	OBD168-p697
30	GTCTTCATTTCCATTTCCTGACACACAG	OBD168-p977
31	AGGAGTCCAGTCAGGTTCCAGCCCAGG	OBD168-p1117
32	TTATGTAAAAGTTTCTAGAAATT	OBD168-p1861
33	CGTGGGTTGCGTCAGTCCCGTGTA	OBD168-p849
34	GGGCAGAGGGAGGACACCCATTAGAAAT	OBD168-p557
35	GGCTTCTCCCTGTTTCTGTCCTCCTCC	OBD168-p765
36	AACTCCAGACTTGCGGGAAAGGCCTG	OBD168-p1541
37	GCAAGAATCACTCAGCCGAGCCCTTCCC	OBD168-p773
38	GCAAACTATGCCCATCGTATTTTACC	OBD168-p1353
39	GTCACACAACAGAGACAGACTTGATAAT	OBD168-p573
40	GGGTTCAAGTGAGTCTCCTGCCTC	OBD168-p1489
41	CCTTCCCTTCTGGCTCCCTCTTTACCCC	OBD168-p737
42	CCTTTCCCCACCAGGTTAGGGCTTT	OBD168-p1325
43	TCTGGGCTGGGCTGGGACTGCTTGGAT	OBD168-p837
44	CAGGAGTGGTCAATGTGTGCCTTGTTGC	OBD168-p805
45	CTGCCCGGACGGCGGCCGCCGC	OBD168-p1869
46	AGGCCAGGAGTTCAAGACCCTAG	OBD168-p1981
47	GGCCAATGCCACCCCAATCTC	OBD168-p1997
48	GGAGAGAGCCAGTGGTGAGAAACGCAGC	OBD168-p529
49	GCCCCGCGCGTCTCCTCTGCCGCC	OBD168-p1605
50	TTTTTTTGTTTTCTTTTGACAGA	OBD168-p2089
51	GGGCTCTTGGCTCACTTGGGA	OBD168-p1677

Table 3.a9

	Sequence	qPCR Probe
1	TAGGCTGGTCTCGAGGGAACTCCCTCCCC	OBD168-p991
2	TGAGTGACTCTAGCGATGTCGACTGCCCGCCCAGATCCCG	OBD168-p2111
3	AGGAGCTGCAACTTTCCATCGAGTTCGCCCTC	OBD168-p671
4	ATGTTGGTCAGGCTGGTCTCGAGGCCAGCCTGACCAACAT	OBD168-p1731
5	AGAGGGCGCGGCCTACACTCGATCTTATCCTT	OBD168-p703
6	TCCTTTTGTCGAACTCCTAACCTTGTGATCTACCCGC	OBD168-p891
7	TGCGTAGTCGAGCCAGCATGAGCTCTCTGTTC	OBD168-p1143
8	TCATTCTCGATGTACTTCTCTGCCTCAGCCTACGTG	OBD168-p1223
9	GTGTTGGCCAGGCTGGTCTCGAGACGACCCTGGCCAACAA	OBD168-p1907
10	ATGTTGGCCAAGCTGGTCTCGAGACCAGCCTTGCCAACAT	OBD168-p1467
11	ATGTTGGCCAGGCTGGTCTCGAGACCAGCCTGACCAACAG	OBD168-p1875
12	TTCTGTCTTTTCGCTGGCTCGAACAACAAATTGTTAAGTG	OBD168-p1439
13	ATGTTGGCCAGACTGATCTCGAGACGATCCCGGCCAACAT	OBD168-p1843
14	AGGCAGACAGGGAACTTGGCATATCGAGGTGG	OBD168-p907
15	TGGTGGACACTACTTTAATCGAACTATTGGGCTCAAGC	OBD168-p707
16	TGGACATAACTGTATTCTCTCTCTCTCTCTCGAAGCT	OBD168-p867
17	AAACTCTAAACAGGTCTTTCGAGAAATGCCACGCTCACTA	OBD168-p1611

18	ATGTTGGCCAGGCTGGTCTCGAGACCAGACTGGCCAACAT	OBD168-p1643
19	AGTCACAGCAAATGCCACAGGGTGTGTTCGAGGAA	OBD168-p1063
20	AAAAAATCAATTTAGATCTCGAAGCTGTCATCTGTGGGCG	OBD168-p2055
21	GTGTTGGTCAGGCTGGTCTCGAGACAAGCCTGACTAACAT	OBD168-p1395
22	TCTCTCTCTCTCTCTCGAGCAGGATGTGGAACAG	OBD168-p571
23	TTCTGTCTTTTCGCTGGCTCGAGATAAGTGGACCCAGCTG	OBD168-p1435
24	AACTAAGCTGACTTATATTCGAGATGGAGTTTTGCTCTTT	OBD168-p1483
25	CCACCTGAGGTCAGGAGTTCGAACTCCTGGACTCAAGTGA	OBD168-p1955
26	AGCAGCAATGGCAGTGGTGGTGATCGAAATGCC	OBD168-p1087
27	ATAGTGATCGACTTGGGAGTGCCTGCGTTCCC	OBD168-p759
28	ATGTTGGTCAGGCTGGTCTCGAGACCAGTCTGACCAACAT	OBD168-p1967
29	ACTTAATTTTCGATACTTCCCCTGGGTGACTCTGACAG	OBD168-p699
30	ACACAACTACAAGGTGATGAGATTATCGATGGG	OBD168-p979
31	TGGTGCTCAGGAGGTGTCGAGCCGAGGA	OBD168-p1119
32	TCATTTGAGGTCAGGAGTTCGAATTCCTGAGCTCAAATGA	OBD168-p1863
33	ACCACCGTTGGGATGAAAGATGGCCTCGAAGTTG	OBD168-p851
34	TGCCTTCACCCAAACTATCTGATCCCTCGACCCT	OBD168-p559
35	ACGCTCCCCTCGACGATGACACCATAACCCTG	OBD168-p767
36	TCTCTCTGTCTCTCAGATTCGAGCTCTTCTTCGGCGTCTG	OBD168-p1543
37	TGGCAGCGCGGCGGTTGGTTCGAGTATCA	OBD168-p775
38	GTGCCCGGTTCCACCCACTCGAAGTGATGGAACTCATAGG	OBD168-p1355
39	TCTCTCTCTCTCTCGAATTCCTGACCTCGGCC	OBD168-p575
40	ATGTTGGCCAGGCTGGTCTCGAGACCAGTCTGGCCAACAT	OBD168-p1491
41	TGCGATTGTCGAGGCCTAACAATTTTCCAGGGTCC	OBD168-p739
42	ATGTTGGCCAGGCTGGTCTCGAGACCAACCTGGCCAACAT	OBD168-p1327
43	ACGCCAATGGTCTGAGTTAATCGAATGCATCCTGGC	OBD168-p839
44	AGCAGAAGGCTCCAGCTGTACGCTCGATTCCT	OBD168-p807
45	GGCCGGCTGCCATGGAGCTCGACCGCCAGGGCCCGCGTCC	OBD168-p1871
46	TAAGTGTGTCCACTTATGTCGAGCAATCCTTCTGCCTCAG	OBD168-p1983
47	TTAGATACATCAAGTCCCTCGAGGCTGCAGAAGGCTGGGT	OBD168-p1999
48	TTAGACTCGATGGTTCCCTATTACCCTCTGCCCG	OBD168-p531
49	TTTTTCCATGAGAAACATTCGAGGTGCTCGGCGGGCAGCG	OBD168-p1607
50	ATGTTGGTCAGGCTGGTCTCGAGACCAGCCTGAGCAACAT	OBD168-p2091
51	ACAGTTACAGAGGAGAAGTCGACGGAGTCGGTTCAGTTTG	OBD168-p1679

Table 3.a10

	Sequence	probe
1	AGGGAGTTCCCTCGAGACCAGCCTAGG	ORF1_8_143363265_143368758_143397073_143399812_RR
2	CGGGATCTGGGCGGGCAGTCGACATCGCTAGAGTCACTCA	ORF1_X_48750795_48754365_48796124_48801821_FF
3	AGGGAGGGCGAACTCGATGGAAAGTTGCAGCT	ORF1_4_186172696_186175767_186190828_186192765_FF
4	ATGTTGGTCAGGCTGGCCTCGAGACCAGCCTGACCAACAT	ORF1_1_26201425_26205480_26333363_26336159_FR
5	AAGGATAAGATCGAGTGTAGGCCGCGCCCTCT	ORF1_2_70887659_70889000_70979229_70981565_FF
6	AGGCGGGTAGATCACAAGGTTAGGAGTTCGACAAAAG	ORF1_2_112539682_112540702_112816387_112823836_RR
7	AACAGAGAGCTCATGCTGGCTCGACTACGCAC	ORF1_12_52037813_52040902_52237944_52243119_FR
8	ACGTAGGCTGAGGCAGAGAAGTACATCGAGAATGATC	ORF1_11_10562525_10569392_10617125_10621846_RR
9	TTGTTGGCCAGGGTCGTCTCGAGACCAGCCTGGCCAACAC	ORF1_2_43086424_43092123_43178166_43179822_FF
10	ATGTTGGCAAGGCTGGTCTCGAGACCAGCTTGGCCAACAT	ORF1_17_67419703_67421985_67604580_67609081_RR

11	CTGTTGGTCAGGCTGGTCTCGAGACCAGCCTGGCCAACAT	ORF1_19_2777060_2780381_2901738_2905384_RF
12	CACTTAACAATTTGTTGTTCGAGCCAGCGAAAAGACAGAA	ORF1_17_43300561_43304860_43444308_43448547_RR
13	ATGTTGGCCGGGATCGTCTCGAGATCAGTCTGGCCAACAT	ORF1_15_74686122_74687597_74772372_74779791_FR
14	ACCACCTCGATATGCCAAGTTCCCTGTCTGCC	ORF1_10_62056179_62058893_62096285_62100217_RR
15	TGCTTGAGCCCAATAGTTCGATTAAAGTAGTGTCCACC	ORF1_15_76885704_76887654_76983002_76985852_RF
16	AGCTTCGAGAGAGAGAGAGAGAATACAGTTATGTCC	ORF1_11_10637008_10641060_10678778_10685244_FR
17	TAGTGAGCGTGGCATTTCTCGAAAGACCTGTTTAGAGTTT	ORF1_3_122768838_122771609_122793452_122794847_FR
18	ATGTTGGCCAGTCTGGTCTCGAGACCAGCCTGGCCAACAT	ORF1_5_140242642_140251155_140386390_140387430_FF
19	TTCCTCGAACACACCCTGTGGCATTTGCTGTGAC	ORF1_2_143119651_143128757_143274179_143284059_FR
20	CGCCCACAGATGACAGCTTCGAGATCTAAATTGATTTTTT	ORF1_7_1769382_1772142_1917082_1921849_RF
21	ATGTTAGTCAGGCTTGTCTCGAGACCAGCCTGACCAACAC	ORF1_13_28585301_28589104_28625877_28627714_FR
22	TCTGTTCCACATCCTGCTCGAGAGAGAGAGAGAG	ORF1_11_10637008_10641060_10826892_10830503_FR
23	CAGCTGGGTCCACTTATCTCGAGCCAGCGAAAAGACAGAA	ORF1_17_43300561_43304860_43353578_43358798_RR
24	AAAGAGCAAAACTCCATCTCGAATATAAGTCAGCTTAGTT	ORF1_18_63921019_63923125_64068334_64074049_RR
25	TCACTTGAGTCCAGGAGTTCGAACTCCTGACCTCAGGTGG	ORF1_20_31989698_31994926_32038678_32045816_RF
26	TGGGCATTTCGATCACCACCACTGCCATTGCTG	ORF1_11_35040602_35047084_35078579_35084103_FR
27	ACGCAGGCACTCCCAAGTCGATCACTATTTGGTTC	ORF1_18_45762052_45766373_45829537_45837293_FF
28	ATGTTGGTCAGACTGGTCTCGAGACCAGCCTGACCAACAT	ORF1_22_42713609_42716051_42864112_42866876_FR
29	CTGTCAGAGTCACCCAGGGGAAGTATCGAAAATTAAGT	ORF1_21_29039171_29043861_29092829_29094361_FF
30	TCCTTGGACTCTCCCCATCGATAATCTCATCACCTTG	ORF1_X_101616906_101623004_101715574_101717864_FF
31	TCCTCGGCTCGACACCTCCTGAGCACCA	ORF1_16_85533210_85536278_85655930_85660237_FR
32	TCATTTGAGCTCAGGAATTCGAACTCCTGACCTCAAATGA	ORF1_16_57546345_57549019_57808053_57811713_RF
33	AACTTCGAGGCCATCTTTCATCCCAACGGTGGTG	ORF1_20_50192390_50194162_50280026_50281924_RF
34	AGGGTCGAGGGATCAGATAGTTTGGGTGAAGGC	ORF1_2_25155910_25160743_25292182_25293890_FR
35	CAGGGTTATGGTGTCATCGTCGAGGGGAGCGT	ORF1_7_151781262_151783710_151930364_151932111_RR
36	CAGACGCCGAAGAAGAGCTCGAATCTGAGAGACAGAGAGA	ORF1_2_74503923_74507137_74519716_74521847_RF
37	TTATCTGATACTCGAACCAACCGCCGCGCTGC	ORF1_6_52573576_52576507_52715481_52719514_FR
38	CCTATGAGTTCCATCACTTCGAGTGGGTGGAACCGGGCAC	ORF1_10_104325690_104332059_104442837_104447074_RR
39	AGGCCGAGGTCAGGAATTCGAGAGAGAGAGAG	ORF1_11_10376885_10382511_10637008_10641060_RF
40	ATGTTGGCCAGACTGGTCTCGAGACCAGCCTGGCCAACAT	ORF1_19_7270757_7273737_7367544_7370291_FR
41	ACCCTGGAAAATTGTTAGGCCTCGACAATCGCACC	ORF1_6_15165975_15168155_15248586_15249747_RF
42	ATGTTGGCCAGGTTGGTCTCGAGACCAGCCTGGCCAACAT	ORF1_1_158181667_158187628_158243613_158252050_FF
43	TGGCCAGGATGCATTCGATTAACTCAGACCATTGGC	ORF1_11_65044650_65046952_65060361_65063993_FF
44	AGGAATCGAGCGTACAGCTGGAGCCTTCTGCT	ORF1_6_31267448_31269252_31531115_31534994_RF
45	GGACGCGGGCCCTGGCGGTCGAGCTCCATGGCAGCCGGCC	ORF1_17_81104538_81109597_81345804_81351809_RR
46	CTGAGGCAGAAGGATTGCTCGACATAAGTGGACACACTTA	ORF1_3_101887192_101889071_101943010_101950739_RF
47	ACCCAGCCTTCTGCAGCCTCGAGGGACTTGATGTATCTAA	ORF1_4_2639345_2642002_2800083_2804902_RR
48	TGCGGGCAGAGGGTAATAGGGAACCATCGAGTCTAA	ORF1_9_123259504_123263022_123339568_123345302_FR
49	CGCTGCCCGCCGAGCACCTCGAATGTTTCTCATGGAAAAA	ORF1_3_51243406_51244925_51388915_51391864_FF
50	ATGTTGCTCAGGCTGGTCTCGAGACCAGCCTGACCAACAT	ORF1_8_73772858_73775783_73991731_73996964_RF
51	CAAACTGAACCGACTCCGTCGACTTCTCCTCTGTAACTGT	ORF1_7_1901148_1902503_2033188_2038434_RF

Table 3.a11

	PCR Marker Set	qPCR Marker Set
1	OBD168-989.991	OBD168-q989.q991.p989/p991
2	OBD168-2109.2111	OBD168-q2109.q2111.p2109/p2111

3	OBD168-669.671	OBD168-q669.q671.p669/p671
4	OBD168-1729.1731	OBD168-q1729.q1731.p1729/p1731
5	OBD168-701.703	OBD168-q701.q703.p701/p703
6	OBD168-889.891	OBD168-q889.q891.p889/p891
7	OBD168-1141.1143	OBD168-q1141.q1143.p1141/p1143
8	OBD168-1221.1223	OBD168-q1221.q1223.p1221/p1223
9	OBD168-1905.1907	OBD168-q1905.q1907.p1905/p1907
10	OBD168-1465.1467	OBD168-q1465.q1467.p1465/p1467
11	OBD168-1873.1875	OBD168-q1873.q1875.p1873/p1875
12	OBD168-1437.1439	OBD168-q1437.q1439.p1437/p1439
13	OBD168-1841.1843	OBD168-q1841.q1843.p1841/p1843
14	OBD168-905.907	OBD168-q905.q907.p905/p907
15	OBD168-705.707	OBD168-q705.q707.p705/p707
16	OBD168-865.867	OBD168-q865.q867.p865/p867
17	OBD168-1609.1611	OBD168-q1609.q1611.p1609/p1611
18	OBD168-1641.1643	OBD168-q1641.q1643.p1641/p1643
19	OBD168-1061.1063	OBD168-q1061.q1063.p1061/p1063
20	OBD168-2053.2055	OBD168-q2053.q2055.p2053/p2055
21	OBD168-1393.1395	OBD168-q1393.q1395.p1393/p1395
22	OBD168-569.571	OBD168-q569.q571.p569/p571
23	OBD168-1433.1435	OBD168-q1433.q1435.p1433/p1435
24	OBD168-1481.1483	OBD168-q1481.q1483.p1481/p1483
25	OBD168-1953.1955	OBD168-q1953.q1955.p1953/p1955
26	OBD168-1085.1087	OBD168-q1085.q1087.p1085/p1087
27	OBD168-757.759	OBD168-q757.q759.p757/p759
28	OBD168-1965.1967	OBD168-q1965.q1967.p1965/p1967
29	OBD168-697.699	OBD168-q697.q699.p697/p699
30	OBD168-977.979	OBD168-q977.q979.p977/p979
31	OBD168-1117.1119	OBD168-q1117.q1119.p1117/p1119
32	OBD168-1861.1863	OBD168-q1861.q1863.p1861/p1863
33	OBD168-849.851	OBD168-q849.q851.p849/p851
34	OBD168-557.559	OBD168-q557.q559.p557/p559
35	OBD168-765.767	OBD168-q765.q767.p765/p767
36	OBD168-1541.1543	OBD168-q1541.q1543.p1541/p1543
37	OBD168-773.775	OBD168-q773.q775.p773/p775
38	OBD168-1353.1355	OBD168-q1353.q1355.p1353/p1355
39	OBD168-573.575	OBD168-q573.q575.p573/p575
40	OBD168-1489.1491	OBD168-q1489.q1491.p1489/p1491
41	OBD168-737.739	OBD168-q737.q739.p737/p739
42	OBD168-1325.1327	OBD168-q1325.q1327.p1325/p1327
43	OBD168-837.839	OBD168-q837.q839.p837/p839
44	OBD168-805.807	OBD168-q805.q807.p805/p807
45	OBD168-1869.1871	OBD168-q1869.q1871.p1869/p1871
46	OBD168-1981.1983	OBD168-q1981.q1983.p1981/p1983
47	OBD168-1997.1999	OBD168-q1997.q1999.p1997/p1999
48	OBD168-529.531	OBD168-q529.q531.p529/p531
49	OBD168-1605.1607	OBD168-q1605.q1607.p1605/p1607

50	OBD168-2089.2091	OBD168-q2089.q2091.p2089/p2091
51	OBD168-1677.1679	OBD168-q1677.q1679.p1677/p1679

Table 3.a12

52	ORF1_22_41776313_41777375_42031915_42033846_RF	295	1915.600527
53	ORF1_2_10016688_10020163_10069588_10070662_RF	300	1950.081799
54	ORF1_7_41457346_41461355_41488360_41491403_FF	230	1511.98957
55	ORF1_7_135917157_135920025_136070982_136076106_FR	342	2112.969893
56	ORF1_6_134102628_134113539_134393136_134395072_RF	617	3237.196304
57	ORF1_17_27740779_27745632_27849258_27851150_FR	179	1226.644201
58	ORF1_X_39624253_39627672_39748652_39756826_RR	786	3811.777698
59	ORF1_21_29066989_29073149_29092829_29094361_RF	341	2111.667632
60	ORF1_17_35363623_35366998_35578150_35580887_FF	427	2463.77808
61	ORF1_2_129732845_129738418_129813191_129815478_RF	789	3819.174236
62	ORF1_15_90688752_90691260_90881362_90884735_RF	529	2871.807678
63	ORF1_2_166059673_166070002_166163002_166177651_RF	228	1504.981553
64	ORF1_22_23665784_23673822_23711932_23713061_FR	184	1286.837245
65	ORF1_1_53182248_53184895_53364674_53371789_RF	635	3294.7368
66	ORF1_20_50280026_50281924_50437155_50439548_FF	373	2212.25714
67	ORF1_17_20844189_20846843_20895269_20898565_RF	832	3968.695995
68	ORF1_19_19361989_19364321_19458777_19462243_RF	768	3761.457058
69	ORF1_14_67469788_67473491_67514914_67519335_FR	478	2676.769491
70	ORF1_21_29039171_29043861_29092829_29094361_RF	380	2252.095813
71	ORF1_19_4252394_4257822_4336234_4339292_FF	207	1414.449942
72	ORF1_8_41806799_41808430_41845432_41849175_RF	232	1525.067865
73	ORF1_11_47655428_47658417_47713810_47715533_RF	652	3360.825526
74	ORF1_1_3073908_3076056_3169997_3177404_FF	770	3771.044431
75	ORF1_19_41422837_41424323_41692451_41693876_RR	766	3759.146475
76	ORF1_9_134315578_134321630_134391769_134398405_RF	754	3730.532291
77	ORF1_3_32625993_32627699_32683326_32685449_FF	459	2572.971635
78	ORF1_19_4264058_4265818_4341821_4342968_FR	221	1462.635611
79	ORF1_21_29092829_29094361_29164018_29174520_FF	398	2338.87323
80	ORF1_2_91859085_91863356_92122473_92125698_RF	310	1980.300976
81	ORF1_X_20268599_20270341_20456973_20459740_RR	811	3868.038973
82	ORF1_6_29844477_29850988_29921307_29925901_FF	283	1854.11491
83	ORF1_19_53278181_53279831_53467555_53470239_FR	560	2987.902851
84	ORF1_19_41422837_41424323_41672917_41678014_RR	249	1632.926185
85	ORF1_5_690177_692906_744214_749963_FR	400	2340.89338
86	ORF1_17_43300561_43304860_43406585_43411982_RF	846	4007.706758
87	ORF1_15_62681808_62691633_62730771_62732716_RR	551	2954.724442
88	ORF1_12_47686852_47690553_47817317_47827238_RF	433	2485.195218
89	ORF1_Y_18283408_18293202_18412555_18418411_RR	237	1545.88146
90	ORF1_2_218162078_218164150_218253352_218257050_FF	787	3812.00956
91	ORF1_19_41422837_41424323_41597548_41599628_RR	239	1554.462101
92	ORF1_20_50280026_50281924_50309417_50313312_FR	241	1558.884246
93	ORF1_9_70371691_70373189_70454780_70468182_RR	727	3635.071398

94	ORF1_5_75205085_75210191_75236091_75239565_FR	337	2099.567055
95	ORF1_X_39735882_39738523_39748652_39756826_FR	778	3797.26634
96	ORF1_11_10637008_10641060_10871146_10872290_FR	248	1629.314725
97	ORF1_20_63754820_63756674_63899802_63901328_FF	867	4053.634633
98	ORF1_4_102249197_102251493_102344820_102348626_FR	790	3820.755115
99	ORF1_1_161657362_161661864_161734762_161740896_RF	644	3341.384869
100	ORF1_16_8770523_8772703_8938508_8943672_RF	865	4048.304309

Table 3.b1

52	1.446445715	0.844353538	0.001764866	Early SSC
53	1.444313939	0.857296534	0.00182229	Early SSC
54	1.444202674	0.70719786	0.001152482	Early SSC
55	1.442909876	0.868305311	0.002104088	Early SSC
56	1.44164787	1.028118327	0.004494626	Early SSC
57	1.441256048	0.622029308	0.000788913	Early SSC
58	1.439937087	1.076426753	0.005994767	Early SSC
59	1.435176841	0.869890982	0.002101767	Early SSC
60	1.434551872	0.915034411	0.002768411	Early SSC
61	1.434549547	1.075994131	0.006015229	Early SSC
62	1.434212325	0.969982617	0.003635674	Early SSC
63	1.432836082	0.707437155	0.001142847	Early SSC
64	1.431899857	0.660136988	0.000860631	Early SSC
65	1.430019987	1.030563723	0.004636752	Early SSC
66	1.428940576	0.86431007	0.00228425	Early SSC
67	1.422169266	1.091590126	0.006434995	Early SSC
68	1.419967948	1.07621306	0.005856319	Early SSC
69	1.418668486	0.947418348	0.003208743	Early SSC
70	1.417447692	0.875891636	0.002358301	Early SSC
71	1.416297822	0.696494413	0.001021535	Early SSC
72	1.415515314	0.712096468	0.001170556	Early SSC
73	1.414697152	1.039518475	0.004802253	Early SSC
74	1.41377078	1.078233722	0.005882594	Early SSC
75	1.411375643	1.077857615	0.005849994	Early SSC
76	1.409033773	1.08039358	0.005771898	Early SSC
77	1.40830109	0.919601928	0.002990734	Early SSC
78	1.407406909	0.693140095	0.001085372	Early SSC
79	1.40724024	0.894701668	0.002523054	Early SSC
80	1.406168907	0.852847711	0.001873262	Early SSC
81	1.405642995	1.070456089	0.006151131	Early SSC
82	1.404695358	0.830066012	0.001664425	Early SSC
83	1.403682128	0.982988691	0.003900334	Early SSC
84	1.40273008	0.75057046	0.001324208	Early SSC
85	1.400704404	0.891601211	0.002526946	Early SSC
86	1.400672498	1.092114447	0.006546419	Early SSC
87	1.39987463	0.979467819	0.003823905	Early SSC
88	1.399263447	0.916381838	0.002811445	Early SSC

89	1.398979973	0.714351228	0.001199569	Early SSC
90	1.398583292	1.075173947	0.005995408	Early SSC
91	1.397442353	0.715489386	0.00121162	Early SSC
92	1.397341217	0.713200465	0.00121785	Early SSC
93	1.395652706	1.070547766	0.005514495	Early SSC
94	1.395237619	0.871205394	0.002080251	Early SSC
95	1.39513079	1.080227905	0.005954705	Early SSC
96	1.394698535	0.750594179	0.001318931	Early SSC
97	1.394072899	1.087179498	0.006678603	Early SSC
98	1.392557299	1.075414102	0.006019606	Early SSC
99	1.391243321	1.041707676	0.004753319	Early SSC
100	1.389721585	1.08718107	0.006663206	Early SSC

Table 3.b2

52	ATGGGCCTCAGAGGGGAAGAAGTACATATCGAGAATGGGCATCTCTACCCTTGTTAGGTC
53	ACTGCGCCTGGCATATTTATTTATTTATTCGAGCCGCTTGAGCATAGAGCTTATGGAGAT
54	TAGTTTCCAAGTGTGTGATAGCTCCAGATCGAGTCTGAGGAGTGAGCGGGAAGCTGCACA
55	TTTCTCTTTCTCTCTCTCTTTTTTTTTTTCGAGATCCTTAGGGGACCTTGTAGTAAAATA
56	GACTCCACATTTCCACCAGCTCAAACAGTCGAACAATTCTTCTGCCTCAGCCTCCCAAGC
57	TGGCTTCTTCTTAACTTTCTCGGGTGAGTCGAAGAGCCCAAATAACTTGTTTTAGACCAG
58	TGGTTTCAGAAGAGGGGCCCAGGGAACCTCGAATCTTCTGAGGGAGCGTGGCCCAGGTGA
59	CATCTGTCAGAGTCACCCAGGGGAAGTATCGAAGGTTTTTTGCAGAACAACATACCAAAT
60	GGCTGAGGTGAGAGAATCACCTGAGCCTTCGAGTTGCAAATTTCTGTTTTCTTTTTTTTT
61	TGATAGCCAAGACAATGGGGAAAAGGCCTCGACCCTTGCACGGGCGCAGATCCAGGTGCA
62	AGGCTTCAGCTGGGGCAGGCTTGGCCTGTCGACACCAATGTCTTGGATGTTTAACCTCCA
63	CATCATGGCAGATGGGTTATCCAACTCCTCGAAAGCTTTCTTTTCTAAGCCTTAGGATGC
64	AGGTTTCACCATGTTGGCCAGGATGGTCTCGAGATCAGCCTGGTCAACATGGTGAAACCC
65	CCACCATGCCAGGCACGAACATGGTCACTCGAAATTACGTGAGCCTTAGTTCTTTTTATT
66	CACACCACCGTTGGGATGAAAGATGGCCTCGATACATGCTTGTCAGTGAAAGAGCGATGC
67	TCATTGGTAGGACATCTCAAAATGGCACTCGAGCTCTACAGCCAGTACCTGGAGCGCCTG
68	TGTGCTGGGGGCACTAGTCCCGCTTGCTTCGATGCCTGGGCTCCTTCTGCCCCATCCCCA
69	GCTGGGCTCCCCGGGCTCAGCGTCCTTGTCGAAACCGAAAGCAAAGAGGAAGCGGGATCT
70	CATCTGTCAGAGTCACCCAGGGGAAGTATCGATTGTGCTTTCAGTGCCTCAGTGAGATGC
71	GGGTTTCACCATGTTGGCCAGGCTGGTCTCGAGACCAGCCTGGGCCAACATGGGGAAACC
72	GGGCTCACTTCATATCCTCTGCCCATCTTCGATGGTTTTCCATGACGATTGTCCAGTTTA
73	CTCATACATCACAGCCCCAGCCTCGGAATCGACCTCAGCTTCATTCTTCTTAAACAAGAG
74	ACCAGGAGCAGCCTCTGCTCTGCCCACCTCGAAGCTTCTCAAACGCCACTCTAACGACCC
75	TGATAAGGCCATGTTTTGGAGACAGTGATCGAGCATTTCTTAAATTCCCTCAGAATTTGC
76	CGGGGCCCTTTGCTGTGAGTAGAGGATGTCGAGGGCTGGGCGGCAGCCTCCCTGGGCTCC
77	GCTCTGACATACCACCCTGCCAAGTACCTCGACTCGGGTTCTTCCCTGCAGGTGGCGTGG
78	GGGTTTCACCATGTTGACCAGGCTGGTCTCGAGACCAGCCTGGCAAACATGGTGAAACCC
79	CATCTGTCAGAGTCACCCAGGGGAAGTATCGACTAGACACTTCCAAAATACTAACCATAC
80	GATATTTGTCTAGCTTTGAGGATTTCGTTCGAATTTTAAGCTCCACAAATGACCAAGAAC
81	CCCTAAATGGCCACGAGGTTCCCCGGCCTCGAGGTGTCAGATATTTTTCTTCCTGTATAT
82	ACTCTTTCCATTATGTGCAATTGTAACTTCGATGCCAGAGAGGGAGCTCGCCCTGGGAAT
83	GAGGCAGGTGGAATGGGTGGAGTCCAAGTCGACTCCAAAACCCTAAAACAGGCGCTGGAG

84	TGATAAGGCCATGTTTTGGAGACAGTGATCGAAGTTTGTGCTCTTTGTGATTCAGACAGA
85	CCCCTAGGCCTGGGAATAGGGAAACGGTTCGATTTGGTTTCCCAAGGTCTTATCAGTGAT
86	TTGAGGGCATTTGGCTGCTCTTTTACACTCGAGCCAGCGAAAAGACAGAACCGGAAGAGA
87	AGACTGGGTGACAGAGTGAGATCGTGTCTCGATTTTCCAGCAGTGTGCCTGGAGGAGTTT
88	GAGTGGAGAAAACGGTTGGATGAGGGACTCGAGTATAGCATTCAATTGCTCTTTCATATT
89	TAGGGTCTTCTTCCAGAGAATCAAATTCTCGACCAGCTTGGCCCCATCTAAAGTATGATT
90	TTTCCTTCTGAGAAGAGATATTCCTTCATCGACTGGTCACGATGGGCTGCTTCATCTGTG
91	TGATAAGGCCATGTTTTGGAGACAGTGATCGACAGATCTCCATTATTTTTCAGCCGGCTC
92	CACACCACCGTTGGGATGAAAGATGGCCTCGAGCTGGTCATGACACGCTTTAAGACCCTG
93	GGGTTTCACCAGGTTGGCCATGCTGGGTTCGAGAGCAGCCTGGGCAACACAGTGAGACCT
94	TCTTGCTTTCTTGCTTTCTTTCTTGCTTTCGATAACCTGAAATACCGACTTTTTTGGATT
95	TGATGTTATGGAAAACCATTTGGCCTTTTCGAATCTTCTGAGGGAGCGTGGCCCAGGTGA
96	GGACATAACTGTATTCTCTCTCTCTCTCTCGAACTCCTGACTTCGGCTGATCTGCCCACC
97	AAACAGGCACTGCGTGTTCCCAGCACCCTCGATTCCATCTTCCGACCTGCCAGCATCATG
98	CTCTTTTCTCTTGCAGAGGTGGCAAAACTCGAAAGAACAGCAGCTCGCGACCTGCGGGGC
99	GTTATTATTCTTCCATTTATATTTTTGTTCGACCCTTCTGCTTTCTCTCCAGGGGATGGC
100	GTACTGAAGGTCTAGCATATGGGTAGAGTCGACCTCTCTGGGCTCAGGTGATCCTCCCAC

Table 3.b3

	Probe Location				
52	22	41776315	41776344	42033815	42033844
53	2	10016690	10016719	10070631	10070660
54	7	41461324	41461353	41491372	41491401
55	7	135919994	135920023	136070984	136071013
56	6	134102630	134102659	134395041	134395070
57	17	27745601	27745630	27849260	27849289
58	X	39624255	39624284	39748654	39748683
59	21	29066991	29067020	29094330	29094359
60	17	35366967	35366996	35580856	35580885
61	2	129732847	129732876	129815447	129815476
62	15	90688754	90688783	90884704	90884733
63	2	166059675	166059704	166177620	166177649
64	22	23673791	23673820	23711934	23711963
65	1	53182250	53182279	53371758	53371787
66	20	50281893	50281922	50439517	50439546
67	17	20844191	20844220	20898534	20898563
68	19	19361991	19362020	19462212	19462241
69	14	67473460	67473489	67514916	67514945
70	21	29039173	29039202	29094330	29094359
71	19	4257791	4257820	4339261	4339290
72	8	41806801	41806830	41849144	41849173
73	11	47655430	47655459	47715502	47715531
74	1	3076025	3076054	3177373	3177402
75	19	41422839	41422868	41692453	41692482
76	9	134315580	134315609	134398374	134398403
77	3	32627668	32627697	32685418	32685447

78	19	4265787	4265816	4341823	4341852
79	21	29094330	29094359	29174489	29174518
80	2	91859087	91859116	92125667	92125696
81	X	20268601	20268630	20456975	20457004
82	6	29850957	29850986	29925870	29925899
83	19	53279800	53279829	53467557	53467586
84	19	41422839	41422868	41672919	41672948
85	5	692875	692904	744216	744245
86	17	43300563	43300592	43411951	43411980
87	15	62681810	62681839	62730773	62730802
88	12	47686854	47686883	47827207	47827236
89	Y	18283410	18283439	18412557	18412586
90	2	218164119	218164148	218257019	218257048
91	19	41422839	41422868	41597550	41597579
92	20	50281893	50281922	50309419	50309448
93	9	70371693	70371722	70454782	70454811
94	5	75210160	75210189	75236093	75236122
95	X	39738492	39738521	39748654	39748683
96	11	10641029	10641058	10871148	10871177
97	20	63756643	63756672	63901297	63901326
98	4	102251462	102251491	102344822	102344851
99	1	161657364	161657393	161740865	161740894
100	16	8770525	8770554	8943641	8943670

Table 3.b4

	4 kb Sequence Location				
52	22	41776315	41780314	42029845	42033844
53	2	10016690	10020689	10066661	10070660
54	7	41457354	41461353	41487402	41491401
55	7	135916024	135920023	136070984	136074983
56	6	134102630	134106629	134391071	134395070
57	17	27741631	27745630	27849260	27853259
58	X	39624255	39628254	39748654	39752653
59	21	29066991	29070990	29090360	29094359
60	17	35362997	35366996	35576886	35580885
61	2	129732847	129736846	129811477	129815476
62	15	90688754	90692753	90880734	90884733
63	2	166059675	166063674	166173650	166177649
64	22	23669821	23673820	23711934	23715933
65	1	53182250	53186249	53367788	53371787
66	20	50277923	50281922	50435547	50439546
67	17	20844191	20848190	20894564	20898563
68	19	19361991	19365990	19458242	19462241
69	14	67469490	67473489	67514916	67518915

70	21	29039173	29043172	29090360	29094359
71	19	4253821	4257820	4335291	4339290
72	8	41806801	41810800	41845174	41849173
73	11	47655430	47659429	47711532	47715531
74	1	3072055	3076054	3173403	3177402
75	19	41422839	41426838	41692453	41696452
76	9	134315580	134319579	134394404	134398403
77	3	32623698	32627697	32681448	32685447
78	19	4261817	4265816	4341823	4345822
79	21	29090360	29094359	29170519	29174518
80	2	91859087	91863086	92121697	92125696
81	X	20268601	20272600	20456975	20460974
82	6	29846987	29850986	29921900	29925899
83	19	53275830	53279829	53467557	53471556
84	19	41422839	41426838	41672919	41676918
85	5	688905	692904	744216	748215
86	17	43300563	43304562	43407981	43411980
87	15	62681810	62685809	62730773	62734772
88	12	47686854	47690853	47823237	47827236
89	Y	18283410	18287409	18412557	18416556
90	2	218160149	218164148	218253049	218257048
91	19	41422839	41426838	41597550	41601549
92	20	50277923	50281922	50309419	50313418
93	9	70371693	70375692	70454782	70458781
94	5	75206190	75210189	75236093	75240092
95	X	39734522	39738521	39748654	39752653
96	11	10637059	10641058	10871148	10875147
97	20	63752673	63756672	63897327	63901326
98	4	102247492	102251491	102344822	102348821
99	1	161657364	161661363	161736895	161740894
100	16	8770525	8774524	8939671	8943670

Table 3.b5

52	ORF1_22_41776313_41777375_42031915_42033846_RF	OBD168-1265
53	ORF1_2_10016688_10020163_10069588_10070662_RF	OBD168-1193
54	ORF1_7_41457346_41461355_41488360_41491403_FF	OBD168-853
55	ORF1_7_135917157_135920025_136070982_136076106_FR	OBD168-1689
56	ORF1_6_134102628_134113539_134393136_134395072_RF	OBD168-1089
57	ORF1_17_27740779_27745632_27849258_27851150_FR	OBD168-625
58	ORF1_X_39624253_39627672_39748652_39756826_RR	OBD168-2101
59	ORF1_21_29066989_29073149_29092829_29094361_RF	OBD168-821
60	ORF1_17_35363623_35366998_35578150_35580887_FF	OBD168-1865
61	ORF1_2_129732845_129738418_129813191_129815478_RF	OBD168-945
62	ORF1_15_90688752_90691260_90881362_90884735_RF	OBD168-1845
63	ORF1_2_166059673_166070002_166163002_166177651_RF	OBD168-1569
64	ORF1_22_23665784_23673822_23711932_23713061_FR	OBD168-1589

65	ORF1_1_53182248_53184895_53364674_53371789_RF	OBD168-1149
66	ORF1_20_50280026_50281924_50437155_50439548_FF	OBD168-1169
67	ORF1_17_20844189_20846843_20895269_20898565_RF	OBD168-473
68	ORF1_19_19361989_19364321_19458777_19462243_RF	OBD168-833
69	ORF1_14_67469788_67473491_67514914_67519335_FR	OBD168-1829
70	ORF1_21_29039171_29043861_29092829_29094361_RF	OBD168-477
71	ORF1_19_4252394_4257822_4336234_4339292_FF	OBD168-1877
72	ORF1_8_41806799_41808430_41845432_41849175_RF	OBD168-665
73	ORF1_11_47655428_47658417_47713810_47715533_RF	OBD168-1765
74	ORF1_1_3073908_3076056_3169997_3177404_FF	OBD168-1045
75	ORF1_19_41422837_41424323_41692451_41693876_RR	OBD168-761
76	ORF1_9_134315578_134321630_134391769_134398405_RF	OBD168-1197
77	ORF1_3_32625993_32627699_32683326_32685449_FF	OBD168-1977
78	ORF1_19_4264058_4265818_4341821_4342968_FR	OBD168-1881
79	ORF1_21_29092829_29094361_29164018_29174520_FF	OBD168-613
80	ORF1_2_91859085_91863356_92122473_92125698_RF	OBD168-1917
81	ORF1_X_20268599_20270341_20456973_20459740_RR	OBD168-1713
82	ORF1_6_29844477_29850988_29921307_29925901_FF	OBD168-1657
83	ORF1_19_53278181_53279831_53467555_53470239_FR	OBD168-1897
84	ORF1_19_41422837_41424323_41672917_41678014_RR	OBD168-1497
85	ORF1_5_690177_692906_744214_749963_FR	OBD168-1109
86	ORF1_17_43300561_43304860_43406585_43411982_RF	OBD168-1441
87	ORF1_15_62681808_62691633_62730771_62732716_RR	OBD168-817
88	ORF1_12_47686852_47690553_47817317_47827238_RF	OBD168-1801
89	ORF1_Y_18283408_18293202_18412555_18418411_RR	OBD168-461
90	ORF1_2_218162078_218164150_218253352_218257050_FF	OBD168-1577
91	ORF1_19_41422837_41424323_41597548_41599628_RR	OBD168-1205
92	ORF1_20_50280026_50281924_50309417_50313312_FR	OBD168-1217
93	ORF1_9_70371691_70373189_70454780_70468182_RR	OBD168-2093
94	ORF1_5_75205085_75210191_75236091_75239565_FR	OBD168-861
95	ORF1_X_39735882_39738523_39748652_39756826_FR	OBD168-2105
96	ORF1_11_10637008_10641060_10871146_10872290_FR	OBD168-709
97	ORF1_20_63754820_63756674_63899802_63901328_FF	OBD168-1229
98	ORF1_4_102249197_102251493_102344820_102348626_FR	OBD168-693
99	ORF1_1_161657362_161661864_161734762_161740896_RF	OBD168-1053
100	ORF1_16_8770523_8772703_8938508_8943672_RF	OBD168-1849

Table 3.b6

52	TGTGCTGATGTCTGCTGCTCTCAACA	OBD168-1267	GATAAAACCCTGATTCTCTCTCCTGG
53	CCCGTGCTGAGATGGAGAACCTG	OBD168-1195	GGTTTCACTCCTCCCACCTCATC
54	GGAGAGTTTCTGTTCAAAGGGTGTAG	OBD168-855	CCCACAAAGGGTGTTCAATCATCCAC
55	AGGAAATAAGCCCTACGTGGCAGGAG	OBD168-1691	CAGGTTTCTCACAAACAGACTGAAAA
56	GGGAGGGAGAGATTGGTTCTTTACC	OBD168-1091	ACATAGGTGATGGTGGCTGACTTCCT
57	AGGAGGGCAAAGGTCACAGTGGC	OBD168-627	CACCTTGCTGCTTGCCAACAGTG
58	ATTTAGCAAGACATTGGAAGAA	OBD168-2103	TTGTGCCTCCGTATACTATAAT
59	CAGCAGTGGGTTCTCAAATGTTAGCA	OBD168-823	CTGTCATCTAAGCCTCCATTCATAAC

60	CAGGCAGATCACTTGAGCCTAG	OBD168-1867	AAATACAAAAATTAGCTTGGAA
61	AGCCTGGTCAAGTGAAAAGCCCATTT	OBD168-947	TGAGGATGACCCAGCAGATAGGGAGA
62	AGCGGTGGGAGCTGGGGGCGCG	OBD168-1847	AAGGAGTACTAGTAGATACAAG
63	ACATACTTTCTAGATCAATTTCTTA	OBD168-1571	TTTCAAAAACCAACTCCATTAGCAG
64	TGCAACATCTACCTCCCGGGTTC	OBD168-1591	GAAACCTCCGCCTCCCAGGTTCA
65	CCCCAGCCCTCCTTCTCTTCTTT	OBD168-1151	AATCCCAGCACTCACCACACGGC
66	GCTTGAAGGCGGATTCCTCCAGG	OBD168-1171	GCTGCCTGACTACTCCTGGGAAA
67	GGCTGTGAGGTTGTCCTTTACTGC	OBD168-475	TCCTGGGAGATGAAGCGACGCAG
68	TGGGTCTGTGCTTGCTGTGCGGT	OBD168-835	CCTGCCTGTCTGTCTGGAGAAGA
69	TGGGGCAACCTCACCAGCTTGGT	OBD168-1831	AGGCCTTTCCGCCGCCCAGAGAG
70	CAGCAGTGGGTTCTCAAATGTTAGCA	OBD168-479	GCTGTCTTGCTGCTGATAGCCTTTA
71	AGTGATCTGTCTGCCTCGGCCT	OBD168-1879	GTAAAGTGGTATGATCTTGGCT
72	GGGACCTTTGAACCACATTTGGAGGG	OBD168-667	CAGGGATTTCTGAGGACAAGACATCT
73	TCGGGCGCTTCCGGGGAGCTAGGCC	OBD168-1767	GGGCACCAAAATGATTAAGGACATT
74	TGACCAAGAGTGAGCCAAGCCCC	OBD168-1047	GCCCTTACTGACTGCCAGGAAAC
75	CTGAACTGTCGTCACTGGTGCTGTG	OBD168-763	CCTACAAGCCAGAAGGGATTGAGAAT
76	CTGGAAGAGACAGAGCCCACACA	OBD168-1199	CGCAGCCCTTCCAAGCCTCAGAA
77	AAACTAGGAAAAGAGAAATAGAACA	OBD168-1979	GCTGTGGCGGTCCCTTGGTGGGGAA
78	CAGCCTGTAGCAATTGTCCTG	OBD168-1883	AGGTTCAAGCGATTCTCCTGC
79	CAGCAGTGGGTTCTCAAATGTTAGCA	OBD168-615	GTCCTCTCTACAAGACAATAGGCAGC
80	TAGATAGAAGCAATGTCAGAAAC	OBD168-1919	ATATCGTTTTCCTGAGTAATAGT
81	AGTCCAAAGCTTCGGGAGAAG	OBD168-1715	GTCAGGAAAAGAGAGGTAAAT
82	TAGAGAAGAGAGGACTCTCCCTA	OBD168-1659	CCGATTAGATACCTGATCATTTA
83	TCCACAGGGAAAGAGAATCCCTCG	OBD168-1899	CCTGACGAAGCAGGGGCGGGGCGA
84	GGAGGGAGGATGGGGGATGAA	OBD168-1499	AAGTAGCATGCACAGGTTCCA
85	TTCATTCCAGCCCTCCACGCCCTAAT	OBD168-1111	GCCAATACATTCAGGAAACACAGGCA
86	GAGTGCTGAAACTTCCTTTTCTTCT	OBD168-1443	GGGCATGGGCCCCTCGTCCCCTCGT
87	GACTGAGCAACATAAGGAGACCCGTC	OBD168-819	GAGAAAGGAAATGGGACAGAAGCAAT
88	GACTCTCAGGCACAGAGGCAAAAAA	OBD168-1803	AACAGATTTTAAAACGTGTCTCATG
89	AGTGTGTGCCCAGGTGAGAGACCATT	OBD168-463	GGCAGACGATACATTTCCAGATAGTT
90	AGGTTGGTGTGGCCCCTGAAGACA	OBD168-1579	CTGTCCCAGAAAAAAGAAAAATCC
91	GGGAAGGAGGAGTGGAAACGGAA	OBD168-1207	AAGCGGAGCCTGGAGCATCTCGT
92	CTTGAAGGCGGATTCCTCCAGGT	OBD168-1219	AGCAGGCACGGAACACAGTGGTG
93	AGCTCACTGCAACCTCTGCCTCCCC	OBD168-2095	GTTCTGCTGGGGGCAGGCCAGGGGA
94	GGTGCCACTGCCTTGGTTCCTGT	OBD168-863	GGTCCCTGCCAAACTGGAAACGA
95	CACAGGTTGAAAGTGAAAATT	OBD168-2107	GGTGCTGTACCAAAGTACCAC
96	GGATAAAGCACAGGATGCCCCAGTTA	OBD168-711	CGGAAGTCCTACCCAAGCAATCAT
97	GCTTCCTGAGTCTTCATCACAAAACC	OBD168-1231	GCCACTGTGCTCAATCTGCGTTCTGA
98	CCAGGTTCAGACACAGTGCCCAC	OBD168-695	TCGGCTACGCTGCCACTTCAATG
99	CAGACTATGTGCCTCAAAGACAGTGC	OBD168-1055	CAGAAGGGTGAGGACAAAGAGATAGC
100	GCCATGAGAAACACAAACGACT	OBD168-1851	GGTGGCTCACACCTGTAATCCC

Table 3.b7

52	OBD168-q1265	CTTCCTGTCATCTCTGTGGCTCTCAGCA	OBD168-q1267
53	OBD168-q1193	CGGTCCCCGTGCTGAGATGGAGAACCTG	OBD168-q1195
54	OBD168-q853	GGAGAGTTTCTGTTCAAAGGGTGTAGAG	OBD168-q855

55	OBD168-q1689	CCCCTCTCCTACTAGGAAATAAG	OBD168-q1691
56	OBD168-q1089	GTGATGATGGTTCTCCTGCTCCGTGTCC	OBD168-q1091
57	OBD168-q625	GGCTGCCCCACGGCTACAGAAGGC	OBD168-q627
58	OBD168-q2101	CCCAAAGGCATTTTGGAGAAT	OBD168-q2103
59	OBD168-q821	GACAGCAGTGGGTTCTCAAATGTTAGCA	OBD168-q823
60	OBD168-q1865	GAGCCTAGGAGTTTGAGACGAGT	OBD168-q1867
61	OBD168-q945	GCAGCAAAGCATTCAAGAGTTACCTGGC	OBD168-q947
62	OBD168-q1845	CAGGCGTTCCGAGGGCCAGAG	OBD168-q1847
63	OBD168-q1569	TGTGAGGACATAGTAAGTATA	OBD168-q1571
64	OBD168-q1589	CCCGGGTTCAGGTGATTCTCC	OBD168-q1591
65	OBD168-q1149	CCCCTGCCCTTCTGCCTGGTCTC	OBD168-q1151
66	OBD168-q1169	GCTTGCTTGAAGGCGGATTCCTCCAGG	OBD168-q1171
67	OBD168-q473	AGGCTGTGAGGTTGTCCTTTACTGC	OBD168-q475
68	OBD168-q833	TCCTGGGTCTGTGCTTGCTGTGCGGTGG	OBD168-q835
69	OBD168-q1829	ACCTCACCAGCTTGGTCTCTTTGT	OBD168-q1831
70	OBD168-q477	GACAGCAGTGGGTTCTCAAATGTTAGCA	OBD168-q479
71	OBD168-q1877	GACCTCAAGTGATCTGTCTGCCTCGG	OBD168-q1879
72	OBD168-q665	CATTGCCCCTGGTGCGACCTGCCCC	OBD168-q667
73	OBD168-q1765	GCTTCCGGGGAGCTAGGCCTC	OBD168-q1767
74	OBD168-q1045	TGGGTGCGGCGACAGGCTCATCTGCGAT	OBD168-q1047
75	OBD168-q761	CGTCACTGGTGCTGTGGTGCCCG	OBD168-q763
76	OBD168-q1197	ACCTGGAAGAGACAGAGCCCACACACGG	OBD168-q1199
77	OBD168-q1977	AGTGTCTCACAAAACTCAAGGAAA	OBD168-q1979
78	OBD168-q1881	GTCCTGCCTTAGCCTCCTGAGTAG	OBD168-q1883
79	OBD168-q613	GACAGCAGTGGGTTCTCAAATGTTAGCA	OBD168-q615
80	OBD168-q1917	AGGACTACGGTGAAAAAGGAA	OBD168-q1919
81	OBD168-q1713	AGCGGTCCCCCTGAGTCCAAAGCTT	OBD168-q1715
82	OBD168-q1657	GAAATGGTGCTTTGGTGCTTAGAT	OBD168-q1659
83	OBD168-q1897	GTCTCATTTTCTACCCTCCACA	OBD168-q1899
84	OBD168-q1497	GGGCCCCAGGTCAGTGTGGGCTC	OBD168-q1499
85	OBD168-q1109	GCGGTCTGACAGCCCCACCTGCC	OBD168-q1111
86	OBD168-q1441	GGGGCTGGGAGAGAGGAAGAGATTAT	OBD168-q1443
87	OBD168-q817	GCCAGGGAGTTGGGAAGTGTGGGAAG	OBD168-q819
88	OBD168-q1801	ATTTGTTGAGCATCTACTCTTTG	OBD168-q1803
89	OBD168-q461	AGTGTGTGCCCAGGTGAGAGACCATT	OBD168-q463
90	OBD168-q1577	GGAGGTACCTCAACAGCTCCTCAG	OBD168-q1579
91	OBD168-q1205	CGTCACTGGTGCTGTGGTGCCCG	OBD168-q1207
92	OBD168-q1217	GCTTGCTTGAAGGCGGATTCCTCCAGG	OBD168-q1219
93	OBD168-q2093	GATGGAGTCTCACTCTGTCAC	OBD168-q2095
94	OBD168-q861	CTTTGGTGCCACTGCCTTGGTTCCTGTT	OBD168-q863
95	OBD168-q2105	AAAAAACACTTCCAAAGCTTTTCACC	OBD168-q2107
96	OBD168-q709	CACACGCATCCCTGCTCCCATTCTGAG	OBD168-q711
97	OBD168-q1229	GCAGTTGGCTTCAGACGGGCAGACAGGG	OBD168-q1231
98	OBD168-q693	TGTCCAGGAACAGGAAGTTTCAGAGGGC	OBD168-q695
99	OBD168-q1053	CTCAGACTATGTGCCTCAAAGACAGTGC	OBD168-q1055
100	OBD168-q1849	CAAGAGCCAAAGGATCAACACC	OBD168-q1851

Table 3.b8

52	CTGCTGCTGCCTCCATCCTCCTCC	OBD168-p1265
53	CGGGCAGAGAGCCAGGGTGAAGC	OBD168-p1193
54	GCCCCTTCTCCTTCCCACCATTCCC	OBD168-p853
55	CTCACAAACAGACTGAAAAAATA	OBD168-p1689
56	CTGCTCCTCTGCCTGCCTTGTAGTCTC	OBD168-p1089
57	GTTACACCTTGCTGCTTGCCAACAGTG	OBD168-p625
58	ATTAGTTTTCCAGGGGTGCTG	OBD168-p2101
59	GCTGTCATCTAAGCCTCCATTCATAACT	OBD168-p823
60	TAAAAATACAAAAATTAGCTTGG	OBD168-p1865
61	ACTTGGTGAGGCTGGAGGAGGAGGGC	OBD168-p945
62	GGAGTACTAGTAGATACAAGA	OBD168-p1845
63	GCAGGTAGGGGTGTGGGAGGG	OBD168-p1569
64	TGAGACAGAGTCTTGTGCTGT	OBD168-p1589
65	GCCCAAATCCCAGCACTCACCACACGGC	OBD168-p1149
66	GCTCCTGCTCATCATCTCCCCAGTGG	OBD168-p1169
67	ATCGTCCACAGCCCCTGGGTCGG	OBD168-p473
68	GCTGCCTGGTGCTGAACTGGTGGG	OBD168-p833
69	GGCTCTGCCCAGCCCCTACCCACG	OBD168-p1829
70	GCTCCTGGCTGTCTTGCTGCTGATAGC	OBD168-p479
71	ACTCTGTTGCCCAGGCTGGAGTAAAG	OBD168-p1877
72	GCAGGCATAACCAGGGATTTCTGAGGAC	OBD168-p665
73	CAAAATGATTAAGGACATTAA	OBD168-p1765
74	CTCCCACCCATACCTCTTCTGCTGGAC	OBD168-p1045
75	GCAAGAAGGACCTCACCGCAACTAT	OBD168-p761
76	GCCTCGCAGCCCTTCCAAGCCTCAGAA	OBD168-p1197
77	CCCGCCGTCTGCCCACTCCTCTAG	OBD168-p1977
78	AAGATCTTGGCTCGCTACAACCTC	OBD168-p1881
79	CCTCTCTACAAGACAATAGGCAGCATCT	OBD168-p615
80	GTTTTCCTGAGTAATAGTTAC	OBD168-p1917
81	GTATTGATGTGTGATGAATAAATTG	OBD168-p1713
82	TTTACCGATTAGATACCTGATCAT	OBD168-p1657
83	GAAGCAGGGGCGGGGCGAGAGG	OBD168-p1897
84	TAGCATGCACAGGTTCCAGGGAT	OBD168-p1497
85	TGCCACTATCAACCTGACACCAAAGCCA	OBD168-p1109
86	GCGCTCCTGCCCTGGGGCCTCGTCTT	OBD168-p1441
87	CCGCTAAAGAGAGGAAAAGTGAACTGGA	OBD168-p817
88	TTAACAATATTCTTTCTTGAAAT	OBD168-p1801
89	CGATACATTTCCAGATAGTTTTGTGGCA	OBD168-p461
90	GAGTGAGACCCTGTCCCAGAAAAA	OBD168-p1577
91	CAAGCGGAGCCTGGAGCATCTCGTGAGG	OBD168-p1205
92	CCCAGGCTCTCTCCATCGCACCTTCTGC	OBD168-p1217
93	GGGGGCAGGCCAGGGGACAGG	OBD168-p2093
94	GAAACTGGTCCCTGCCAAACTGGAAACG	OBD168-p861
95	CTGGATATTTATACAAGAGACTGGAT	OBD168-p2105
96	GGCACAGGAGGAACATACCAAAACATAC	OBD168-p709

97	TCGTGTCTCACTGCCGCTTCCACCTC	OBD168-p1229
98	CGCTCCCCTCGGCTACGCTGCCAC	OBD168-p693
99	GGGTGCCCAGTCTGCCACAACCTGTC	OBD168-p1053
100	GTGGCTCACACCTGTAATCCCA	OBD168-p1849

Table 3.b9

52	AGTACATATCGAGAATGGGCATCTCTACCCTTGTTAGG	OBD168-p1267
53	ATTTATTCGAGCCGCTTGAGCATAGAGCTTATGGAGATG	OBD168-p1195
54	ATAGCTCCAGATCGAGTCTGAGGAGTGAGCGG	OBD168-p855
55	TCTCTCTCTTTTTTTTTTTCGAGATCCTTAGGGGACCTTG	OBD168-p1691
56	TCAAACAGTCGAACAATTCTTCTGCCTCAGCCTCCC	OBD168-p1091
57	TGGCTTCTTCTTAACTTTCTCGGGTGAGTCGAAGAGC	OBD168-p627
58	AGAGGGGCCCAGGGAACCTCGAATCTTCTGAGGGAGCGTG	OBD168-p2103
59	ACCTTCGATACTTCCCCTGGGTGACTCTGACAG	OBD168-p821
60	AGAGAATCACCTGAGCCTTCGAGTTGCAAATTTCTGTTTT	OBD168-p1867
61	AAAAGGCCTCGACCCTTGCACGGGCGCA	OBD168-p947
62	TGGGGCAGGCTTGGCCTGTCGACACCAATGTCTTGGATGT	OBD168-p1847
63	GATGGGTTATCCAACTCCTCGAAAGCTTTCTTTTCTAAGC	OBD168-p1571
64	ATGTTGGCCAGGATGGTCTCGAGATCAGCCTGGTCAACAT	OBD168-p1591
65	TGCCAGGCACGAACATGGTCACTCGAAATTACGTG	OBD168-p1151
66	ACACCACCGTTGGGATGAAAGATGGCCTCGATACA	OBD168-p1171
67	AATGGCACTCGAGCTCTACAGCCAGTACCTGG	OBD168-p475
68	ACTAGTCCCGCTTGCTTCGATGCCTGGGCT	OBD168-p835
69	CCGGGCTCAGCGTCCTTGTCGAAACCGAAAGCAAAGAGGA	OBD168-p1831
70	AGCACAATCGATACTTCCCCTGGGTGACTCTGAC	OBD168-p477
71	ATGTTGGCCAGGCTGGTCTCGAGACCAGCCTGGGCCAACA	OBD168-p1879
72	TCCTCTGCCCATCTTCGATGGTTTTCCATGACGATTG	OBD168-p667
73	ACAGCCCCAGCCTCGGAATCGACCTCAGCTTCATTCTTCT	OBD168-p1767
74	AGCAGCCTCTGCTCTGCCCACCTCGAAGCTT	OBD168-p1047
75	AGGCCATGTTTTGGAGACAGTGATCGAGCATTTC	OBD168-p763
76	TTTGCTGTGAGTAGAGGATGTCGAGGGCTGGG	OBD168-p1199
77	ACCACCCTGCCAAGTACCTCGACTCGGGTTCTTCCCTGCA	OBD168-p1979
78	ATGTTGACCAGGCTGGTCTCGAGACCAGCCTGGCAAACAT	OBD168-p1883
79	TCTAGTCGATACTTCCCCTGGGTGACTCTGACAG	OBD168-p613
80	TAGCTTTGAGGATTTCGTTCGAATTTTAAGCTCCACAAAT	OBD168-p1919
81	CCACGAGGTTCCCCGGCCTCGAGGTGTCAGATATTTTTCT	OBD168-p1715
82	TTATGTGCAATTGTAACTTCGATGCCAGAGAGGGAGCTCG	OBD168-p1659
83	GAATGGGTGGAGTCCAAGTCGACTCCAAAACCCTAAAACA	OBD168-p1899
84	ATGTTTTGGAGACAGTGATCGAAGTTTGTGCTCTTTGTGA	OBD168-p1499
85	AGGCCTGGGAATAGGGAAACGGTTCGATTTGG	OBD168-p1111
86	TTGGCTGCTCTTTTACACTCGAGCCAGCGAAAAGACAGAA	OBD168-p1443
87	TCGTGTCTCGATTTTCCAGCAGTGTGCCTGGAG	OBD168-p819
88	AACGGTTGGATGAGGGACTCGAGTATAGCATTCAATTGCT	OBD168-p1803
89	AGAATCAAATTCTCGACCAGCTTGGCCCCATCTAAAG	OBD168-p463
90	AGAAGAGATATTCCTTCATCGACTGGTCACGATGGGCTGC	OBD168-p1579
91	AGGCCATGTTTTGGAGACAGTGATCGACAGATCTCC	OBD168-p1207

92	ACCGTTGGGATGAAAGATGGCCTCGAGCTGGT	OBD168-p1219
93	AGGTTGGCCATGCTGGGTTCGAGAGCAGCCTGGGCAACAC	OBD168-p2095
94	TTCTTGCTTTCTTGCTTTCTTTCTTGCTTTCGATAACCTG	OBD168-p863
95	GAAAACCATTTGGCCTTTTCGAATCTTCTGAGGGAGCGTG	OBD168-p2107
96	TCTCTCTCTCTCTCTCGAACTCCTGACTTCGGC	OBD168-p711
97	ACTGCGTGTTCCCAGCACCCTCGATTCCATCT	OBD168-p1231
98	AGGTGGCAAAACTCGAAAGAACAGCAGCTCGCG	OBD168-p695
99	TTTTGTTCGACCCTTCTGCTTTCTCTCCAGGG	OBD168-p1055
100	TCTAGCATATGGGTAGAGTCGACCTCTCTGGGCTCAGGTG	OBD168-p1851

Table 3.b10

52	TGCCCATTCTCGATATGTACTTCTTCCCCTCTGAGG	ORF1_22_41776313_41777375_42031915_42033846_RF
53	AGCGGCTCGAATAAATAAATAAATATGCCAGGCGCAGTG	ORF1_2_10016688_10020163_10069588_10070662_RF
54	TTCCCGCTCACTCCTCAGACTCGATCTGGAG	ORF1_7_41457346_41461355_41488360_41491403_FF
55	CAAGGTCCCCTAAGGATCTCGAAAAAAAAAAAGAGAGAGA	ORF1_7_135917157_135920025_136070982_136076106_FR
56	TGGGAGGCTGAGGCAGAAGAATTGTTCGACTGTTTG	ORF1_6_134102628_134113539_134393136_134395072_RF
57	TGGGCTCTTCGACTCACCCGAGAAAGTTAAGAAGAAG	ORF1_17_27740779_27745632_27849258_27851150_FR
58	CACGCTCCCTCAGAAGATTCGAGGTTCCCTGGGCCCCTCT	ORF1_X_39624253_39627672_39748652_39756826_RR
59	CTGTCAGAGTCACCCAGGGGAAGTATCGAAGGT	ORF1_21_29066989_29073149_29092829_29094361_RF
60	AAAACAGAAATTTGCAACTCGAAGGCTCAGGTGATTCTCT	ORF1_17_35363623_35366998_35578150_35580887_FF
61	AGGGTCGAGGCCTTTTCCCCATTGTCTTGGCT	ORF1_2_129732845_129738418_129813191_129815478_RF
62	ACATCCAAGACATTGGTGTCGACAGGCCAAGCCTGCCCCA	ORF1_15_90688752_90691260_90881362_90884735_RF
63	GCTTAGAAAAGAAAGCTTTCGAGGAGTTGGATAACCCATC	ORF1_2_166059673_166070002_166163002_166177651_RF
64	ATGTTGACCAGGCTGATCTCGAGACCATCCTGGCCAACAT	ORF1_22_23665784_23673822_23711932_23713061_FR
65	TCACGTAATTTCGAGTGACCATGTTCGTGCCTGGC	ORF1_1_53182248_53184895_53364674_53371789_RF
66	TGTATCGAGGCCATCTTTCATCCCAACGGTGGTG	ORF1_20_50280026_50281924_50437155_50439548_FF
67	TCCAGGTACTGGCTGTAGAGCTCGAGTGCCAT	ORF1_17_20844189_20846843_20895269_20898565_RF
68	AGCCCAGGCATCGAAGCAAGCGGGACTAGT	ORF1_19_19361989_19364321_19458777_19462243_RF
69	TCCTCTTTGCTTTCGGTTTCGACAAGGACGCTGAGCCCGG	ORF1_14_67469788_67473491_67514914_67519335_FR
70	GTCAGAGTCACCCAGGGGAAGTATCGATTGTGCT	ORF1_21_29039171_29043861_29092829_29094361_RF
71	TGTTGGCCCAGGCTGGTCTCGAGACCAGCCTGGCCAACAT	ORF1_19_4252394_4257822_4336234_4339292_FF
72	ACCATCGAAGATGGGCAGAGGATATGAAGTGAGCC	ORF1_8_41806799_41808430_41845432_41849175_RF
73	AGAAGAATGAAGCTGAGGTCGATTCCGAGGCTGGGGCTGT	ORF1_11_47655428_47658417_47713810_47715533_RF
74	AAGCTTCGAGGTGGGCAGAGCAGAGGCTG	ORF1_1_3073908_3076056_3169997_3177404_FF
75	ATGCTCGATCACTGTCTCCAAAACATGGCCTTATCACC	ORF1_19_41422837_41424323_41692451_41693876_RR
76	AGCCCTCGACATCCTCTACTCACAGCAAAGGG	ORF1_9_134315578_134321630_134391769_134398405_RF
77	TGCAGGGAAGAACCCGAGTCGAGGTACTTGGCAGGGTGGT	ORF1_3_32625993_32627699_32683326_32685449_FF
78	ATGTTTGCCAGGCTGGTCTCGAGACCAGCCTGGTCAACAT	ORF1_19_4264058_4265818_4341821_4342968_FR
79	CTGTCAGAGTCACCCAGGGGAAGTATCGACTAGA	ORF1_21_29092829_29094361_29164018_29174520_FF
80	ATTTGTGGAGCTTAAAATTCGAACGAAATCCTCAAAGCTA	ORF1_2_91859085_91863356_92122473_92125698_RF
81	AGAAAAATATCTGACACCTCGAGGCCGGGGAACCTCGTGG	ORF1_X_20268599_20270341_20456973_20459740_RR
82	CGAGCTCCCTCTCTGGCATCGAAGTTACAATTGCACATAA	ORF1_6_29844477_29850988_29921307_29925901_FF
83	TGTTTTAGGGTTTTGGAGTCGACTTGGACTCCACCCATTC	ORF1_19_53278181_53279831_53467555_53470239_FR
84	TCACAAAGAGCACAAACTTCGATCACTGTCTCCAAAACAT	ORF1_19_41422837_41424323_41672917_41678014_RR
85	ACCAAATCGAACCGTTTCCCTATTCCCAGGCCTAG	ORF1_5_690177_692906_744214_749963_FR
86	TTCTGTCTTTTCGCTGGCTCGAGTGTAAAAGAGCAGCCAA	ORF1_17_43300561_43304860_43406585_43411982_RF

87	TCCAGGCACACTGCTGGAAAATCGAGACACGATC	ORF1_15_62681808_62691633_62730771_62732716_RR
88	AGCAATTGAATGCTATACTCGAGTCCCTCATCCAACCGTT	ORF1_12_47686852_47690553_47817317_47827238_RF
89	CTTTAGATGGGGCCAAGCTGGTCGAGAATTTGATTCT	ORF1_Y_18283408_18293202_18412555_18418411_RR
90	GCAGCCCATCGTGACCAGTCGATGAAGGAATATCTCTTCT	ORF1_2_218162078_218164150_218253352_218257050_FF
91	TCTGTCGATCACTGTCTCCAAAACATGGCCTTATCACC	ORF1_19_41422837_41424323_41597548_41599628_RR
92	ACCAGCTCGAGGCCATCTTTCATCCCAACGGT	ORF1_20_50280026_50281924_50309417_50313312_FR
93	GTGTTGCCCAGGCTGCTCTCGAACCCAGCATGGCCAACCT	ORF1_9_70371691_70373189_70454780_70468182_RR
94	AGGTTATCGAAAGCAAGAAAGAAAGCAAGAAAGCAAGAAG	ORF1_5_75205085_75210191_75236091_75239565_FR
95	CACGCTCCCTCAGAAGATTCGAAAAGGCCAAATGGTTTTC	ORF1_X_39735882_39738523_39748652_39756826_FR
96	AGCCGAAGTCAGGAGTTCGAGAGAGAGAGAGAG	ORF1_11_10637008_10641060_10871146_10872290_FR
97	AGATGGAATCGAGGGTGCTGGGAACACGCAGT	ORF1_20_63754820_63756674_63899802_63901328_FF
98	TCGCGAGCTGCTGTTCTTTCGAGTTTTGCCACC	ORF1_4_102249197_102251493_102344820_102348626_FR
99	TCCCCTGGAGAGAAAGCAGAAGGGTCGAACAAAA	ORF1_1_161657362_161661864_161734762_161740896_RF
100	CACCTGAGCCCAGAGAGGTCGACTCTACCCATATGCTAGA	ORF1_16_8770523_8772703_8938508_8943672_RF

Table 3.b11

52	OBD168-1265.1267	OBD168-q1265.q1267.p1265/p1267
53	OBD168-1193.1195	OBD168-q1193.q1195.p1193/p1195
54	OBD168-853.855	OBD168-q853.q855.p853/p855
55	OBD168-1689.1691	OBD168-q1689.q1691.p1689/p1691
56	OBD168-1089.1091	OBD168-q1089.q1091.p1089/p1091
57	OBD168-625.627	OBD168-q625.q627.p625/p627
58	OBD168-2101.2103	OBD168-q2101.q2103.p2101/p2103
59	OBD168-821.823	OBD168-q821.q823.p823/p821
60	OBD168-1865.1867	OBD168-q1865.q1867.p1865/p1867
61	OBD168-945.947	OBD168-q945.q947.p945/p947
62	OBD168-1845.1847	OBD168-q1845.q1847.p1845/p1847
63	OBD168-1569.1571	OBD168-q1569.q1571.p1569/p1571
64	OBD168-1589.1591	OBD168-q1589.q1591.p1589/p1591
65	OBD168-1149.1151	OBD168-q1149.q1151.p1149/p1151
66	OBD168-1169.1171	OBD168-q1169.q1171.p1169/p1171
67	OBD168-473.475	OBD168-q473.q475.p473/p475
68	OBD168-833.835	OBD168-q833.q835.p833/p835
69	OBD168-1829.1831	OBD168-q1829.q1831.p1829/p1831
70	OBD168-477.479	OBD168-q477.q479.p479/p477
71	OBD168-1877.1879	OBD168-q1877.q1879.p1877/p1879
72	OBD168-665.667	OBD168-q665.q667.p665/p667
73	OBD168-1765.1767	OBD168-q1765.q1767.p1765/p1767
74	OBD168-1045.1047	OBD168-q1045.q1047.p1045/p1047
75	OBD168-761.763	OBD168-q761.q763.p761/p763
76	OBD168-1197.1199	OBD168-q1197.q1199.p1197/p1199
77	OBD168-1977.1979	OBD168-q1977.q1979.p1977/p1979
78	OBD168-1881.1883	OBD168-q1881.q1883.p1881/p1883
79	OBD168-613.615	OBD168-q613.q615.p615/p613
80	OBD168-1917.1919	OBD168-q1917.q1919.p1917/p1919
81	OBD168-1713.1715	OBD168-q1713.q1715.p1713/p1715

82	OBD168-1657.1659	OBD168-q1657.q1659.p1657/p1659
83	OBD168-1897.1899	OBD168-q1897.q1899.p1897/p1899
84	OBD168-1497.1499	OBD168-q1497.q1499.p1497/p1499
85	OBD168-1109.1111	OBD168-q1109.q1111.p1109/p1111
86	OBD168-1441.1443	OBD168-q1441.q1443.p1441/p1443
87	OBD168-817.819	OBD168-q817.q819.p817/p819
88	OBD168-1801.1803	OBD168-q1801.q1803.p1801/p1803
89	OBD168-461.463	OBD168-q461.q463.p461/p463
90	OBD168-1577.1579	OBD168-q1577.q1579.p1577/p1579
91	OBD168-1205.1207	OBD168-q1205.q1207.p1205/p1207
92	OBD168-1217.1219	OBD168-q1217.q1219.p1217/p1219
93	OBD168-2093.2095	OBD168-q2093.q2095.p2093/p2095
94	OBD168-861.863	OBD168-q861.q863.p861/p863
95	OBD168-2105.2107	OBD168-q2105.q2107.p2105/p2107
96	OBD168-709.711	OBD168-q709.q711.p709/p711
97	OBD168-1229.1231	OBD168-q1229.q1231.p1229/p1231
98	OBD168-693.695	OBD168-q693.q695.p693/p695
99	OBD168-1053.1055	OBD168-q1053.q1055.p1053/p1055
100	OBD168-1849.1851	OBD168-q1849.q1851.p1849/p1851

Table 3.b12

	Probe	gene.index	RP/Rsum
1	ORF1_11_61243450_61246026_61388261_61391790_FR	65	683.7987722
2	ORF1_3_18693806_18695229_18731498_18743005_FR	121	1311.207619
3	ORF1_2_118112112_118113416_118185366_118187110_FR	42	424.4713289
4	ORF1_17_27395089_27399400_27471513_27474666_RR	123	1345.935183
5	ORF1_12_131862265_131863764_132122269_132123632_RF	192	1895.333542
6	ORF1_12_121447890_121451709_121468997_121471919_FF	64	676.3740979
7	ORF1_14_81120330_81122262_81268937_81270783_RF	225	2139.947545
8	ORF1_13_45338339_45340076_45393094_45398989_FR	247	2241.882572
9	ORF1_12_5915876_5919160_6152139_6154132_FF	95	973.1243446
10	ORF1_16_9911562_9916434_9954809_9955829_RF	204	2003.48294
11	ORF1_22_16907330_16914217_17087415_17089015_RR	189	1885.344261
12	ORF1_9_131999122_132006607_132139741_132142158_FR	216	2077.891178
13	ORF1_12_5915876_5919160_6059110_6067436_FF	112	1190.76143
14	ORF1_19_52960383_52965476_52976109_52979684_FR	105	1105.727185
15	ORF1_1_229299065_229300173_229506871_229512794_FR	224	2125.739433
16	ORF1_16_18252588_18255195_18400348_18402976_RR	274	2399.456066
17	ORF1_2_111366352_111370512_111529947_111533147_FF	282	2454.310373
18	ORF1_5_55186470_55190634_55308382_55310405_FR	119	1277.819011
19	ORF1_7_2130888_2136507_2376124_2377913_FF	308	2576.79482
20	ORF1_12_109959287_109961500_109999941_110004320_FF	292	2522.263056
21	ORF1_5_148804534_148807399_148901266_148906110_RF	315	2610.322544
22	ORF1_2_174610120_174616390_174648154_174652062_RR	205	2020.977518
23	ORF1_17_43832124_43833485_43905109_43906650_FF	273	2395.722643
24	ORF1_4_74078231_74079386_74117911_74125141_FR	284	2461.265909

25	ORF1_1_36159277_36165949_36303183_36304407_RF	260	2319.480175
26	ORF1_5_124631740_124634000_124857558_124858678_FR	269	2362.930803
27	ORF1_6_86970655_86977787_87154540_87156275_RR	335	2708.303887
28	ORF1_4_38133158_38135017_38161792_38166364_RF	158	1684.416661
29	ORF1_1_42817616_42818863_42949613_42952408_FF	156	1670.587608
30	ORF1_10_44948033_44949598_44963508_44966433_RR	215	2075.653386
31	ORF1_18_75155500_75159840_75214354_75217340_RF	319	2622.075007
32	ORF1_1_151547581_151552501_151755108_151762446_RF	317	2616.065515
33	ORF1_X_49053496_49056424_49286142_49288605_RF	214	2072.613711
34	ORF1_11_61243450_61246026_61472770_61474691_FR	173	1776.408098
35	ORF1_14_81530269_81532452_81602546_81604597_FF	313	2604.836014
36	ORF1_14_74588744_74593680_74780483_74782393_FF	374	2923.537449
37	ORF1_2_27481760_27484387_27626184_27635183_RF	281	2452.218225
38	ORF1_18_10287457_10291556_10505933_10507774_FF	382	2969.774836
39	ORF1_1_109681178_109683602_109788010_109790308_FF	352	2769.148458
40	ORF1_11_95040575_95045594_95230445_95231653_FF	145	1598.706819
41	ORF1_6_6745894_6751892_6983650_6986668_FR	324	2654.348688
42	ORF1_6_113632952_113639716_113727754_113732296_RF	345	2749.196717
43	ORF1_11_61224624_61227200_61388261_61391790_FR	193	1898.912573
44	ORF1_10_91056658_91062643_91164372_91168358_RF	174	1780.548073
45	ORF1_2_102100064_102105009_102374574_102377537_FR	207	2033.960539
46	ORF1_11_17097711_17100441_17188135_17191681_RR	322	2640.403311
47	ORF1_1_199677018_199683841_199811400_199820398_RR	395	3048.106352
48	ORF1_7_100090606_100091968_100119089_100121546_RR	410	3137.941194
49	ORF1_12_7868599_7870934_7932397_7933511_FF	201	1979.138215
50	ORF1_7_87727621_87737484_87868535_87872727_FF	339	2722.114145

Table 4.a1

	FC:(class1/class2)	pfp	P.value	Type
1	-1.880110497	0.586539786	0.000270132	Late SSc
2	-1.799608311	1.03860777	0.000890435	Late SSc
3	-1.780583699	0.371293764	0.000110492	Late SSc
4	-1.667670091	1.071320657	0.000933662	Late SSc
5	-1.602310181	1.272773307	0.00173148	Late SSc
6	-1.594316169	0.583773394	0.000264722	Late SSc
7	-1.585703511	1.35013943	0.002152417	Late SSc
8	-1.56216833	1.336623574	0.002339221	Late SSc
9	-1.556271307	0.768375125	0.000517204	Late SSc
10	-1.555096184	1.323326956	0.001912769	Late SSc
11	-1.540705079	1.280763297	0.001715126	Late SSc
12	-1.538681271	1.334213022	0.002041946	Late SSc
13	-1.536705015	0.941892109	0.000747454	Late SSc
14	-1.536449321	0.877882311	0.000653117	Late SSc
15	-1.527220454	1.340092929	0.002126906	Late SSc
16	-1.52149253	1.360282508	0.002640857	Late SSc
17	-1.519473048	1.376054571	0.002749477	Late SSc

18	-1.503923716	1.007768197	0.000849714	Late SSc
19	-1.502514474	1.374072688	0.002998649	Late SSc
20	-1.502130011	1.39520081	0.002886588	Late SSc
21	-1.50156792	1.374806784	0.003068439	Late SSc
22	-1.500042403	1.337558365	0.001942817	Late SSc
23	-1.496149497	1.361478188	0.002633532	Late SSc
24	-1.494024976	1.373274177	0.002763382	Late SSc
25	-1.492254542	1.349373491	0.002485826	Late SSc
26	-1.482938536	1.348160178	0.002569562	Late SSc
27	-1.48249355	1.380279235	0.00327625	Late SSc
28	-1.482383403	1.250937648	0.001400419	Late SSc
29	-1.47881757	1.248294422	0.001379771	Late SSc
30	-1.477514304	1.337834051	0.002038008	Late SSc
31	-1.475489797	1.368461872	0.003093062	Late SSc
32	-1.473695833	1.371485397	0.003080461	Late SSc
33	-1.473125886	1.34056185	0.002032665	Late SSc
34	-1.47310541	1.257251246	0.001541109	Late SSc
35	-1.472213708	1.378421017	0.003056972	Late SSc
36	-1.467917288	1.416119903	0.00375264	Late SSc
37	-1.467652572	1.378853794	0.0027453	Late SSc
38	-1.467315677	1.425572936	0.003858496	Late SSc
39	-1.4669037	1.36651033	0.003408167	Late SSc
40	-1.464113123	1.240602908	0.001274577	Late SSc
41	-1.462599528	1.37698371	0.003161106	Late SSc
42	-1.457734612	1.37644207	0.003364669	Late SSc
43	-1.456367968	1.270475422	0.001737356	Late SSc
44	-1.451682509	1.255271302	0.001547576	Late SSc
45	-1.446541214	1.339926641	0.001965245	Late SSc
46	-1.443313466	1.372615939	0.003131628	Late SSc
47	-1.442937935	1.443731983	0.004040629	Late SSc
48	-1.442059337	1.464295228	0.004253807	Late SSc
49	-1.441214801	1.313952351	0.001871289	Late SSc
50	-1.439270427	1.376378475	0.003306	Late SSc

Table 4.a2

	Probe sequence
	60 mer
1	CCTGGCTCCTTCCTGTATTATGCTCCCTTCGAGAAGTAGAATATCTGAATGTTCTTATAT
2	TGGACTGGGCTAATGTGGAAAGTGAGGATCGAGAATGAAGAAGGAACAGTCACGAAGGGA
3	TATTTATTTTTATTTTTATTTATTTTTTTCGATTGTGTTCACCAGGACGGCAGGCTATTA
4	CACATGGCTAAAAGGAAGACTGACAATTTCGAGCTTGGTGTGGTCAAGGGCCAGGAGGAG
5	TAATATTGGCTTTGGCTAATCAGAGATTTCGACAGGAGGATGGTGGGGAGGGGAGGCCAG
6	GGTGGGTAGATCACTTGAGGTCAGGAGTTCGAACTCCTGACCTCAAGTGATCCACGCCCA
7	GGAGGCAGAAGTTGTGGGCATGCTGAACTCGAGGAAATCCATTGACATGAAAAACGTCAA
8	TTCCTGCAGGTGATGGTTCATGACAATATCGACTGAGCTGCCAAGTATTTCATACATGGG
9	GAGTGTGATGAAGAAAAGTAAGGCAGGATCGATGAATTCTAGGGCATGTAAATGCTCAAG

10	GCGAATGAGCTCCCTGTGTCACACAGCATCGAGAGTCCTGAGCACCATCCCAATCCCTGT
11	TCTAGGCTTCAAGAGAGAGAATCCAATGTCGATTTAGCCTTCCATAACTATCCTCAGACA
12	AATGGTGTCTATAGCCAGGTTTTTGTAATCGAAGGACCCCTTGCTGGGGGCGCCTAAAGA
13	GAGTGTGATGAAGAAAAGTAAGGCAGGATCGAATATTTGCACATTTCTCGTTGACCCTTC
14	CTATATTTTTCACTCACATCCCTAGTTATCGAGAACATCCTGGCTAATGTGATGAAACCC
15	ACGCTGAACTAATTGGGCTGAAGTATGGTCGAACAGGTTACGAGCATCAGCTGTTACATG
16	CATTGGTCACAATGGGTCACGTGCCTATTCGAGACCACCCAGCAAAGCCCCAAGGACACA
17	TGCACCTCTCTTTTGAATCCCTCCCCCATCGAGGTTAATCCCTCTCCACAGGGCGGCACC
18	AGAGAGAGTAACAAATACGAGGAGGGTTTCGATGTTACTGATTCTGTCCCCATCTTCGCG
19	ACTCTCTTACCCAAGTTTCCTAACAGGATCGACACCCAGGGTCATTCACACAACACGGCT
20	CTGAAGCCAACACACGCAAAGGCAAACGTCGAAACTGATCATTTAGGTTTTCCTTTTAAG
21	GTTTACAGACCTTGGATGCAGGCTCTTCTCGAGGGGAAAAAGGAGCAAGTTGGGAGGTGA
22	CCTGTGGCCTGATAAGGTATTGACCCCATCGAGATTTTATTAATTAGTGGCAGTCATAAT
23	AGGGGTGGACACCTGCTCAACAGAGAATTCGACCCCATCCTCTGGCCCTCAGTTCTGTCC
24	AGCCTCTTCCAACACTGAGGATCACAACTCGATGATATAATACTCTGCTGACTACATTTT
25	GGAGCTAAGATGACTAATTTGATGATTTTCGAACTCCTGACCTCGTGATCTTCCCACCTT
26	TCAAATGAGCATCCCCATTCTGTTTACATCGAGACCAGCCTGGCCAAAATGGTGAAAACC
27	TGCCAGCTTTTCTTGCCATTCTGGCCATTCGACAATATTGTTTTATTTTAGCATCAATTT
28	TGACTCACGAGGGAAGTGGTTGTTGACCTCGATTCCTCTCCTCTCAGTGACAACCAAAGA
29	TTTTTAAAAACCCTATACAAATGCTGATTCGACTGCATCAGCCTCTACGGGAATCTCCTC
30	ACATTCCACTTAACTGCAACTTGGCTTCTCGAATGTGGTAGCCACAGACTGCAGTCAGGA
31	AACTTGACAACCTGTAAGGGATTCTGAATCGACAGGGGAGAAAGTGCCGGCCCAGAGAAA
32	CATATACAGCCAGTCCCTGAGGAAGGAGTCGATGAAGGAAGAAAAGAGACGTGGTTTTCT
33	GCACGATATTTTTGCAAGAGTAGACAAATCGAAGACCCGAGCCGGCGCTTGCGCACTTAG
34	CCTGGCTCCTTCCTGTATTATGCTCCCTTCGAGTATTCTTCTGGGTGTTTCTATGAGGAT
35	CAAATATTAAATAACTGCTAAAAGTGCTTCGAACTCCTGAGCTCAGGTGATCCACCCACC
36	TCAGTCTCACAAGCCATATTTCAAGTGCTCGAGAACCAAATAGCCTAAGTCAATAAAATA
37	AACAGTTGTCATCTATGTAATGGACACATCGAACTCCTGACCTTGTGATCAGCCCGTCTC
38	CACCAGGCCCAGGTTCTCGCAGAAAGGCTCGAACTTGCTAGACAAAGACTTTGAATCAGT
39	TTCATAGTGCCTGGAATGTAGTAGGATCTCGATTTGTATAATTTCAATTAAAACCATCCA
40	CTGCCTATCTTTGGCTCTAACCCACAGATCGAGAGATCAGGAAATATTTAGCTCAATCTT
41	AGCCAGAGGTCGTAAAACGATGATAGAATCGAACTCCTGGTCTCAAGTGATCCACCAGCC
42	CACGGAGGTCTTTTAAGCTTAGTTGGAATCGACCTTTCAGGCTCAAGCAATCCTCCCACC
43	CCTGGCTCCTTCCTGTATTATGCTCCCTTCGAGAAGTAGAATATCTGAATGTTCTTATAT
44	TGGGCAAAGAAAGATAAGGAAGGAGATTTCGATTTCTGGGCTTGGCCATTATCACCCTGG
45	CTGATAAAAGGTAACGTTATATTGTTTGTCGAGACCATGCTGGCTAATATGATGAAACCC
46	GGGTTTTGCCATGTTGGCCAGGCTGGTCTCGAGACCAGCCTGGCCAACATGGCGAAACCC
47	GGTGCTAGGAAGCAAGGATACTGCATTGTCGACTGCATTTCTGCCTTCGGGGGCTTGACC
48	AGGGTTCAACTTCAGAAAGAGGGGGCTCTCGAAGATCCCCGGGCAGCGCGAAAGGAGGTT
49	GGGGCCACATCCAATGTCTTCGTGATGTTCGAAGCACAAAGCTCACTTACTCCCGGAACG
50	AGTTTGCATAAGAGAAGAAATTAATTTTTCGACCTCCCAAAGTGCTAGGATTACAAGCGT

Table 4.a3

	Probe Location				
		Start1	End1	Start2	End2
1	11	61245995	61246024	61388263	61388292
2	3	18695198	18695227	18731500	18731529
3	2	118113385	118113414	118185368	118185397
4	17	27395091	27395120	27471515	27471544
5	12	131862267	131862296	132123601	132123630
6	12	121451678	121451707	121471888	121471917
7	14	81120332	81120361	81270752	81270781
8	13	45340045	45340074	45393096	45393125
9	12	5919129	5919158	6154101	6154130
10	16	9911564	9911593	9955798	9955827
11	22	16907332	16907361	17087417	17087446
12	9	132006576	132006605	132139743	132139772
13	12	5919129	5919158	6067405	6067434
14	19	52965445	52965474	52976111	52976140
15	1	229300142	229300171	229506873	229506902
16	16	18252590	18252619	18400350	18400379
17	2	111370481	111370510	111533116	111533145
18	5	55190603	55190632	55308384	55308413
19	7	2136476	2136505	2377882	2377911
20	12	109961469	109961498	110004289	110004318
21	5	148804536	148804565	148906079	148906108
22	2	174610122	174610151	174648156	174648185
23	17	43833454	43833483	43906619	43906648
24	4	74079355	74079384	74117913	74117942
25	1	36159279	36159308	36304376	36304405
26	5	124633969	124633998	124857560	124857589
27	6	86970657	86970686	87154542	87154571
28	4	38133160	38133189	38166333	38166362
29	1	42818832	42818861	42952377	42952406
30	10	44948035	44948064	44963510	44963539
31	18	75155502	75155531	75217309	75217338
32	1	151547583	151547612	151762415	151762444
33	X	49053498	49053527	49288574	49288603
34	11	61245995	61246024	61472772	61472801
35	14	81532421	81532450	81604566	81604595
36	14	74593649	74593678	74782362	74782391
37	2	27481762	27481791	27635152	27635181
38	18	10291525	10291554	10507743	10507772
39	1	109683571	109683600	109790277	109790306
40	11	95045563	95045592	95231622	95231651
41	6	6751861	6751890	6983652	6983681
42	6	113632954	113632983	113732265	113732294
43	11	61227169	61227198	61388263	61388292
44	10	91056660	91056689	91168327	91168356
45	2	102104978	102105007	102374576	102374605

46	11	17097713	17097742	17188137	17188166
47	1	199677020	199677049	199811402	199811431
48	7	100090608	100090637	100119091	100119120
49	12	7870903	7870932	7933480	7933509
50	7	87737453	87737482	87872696	87872725

Table 4.a4

	4 kb Sequence Location					
		Start1	End1	Start2	End2	probe
1	11	61242025	61246024	61388263	61392262	ORF1_11_61243450_61246026_61388261_61391790_FR
2	3	18691228	18695227	18731500	18735499	ORF1_3_18693806_18695229_18731498_18743005_FR
3	2	118109415	118113414	118185368	118189367	ORF1_2_118112112_118113416_118185366_118187110_FR
4	17	27395091	27399090	27471515	27475514	ORF1_17_27395089_27399400_27471513_27474666_RR
5	12	131862267	131866266	132119631	132123630	ORF1_12_131862265_131863764_132122269_132123632_RF
6	12	121447708	121451707	121467918	121471917	ORF1_12_121447890_121451709_121468997_121471919_FF
7	14	81120332	81124331	81266782	81270781	ORF1_14_81120330_81122262_81268937_81270783_RF
8	13	45336075	45340074	45393096	45397095	ORF1_13_45338339_45340076_45393094_45398989_FR
9	12	5915159	5919158	6150131	6154130	ORF1_12_5915876_5919160_6152139_6154132_FF
10	16	9911564	9915563	9951828	9955827	ORF1_16_9911562_9916434_9954809_9955829_RF
11	22	16907332	16911331	17087417	17091416	ORF1_22_16907330_16914217_17087415_17089015_RR
12	9	132002606	132006605	132139743	132143742	ORF1_9_131999122_132006607_132139741_132142158_FR
13	12	5915159	5919158	6063435	6067434	ORF1_12_5915876_5919160_6059110_6067436_FF
14	19	52961475	52965474	52976111	52980110	ORF1_19_52960383_52965476_52976109_52979684_FR
15	1	229296172	229300171	229506873	229510872	ORF1_1_229299065_229300173_229506871_229512794_FR
16	16	18252590	18256589	18400350	18404349	ORF1_16_18252588_18255195_18400348_18402976_RR
17	2	111366511	111370510	111529146	111533145	ORF1_2_111366352_111370512_111529947_111533147_FF
18	5	55186633	55190632	55308384	55312383	ORF1_5_55186470_55190634_55308382_55310405_FR
19	7	2132506	2136505	2373912	2377911	ORF1_7_2130888_2136507_2376124_2377913_FF
20	12	109957499	109961498	110000319	110004318	ORF1_12_109959287_109961500_109999941_110004320_FF
21	5	148804536	148808535	148902109	148906108	ORF1_5_148804534_148807399_148901266_148906110_RF
22	2	174610122	174614121	174648156	174652155	ORF1_2_174610120_174616390_174648154_174652062_RR
23	17	43829484	43833483	43902649	43906648	ORF1_17_43832124_43833485_43905109_43906650_FF
24	4	74075385	74079384	74117913	74121912	ORF1_4_74078231_74079386_74117911_74125141_FR
25	1	36159279	36163278	36300406	36304405	ORF1_1_36159277_36165949_36303183_36304407_RF
26	5	124629999	124633998	124857560	124861559	ORF1_5_124631740_124634000_124857558_124858678_FR
27	6	86970657	86974656	87154542	87158541	ORF1_6_86970655_86977787_87154540_87156275_RR
28	4	38133160	38137159	38162363	38166362	ORF1_4_38133158_38135017_38161792_38166364_RF
29	1	42814862	42818861	42948407	42952406	ORF1_1_42817616_42818863_42949613_42952408_FF
30	10	44948035	44952034	44963510	44967509	ORF1_10_44948033_44949598_44963508_44966433_RR
31	18	75155502	75159501	75213339	75217338	ORF1_18_75155500_75159840_75214354_75217340_RF
32	1	151547583	151551582	151758445	151762444	ORF1_1_151547581_151552501_151755108_151762446_RF
33	X	49053498	49057497	49284604	49288603	ORF1_X_49053496_49056424_49286142_49288605_RF
34	11	61242025	61246024	61472772	61476771	ORF1_11_61243450_61246026_61472770_61474691_FR
35	14	81528451	81532450	81600596	81604595	ORF1_14_81530269_81532452_81602546_81604597_FF
36	14	74589679	74593678	74778392	74782391	ORF1_14_74588744_74593680_74780483_74782393_FF
37	2	27481762	27485761	27631182	27635181	ORF1_2_27481760_27484387_27626184_27635183_RF

38	18	10287555	10291554	10503773	10507772	ORF1_18_10287457_10291556_10505933_10507774_FF
39	1	109679601	109683600	109786307	109790306	ORF1_1_109681178_109683602_109788010_109790308_FF
40	11	95041593	95045592	95227652	95231651	ORF1_11_95040575_95045594_95230445_95231653_FF
41	6	6747891	6751890	6983652	6987651	ORF1_6_6745894_6751892_6983650_6986668_FR
42	6	113632954	113636953	113728295	113732294	ORF1_6_113632952_113639716_113727754_113732296_RF
43	11	61223199	61227198	61388263	61392262	ORF1_11_61224624_61227200_61388261_61391790_FR
44	10	91056660	91060659	91164357	91168356	ORF1_10_91056658_91062643_91164372_91168358_RF
45	2	102101008	102105007	102374576	102378575	ORF1_2_102100064_102105009_102374574_102377537_FR
46	11	17097713	17101712	17188137	17192136	ORF1_11_17097711_17100441_17188135_17191681_RR
47	1	199677020	199681019	199811402	199815401	ORF1_1_199677018_199683841_199811400_199820398_RR
48	7	100090608	100094607	100119091	100123090	ORF1_7_100090606_100091968_100119089_100121546_RR
49	12	7866933	7870932	7929510	7933509	ORF1_12_7868599_7870934_7932397_7933511_FF
50	7	87733483	87737482	87868726	87872725	ORF1_7_87727621_87737484_87868535_87872727_FF

Table 4.a5

	Primer ID	Sequence	Primer ID	Sequence
1	OBD168-1361	TGCATGAGATGAACCAGGGTGG	OBD168-1363	AGGTATTTCTTCTTTTTCTATT
2	OBD168-913	CTCCTTGTTCAGACTCAGGGAATAAG	OBD168-915	GGCTCCAGGTCTCTTCTGTCTCTTGA
3	OBD168-1925	GTGGGAAGGAAGGGTGTCATCTATAC	OBD168-1927	CATAAAGCCTCTCTCCAATCGCTTTC
4	OBD168-1093	AGCAGATTAGAACCACAGTGAGTTGC	OBD168-1095	GGAGGACACCTGTTTGCTGAGTTGGT
5	OBD168-1389	ACAGATACAAATAAGCTTGACC	OBD168-1391	TGTACAGTCCCAGCTACTCAGG
6	OBD168-1385	ACTGCAGCACTATTCACAACA	OBD168-1387	ATCCTTTTAATGTTGAGACCA
7	OBD168-581	GATGCTTCCCAAGGCTACCTGGT	OBD168-583	CAGAAAATCAGAAAGCCTCCACCAAA
8	OBD168-513	CTGCGAAAGAACCTCAAAAGTTAGCC	OBD168-515	TGGGATAATCTTACTCATTGCCTGGC
9	OBD168-533	TTGTTATTCCAGGTGGCAATGCTGAG	OBD168-535	GGCAGGACTTACCCAACATCAGGACT
10	OBD168-485	GCTTGTTTTGAATGAGGTTAGGCAGC	OBD168-487	GCCATCACAGGTTAGGAGACAGACC
11	OBD168-1585	CACCCCTTCCCCTTGCATTGGTTTCC	OBD168-1587	GCTGACCGTTCTTTCCTTCATTCATG
12	OBD168-813	CCAGGAACAAAACAAACCCCAGGTAA	OBD168-815	AAGAAGCCAGGCAAGAAGACACGAGC
13	OBD168-1793	ACACTTATTAAGCACCTATATGTG	OBD168-1795	TTCAGAAATTATCATCATTCTACA
14	OBD168-1509	CCAGCCTGGGCAACAGAGTGAGACTG	OBD168-1511	CTGTCACTCGGGCTACAGTGCAGTGG
15	OBD168-925	GAGCCAGCCAGTCCTCATCAAGG	OBD168-927	GCCCTTAGCCCTTCTGTATGTGC
16	OBD168-1185	GGTGCCACAGTGCCTTACATCAC	OBD168-1187	TTTCTGGGTCACTCCCGCCTGTG
17	OBD168-1561	GCCTGGTGAACTCTGTCGTGTGGG	OBD168-1563	GTGATTCATAAAGCAGCTCTTTTC
18	OBD168-1173	CGGGCTGTCTCCTGAATGGTGTG	OBD168-1175	TGTGCCAGGTGTTGTGCTGATGC
19	OBD168-2057	GCAGGATCAGTGCCAGGGCAGGGGG	OBD168-2059	GGAGGAAGGAGCAGGCGCGAGCGCT
20	OBD168-1805	CCAGGGCGCTGTGGTTTTGCGTGGC	OBD168-1807	AAGAAAAGTGGATGAGCTGAAATGA
21	OBD168-673	GAGGGCTTCTGTGAGATTGGGCAC	OBD168-675	GGCAGAGAGGCAATGTCAGGAAG
22	OBD168-661	GAAAAGAGTCAACACGGAGCAGAAAG	OBD168-663	GCACCACCCAGAGCACCAACCTTATT
23	OBD168-1445	ACCGCCGCACCCTCCGGGCCG	OBD168-1447	TCCCACCCATCCCTCCATCCA
24	OBD168-621	AAGTGGGAGAGTGAAGGGAGAAGGGA	OBD168-623	CAAGCACGGTTGTAGGAGTTGTAAGT
25	OBD168-1049	GGCGGGAGAGCGATGCTTGGATT	OBD168-1051	CTCTCCGCTGCCTTCTTGTCCTA
26	OBD168-2025	TAAAAGAACTACTAATTATTATGTT	OBD168-2027	CATCCAGGCTGGAGTACACTGGCGC
27	OBD168-2037	TTGAGCTTCACAAAGGTTCCACTGAA	OBD168-2039	TTTCACCGTGATTTAGACTCTACTAC
28	OBD168-1013	GGTAAGCGTAGGAGCAGAGCAAC	OBD168-1015	GGGTGGGAAAGGTCCTCTGGTCA
29	OBD168-1313	GGGCTCAAGTGATCCTCCTGCC	OBD168-1315	GACCATGCAGTGAAAATGAGGA
30	OBD168-985	CCTTGTCATAATGGGAAACTCAGGGC	OBD168-987	CCTGGGAAGCAAAAGAAAGGAGGACA

31	OBD168-481	GAGTTTTGGCTGCTGAAGGGAAGGCA	OBD168-483	ATGGTCATTCACTCAAATCCTGGGC
32	OBD168-901	CCCCAAGTCTCTCTGTCCTTCCT	OBD168-903	CATCAAAGGGAGTGGCTCTGCCC
33	OBD168-1721	GATCATGACACATTAATTCTTAAATT	OBD168-1723	GTAGGAGGGGAGCGCCGGCCCGGCCG
34	OBD168-797	CCCAGGTTGGAGGCATCTCTGAC	OBD168-799	CCAGGCGAATCTGAAGGCAGGAT
35	OBD168-897	GCTGTTCCAGACCTAAAACCCAATGT	OBD168-899	AAGATGACTTCCTTCCTTAGCCCAGC
36	OBD168-645	GAGTCTCACACTGTAGCCACGAACTG	OBD168-647	GCTCTGCCATACAGTTCATTCTCATC
37	OBD168-1901	GCTCTGCACACCCTGCCTAAAGTGG	OBD168-1903	GCTCTTTGTGGGCCCAGACGGTGTT
38	OBD168-1477	CATAAATTCCTAGTTTCCTGTGCAA	OBD168-1479	TTTCTAATTCTACTTGGTTTCTTTT
39	OBD168-857	CTCTCCCCTGAAGTTCCCACCTG	OBD168-859	GCAGAAGTTGGAGCCTCTACCTC
40	OBD168-1781	GATAAAGCTTCACCATCTCTGC	OBD168-1783	AGGGAACAGTTTGCTCTCCTCT
41	OBD168-1645	GAGACACGCAAGTCTTGCATCTG	OBD168-1647	ACTCTTGTGCTCAAGTGATTAGC
42	OBD168-1669	CTGATCTAACCCCCAAAATCCT	OBD168-1671	AGTGCTAGCTATTTGGTCTTGA
43	OBD168-1777	AGCTCAGTGAACATGACCCGATGGTG	OBD168-1779	ATAGTGTAAGCTAGGTAATATTTCTT
44	OBD168-949	GAGGAGGTAGACAGGATGCTGAG	OBD168-951	AGCCCAGGACAAGTGTGACCAGG
45	OBD168-1269	ACCCCGACATTCTCCACCTCCTG	OBD168-1271	ATTCTCCTTCCTCAGCCTCCCGA
46	OBD168-1357	TCCAGCACCCAGTGTGGAGTGCA	OBD168-1359	CTTTTTCTTTTTTTTTGAGACAG
47	OBD168-909	GTGTGAGCCATCTGTTTATGCCTTTT	OBD168-911	GGGTTTGACCACAGACCTGAGAGATG
48	OBD168-2069	AGTGTCACACAGTAAAAGGTATAG	OBD168-2071	GGAGGAGACCCTTTGAAGGTCCCT
49	OBD168-1177	CACCAAGAAGCGACCACAGCACA	OBD168-1179	GAAGAACAGCACCGCCCAGCGTT
50	OBD168-2065	GTTCCAATTTTTCAATGAGGTAA	OBD168-2067	GGCTTGAGCAAGCCTTTCAATCC

Table 4.a6

	qPCR Primer ID	Sequence	qPCR Primer ID
1	OBD168-q1361	CCTGCATGAGATGAACCAGGG	OBD168-q1363
2	OBD168-q913	GACTCCTTGTTCAGACTCAGGGAATAAG	OBD168-q915
3	OBD168-q1925	TTTTGACCATTTGAGCAGGTAC	OBD168-q1927
4	OBD168-q1093	AAAGCAGATTAGAACCACAGTGAGTTGC	OBD168-q1095
5	OBD168-q1389	TTGACAAGTCTTTTAAGAAAAAGTAC	OBD168-q1391
6	OBD168-q1385	CAAAACATGATCTCAAAGAGATAT	OBD168-q1387
7	OBD168-q581	GCCAGATGCTTCCCAAGGCTACCTG	OBD168-q583
8	OBD168-q513	CACTGCGAAAGAACCTCAAAAGTTAGCC	OBD168-q515
9	OBD168-q533	GATGAAAATGGCACCTCAAGCCTCAGCA	OBD168-q535
10	OBD168-q485	TGGCTTGTTTTGAATGAGGTTAGGCAGC	OBD168-q487
11	OBD168-q1585	TGCTGCTGTAACAAATTACCAC	OBD168-q1587
12	OBD168-q813	GGAAAAGGAGACTGAGGAAACGCTCTGC	OBD168-q815
13	OBD168-q1793	GCGAGCCAAACAAGATCTCTGCC	OBD168-q1795
14	OBD168-q1509	AAATTATAAACTTTTACATCACCGCA	OBD168-q1511
15	OBD168-q925	CCTGCCCCAGCCAGAGGATAGAGGAGG	OBD168-q927
16	OBD168-q1185	GGGTGCCACAGTGCCTTACATCACATCC	OBD168-q1187
17	OBD168-q1561	CAATGGGAAGGTGGACAGAGGA	OBD168-q1563
18	OBD168-q1173	GGACGGGCTGTCTCCTGAATGGTGTG	OBD168-q1175
19	OBD168-q2057	GCAGGCAGGATCAGTGCCAGGGCAG	OBD168-q2059
20	OBD168-q1805	GCTGTGGTTTTGCGTGGCAAGCCAGA	OBD168-q1807
21	OBD168-q673	GTCAGGTCAGCACATCCCATTAGGTGGA	OBD168-q675
22	OBD168-q661	GGGAAAAGAGTCAACACGGAGCAGAAAG	OBD168-q663
23	OBD168-q1445	CTGCCTGTGTCCCCCCGCACCCT	OBD168-q1447

24	OBD168-q621	GGAGAGTGAAGGGAGAAGGGACACACCC	OBD168-q623
25	OBD168-q1049	GGGTAGGGCGGGAGAGCGATGCTTGGAT	OBD168-q1051
26	OBD168-q2025	TAATTATTATGTTAAAATCTGGG	OBD168-q2027
27	OBD168-q2037	ACCTTTCAGAACACCTTTGTGTGC	OBD168-q2039
28	OBD168-q1013	GGTGAAAGGGTAAGCGTAGGAGCAGAGC	OBD168-q1015
29	OBD168-q1313	GGAAATCCTGGGCTCAAGTGATC	OBD168-q1315
30	OBD168-q985	GCTGGGCATCCCTGAGGCTTGGAGC	OBD168-q987
31	OBD168-q481	CAAGAGTTTTGGCTGCTGAAGGGAAGGC	OBD168-q483
32	OBD168-q901	CTCACCGCCTCACCTGCCTTGGTCTGG	OBD168-q903
33	OBD168-q1721	GTTTTGCCTGTGTGTAGATCATGAC	OBD168-q1723
34	OBD168-q797	CCCACCCAGGTTGGAGGCATCTCTGAC	OBD168-q799
35	OBD168-q897	GGATACACACCGTGCTCTTTCATTACTG	OBD168-q899
36	OBD168-q645	GGCAGGAGGATTGGTTTGGTTTGACCCC	OBD168-q647
37	OBD168-q1901	AAGAGTTTGAGGACAGATCGTGAG	OBD168-q1903
38	OBD168-q1477	CCTGTGCAATCTCAGTATTTT	OBD168-q1479
39	OBD168-q857	ACCCCTCTCCCACTCCACTGCCTCTCAG	OBD168-q859
40	OBD168-q1781	ATCCCATGACTTCCCGGTAGTG	OBD168-q1783
41	OBD168-q1645	CTTTCCCCTCCCCCTCCCCCTCCCC	OBD168-q1647
42	OBD168-q1669	ACTTGTATGAATGATATGTTACTG	OBD168-q1671
43	OBD168-q1777	AGGGTGGCTCTGGGCCTGAGGCT	OBD168-q1779
44	OBD168-q949	GGGAGATAGGAGGAGGTAGACAGGATGC	OBD168-q951
45	OBD168-q1269	GATTACCCCGACATTCTCCACCTCCTGG	OBD168-q1271
46	OBD168-q1357	CCTCTTTCCTCCTGGGTTCAAGC	OBD168-q1359
47	OBD168-q909	TAGTGTGAGCCATCTGTTTATGCCTTTT	OBD168-q911
48	OBD168-q2069	AAGTGGCATCTGGCATTCCCCAAT	OBD168-q2071
49	OBD168-q1177	CTCTGCTACCTTCCCCACCCTGCG	OBD168-q1179
50	OBD168-q2065	ATTTTTCAATGAGGTAAAATGAAA	OBD168-q2067

Table 4.a7

	Sequence	qPCR Probe	Sequence
1	CAATAAAGCGAAAGGTATTTC	OBD168-p1361	TCCTGTATTATGCTCCCTTCGAGAAGTAGAATATCTGAAT
2	CCTGCCAAGCCTGCCGCCACTGT	OBD168-p913	TGGACTGGGCTAATGTGGAAAGTGAGGATCGAGAATG
3	TAAAGCCTCTCTCCAATCGCTT	OBD168-p1925	TATTTTTATTTATTTTTTTCGATTGTGTTCACCAGGACGG
4	GTAGGAGGACACCTGTTTGCTGAGTTGG	OBD168-p1093	ACAATTTCGAGCTTGGTGTGGTCAAGGGCCAGG
5	CAGGTGCAGTGGCACAGGCCTGTACA	OBD168-p1389	TTTGGCTAATCAGAGATTTCGACAGGAGGATGGTGGGGAG
6	TTTTCCAGAGGCTCAGGGCAGAGA	OBD168-p1385	TCACTTGAGGTCAGGAGTTCGAACTCCTGACCTCAAGTGA
7	CTGTTTCTGAGTGCGGATGACATTATCT	OBD168-p581	AGGCAGAAGTTGTGGGCATGCTGAACTCGAGGAA
8	GCTGGGATAATCTTACTCATTGCCTGGC	OBD168-p513	TGCAGGTGATGGTTCATGACAATATCGACTGAGCTGC
9	GGCAGGACTTACCCAACATCAGGACTTC	OBD168-p533	AGGCAGGATCGATGAATTCTAGGGCATGTAAATGCTC
10	GCCATCACAGGTTAGGAGACAGACC	OBD168-p485	ATGAGCTCCCTGTGTCACACAGCATCGAGAGTC
11	TTTGTTCAGTCAACACATATGT	OBD168-p1585	AAGAGAGAGAATCCAATGTCGATTTAGCCTTCCATAACTA
12	GCAAGAAGCCAGGCAAGAAGACACGAGC	OBD168-p813	TTTTGTAATCGAAGGACCCCTTGCTGGG
13	GGAATTCTTCCCCCTGCCTTTCT	OBD168-p1793	AAGAAAAGTAAGGCAGGATCGAATATTTGCACATTTCTCG
14	TCTGTCACTCGGGCTACAGTGCAGTG	OBD168-p1509	CACTCACATCCCTAGTTATCGAGAACATCCTGGCTAATGT
15	CTCTGTCAGGAAACAAAGCCCTTAGCCC	OBD168-p925	TGGGCTGAAGTATGGTCGAACAGGTTACGAGCATC
16	TATTTCCCAGGCTCCAGGCTCCTCGCCG	OBD168-p1185	ACAATGGGTCACGTGCCTATTCGAGACCACCC

17	TGTGATTCATAAAGCAGCTCTT	OBD168-p1561	TTTTGAATCCCTCCCCCATCGAGGTTAATCCCTCTCCACA
18	GACTATGTGCCAGGTGTTGTGCTGATGC	OBD168-p1173	ACGAGGAGGGTTTCGATGTTACTGATTCTGTCCCC
19	AATGACCCTGGGTGTCATGGAGGAA	OBD168-p2057	CCAAGTTTCCTAACAGGATCGACACCCAGGGTCATTCACA
20	CAAGAAAAGTGGATGAGCTGAAATGA	OBD168-p1805	CACACGCAAAGGCAAACGTCGAAACTGATCATTTAGGTTT
21	AAAGGCAGAGAGGCAATGTCAGGAAGAC	OBD168-p675	TTCCCCTCGAGAAGAGCCTGCATCCAAGGTCT
22	CTTTAGGCACCACCCAGAGCACCAACC	OBD168-p661	TCCTGTGGCCTGATAAGGTATTGACCCCATCGAGATT
23	CATCACCCATAGTGTCCGCAGGC	OBD168-p1445	ACCTGCTCAACAGAGAATTCGACCCCATCCTCTGGCCCTC
24	GTGTGAATCAGGAGAGGACAAAAGAGGG	OBD168-p621	AGCCTCTTCCAACACTGAGGATCACAACTCGATGAT
25	CCCCTCTCCGCTGCCTTCTTGTCC	OBD168-p1049	TGATTTTCGAACTCCTGACCTCGTGATCTTCCCACC
26	CTCCCGGGTTCAAATGATCCTTC	OBD168-p2025	ATCCCCATTCTGTTTACATCGAGACCAGCCTGGCCAAAAT
27	GTTTCACCGTGATTTAGACTCTAC	OBD168-p2037	TCTTGCCATTCTGGCCATTCGACAATATTGTTTTATTTTA
28	GCTCTGGGACTGCCTGACCTTAGCAAAG	OBD168-p1013	ACTCACGAGGGAAGTGGTTGTTGACCTCGATTCC
29	TTCTGTGGCTGGTGGGCTCAAAG	OBD168-p1313	CCCTATACAAATGCTGATTCGACTGCATCAGCCTCTACGG
30	GCCACGCTGACGGCATTCCTGGG	OBD168-p985	TGGCTTCTCGAATGTGGTAGCCACAGACTGCAG
31	CCCCAACCCCAGCACAACCAGCCCTG	OBD168-p481	ACTTGACAACCTGTAAGGGATTCTGAATCGACAGGG
32	CACCCACTTGCTAAGCCAGTCTCACTCT	OBD168-p901	ACAGCCAGTCCCTGAGGAAGGAGTCGATGAAG
33	GTCTGTCCGCTTCCAGCGGCACGGC	OBD168-p1721	TTTGCAAGAGTAGACAAATCGAAGACCCGAGCCGGCGCTT
34	GCCAGTGTTCCCAGGCGAATCTGAAGGC	OBD168-p797	ACCTGGCTCCTTCCTGTATTATGCTCCCTTCGAGTAT
35	CCAAGATGACTTCCTTCCTTAGCCCAGC	OBD168-p897	AAATAACTGCTAAAAGTGCTTCGAACTCCTGAGCTC
36	GCCCCACCGACAACTTACCATCCTCCG	OBD168-p645	TCAGTCTCACAAGCCATATTTCAAGTGCTCGAGAACC
37	TGACCCTCCTTAAAAAAAGAAGCC	OBD168-p1901	ATCTATGTAATGGACACATCGAACTCCTGACCTTGTGATC
38	CAGCTCCAGGATTTCTAATTC	OBD168-p1477	AGGTTCTCGCAGAAAGGCTCGAACTTGCTAGACAAAGACT
39	GTGGGAACGGGTCAGCGTCCTGG	OBD168-p857	TTTATTCATAGTGCCTGGAATGTAGTAGGATCTCGATTTG
40	CCAATAAGAGGACGAGGGTGTG	OBD168-p1781	TTGGCTCTAACCCACAGATCGAGAGATCAGGAAATATTTA
41	CCCAGCCTGATCTCAGACTCTTGTG	OBD168-p1645	CGTAAAACGATGATAGAATCGAACTCCTGGTCTCAAGTGA
42	GGCTTCAAGCAATCCTCCCACCTC	OBD168-p1669	TTTTAAGCTTAGTTGGAATCGACCTTTCAGGCTCAAGCAA
43	ATTCTCCGGAAGAGATAGTGTAA	OBD168-p1777	TCCTGTATTATGCTCCCTTCGAGAAGTAGAATATCTGAAT
44	GCCCAGCAGTCAAGGTTGGAAGCCCAGG	OBD168-p949	AGGAGATTTCGATTTCTGGGCTTGGCCATTATCACCC
45	TGATTCTCCTTCCTCAGCCTCCCGA	OBD168-p1269	TGTTTGTCGAGACCATGCTGGCTAATATGATGAAACCC
46	CACCCAGGTTGGAGTGTAGTGGT	OBD168-p1357	ATGTTGGCCAGGCTGGTCTCGAGACCAGCCTGGCCAACAT
47	AGGGTTTGACCACAGACCTGAGAGATGA	OBD168-p909	AGGATACTGCATTGTCGACTGCATTTCTGCCTTCGG
48	CCCCGGAGGAGACCCTTTGAAGGT	OBD168-p2069	TTCAGAAAGAGGGGGCTCTCGAAGATCCCCGGGCAGCGCG
49	GGGAGGAAGAACAGCACCGCCCAGCGTT	OBD168-p1177	TCGTGATGTTCGAAGCACAAAGCTCACTTACTCCCG
50	ATCCTTTTCAATGAAAGGGAAATT	OBD168-p2065	AGAGAAGAAATTAATTTTTCGACCTCCCAAAGTGCTAGGA

Table 4.a8

	qPCR Probe	Sequence
1	OBD168-p1363	ATTCAGATATTCTACTTCTCGAAGGGAGCATAATACAGGA
2	OBD168-p915	TCATTCTCGATCCTCACTTTCCACATTAGCCCAGTCC
3	OBD168-p1927	CCGTCCTGGTGAACACAATCGAAAAAAATAAATAAAAATA
4	OBD168-p1095	TGGCCCTTGACCACACCAAGCTCGAAATTGTCAG
5	OBD168-p1391	CTCCCCACCATCCTCCTGTCGAAATCTCTGATTAGCCAAA
6	OBD168-p1387	TCACTTGAGGTCAGGAGTTCGAACTCCTGACCTCAAGTGA
7	OBD168-p583	TTCCTCGAGTTCAGCATGCCCACAACTTCTGCC
8	OBD168-p515	TGGCAGCTCAGTCGATATTGTCATGAACCATCACCTG
9	OBD168-p535	TGAGCATTTACATGCCCTAGAATTCATCGATCCTGCC

10	OBD168-p487	AGGACTCTCGATGCTGTGTGACACAGGGAGCT
11	OBD168-p1587	TAGTTATGGAAGGCTAAATCGACATTGGATTCTCTCTCTT
12	OBD168-p815	CCCAGCAAGGGGTCCTTCGATTACAAAA
13	OBD168-p1795	CGAGAAATGTGCAAATATTCGATCCTGCCTTACTTTTCTT
14	OBD168-p1511	ACATTAGCCAGGATGTTCTCGATAACTAGGGATGTGAGTG
15	OBD168-p927	TGATGCTCGTAACCTGTTCGACCATACTTCAGCCC
16	OBD168-p1187	TGGGTGGTCTCGAATAGGCACGTGACCCATTG
17	OBD168-p1563	TGTGGAGAGGGATTAACCTCGATGGGGGAGGGATTCAAAA
18	OBD168-p1175	AACATCGAAACCCTCCTCGTATTTGTTACTCTCTCTAC
19	OBD168-p2059	TGTGAATGACCCTGGGTGTCGATCCTGTTAGGAAACTTGG
20	OBD168-p1807	AAACCTAAATGATCAGTTTCGACGTTTGCCTTTGCGTGTG
21	OBD168-p673	AGACCTTGGATGCAGGCTCTTCTCGAGGGGAA
22	OBD168-p663	AATCTCGATGGGGTCAATACCTTATCAGGCCACAGGA
23	OBD168-p1447	GAGGGCCAGAGGATGGGGTCGAATTCTCTGTTGAGCAGGT
24	OBD168-p623	ATCATCGAGTTGTGATCCTCAGTGTTGGAAGAGGCTC
25	OBD168-p1051	AGGTGGGAAGATCACGAGGTCAGGAGTTCGAAAATCA
26	OBD168-p2027	ATTTTGGCCAGGCTGGTCTCGATGTAAACAGAATGGGGAT
27	OBD168-p2039	TAAAATAAAACAATATTGTCGAATGGCCAGAATGGCAAGA
28	OBD168-p1015	AGGAATCGAGGTCAACAACCACTTCCCTCGTGAG
29	OBD168-p1315	CCGTAGAGGCTGATGCAGTCGAATCAGCATTTGTATAGGG
30	OBD168-p987	TGCAGTCTGTGGCTACCACATTCGAGAAGCCAAG
31	OBD168-p483	TCTCCCCTGTCGATTCAGAATCCCTTACAGGTTGTC
32	OBD168-p903	TCCTTCATCGACTCCTTCCTCAGGGACTGGCT
33	OBD168-p1723	AAGCGCCGGCTCGGGTCTTCGATTTGTCTACTCTTGCAAA
34	OBD168-p799	ATACTCGAAGGGAGCATAATACAGGAAGGAGCCAGG
35	OBD168-p899	AGCTCAGGAGTTCGAAGCACTTTTAGCAGTTATTTA
36	OBD168-p647	TGGTTCTCGAGCACTTGAAATATGGCTTGTGAGACTG
37	OBD168-p1903	GATCACAAGGTCAGGAGTTCGATGTGTCCATTACATAGAT
38	OBD168-p1479	AGTCTTTGTCTAGCAAGTTCGAGCCTTTCTGCGAGAACCT
39	OBD168-p859	ACAAATCGAGATCCTACTACATTCCAGGCACTATGAATAA
40	OBD168-p1783	TAAATATTTCCTGATCTCTCGATCTGTGGGTTAGAGCCAA
41	OBD168-p1647	TCACTTGAGACCAGGAGTTCGATTCTATCATCGTTTTACG
42	OBD168-p1671	TTGCTTGAGCCTGAAAGGTCGATTCCAACTAAGCTTAAAA
43	OBD168-p1779	ATTCAGATATTCTACTTCTCGAAGGGAGCATAATACAGGA
44	OBD168-p951	AGGGTGATAATGGCCAAGCCCAGAAATCGAAATCTCC
45	OBD168-p1271	TCATATTAGCCAGCATGGTCTCGACAAACAATATAACGT
46	OBD168-p1359	ATGTTGGCCAGGCTGGTCTCGAGACCAGCCTGGCCAACAT
47	OBD168-p911	TGCAGTCGACAATGCAGTATCCTTGCTTCCTAGCAC
48	OBD168-p2071	CGCGCTGCCCGGGGATCTTCGAGAGCCCCCTCTTTCTGAA
49	OBD168-p1179	TGCTTCGAACATCACGAAGACATTGGATGTGGCCC
50	OBD168-p2067	TCCTAGCACTTTGGGAGGTCGAAAAATTAATTTCTTCTCT

Table 4.a9

	probe	PCR Marker Set	qPCR Marker Set
1	ORF1_11_61243450_61246026_61388261_61391790_FR	OBD168-1361.1363	OBD168-q1361.q1363 .p1361/p1363
2	ORF1_3_18693806_18695229_18731498_18743005_FR	OBD168-913.915	OBD168-q913.q915 .p913/p915

3	ORF1_2_118112112_118113416_118185366_118187110_FR	OBD168-1925.1927	OBD168-q1925.q1927 .p1925/p1927
4	ORF1_17_27395089_27399400_27471513_27474666_RR	OBD168-1093.1095	OBD168-q1093.q1095 .p1093/p1095
5	ORF1_12_131862265_131863764_132122269_132123632_RF	OBD168-1389.1391	OBD168-q1389.q1391 .p1389/p1391
6	ORF1_12_121447890_121451709_121468997_121471919_FF	OBD168-1385.1387	OBD168-q1385.q1387 .p1385/p1387
7	ORF1_14_81120330_81122262_81268937_81270783_RF	OBD168-581.583	OBD168-q581.q583 .p581/p583
8	ORF1_13_45338339_45340076_45393094_45398989_FR	OBD168-513.515	OBD168-q513.q515 .p513/p515
9	ORF1_12_5915876_5919160_6152139_6154132_FF	OBD168-533.535	OBD168-q533.q535 .p533/p535
10	ORF1_16_9911562_9916434_9954809_9955829_RF	OBD168-485.487	OBD168-q485.q487 .p485/p487
11	ORF1_22_16907330_16914217_17087415_17089015_RR	OBD168-1585.1587	OBD168-q1585.q1587 .p1585/p1587
12	ORF1_9_131999122_132006607_132139741_132142158_FR	OBD168-813.815	OBD168-q813.q815 .p813/p815
13	ORF1_12_5915876_5919160_6059110_6067436_FF	OBD168-1793.1795	OBD168-q1793.q1795 .p1793/p1795
14	ORF1_19_52960383_52965476_52976109_52979684_FR	OBD168-1509.1511	OBD168-q1509.q1511 .p1509/p1511
15	ORF1_1_229299065_229300173_229506871_229512794_FR	OBD168-925.927	OBD168-q925.q927 .p925/p927
16	ORF1_16_18252588_18255195_18400348_18402976_RR	OBD168-1185.1187	OBD168-q1185.q1187 .p1185/p1187
17	ORF1_2_111366352_111370512_111529947_111533147_FF	OBD168-1561.1563	OBD168-q1561.q1563 .p1561/p1563
18	ORF1_5_55186470_55190634_55308382_55310405_FR	OBD168-1173.1175	OBD168-q1173.q1175 .p1173/p1175
19	ORF1_7_2130888_2136507_2376124_2377913_FF	OBD168-2057.2059	OBD168-q2057.q2059 .p2057/p2059
20	ORF1_12_109959287_109961500_109999941_110004320_FF	OBD168-1805.1807	OBD168-q1805.q1807 .p1805/p1807
21	ORF1_5_148804534_148807399_148901266_148906110_RF	OBD168-673.675	OBD168-q673.q675 .p675/p673
22	ORF1_2_174610120_174616390_174648154_174652062_RR	OBD168-661.663	OBD168-q661.q663 .p661/p663
23	ORF1_17_43832124_43833485_43905109_43906650_FF	OBD168-1445.1447	OBD168-q1445.q1447 .p1445/p1447
24	ORF1_4_74078231_74079386_74117911_74125141_FR	OBD168-621.623	OBD168-q621.q623 .p621/p623
25	ORF1_1_36159277_36165949_36303183_36304407_RF	OBD168-1049.1051	OBD168-q1049.q1051 .p1049/p1051
26	ORF1_5_124631740_124634000_124857558_124858678_FR	OBD168-2025.2027	OBD168-q2025.q2027 .p2025/p2027
27	ORF1_6_86970655_86977787_87154540_87156275_RR	OBD168-2037.2039	OBD168-q2037.q2039 .p2037/p2039
28	ORF1_4_38133158_38135017_38161792_38166364_RF	OBD168-1013.1015	OBD168-q1013.q1015 .p1013/p1015
29	ORF1_1_42817616_42818863_42949613_42952408_FF	OBD168-1313.1315	OBD168-q1313.q1315 .p1313/p1315
30	ORF1_10_44948033_44949598_44963508_44966433_RR	OBD168-985.987	OBD168-q985.q987 .p985/p987
31	ORF1_18_75155500_75159840_75214354_75217340_RF	OBD168-481.483	OBD168-q481.q483 .p481/p483
32	ORF1_1_151547581_151552501_151755108_151762446_RF	OBD168-901.903	OBD168-q901.q903 .p901/p903
33	ORF1_X_49053496_49056424_49286142_49288605_RF	OBD168-1721.1723	OBD168-q1721.q1723 .p1721/p1723
34	ORF1_11_61243450_61246026_61472770_61474691_FR	OBD168-797.799	OBD168-q797.q799 .p797/p799
35	ORF1_14_81530269_81532452_81602546_81604597_FF	OBD168-897.899	OBD168-q897.q899 .p897/p899
36	ORF1_14_74588744_74593680_74780483_74782393_FF	OBD168-645.647	OBD168-q645.q647 .p645/p647
37	ORF1_2_27481760_27484387_27626184_27635183_RF	OBD168-1901.1903	OBD168-q1901.q1903 .p1901/p1903
38	ORF1_18_10287457_10291556_10505933_10507774_FF	OBD168-1477.1479	OBD168-q1477.q1479 .p1477/p1479
39	ORF1_1_109681178_109683602_109788010_109790308_FF	OBD168-857.859	OBD168-q857.q859 .p857/p859
40	ORF1_11_95040575_95045594_95230445_95231653_FF	OBD168-1781.1783	OBD168-q1781.q1783 .p1781/p1783
41	ORF1_6_6745894_6751892_6983650_6986668_FR	OBD168-1645.1647	OBD168-q1645.q1647 .p1645/p1647
42	ORF1_6_113632952_113639716_113727754_113732296_RF	OBD168-1669.1671	OBD168-q1669.q1671 .p1669/p1671
43	ORF1_11_61224624_61227200_61388261_61391790_FR	OBD168-1777.1779	OBD168-q1777.q1779 .p1777/p1779
44	ORF1_10_91056658_91062643_91164372_91168358_RF	OBD168-949.951	OBD168-q949.q951 .p949/p951
45	ORF1_2_102100064_102105009_102374574_102377537_FR	OBD168-1269.1271	OBD168-q1269.q1271 .p1269/p1271
46	ORF1_11_17097711_17100441_17188135_17191681_RR	OBD168-1357.1359	OBD168-q1357.q1359 .p1357/p1359
47	ORF1_1_199677018_199683841_199811400_199820398_RR	OBD168-909.911	OBD168-q909.q911 .p909/p911
48	ORF1_7_100090606_100091968_100119089_100121546_RR	OBD168-2069.2071	OBD168-q2069.q2071 .p2069/p2071
49	ORF1_12_7868599_7870934_7932397_7933511_FF	OBD168-1177.1179	OBD168-q1177.q1179 .p1177/p1179

50	ORF1_7_87727621_87737484_87868535_87872727_FF	OBD168-2065.2067	OBD168-q2065.q2067 .p2065/p2067

Table 4.a10

51	ORF1_12_51666821_51670814_51862305_51869704_FR	401	3075.288832
52	ORF1_7_137931629_137933966_137981878_137983291_FR	323	2644.935118
53	ORF1_11_61042263_61044402_61243450_61246026_FF	245	2203.942492
54	ORF1_X_2888191_2891631_3046105_3049187_RF	220	2093.173181
55	ORF1_11_115616166_115618345_115711125_115715158_FF	359	2842.705641
56	ORF1_X_77646855_77652042_77915112_77916580_RF	430	3219.053584
57	ORF1_20_62658422_62663845_62934812_62935956_RF	419	3172.19168
58	ORF1_22_17921708_17928023_17999187_18001605_FF	398	3062.496857
59	ORF1_19_47777294_47778517_47957709_47959307_RF	364	2875.54375
60	ORF1_8_7882531_7883805_7954782_7966362_FF	266	2337.981624
61	ORF1_11_12091217_12094358_12153671_12160688_FR	298	2559.990469
62	ORF1_17_31222339_31224131_31324781_31330350_RR	288	2501.124218
63	ORF1_7_4620261_4621735_4724415_4726417_FR	416	3166.931042
64	ORF1_10_45820548_45823847_45898343_45903899_RF	311	2598.185801
65	ORF1_16_81474879_81476453_81607034_81611259_RR	463	3398.382345
66	ORF1_11_10776569_10779775_10900691_10903608_FF	332	2691.77054
67	ORF1_8_97253466_97261198_97345458_97357412_RF	411	3139.677711
68	ORF1_1_109681178_109683602_109741801_109745521_FR	340	2722.247784
69	ORF1_1_7774817_7777030_7966809_7968736_FF	294	2534.406731
70	ORF1_12_7858281_7862390_7932397_7933511_RF	304	2568.815685
71	ORF1_13_30408291_30410407_30585632_30589891_RR	310	2592.51634
72	ORF1_15_30288521_30290733_30544055_30547496_FR	375	2927.700157
73	ORF1_11_61152527_61154904_61243450_61246026_RF	316	2615.722841
74	ORF1_17_64322183_64329531_64384310_64385587_RF	483	3472.308017
75	ORF1_6_26459325_26460705_26493174_26499033_RR	449	3319.91788
76	ORF1_2_74503923_74507137_74519716_74521847_FF	514	3577.121944
77	ORF1_2_159230477_159238639_159250572_159255062_FF	498	3520.298247
78	ORF1_16_46899253_46904082_47060044_47061469_FF	459	3384.670678
79	ORF1_5_40609009_40613245_40692971_40695207_FR	341	2735.33663
80	ORF1_4_47908113_47912137_48013964_48015665_FF	354	2796.807098
81	ORF1_4_38161792_38166364_38180538_38182770_FR	357	2829.764831
82	ORF1_7_22482163_22488443_22587350_22592472_RR	504	3548.464077
83	ORF1_17_27477797_27480875_27629083_27630392_RR	373	2916.46944
84	ORF1_10_13707193_13712319_13854651_13857653_FR	365	2875.544458
85	ORF1_15_79006295_79007772_79123113_79127341_RF	541	3719.882512
86	ORF1_19_9777468_9779791_9828343_9833999_FF	383	2978.506253
87	ORF1_17_48576277_48578280_48760984_48766661_FF	500	3523.786793
88	ORF1_3_124942088_124944537_125145442_125149201_RR	406	3118.518158
89	ORF1_2_230319552_230322976_230433766_230436650_RR	403	3095.482353
90	ORF1_5_179455074_179456297_179632102_179634386_RF	525	3614.075373
91	ORF1_13_94395452_94397500_94478315_94481582_FR	421	3181.350595
92	ORF1_1_185482953_185486658_185569901_185571399_FF	426	3194.213302
93	ORF1_7_105801948_105809991_105902395_105905257_RF	423	3184.944399

94	ORF1_17_75411072_75413612_75649583_75651419_RF	434	3237.927886
95	ORF1_11_61224624_61227200_61378098_61379415_FF	415	3162.182868
96	ORF1_5_94419239_94427299_94505842_94514405_FR	551	3764.075451
97	ORF1_17_82434207_82440644_82511425_82512972_FR	567	3825.12433
98	ORF1_17_59893718_59895987_59916319_59918152_FR	568	3830.891167
99	ORF1_2_102051982_102057593_102268036_102274328_RR	543	3724.636088
100	ORF1_1_203288566_203291154_203473865_203477190_FR	577	3888.735935

Table 4.b1

51	-1.437023753	1.444662839	0.00410465	Late SSc
52	-1.436812218	1.372546527	0.003141195	Late SSc
53	-1.435876536	1.307037927	0.002268922	Late SSc
54	-1.433613438	1.327259391	0.00206892	Late SSc
55	-1.432745201	1.403705162	0.003570554	Late SSc
56	-1.429058783	1.46064713	0.004450195	Late SSc
57	-1.426850922	1.460623768	0.004336283	Late SSc
58	-1.426020051	1.444849909	0.00407447	Late SSc
59	-1.422034199	1.41292781	0.003644069	Late SSc
60	-1.420867576	1.337778105	0.002521338	Late SSc
61	-1.417944096	1.403736871	0.002963925	Late SSc
62	-1.416627122	1.393528599	0.002843634	Late SSc
63	-1.416315236	1.466844799	0.004323573	Late SSc
64	-1.414963784	1.380989039	0.003043098	Late SSc
65	-1.413911362	1.49285337	0.004897376	Late SSc
66	-1.411966593	1.37767433	0.003240783	Late SSc
67	-1.41025199	1.462162948	0.004257973	Late SSc
68	-1.409458393	1.372450033	0.003306288	Late SSc
69	-1.408443165	1.397614445	0.002911387	Late SSc
70	-1.407950766	1.384488035	0.00298214	Late SSc
71	-1.404913131	1.380068244	0.00303129	Late SSc
72	-1.403981089	1.415911341	0.00376212	Late SSc
73	-1.403771448	1.375504908	0.003079743	Late SSc
74	-1.403471491	1.486407014	0.005086864	Late SSc
75	-1.401945125	1.477210974	0.004699527	Late SSc
76	-1.400464213	1.471925259	0.005360609	Late SSc
77	-1.400250828	1.476947968	0.005211465	Late SSc
78	-1.399306124	1.495157038	0.004862558	Late SSc
79	-1.39807413	1.380138694	0.00333459	Late SSc
80	-1.396796568	1.382985423	0.003468855	Late SSc
81	-1.393419416	1.400184107	0.003541756	Late SSc
82	-1.392802437	1.480005974	0.005285174	Late SSc
83	-1.391786866	1.413834843	0.003736567	Late SSc
84	-1.391343564	1.409057391	0.003644071	Late SSc
85	-1.389469621	1.498207138	0.005742942	Late SSc
86	-1.388905146	1.429267903	0.003878624	Late SSc
87	-1.387700446	1.473610575	0.005220571	Late SSc

88	-1.382271601	1.462565011	0.004207329	Late SSc
89	-1.382083594	1.454244682	0.004152482	Late SSc
90	-1.381646553	1.467409322	0.005458532	Late SSc
91	-1.381291697	1.461116048	0.00435845	Late SSc
92	-1.380681871	1.45430681	0.00438966	Late SSc
93	-1.380346255	1.457114043	0.004367161	Late SSc
94	-1.380100261	1.462217536	0.004496421	Late SSc
95	-1.379802039	1.466482296	0.004312114	Late SSc
96	-1.379749126	1.501894245	0.00586349	Late SSc
97	-1.379483586	1.501385344	0.006031711	Late SSc
98	-1.379324736	1.50271561	0.006047702	Late SSc
99	-1.378671665	1.496046282	0.005755859	Late SSc
100	-1.378053209	1.518746877	0.006209069	Late SSc

Table 4.b2

51	GATAGATTATGGAGGGTTAAGGAAGGAATCGATAACGCCAAGCACTCGGGCATGGGTGAC
52	AAAACCAGAGAAAGGAGCAAAGTGAGCCTCGAGTACAGAGGCACAGGGCAGCTTTTGGGG
53	ACTATTACTCAAATGTTAAAGCTCTTGGTCGAAGGGAGCATAATACAGGAAGGAGCCAGG
54	TTTCTACATTTTAGGGAGACATGAGATATCGAGACCAACCTGACAACATGGCAAAACCCC
55	AGTGGTATGACAATGGCTCACTGCAGCCTCGAACTCCACACCCCTGCTAGGAAGGGCACA
56	TAATTAGTGAGCCACAGACTCTAGGCCATCGAGGCTACAGTGAGCTATGATCACGTCACT
57	AGTTTCTAGAGAGGATTAAGGAGGGGGCTCGAGGGCCTTTGCCCTTTCGTAAGGGAAAGA
58	TTGGCTTCTGACTGTATACTCTGAGCACTCGAGGTGTACTGAGATATCTCGCCCCCGAGG
59	AAAAACCTTAGACTAGACGGATTCACAGTCGAGACAGTGTCTTACTCTGTTGTCCAGGCT
60	AGTGCAACAGACCAATGAAGTGAGACTTTCGATATAATAGTGGCAAACAAAATCCAGCAA
61	GGCAGAAAAATGAGTGAAGTCAGAGCGATCGAGTCTGCACCTATTTAATAATAACTCTCC
62	AAGCAGGTGTCCATTATTAATTCATTCATCGAACTCCTGGCCTTATGTAACCCACCTGCC
63	TCACTTAGTAGCCATCACGGTTATCAGATCGAACTCCTGTTCTCAAGTGATCTGCGTGCC
64	ATCTAGTTTCCATGCAAACTCAGAAGCATCGATTTGGGTGTGTCTGATGTATTTCCATGA
65	CCAGCAGTTCTGCAAAGACAAGCACTGGTCGATTGTGGATGGGAGTGTGGATTTTGTGGC
66	TTATGGGTAACTTCGTGTCTTTTTTTGTTCGAATTTTTACACCCGGCCCTTGCTTCCAGG
67	TTCAATTACCTCCCACTAGGTCCCTCCCTCGATAGCAGAATCTCCCAGTCTGGAGCACAG
68	TTCATAGTGCCTGGAATGTAGTAGGATCTCGAATCACTTCCTACCTGCAGGAGGCAGAGA
69	GGGTTTCCCCATGTTGGCCAGGTTGGTCTCGAGACCAGCCTGGCCAACATGGCAAAACCC
70	CGTTCCGGGAGTAAGTGAGCTTTGTGCTTCGAGCCTTCTTACTCAACCACTCAACATCTG
71	TTCCAAGGACACAACATGATCTCATCTTTCGAACTCCAGCCTGGGTAACAGAGACTCCAT
72	CTTCTATACGCCAGAACATGGATGAACCTCGAGATAATTTTGTATGTTTCCTTTTTTCTT
73	CCTGGCTCCTTCCTGTATTATGCTCCCTTCGAGAGAACACTATCAGAGCTCCCATGGCCC
74	TTCAAGTTCCCATCCAATGAGACATGTGTCGAGATCAGCCTGGCCAACGTGGTGAAACCC
75	AAATCTGGGGACCAGTAGCTGTGGCTAGTCGAGCCACTGCACTCCAGCCTGCAGGACAGA
76	TGTGTTCATTCAAGTCTTTGATCTTCACTCGAATCTGAGAGACAGAGAGAGAGCAAGGGA
77	AATCACTAAATTTCCAAATGTACATGGATCGACCTCCCAGGCTCAAGTGGTCTTCCTGTC
78	GAATGAAGGGGCCCTAGGGCAGTGGTGTTCGAGAGGCGGAAGTAAAAGGATTCAGATCCC
79	TTTGACTCTAGCCCAGTGATTCCCAAACTCGAGTCAAAGTTGAAAATTCATAGTAAGATT
80	AAAACAAATTGAGTATTTCAAGTAAACCTCGAACCACTGCACTCTAGTCCAGGCAACAGA
81	TGACTCACGAGGGAAGTGGTTGTTGACCTCGAGGAGACTGGACCAGAAGAGTTTCCCACC

82	GAGGTGGTGGGCAGGAAAGGAAGACAGTTCGAATGGTCTGTTCAAGACTATTTTATAGTG
83	GGCAGGAGGATTGCTTGAGCCTAGGAAATCGAACTCCTGGGCTCAAGCAATCCTCCCGCC
84	GGTTGGGGGATCACTTGAGGTCAGGAGCTCGAACTCCTGACCTCAAGTGATCCACTCTCC
85	CAGACTTTCATATTTTCAATCTCTCTCTTCGATGCTCAGGAAGCGCAGGTCCGTCAGCCT
86	AGGTTTCACCATGTTGGCCAGGCTGGTCTCGAGACCAGCCTGGCCAACATGGTGAAACCC
87	ATATTCCTCGCATGGAGGGAACTTGGGGTCGAAATCCTGGCCTCAAGCAATTCACCCACC
88	TAAGAAGTGGAAGTCGCCATGAGAGTGCTCGATACAATGGAATGTTATTCCACCATAAAA
89	GGTGGCTACATCATTATATGGCCAAGACTCGACTTTTAAATTCCTAAGTTTCCTAGTTGG
90	CGCGCACTGGATCAAAATAATACACGCCTCGAACTAACTTTCCAAGCTTGACTCTTAGGA
91	TTTACTGAACATTGGTAAATCTACCTAATCGAAATACAAAAATTAGCCAGGCATGATGGC
92	GTGATTGGTGAACAGTGGCTTCCTTTAGTCGACTAAATGGAACGTTTAAATGAGTTGAAG
93	CGCCTTTGAGTCTATTTCTGACTTCATCTCGACGGAATGTGGCCCACGGCATTAAATTTA
94	GCCAGGAGGATCATTTGAGGTCAGGAGTTCGAACTCCTGACCTCAGATGATCCACACACC
95	CCTGGCTCCTTCCTGTATTATGCTCCCTTCGAATCTTCATCGCTATCAGTCAGAAATTCT
96	ATGCCTGTAATCACGGGACTTTGGGAGGTCGATCTCATGACATTTAATATTACTTTTTGG
97	TTTGTTTCGGGTGCTCTAGAATATTCCATCGAGGGCCGTGGTTACAGAATCTTCTGGGGT
98	TCATGCAGAATTCCAATTAGCCTCTTAATCGAACTCCTGACCTCGGGGGATCGGCCCGCC
99	GAGCCGACCCTTGGGAGTCTGAACATCTTCGACTTCAAAAGCCACATAGATGATCCCCTT
100	TCTCCATAAAATATGGAGGATACTGCCCTCGAACTCCTGGGCTCCATTAATCTTCTGCCT

Table 4.b3

51	12	51670783	51670812	51862307	51862336
52	7	137933935	137933964	137981880	137981909
53	11	61044371	61044400	61245995	61246024
54	X	2888193	2888222	3049156	3049185
55	11	115618314	115618343	115715127	115715156
56	X	77646857	77646886	77916549	77916578
57	20	62658424	62658453	62935925	62935954
58	22	17927992	17928021	18001574	18001603
59	19	47777296	47777325	47959276	47959305
60	8	7883774	7883803	7966331	7966360
61	11	12094327	12094356	12153673	12153702
62	17	31222341	31222370	31324783	31324812
63	7	4621704	4621733	4724417	4724446
64	10	45820550	45820579	45903868	45903897
65	16	81474881	81474910	81607036	81607065
66	11	10779744	10779773	10903577	10903606
67	8	97253468	97253497	97357381	97357410
68	1	109683571	109683600	109741803	109741832
69	1	7776999	7777028	7968705	7968734
70	12	7858283	7858312	7933480	7933509
71	13	30408293	30408322	30585634	30585663
72	15	30290702	30290731	30544057	30544086
73	11	61152529	61152558	61245995	61246024
74	17	64322185	64322214	64385556	64385585
75	6	26459327	26459356	26493176	26493205

76	2	74507106	74507135	74521816	74521845
77	2	159238608	159238637	159255031	159255060
78	16	46904051	46904080	47061438	47061467
79	5	40613214	40613243	40692973	40693002
80	4	47912106	47912135	48015634	48015663
81	4	38166333	38166362	38180540	38180569
82	7	22482165	22482194	22587352	22587381
83	17	27477799	27477828	27629085	27629114
84	10	13712288	13712317	13854653	13854682
85	15	79006297	79006326	79127310	79127339
86	19	9779760	9779789	9833968	9833997
87	17	48578249	48578278	48766630	48766659
88	3	124942090	124942119	125145444	125145473
89	2	230319554	230319583	230433768	230433797
90	5	179455076	179455105	179634355	179634384
91	13	94397469	94397498	94478317	94478346
92	1	185486627	185486656	185571368	185571397
93	7	105801950	105801979	105905226	105905255
94	17	75411074	75411103	75651388	75651417
95	11	61227169	61227198	61379384	61379413
96	5	94427268	94427297	94505844	94505873
97	17	82440613	82440642	82511427	82511456
98	17	59895956	59895985	59916321	59916350
99	2	102051984	102052013	102268038	102268067
100	1	203291123	203291152	203473867	203473896

Table 4.b4

51	12	51666813	51670812	51862307	51866306	ORF1_12_51666821_51670814_51862305_51869704_FR
52	7	137929965	137933964	137981880	137985879	ORF1_7_137931629_137933966_137981878_137983291_FR
53	11	61040401	61044400	61242025	61246024	ORF1_11_61042263_61044402_61243450_61246026_FF
54	X	2888193	2892192	3045186	3049185	ORF1_X_2888191_2891631_3046105_3049187_RF
55	11	115614344	115618343	115711157	115715156	ORF1_11_115616166_115618345_115711125_115715158_FF
56	X	77646857	77650856	77912579	77916578	ORF1_X_77646855_77652042_77915112_77916580_RF
57	20	62658424	62662423	62931955	62935954	ORF1_20_62658422_62663845_62934812_62935956_RF
58	22	17924022	17928021	17997604	18001603	ORF1_22_17921708_17928023_17999187_18001605_FF
59	19	47777296	47781295	47955306	47959305	ORF1_19_47777294_47778517_47957709_47959307_RF
60	8	7879804	7883803	7962361	7966360	ORF1_8_7882531_7883805_7954782_7966362_FF
61	11	12090357	12094356	12153673	12157672	ORF1_11_12091217_12094358_12153671_12160688_FR
62	17	31222341	31226340	31324783	31328782	ORF1_17_31222339_31224131_31324781_31330350_RR
63	7	4617734	4621733	4724417	4728416	ORF1_7_4620261_4621735_4724415_4726417_FR
64	10	45820550	45824549	45899898	45903897	ORF1_10_45820548_45823847_45898343_45903899_RF
65	16	81474881	81478880	81607036	81611035	ORF1_16_81474879_81476453_81607034_81611259_RR
66	11	10775774	10779773	10899607	10903606	ORF1_11_10776569_10779775_10900691_10903608_FF
67	8	97253468	97257467	97353411	97357410	ORF1_8_97253466_97261198_97345458_97357412_RF
68	1	109679601	109683600	109741803	109745802	ORF1_1_109681178_109683602_109741801_109745521_FR
69	1	7773029	7777028	7964735	7968734	ORF1_1_7774817_7777030_7966809_7968736_FF

70	12	7858283	7862282	7929510	7933509	ORF1_12_7858281_7862390_7932397_7933511_RF
71	13	30408293	30412292	30585634	30589633	ORF1_13_30408291_30410407_30585632_30589891_RR
72	15	30286732	30290731	30544057	30548056	ORF1_15_30288521_30290733_30544055_30547496_FR
73	11	61152529	61156528	61242025	61246024	ORF1_11_61152527_61154904_61243450_61246026_RF
74	17	64322185	64326184	64381586	64385585	ORF1_17_64322183_64329531_64384310_64385587_RF
75	6	26459327	26463326	26493176	26497175	ORF1_6_26459325_26460705_26493174_26499033_RR
76	2	74503136	74507135	74517846	74521845	ORF1_2_74503923_74507137_74519716_74521847_FF
77	2	159234638	159238637	159251061	159255060	ORF1_2_159230477_159238639_159250572_159255062_FF
78	16	46900081	46904080	47057468	47061467	ORF1_16_46899253_46904082_47060044_47061469_FF
79	5	40609244	40613243	40692973	40696972	ORF1_5_40609009_40613245_40692971_40695207_FR
80	4	47908136	47912135	48011664	48015663	ORF1_4_47908113_47912137_48013964_48015665_FF
81	4	38162363	38166362	38180540	38184539	ORF1_4_38161792_38166364_38180538_38182770_FR
82	7	22482165	22486164	22587352	22591351	ORF1_7_22482163_22488443_22587350_22592472_RR
83	17	27477799	27481798	27629085	27633084	ORF1_17_27477797_27480875_27629083_27630392_RR
84	10	13708318	13712317	13854653	13858652	ORF1_10_13707193_13712319_13854651_13857653_FR
85	15	79006297	79010296	79123340	79127339	ORF1_15_79006295_79007772_79123113_79127341_RF
86	19	9775790	9779789	9829998	9833997	ORF1_19_9777468_9779791_9828343_9833999_FF
87	17	48574279	48578278	48762660	48766659	ORF1_17_48576277_48578280_48760984_48766661_FF
88	3	124942090	124946089	125145444	125149443	ORF1_3_124942088_124944537_125145442_125149201_RR
89	2	230319554	230323553	230433768	230437767	ORF1_2_230319552_230322976_230433766_230436650_RR
90	5	179455076	179459075	179630385	179634384	ORF1_5_179455074_179456297_179632102_179634386_RF
91	13	94393499	94397498	94478317	94482316	ORF1_13_94395452_94397500_94478315_94481582_FR
92	1	185482657	185486656	185567398	185571397	ORF1_1_185482953_185486658_185569901_185571399_FF
93	7	105801950	105805949	105901256	105905255	ORF1_7_105801948_105809991_105902395_105905257_RF
94	17	75411074	75415073	75647418	75651417	ORF1_17_75411072_75413612_75649583_75651419_RF
95	11	61223199	61227198	61375414	61379413	ORF1_11_61224624_61227200_61378098_61379415_FF
96	5	94423298	94427297	94505844	94509843	ORF1_5_94419239_94427299_94505842_94514405_FR
97	17	82436643	82440642	82511427	82515426	ORF1_17_82434207_82440644_82511425_82512972_FR
98	17	59891986	59895985	59916321	59920320	ORF1_17_59893718_59895987_59916319_59918152_FR
99	2	102051984	102055983	102268038	102272037	ORF1_2_102051982_102057593_102268036_102274328_RR
100	1	203287153	203291152	203473867	203477866	ORF1_1_203288566_203291154_203473865_203477190_FR

Table 4.b5

51	OBD168-1073	CTGAGTTACAGTGGTGGGAGTGG	OBD168-1075	CTTGCTCTTGTCCACCACGCCGT
52	OBD168-873	GTCAACATCCCATTGCTGGTGCC	OBD168-875	CTCCCTCTTGCTGCTGGGCACTA
53	OBD168-1769	TTGCGTTATAAAAACATGTATAAAA	OBD168-1771	CTGGCATCCAGAGCTCAGTGAACAT
54	OBD168-1709	AATATGAGTGACCATGGCCGC	OBD168-1711	ACGATCTCGGCTTACTGCAAC
55	OBD168-1785	GGATGCATCCCAAGGGCCTATTTC	OBD168-1787	CATTTTTCCGGGGAATTTTTGTGC
56	OBD168-2113	ATAGTACACCTACATATGCTAA	OBD168-2115	CTTTATATTTATTAAGGCTTTT
57	OBD168-1581	CCCTGTCTGCTATGTGAGAGGTAGTG	OBD168-1583	AGGGGCTGCGGAGGGCCGTGTGGGGC
58	OBD168-933	CGCCAGAACCACAACACACACTC	OBD168-935	TGCCTCATACTGCGGTGTCCCTC
59	OBD168-1501	TGGAAACATAAAACCTCTCAAGA	OBD168-1503	ATGTACCTGTACTCCCAGTTACT
60	OBD168-2077	CTTTCCATCCAAAATGGACTCACTGC	OBD168-2079	GGTTTTTAATTTAAAGGAATGTTGAA
61	OBD168-937	GGAGGGCAGCATTCACACTGGAC	OBD168-939	GGGTGCCCAGGAAAACTGTGAAC
62	OBD168-1025	CATTTTCCTCCGTGTGGTGACTTCAT	OBD168-1027	AAATGGGAGCAGCCACAGTGAGGAC
63	OBD168-1237	TTTGTCCAGGGAACCCACACTGC	OBD168-1239	CGAGGCACAGACCCCTGATTGAC

64	OBD168-1345	GGCTCTTCTGTGAGGCACTCTGCCA	OBD168-1347	AGAACTATCAATGCCATAACTCTGA
65	OBD168-1277	CCTCCAGACACAGCATCTTCTCC	OBD168-1279	CCCCACCCTCCTCCTCAACATTC
66	OBD168-1757	TATAATGTGTTAGGTTGAATAAG	OBD168-1759	AGAAAGAAGAAGAAGCTGATAGT
67	OBD168-721	GAAGGAGGAACTGTCAAACACTCACA	OBD168-723	CCTGGCTATGTAAGTCCTCTGCTGTG
68	OBD168-1041	CTCTCCCCTGAAGTTCCCACCTG	OBD168-1043	CATCTCTGCTACTCGTGCTCCCA
69	OBD168-1301	CTCCTGAGTAGTTGGGATTACA	OBD168-1303	TGCCTCCTAGGTTCAAGCGATT
70	OBD168-1797	TCTGCTAAGGGAACCCAGCTTC	OBD168-1799	AAAGTGAAAAGACAACCCACAG
71	OBD168-565	CTGGAGAACTGAGCAGAGCGGGC	OBD168-567	CCCCTTAGTCTGGGATTGTAGATTG
72	OBD168-1837	GATTAGAAATACAGGGGACTCCA	OBD168-1839	AACACTAAAATTTCTCTAAGAGA
73	OBD168-749	GGTTGGAGGCATCTCTGACACCA	OBD168-751	GCGGAGAAGCCTGTGCTGCGAAT
74	OBD168-1461	GGCTGCCCACCCTCGTCAGGAAAA	OBD168-1463	CCTGGGTTCAAGCAGTTCTCCTGT
75	OBD168-1029	CCATAGGGTCTCTTTGGGCTGAG	OBD168-1031	CTGGGAGTGCCTGACCTGTTCTC
76	OBD168-1545	TCTCCAAGGCACTCACAAGTAT	OBD168-1547	GAAACGTTCATCAGGAGTTGGA
77	OBD168-1929	CTGGGTTTCTGATTCATTTGG	OBD168-1931	ACACTTTGGGAGGCCAAGGCT
78	OBD168-1413	AGGGGAAACGTGGCATTCACG	OBD168-1415	GTGTGAGCTGCTCCCTCTACC
79	OBD168-1625	ACAGAAAAGAGAGAGGAATGGCA	OBD168-1627	GTTTTCTGGATAAATAAATGTAA
80	OBD168-641	GGACCACAGGGATTTTCTTCAAGCAC	OBD168-643	CACTACCCCACCCCTCACCTTTT
81	OBD168-1617	CTCCCTGAAATGCAGATGGAAATG	OBD168-1619	AAATTGATACTTTCCACAACAATG
82	OBD168-685	GCTCTGCTTCTGGGAACCCTTTC	OBD168-687	CAGGAAGCCCAGATGCTGTGTGG
83	OBD168-1157	GGTGTGGTGCCTCACGCCTTGTA	OBD168-1159	GCAGGAAGGAGTCTTTGAGAGGC
84	OBD168-561	CCTTGGAGTCCTGGCTTCCTCTA	OBD168-563	GCAGTTCAGCCCACAGACAGCATC
85	OBD168-753	CTGCTTGCTTGGGAGTCTGTGGC	OBD168-755	TCTCAGGTCCGACGCCTCCTTAT
86	OBD168-1893	CAAGTTTCACTCTTGTTGCCCAGG	OBD168-1895	GTCTCGCTCTGTCACCTACGCTGG
87	OBD168-1453	CCGCGTAGCGCTGCACGGTGCA	OBD168-1455	CTTCCCTTTCTTCGTGTGGCTT
88	OBD168-1985	GGCGACAGAGTGAGACCCTGTCT	OBD168-1987	GCCCTGTGGATAAAGGGGAGCTA
89	OBD168-841	AGACACCAGAGAGAGAGCCAGAAGTG	OBD168-843	GCTTAGTGGACAGTTTCAGGGTTCTA
90	OBD168-1129	AAGCCAAGCCAAGTCACATACGGCAC	OBD168-1131	CTCCTGTCAGTAATCCCATACATTGG
91	OBD168-1821	AGGAGTCAGAGAGGGCCCCAAGCACA	OBD168-1823	GTGGCTGGAGTGCAATGGTGCTATCT
92	OBD168-1333	CGTGTGCTAGAGAAGGTGACAGGTCA	OBD168-1335	CAGTTATTCATTCACCAGAAATGTGT
93	OBD168-981	CAAATCTCTTCTTGCTCAACCGCAGC	OBD168-983	CTTAGGAAGGTTTTCAGACACCAGGC
94	OBD168-1469	TGGACTACCTTAGAGCCACAAAA	OBD168-1471	TGTAACCCCAGCACTTTAGGATG
95	OBD168-1773	GGCTCTGGGCCTGAGGCTGGC	OBD168-1775	TGGTGGTGCGTGTCTGTAATC
96	OBD168-1633	CAGTCTTTTTATCACTCAATTTGT	OBD168-1635	TGATTGCTGATAGCTAAACGTATT
97	OBD168-1473	CCCATCCGCCACCCGTGACTGGGGCA	OBD168-1475	TGCAAACCCTTCCCTGCTTTCTGCGT
98	OBD168-1457	GCTAATTGTTTGTATTTTAGT	OBD168-1459	GTAGATTCAAAGAAAGCAAAA
99	OBD168-1181	TACTCGCCAGGCAGTGATTCCAC	OBD168-1183	GAGGGCACAGGACAGAGGTCACA
100	OBD168-809	GACATCCTTGCCTCTGCCTTGGG	OBD168-811	GTGGGTGGTAGATGATAGAGGGC

Table 4.b6

51	OBD168-q1073	CTGAGGAACAGTGGAAGATGAGGCTGGG	OBD168-q1075
52	OBD168-q873	GGGTGTCCTTGGCAGTGGTGGGC	OBD168-q875
53	OBD168-q1769	TTAAATATTCTTAGAAAAAAGTT	OBD168-q1771
54	OBD168-q1709	CAAATATGAGTGACCATGGCCGC	OBD168-q1711
55	OBD168-q1785	AAGGGCCTATTTCCTCGTTCTAG	OBD168-q1787

56	OBD168-q2113	CATTATTACAGCTGGCAAATCAAAT	OBD168-q2115
57	OBD168-q1581	TGAGAGGTAGTGACAGGACTT	OBD168-q1583
58	OBD168-q933	CTCTGTTCTCCAAGCACCTCCCACCAGG	OBD168-q935
59	OBD168-q1501	AAGAAATGGAAACCCTGAACAAACCA	OBD168-q1503
60	OBD168-q2077	CTGCTCCTCACTTTCCATCCAAAATG	OBD168-q2079
61	OBD168-q937	GCCAGACACAGAGGATGAGGAGAGCAGC	OBD168-q939
62	OBD168-q1025	TACATTTTCCTCCGTGTGGTGACTTCAT	OBD168-q1027
63	OBD168-q1237	GCAACACTCGGCTCCATCCCACTTGG	OBD168-q1239
64	OBD168-q1345	AAATACGAGCAAGTGATAGTCCGG	OBD168-q1347
65	OBD168-q1277	GAGGGAGGGAGAGAAGGGAGGAAAGGGT	OBD168-q1279
66	OBD168-q1757	ATGTAGATAAAATCACAAATG	OBD168-q1759
67	OBD168-q721	CGCAACCAGGAGTCTGCCTACAT	OBD168-q723
68	OBD168-q1041	ACCCCTCTCCCACTCCACTGCCTCTCAG	OBD168-q1043
69	OBD168-q1301	CTCAGCCTCCTGAGTAGTTGGGAT	OBD168-q1303
70	OBD168-q1797	GCACCGATGTTCACAGTCTACCC	OBD168-q1799
71	OBD168-q565	CGCCCTGGAGAACTGAGCAGAGCGGG	OBD168-q567
72	OBD168-q1837	ACTCCATGTTCATAGTGGCGTTATTC	OBD168-q1839
73	OBD168-q749	CCCACCCAGGTTGGAGGCATCTCTGAC	OBD168-q751
74	OBD168-q1461	TGGAGGGTGCAGGAGAAGGAGGGGCT	OBD168-q1463
75	OBD168-q1029	GCCACGCTGCCCCTGCTGATGTCTTTGC	OBD168-q1031
76	OBD168-q1545	GGGTGGGGTGCCTGGATGCGTGAGG	OBD168-q1547
77	OBD168-q1929	CCCTTTTTATGTCTGGGTTTCTGA	OBD168-q1931
78	OBD168-q1413	GTAAGAACCTGCAAATGCATGCC	OBD168-q1415
79	OBD168-q1625	AATCTAGGGTGTAAATAATAC	OBD168-q1627
80	OBD168-q641	GCAAGGACCACAGGGATTTTCTTCAAGC	OBD168-q643
81	OBD168-q1617	GTGCTGCCATCCGCAGGCTTAAA	OBD168-q1619
82	OBD168-q685	CCTCTCTGCCTATCCTTCTTCCCAGGGC	OBD168-q687
83	OBD168-q1157	GCCAGGTGTGGTGCCTCACGCCTTGTA	OBD168-q1159
84	OBD168-q561	CTTCTATCCTTGGAGTCCTGGCTTCCTC	OBD168-q563
85	OBD168-q753	GACCTGCTTGCTTGGGAGTCTGTGGC	OBD168-q755
86	OBD168-q1893	TTCTGCCTCCCAGGTTCAAGGAATT	OBD168-q1895
87	OBD168-q1453	GCGGGGGCCCAGGGTCCCGGCAG	OBD168-q1455
88	OBD168-q1985	TGAGCAGAGATTGCACCACTG	OBD168-q1987
89	OBD168-q841	CAGACACCAGAGAGAGAGCCAGAAGTGG	OBD168-q843
90	OBD168-q1129	TTCCATCCCGCACAGGTGAGCCGTCTGG	OBD168-q1131
91	OBD168-q1821	CCTAGGCAGCTTAGGCAGCTCACAT	OBD168-q1823
92	OBD168-q1333	GGTGACAGGTCATGAGGAAGAGA	OBD168-q1335
93	OBD168-q981	GGGCACAGTCATAAGCCAGGAAATCCCT	OBD168-q983
94	OBD168-q1469	GAATTGGACTACCTTAGAGCCACA	OBD168-q1471
95	OBD168-q1773	CCAAGTCCTGCATGAGATGAACCAGG	OBD168-q1775
96	OBD168-q1633	AAATAGCTAATACTAAATAAGGACAT	OBD168-q1635
97	OBD168-q1473	CTTGCCCACGGCCCCATCCGC	OBD168-q1475
98	OBD168-q1457	TTTTAGTAGAGATGGGGTTTCAC	OBD168-q1459
99	OBD168-q1181	GGCATTGACCTCATACTCGCCAGGCAG	OBD168-q1183
100	OBD168-q809	TCAAGAGCCAGAGCCCAGGCGGG	OBD168-q811

Table 4.b7

51	GAACGCTTGCTCTTGTCCACCACGCCG	OBD168-p1073	AGGAAGGAATCGATAACGCCAAGCACTCGGGC
52	GCTCTGCTCCCTCTTGCTGCTGGGCACT	OBD168-p873	AGGAGCAAAGTGAGCCTCGAGTACAGAGGCAC
53	CTGAGGCTGGCATCCAGAGCTCA	OBD168-p1769	AAATGTTAAAGCTCTTGGTCGAAGGGAGCATAATACAGGA
54	CCGCCTCCAAGGTTCAAGCGATT	OBD168-p1709	TTAGGGAGACATGAGATATCGAGACCAACCTGACAACATG
55	ATTTTTCCGGGGAATTTTTGTGC	OBD168-p1785	CAATGGCTCACTGCAGCCTCGAACTCCACACCCCTGCTAG
56	AGGCTTTTTTGTGCCTGATTATATG	OBD168-p2113	GCCACAGACTCTAGGCCATCGAGGCTACAGTGAGCTATGA
57	CTCCGGCCCACTCCCCTCATG	OBD168-p1581	GAGGATTAAGGAGGGGGCTCGAGGGCCTTTGCCCTTTCGT
58	TCTGCCTCATACTGCGGTGTCCCTCGG	OBD168-p933	TGGCTTCTGACTGTATACTCTGAGCACTCGAGGTG
59	CCAAGAGTCTGAGACCAGCTGGGGCA	OBD168-p1501	GACTAGACGGATTCACAGTCGAGACAGTGTCTTACTCTGT
60	TCAAAGATCTATTCTGAGTCTACTGA	OBD168-p2077	ACCAATGAAGTGAGACTTTCGATATAATAGTGGCAAACAA
61	CCCCTGCTGGTGAAGTCCCCAAGAAGG	OBD168-p937	ATGAGTGAAGTCAGAGCGATCGAGTCTGCACC
62	TAAATGGGAGCAGCCACAGTGAGGACCA	OBD168-p1025	TCATTCATCGAACTCCTGGCCTTATGTAACCCACCTG
63	CCTCCCTCCTCTCTCCCCTCTGGAATGG	OBD168-p1237	AGTAGCCATCACGGTTATCAGATCGAACTCCTGTTCTC
64	TACAATGGAGAAATCCAGCAGAAA	OBD168-p1345	CATGCAAACTCAGAAGCATCGATTTGGGTGTGTCTGATGT
65	GCTGGAGGGCAAGAACTGAGGGACTGC	OBD168-p1277	ACAAGCACTGGTCGATTGTGGATGGGAGTGTGG
66	TCCTTGAGGGAAAAGTCACTG	OBD168-p1757	CTTCGTGTCTTTTTTTGTTCGAATTTTTACACCCGGCCCT
67	TCCCTGGCTATGTAAGTCCTCTGCTGTG	OBD168-p721	AATTACCTCCCACTAGGTCCCTCCCTCGATAGC
68	GCCTCGGGCAGGTCTCTTGCTCTG	OBD168-p1041	AGTGCCTGGAATGTAGTAGGATCTCGAATCACTTCC
69	CTAGAGTGCGGTGGTGCAGCCTCA	OBD168-p1301	ATGTTGGCCAGGTTGGTCTCGAGACCAGCCTGGCCAACAT
70	TGTGTATGATAAGGGGCTTGTAT	OBD168-p1797	GTAAGTGAGCTTTGTGCTTCGAGCCTTCTTACTCAACCAC
71	GGGTTGGAGACCACAGTGACAGGACAGT	OBD168-p565	TCTCATCTTTCGAACTCCAGCCTGGGTAACAGAGAC
72	TTCTCTAAGAGAACCTTCTACTTTCT	OBD168-p1837	CCAGAACATGGATGAACCTCGAGATAATTTTGTATGTTTC
73	GGAGAGCAAGAGCAAAGGCGGAGAAGCC	OBD168-p749	TGCTCCCTTCGAGAGAACACTATCAGAGCTCCC
74	GCTGGACTGCAGCGGCGCAACCTCTG	OBD168-p1461	CATCCAATGAGACATGTGTCGAGATCAGCCTGGCCAACGT
75	GCTGGGAGTGCCTGACCTGTTCTCA	OBD168-p1029	TGGCTAGTCGAGCCACTGCACTCCAGCCTG
76	CTCTCTCTCCCTCTCTTTCCCTCTC	OBD168-p1545	CAAGTCTTTGATCTTCACTCGAATCTGAGAGACAGAGAGA
77	TGCAGTGGCTCATGCCCATAATCC	OBD168-p1929	TTTCCAAATGTACATGGATCGACCTCCCAGGCTCAAGTGG
78	TCCAGGCTGTGTGGGATCCTTGG	OBD168-p1413	GCCCTAGGGCAGTGGTGTTCGAGAGGCGGAAGTAAAAGGA
79	TAAATAAATGTAATATCACTA	OBD168-p1625	GCCCAGTGATTCCCAAACTCGAGTCAAAGTTGAAAATTCA
80	GAGCACAAAGGCACCCCAGTTCTCCCTG	OBD168-p641	AGTAAACCTCGAACCACTGCACTCTAGTCCAGGC
81	TTGTAAATTGATACTTTCCACAA	OBD168-p1617	GGGAAGTGGTTGTTGACCTCGAGGAGACTGGACCAGAAGA
82	CAGGAAGCCCAGATGCTGTGTGGTTTT	OBD168-p685	TGGTGGGCAGGAAAGGAAGACAGTTCGAATGGTC
83	GGGCAGGAAGGAGTCTTTGAGAGGCTGG	OBD168-p1157	TGCTTGAGCCTAGGAAATCGAACTCCTGGGCTC
84	GCAGTTCAGCCCACAGACAGCATCTTCT	OBD168-p561	AGGAGCTCGAACTCCTGACCTCAAGTGATCCAC
85	CTCCCCTCTCAGGTCCGACGCCTCCTTA	OBD168-p753	TCTCTCTCTTCGATGCTCAGGAAGCGCAGGTC
86	TGGAGTGCAGTGGTGCGATCTCGGC	OBD168-p1893	ATGTTGGCCAGGCTGGTCTCGAGACCAGCCTGGCCAACAT
87	CTTCCCTTTCTTCGTGTGGCTTC	OBD168-p1453	CATGGAGGGAACTTGGGGTCGAAATCCTGGCCTCAAGCAA
88	ATTATCTGCCATTTCAGGCCT	OBD168-p1985	AAGTCGCCATGAGAGTGCTCGATACAATGGAATGTTATTC
89	CTGGCTTAGTGGACAGTTTCAGGGTTCT	OBD168-p841	TGGTGGCTACATCATTATATGGCCAAGACTCGACTTT
90	GCTCAACCCGTGACCACAGCATCTGC	OBD168-p1129	ACGCGCACTGGATCAAAATAATACACGCCTCGAACTA
91	TTGGAGATGGAGTCTCGCTTTGTCA	OBD168-p1821	ATTGGTAAATCTACCTAATCGAAATACAAAAATTAGCCAG
92	GGGGAAAAAAAGGCTGTATTCTG	OBD168-p1333	AACAGTGGCTTCCTTTAGTCGACTAAATGGAACGTTTAAA
93	GGCAGCCCTCGGGAGAACAGGTTGC	OBD168-p981	TCTGACTTCATCTCGACGGAATGTGGCCCACG
94	ACTTTAGGATGCTGAGGTGGGAGG	OBD168-p1469	TCATTTGAGGTCAGGAGTTCGAACTCCTGACCTCAGATGA
95	ACTTCAACCCAGGAGGAGGAGGTTGC	OBD168-p1773	TCCTGTATTATGCTCCCTTCGAATCTTCATCGCTATCAGT

96	TACCTGGGGACAATAGTCAATAGATT	OBD168-p1633	TCACGGGACTTTGGGAGGTCGATCTCATGACATTTAATAT
97	TACTCCCTTTGCAAACCCTTC	OBD168-p1473	GTGCTCTAGAATATTCCATCGAGGGCCGTGGTTACAGAAT
98	CAAAACAAAATGAGAGGATGAGG	OBD168-p1457	TTCCAATTAGCCTCTTAATCGAACTCCTGACCTCGGGGGA
99	GGCGGAGGGCACAGGACAGAGGTCACAT	OBD168-p1181	ACCCTTGGGAGTCTGAACATCTTCGACTTCAAAAGCC
100	CGCCCTGCTGGTGAGGTCTTGCTGGAAG	OBD168-p809	ATATGGAGGATACTGCCCTCGAACTCCTGGGC

Table 4.b8

51	OBD168-p1075	TGCCCGAGTGCTTGGCGTTATCGATTCCTTCC
52	OBD168-p875	TGTGCCTCTGTACTCGAGGCTCACTTTGCTCC
53	OBD168-p1771	TCCTGTATTATGCTCCCTTCGACCAAGAGCTTTAACATTT
54	OBD168-p1711	CATGTTGTCAGGTTGGTCTCGATATCTCATGTCTCCCTAA
55	OBD168-p1787	CTAGCAGGGGTGTGGAGTTCGAGGCTGCAGTGAGCCATTG
56	OBD168-p2115	TCATAGCTCACTGTAGCCTCGATGGCCTAGAGTCTGTGGC
57	OBD168-p1583	ACGAAAGGGCAAAGGCCCTCGAGCCCCCTCCTTAATCCTC
58	OBD168-p935	ACACCTCGAGTGCTCAGAGTATACAGTCAGAAGCC
59	OBD168-p1503	ACAGAGTAAGACACTGTCTCGACTGTGAATCCGTCTAGTC
60	OBD168-p2079	TTGTTTGCCACTATTATATCGAAAGTCTCACTTCATTGGT
61	OBD168-p939	AGGTGCAGACTCGATCGCTCTGACTTCACTCA
62	OBD168-p1027	AGGTGGGTTACATAAGGCCAGGAGTTCGATGAATG
63	OBD168-p1239	TGAGAACAGGAGTTCGATCTGATAACCGTGATGGCTAC
64	OBD168-p1347	ACATCAGACACACCCAAATCGATGCTTCTGAGTTTGCATG
65	OBD168-p1279	TCCACACTCCCATCCACAATCGACCAGTGCTTG
66	OBD168-p1759	AGGGCCGGGTGTAAAAATTCGAACAAAAAAAGACACGAAG
67	OBD168-p723	TGCTATCGAGGGAGGGACCTAGTGGGAGGTAA
68	OBD168-p1043	AGGAAGTGATTCGAGATCCTACTACATTCCAGGCAC
69	OBD168-p1303	ATGTTGGCCAGGCTGGTCTCGAGACCAACCTGGCCAACAT
70	OBD168-p1799	GTGGTTGAGTAAGAAGGCTCGAAGCACAAAGCTCACTTAC
71	OBD168-p567	AGTCTCTGTTACCCAGGCTGGAGTTCGAAAGATGAG
72	OBD168-p1839	GAAACATACAAAATTATCTCGAGGTTCATCCATGTTCTGG
73	OBD168-p751	TGGGAGCTCTGATAGTGTTCTCTCGAAGGGAGC
74	OBD168-p1463	ACGTTGGCCAGGCTGATCTCGACACATGTCTCATTGGATG
75	OBD168-p1031	TGGCTCGACTAGCCACAGCTACTGGTCCCCA
76	OBD168-p1547	TCTCTCTGTCTCTCAGATTCGAGTGAAGATCAAAGACTTG
77	OBD168-p1931	CCACTTGAGCCTGGGAGGTCGATCCATGTACATTTGGAAA
78	OBD168-p1415	TCCTTTTACTTCCGCCTCTCGAACACCACTGCCCTAGGGC
79	OBD168-p1627	TGAATTTTCAACTTTGACTCGAGTTTGGGAATCACTGGGC
80	OBD168-p643	TGCCTGGACTAGAGTGCAGTGGTTCGAGGTTTAC
81	OBD168-p1619	TCTTCTGGTCCAGTCTCCTCGAGGTCAACAACCACTTCCC
82	OBD168-p687	ACCATTCGAACTGTCTTCCTTTCCTGCCCACCAC
83	OBD168-p1159	TGCTTGAGCCCAGGAGTTCGATTTCCTAGGCTC
84	OBD168-p563	AGGAGTTCGAGCTCCTGACCTCAAGTGATCCC
85	OBD168-p755	ACCTGCGCTTCCTGAGCATCGAAGAGAGAGATTG
86	OBD168-p1895	ATGTTGGCCAGGCTGGTCTCGAGACCAGCCTGGCCAACAT
87	OBD168-p1455	TTGCTTGAGGCCAGGATTTCGACCCCAAGTTCCCTCCATG
88	OBD168-p1987	GAATAACATTCCATTGTATCGAGCACTCTCATGGCGACTT
89	OBD168-p843	AAAGTCGAGTCTTGGCCATATAATGATGTAGCCACCAC

90	OBD168-p1131	TAGTTCGAGGCGTGTATTATTTTGATCCAGTGCGCGTG
91	OBD168-p1823	CTGGCTAATTTTTGTATTTCGATTAGGTAGATTTACCAAT
92	OBD168-p1335	TTTAAACGTTCCATTTAGTCGACTAAAGGAAGCCACTGTT
93	OBD168-p983	ATGCCGTGGGCCACATTCCGTCGAGATGAAGT
94	OBD168-p1471	TCATCTGAGGTCAGGAGTTCGAACTCCTGACCTCAAATGA
95	OBD168-p1775	ACTGATAGCGATGAAGATTCGAAGGGAGCATAATACAGGA
96	OBD168-p1635	ATATTAAATGTCATGAGATCGACCTCCCAAAGTCCCGTGA
97	OBD168-p1475	ATTCTGTAACCACGGCCCTCGATGGAATATTCTAGAGCAC
98	OBD168-p1459	TCCCCCGAGGTCAGGAGTTCGATTAAGAGGCTAATTGGAA
99	OBD168-p1183	TGAAGTCGAAGATGTTCAGACTCCCAAGGGTCGG
100	OBD168-p811	AGCCCAGGAGTTCGAGGGCAGTATCCTCCATA

Table 4.b9

51	ORF1_12_51666821_51670814_51862305_51869704_FR	OBD168-1073.1075	OBD168-q1073.q1075 .p1073/p1075
52	ORF1_7_137931629_137933966_137981878_137983291_FR	OBD168-873.875	OBD168-q873.q875 .p873/p875
53	ORF1_11_61042263_61044402_61243450_61246026_FF	OBD168-1769.1771	OBD168-q1769.q1771 .p1769/p1771
54	ORF1_X_2888191_2891631_3046105_3049187_RF	OBD168-1709.1711	OBD168-q1709.q1711 .p1709/p1711
55	ORF1_11_115616166_115618345_115711125_115715158_FF	OBD168-1785.1787	OBD168-q1785.q1787 .p1785/p1787
56	ORF1_X_77646855_77652042_77915112_77916580_RF	OBD168-2113.2115	OBD168-q2113.q2115 .p2113/p2115
57	ORF1_20_62658422_62663845_62934812_62935956_RF	OBD168-1581.1583	OBD168-q1581.q1583 .p1581/p1583
58	ORF1_22_17921708_17928023_17999187_18001605_FF	OBD168-933.935	OBD168-q933.q935 .p933/p935
59	ORF1_19_47777294_47778517_47957709_47959307_RF	OBD168-1501.1503	OBD168-q1501.q1503 .p1501/p1503
60	ORF1_8_7882531_7883805_7954782_7966362_FF	OBD168-2077.2079	OBD168-q2077.q2079 .p2077/p2079
61	ORF1_11_12091217_12094358_12153671_12160688_FR	OBD168-937.939	OBD168-q937.q939 .p937/p939
62	ORF1_17_31222339_31224131_31324781_31330350_RR	OBD168-1025.1027	OBD168-q1025.q1027 .p1025/p1027
63	ORF1_7_4620261_4621735_4724415_4726417_FR	OBD168-1237.1239	OBD168-q1237.q1239 .p1237/p1239
64	ORF1_10_45820548_45823847_45898343_45903899_RF	OBD168-1345.1347	OBD168-q1345.q1347 .p1345/p1347
65	ORF1_16_81474879_81476453_81607034_81611259_RR	OBD168-1277.1279	OBD168-q1277.q1279 .p1277/p1279
66	ORF1_11_10776569_10779775_10900691_10903608_FF	OBD168-1757.1759	OBD168-q1757.q1759 .p1757/p1759
67	ORF1_8_97253466_97261198_97345458_97357412_RF	OBD168-721.723	OBD168-q721.q723 .p721/p723
68	ORF1_1_109681178_109683602_109741801_109745521_FR	OBD168-1041.1043	OBD168-q1041.q1043 .p1041/p1043
69	ORF1_1_7774817_7777030_7966809_7968736_FF	OBD168-1301.1303	OBD168-q1301.q1303 .p1301/p1303
70	ORF1_12_7858281_7862390_7932397_7933511_RF	OBD168-1797.1799	OBD168-q1797.q1799 .p1797/p1799
71	ORF1_13_30408291_30410407_30585632_30589891_RR	OBD168-565.567	OBD168-q565.q567 .p565/p567
72	ORF1_15_30288521_30290733_30544055_30547496_FR	OBD168-1837.1839	OBD168-q1837.q1839 .p1837/p1839
73	ORF1_11_61152527_61154904_61243450_61246026_RF	OBD168-749.751	OBD168-q749.q751 .p749/p751
74	ORF1_17_64322183_64329531_64384310_64385587_RF	OBD168-1461.1463	OBD168-q1461.q1463 .p1461/p1463
75	ORF1_6_26459325_26460705_26493174_26499033_RR	OBD168-1029.1031	OBD168-q1029.q1031 .p1029/p1031
76	ORF1_2_74503923_74507137_74519716_74521847_FF	OBD168-1545.1547	OBD168-q1545.q1547 .p1545/p1547
77	ORF1_2_159230477_159238639_159250572_159255062_FF	OBD168-1929.1931	OBD168-q1929.q1931 .p1929/p1931
78	ORF1_16_46899253_46904082_47060044_47061469_FF	OBD168-1413.1415	OBD168-q1413.q1415 .p1413/p1415
79	ORF1_5_40609009_40613245_40692971_40695207_FR	OBD168-1625.1627	OBD168-q1625.q1627 .p1625/p1627
80	ORF1_4_47908113_47912137_48013964_48015665_FF	OBD168-641.643	OBD168-q641.q643 .p641/p643
81	ORF1_4_38161792_38166364_38180538_38182770_FR	OBD168-1617.1619	OBD168-q1617.q1619 .p1617/p1619
82	ORF1_7_22482163_22488443_22587350_22592472_RR	OBD168-685.687	OBD168-q685.q687 .p685/p687
83	ORF1_17_27477797_27480875_27629083_27630392_RR	OBD168-1157.1159	OBD168-q1157.q1159 .p1157/p1159

84	ORF1_10_13707193_13712319_13854651_13857653_FR	OBD168-561.563	OBD168-q561.q563 .p561/p563
85	ORF1_15_79006295_79007772_79123113_79127341_RF	OBD168-753.755	OBD168-q753.q755 .p753/p755
86	ORF1_19_9777468_9779791_9828343_9833999_FF	OBD168-1893.1895	OBD168-q1893.q1895 .p1893/p1895
87	ORF1_17_48576277_48578280_48760984_48766661_FF	OBD168-1453.1455	OBD168-q1453.q1455 .p1453/p1455
88	ORF1_3_124942088_124944537_125145442_125149201_RR	OBD168-1985.1987	OBD168-q1985.q1987 .p1985/p1987
89	ORF1_2_230319552_230322976_230433766_230436650_RR	OBD168-841.843	OBD168-q841.q843 .p841/p843
90	ORF1_5_179455074_179456297_179632102_179634386_RF	OBD168-1129.1131	OBD168-q1129.q1131 .p1129/p1131
91	ORF1_13_94395452_94397500_94478315_94481582_FR	OBD168-1821.1823	OBD168-q1821.q1823 .p1821/p1823
92	ORF1_1_185482953_185486658_185569901_185571399_FF	OBD168-1333.1335	OBD168-q1333.q1335 .p1333/p1335
93	ORF1_7_105801948_105809991_105902395_105905257_RF	OBD168-981.983	OBD168-q981.q983 .p981/p983
94	ORF1_17_75411072_75413612_75649583_75651419_RF	OBD168-1469.1471	OBD168-q1469.q1471 .p1469/p1471
95	ORF1_11_61224624_61227200_61378098_61379415_FF	OBD168-1773.1775	OBD168-q1773.q1775 .p1773/p1775
96	ORF1_5_94419239_94427299_94505842_94514405_FR	OBD168-1633.1635	OBD168-q1633.q1635 .p1633/p1635
97	ORF1_17_82434207_82440644_82511425_82512972_FR	OBD168-1473.1475	OBD168-q1473.q1475 .p1473/p1475
98	ORF1_17_59893718_59895987_59916319_59918152_FR	OBD168-1457.1459	OBD168-q1457.q1459 .p1457/p1459
99	ORF1_2_102051982_102057593_102268036_102274328_RR	OBD168-1181.1183	OBD168-q1181.q1183 .p1181/p1183
100	ORF1_1_203288566_203291154_203473865_203477190_FR	OBD168-809.811	OBD168-q809.q811.p809/p811

Table 4.b10

	probe	gene.index	RP/Rsum	FC:(class1/class2)
1	ORF1_13_80048989_80053962_80108036_80110958_RR	419	2825.713915	2.124095099
2	ORF1_11_36263501_36265092_36503363_36509375_RR	177	1213.237849	2.041459285
3	ORF1_4_928981_931161_985198_989096_FF	329	2294.052797	2.007502947
4	ORF1_9_96135943_96140879_96269701_96274236_FF	485	3195.533146	1.859266991
5	ORF1_1_155206612_155209922_155288575_155290398_FR	27	247.895163	1.852929501
6	ORF1_1_185478961_185481250_185562847_185565090_FF	698	4271.30051	1.749091064
7	ORF1_16_30340361_30342037_30569930_30571793_FF	907	5157.748755	1.725394607
8	ORF1_6_169127198_169132046_169286051_169290790_RF	159	1109.170033	1.659776024
9	ORF1_18_75239929_75247051_75392542_75394957_FF	911	5160.683472	1.654347844
10	ORF1_15_31214670_31223381_31397997_31400727_RF	629	3926.448123	1.639072304
11	ORF1_12_12889292_12890821_12982042_12990253_FR	831	4871.786943	1.638553157
12	ORF1_12_124112544_124115693_124251083_124252846_FF	60	504.1606399	1.635878194
13	ORF1_20_35273707_35277578_35323324_35324547_RR	773	4585.205636	1.610695569
14	ORF1_6_17488412_17494115_17602256_17605423_FF	73	577.5597894	1.607076672
15	ORF1_6_169127198_169132046_169290790_169293970_RF	194	1298.641194	1.605135763
16	ORF1_11_118438429_118442280_118496275_118499072_RR	276	1915.265338	1.602784411
17	ORF1_12_427695_429020_611557_612617_FF	1295	6696.150841	1.59866513
18	ORF1_14_88868042_88879418_89003053_89008734_FF	647	4056.574955	1.5955909
19	ORF1_22_50531145_50533032_50776978_50783308_FR	1970	8884.98958	1.553604813
20	ORF1_X_2276455_2282906_2372831_2374536_FF	511	3330.494838	1.542512184
21	ORF1_6_17759689_17762431_17990489_17995237_RR	1133	6061.245091	1.539957959
22	ORF1_12_117309542_117310883_117405729_117409691_FF	102	799.5396006	1.539917198
23	ORF1_1_21177377_21179201_21360997_21362872_RF	1984	8927.194783	1.527758749
24	ORF1_8_7810112_7811114_7862332_7864865_FR	172	1193.63032	1.525213622
25	ORF1_9_37463569_37466721_37580276_37583007_RF	1954	8845.11861	1.521474808
26	ORF1_12_117381529_117383570_117405729_117409691_FF	126	915.966393	1.510901505

27	ORF1_3_13931883_13934230_14046920_14054882_RR	1351	6875.273187	1.500353833
28	ORF1_12_10092308_10096371_10157054_10158072_RF	1461	7266.928609	1.49098816
29	ORF1_7_143815670_143817160_143832880_143837398_FF	2208	9517.746791	1.480804168
30	ORF1_22_42535866_42536905_42603122_42604347_RR	1781	8336.699623	1.478170729
31	ORF1_2_230865528_230871371_230949383_230957363_RR	588	3687.643417	1.477305491
32	ORF1_11_12153671_12160688_12204447_12211177_FR	175	1195.365584	1.475548393
33	ORF1_16_23959562_23960563_24103092_24104963_RR	754	4519.649801	1.472890202
34	ORF1_2_60549072_60551678_60704331_60707715_RR	203	1396.243105	1.459163877
35	ORF1_20_45852988_45854096_46007260_46009918_FF	227	1561.169981	1.448953404
36	ORF1_16_75377735_75379311_75564971_75566881_FF	232	1608.653115	1.448232463
37	ORF1_11_12136334_12141132_12153671_12160688_FF	263	1842.300047	1.445343477
38	ORF1_3_129012383_129018436_129244687_129248922_FR	1005	5541.80804	1.442388064
39	ORF1_10_107634434_107636773_107740167_107742400_RR	218	1498.254177	1.441567369
40	ORF1_2_60549072_60551678_60708542_60711616_RF	239	1675.8149	1.438133894
41	ORF1_10_76940960_76942733_76997164_76999885_FF	226	1559.386392	1.434805759
42	ORF1_1_20115093_20117021_20174195_20175240_RR	233	1621.68179	1.431876764
43	ORF1_4_138242151_138246996_138326681_138334943_FF	240	1689.640917	1.429825432
44	ORF1_11_11944920_11948043_12153671_12160688_RF	269	1868.062483	1.429441007
45	ORF1_11_12153671_12160688_12359781_12366018_FR	265	1843.29157	1.42750786
46	ORF1_1_160215823_160220940_160398180_160400303_FR	1459	7258.1481	1.427388698
47	ORF1_6_36126333_36131280_36222214_36228907_RR	2228	9560.939689	1.425190029
48	ORF1_2_113266536_113267636_113504184_113510749_FF	1601	7740.65394	1.422208337
49	ORF1_11_11984245_11993733_12153671_12160688_RF	292	2024.157273	1.421811212
50	ORF1_1_67685932_67691400_67707953_67710845_RR	291	2011.449609	1.420820804

Table 5.a1

				Probe sequence
	pfp	P.value	Type	60 mer
1	0.039118584	0.000116135	SSc	CCTCCATTTCCACCCCCACGCTCAAACCTCGACTTAGAACTGTAATTGAATTTGTTATAA
2	0.004577452	5.74067E-06	SSc	ATGAAGATGAGCAACTTGTCTATCTTGTTCGACTCACTGCAACCCCCGCCTCTGGGTTCT
3	0.024204606	5.64234E-05	SSc	AGAGAATGGGACCCACTGGCACTGGTGATCGACTGCGCCCCGCTGCTGTTCCTAGACGCA
4	0.051401642	0.000176638	SSc	CGGGGCAAACATAAAGAAGGATTTAGTGTCGAACTCCTGACTTCAGGTGATCCACCCACC
5	6.29435E-05	1.20415E-08	SSc	AAAGATGAATAAAATTTGGTTCCTCCCTTCGACCCTGTGCGGACATTCCGCATACTGCCA
6	0.09408723	0.00046532	SSc	CCCCATACCTGCTCCAAGTCTTTCCATCTCGAAGTATCCTCCTTAGGAAAACCCACTGGA
7	0.133670574	0.00085903	SSc	CTCTGTATTTGGAAGCTGCTCTAAGGTTTCGAATCCCTAGCAGCCAGTCCCTGCTACTTC
8	0.003661224	4.12467E-06	SSc	AGATCTGGTCTATTTGGTTCTTTAAACCTCGAGGCTCATGCAGGCTAACTGAGGCACCTC
9	0.133327303	0.000860603	SSc	ATATATGATTTCTGAATAATCTTTTTGCTCGAGAGGGTTTGGCCCCCAGCGCACCTCTGC
10	0.07907398	0.000352411	SSc	GTGGAAGGTGGAGGAGGGTGGAGGAGGGTCGAGCTCCACTCAGCTGGGTTCAGACAAGCT
11	0.121371898	0.000714635	SSc	GGCGCCCCCGTTCAATCAGCCTGCATTGTCGAACTCCTAAGCTCAGGTGATCCACCTGCC
12	0.000485193	2.06268E-07	SSc	ACATCTCCCTTCGGCCCCTGTGGCCGGCTCGATTTCAAGAAGTTGGTGAAAGCAGTGTTG
13	0.107154223	0.000586886	SSc	ATCACTCCCTGGGCAACCACCCCAGGGCTCGACAAGGTCAAATGCACAGTATTATGTCTA
14	0.000676047	3.49675E-07	SSc	ATCTCTTGTCGGAATTATTGCAGTAGTCTCGATTACTTTTTCGTCTTGGGCTGATAATCT
15	0.005359081	7.36643E-06	SSc	CTGGACTTGATAGTTTTAATGGAATATGTCGAGGCTCATGCAGGCTAACTGAGGCACCTC
16	0.015278779	2.98788E-05	SSc	CCCCATGCCATCCTCCCCCCTCTACAATTCGAGAAGACAGTCCAGAGCTGAACCCACCCC

17	0.213997083	0.001963554	SSc	TTTGCCTGAGTTTTTAAAGCATTTTTCTTCGAGCCCTACCAACCCAGACAGCTCCTTCCC
18	0.085636774	0.000392582	SSc	ACAAATTGCTCAACCAAAATTCATATCATCGACAGGCACCTTTCCAGGCTCTTCCAAGAG
19	0.335479296	0.00468271	SSc	CAGCCTGGGCAATACAGTGAGACCCATCTCGAAGTCTGAGGTAAAACACAGAACAGGATT
20	0.056111863	0.000203161	SSc	GAGAGGGAGGGAGGAGGGAGAAGGGAGGTCGAACTCCCGACCTCAGGTGATTTGCCTGCC
21	0.178943249	0.001436516	SSc	CACCCTTTACCATGTTTGCAGGAGATGATCGAACTTCTGACCTCAGGTGATCTGCCCACC
22	0.00167783	1.21259E-06	SSc	ATGTAGCCCAGGCTGGTTGTCTTTTTTTTCGATCCACCCATCCACCCATCCTCCCATCCA
23	0.337922691	0.004750336	SSc	CAGTGGGTCAACTTGGCACATGGAGGCCTCGACACTTCCTCAGACGCTCTGAGAGGTGAA
24	0.004436615	5.40686E-06	SSc	CTCCTCCTTTGTAATAAGGGCACTGAATTCGATCTCAGACTCCATCAGAGCACAGCAGCC
25	0.333652548	0.004619386	SSc	TCCTCCCTACTGCCTCCCAGGCTCAAAATCGATATAATTCATGCTGAGTTCTTTAAGTAC
26	0.00226586	2.02287E-06	SSc	TATGGTCTCAGCAAAGCGAAGGAGAAAGTCGATCCACCCATCCACCCATCCTCCCATCCA
27	0.222707957	0.002131849	SSc	CAGTCTTTTGTGGAGAAATACTTGTGACTCGATCCCTTACTCCTGAGGCAACTGTGACAA
28	0.244545841	0.002531487	SSc	ACAGATTAAAACTATGAGGATATACCATTCGAGACCAGCCTGAGCAACATAGTGAGATCC
29	0.368303263	0.005761956	SSc	AGTATGAGCCACTCTCATTTTTAGCCCCTCGAGCGACGGAGGCGACGCGGCGGCTACCGG
30	0.305811136	0.003859069	SSc	GGCATGCATATCGCTTGAGGGCAGGAGTTCGAGATCGGACACCTCCAACTCCCGGTCTGG
31	0.068646104	0.000285995	SSc	ACCCTCCTCCCATCCCCCACCTGGGGACTCGAACTCCTGAACTTGCGATCTGCCCGCGTT
32	0.004383924	5.43584E-06	SSc	TTTCTCTCTTGTGGCCCCTCTGGACTCCTCGACCATATCAGTGAGTGGAGTCTATGGTGA
33	0.10481268	0.000559952	SSc	GTTTGTATCTATTTCTGTGCAGAAGTCCTCGAACTCCTGACCTCAGGTCATCCTCTCACT
34	0.006670746	9.5948E-06	SSc	ATTATTTGCCCACTCCCTTCCACTTCAATCGAAGATTTTTCTATTTATCTCTGATGTAGT
35	0.00893888	1.43772E-05	SSc	TTATTTATTTTTTTGTAGAGACAAGGTCTCGACTCTCCACGCATCTCTGCCACCCGAGTG
36	0.009743215	1.60161E-05	SSc	AGCTGGTTCTTTGAACAGATCAATAAAATCGAATCTTCGCGGACTCCACGCATCTGTGTT
37	0.013966084	2.60253E-05	SSc	CCCTAAGTGATACTTGGGTCATCTTTCTTCGAGGAGTCCAGAGGGGCCACAAGAGAGAAA
38	0.151829671	0.001081155	SSc	AAAATTTCATAAAATTCAAATTTTAGTGTCGAACTCCTAACCTCAGGTGATCCGTCTGCC
39	0.008022575	1.23918E-05	SSc	TTCACTTGGACTACCCTCTCCGTCCACCTCGAATTCTAGCAGGTTTTATTGTAAAATTGA
40	0.010955144	1.85516E-05	SSc	CCAAAGAGCTGAGACAAAAGTACAATGTTCGATTGAAGTGGAAGGGAGTGGGCAAATAAT
41	0.008941487	1.4318E-05	SSc	TCTAATCTGTGGCCCTGGAAAATCATGATCGAGCCATATTAGAGGCATTTGGAAAACTTT
42	0.00998706	1.64877E-05	SSc	CATCATCACTGATGCTCGTGGCAGCCTGTCGAGCTCCAGGAGTGATATTTAAGGCCCCAC
43	0.011235739	1.91064E-05	SSc	ATATGAAACATTAACAAAACTATCCGTATCGACACTCACACCCACACACACTCAGAGTCA
44	0.014346301	2.73437E-05	SSc	TTTCTCTCTTGTGGCCCCTCTGGACTCCTCGATGGGAATACTTAGAATTATAGTTTGAAA
45	0.013887258	2.60752E-05	SSc	TTTCTCTCTTGTGGCCCCTCTGGACTCCTCGATAAGAGAAACACTAAAGAACTCTTGGTT
46	0.243967232	0.002522041	SSc	AGCAGAGGGAGCCAAGTAAAAGACCACATCGACTATGTCCTCAAGGACAGGAGCTGTACA
47	0.369992569	0.005840815	SSc	TGGGAATTGGTGACTGGTTTCTTAGAGATCGAGTGCCCTTCCTGGAAGGTGTGAACGGAG
48	0.271112479	0.003075432	SSc	TAGCTTACACCCTACTTTCCCCAGTGCATCGATGATTTCTATTAATTGTTATTATATTTA
49	0.01756551	3.6342E-05	SSc	TTTCTCTCTTGTGGCCCCTCTGGACTCCTCGAGTTATCAAAATATTTTGAGAGACAGTAT
50	0.0172379	3.55421E-05	SSc	CCCTCGTCCGGTACCACGCCCCTCCCTCTCGATGCACCCCAACATATAACACAAAACTAG

Table 5.a2

	Probe Location					4 kb Sequence Location				
		Start1	End1	Start2	End2		Start1	End1	Start2	End2
1	13	80048991	80049020	80108038	80108067	13	80048991	80052990	80108038	80112037
2	11	36263503	36263532	36503365	36503394	11	36263503	36267502	36503365	36507364
3	4	931130	931159	989065	989094	4	927160	931159	985095	989094
4	9	96140848	96140877	96274205	96274234	9	96136878	96140877	96270235	96274234
5	1	155209891	155209920	155288577	155288606	1	155205921	155209920	155288577	155292576
6	1	185481219	185481248	185565059	185565088	1	185477249	185481248	185561089	185565088

7	16	30342006	30342035	30571762	30571791	16	30338036	30342035	30567792	30571791
8	6	169127200	169127229	169290759	169290788	6	169127200	169131199	169286789	169290788
9	18	75247020	75247049	75394926	75394955	18	75243050	75247049	75390956	75394955
10	15	31214672	31214701	31400696	31400725	15	31214672	31218671	31396726	31400725
11	12	12890790	12890819	12982044	12982073	12	12886820	12890819	12982044	12986043
12	12	124115662	124115691	124252815	124252844	12	124111692	124115691	124248845	124252844
13	20	35273709	35273738	35323326	35323355	20	35273709	35277708	35323326	35327325
14	6	17494084	17494113	17605392	17605421	6	17490114	17494113	17601422	17605421
15	6	169127200	169127229	169293939	169293968	6	169127200	169131199	169289969	169293968
16	11	118438431	118438460	118496277	118496306	11	118438431	118442430	118496277	118500276
17	12	428989	429018	612586	612615	12	425019	429018	608616	612615
18	14	88879387	88879416	89008703	89008732	14	88875417	88879416	89004733	89008732
19	22	50533001	50533030	50776980	50777009	22	50529031	50533030	50776980	50780979
20	X	2282875	2282904	2374505	2374534	X	2278905	2282904	2370535	2374534
21	6	17759691	17759720	17990491	17990520	6	17759691	17763690	17990491	17994490
22	12	117310852	117310881	117409660	117409689	12	117306882	117310881	117405690	117409689
23	1	21177379	21177408	21362841	21362870	1	21177379	21181378	21358871	21362870
24	8	7811083	7811112	7862334	7862363	8	7807113	7811112	7862334	7866333
25	9	37463571	37463600	37582976	37583005	9	37463571	37467570	37579006	37583005
26	12	117383539	117383568	117409660	117409689	12	117379569	117383568	117405690	117409689
27	3	13931885	13931914	14046922	14046951	3	13931885	13935884	14046922	14050921
28	12	10092310	10092339	10158041	10158070	12	10092310	10096309	10154071	10158070
29	7	143817129	143817158	143837367	143837396	7	143813159	143817158	143833397	143837396
30	22	42535868	42535897	42603124	42603153	22	42535868	42539867	42603124	42607123
31	2	230865530	230865559	230949385	230949414	2	230865530	230869529	230949385	230953384
32	11	12160657	12160686	12204449	12204478	11	12156687	12160686	12204449	12208448
33	16	23959564	23959593	24103094	24103123	16	23959564	23963563	24103094	24107093
34	2	60549074	60549103	60704333	60704362	2	60549074	60553073	60704333	60708332
35	20	45854065	45854094	46009887	46009916	20	45850095	45854094	46005917	46009916
36	16	75379280	75379309	75566850	75566879	16	75375310	75379309	75562880	75566879
37	11	12141101	12141130	12160657	12160686	11	12137131	12141130	12156687	12160686
38	3	129018405	129018434	129244689	129244718	3	129014435	129018434	129244689	129248688
39	10	107634436	107634465	107740169	107740198	10	107634436	107638435	107740169	107744168
40	2	60549074	60549103	60711585	60711614	2	60549074	60553073	60707615	60711614
41	10	76942702	76942731	76999854	76999883	10	76938732	76942731	76995884	76999883
42	1	20115095	20115124	20174197	20174226	1	20115095	20119094	20174197	20178196
43	4	138246965	138246994	138334912	138334941	4	138242995	138246994	138330942	138334941
44	11	11944922	11944951	12160657	12160686	11	11944922	11948921	12156687	12160686
45	11	12160657	12160686	12359783	12359812	11	12156687	12160686	12359783	12363782
46	1	160220909	160220938	160398182	160398211	1	160216939	160220938	160398182	160402181
47	6	36126335	36126364	36222216	36222245	6	36126335	36130334	36222216	36226215
48	2	113267605	113267634	113510718	113510747	2	113263635	113267634	113506748	113510747
49	11	11984247	11984276	12160657	12160686	11	11984247	11988246	12156687	12160686
50	1	67685934	67685963	67707955	67707984	1	67685934	67689933	67707955	67711954

Table 5.a3

	probe	Primer ID
1	ORF1_13_80048989_80053962_80108036_80110958_RR	OBD168-469
2	ORF1_11_36263501_36265092_36503363_36509375_RR	OBD168-1245
3	ORF1_4_928981_931161_985198_989096_FF	OBD168-1613
4	ORF1_9_96135943_96140879_96269701_96274236_FF	OBD168-1697
5	ORF1_1_155206612_155209922_155288575_155290398_FR	OBD168-489
6	ORF1_1_185478961_185481250_185562847_185565090_FF	OBD168-629
7	ORF1_16_30340361_30342037_30569930_30571793_FF	OBD168-1853
8	ORF1_6_169127198_169132046_169286051_169290790_RF	OBD168-2045
9	ORF1_18_75239929_75247051_75392542_75394957_FF	OBD168-1485
10	ORF1_15_31214670_31223381_31397997_31400727_RF	OBD168-1113
11	ORF1_12_12889292_12890821_12982042_12990253_FR	OBD168-1057
12	ORF1_12_124112544_124115693_124251083_124252846_FF	OBD168-605
13	ORF1_20_35273707_35277578_35323324_35324547_RR	OBD168-1037
14	ORF1_6_17488412_17494115_17602256_17605423_FF	OBD168-2029
15	ORF1_6_169127198_169132046_169290790_169293970_RF	OBD168-2049
16	ORF1_11_118438429_118442280_118496275_118499072_RR	OBD168-1133
17	ORF1_12_427695_429020_611557_612617_FF	OBD168-781
18	ORF1_14_88868042_88879418_89003053_89008734_FF	OBD168-845
19	ORF1_22_50531145_50533032_50776978_50783308_FR	OBD168-1973
20	ORF1_X_2276455_2282906_2372831_2374536_FF	OBD168-1705
21	ORF1_6_17759689_17762431_17990489_17995237_RR	OBD168-1233
22	ORF1_12_117309542_117310883_117405729_117409691_FF	OBD168-1809
23	ORF1_1_21177377_21179201_21360997_21362872_RF	OBD168-1305
24	ORF1_8_7810112_7811114_7862332_7864865_FR	OBD168-597
25	ORF1_9_37463569_37466721_37580276_37583007_RF	OBD168-677
26	ORF1_12_117381529_117383570_117405729_117409691_FF	OBD168-1209
27	ORF1_3_13931883_13934230_14046920_14054882_RR	OBD168-1001
28	ORF1_12_10092308_10096371_10157054_10158072_RF	OBD168-1377
29	ORF1_7_143815670_143817160_143832880_143837398_FF	OBD168-881
30	ORF1_22_42535866_42536905_42603122_42604347_RR	OBD168-1597
31	ORF1_2_230865528_230871371_230949383_230957363_RR	OBD168-649
32	ORF1_11_12153671_12160688_12204447_12211177_FR	OBD168-1201
33	ORF1_16_23959562_23960563_24103092_24104963_RR	OBD168-1121
34	ORF1_2_60549072_60551678_60704331_60707715_RR	OBD168-1065
35	ORF1_20_45852988_45854096_46007260_46009918_FF	OBD168-917
36	ORF1_16_75377735_75379311_75564971_75566881_FF	OBD168-553
37	ORF1_11_12136334_12141132_12153671_12160688_FF	OBD168-993
38	ORF1_3_129012383_129018436_129244687_129248922_FR	OBD168-1993
39	ORF1_10_107634434_107636773_107740167_107742400_RR	OBD168-465
40	ORF1_2_60549072_60551678_60708542_60711616_RF	OBD168-1257
41	ORF1_10_76940960_76942733_76997164_76999885_FF	OBD168-725
42	ORF1_1_20115093_20117021_20174195_20175240_RR	OBD168-585
43	ORF1_4_138242151_138246996_138326681_138334943_FF	OBD168-1621
44	ORF1_11_11944920_11948043_12153671_12160688_RF	OBD168-1153

45	ORF1_11_12153671_12160688_12359781_12366018_FR	OBD168-941
46	ORF1_1_160215823_160220940_160398180_160400303_FR	OBD168-1105
47	ORF1_6_36126333_36131280_36222214_36228907_RR	OBD168-1665
48	ORF1_2_113266536_113267636_113504184_113510749_FF	OBD168-1921
49	ORF1_11_11984245_11993733_12153671_12160688_RF	OBD168-1101
50	ORF1_1_67685932_67691400_67707953_67710845_RR	OBD168-729

Table 5.a4

	Sequence	Primer ID	Sequence
1	GAGCAGCCAGTCAGTAGGAGAAACCA	OBD168-471	TTTGCTCTTCCCATTCCACCTCAGAA
2	GTCGTTGTCTGTCTCCCCACTGG	OBD168-1247	GTCTTGCCATTGTTTGCTTCCTTTCA
3	GAGGGCTTTTGTGTCGCTTCACTC	OBD168-1615	GTCTGCACGGCATCGTGCACACTG
4	GGGCGCTGCAGAACAGAGCCCG	OBD168-1699	ACAAAGAAGTCAAAATAATTGT
5	GACCAAACGACTCACAGCCAGGC	OBD168-491	CTTGGCAGTGGAGACATACAGCG
6	GTCTGGTCTGAAGAGGCTGGAGG	OBD168-631	CAAGCCAGTGCCAGAAGACAAGC
7	GATCTCAAAAAAGCACTATTCCAT	OBD168-1855	CCCCGGGCCTCGGCGCCAGGAGCG
8	GCCACACAGCTCGTGTGGGATT	OBD168-2047	TTCACTTAGCCTGCATGAGCCT
9	TCACAATAATGGAGTACTAAAGC	OBD168-1487	CTTTGAGGAAGTCAACTACTGAG
10	TGGAGCAGAACAGGGAGGTCAGA	OBD168-1115	ATAGTCGGCACTGCTGAGCCTGG
11	TGGAAGAGGAGTGGGCAGTGGAG	OBD168-1059	GCACCCTGTCCTTTTCTGTCCTC
12	TGAAGCACAATCGGGACCGTGTC	OBD168-607	CCCTCATTGACCCACCTTTGCCG
13	TTGGGAGCCTTCTGGGAGAGAGG	OBD168-1039	CTGTGACCAGTGCCAACCCATTG
14	CCCCATCTCAGTTGATGGCGA	OBD168-2031	TGGCTAATTTTTGTATTTTTA
15	GAGACGGGGTTTCACCATGTTGGC	OBD168-2051	TCACTTAGGCTGCATGGGCCTAGA
16	ATCAAGAGCACTCCAGAGCAGCAACC	OBD168-1135	ACTGTCTATTGTCTTCTATGCCTGGG
17	CGCTGGAGAAGGCAGATGGAGAA	OBD168-783	GCAGCCCCAGAAAAGCAGAGGGA
18	GCGTAACTTCTGGCTTCTGTGCC	OBD168-847	GAGAAGGGCACAACAGAGGGAGC
19	AAAAAAATCATGTATTGGGCCACAAA	OBD168-1975	GGAATGGTCATGTTGCTACCTAGGGT
20	GAGAGAGGGAGGGAGGGAGAGGGAGA	OBD168-1707	GAGGCCAGGCTCAGGGCTGTAATCCC
21	GGTAGGTTTCACTGTGGCGTGGT	OBD168-1235	GGCAAACCTCGGTGTTCCTTGGC
22	CACTGCAGCCTTGAACTCCTG	OBD168-1811	AGATGGGTGGATGGAGGGGTG
23	AAGAACTTAACAAAGACTGGCC	OBD168-1307	ATTAGATATGGCGGCTCAGGTC
24	GCAGACAAGTCCAGAAAGCCCGA	OBD168-599	TGGGTGAGGCTCTGCTTCCACAC
25	TTATGTGTCTCTTCCTAAGGGAGTCC	OBD168-679	GACTCACAAGACTGTCCCCAAAGTGG
26	TTGGGATGGGAACTGGAGGCTGG	OBD168-1211	TAGGTGAATGGAGAGGTGGAGGG
27	CAGAGGTGGTGCTGGAGGCAGAT	OBD168-1003	GGAGACACATCCTGCTGCCTTGT
28	AGAATTGCTTGAACCCAGGAGG	OBD168-1379	GCTCAAGCAATCCTCCCACCTC
29	GGTGGTGTTATCTGTCCTTGGGC	OBD168-883	GAATCAGGCTCCCTTCCCTCCGA
30	TCCCGGCCCACTGCAACCTCC	OBD168-1599	CTCCTCTGTCCCCAGTGTTAC
31	GTCCCACCGCCCTACTTTGGAAA	OBD168-651	TTCCCCACAGAGTGCCTGAGCCA
32	CCACTGTCCCGCTCTTTCCACAC	OBD168-1203	CCAGAACAAGGCACAAAGCAGGC
33	AGTGAGGAAGTGACACCCAAGATTGC	OBD168-1123	CCCTCAAGGAAGTAGCAAAAGCCAGA
34	GCTCTCGTTTTGCTCGCTCCTTACCA	OBD168-1067	TATGAAAATAAGCCCACGCACTGGC
35	GGGAAGGAAAGAAAACAGTGAGGGTT	OBD168-919	ATGAGTGTCTGGAGGGAGTCCTTTGG

36	GCAGTGTGAGGGAAATGTGTAGTAAG	OBD168-555	TCAGCCCCGTTTGTTTCTCCCACAGA
37	GTGGCAAGGGCTGGAGAAACAAC	OBD168-995	CCACTGTCCCGCTCTTTCCACAC
38	TGTCTCCATAGGGAGCAGAAG	OBD168-1995	CCCACCTCTGACTCGGATAGT
39	ACACCCCTTGATGTTACTTTGTCACA	OBD168-467	CTTTCGTTTCCCTTCTCCAAGTCCTT
40	CAATCCCTTTGTGACTTCTGACCGA	OBD168-1259	ATTTTCTATTTCTTCCTCCCCTCGTA
41	ATCTAAGAGGCTGGGATGAGGTTTA	OBD168-727	AATCCTGTCCCTTGGCACTGCTCTG
42	GCTAAAATGAGACAGACAGAATGGGC	OBD168-587	GAAGTTGTCCATCTGGGTGAGGTTGC
43	AAGCAAAACTGTAGAAAATTTGG	OBD168-1623	TGCCTGAGGTTAATGATTACCCT
44	AACTTGCTGTCATTCCACCACTGTCC	OBD168-1155	GTTGTAGTGAATGGTTTCTCTTCTTC
45	CGCTCTTTCCACACTCACATCCCTGT	OBD168-943	TAAACACTTGCCGAAATGAGAGCGG
46	CCCAACCCTTGTCCCTGTGAAGC	OBD168-1107	GCCAAGAGCCTGAGGGACAATAG
47	CATGATCTTCATACCTGGCATCTG	OBD168-1667	AGTATGATTGGCCTGGGAGAGTGC
48	AGTGAGGAGCTAGTGGCCAGGAGGGG	OBD168-1923	CTCCCACCCAGGATATTAGGAAAAAA
49	CGCTCTTTCCACACTCACATCCCTGT	OBD168-1103	CTATCCAGTGTGTTCATAAGAAGCCC
50	CCCACCTTATCCATCCTACACGC	OBD168-731	GCCACAGGTCCCCTAAGTGCTAC

Table 5.a5

	qPCR Primer ID	Sequence	qPCR Primer ID
1	OBD168-q469	GAGCAGCCAGTCAGTAGGAGAAACCAAA	OBD168-q471
2	OBD168-q1245	CCCACCCACCCCTCGCCCTGCTCC	OBD168-q1247
3	OBD168-q1613	CTGTGTTTAGCCCATAAACTTCA	OBD168-q1615
4	OBD168-q1697	AGCGGATGTCTCCAGGAGGAGG	OBD168-q1699
5	OBD168-q489	GGCTGGACTGTCTCAGGGACCTACTC	OBD168-q491
6	OBD168-q629	TAGGTCTGGTCTGAAGAGGCTGGAGGAT	OBD168-q631
7	OBD168-q1853	TAAGAACTGGTTTAGCTCAGG	OBD168-q1855
8	OBD168-q2045	CCTCCATGATCTGGGTTGCTTTCAA	OBD168-q2047
9	OBD168-q1485	GAGACAATAACTGTCTTAAAA	OBD168-q1487
10	OBD168-q1113	GGCTGGAGCAGAACAGGGAGGTCAGAGC	OBD168-q1115
11	OBD168-q1057	CCGACACAGGCGGGCAGCCACTCC	OBD168-q1059
12	OBD168-q605	AATGGTGAAGCACAATCGGGACCGTGTC	OBD168-q607
13	OBD168-q1037	GTGCTGCCCAGACAGGACCCCTTGC	OBD168-q1039
14	OBD168-q2029	GTCAGAGACCAAGGAGTCATTCC	OBD168-q2031
15	OBD168-q2049	GGCCAGGCTGGTTTTGAACTCC	OBD168-q2051
16	OBD168-q1133	GGCAGAGCACGCAGGAAACGGCTGG	OBD168-q1135
17	OBD168-q781	GTATCCGCTGGAGAAGGCAGATGGAGAA	OBD168-q783
18	OBD168-q845	GGACTGCGTAACTTCTGGCTTCTGTGCC	OBD168-q847
19	OBD168-q1973	AAGTCCATGAAATATTCGCAAAA	OBD168-q1975
20	OBD168-q1705	AAGGAAGGAGAGAGGGAGGGAGG	OBD168-q1707
21	OBD168-q1233	CACCTGCCCCTCCACCTGCTGAC	OBD168-q1235
22	OBD168-q1809	TGCCTCAGTCGCCTGAGTAGCTA	OBD168-q1811
23	OBD168-q1305	CTTAACAAAGACTGGCCACCACCATG	OBD168-q1307
24	OBD168-q597	CAGACAAGTCCAGAAAGCCCGAAGTTGG	OBD168-q599
25	OBD168-q677	GGACTGAGGCTTTCTTGCTCTTCTGTGC	OBD168-q679
26	OBD168-q1209	GAGGTTGGGATGGGAACTGGAGGCTGGG	OBD168-q1211

27	OBD168-q1001	GCTTGGCAGAGGTGGTGCTGGAGGCAGA	OBD168-q1003
28	OBD168-q1377	GCCGGTAATCCCAGCTACTTGG	OBD168-q1379
29	OBD168-q881	CTCTGAGGTAGGCTTGGCTTCGGTGGTG	OBD168-q883
30	OBD168-q1597	TTTTTTTTTGAGAGAGAGAGTC	OBD168-q1599
31	OBD168-q649	CAGCCAATCAGGTCCCACCGCCC	OBD168-q651
32	OBD168-q1201	CGCTGGACATCCCCACCGCACCTCC	OBD168-q1203
33	OBD168-q1121	CCAGTGAGGAAGTGACACCCAAGATTGC	OBD168-q1123
34	OBD168-q1065	GCTCTCGTTTTGCTCGCTCCTTACCAAC	OBD168-q1067
35	OBD168-q917	GGGATGAGGAGTAAGAGACACGGGACAG	OBD168-q919
36	OBD168-q553	GCTAAAGCAGTGTGAGGGAAATGTGTAG	OBD168-q555
37	OBD168-q993	GGAGCCTACCTCTTCCTTCTCACTGACC	OBD168-q995
38	OBD168-q1993	AAACTACAGCCTGTGGGCCAGTCC	OBD168-q1995
39	OBD168-q465	GGTATGGCAAGGGAGGTGAGGGTTG	OBD168-q467
40	OBD168-q1257	ATCTGCCTCTGCTTTTCTCTTCCCCTA	OBD168-q1259
41	OBD168-q725	GTATTTGGCAGGGAGTAGGTGGAGGGTA	OBD168-q727
42	OBD168-q585	GCTGTGAAGAGGCAAGAATGGGTATGGG	OBD168-q587
43	OBD168-q1621	AATAGTTGAAAATTTGTGATATTC	OBD168-q1623
44	OBD168-q1153	CGCTGGACATCCCCACCGCACCTCC	OBD168-q1155
45	OBD168-q941	CCGCTCTTTCCACACTCACATCCCTG	OBD168-q943
46	OBD168-q1105	CCCCAACCCTTGTCCCTGTGAAGC	OBD168-q1107
47	OBD168-q1665	AAGTCTGCACATTTAACTGTCAACT	OBD168-q1667
48	OBD168-q1921	GAGCTAGTGGCCAGGAGGGGCTCATG	OBD168-q1923
49	OBD168-q1101	CGCTGGACATCCCCACCGCACCTCC	OBD168-q1103
50	OBD168-q729	GCTGAGCACTTCCTCCAGGGCATCCCC	OBD168-q731

Table 5.a6

	Sequence	qPCR Probe	Sequence
1	CAAGTTTGCTCTTCCCATTCCACCTCAG	OBD168-p469	ACGCTCAAACCTCGACTTAGAACTGTAATTGAATTT
2	GGCAAAACCCCGTCTCTACTAAACACAA	OBD168-p1245	AGCAACTTGTCTATCTTGTTCGACTCACTGCAACCCC
3	TCAGCCGTGTCCCCGGGGCCCTC	OBD168-p1613	ACCCACTGGCACTGGTGATCGACTGCGCCCCGCTGCTGTT
4	AAAACTGTCTAACAAAGAAGTC	OBD168-p1697	ATAAAGAAGGATTTAGTGTCGAACTCCTGACTTCAGGTGA
5	CGGGTGAATGGATTATGATGGGACAAGC	OBD168-p489	AATTTGGTTCCTCCCTTCGACCCTGTGCGGAC
6	GGTTCTGTATGGTGGATGGGCAAGGGC	OBD168-p629	ACCTGCTCCAAGTCTTTCCATCTCGAAGTATCCTCC
7	GCCTCGGCGCCAGGAGCGGGG	OBD168-p1853	GGAAGCTGCTCTAAGGTTTCGAATCCCTAGCAGCCAGTCC
8	CTCACTTAGGCTGCATGGGCCTAGA	OBD168-p2045	TATTTGGTTCTTTAAACCTCGAGGCTCATGCAGGCTAACT
9	ACCTGAACTGGGGTGTGAGAG	OBD168-p1485	TCTGAATAATCTTTTTGCTCGAGAGGGTTTGGCCCCCAGC
10	CCTTCTGTGCCCACGCCTGGTGC	OBD168-p1113	AGGAGGGTCGAGCTCCACTCAGCTGGGTT
11	GGGACCAAGGGTTTTCAGTCTTAGCACC	OBD168-p1057	TCAGCCTGCATTGTCGAACTCCTAAGCTCAGGTG
12	CGTATCCCCTGGTGGGCTCCTGAGGC	OBD168-p605	TGTGGCCGGCTCGATTTCAAGAAGTTGGTGAAAGC
13	CTGTGACCAGTGCCAACCCATTGTAACC	OBD168-p1037	AACCACCCCAGGGCTCGACAAGGTCAAATGCA
14	AGGTGCATACCACCACACCTGGC	OBD168-p2029	GGAATTATTGCAGTAGTCTCGATTACTTTTTCGTCTTGGG
15	CTCACTTAGGCTGCATGGGCCT	OBD168-p2049	TAGTTTTAATGGAATATGTCGAGGCTCATGCAGGCTAACT
16	CCCAGTCATCAAGTATGGACACAAGGAC	OBD168-p1133	TCTACAATTCGAGAAGACAGTCCAGAGCTGAACCC
17	GCCAGGCAGCCCCAGAAAAGCAGAGGG	OBD168-p781	TTTTCTTCGAGCCCTACCAACCCAGACAGCTC

18	CAGGACAAGACTGGGATTTGCCACCCC	OBD168-p845	TCATATCATCGACAGGCACCTTTCCAGGCTCTTCC
19	CTACCTAGGGTTAGGGTTTCCTT	OBD168-p1973	AATACAGTGAGACCCATCTCGAAGTCTGAGGTAAAACACA
20	ACTTTGGGAGGCCGTGGTGGGAA	OBD168-p1705	GAGGAGGGAGAAGGGAGGTCGAACTCCCGACCTCAGGTGA
21	GGTGGCTCCTGGCAAACCTCGGTGTTCC	OBD168-p1233	AGATGATCGAACTTCTGACCTCAGGTGATCTGCCC
22	GGAGGGGTGGAGGGGTGGATAGA	OBD168-p1809	GGCTGGTTGTCTTTTTTTTCGATCCACCCATCCACCCATC
23	GATTAGATATGGCGGCTCAGGTCATG	OBD168-p1305	ACTTGGCACATGGAGGCCTCGACACTTCCTCAGACGCTCT
24	CCCCTTGGTCCTTGGGTGAGGCTCTGC	OBD168-p597	AGGGCACTGAATTCGATCTCAGACTCCATCAGAGC
25	GAGACTCACAAGACTGTCCCCAAAGTGG	OBD168-p677	TCCTCCCTACTGCCTCCCAGGCTCAAAATCGATATA
26	GAGGGTGGACAGACAGGGAGGTGG	OBD168-p1209	AGCGAAGGAGAAAGTCGATCCACCCATCCACC
27	GCCTCTCCCTTCCCACCTACTTGGC	OBD168-p1001	TGTGACTCGATCCCTTACTCCTGAGGCAACTGTG
28	CCTTGACCTCCCTGGCTCAAGC	OBD168-p1377	ACTATGAGGATATACCATTCGAGACCAGCCTGAGCAACAT
29	GGGTCTCTGCGGGTTCTTGGATGCGAG	OBD168-p881	TTTTAGCCCCTCGAGCGACGGAGGCGAC
30	TCTGTCCCCAGTGTTACCACAG	OBD168-p1597	TCGCTTGAGGGCAGGAGTTCGAGATCGGACACCTCCAACT
31	CCTTCCCCACAGAGTGCCTGAGCCACAC	OBD168-p651	ATCGCAAGTTCAGGAGTTCGAGTCCCCAGGTG
32	GCCCAGAACAAGGCACAAAGCAGGC	OBD168-p1201	TCTTGTGGCCCCTCTGGACTCCTCGACCATAT
33	GCCCTCAAGGAAGTAGCAAAAGCCAGAA	OBD168-p1121	TCTGTGCAGAAGTCCTCGAACTCCTGACCTCAG
34	CAGTCCTAAAGGTATCCTCTCTGCCAGG	OBD168-p1065	TGATTATTTGCCCACTCCCTTCCACTTCAATCGAAGAT
35	GCAGTGGGCTGATACCGTCTCTCCG	OBD168-p917	AGACAAGGTCTCGACTCTCCACGCATCTCTGC
36	GCCGTCAGCCCCGTTTGTTTCTCCC	OBD168-p553	TCAATAAAATCGAATCTTCGCGGACTCCACGCATCTGTG
37	CCCCACCGCACCTCCTCACGAATCCTGA	OBD168-p993	ACTTGGGTCATCTTTCTTCGAGGAGTCCAGAGGG
38	TCGGATAGTGCTGGGATTACAGGC	OBD168-p1993	AAAATTCAAATTTTAGTGTCGAACTCCTAACCTCAGGTGA
39	TTCTTTCGTTTCCCTTCTCCAAGTCCTT	OBD168-p465	ACTTGGACTACCCTCTCCGTCCACCTCGAATTC
40	GCTCTCGTTTTGCTCGCTCCTTACCA	OBD168-p1257	AGTACAATGTTCGATTGAAGTGGAAGGGAGTGGGC
41	CCTGTCCCTTGGCACTGCTCTGGAG	OBD168-p725	TCATGATCGAGCCATATTAGAGGCATTTGGAAAACT
42	GAGAAGTTGTCCATCTGGGTGAGGTTGC	OBD168-p585	AGCCTGTCGAGCTCCAGGAGTGATATTTAAGGCC
43	CCTGCTGCTTGCCTGAGGTTAATG	OBD168-p1621	TTAACAAAACTATCCGTATCGACACTCACACCCACACACA
44	GCTATCCCTACTCCCCTATCTCCAAACC	OBD168-p1153	TTGTGGCCCCTCTGGACTCCTCGATGGGAATA
45	TAAACACTTGCCGAAATGAGAGCGG	OBD168-p941	TCTCTTGTGGCCCCTCTGGACTCCTCGATAAG
46	GCCAAGAGCCTGAGGGACAATAGAATGG	OBD168-p1105	AGACCACATCGACTATGTCCTCAAGGACAGGAGC
47	ATGATTGGCCTGGGAGAGTGCCATC	OBD168-p1665	TGACTGGTTTCTTAGAGATCGAGTGCCCTTCCTGGAAGGT
48	ATGACCGAAGGGGTGTATACCCACTG	OBD168-p1921	CCTACTTTCCCCAGTGCATCGATGATTTCTATTAATTGTT
49	GGGCAATGGATTAGGGACACTGAAGCAG	OBD168-p1101	TCTCTTGTGGCCCCTCTGGACTCCTCGAGTTA
50	GGTCCCCTAAGTGCTACAAGTGTTTGCG	OBD168-p729	TACCACGCCCCTCCCTCTCGATGCACC

Table 5.a7

	qPCR Probe	Sequence
1	OBD168-p471	TCAATTACAGTTCTAAGTCGAGGTTTGAGCGTGGG
2	OBD168-p1247	TGCAGTGAGTCGAACAAGATAGACAAGTTGCTCATC
3	OBD168-p1615	AACAGCAGCGGGGCGCAGTCGATCACCAGTGCCAGTGGGT
4	OBD168-p1699	TCACCTGAAGTCAGGAGTTCGACACTAAATCCTTCTTTAT
5	OBD168-p491	TGTCCGCACAGGGTCGAAGGGAGGAACCAAAT
6	OBD168-p631	AGGAGGATACTTCGAGATGGAAAGACTTGGAGCAGG
7	OBD168-p1855	GGACTGGCTGCTAGGGATTCGAAACCTTAGAGCAGCTTCC
8	OBD168-p2047	AGTTAGCCTGCATGAGCCTCGAGGTTTAAAGAACCAAATA

9	OBD168-p1487	GCTGGGGGCCAAACCCTCTCGAGCAAAAAGATTATTCAGA
10	OBD168-p1115	AACCCAGCTGAGTGGAGCTCGACCCTCCT
11	OBD168-p1059	TCACCTGAGCTTAGGAGTTCGACAATGCAGGCTG
12	OBD168-p607	ACCAACTTCTTGAAATCGAGCCGGCCACAGGG
13	OBD168-p1039	ACATAATACTGTGCATTTGACCTTGTCGAGCCCTGGG
14	OBD168-p2031	CCCAAGACGAAAAAGTAATCGAGACTACTGCAATAATTCC
15	OBD168-p2051	AGTTAGCCTGCATGAGCCTCGACATATTCCATTAAAACTA
16	OBD168-p1135	TCAGCTCTGGACTGTCTTCTCGAATTGTAGAGGG
17	OBD168-p783	AGCTGTCTGGGTTGGTAGGGCTCGAAGAAAA
18	OBD168-p847	TGGAAGAGCCTGGAAAGGTGCCTGTCGATGATATG
19	OBD168-p1975	TGTGTTTTACCTCAGACTTCGAGATGGGTCTCACTGTATT
20	OBD168-p1707	TCACCTGAGGTCGGGAGTTCGACCTCCCTTCTCCCTCCTC
21	OBD168-p1235	AGATCACCTGAGGTCAGAAGTTCGATCATCTCCTGC
22	OBD168-p1811	GATGGGTGGATGGGTGGATCGAAAAAAAAGACAACCAGCC
23	OBD168-p1307	AGAGCGTCTGAGGAAGTGTCGAGGCCTCCATGTGCCAAGT
24	OBD168-p599	TGCTCTGATGGAGTCTGAGATCGAATTCAGTGCCC
25	OBD168-p679	TATATCGATTTTGAGCCTGGGAGGCAGTAGGGAGG
26	OBD168-p1211	TGGGTGGATGGGTGGATCGACTTTCTCCTTCG
27	OBD168-p1003	ACAGTTGCCTCAGGAGTAAGGGATCGAGTCACAAG
28	OBD168-p1379	ATGTTGCTCAGGCTGGTCTCGAATGGTATATCCTCATAGT
29	OBD168-p883	GTCGCCTCCGTCGCTCGAGGGGCTAAAA
30	OBD168-p1599	AGTTGGAGGTGTCCGATCTCGAACTCCTGCCCTCAAGCGA
31	OBD168-p649	CACCTGGGGACTCGAACTCCTGAACTTGCGAT
32	OBD168-p1203	TCCACTCACTGATATGGTCGAGGAGTCCAGAGG
33	OBD168-p1123	ACCTGAGGTCAGGAGTTCGAGGACTTCTGCAC
34	OBD168-p1067	ATCTTCGATTGAAGTGGAAGGGAGTGGGCAAATAATC
35	OBD168-p919	TGGCAGAGATGCGTGGAGAGTCGAGACCTTGT
36	OBD168-p555	ACACAGATGCGTGGAGTCCGCGAAGATTCGATTTTATTG
37	OBD168-p995	TGGCCCCTCTGGACTCCTCGAAGAAAGATGAC
38	OBD168-p1995	TCACCTGAGGTTAGGAGTTCGACACTAAAATTTGAATTTT
39	OBD168-p467	AGAATTCGAGGTGGACGGAGAGGGTAGTCCAAG
40	OBD168-p1259	TGCCCACTCCCTTCCACTTCAATCGAACATTGTAC
41	OBD168-p727	TTTTCCAAATGCCTCTAATATGGCTCGATCATGA
42	OBD168-p587	AATATCACTCCTGGAGCTCGACAGGCTGCCAC
43	OBD168-p1623	TGTGTGTGGGTGTGAGTGTCGATACGGATAGTTTTGTTAA
44	OBD168-p1155	TTCTAAGTATTCCCATCGAGGAGTCCAGAGGG
45	OBD168-p943	AGTTCTTTAGTGTTTCTCTTATCGAGGAGTCCAGAGGG
46	OBD168-p1107	AGCTCCTGTCCTTGAGGACATAGTCGATGTGGTC
47	OBD168-p1667	ACCTTCCAGGAAGGGCACTCGATCTCTAAGAAACCAGTCA
48	OBD168-p1923	AACAATTAATAGAAATCATCGATGCACTGGGGAAAGTAGG
49	OBD168-p1103	AATATTTTGATAACTCGAGGAGTCCAGAGGG
50	OBD168-p731	GGTGCATCGAGAGGGAGGGGCGTGGTA

Table 5.a8

	probe	PCR Marker Set	qPCR Marker Set
1	ORF1_13_80048989_80053962_80108036_80110958_RR	OBD168-469.471	OBD168-q469.q471.p469/p471
2	ORF1_11_36263501_36265092_36503363_36509375_RR	OBD168-1245.1247	OBD168-q1245.q1247.p1245/p1247
3	ORF1_4_928981_931161_985198_989096_FF	OBD168-1613.1615	OBD168-q1613.q1615.p1613/p1615
4	ORF1_9_96135943_96140879_96269701_96274236_FF	OBD168-1697.1699	OBD168-q1697.q1699.p1697/p1699
5	ORF1_1_155206612_155209922_155288575_155290398_FR	OBD168-489.491	OBD168-q489.q491.p489/p491
6	ORF1_1_185478961_185481250_185562847_185565090_FF	OBD168-629.631	OBD168-q629.q631.p629/p631
7	ORF1_16_30340361_30342037_30569930_30571793_FF	OBD168-1853.1855	OBD168-q1853.q1855.p1853/p1855
8	ORF1_6_169127198_169132046_169286051_169290790_RF	OBD168-2045.2047	OBD168-q2045.q2047.p2045/p2047
9	ORF1_18_75239929_75247051_75392542_75394957_FF	OBD168-1485.1487	OBD168-q1485.q1487.p1485/p1487
10	ORF1_15_31214670_31223381_31397997_31400727_RF	OBD168-1113.1115	OBD168-q1113.q1115.p1113/p1115
11	ORF1_12_12889292_12890821_12982042_12990253_FR	OBD168-1057.1059	OBD168-q1057.q1059.p1057/p1059
12	ORF1_12_124112544_124115693_124251083_124252846_FF	OBD168-605.607	OBD168-q605.q607.p605/p607
13	ORF1_20_35273707_35277578_35323324_35324547_RR	OBD168-1037.1039	OBD168-q1037.q1039.p1037/p1039
14	ORF1_6_17488412_17494115_17602256_17605423_FF	OBD168-2029.2031	OBD168-q2029.q2031.p2029/p2031
15	ORF1_6_169127198_169132046_169290790_169293970_RF	OBD168-2049.2051	OBD168-q2049.q2051.p2049/p2051
16	ORF1_11_118438429_118442280_118496275_118499072_RR	OBD168-1133.1135	OBD168-q1133.q1135.p1133/p1135
17	ORF1_12_427695_429020_611557_612617_FF	OBD168-781.783	OBD168-q781.q783.p781/p783
18	ORF1_14_88868042_88879418_89003053_89008734_FF	OBD168-845.847	OBD168-q845.q847.p845/p847
19	ORF1_22_50531145_50533032_50776978_50783308_FR	OBD168-1973.1975	OBD168-q1973.q1975.p1973/p1975
20	ORF1_X_2276455_2282906_2372831_2374536_FF	OBD168-1705.1707	OBD168-q1705.q1707.p1705/p1707
21	ORF1_6_17759689_17762431_17990489_17995237_RR	OBD168-1233.1235	OBD168-q1233.q1235.p1233/p1235
22	ORF1_12_117309542_117310883_117405729_117409691_FF	OBD168-1809.1811	OBD168-q1809.q1811.p1809/p1811
23	ORF1_1_21177377_21179201_21360997_21362872_RF	OBD168-1305.1307	OBD168-q1305.q1307.p1305/p1307
24	ORF1_8_7810112_7811114_7862332_7864865_FR	OBD168-597.599	OBD168-q597.q599.p597/p599
25	ORF1_9_37463569_37466721_37580276_37583007_RF	OBD168-677.679	OBD168-q677.q679.p677/p679
26	ORF1_12_117381529_117383570_117405729_117409691_FF	OBD168-1209.1211	OBD168-q1209.q1211.p1209/p1211
27	ORF1_3_13931883_13934230_14046920_14054882_RR	OBD168-1001.1003	OBD168-q1001.q1003.p1001/p1003
28	ORF1_12_10092308_10096371_10157054_10158072_RF	OBD168-1377.1379	OBD168-q1377.q1379.p1377/p1379
29	ORF1_7_143815670_143817160_143832880_143837398_FF	OBD168-881.883	OBD168-q881.q883.p881/p883
30	ORF1_22_42535866_42536905_42603122_42604347_RR	OBD168-1597.1599	OBD168-q1597.q1599.p1597/p1599
31	ORF1_2_230865528_230871371_230949383_230957363_RR	OBD168-649.651	OBD168-q649.q651.p651/p649
32	ORF1_11_12153671_12160688_12204447_12211177_FR	OBD168-1201.1203	OBD168-q1201.q1203.p1201/p1203
33	ORF1_16_23959562_23960563_24103092_24104963_RR	OBD168-1121.1123	OBD168-q1121.q1123.p1121/p1123
34	ORF1_2_60549072_60551678_60704331_60707715_RR	OBD168-1065.1067	OBD168-q1065.q1067.p1065/p1067
35	ORF1_20_45852988_45854096_46007260_46009918_FF	OBD168-917.919	OBD168-q917.q919.p917/p919
36	ORF1_16_75377735_75379311_75564971_75566881_FF	OBD168-553.555	OBD168-q553.q555.p553/p555
37	ORF1_11_12136334_12141132_12153671_12160688_FF	OBD168-993.995	OBD168-q993.q995.p993/p995
38	ORF1_3_129012383_129018436_129244687_129248922_FR	OBD168-1993.1995	OBD168-q1993.q1995.p1993/p1995
39	ORF1_10_107634434_107636773_107740167_107742400_RR	OBD168-465.467	OBD168-q465.q467.p465/p467
40	ORF1_2_60549072_60551678_60708542_60711616_RF	OBD168-1257.1259	OBD168-q1257.q1259.p1257/p1259
41	ORF1_10_76940960_76942733_76997164_76999885_FF	OBD168-725.727	OBD168-q725.q727.p725/p727
42	ORF1_1_20115093_20117021_20174195_20175240_RR	OBD168-585.587	OBD168-q585.q587.p585/p587
43	ORF1_4_138242151_138246996_138326681_138334943_FF	OBD168-1621.1623	OBD168-q1621.q1623.p1621/p1623
44	ORF1_11_11944920_11948043_12153671_12160688_RF	OBD168-1153.1155	OBD168-q1153.q1155.p1153/p1155
45	ORF1_11_12153671_12160688_12359781_12366018_FR	OBD168-941.943	OBD168-q941.q943.p941/p943
46	ORF1_1_160215823_160220940_160398180_160400303_FR	OBD168-1105.1107	OBD168-q1105.q1107.p1105/p1107

47	ORF1_6_36126333_36131280_36222214_36228907_RR	OBD168-1665.1667	OBD168-q1665.q1667.p1665/p1667
48	ORF1_2_113266536_113267636_113504184_113510749_FF	OBD168-1921.1923	OBD168-q1921.q1923.p1921/p1923
49	ORF1_11_11984245_11993733_12153671_12160688_RF	OBD168-1101.1103	OBD168-q1101.q1103.p1101/p1103
50	ORF1_1_67685932_67691400_67707953_67710845_RR	OBD168-729.731	OBD168-q729.q731.p729/p731

Table 5.a9

51	ORF1_5_126558745_126564482_126687692_126691508_FR	264	1843.189907	1.420399219
52	ORF1_17_47945779_47949526_48160816_48163394_RR	976	5412.489422	1.416395767
53	ORF1_10_5798770_5800647_6041802_6045506_RF	2312	9736.38043	1.413748387
54	ORF1_12_57601753_57604119_57758134_57764996_FR	257	1814.399786	1.411737622
55	ORF1_14_106703042_106707057_106732214_106736829_RR	318	2223.082668	1.409196975
56	ORF1_11_57374233_57377459_57426633_57429019_FR	371	2583.552924	1.402595132
57	ORF1_8_62981921_62989688_63002922_63008042_FF	1388	6990.773109	1.400141562
58	ORF1_7_8143002_8149481_8335072_8341646_RR	399	2740.467886	1.398079472
59	ORF1_8_140596381_140598037_140783960_140789447_RR	1434	7143.652507	1.395733401
60	ORF1_20_45815058_45818479_46007260_46009918_FF	305	2099.941321	1.3945552
61	ORF1_11_12153671_12160688_12216760_12220209_FR	320	2226.338597	1.392175625
62	ORF1_7_102513081_102515918_102618627_102620296_RF	336	2330.127212	1.391206245
63	ORF1_8_72866427_72867681_72985368_72989505_FF	1969	8881.585714	1.386833222
64	ORF1_17_27528031_27530003_27672414_27678224_RR	1789	8356.225976	1.386084205
65	ORF1_16_21532877_21535918_21626611_21627744_RR	340	2371.450535	1.383780942
66	ORF1_17_46588843_46590052_46655874_46660167_FF	391	2706.432558	1.38133938
67	ORF1_2_112933066_112936593_113031116_113032593_RF	361	2546.429792	1.380522992
68	ORF1_11_68953615_68955511_69110685_69112785_FR	346	2444.640804	1.377326917
69	ORF1_1_2986093_2988416_3070581_3073621_RF	353	2470.335537	1.37695303
70	ORF1_2_233770451_233776693_233851260_233853895_RF	393	2715.586333	1.376771276
71	ORF1_11_123648319_123653877_123684415_123688115_FF	1775	8318.413763	1.36946818
72	ORF1_16_56302242_56305491_56354996_56357979_RF	360	2542.016781	1.367449353
73	ORF1_6_109242018_109247965_109423758_109426226_RR	434	2895.083912	1.364761815
74	ORF1_7_77473907_77477977_77652906_77658625_RR	671	4142.290351	1.364479462
75	ORF1_17_79647743_79650208_79779269_79782236_RF	429	2880.594219	1.362329268
76	ORF1_4_123369547_123373273_123505935_123508246_RR	433	2894.809412	1.361853703
77	ORF1_2_60549072_60551678_60585452_60591312_RR	400	2741.589992	1.360642047
78	ORF1_2_200711316_200714252_200958736_200960996_FR	449	3000.314558	1.360550483
79	ORF1_2_160492996_160495482_160608080_160611872_FF	604	3774.294445	1.360353024
80	ORF1_7_37779378_37787306_37904027_37907035_FR	454	3030.39315	1.36003832
81	ORF1_1_93609850_93612271_93677337_93680831_FF	2270	9652.970143	1.360018148
82	ORF1_13_41335196_41337563_41355649_41358912_RR	446	2982.959423	1.359616571
83	ORF1_1_192936077_192944754_193066855_193069148_FF	406	2773.668969	1.35851117
84	ORF1_19_52598706_52601696_52670081_52671998_RR	410	2788.031445	1.358207302
85	ORF1_12_4049880_4053103_4104763_4106745_RF	930	5249.941945	1.356775693
86	ORF1_5_74469407_74475515_74537627_74543794_RF	432	2886.148978	1.35658488
87	ORF1_7_127648061_127651700_127781428_127785589_RF	1111	5955.410877	1.354984218
88	ORF1_14_90485762_90489489_90636665_90642057_FR	476	3140.736349	1.352015821
89	ORF1_5_180083035_180085563_180303025_180304376_RF	445	2971.913692	1.351046773
90	ORF1_2_187296012_187300600_187333661_187349760_FF	458	3062.446524	1.350778635

91	ORF1_17_36104009_36106111_36150024_36152875_RR	509	3316.432305	1.348582449
92	ORF1_10_103675840_103680824_103756732_103768333_FR	460	3074.121972	1.34764065
93	ORF1_17_46172500_46175294_46370925_46372131_RF	557	3570.187804	1.347271817
94	ORF1_14_93886681_93889278_93972230_93975078_FR	2931	11190.0887	1.346109013
95	ORF1_5_179958098_179961598_180083035_180085563_FR	520	3412.75877	1.345171283
96	ORF1_6_10510556_10512653_10613542_10617081_RR	861	4986.41428	1.344654345
97	ORF1_3_123064243_123067734_123161904_123162916_RF	2877	11062.72759	1.3445561
98	ORF1_5_95749524_95751329_95836578_95843620_RF	488	3218.60268	1.343903594
99	ORF1_1_192936077_192944754_193111803_193113272_FF	475	3134.512644	1.343621216
100	ORF1_16_11305532_11309621_11461548_11463016_RF	2558	10326.79147	1.343510402

Table 5.b1

51	0.013937125	2.60701E-05	SSc	CATACATTTATTACTGATCTTTTGATCATCGACCTCCTAGCCCTGTCTCATCCAAGAGGG
52	0.144987137	0.001002639	SSc	TACCAGCACAGGCCCCGTTCCTCTCTGTTCGATTACCCCTGTAATGCCAGTGTGGTAATG
53	0.376527839	0.006168083	SSc	TATGTTCTAATCCTGGGAGTCTTCTCGGTCGAGACCAGCATGGCCAACAAGAAGAAATCC
54	0.013535854	2.46481E-05	SSc	GAACCATACACTTGACACCACCACCACCTCGAGAAGGTCCAGATTGCTGCCATAGTTCTG
55	0.022433273	5.05458E-05	SSc	TGACACAAAGATATTCTGCTTTGCCAGCTCGAAGGAATATTCTAGCCTTTGATTCCTTTC
56	0.032448855	8.52979E-05	SSc	CGCTACTCTCATTGGTCATACCTGTTGTTCGAATTCTGAATACCGTCCCCTAAAATAATG
57	0.228289907	0.00224513	SSc	CTGCACTCCAACAGAGGGAGACTCTGTCTCGATGCCCTGCCTGTGCCTGAGGTGATTAGG
58	0.03697672	0.000104536	SSc	AGGCTTATACTTTTATTGTATTTCTAAATCGAAGCAGGGAAGGGAGAAAAGGCCTTCTGA
59	0.236300225	0.002400925	SSc	GGGTTTCACCATGTTGGTCAGGCTGGTCTCGAGATCAGCCTGGCCAACGTTGTGAAACCC
60	0.019145107	4.13736E-05	SSc	GTAAGACCTTATCTCTAAAAGAAATGTTTCGACTCTCCACGCATCTCTGCCACCCGAGTG
61	0.022407716	5.08057E-05	SSc	TTTCTCTCTTGTGGCCCCTCTGGACTCCTCGATCTGCATCTTGACTCTGCCACATACCTC
62	0.025028005	5.95842E-05	SSc	GAGCCAAAGCATTTCCCGCTCTTAAACCTCGAGCCCCTTACTCTCCCTGGAGCCTTTGCT
63	0.335260652	0.004677282	SSc	ACATTTTTTGCTCCTGCTTGTTGAGGTTTCGAGACAAGCCTGGCCAACATGGTGAAACCC
64	0.30662177	0.003886678	SSc	AATGCATTAACTTACACAGAATACCTACTCGACCTAGGGAGACAAGTCCTGCCTCAGAAA
65	0.026297675	6.33522E-05	SSc	AAGGAAGGAAGCGTTGTTACCCAGGAGATCGAGTGGTTTGTCATGGTAAAGAAAAAATGC
66	0.036144627	0.000100135	SSc	AAACAACACTGGGGAATGAAAAGGTTGGTCGAAGATACTTTCAGATTATAGCCTTTGTTA
67	0.0317184	8.11304E-05	SSc	TACCTTTGACAAGACTCCCAGAGGCACTTCGAAGACCCACTTCCTACGTCAGACGTTTTC
68	0.028725693	7.04226E-05	SSc	ACCCAAGTCTTTATTAGCGAAGTCACGTTCGATCCATCCATCCATTCATCCATCCAAACA
69	0.029197732	7.30279E-05	SSc	CGGTGCAGCGGCGGCCGCGGGCTCAGAATCGATCCATCCATCCATCATCCACTTATCTAT
70	0.036381223	0.000101306	SSc	CGTGGCCATTTGCACCACCGGGGTGTCCTCGAAACCAACCTGACCAACATGAAGAAACCT
71	0.304798022	0.003833326	SSc	GTCAAGGACTGCGCCCTCTCAGATTCTTTCGACTTATTTTTTTAAACCTTTTTCTCTTGC
72	0.031615997	8.06445E-05	SSc	GGGCCCAGCCTGACCAGGAAGGCTGCCTTCGACACACCCCCCCACCACCCACCTCCTCTC
73	0.041038607	0.000126197	SSc	CCTGACTTCATACTTGTTGACTTCTAAGTCGAGGGAGCCAGAGGGGGAATCCAACCAAAG
74	0.088474811	0.000420637	SSc	CACCTGCTTGGGACATGAGGGCTTCCCCTCGATATCTTAACCTCGTGATCCGCCTGCCTC
75	0.040809999	0.000124048	SSc	CCGGGCCCACCTGCGGGTGCACCTTAAATCGATCCACCTGACCCCTGCCTCCTCCCCAAC
76	0.04112004	0.000126156	SSc	TATCAATTTGTCTATTTTATTCCATTTATCGACAGGAAGGAAGGAGGAAGGGGCGCTCTG
77	0.036936253	0.000104683	SSc	ATTATTTGCCCACTCCCTTCCACTTCAATCGATTCACACACCATTCCTCCTCAGCACACC
78	0.044813002	0.000142566	SSc	AAAGTAAAACATGTCCTTTAATGGACATTCGAACACTTTACACTCAGTTCCTCACTGAAC
79	0.07220987	0.000309029	SSc	GAAGAGTGACAGAAGGAAGAGAAGTAAATCGATCTTCAGCACCCTGTTCCCAGGAAGTGG
80	0.045852249	0.000147497	SSc	AATGAAGCATTTACTTATGAGAATATTCTCGATCTGACCTTGTGATCCACCCGCCTCAGC
81	0.37373372	0.006011093	SSc	CAGGCCTTCTCTCTGTGCTATGAAGACTTCGAGGAGGAGGTTGAGCGGACTCCGAAGCAT
82	0.04423046	0.000139772	SSc	TCTCTGATATCTGACAGTTTTTATATTTTCGAATACCTGACCTCGTGATCCACCCGCCTC
83	0.03787522	0.000108955	SSc	TCCCCCACCTCCCTTCCAACCTTCCCCTTCGATTCATGTCAGTGACTTGCCATACATATC
84	0.038177056	0.000110905	SSc	AGGTCTTACTATGTTGCCTAGGCTGATTTCGATCACCTGCTCCACCCTGACTCATTCCAA

85	0.137999299	0.000909338	SSc	ACCTTCCGAGCCACCATTTCCCCACTGCTCGACTCCCCAGTCTGACCTGGCCTCACCTGG
86	0.040794748	0.000124869	SSc	AAGCCTTTTTGCCAAACTACAGGCTTATTCGACCGCCCACCCCTCTCCCACTCCCCATCC
87	0.172610563	0.001358772	SSc	TTTCTGGGTGACTGTAATTGCTAGATGTTCGAACTCCTGACCTCCTGATCCCCCTGCTTT
88	0.049389272	0.000166573	SSc	ACAGCCACAATCCCTTCAATGATGAGGCTCGACCAATTTCAAATGTATATATAGTCTTTA
89	0.043772158	0.000138014	SSc	GACCCCTGGCTTGCAACAGGTGCCTGAATCGAAGATCCTCCCCACCCGCCCCCCTCCCAC
90	0.047109718	0.000152877	SSc	CCATCTTCTCCCTTGCCCTCTATTATTTTCGATCTGTGTAAACAAAAGGGACACAGAACC
91	0.055533477	0.00020028	SSc	GAAAAAAGGACTCTGCCTACACCTTGACTCGATAAATGGTAGTGTGAAGTTGGCACTAGG
92	0.047516156	0.000154869	SSc	GGAAAAAAATATTTTTTTCTTTCACACTTCGACCCCACCCCACCACCTCCAATCCATCAG
93	0.065030297	0.000256647	SSc	AAACAACACTGGGGAATGAAAAGGTTGGTCGATTCAGAGAAAATCACAGATTGTTAAAAT
94	0.44902263	0.00932501	SSc	CAGCTTACAAGGGTGAGTTGTGCGTATTTCGACCTCCTTCCTTGCAATGCTCTCTCCTTC
95	0.0598673	0.000220576	SSc	AGGTGACTATTAAACTACCCAATAATTCTCGAAGATCCTCCCCACCCGCCCCCCTCCCAC
96	0.126289423	0.000770434	SSc	TTTTATTCCTCACCTGACTGGGAGCAGCTCGAGTCCAGTATTTTTCCAATACTAGTTGTG
97	0.442278174	0.009015725	SSc	CACCCTGGCTGGAAGGGATGGTGTGTTCTCGAGGTTGCAGAGCAGAGCATGCCAAGGAAG
98	0.052345849	0.000180995	SSc	CTAAGGAAGCAGGAGGTCTTCTGAATCCTCGATGACTGTGAGAAACTTTTGTTGCATTCA
99	0.049161058	0.000165455	SSc	TCCCCCACCTCCCTTCCAACCTTCCCCTTCGAACTGCTGAGTAGGAAGCGCTCTAGCAGG
100	0.405690362	0.007352931	SSc	ACTAATCTCCACACGGCAACCAGACACGTCGAGACCATCCTGGCTAACACAGTGCAACCC

Table 5.b2

51	5	126564451	126564480	126687694	126687723	5	126560481	126564480	126687694	126691693
52	17	47945781	47945810	48160818	48160847	17	47945781	47949780	48160818	48164817
53	10	5798772	5798801	6045475	6045504	10	5798772	5802771	6041505	6045504
54	12	57604088	57604117	57758136	57758165	12	57600118	57604117	57758136	57762135
55	14	106703044	106703073	106732216	106732245	14	106703044	106707043	106732216	106736215
56	11	57377428	57377457	57426635	57426664	11	57373458	57377457	57426635	57430634
57	8	62989657	62989686	63008011	63008040	8	62985687	62989686	63004041	63008040
58	7	8143004	8143033	8335074	8335103	7	8143004	8147003	8335074	8339073
59	8	140596383	140596412	140783962	140783991	8	140596383	140600382	140783962	140787961
60	20	45818448	45818477	46009887	46009916	20	45814478	45818477	46005917	46009916
61	11	12160657	12160686	12216762	12216791	11	12156687	12160686	12216762	12220761
62	7	102513083	102513112	102620265	102620294	7	102513083	102517082	102616295	102620294
63	8	72867650	72867679	72989474	72989503	8	72863680	72867679	72985504	72989503
64	17	27528033	27528062	27672416	27672445	17	27528033	27532032	27672416	27676415
65	16	21532879	21532908	21626613	21626642	16	21532879	21536878	21626613	21630612
66	17	46590021	46590050	46660136	46660165	17	46586051	46590050	46656166	46660165
67	2	112933068	112933097	113032562	113032591	2	112933068	112937067	113028592	113032591
68	11	68955480	68955509	69110687	69110716	11	68951510	68955509	69110687	69114686
69	1	2986095	2986124	3073590	3073619	1	2986095	2990094	3069620	3073619
70	2	233770453	233770482	233853864	233853893	2	233770453	233774452	233849894	233853893
71	11	123653846	123653875	123688084	123688113	11	123649876	123653875	123684114	123688113
72	16	56302244	56302273	56357948	56357977	16	56302244	56306243	56353978	56357977
73	6	109242020	109242049	109423760	109423789	6	109242020	109246019	109423760	109427759
74	7	77473909	77473938	77652908	77652937	7	77473909	77477908	77652908	77656907
75	17	79647745	79647774	79782205	79782234	17	79647745	79651744	79778235	79782234
76	4	123369549	123369578	123505937	123505966	4	123369549	123373548	123505937	123509936
77	2	60549074	60549103	60585454	60585483	2	60549074	60553073	60585454	60589453
78	2	200714221	200714250	200958738	200958767	2	200710251	200714250	200958738	200962737

79	2	160495451	160495480	160611841	160611870	2	160491481	160495480	160607871	160611870
80	7	37787275	37787304	37904029	37904058	7	37783305	37787304	37904029	37908028
81	1	93612240	93612269	93680800	93680829	1	93608270	93612269	93676830	93680829
82	13	41335198	41335227	41355651	41355680	13	41335198	41339197	41355651	41359650
83	1	192944723	192944752	193069117	193069146	1	192940753	192944752	193065147	193069146
84	19	52598708	52598737	52670083	52670112	19	52598708	52602707	52670083	52674082
85	12	4049882	4049911	4106714	4106743	12	4049882	4053881	4102744	4106743
86	5	74469409	74469438	74543763	74543792	5	74469409	74473408	74539793	74543792
87	7	127648063	127648092	127785558	127785587	7	127648063	127652062	127781588	127785587
88	14	90489458	90489487	90636667	90636696	14	90485488	90489487	90636667	90640666
89	5	180083037	180083066	180304345	180304374	5	180083037	180087036	180300375	180304374
90	2	187300569	187300598	187349729	187349758	2	187296599	187300598	187345759	187349758
91	17	36104011	36104040	36150026	36150055	17	36104011	36108010	36150026	36154025
92	10	103680793	103680822	103756734	103756763	10	103676823	103680822	103756734	103760733
93	17	46172502	46172531	46372100	46372129	17	46172502	46176501	46368130	46372129
94	14	93889247	93889276	93972232	93972261	14	93885277	93889276	93972232	93976231
95	5	179961567	179961596	180083037	180083066	5	179957597	179961596	180083037	180087036
96	6	10510558	10510587	10613544	10613573	6	10510558	10514557	10613544	10617543
97	3	123064245	123064274	123162885	123162914	3	123064245	123068244	123158915	123162914
98	5	95749526	95749555	95843589	95843618	5	95749526	95753525	95839619	95843618
99	1	192944723	192944752	193113241	193113270	1	192940753	192944752	193109271	193113270
100	16	11305534	11305563	11462985	11463014	16	11305534	11309533	11459015	11463014

Table 5.b3

51	ORF1_5_126558745_126564482_126687692_126691508_FR	OBD168-1637
52	ORF1_17_47945779_47949526_48160816_48163394_RR	OBD168-1033
53	ORF1_10_5798770_5800647_6041802_6045506_RF	OBD168-1749
54	ORF1_12_57601753_57604119_57758134_57764996_FR	OBD168-1021
55	ORF1_14_106703042_106707057_106732214_106736829_RR	OBD168-501
56	ORF1_11_57374233_57377459_57426633_57429019_FR	OBD168-1161
57	ORF1_8_62981921_62989688_63002922_63008042_FF	OBD168-1249
58	ORF1_7_8143002_8149481_8335072_8341646_RR	OBD168-653
59	ORF1_8_140596381_140598037_140783960_140789447_RR	OBD168-1693
60	ORF1_20_45815058_45818479_46007260_46009918_FF	OBD168-1957
61	ORF1_11_12153671_12160688_12216760_12220209_FR	OBD168-1125
62	ORF1_7_102513081_102515918_102618627_102620296_RF	OBD168-1005
63	ORF1_8_72866427_72867681_72985368_72989505_FF	OBD168-2085
64	ORF1_17_27528031_27530003_27672414_27678224_RR	OBD168-1429
65	ORF1_16_21532877_21535918_21626611_21627744_RR	OBD168-657
66	ORF1_17_46588843_46590052_46655874_46660167_FF	OBD168-769
67	ORF1_2_112933066_112936593_113031116_113032593_RF	OBD168-1565
68	ORF1_11_68953615_68955511_69110685_69112785_FR	OBD168-1365
69	ORF1_1_2986093_2988416_3070581_3073621_RF	OBD168-1725
70	ORF1_2_233770451_233776693_233851260_233853895_RF	OBD168-1941
71	ORF1_11_123648319_123653877_123684415_123688115_FF	OBD168-961
72	ORF1_16_56302242_56305491_56354996_56357979_RF	OBD168-1261

73	ORF1_6_109242018_109247965_109423758_109426226_RR	OBD168-973
74	ORF1_7_77473907_77477977_77652906_77658625_RR	OBD168-1293
75	ORF1_17_79647743_79650208_79779269_79782236_RF	OBD168-545
76	ORF1_4_123369547_123373273_123505935_123508246_RR	OBD168-2009
77	ORF1_2_60549072_60551678_60585452_60591312_RR	OBD168-1533
78	ORF1_2_200711316_200714252_200958736_200960996_FR	OBD168-1573
79	ORF1_2_160492996_160495482_160608080_160611872_FF	OBD168-497
80	ORF1_7_37779378_37787306_37904027_37907035_FR	OBD168-1681
81	ORF1_1_93609850_93612271_93677337_93680831_FF	OBD168-733
82	ORF1_13_41335196_41337563_41355649_41358912_RR	OBD168-1817
83	ORF1_1_192936077_192944754_193066855_193069148_FF	OBD168-1337
84	ORF1_19_52598706_52601696_52670081_52671998_RR	OBD168-1281
85	ORF1_12_4049880_4053103_4104763_4106745_RF	OBD168-509
86	ORF1_5_74469407_74475515_74537627_74543794_RF	OBD168-969
87	ORF1_7_127648061_127651700_127781428_127785589_RF	OBD168-2073
88	ORF1_14_90485762_90489489_90636665_90642057_FR	OBD168-1833
89	ORF1_5_180083035_180085563_180303025_180304376_RF	OBD168-1165
90	ORF1_2_187296012_187300600_187333661_187349760_FF	OBD168-601
91	ORF1_17_36104009_36106111_36150024_36152875_RR	OBD168-825
92	ORF1_10_103675840_103680824_103756732_103768333_FR	OBD168-1349
93	ORF1_17_46172500_46175294_46370925_46372131_RF	OBD168-493
94	ORF1_14_93886681_93889278_93972230_93975078_FR	OBD168-637
95	ORF1_5_179958098_179961598_180083035_180085563_FR	OBD168-829
96	ORF1_6_10510556_10512653_10613542_10617081_RR	OBD168-1649
97	ORF1_3_123064243_123067734_123161904_123162916_RF	OBD168-1097
98	ORF1_5_95749524_95751329_95836578_95843620_RF	OBD168-2021
99	ORF1_1_192936077_192944754_193111803_193113272_FF	OBD168-1341
100	ORF1_16_11305532_11309621_11461548_11463016_RF	OBD168-1409

Table 5.b4

51	ACCATGTAGCCCAGGCTGGTCTTG	OBD168-1639	AAATACCATAATGGATTCAAGTTA
52	GGGATGGCTCTGGGTGAATGGCA	OBD168-1035	CCCACAGCACCTTTCTATGGTTCC
53	ACGAAATGATGGGGTGGTGGGGTG	OBD168-1751	TATTTTTTTGAGACAGTCTTGCTC
54	TGATGTGGGAAGCAGAGCAGAGC	OBD168-1023	CAACCAGGAAGAGCGAGCCCAGA
55	CACACCCTGACACAATGACGAATGAA	OBD168-503	TGGATGGACCCTTCCTCTTCACCAAG
56	GGTGGGCATCTTGTCTCTCAGCC	OBD168-1163	GCAGCGGGAGTTTGTGTCTTCTG
57	GGGACACAGCCAAGCCAAATCAC	OBD168-1251	GCCAAGGCACAGAAGGCACAGAAG
58	CTATTCTCTACTCCTTTTCCACACAC	OBD168-655	CAGAGCCTGTGACCCTCAGACTTTTG
59	CAACCTCCGCCTCCAGGGTTCA	OBD168-1695	CTCACTGCAACCTCCGCCTCCC
60	TGGTTCACATCAGCAATCTCAA	OBD168-1959	GAGGTCCAGGCTGCAGTGGGCT
61	CGCTCTTTCCACACTCACATCCC	OBD168-1127	GTTTGCCCACAGTCTGGAGGAGG
62	CCAAAGTGAGAAAATGTGACCTACGA	OBD168-1007	ATGAAGTGGGCAGGCAGTGTGAGTC
63	TGTTGATAATAAACAATGGCTCTT	OBD168-2087	GTGCAATGGTGTGATCTCGGCTCA
64	GCTAAGGAACAAGAATTGCTTG	OBD168-1431	CCAAGGCTCCCACTGGGTTGCA
65	ATGAACTGGAAGGTCTGGGCGTC	OBD168-659	GGACACAGGAACCCAGGACCTTC
66	CAGTGGAGAAATGGTATGGTGGAAAC	OBD168-771	CCCACCTCCTTTACTACCCAATGAGC

67	CAAGAATATCACAGACACTCCAC	OBD168-1567	AGCCTCACTTTCTTCAACGGGGG
68	ACAGTAGTATCCGGTGCTGTGGGGGC	OBD168-1367	GTTTGGATGGATGGATGGATGAATGG
69	AATCAAACCCGTGTAACGAGTC	OBD168-1727	AAAGATAGACGAATGAATGATT
70	GGTGAACAATGTTTACTTCTTAA	OBD168-1943	CTGTCGCCCAGGCTGGAGTGGAG
71	GGCTACACAGAGAGATTCCCTCG	OBD168-963	GCAGAAGAGGTGTCCTGGGCTGT
72	TTGAGAAATGAGGTGGAAGTGGG	OBD168-1263	TAGGGCTGGCTGGGAAGCAGAGGCTA
73	GTGACCTGGGAGAAAAGAGGGTGAGA	OBD168-975	GAGAGTGTAAGAAGGAAAATAGGTGG
74	CTTGGGAGGTTGAGGCAGAAGAA	OBD168-1295	AAAATGCTGGGATTACAGGTGTGAGC
75	GGGACGGAAAGGAACAGGAAGCA	OBD168-547	GTGGGAGACAGGTGTGAGTTGGG
76	GTCTTGTAGTAGTACAAGAACA	OBD168-2011	AAACAAAGGGGTTCTGCACCAT
77	TCTGTCACTGAGACATTGAGA	OBD168-1535	ACGTGCATGGAAAAGGGCTCC
78	TTGGCCTGTTACTGGGTATAG	OBD168-1575	ACTGATTAGCTGGCAGCAGTT
79	ATAGGTGAGAACATTTTGGCTCTGCC	OBD168-499	GGGTTTGAGGGTTTTCTGGAATCCCC
80	AAGTCTCACAGGAAGTCATGCCACAG	OBD168-1683	TGTGGTTCCCAAGTCATGTCAGTGTA
81	CGAGGGCTACAGTTTCCAGTGAG	OBD168-735	AACACGCCGCCTTGCCAGATGCT
82	CAAATAACTTGTCCATTAAAAACCTT	OBD168-1819	TTCCAATATAAACTAACTACATGGTC
83	GTGATTTTTAGTTAGATGAGTAA	OBD168-1339	CATTTCAGTAAACCTACATTTTG
84	AGGCTGGAGTGTGGTGGCAAGAT	OBD168-1283	TGAGGCAGGGTGGAGCAGGTGAT
85	GGGACACTCACACTCCAGGTTGT	OBD168-511	CCGCCTGAGTCCCTACATAGTGC
86	GCTGGCACCCCTGCTGAGAAGAA	OBD168-971	GCAGCAGGGACCGCTATGAAATG
87	ATTAGTGGTGAGATGACATTC	OBD168-2075	ATCGTATCTACTTCCATGACT
88	GAGGCTAGGGATGGGGGGACT	OBD168-1835	ATAATTCTAAATATTTTGAAA
89	TGGGAGGGTGACACATCCTGAGG	OBD168-1167	TACAGCACAACTGACCTCCCAGC
90	GCACAAGGGCATAATCAGAAAGCCAC	OBD168-603	CTGAAACAGGGATTGTATCTCCAGAG
91	GCTGCCTTTTGTCCCATCCCCAG	OBD168-827	GACCAAGGGAGGTTCAGAGAAGG
92	TGCAAGACTTTATTCTAACAAT	OBD168-1351	TCCTGGAGAGGCAGGTGAGAGG
93	AATCTTTCTCCTCTCAGCGTGCTTGC	OBD168-495	GCTGATGAAAACTGGATTCCCTGGC
94	TCACACACCCGATGATGGACAGC	OBD168-639	TCCTACACCTCCGAGCACTCCAG
95	GGAGAAGGGTTGAACTAAGTAAGGCA	OBD168-831	AATACAGCACAACTGACCTCCCAGCC
96	CTCTTCCTTTTTTTTTTTTAGGTGAT	OBD168-1651	GAAAAAACACTGTATACCATCACACA
97	CTCCATTCCCTCCCCAATCTCCC	OBD168-1099	GGAGCCACAGATGGTTCTCACTG
98	GGGCCTGGCCTAGAGTAGGTGCTTAG	OBD168-2023	TGACAAATGAACCTTCACAATAAGCA
99	TTTGTTTTTGAAAAGTTTTTCTGGG	OBD168-1343	CCTAGTTCAGCTAAAGACGGGGTTC
100	CATTCAGTCCATCAGGAACTTGAGTC	OBD168-1411	CTGTGTCGCCCAGGTTAGAGTGCAGT

Table 5.b5

51	OBD168-q1637	TGAACTCTTGAGCTCAGGCAA	OBD168-q1639
52	OBD168-q1033	CACCACCTGGAGGACTACAGCGGAGC	OBD168-q1035
53	OBD168-q1749	ATACCCCTACAAGCAGCTGCC	OBD168-q1751
54	OBD168-q1021	GGATTGGGCGGAGACTGCTTGATGTGGG	OBD168-q1023
55	OBD168-q501	GCACACCCTGACACAATGACGAATGAAT	OBD168-q503
56	OBD168-q1161	GGTGGGCATCTTGTCTCTCAGCCATCCC	OBD168-q1163
57	OBD168-q1249	TGGCAGAAGGCAAAGGAGGAGCAAAGT	OBD168-q1251
58	OBD168-q653	CCTCGTTTCTATTCTCTACTCCTTTTCC	OBD168-q655
59	OBD168-q1693	CTGGAGTGCAATGGTGCCATCTCAGC	OBD168-q1695
60	OBD168-q1957	AAAGAAAAATAAATAAATCTT	OBD168-q1959

61	OBD168-q1125	CCCCACCGCACCTCCTCACGAATCCTGA	OBD168-q1127
62	OBD168-q1005	CTTCCAAAGTGAGAAAATGTGACCTACG	OBD168-q1007
63	OBD168-q2085	GTGTGTGATCTATAGACCTATGTA	OBD168-q2087
64	OBD168-q1429	CGCAGTGAGCCGTGATGGCACCAC	OBD168-q1431
65	OBD168-q657	GCTCACCCTGGCTGCCCTCTATTCC	OBD168-q659
66	OBD168-q769	GAATCTTTCTCCTCTCAGCGTGCTTGC	OBD168-q771
67	OBD168-q1565	ACAATGAGAACCAGTTGTTCACAA	OBD168-q1567
68	OBD168-q1365	CTGGGAACAGTAGTATCCGGTGCT	OBD168-q1367
69	OBD168-q1725	GCGGGAGGACCAGGAGCAGCTC	OBD168-q1727
70	OBD168-q1941	ATGTTTACTTCTTAAGAGAGCAG	OBD168-q1943
71	OBD168-q961	GCTGGCGGCTTCCAAGGCTACACAGAG	OBD168-q963
72	OBD168-q1261	TTTTGAGAAATGAGGTGGAAGTGGG	OBD168-q1263
73	OBD168-q973	GCTGGCTGCCCACTTTGTGACCTGG	OBD168-q975
74	OBD168-q1293	AGGGAGGCTGAGGCGGGTGGGAT	OBD168-q1295
75	OBD168-q545	GCACGCCTCTCTGCTGGGTGGCA	OBD168-q547
76	OBD168-q2009	ATGGTACTTCTGTGTGGTTTTAAT	OBD168-q2011
77	OBD168-q1533	TTGAGACGTTCCAGGCTGTCTTGC	OBD168-q1535
78	OBD168-q1573	GATGCAGGGTCTGCCTGGTCAACG	OBD168-q1575
79	OBD168-q497	ATAGGTGAGAACATTTTGGCTCTGCC	OBD168-q499
80	OBD168-q1681	ATGTGAAACATTTGGGGCAATAC	OBD168-q1683
81	OBD168-q733	GGGACCGAGGGCTACAGTTTCCAGTGAG	OBD168-q735
82	OBD168-q1817	ATCACTGTAAAATGAAGGCAATACC	OBD168-q1819
83	OBD168-q1337	TTTCTGGGTACTGGTGATTTTTAG	OBD168-q1339
84	OBD168-q1281	CAGGCTGGAGTGTGGTGGCAAGAT	OBD168-q1283
85	OBD168-q509	AAGGGCAGGCAGGACCAGAGAACCAGCC	OBD168-q511
86	OBD168-q969	GGCTGCTGGCACCCCTGCTGAGA	OBD168-q971
87	OBD168-q2073	CTTGTGAATTCTGATGCATGCTCTT	OBD168-q2075
88	OBD168-q1833	GCCTGGTGATCTTCCACACCT	OBD168-q1835
89	OBD168-q1165	CGTGCTGGGAGGGTGACACATCCTGAGG	OBD168-q1167
90	OBD168-q601	GCACAAGGGCATAATCAGAAAGCCACAA	OBD168-q603
91	OBD168-q825	GGAAACCAAGGCACAGAGAGGGACAGG	OBD168-q827
92	OBD168-q1349	CAAAATACATTTTCAAGCTGGCTG	OBD168-q1351
93	OBD168-q493	GAATCTTTCTCCTCTCAGCGTGCTTGC	OBD168-q495
94	OBD168-q637	TGGACAGCGGGACCTCGTGGTGC	OBD168-q639
95	OBD168-q829	CCTCTACAACTGCTAATGGGAGAAGGGT	OBD168-q831
96	OBD168-q1649	TTTGCCTGACACCGAGTGGCCC	OBD168-q1651
97	OBD168-q1097	CGTCTCTCCATTCCCTCCCCAATCTCCC	OBD168-q1099
98	OBD168-q2021	AGCTGGCACTGCCAGTGCACAG	OBD168-q2023
99	OBD168-q1341	TGTCATTTGTTTTTGAAAAGT	OBD168-q1343
100	OBD168-q1409	CCTATGGAACGCGTCTAGAATC	OBD168-q1411

Table 5.b6

51	TAGACTGGGAGATAAAATATG	OBD168-p1637	TTACTGATCTTTTGATCATCGACCTCCTAGCCCTGTCTCA
52	CCACAGCACCTTTCTATGGTTCCAACAG	OBD168-p1033	AGCACAGGCCCCGTTCCTCTCTGTTCGATTAC
53	TTGTCCAAGCTGATGTGTAGT	OBD168-p1749	TCCTGGGAGTCTTCTCGGTCGAGACCAGCATGGCCAACAA
54	GCTGAGTGAGGACCAGATGAGCCAGGAG	OBD168-p1021	ACACTTGACACCACCACCACCTCGAGAAGGTC

55	CTGACTGGATGGACCCTTCCTCTTCACC	OBD168-p501	TGACACAAAGATATTCTGCTTTGCCAGCTCGAAGGA
56	AGAAGTTGATGCGAGGAAGGGCGGCGG	OBD168-p1161	TGGTCATACCTGTTGTTCGAATTCTGAATACCGTCCCC
57	GCCAAGGCACAGAAGGCACAGAAGTGAC	OBD168-p1249	AGAGGGAGACTCTGTCTCGATGCCCTGCCT
58	TCAGAGCCTGTGACCCTCAGACTTTTGA	OBD168-p653	TGTATTTCTAAATCGAAGCAGGGAAGGGAGAAAAGGCC
59	ACTTTGTGATAGTTTTTTTCCCCCCA	OBD168-p1693	ATGTTGGTCAGGCTGGTCTCGAGATCAGCCTGGCCAACGT
60	TGCAGTGGGCTGATACCGTCT	OBD168-p1957	ATCTCTAAAAGAAATGTTTCGACTCTCCACGCATCTCTGC
61	GGGAATCTACAAACCCACCCTCTGCCG	OBD168-p1125	TCTGGACTCCTCGATCTGCATCTTGACTCTGCC
62	ATGAAGTGGGCAGGCAGTGTGAGTCCA	OBD168-p1005	TCCCGCTCTTAAACCTCGAGCCCCTTACTCTC
63	TTTTTGAGACAGGGTTTTGCTCTT	OBD168-p2085	CTCCTGCTTGTTGAGGTTTCGAGACAAGCCTGGCCAACAT
64	AGCTGGGCTGCCAGCAGACATGGG	OBD168-p1429	CTTACACAGAATACCTACTCGACCTAGGGAGACAAGTCCT
65	GCCCAACAGGACACAGGAACCCAGGACC	OBD168-p657	AGGAAGCGTTGTTACCCAGGAGATCGAGTGGTTTG
66	CCGTCACTTCCTGTCTCTCCCACCTCC	OBD168-p769	AATGAAAAGGTTGGTCGAAGATACTTTCAGATTATAGCCT
67	TGTGACCGTTGTCTTGATTCCTGG	OBD168-p1565	AAGACTCCCAGAGGCACTTCGAAGACCCACTTCCTACGTC
68	GTTTGGATGGATGGATGGATGAAT	OBD168-p1365	TTATTAGCGAAGTCACGTTCGATCCATCCATCCATTCATC
69	GAATGAATGATTGATGGATGAT	OBD168-p1725	GCGGCCGCGGGCTCAGAATCGATCCATCCATCCATCATCC
70	TTTTTTTTTTAAGTAAGACGGA	OBD168-p1941	TGCACCACCGGGGTGTCCTCGAAACCAACCTGACCAACAT
71	GTCCAGTGGGTCTCACCTCAGAGTCAGC	OBD168-p961	TCAAGGACTGCGCCCTCTCAGATTCTTTCGACTTA
72	GGGAAGGAGGTAGGGCTGGCTGGG	OBD168-p1261	AGCCTGACCAGGAAGGCTGCCTTCGACACA
73	CCCTCCTGCCACCCTCCTACTCCTTACC	OBD168-p973	ACTTGTTGACTTCTAAGTCGAGGGAGCCAGAGGG
74	CAAAATGCTGGGATTACAGGTGTGAGC	OBD168-p1293	TGCTTGGGACATGAGGGCTTCCCCTCGATATC
75	TGAGATGGGCTCCGTGTCCCCTGCTGGA	OBD168-p545	TGCACCTTAAATCGATCCACCTGACCCCTGCC
76	CACCTTAAGTAAAGGAAAAAGCGT	OBD168-p2009	TCTATTTTATTCCATTTATCGACAGGAAGGAAGGAGGAAG
77	ACCCTCTGGGTTCTTTCTCCACGT	OBD168-p1533	CACTCCCTTCCACTTCAATCGATTCACACACCATTCCTCC
78	GGCAGCAGTTAAAATCATCATTAG	OBD168-p1573	ATGTCCTTTAATGGACATTCGAACACTTTACACTCAGTTC
79	GGGTTTGAGGGTTTTCTGGAATCCCCAC	OBD168-p497	AGAGAAGTAAATCGATCTTCAGCACCCTGTTCCCAGG
80	CAATAATTTGTGAAAATGGACTT	OBD168-p1681	TTACTTATGAGAATATTCTCGATCTGACCTTGTGATCCAC
81	ACGGAACACGCCGCCTTGCCAGATGCT	OBD168-p733	TGAAGACTTCGAGGAGGAGGTTGAGCGGACTC
82	AACAGGTTCCAATATAAACTAACTA	OBD168-p1817	CTGACAGTTTTTATATTTTCGAATACCTGACCTCGTGATC
83	ATTTCAGTAAACCTACATTTTGTT	OBD168-p1337	CCCTTCCAACCTTCCCCTTCGATTCATGTCAGTGACTTGC
84	GGAATGAGGCAGGGTGGAGCAGGTG	OBD168-p1281	AGGCTGATTTCGATCACCTGCTCCACCCTGAC
85	CCACCCGCACCGCACACCAGTTG	OBD168-p509	ACCATTTCCCCACTGCTCGACTCCCCAGTCT
86	GTTCAAGGAGCAGTGAGGGCACCCAGGG	OBD168-p969	TGCCAAACTACAGGCTTATTCGACCGCCCACC
87	ATCGTATCTACTTCCATGACTGCAT	OBD168-p2073	ACTGTAATTGCTAGATGTTCGAACTCCTGACCTCCTGATC
88	TTTCTGTTATTTTCTTTTTGA	OBD168-p1833	TCCCTTCAATGATGAGGCTCGACCAATTTCAAATGTATAT
89	CCCAGGCTCCCTTGTCCGTCTCC	OBD168-p1165	TGCAACAGGTGCCTGAATCGAAGATCCTCCCC
90	GAGGAACTGAAAGATTTGGGAACAACCT	OBD168-p601	TCCATCTTCTCCCTTGCCCTCTATTATTTTCGATCTG
91	GAGGTCCACAGAGAGGAGACACAAGGC	OBD168-p825	AGGACTCTGCCTACACCTTGACTCGATAAATGGTAGTG
92	CCTGGAGAGGCAGGTGAGAGGGCA	OBD168-p1349	ATTTTTTTCTTTCACACTTCGACCCCACCCCACCACCTCC
93	GCTGAGAGGAAGAAGCCAGTAGAGAAGA	OBD168-p493	AATGAAAAGGTTGGTCGATTCAGAGAAAATCACAGATTG
94	GACAGGACAAGGACCCACAGGCACCAGC	OBD168-p637	ACAAGGGTGAGTTGTGCGTATTTCGACCTCCTTCC
95	GCCCAGGCTCCCTTGTCCGTCTCC	OBD168-p829	AATAATTCTCGAAGATCCTCCCCACCCGCCCC
96	TATATAAAGCAAACAAGTTTCA	OBD168-p1649	CACCTGACTGGGAGCAGCTCGAGTCCAGTATTTTTCCAAT
97	GCACAGGACGGAGCCACAGATGGTTCTC	OBD168-p1097	TGGAAGGGATGGTGTGTTCTCGAGGTTGCAGAG
98	AGCAAAACCAAACCATCTTTTT	OBD168-p2021	AGGAGGTCTTCTGAATCCTCGATGACTGTGAGAAACTTTT
99	ACGGGGTTCCTTGTCCCACTG	OBD168-p1341	CCCTTCCAACCTTCCCCTTCGAACTGCTGAGTAGGAAGCG
100	TTTTTTTGAGACGGAGTCTCGC	OBD168-p1409	ACACGGCAACCAGACACGTCGAGACCATCCTGGCTAACAC

Table 5.b7

51	OBD168-p1639	TGAGACAGGGCTAGGAGGTCGATGATCAAAAGATCAGTAA
52	OBD168-p1035	GTAATCGAACAGAGAGGAACGGGGCCTGTGCT
53	OBD168-p1751	TTGTTGGCCATGCTGGTCTCGACCGAGAAGACTCCCAGGA
54	OBD168-p1023	TGGACCTTCTCGAGGTGGTGGTGGTGTCAAGT
55	OBD168-p503	TCCTTCGAGCTGGCAAAGCAGAATATCTTTGTGTCAG
56	OBD168-p1163	AGAATTCGAACAACAGGTATGACCAATGAGAGTAGCGG
57	OBD168-p1251	AGGCAGGGCATCGAGACAGAGTCTCCCTCT
58	OBD168-p655	AGGCCTTTTCTCCCTTCCCTGCTTCGATTTAGA
59	OBD168-p1695	ACGTTGGCCAGGCTGATCTCGAGACCAGCCTGACCAACAT
60	OBD168-p1959	GCAGAGATGCGTGGAGAGTCGAAACATTTCTTTTAGAGAT
61	OBD168-p1127	AGAGTCAAGATGCAGATCGAGGAGTCCAGAGGG
62	OBD168-p1007	GAGAGTAAGGGGCTCGAGGTTTAAGAGCGGGA
63	OBD168-p2087	ATGTTGGCCAGGCTTGTCTCGAAACCTCAACAAGCAGGAG
64	OBD168-p1431	AGGACTTGTCTCCCTAGGTCGAGTAGGTATTCTGTGTAAG
65	OBD168-p659	ACCACTCGATCTCCTGGGTAACAACGCTTCCTTC
66	OBD168-p771	TCTGAAAGTATCTTCGACCAACCTTTTCATTCCCCAGTG
67	OBD168-p1567	GACGTAGGAAGTGGGTCTTCGAAGTGCCTCTGGGAGTCTT
68	OBD168-p1367	GATGAATGGATGGATGGATCGAACGTGACTTCGCTAATAA
69	OBD168-p1727	GGATGATGGATGGATGGATCGATTCTGAGCCCGCGGCCGC
70	OBD168-p1943	ATGTTGGTCAGGTTGGTTTCGAGGACACCCCGGTGGTGCA
71	OBD168-p963	TAAGTCGAAAGAATCTGAGAGGGCGCAGTCCTTGAC
72	OBD168-p1263	TGTGTCGAAGGCAGCCTTCCTGGTCAGGCT
73	OBD168-p975	TCCCTCGACTTAGAAGTCAACAAGTATGAAGTCAGGC
74	OBD168-p1295	GATATCGAGGGGAAGCCCTCATGTCCCAAGCA
75	OBD168-p547	TCAGGTGGATCGATTTAAGGTGCAC
76	OBD168-p2011	CTTCCTCCTTCCTTCCTGTCGATAAATGGAATAAAATAGA
77	OBD168-p1535	GGAGGAATGGTGTGTGAATCGATTGAAGTGGAAGGGAGTG
78	OBD168-p1575	GAACTGAGTGTAAAGTGTTCGAATGTCCATTAAAGGACAT
79	OBD168-p499	TCCTGGGAACAGGGTGCTGAAGATCGATTTACTTCTC
80	OBD168-p1683	GTGGATCACAAGGTCAGATCGAGAATATTCTCATAAGTAA
81	OBD168-p735	TCCGCTCAACCTCCTCCTCGAAGTCTTCATAGC
82	OBD168-p1819	GATCACGAGGTCAGGTATTCGAAAATATAAAAACTGTCAG
83	OBD168-p1339	GCAAGTCACTGACATGAATCGAAGGGGAAGGTTGGAAGGG
84	OBD168-p1283	AGGGTGGAGCAGGTGATCGAAATCAGCCTAGG
85	OBD168-p511	AGACTGGGGAGTCGAGCAGTGGGGAAATGGT
86	OBD168-p971	TGGGCGGTCGAATAAGCCTGTAGTTTGGCAAA
87	OBD168-p2075	GATCAGGAGGTCAGGAGTTCGAACATCTAGCAATTACAGT
88	OBD168-p1835	ATATACATTTGAAATTGGTCGAGCCTCATCATTGAAGGGA
89	OBD168-p1167	ATCTTCGATTCAGGCACCTGTTGCAAGCCAGG
90	OBD168-p603	ACAGATCGAAAATAATAGAGGGCAAGGGAGAAGATGG
91	OBD168-p827	ACACTACCATTTATCGAGTCAAGGTGTAGGCAGAGTCC
92	OBD168-p1351	GGAGGTGGTGGGGTGGGGTCGAAGTGTGAAAGAAAAAAAT
93	OBD168-p495	TCTCTGAATCGACCAACCTTTTCATTCCCCAGTGTTG
94	OBD168-p639	AGGAAGGAGGTCGAAATACGCACAACTCACCCTTG
95	OBD168-p831	AGGATCTTCGAGAATTATTGGGTAGTTTAATAGTCACC

96	OBD168-p1651	ATTGGAAAAATACTGGACTCGAGCTGCTCCCAGTCAGGTG
97	OBD168-p1099	TCTGCAACCTCGAGAACACACCATCCCTTCCAG
98	OBD168-p2023	AAAAGTTTCTCACAGTCATCGAGGATTCAGAAGACCTCCT
99	OBD168-p1343	CGCTTCCTACTCAGCAGTTCGAAGGGGAAGGTTGGAAGGG
100	OBD168-p1411	GTGTTAGCCAGGATGGTCTCGACGTGTCTGGTTGCCGTGT

Table 5.b8

51	ORF1_5_126558745_126564482_126687692_126691508_FR	OBD168-1637.1639	OBD168-q1637.q1639.p1637/p1639
52	ORF1_17_47945779_47949526_48160816_48163394_RR	OBD168-1033.1035	OBD168-q1033.q1035.p1033/p1035
53	ORF1_10_5798770_5800647_6041802_6045506_RF	OBD168-1749.1751	OBD168-q1749.q1751.p1749/p1751
54	ORF1_12_57601753_57604119_57758134_57764996_FR	OBD168-1021.1023	OBD168-q1021.q1023.p1021/p1023
55	ORF1_14_106703042_106707057_106732214_106736829_RR	OBD168-501.503	OBD168-q501.q503.p501/p503
56	ORF1_11_57374233_57377459_57426633_57429019_FR	OBD168-1161.1163	OBD168-q1161.q1163.p1161/p1163
57	ORF1_8_62981921_62989688_63002922_63008042_FF	OBD168-1249.1251	OBD168-q1249.q1251.p1249/p1251
58	ORF1_7_8143002_8149481_8335072_8341646_RR	OBD168-653.655	OBD168-q653.q655.p653/p655
59	ORF1_8_140596381_140598037_140783960_140789447_RR	OBD168-1693.1695	OBD168-q1693.q1695.p1693/p1695
60	ORF1_20_45815058_45818479_46007260_46009918_FF	OBD168-1957.1959	OBD168-q1957.q1959.p1957/p1959
61	ORF1_11_12153671_12160688_12216760_12220209_FR	OBD168-1125.1127	OBD168-q1125.q1127.p1125/p1127
62	ORF1_7_102513081_102515918_102618627_102620296_RF	OBD168-1005.1007	OBD168-q1005.q1007.p1005/p1007
63	ORF1_8_72866427_72867681_72985368_72989505_FF	OBD168-2085.2087	OBD168-q2085.q2087.p2085/p2087
64	ORF1_17_27528031_27530003_27672414_27678224_RR	OBD168-1429.1431	OBD168-q1429.q1431.p1429/p1431
65	ORF1_16_21532877_21535918_21626611_21627744_RR	OBD168-657.659	OBD168-q657.q659.p657/p659
66	ORF1_17_46588843_46590052_46655874_46660167_FF	OBD168-769.771	OBD168-q769.q771.p769/p771
67	ORF1_2_112933066_112936593_113031116_113032593_RF	OBD168-1565.1567	OBD168-q1565.q1567.p1565/p1567
68	ORF1_11_68953615_68955511_69110685_69112785_FR	OBD168-1365.1367	OBD168-q1365.q1367.p1365/p1367
69	ORF1_1_2986093_2988416_3070581_3073621_RF	OBD168-1725.1727	OBD168-q1725.q1727.p1725/p1727
70	ORF1_2_233770451_233776693_233851260_233853895_RF	OBD168-1941.1943	OBD168-q1941.q1943.p1941/p1943
71	ORF1_11_123648319_123653877_123684415_123688115_FF	OBD168-961.963	OBD168-q961.q963.p961/p963
72	ORF1_16_56302242_56305491_56354996_56357979_RF	OBD168-1261.1263	OBD168-q1261.q1263.p1261/p1263
73	ORF1_6_109242018_109247965_109423758_109426226_RR	OBD168-973.975	OBD168-q973.q975.p973/p975
74	ORF1_7_77473907_77477977_77652906_77658625_RR	OBD168-1293.1295	OBD168-q1293.q1295.p1293/p1295
75	ORF1_17_79647743_79650208_79779269_79782236_RF	OBD168-545.547	OBD168-q545.q547.p545/p547
76	ORF1_4_123369547_123373273_123505935_123508246_RR	OBD168-2009.2011	OBD168-q2009.q2011.p2009/p2011
77	ORF1_2_60549072_60551678_60585452_60591312_RR	OBD168-1533.1535	OBD168-q1533.q1535.p1533/p1535
78	ORF1_2_200711316_200714252_200958736_200960996_FR	OBD168-1573.1575	OBD168-q1573.q1575.p1573/p1575
79	ORF1_2_160492996_160495482_160608080_160611872_FF	OBD168-497.499	OBD168-q497.q499.p497/p499
80	ORF1_7_37779378_37787306_37904027_37907035_FR	OBD168-1681.1683	OBD168-q1681.q1683.p1681/p1683
81	ORF1_1_93609850_93612271_93677337_93680831_FF	OBD168-733.735	OBD168-q733.q735.p733/p735
82	ORF1_13_41335196_41337563_41355649_41358912_RR	OBD168-1817.1819	OBD168-q1817.q1819.p1817/p1819
83	ORF1_1_192936077_192944754_193066855_193069148_FF	OBD168-1337.1339	OBD168-q1337.q1339.p1337/p1339
84	ORF1_19_52598706_52601696_52670081_52671998_RR	OBD168-1281.1283	OBD168-q1281.q1283.p1281/p1283
85	ORF1_12_4049880_4053103_4104763_4106745_RF	OBD168-509.511	OBD168-q509.q511.p509/p511
86	ORF1_5_74469407_74475515_74537627_74543794_RF	OBD168-969.971	OBD168-q969.q971.p969/p971
87	ORF1_7_127648061_127651700_127781428_127785589_RF	OBD168-2073.2075	OBD168-q2073.q2075.p2073/p2075
88	ORF1_14_90485762_90489489_90636665_90642057_FR	OBD168-1833.1835	OBD168-q1833.q1835.p1833/p1835
89	ORF1_5_180083035_180085563_180303025_180304376_RF	OBD168-1165.1167	OBD168-q1165.q1167.p1165/p1167

90	ORF1_2_187296012_187300600_187333661_187349760_FF	OBD168-601.603	OBD168-q601.q603.p601/p603
91	ORF1_17_36104009_36106111_36150024_36152875_RR	OBD168-825.827	OBD168-q825.q827.p825/p827
92	ORF1_10_103675840_103680824_103756732_103768333_FR	OBD168-1349.1351	OBD168-q1349.q1351.p1349/p1351
93	ORF1_17_46172500_46175294_46370925_46372131_RF	OBD168-493.495	OBD168-q493.q495.p493/p495
94	ORF1_14_93886681_93889278_93972230_93975078_FR	OBD168-637.639	OBD168-q637.q639.p637/p639
95	ORF1_5_179958098_179961598_180083035_180085563_FR	OBD168-829.831	OBD168-q829.q831.p829/p831
96	ORF1_6_10510556_10512653_10613542_10617081_RR	OBD168-1649.1651	OBD168-q1649.q1651.p1649/p1651
97	ORF1_3_123064243_123067734_123161904_123162916_RF	OBD168-1097.1099	OBD168-q1097.q1099.p1097/p1099
98	ORF1_5_95749524_95751329_95836578_95843620_RF	OBD168-2021.2023	OBD168-q2021.q2023.p2021/p2023
99	ORF1_1_192936077_192944754_193111803_193113272_FF	OBD168-1341.1343	OBD168-q1341.q1343.p1341/p1343
100	ORF1_16_11305532_11309621_11461548_11463016_RF	OBD168-1409.1411	OBD168-q1409.q1411.p1409/p1411

Table 5.b9

	probe	gene.index	RP/Rsum
1	ORF1_19_56561558_56564720_56759775_56765600_RF	17	699.403305
2	ORF1_15_69599001_69607474_69822688_69824653_FF	19	767.4793963
3	ORF1_1_16764579_16768424_17044824_17050263_RR	35	1194.412603
4	ORF1_4_24971631_24973362_25125726_25129421_RR	37	1204.291508
5	ORF1_13_57155089_57159703_57172839_57181375_RR	60	1450.88541
6	ORF1_9_98247819_98251791_98368594_98373451_FF	53	1421.889222
7	ORF1_1_234729070_234732599_234814122_234817959_RF	73	1642.123836
8	ORF1_5_54687073_54701690_54895820_54899919_RF	42	1300.310218
9	ORF1_5_77219829_77221017_77232748_77239462_FR	71	1610.458742
10	ORF1_8_57997832_57999789_58156560_58160085_FF	40	1277.907063
11	ORF1_1_224094766_224099331_224328317_224334418_FF	47	1350.536348
12	ORF1_5_141346067_141348820_141380617_141383700_RR	91	1843.602649
13	ORF1_19_54789678_54792948_54890303_54892564_RF	56	1442.042553
14	ORF1_6_14206770_14210218_14395326_14400003_RR	83	1813.287964
15	ORF1_6_13871589_13875376_13978828_13980695_RR	103	1968.695864
16	ORF1_12_52899110_52901976_53003793_53005352_FF	92	1844.510613
17	ORF1_4_24971631_24973362_25161538_25167741_RR	82	1797.933673
18	ORF1_6_33937395_33940607_33982531_33984798_RF	94	1906.49428
19	ORF1_6_34087216_34091346_34298424_34301201_FR	87	1821.743189
20	ORF1_22_29467180_29469328_29549133_29556322_FR	89	1839.627708
21	ORF1_13_112592963_112600705_112765663_112769601_RF	112	2050.285091
22	ORF1_1_89127656_89129856_89152351_89155427_RR	113	2053.131489
23	ORF1_12_62435376_62437096_62567854_62572530_RR	99	1932.678217
24	ORF1_1_117001584_117004481_117080679_117085351_RF	85	1818.554381
25	ORF1_1_89127656_89129856_89172214_89177508_RR	128	2141.773756
26	ORF1_20_4141331_4145409_4240264_4242807_RF	95	1907.921601
27	ORF1_1_234593513_234598020_234817959_234822547_FR	120	2105.950769
28	ORF1_16_86891168_86894116_87066023_87067839_FF	101	1940.201045
29	ORF1_X_44917246_44925908_44940640_44941996_RR	108	2034.612448
30	ORF1_2_54954222_54956881_55045882_55048981_FF	145	2359.189043
31	ORF1_2_92108138_92110573_92242402_92244832_FF	137	2251.709055
32	ORF1_16_29013007_29015111_29280587_29285290_RF	134	2210.422483

33	ORF1_13_112765663_112769601_112883502_112886179_FR	140	2289.180838
34	ORF1_2_28424743_28426988_28597316_28599022_FF	138	2263.050952
35	ORF1_6_14018522_14021640_14102931_14109639_RR	167	2550.977959
36	ORF1_6_33846691_33848820_33982531_33984798_RF	143	2295.859761
37	ORF1_14_74374067_74376797_74492554_74493993_RF	147	2363.728795
38	ORF1_2_92108138_92110573_92210006_92223089_FF	151	2380.232566
39	ORF1_1_33081752_33087352_33257774_33262528_RR	152	2434.427905
40	ORF1_5_77940215_77942645_77971521_77974256_FF	153	2437.102121
41	ORF1_5_77232748_77239462_77325709_77329000_RF	174	2605.038446
42	ORF1_19_54627987_54632181_54748746_54753675_FF	188	2692.859066
43	ORF1_6_33982531_33984798_34087216_34091346_RF	165	2550.07527
44	ORF1_15_69554282_69555739_69599001_69607474_RF	160	2523.803019
45	ORF1_16_70112537_70113568_70359934_70360962_FR	163	2539.648071
46	ORF1_5_76987562_76988733_77232748_77239462_RR	201	2796.081245
47	ORF1_2_8316756_8318269_8515734_8517409_RF	159	2511.182773
48	ORF1_8_8984061_8987615_9203064_9212772_RR	161	2528.041334
49	ORF1_1_165695181_165697826_165952803_165953958_FF	162	2535.270897
50	ORF1_9_98247819_98251791_98381297_98383610_FR	178	2639.438668

Table 6.a1

	FC:(class1/class2)	pfp	P.value	Type
1	-1.604949366	0.006055278	7.29371E-07	HC
2	-1.585263892	0.007714111	1.0385E-06	HC
3	-1.57986708	0.021855405	5.41991E-06	HC
4	-1.541181801	0.021309875	5.5866E-06	HC
5	-1.538722995	0.025946264	1.10304E-05	HC
6	-1.501578393	0.027297778	1.02511E-05	HC
7	-1.500205854	0.033344725	1.72471E-05	HC
8	-1.495061128	0.024870375	7.40111E-06	HC
9	-1.49199903	0.031965768	1.60808E-05	HC
10	-1.489916383	0.024505154	6.94517E-06	HC
11	-1.478859991	0.02552298	8.49952E-06	HC
12	-1.473734365	0.040465222	2.60909E-05	HC
13	-1.469537812	0.027189805	1.07885E-05	HC
14	-1.46751231	0.041820736	2.45943E-05	HC
15	-1.459632816	0.045136366	3.29404E-05	HC
16	-1.457176135	0.040095608	2.61366E-05	HC
17	-1.454354906	0.04106626	2.38597E-05	HC
18	-1.453554039	0.044136012	2.93959E-05	HC
19	-1.452332007	0.040565048	2.50056E-05	HC
20	-1.445931854	0.041057794	2.58911E-05	HC
21	-1.442250604	0.047917611	3.80258E-05	HC
22	-1.441935693	0.047726672	3.82124E-05	HC
23	-1.440308223	0.043985399	3.08538E-05	HC
24	-1.437292865	0.041261081	2.48499E-05	HC
25	-1.434709807	0.048898615	4.43478E-05	HC

26	-1.434049558	0.043787621	2.94741E-05	HC
27	-1.431859199	0.049152691	4.17921E-05	HC
28	-1.424180854	0.043712476	3.12818E-05	HC
29	-1.423271831	0.04836415	3.70094E-05	HC
30	-1.41919881	0.060559097	6.22175E-05	HC
31	-1.416839847	0.054458544	5.2863E-05	HC
32	-1.414210942	0.052181746	4.95437E-05	HC
33	-1.414181385	0.05645962	5.60056E-05	HC
34	-1.411289737	0.055023231	5.3801E-05	HC
35	-1.41094975	0.068989954	8.16333E-05	HC
36	-1.41068641	0.055840999	5.65789E-05	HC
37	-1.409419005	0.060136926	6.2636E-05	HC
38	-1.406672271	0.059981014	6.41735E-05	HC
39	-1.404926258	0.064443897	6.9405E-05	HC
40	-1.404080442	0.064267578	6.96705E-05	HC
41	-1.400961136	0.071196654	8.77757E-05	HC
42	-1.399844261	0.073882381	9.84156E-05	HC
43	-1.399014137	0.069740672	8.15334E-05	HC
44	-1.398599688	0.069385444	7.86599E-05	HC
45	-1.398529753	0.069601611	8.03845E-05	HC
46	-1.396939152	0.078648377	0.000112009	HC
47	-1.396937941	0.068618829	7.73047E-05	HC
48	-1.396105081	0.06935665	7.91187E-05	HC
49	-1.396062108	0.069613977	7.99055E-05	HC
50	-1.395891843	0.07282288	9.18445E-05	HC

Table 6.a2

	Probe sequence
	60 mer
1	CGCGTGATGTGTTTGAAGGTGTGTTTGTTCGAAAAAGACTTGCATTTATGCAGAGTGAGG
2	AATGAAGTCCCAGGCTTTCGTCTCACGTTCGAATAACAACCAGTTTAAAAACATACTAAA
3	AGCTCAGGCAATCCATGCTTGGAGAAAGTCGATAGATGGCAAATTTCTTGATACGGGGAG
4	GGTGAGTGGCAGATAGCTGGGAAAACATTCGAGCCAAGCTGAGTGACAGCTTTGTCACGG
5	TCAGTCTAGAACATAACAGAAAATGTCTTCGACTCTTTTTACAAAAGGCCACTTGACATC
6	CAGGAGGGTAGCCCATTGGGTACCTAGCTCGAGTTCCAGGCTTAGCTCTGGAGCTGTGTG
7	AGCTCAGGCAATCCATGCTTGGAGAAAGTCGATTTCCCCATTTTGGCCGATGGCATCGCT
8	ATTAGGAGTGGGGGCCTTGAGAGGTAATTCGATCTTTTCAAAGAACCACATTTTAGTTTT
9	ATTTTATCTCCAGGTAAAAAGGGGTGTGTCGAAGTGCTCTGTGGTGATGCAGCAGGTTGA
10	AGCGAATTTAAGGCAGTAATAAGTGCAGTCGAGGCAGTGGGAGTTGAATCCTCTCCCCTC
11	GGCAGGTGGATTGCTTGAGCTCAGGAGTTCGAAAAAGAAAAGAAAAGAACATAACAGAAC
12	GTCCGAATCGTTGGGTTTGGCGGAGGGCTCGATAACTTAGAAAATGTGAATGCTAGAGAC
13	AAGGCAGGCAGATCACGAGGCCAGGAGTTCGATAGATAATAGATAGAAATATGCAGAAAG
14	AGTTTTTTCATCTGAAAGACAAACGAGGTCGAGCTGCCGTGTGTCCCATAGCCACCAGCT
15	TCTAGCTCAGGGTTTGTGAATGCACCAATCGAGGTGAACTGTGGCAATGAAAACCAGAAA
16	CTGCCGCCTAAGGTTGTTGATGTAGCTCTCGAACGTCTTGTGTAAGAATGGTTTTAATGA
17	GGTGAGTGGCAGATAGCTGGGAAAACATTCGATAACCCCAAATTTTCCAGCCCCTCACCC

18	GTTCAAATCAAGCTAGGAGGCATCCGTGTCGAAAGAAAAAGATACAGAGAGTTCCTATAT
19	GATGGCATCAGGGTACGAGGGGGAGACCTCGACACCAACATATATCTGTGATTCACTCTG
20	CAGGCAGGCAGAATGCACCATCAATGAATCGATTCTGATGACATGGTTGTTCCTCCTGTT
21	GCCGGCCCATAGCTCAGTCATGTGAACCTCGAAAAAGAAAGAAACATTTCAAAATATTGA
22	TTTAGCTCAAGGTTTGTGAATGCACCAATCGAACAGTCCAAATAAAGTCTGGAAAGAAAC
23	CGCAGCAGTTCGCTTAGGGATGCAGACGTCGAATAGTCCACTGTTACTGGCTTACTGCTT
24	GGCAGGCAGATCACTTGAGCTCAGGAGTTCGATATCTGTTTACTTAACCACAAAGATAAC
25	TTTAGCTCAAGGTTTGTGAATGCACCAATCGATATTTTACTTAACCATAGAACAATTACT
26	TGATCTGCCCAACAAGAGAGAGCTGGGATCGAATGCAACATTCATTTACTACATGACCAT
27	CTATACATCCTCCAAGGTGATGATAACTTCGAGAGTGTTTTTAGGAGGCTGGTGCTGACA
28	ATTCATAGGCACGGGTACCAAGACTACTTCGATGCTGCATTTTAGAACATTCCAGCAAAA
29	GGCAGGCAGATCACTTGAGGTCAAGAGTTCGAGTCAAAGTGATGCTCCATGAAAAAAGAG
30	TAACAGGTTTAAAACAAAAATTTAAAACTCGAGGGGGCGTAGTTCTGCCGGGGTTTCAGC
31	TGGAAACGGGATATCTTCATATAAAATCTCGAAATATCCTCTTGCAGATATTACAAAAAG
32	AGAGGTGTCCTCCGTGGGTCAGGAAGGGTCGACAATCATGTTGAGCAAATGAATTAAAAA
33	GCCGGCCCATAGCTCAGTCATGTGAACCTCGACAGTAGGTATTTTTGGAAGCTCAGATTT
34	GGCAGGAGGATCACTTGAGGCCAAGAATTCGATTCGTCCAATTATGAGAACATGCTGCAC
35	TTACAAACCTTGAGCTAGATACAGAGTGTCGAAATCAGCTTGAGGTCTTGGGGACTGAGT
36	GTTCAAATCAAGCTAGGAGGCATCCGTGTCGAATTTTCATGGCAGCCCTCTTTTGATATC
37	CGCCAGGTTTAGCGTGAGGCGCTCCAGGTCGAGTGGTTGACCTGGAAGCAAAATTAAAAG
38	TGGAAACGGGATATCTTCATATAAAATCTCGAAATATCCTCTTGCAGATTTTACAAAAAG
39	GTCTCAGCCTAAGAGCAAGAGCTTAAGTTCGAGCAGTGTGGAACCTTCGGGAGCTGTGTG
40	GTGGGCAGATGACTTGAGCTTCAGGAGTTCGAGACCAGTTTGGCCAACAAAGCAAAACCG
41	GTTTGACTTGGAGCCTTCTCATTGCAGGTCGAAGTGCTCTGTGGTGATGCAGCAGGTTGA
42	GTGGTGGTACAGGTGCTATGCTTATGACTCGAGATCTCCACTCAGATACCAAAATCTGTA
43	GATGGCATCAGGGTACGAGGGGGAGACCTCGATGAGCAGCATGTTATTTACTGGCTCCTG
44	AATGAAGTCCCAGGCTTTCGTCTCACGTTCGACAGCCTAAATCTCTGAAGCCGTCTCCTG
45	TAAAGCTATGCATAAGACTAAGGTTCTGTCGAACCACCTTTATTTACTGTATATCAGCTA
46	CACTGCACTCATCAATAACATCTTCAACTCGAAGTGCTCTGTGGTGATGCAGCAGGTTGA
47	GGCAGGTGGATCACTTGAGCTCAGGAGTTCGAAACCCAACATAAATGCAAATAAATAAAT
48	GGCAGGTGGATCACTTGAGGCCACGAGTTCGAGTACTCAGATATTTACTTACCTACTCAA
49	GGCGGGAGGATCACCTAAGCTCAGGAGTTCGAGACTAGCTTGGCCAACATGGTAAAATCC
50	CAGGAGGGTAGCCCATTGGGTACCTAGCTCGAATGCAGGCTGTTGTTGGAAGATCCGTGA

Table 6.a3

	Probe Location					4 kb Sequence Location				
		Start1	End1	Start2	End2		Start1	End1	Start2	End2
1	19	56561560	56561589	56765569	56765598	19	56561560	56565559	56761599	56765598
2	15	69607443	69607472	69824622	69824651	15	69603473	69607472	69820652	69824651
3	1	16764581	16764610	17044826	17044855	1	16764581	16768580	17044826	17048825
4	4	24971633	24971662	25125728	25125757	4	24971633	24975632	25125728	25129727
5	13	57155091	57155120	57172841	57172870	13	57155091	57159090	57172841	57176840
6	9	98251760	98251789	98373420	98373449	9	98247790	98251789	98369450	98373449
7	1	234729072	234729101	234817928	234817957	1	234729072	234733071	234813958	234817957
8	5	54687075	54687104	54899888	54899917	5	54687075	54691074	54895918	54899917
9	5	77220986	77221015	77232750	77232779	5	77217016	77221015	77232750	77236749
10	8	57999758	57999787	58160054	58160083	8	57995788	57999787	58156084	58160083

11	1	224099300	224099329	224334387	224334416	1	224095330	224099329	224330417	224334416
12	5	141346069	141346098	141380619	141380648	5	141346069	141350068	141380619	141384618
13	19	54789680	54789709	54892533	54892562	19	54789680	54793679	54888563	54892562
14	6	14206772	14206801	14395328	14395357	6	14206772	14210771	14395328	14399327
15	6	13871591	13871620	13978830	13978859	6	13871591	13875590	13978830	13982829
16	12	52901945	52901974	53005321	53005350	12	52897975	52901974	53001351	53005350
17	4	24971633	24971662	25161540	25161569	4	24971633	24975632	25161540	25165539
18	6	33937397	33937426	33984767	33984796	6	33937397	33941396	33980797	33984796
19	6	34091315	34091344	34298426	34298455	6	34087345	34091344	34298426	34302425
20	22	29469297	29469326	29549135	29549164	22	29465327	29469326	29549135	29553134
21	13	112592965	112592994	112769570	112769599	13	112592965	112596964	112765600	112769599
22	1	89127658	89127687	89152353	89152382	1	89127658	89131657	89152353	89156352
23	12	62435378	62435407	62567856	62567885	12	62435378	62439377	62567856	62571855
24	1	117001586	117001615	117085320	117085349	1	117001586	117005585	117081350	117085349
25	1	89127658	89127687	89172216	89172245	1	89127658	89131657	89172216	89176215
26	20	4141333	4141362	4242776	4242805	20	4141333	4145332	4238806	4242805
27	1	234597989	234598018	234817961	234817990	1	234594019	234598018	234817961	234821960
28	16	86894085	86894114	87067808	87067837	16	86890115	86894114	87063838	87067837
29	X	44917248	44917277	44940642	44940671	X	44917248	44921247	44940642	44944641
30	2	54956850	54956879	55048950	55048979	2	54952880	54956879	55044980	55048979
31	2	92110542	92110571	92244801	92244830	2	92106572	92110571	92240831	92244830
32	16	29013009	29013038	29285259	29285288	16	29013009	29017008	29281289	29285288
33	13	112769570	112769599	112883504	112883533	13	112765600	112769599	112883504	112887503
34	2	28426957	28426986	28598991	28599020	2	28422987	28426986	28595021	28599020
35	6	14018524	14018553	14102933	14102962	6	14018524	14022523	14102933	14106932
36	6	33846693	33846722	33984767	33984796	6	33846693	33850692	33980797	33984796
37	14	74374069	74374098	74493962	74493991	14	74374069	74378068	74489992	74493991
38	2	92110542	92110571	92223058	92223087	2	92106572	92110571	92219088	92223087
39	1	33081754	33081783	33257776	33257805	1	33081754	33085753	33257776	33261775
40	5	77942614	77942643	77974225	77974254	5	77938644	77942643	77970255	77974254
41	5	77232750	77232779	77328969	77328998	5	77232750	77236749	77324999	77328998
42	19	54632150	54632179	54753644	54753673	19	54628180	54632179	54749674	54753673
43	6	33982533	33982562	34091315	34091344	6	33982533	33986532	34087345	34091344
44	15	69554284	69554313	69607443	69607472	15	69554284	69558283	69603473	69607472
45	16	70113537	70113566	70359936	70359965	16	70109567	70113566	70359936	70363935
46	5	76987564	76987593	77232750	77232779	5	76987564	76991563	77232750	77236749
47	2	8316758	8316787	8517378	8517407	2	8316758	8320757	8513408	8517407
48	8	8984063	8984092	9203066	9203095	8	8984063	8988062	9203066	9207065
49	1	165697795	165697824	165953927	165953956	1	165693825	165697824	165949957	165953956
50	9	98251760	98251789	98381299	98381328	9	98247790	98251789	98381299	98385298

Table 6.a4

	probe	Primer ID
1	ORF1_19_56561558_56564720_56759775_56765600_RF	OBD168-1529
2	ORF1_15_69599001_69607474_69822688_69824653_FF	OBD168-681
3	ORF1_1_16764579_16768424_17044824_17050263_RR	OBD168-921
4	ORF1_4_24971631_24973362_25125726_25129421_RR	OBD168-893

5	ORF1_13_57155089_57159703_57172839_57181375_RR	OBD168-1273
6	ORF1_9_98247819_98251791_98368594_98373451_FF	OBD168-617
7	ORF1_1_234729070_234732599_234814122_234817959_RF	OBD168-633
8	ORF1_5_54687073_54701690_54895820_54899919_RF	OBD168-1629
9	ORF1_5_77219829_77221017_77232748_77239462_FR	OBD168-1145
10	ORF1_8_57997832_57999789_58156560_58160085_FF	OBD168-885
11	ORF1_1_224094766_224099331_224328317_224334418_FF	OBD168-1741
12	ORF1_5_141346067_141348820_141380617_141383700_RR	OBD168-517
13	ORF1_19_54789678_54792948_54890303_54892564_RF	OBD168-1525
14	ORF1_6_14206770_14210218_14395326_14400003_RR	OBD168-789
15	ORF1_6_13871589_13875376_13978828_13980695_RR	OBD168-1653
16	ORF1_12_52899110_52901976_53003793_53005352_FF	OBD168-689
17	ORF1_4_24971631_24973362_25161538_25167741_RR	OBD168-457
18	ORF1_6_33937395_33940607_33982531_33984798_RF	OBD168-793
19	ORF1_6_34087216_34091346_34298424_34301201_FR	OBD168-2033
20	ORF1_22_29467180_29469328_29549133_29556322_FR	OBD168-1961
21	ORF1_13_112592963_112600705_112765663_112769601_RF	OBD168-1825
22	ORF1_1_89127656_89129856_89152351_89155427_RR	OBD168-1317
23	ORF1_12_62435376_62437096_62567854_62572530_RR	OBD168-1381
24	ORF1_1_117001584_117004481_117080679_117085351_RF	OBD168-1077
25	ORF1_1_89127656_89129856_89172214_89177508_RR	OBD168-1321
26	ORF1_20_4141331_4145409_4240264_4242807_RF	OBD168-1213
27	ORF1_1_234593513_234598020_234817959_234822547_FR	OBD168-589
28	ORF1_16_86891168_86894116_87066023_87067839_FF	OBD168-869
29	ORF1_X_44917246_44925908_44940640_44941996_RR	OBD168-1717
30	ORF1_2_54954222_54956881_55045882_55048981_FF	OBD168-1909
31	ORF1_2_92108138_92110573_92242402_92244832_FF	OBD168-1547
32	ORF1_16_29013007_29015111_29280587_29285290_RF	OBD168-745
33	ORF1_13_112765663_112769601_112883502_112886179_FR	OBD168-1405
34	ORF1_2_28424743_28426988_28597316_28599022_FF	OBD168-1017
35	ORF1_6_14018522_14021640_14102931_14109639_RR	OBD168-1081
36	ORF1_6_33846691_33848820_33982531_33984798_RF	OBD168-525
37	ORF1_14_74374067_74376797_74492554_74493993_RF	OBD168-521
38	ORF1_2_92108138_92110573_92210006_92223089_FF	OBD168-1546
39	ORF1_1_33081752_33087352_33257774_33262528_RR	OBD168-877
40	ORF1_5_77940215_77942645_77971521_77974256_FF	OBD168-2017
41	ORF1_5_77232748_77239462_77325709_77329000_RF	OBD168-1009
42	ORF1_19_54627987_54632181_54748746_54753675_FF	OBD168-1517
43	ORF1_6_33982531_33984798_34087216_34091346_RF	OBD168-1661
44	ORF1_15_69554282_69555739_69599001_69607474_RF	OBD168-965
45	ORF1_16_70112537_70113568_70359934_70360962_FR	OBD168-1417
46	ORF1_5_76987562_76988733_77232748_77239462_RR	OBD168-777
47	ORF1_2_8316756_8318269_8515734_8517409_RF	OBD168-785
48	ORF1_8_8984061_8987615_9203064_9212772_RR	OBD168-1189
49	ORF1_1_165695181_165697826_165952803_165953958_FF	OBD168-1329
50	ORF1_9_98247819_98251791_98381297_98383610_FR	OBD168-1701

Table 6.a5

	Sequence	Primer ID	Sequence
1	CAAGTGTGGGGGCGAGTGTTGCG	OBD168-1531	TGCACACCCAGGACCTGGAAAAA
2	CCGTTGCTCAAGAACCATCCAGAGTC	OBD168-683	GCAAACTTCAGGCTGTATTGTTCTCG
3	TTATCCCCTGTCTGACTTGTTCCCCG	OBD168-923	GCGTTACATCTGTTGTGCCAGCAAAA
4	CAGTAGTTCTAAAAGAGAGGATGGTA	OBD168-895	GCCAGTAAACCAAGGCTTATTAGGAT
5	GCGGGAGACAGAGAAAGGAAAAG	OBD168-1275	CAGGCAGAGGTGGACCGAGAACC
6	CATTCCCAGCAGGAGGGTAAAGGCTT	OBD168-619	ACAACAACAATAACAGACACCAGGGT
7	TATCCCCTGTCTGACTCGTTCCC	OBD168-635	TTTGGAATGCGGTGGCGTCTGGC
8	TGGAAAGGACTCCCAAATTCA	OBD168-1631	TAAAATCAGTAATCTAAGCTT
9	GCTACATCTGCTCAACCGTCCTG	OBD168-1147	CCCACACTGCCAAGCCCTTACCA
10	AACATCAGTCAGGAAAGACAAGGTTC	OBD168-887	TGGTGTGTCCTGGGTTTTGTGGAGCA
11	AAAGTGAGAGAAGGGTCCTGTAGCA	OBD168-1743	TTCACATGTTCAGTGTCTTCCTTTT
12	TGGCTGATGAGCGTGTCCGCATAGTT	OBD168-519	CTCCGAACACAAAGCATACATACCCT
13	AAAGTAATATCTTCCCAATGACC	OBD168-1527	TCTGACCTCACTTTCTCACCTCT
14	AAGTATGATGTAGAAAAGCCTTGAGC	OBD168-791	ATGGATGGGCAGTGGAAATAAGGCAG
15	CTACTCTGGTGGGACCTTGGA	OBD168-1655	GTCTAGACTACAACACAAAGT
16	GGGTGGGAGTTGCTCACTTGTTC	OBD168-691	GCCTGGCACACGGTGGGAAACAA
17	CAGTAGTTCTAAAAGAGAGGATGGTA	OBD168-459	CCAGGAAACAGGAAGAGTTCTCAAGC
18	TGGAAGTGCTGAACTGGAGCCCC	OBD168-795	GAGGAATAGGCAGAGCACAGCAG
19	GCCACTTATCACTGGGGACACCTGAA	OBD168-2035	ACATCATTAGTTTCTACATTCTACAA
20	ACTCCCTAAAATCAAACAACA	OBD168-1963	AGATGCTTCCCTGTTGTATTA
21	CCTCTTTGGCCAGAGCCAAAAC	OBD168-1827	CTTGATTTGGTTTTCCTTTTCT
22	ATTGTAAACACACCAATCGGC	OBD168-1319	TCCTTCCTTAGCTGAGATCCC
23	ATGGCACCTGCCGCAGCTCAGGTGGG	OBD168-1383	TGTATCTCAATGGATTCTCTCATTAT
24	GGGTAACTTGTAGACACTGCTGCCTC	OBD168-1079	GCCCACTGAGAAATAGAGATGTCTTG
25	TGTGTATCTAGCTGCTCTGGTGGG	OBD168-1323	TGGATTGGATCATGAAGCAGAAGG
26	AGGTGGAGGTCAGTGATGCTCGG	OBD168-1215	GAACATCCCTCACTTGCCCAGTC
27	TGGTGGTTCATAGGCAGGCTGAG	OBD168-591	ATGATGGCTGTGCCTGGGTGCTG
28	ATGGAGGCTGCCCCTGTAACACA	OBD168-871	TGTGTTACCCCTGCTCCCACGGA
29	AAGGTATGTGTGTGTTGAGGGGTGGG	OBD168-1719	ATCCGCCCACCTCGGCCTCCCAAAGT
30	CCAGCTACATCAAAACCCACCAC	OBD168-1911	TGGCAAGGAATCCACAGGTTTTC
31	TCTCCAAGGCACTCACAAGTAT	OBD168-1549	GAAACGTTCATCAGGAGTTGGA
32	TTGTGAGTGGGAAGCAGTGGGATTTC	OBD168-747	GTGTTAGGGCTGGAAGGAACTTGTTG
33	CTGCACACTGGAGCAGGGACCTTGG	OBD168-1407	ACCCTCATCTTTGGTGTGATGTTTG
34	AAGGAATAGGAGGCTGAGTATGGTGG	OBD168-1019	GGTTCAACTCCTGACCTTGCCTTCAT
35	GGTAACAGAGTGTGGACTGGTGC	OBD168-1083	TCAGGCAGGACCAAGACCACCCA
36	TGGAAGTGCTGAACTGGAGCCCC	OBD168-527	CCAGTATCCTGACTCCTGACAGC
37	TTGTGGAGGAAGATGGCTGCCGC	OBD168-523	TATGGTGGAATGGACCTGCCTGC
38	TCTCCAAGGCACTCACAAGTAT	OBD168-1548	GAAACGTTCATCAGGAGTTGGA
39	CCAGTCTTGACCACGCCCACCTA	OBD168-879	TTGGGCGAGATTCCAGCCTACAC
40	CACTTCAATTGAAAAAAAAAAAAG	OBD168-2019	CGCCCGGCTAAGTTTTCTGCAGTT
41	GTCCTAATCCACAAGGGCATCTTTCT	OBD168-1011	TCAAAGGATTCGCTACTTACAGCAGT
42	ACTCACAGGTGGCATTTGATGGC	OBD168-1519	TCAAAAATATTCAGAGAAAATAT
43	TGTTATCGCTCAGCCACTTATCACTG	OBD168-1663	CCACTTTCCTTTCCTTCCCACCCCAG
44	ACAATCTGCTCTCCACCACCAGC	OBD168-967	GCCAAGGTCGCTGGAGATGTGAG
45	GGTTTGTGTGGTGAGACAGTATT	OBD168-1419	AGGCTGGTCTTGAACTCCTAATC
46	GACACCAGTGATTGGATTTCAGGTTC	OBD168-779	TCAAAGGATTCGCTACTTACAGCAGT

47	CCCGTATTCAGAGACCACCCACTTTA	OBD168-787	TCCTGAGGGCTTCATTCAAACTTG
48	CTGGGAGTGGTAGATGTAATGCCTGT	OBD168-1191	GCCTCTAATAAGTGTGGAATCCTGGG
49	AATTCCTCTCCTATGCACACATT	OBD168-1331	TCAAGCGATTCTTCTGCCTCAGC
50	TAGCAGAGGGCTCCTCCCGCTCAT	OBD168-1703	TGGGTTGTATTCCACCTGCTATTC

Table 6.a6

	qPCR Primer ID	Sequence	qPCR Primer ID
1	OBD168-q1529	GTGGGGGCGAGTGTTGCGTGAG	OBD168-q1531
2	OBD168-q681	GCCTCTGCCCCACTGCTCAGGAG	OBD168-q683
3	OBD168-q921	CTGGTGAGGAAGGAGGAAGAGAGGAGGC	OBD168-q923
4	OBD168-q893	GAAAGGTGGGACAACTGGAAGTGAGAGC	OBD168-q895
5	OBD168-q1273	AGAGAGCGGGAGACAGAGAAAGGAAAAG	OBD168-q1275
6	OBD168-q617	CTCATTCCCAGCAGGAGGGTAAAGGCTT	OBD168-q619
7	OBD168-q633	CTGGTGAGGAAGGAGGAAGAGAGGAGGC	OBD168-q635
8	OBD168-q1629	GTTATGGACCAAATGTCTGGCC	OBD168-q1631
9	OBD168-q1145	GAGGAAGTGGAGGCACAGGCGGCTCAAG	OBD168-q1147
10	OBD168-q885	CCTCACAGCCCCATTAGAAGTTTATTTC	OBD168-q887
11	OBD168-q1741	AAAAAAATAAAAAATAGTTAAT	OBD168-q1743
12	OBD168-q517	GCCAGGAAGACGCAGGAGACCGC	OBD168-q519
13	OBD168-q1525	CAAGCATGAGTGACAACCAAT	OBD168-q1527
14	OBD168-q789	CAGTGTCATAGAGTCCAAAGTTGTAGGC	OBD168-q791
15	OBD168-q1653	TCAGGGATTGTAAATACACCAAT	OBD168-q1655
16	OBD168-q689	CGGTGACTTCAGTTGGGTGGAGGGTGGG	OBD168-q691
17	OBD168-q457	GAAAGGTGGGACAACTGGAAGTGAGAGC	OBD168-q459
18	OBD168-q793	CAGGAGGACGGCAGGGCTATGGACCTA	OBD168-q795
19	OBD168-q2033	CCTGCTAGGTGGGAGTCACCTG	OBD168-q2035
20	OBD168-q1961	AACATTCATGTCAAAACTCCCTAA	OBD168-q1963
21	OBD168-q1825	CCTCTTTGGCCAGAGCCAAAACC	OBD168-q1827
22	OBD168-q1317	TTTATGTCTAGCTCAGGGATTG	OBD168-q1319
23	OBD168-q1381	CAGCTCAGGTGGGGTGTGGTG	OBD168-q1383
24	OBD168-q1077	GGCATCAGGGTGGCAGTGGCAGGC	OBD168-q1079
25	OBD168-q1321	GGGGCCTTGGAGAACCTTTATG	OBD168-q1323
26	OBD168-q1213	GGCTGGAGTGGGACATTGGCTGGGCTGT	OBD168-q1215
27	OBD168-q589	ATTTTGGTGGTTCATAGGCAGGCTGAGC	OBD168-q591
28	OBD168-q869	AGCCTCCCTGCCCATCTGCCCCTCTCAT	OBD168-q871
29	OBD168-q1717	AAAGATTCATGCTCTCTCAAGG	OBD168-q1719
30	OBD168-q1909	GAAAAAAATAGGTGTGTGAATAAT	OBD168-q1911
31	OBD168-q1547	GGGTGGGGTGCCTGGATGCGTGAGG	OBD168-q1549
32	OBD168-q745	CCTGGATTTGAACTGCCTTGTCCGTGGG	OBD168-q747
33	OBD168-q1405	GTTCTCTTCTGCACACTGGAGCAG	OBD168-q1407
34	OBD168-q1017	AAAGGAATAGGAGGCTGAGTATGGTGGC	OBD168-q1019
35	OBD168-q1081	GCTGGGTAACAGAGTGTGGACTGGTGC	OBD168-q1083
36	OBD168-q525	GGCAACCAGGAGGACGGCAGGGC	OBD168-q527
37	OBD168-q521	TTGTGGAGGAAGATGGCTGCCGCCTGGG	OBD168-q523
38	OBD168-q1546	GGGTGGGGTGCCTGGATGCGTGAGG	OBD168-q1548
39	OBD168-q877	CCCCAGTCTTGACCACGCCCACC	OBD168-q879

40	OBD168-q2017	CACTGAATTGTTCAGTTTAAA	OBD168-q2019
41	OBD168-q1009	CTGATAAGAAGAGGATTGTAGGACTGCC	OBD168-q1011
42	OBD168-q1517	ACTCAGGAGGGAATGTAACCCTC	OBD168-q1519
43	OBD168-q1661	GCTCCCGGGCCCTGCTAGGTGGG	OBD168-q1663
44	OBD168-q965	CTTCCCGCTCTGCTCTTTTGAGGCTGGC	OBD168-q967
45	OBD168-q1417	CAGTATTGAATCCAACAAACGG	OBD168-q1419
46	OBD168-q777	GGGCTCCTCTGTGTATCTCCTCTGTCTC	OBD168-q779
47	OBD168-q785	CCCCGCAAAAGGCTTGAAGGAGCACCCG	OBD168-q787
48	OBD168-q1189	GTCTCCACGGTCTCTGCTGTCTCCTTGC	OBD168-q1191
49	OBD168-q1329	ATTCCCAGCACAAATGATTATCTTCC	OBD168-q1331
50	OBD168-q1701	TAGGACTAGGATTTGAACCCAGGC	OBD168-q1703

Table 6.a7

	Sequence	qPCR Probe	Sequence
1	GGTCATCTAGTCACATCTCATA	OBD168-p1529	GTTTGAAGGTGTGTTTGTTCGAAAAAGACTTGCATTTATG
2	GCAAACTTCAGGCTGTATTGTTCTCGTC	OBD168-p681	AGTCCCAGGCTTTCGTCTCACGTTCGAATAACAACC
3	CCAGCGTTACATCTGTTGTGCCAGCAAA	OBD168-p921	TCAGGCAATCCATGCTTGGAGAAAGTCGATAGATGGC
4	GCCAGTAAACCAAGGCTTATTAGGATAC	OBD168-p893	AGTGGCAGATAGCTGGGAAAACATTCGAGCCAAGC
5	TCAGGCAGAGGTGGACCGAGAACC	OBD168-p1273	AGTTCAGTCTAGAACATAACAGAAAATGTCTTCGACTCT
6	GGGACTTGACAGTTCATCTCATTCATTC	OBD168-p617	AGGGTAGCCCATTGGGTACCTAGCTCGAGTTC
7	CCTGTTTTGGAATGCGGTGGCGTCTGGC	OBD168-p633	TGGAGAAAGTCGATTTCCCCATTTTGGCCGATGGC
8	TTCCGTTTTAGGAAACTAGAAA	OBD168-p1629	GGGGCCTTGAGAGGTAATTCGATCTTTTCAAAGAACCACA
9	CTCCCCACACTGCCAAGCCCTTACC	OBD168-p1147	TGCATCACCACAGAGCACTTCGACACACCCCT
10	TGGTGTGTCCTGGGTTTTGTGGAGCAC	OBD168-p885	AGTGCAGTCGAGGCAGTGGGAGTTGAATCCTC
11	TTCTAGTTTGGACAATGTATGA	OBD168-p1741	TTGCTTGAGCTCAGGAGTTCGAAAAAGAAAAGAAAAGAAC
12	CTACTCCGAACACAAAGCATACATACCC	OBD168-p517	TCGTTGGGTTTGGCGGAGGGCTCGATAACTTAG
13	TTTCTCACCTCTAGATATGTT	OBD168-p1525	GATCACGAGGCCAGGAGTTCGATAGATAATAGATAGAAAT
14	GCTGCCTGCTGTTCCCGTGCCAG	OBD168-p789	AAAGACAAACGAGGTCGAGCTGCCGTGTGTCC
15	TTTTCAAGCAGGGCTTCAGCTTT	OBD168-p1653	GGTTTGTGAATGCACCAATCGAGGTGAACTGTGGCAATGA
16	TACCCGCAAGTGTCTGTGCCTGGC	OBD168-p689	TGCCGCCTAAGGTTGTTGATGTAGCTCTCGAACGT
17	CAGACCAGTATTCCGACAGCAGGCTTGC	OBD168-p457	TGAGTGGCAGATAGCTGGGAAAACATTCGATAACCCC
18	GGAGGGAGGAATAGGCAGAGCACAGCAG	OBD168-p793	AGTTCAAATCAAGCTAGGAGGCATCCGTGTCGAAAGA
19	TACATTCTACAAGGTGAAAGAC	OBD168-p2033	GGGTACGAGGGGGAGACCTCGACACCAACATATATCTGTG
20	TGAGAGATGCTTCCCTGTTGTATT	OBD168-p1961	GAATGCACCATCAATGAATCGATTCTGATGACATGGTTGT
21	AGCTACCGCGCCCAGCATCCATT	OBD168-p1825	AGCTCAGTCATGTGAACCTCGAAAAAGAAAGAAACATTTC
22	TTTCTAAGTGAGATGTGGAAAT	OBD168-p1317	GGTTTGTGAATGCACCAATCGAACAGTCCAAATAAAGTCT
23	GGAACTCAATTTTTATTCAGC	OBD168-p1381	CGCTTAGGGATGCAGACGTCGAATAGTCCACTGTTACTGG
24	GAGGTTGAGTGACAAATGCTGTGCTCTC	OBD168-p1077	AGCTCAGGAGTTCGATATCTGTTTACTTAACCACAAA
25	ACTACAGAAACATAATGACTAA	OBD168-p1321	GGTTTGTGAATGCACCAATCGATATTTTACTTAACCATAG
26	CCAGCACCCAGAGGCAAACTCACCC	OBD168-p1213	TCTGCCCAACAAGAGAGAGCTGGGATCGAATGC
27	GCCCCAGGTGCCAGCAGGGTGAC	OBD168-p589	ACTATACATCCTCCAAGGTGATGATAACTTCGAGAGTG
28	GACTGTGTTACCCCTGCTCCCACGG	OBD168-p869	AGGCACGGGTACCAAGACTACTTCGATGCTGC
29	TGGTCAGGCTGGTCTCCAACTC	OBD168-p1717	TCACTTGAGGTCAAGAGTTCGAGTCAAAGTGATGCTCCAT
30	TTTAGGAATGTCAACCATTTTGCC	OBD168-p1909	AAAACAAAAATTTAAAACTCGAGGGGGCGTAGTTCTGCCG
31	CTCTCTCTCCCTCTCTTTCCCTCTC	OBD168-p1547	CAAGTCTTTGATCTTCACTCGAATCTGAGAGACAGAGAGA
32	GACAGTGCTTTCTCTAAGGCTGGGAACG	OBD168-p745	TCCTCCGTGGGTCAGGAAGGGTCGACAATCAT

33	TCGGGACAGAGTGGAGTCTTCCCC	OBD168-p1405	AGCTCAGTCATGTGAACCTCGACAGTAGGTATTTTTGGAA
34	GCCCTCTTCCCTGCTGCCCCTGTG	OBD168-p1017	AGGAGGATCACTTGAGGCCAAGAATTCGATTCGTCC
35	GAGTCAGGCAGGACCAAGACCACCCAGC	OBD168-p1081	ACCTTGAGCTAGATACAGAGTGTCGAAATCAGCTTGAGG
36	CATTCTGCTGTTGATGGGCATTGGGTTG	OBD168-p525	AGGAGGCATCCGTGTCGAATTTTCATGGCAGCC
37	GTGGAATGGACCTGCCTGCCTGGC	OBD168-p521	TTTAGCGTGAGGCGCTCCAGGTCGAGTGGTT
38	CTCTCTCTCCCTCTCTTTCCCTCTC	OBD168-p1546	CAAGTCTTTGATCTTCACTCGAATCTGAGAGACAGAGAGA
39	GCTTGGGCGAGATTCCAGCCTACACGGG	OBD168-p877	AGAGCTTAAGTTCGAGCAGTGTGGAACCTTCGGG
40	GGCATTTCGCCACGTTGGCCA	OBD168-p2017	GACTTGAGCTTCAGGAGTTCGAGACCAGTTTGGCCAACAA
41	CTCCCCACACTGCCAAGCCCTTACC	OBD168-p1009	TTGCAGGTCGAAGTGCTCTGTGGTGATGCAGC
42	AGAAAATATCCACAGAGTTCCAA	OBD168-p1517	AGGTGCTATGCTTATGACTCGAGATCTCCACTCAGATACC
43	CTTGCTGGGGGCTTGACTTCTCT	OBD168-p1661	GGGTACGAGGGGGAGACCTCGATGAGCAGCATGTTATTTA
44	CATCACCCCAGCCTTTGCTATCACGGGC	OBD168-p965	AAGTCCCAGGCTTTCGTCTCACGTTCGACAGC
45	CCACCTGCCTCGGCCTCCCAAA	OBD168-p1417	CATAAGACTAAGGTTCTGTCGAACCACCTTTATTTACTGT
46	GCTCCCCACACTGCCAAGCCCTTACC	OBD168-p777	TTCAACTCGAAGTGCTCTGTGGTGATGCAGCAGG
47	GGGAGTGGCAGGTCCAAGACTACCC	OBD168-p785	AGCTCAGGAGTTCGAAACCCAACATAAATGCAAATA
48	GAGCCTCTAATAAGTGTGGAATCCTGGG	OBD168-p1189	AGGTGGATCACTTGAGGCCACGAGTTCGAGTAC
49	TGAGATGGAGTTTAGCTTTTGTTGCC	OBD168-p1329	TCACCTAAGCTCAGGAGTTCGAGACTAGCTTGGCCAACAT
50	GTGCCATGGATTCTGTCCTTCGGA	OBD168-p1701	GCCCATTGGGTACCTAGCTCGAATGCAGGCTGTTGTTGGA

Table 6.a8

	qPCR Probe	Sequence
1	OBD168-p1531	CATAAATGCAAGTCTTTTTCGAACAAACACACCTTCAAAC
2	OBD168-p683	TGGTTGTTATTCGAACGTGAGACGAAAGCCTGGGAC
3	OBD168-p923	TCTATCGACTTTCTCCAAGCATGGATTGCCTGAGCTC
4	OBD168-p895	TGGCTCGAATGTTTTCCCAGCTATCTGCCACTCAC
5	OBD168-p1275	AGAGTCGAAGACATTTTCTGTTATGTTCTAGACTGAACT
6	OBD168-p619	TGGAACTCGAGCTAGGTACCCAATGGGCTACC
7	OBD168-p635	GCCATCGGCCAAAATGGGGAAATCGACTTTCTCCA
8	OBD168-p1631	TGTGGTTCTTTGAAAAGATCGAATTACCTCTCAAGGCCCC
9	OBD168-p1145	AGGGGTGTGTCGAAGTGCTCTGTGGTGATGCA
10	OBD168-p887	AGAGGATTCAACTCCCACTGCCTCGACTGCAC
11	OBD168-p1743	GTTCTTTTCTTTTCTTTTTCGAACTCCTGAGCTCAAGCAA
12	OBD168-p519	AGTTATCGAGCCCTCCGCCAAACCCAACGATTC
13	OBD168-p1527	ATTTCTATCTATTATCTATCGAACTCCTGGCCTCGTGATC
14	OBD168-p791	TATGGGACACACGGCAGCTCGACCTCGTTTGT
15	OBD168-p1655	TCATTGCCACAGTTCACCTCGATTGGTGCATTCACAAACC
16	OBD168-p691	ACGTTCGAGAGCTACATCAACAACCTTAGGCGGC
17	OBD168-p459	GGGGTTATCGAATGTTTTCCCAGCTATCTGCCACTCA
18	OBD168-p795	TCTTTCGACACGGATGCCTCCTAGCTTGATTTGAAC
19	OBD168-p2035	CACAGATATATGTTGGTGTCGAGGTCTCCCCCTCGTACCC
20	OBD168-p1963	ACAACCATGTCATCAGAATCGATTCATTGATGGTGCATTC
21	OBD168-p1827	GAAATGTTTCTTTCTTTTTCGAGGTTCACATGACTGAGCT
22	OBD168-p1319	AGACTTTATTTGGACTGTTCGATTGGTGCATTCACAAACC
23	OBD168-p1383	CCAGTAACAGTGGACTATTCGACGTCTGCATCCCTAAGCG
24	OBD168-p1079	TCTTTGTGGTTAAGTAAACAGATATCGAACTCCTGAGCT
25	OBD168-p1323	CTATGGTTAAGTAAAATATCGATTGGTGCATTCACAAACC

26	OBD168-p1215	TGCATTCGATCCCAGCTCTCTCTTGTTGGGCAG
27	OBD168-p591	ACACTCTCGAAGTTATCATCACCTTGGAGGATGTATAG
28	OBD168-p871	TGCAGCATCGAAGTAGTCTTGGTACCCGTGCC
29	OBD168-p1719	ATGGAGCATCACTTTGACTCGAACTCTTGACCTCAAGTGA
30	OBD168-p1911	CGGCAGAACTACGCCCCCTCGAGTTTTAAATTTTTGTTTT
31	OBD168-p1549	TCTCTCTGTCTCTCAGATTCGAGTGAAGATCAAAGACTTG
32	OBD168-p747	ATGATTGTCGACCCTTCCTGACCCACGGAGGA
33	OBD168-p1407	TTCCAAAAATACCTACTGTCGAGGTTCACATGACTGAGCT
34	OBD168-p1019	ACGAATCGAATTCTTGGCCTCAAGTGATCCTCCTGC
35	OBD168-p1083	AGTCCCCAAGACCTCAAGCTGATTTCGACACTCTG
36	OBD168-p527	AGGGCTGCCATGAAAATTCGACACGGATGCCTC
37	OBD168-p523	AACCACTCGACCTGGAGCGCCTCACGCTAAA
38	OBD168-p1548	TCTCTCTGTCTCTCAGATTCGAGTGAAGATCAAAGACTTG
39	OBD168-p879	TCCCGAAGGTTCCACACTGCTCGAACTTAAGCTC
40	OBD168-p2019	TTGTTGGCCAAACTGGTCTCGAACTCCTGAAGCTCAAGTC
41	OBD168-p1011	TGCTGCATCACCACAGAGCACTTCGACCTGCA
42	OBD168-p1519	GGTATCTGAGTGGAGATCTCGAGTCATAAGCATAGCACCT
43	OBD168-p1663	TAAATAACATGCTGCTCATCGAGGTCTCCCCCTCGTACCC
44	OBD168-p967	TAGGCTGTCGAACGTGAGACGAAAGCCTGGGA
45	OBD168-p1419	ACAGTAAATAAAGGTGGTTCGACAGAACCTTAGTCTTATG
46	OBD168-p779	ACCTGCTGCATCACCACAGAGCACTTCGAGTTGAA
47	OBD168-p787	ATTTGCATTTATGTTGGGTTTCGAACTCCTGAGCTC
48	OBD168-p1191	AGTACTCGAACTCGTGGCCTCAAGTGATCCAC
49	OBD168-p1331	ATGTTGGCCAAGCTAGTCTCGAACTCCTGAGCTTAGGTGA
50	OBD168-p1703	TCCAACAACAGCCTGCATTCGAGCTAGGTACCCAATGGGC

Table 6.a9

	probe	PCR Marker Set	qPCR Marker Set
1	ORF1_19_56561558_56564720_56759775_56765600_RF	OBD168-1529.1531	OBD168-q1529.q1531 .p1529/p1531
2	ORF1_15_69599001_69607474_69822688_69824653_FF	OBD168-681.683	OBD168-q681.q683 .p681/p683
3	ORF1_1_16764579_16768424_17044824_17050263_RR	OBD168-921.923	OBD168-q921.q923 .p921/p923
4	ORF1_4_24971631_24973362_25125726_25129421_RR	OBD168-893.895	OBD168-q893.q895 .p893/p895
5	ORF1_13_57155089_57159703_57172839_57181375_RR	OBD168-1273.1275	OBD168-q1273.q1275 .p1273/p1275
6	ORF1_9_98247819_98251791_98368594_98373451_FF	OBD168-617.619	OBD168-q617.q619 .p617/p619
7	ORF1_1_234729070_234732599_234814122_234817959_RF	OBD168-633.635	OBD168-q633.q635 .p633/p635
8	ORF1_5_54687073_54701690_54895820_54899919_RF	OBD168-1629.1631	OBD168-q1629.q1631 .p1629/p1631
9	ORF1_5_77219829_77221017_77232748_77239462_FR	OBD168-1145.1147	OBD168-q1145.q1147 .p1147/p1145
10	ORF1_8_57997832_57999789_58156560_58160085_FF	OBD168-885.887	OBD168-q885.q887 .p885/p887
11	ORF1_1_224094766_224099331_224328317_224334418_FF	OBD168-1741.1743	OBD168-q1741.q1743 .p1741/p1743
12	ORF1_5_141346067_141348820_141380617_141383700_RR	OBD168-517.519	OBD168-q517.q519 .p517/p519
13	ORF1_19_54789678_54792948_54890303_54892564_RF	OBD168-1525.1527	OBD168-q1525.q1527 .p1525/p1527
14	ORF1_6_14206770_14210218_14395326_14400003_RR	OBD168-789.791	OBD168-q789.q791 .p789/p791
15	ORF1_6_13871589_13875376_13978828_13980695_RR	OBD168-1653.1655	OBD168-q1653.q1655 .p1653/p1655
16	ORF1_12_52899110_52901976_53003793_53005352_FF	OBD168-689.691	OBD168-q689.q691 .p689/p691
17	ORF1_4_24971631_24973362_25161538_25167741_RR	OBD168-457.459	OBD168-q457.q459 .p457/p459
18	ORF1_6_33937395_33940607_33982531_33984798_RF	OBD168-793.795	OBD168-q793.q795 .p793/p795

19	ORF1_6_34087216_34091346_34298424_34301201_FR	OBD168-2033.2035	OBD168-q2033.q2035 .p2033/p2035
20	ORF1_22_29467180_29469328_29549133_29556322_FR	OBD168-1961.1963	OBD168-q1961.q1963 .p1961/p1963
21	ORF1_13_112592963_112600705_112765663_112769601_RF	OBD168-1825.1827	OBD168-q1825.q1827 .p1825/p1827
22	ORF1_1_89127656_89129856_89152351_89155427_RR	OBD168-1317.1319	OBD168-q1317.q1319 .p1317/p1319
23	ORF1_12_62435376_62437096_62567854_62572530_RR	OBD168-1381.1383	OBD168-q1381.q1383 .p1381/p1383
24	ORF1_1_117001584_117004481_117080679_117085351_RF	OBD168-1077.1079	OBD168-q1077.q1079 .p1077/p1079
25	ORF1_1_89127656_89129856_89172214_89177508_RR	OBD168-1321.1323	OBD168-q1321.q1323 .p1321/p1323
26	ORF1_20_4141331_4145409_4240264_4242807_RF	OBD168-1213.1215	OBD168-q1213.q1215 .p1213/p1215
27	ORF1_1_234593513_234598020_234817959_234822547_FR	OBD168-589.591	OBD168-q589.q591 .p589/p591
28	ORF1_16_86891168_86894116_87066023_87067839_FF	OBD168-869.871	OBD168-q869.q871 .p869/p871
29	ORF1_X_44917246_44925908_44940640_44941996_RR	OBD168-1717.1719	OBD168-q1717.q1719 .p1717/p1719
30	ORF1_2_54954222_54956881_55045882_55048981_FF	OBD168-1909.1911	OBD168-q1909.q1911 .p1909/p1911
31	ORF1_2_92108138_92110573_92242402_92244832_FF	OBD168-1547.1549	OBD168-q1547.q1549 .p1547/p1549
32	ORF1_16_29013007_29015111_29280587_29285290_RF	OBD168-745.747	OBD168-q745.q747 .p745/p747
33	ORF1_13_112765663_112769601_112883502_112886179_FR	OBD168-1405.1407	OBD168-q1405.q1407 .p1405/p1407
34	ORF1_2_28424743_28426988_28597316_28599022_FF	OBD168-1017.1019	OBD168-q1017.q1019 .p1017/p1019
35	ORF1_6_14018522_14021640_14102931_14109639_RR	OBD168-1081.1083	OBD168-q1081.q1083 .p1081/p1083
36	ORF1_6_33846691_33848820_33982531_33984798_RF	OBD168-525.527	OBD168-q525.q527 .p525/p527
37	ORF1_14_74374067_74376797_74492554_74493993_RF	OBD168-521.523	OBD168-q521.q523 .p521/p523
38	ORF1_2_92108138_92110573_92210006_92223089_FF	OBD168-1546.1548	OBD168-q1546.q1548 .p1546/p1548
39	ORF1_1_33081752_33087352_33257774_33262528_RR	OBD168-877.879	OBD168-q877.q879 .p877/p879
40	ORF1_5_77940215_77942645_77971521_77974256_FF	OBD168-2017.2019	OBD168-q2017.q2019 .p2017/p2019
41	ORF1_5_77232748_77239462_77325709_77329000_RF	OBD168-1009.1011	OBD168-q1009.q1011 .p1009/p1011
42	ORF1_19_54627987_54632181_54748746_54753675_FF	OBD168-1517.1519	OBD168-q1517.q1519 .p1517/p1519
43	ORF1_6_33982531_33984798_34087216_34091346_RF	OBD168-1661.1663	OBD168-q1661.q1663 .p1661/p1663
44	ORF1_15_69554282_69555739_69599001_69607474_RF	OBD168-965.967	OBD168-q965.q967 .p965/p967
45	ORF1_16_70112537_70113568_70359934_70360962_FR	OBD168-1417.1419	OBD168-q1417.q1419 .p1417/p1419
46	ORF1_5_76987562_76988733_77232748_77239462_RR	OBD168-777.779	OBD168-q777.q779 .p777/p779
47	ORF1_2_8316756_8318269_8515734_8517409_RF	OBD168-785.787	OBD168-q785.q787 .p785/p787
48	ORF1_8_8984061_8987615_9203064_9212772_RR	OBD168-1189.1191	OBD168-q1189.q1191 .p1189/p1191
49	ORF1_1_165695181_165697826_165952803_165953958_FF	OBD168-1329.1331	OBD168-q1329.q1331 .p1329/p1331
50	ORF1_9_98247819_98251791_98381297_98383610_FR	OBD168-1701.1703	OBD168-q1701.q1703 .p1701/p1703

Table 6.a10

51	ORF1_1_40249894_40253001_40397735_40401055_FR	266	3261.962157
52	ORF1_3_128892194_128893890_129064130_129068087_RF	179	2643.521301
53	ORF1_4_113710897_113723443_113810658_113830867_RF	166	2550.222683
54	ORF1_19_54627987_54632181_54828537_54832427_FR	173	2600.984915
55	ORF1_12_14189_15286_93751_97454_FF	230	3025.599211
56	ORF1_13_27789091_27791217_27935736_27938158_RF	175	2611.734713
57	ORF1_19_6507876_6510412_6736179_6739196_RR	186	2684.363335
58	ORF1_5_71466175_71468826_71713282_71719473_RF	190	2707.443468
59	ORF1_22_50201186_50205111_50373464_50374527_FF	198	2781.252576
60	ORF1_2_233813067_233815110_233853895_233857139_FR	200	2795.051917
61	ORF1_4_168182554_168187989_168317980_168319647_FF	184	2678.622211
62	ORF1_2_101327421_101335518_101390331_101393544_FF	187	2686.831942

63	ORF1_1_221106643_221120931_221185158_221187933_RF	309	3457.695551
64	ORF1_15_31334951_31340691_31546136_31558743_FF	193	2745.03243
65	ORF1_7_43795674_43802582_44019092_44021471_RF	195	2772.676516
66	ORF1_13_99494037_99497802_99735907_99738338_FF	197	2781.085401
67	ORF1_12_14189_15286_200475_202854_FF	242	3107.068033
68	ORF1_10_3653748_3655479_3866568_3872650_RR	209	2880.834449
69	ORF1_2_74446225_74448326_74574097_74579710_FR	222	2938.850856
70	ORF1_6_154995123_154998831_155125636_155128798_RF	220	2915.081526
71	ORF1_19_9082207_9087550_9202787_9208911_RR	221	2935.649237
72	ORF1_13_27935736_27938158_27961367_27964197_FR	228	2992.736336
73	ORF1_6_158943910_158945125_159080063_159084244_RR	227	2988.023125
74	ORF1_22_44263290_44267587_44326770_44330737_FF	204	2827.501658
75	ORF1_3_32385454_32386698_32541292_32554994_RF	226	2979.923877
76	ORF1_19_20562776_20567807_20680600_20685168_RR	238	3074.794125
77	ORF1_9_127592507_127594232_127769656_127771134_FR	233	3053.776723
78	ORF1_12_134194_137994_14189_15286_RF	279	3316.092388
79	ORF1_3_167588699_167598102_167735969_167742420_FF	236	3070.236279
80	ORF1_20_2111595_2115703_2369884_2374210_FR	251	3175.82756
81	ORF1_2_53649025_53656227_53766349_53775695_FR	243	3112.832366
82	ORF1_16_70112537_70113568_70281463_70283063_FF	262	3242.712372
83	ORF1_1_35943227_35949162_35991655_35992829_FF	250	3168.607921
84	ORF1_11_3589286_3591426_3777994_3782240_FF	285	3336.811355
85	ORF1_13_40903938_40912685_40990073_40992867_FR	256	3199.669699
86	ORF1_17_46177013_46180826_46195798_46197440_RF	257	3200.455689
87	ORF1_11_33667893_33674633_33693896_33698608_RR	269	3274.351845
88	ORF1_2_233756599_233760219_233853895_233857139_FR	281	3324.060521
89	ORF1_21_44873351_44875256_44901291_44903482_FF	271	3277.035573
90	ORF1_1_39712316_39716819_39935069_39938243_RF	270	3274.528209
91	ORF1_20_51449039_51452721_51482831_51487722_FF	278	3296.630806
92	ORF1_11_10332545_10336410_10435291_10442726_FR	268	3268.369829
93	ORF1_17_1305781_1308105_1405058_1407538_FR	405	4046.661111
94	ORF1_6_14276298_14278467_14395326_14400003_FR	298	3398.290266
95	ORF1_19_54461246_54463256_54564139_54574977_RF	287	3339.709353
96	ORF1_2_227722929_227725809_227932124_227939987_FR	289	3350.237008
97	ORF1_20_20121190_20124157_20274659_20278486_RR	282	3330.318405
98	ORF1_15_90843215_90845291_91002629_91006437_RR	274	3285.787482
99	ORF1_22_24255117_24260015_24453446_24457028_FR	252	3177.329191
100	ORF1_4_102481630_102483332_102522760_102539034_FR	369	3816.059579

Table 6.b1

51	-1.395349802	0.100481915	0.00018938	HC
52	-1.394605873	0.07280341	9.23358E-05	HC
53	-1.394019039	0.069334424	8.15497E-05	HC
54	-1.393940744	0.071223807	8.73045E-05	HC
55	-1.393935973	0.090021457	0.000146703	HC
56	-1.392732078	0.07142062	8.85578E-05	HC

57	-1.392045991	0.073868068	9.73498E-05	HC
58	-1.391817271	0.074477563	0.000100264	HC
59	-1.391435503	0.078395267	0.000109982	HC
60	-1.389447743	0.078941759	0.000111867	HC
61	-1.388162304	0.074121954	9.6634E-05	HC
62	-1.387816432	0.073706177	9.76587E-05	HC
63	-1.387782969	0.105280142	0.0002305	HC
64	-1.385630516	0.076882938	0.000105136	HC
65	-1.385106801	0.078761241	0.000108821	HC
66	-1.383613903	0.078776945	0.000109959	HC
67	-1.382570148	0.093653852	0.000160585	HC
68	-1.381365435	0.083791812	0.000124083	HC
69	-1.378245812	0.084452402	0.00013284	HC
70	-1.377515984	0.082886988	0.000129204	HC
71	-1.376577399	0.084519141	0.000132347	HC
72	-1.376502872	0.087492255	0.000141342	HC
73	-1.376374612	0.087406474	0.000140584	HC
74	-1.376326886	0.080520984	0.000116387	HC
75	-1.375231562	0.086983939	0.000139288	HC
76	-1.374198345	0.091906279	0.000154984	HC
77	-1.37322453	0.091712649	0.000151409	HC
78	-1.372472194	0.101278707	0.000200211	HC
79	-1.371647873	0.092218553	0.000154204	HC
80	-1.370634715	0.097260863	0.000172973	HC
81	-1.370591898	0.093857745	0.0001616	HC
82	-1.369001392	0.099993659	0.000185626	HC
83	-1.367985092	0.096899096	0.000171643	HC
84	-1.367790553	0.101252915	0.000204464	HC
85	-1.366608289	0.097809856	0.000177414	HC
86	-1.366352925	0.097510393	0.000177562	HC
87	-1.365301253	0.100643162	0.000191824	HC
88	-1.365290466	0.101375894	0.00020184	HC
89	-1.365261052	0.100177474	0.000192356	HC
90	-1.363988483	0.100288669	0.000191858	HC
91	-1.36386899	0.099642396	0.00019627	HC
92	-1.363654072	0.100396086	0.000190641	HC
93	-1.363297723	0.135705371	0.000389419	HC
94	-1.363180618	0.102982649	0.000217443	HC
95	-1.362941181	0.100842256	0.000205064	HC
96	-1.362639868	0.101213262	0.000207253	HC
97	-1.362102923	0.101659702	0.000203125	HC
98	-1.361938026	0.099977846	0.000194097	HC
99	-1.36144754	0.097030319	0.00017325	HC
100	-1.361141308	0.122607616	0.00032056	HC

Table 6.b2

51	GGCAGGAGGATTGCTTGAGTTCAGGAGTTCGAACAAGATATTAAGTATTAGAAGAACAAA
52	CACCACCAGAGTAGCTAGATACAGAGTGTCGATTGTCATGTTTTCACTGACAAATATGTC
53	GGCAGGCAGATCACCTGAGGTTTGGAGTTCGAATGTTTCTCTAATGCATGTCTTCTTTGG
54	GTGGTGGTACAGGTGCTATGCTTATGACTCGAGACATGTGGAGTCACCCCATTTGCAGTG
55	GTGTTTCCTAGTTAGCTCAGAGCCTCAGTCGAAGGAAGCTTAGGAATATAGCTTATGTGT
56	AGCAGGCAGATCACTTGAGGTCAGAAATTCGACCTCCTTGCTCAACTGTCTTTTATCCAC
57	AGGAGCTGGGGTGTATGTCAACAATTTCTCGAACTCCCAGGTTCAAACGATCCTCTCACC
58	AAGGAGCTGGTCGGTATTCCCCTCGCTCTCGAGTAAAAGTGGCAGAAGATGGTTCCATTA
59	AGGGAGTAGAGGAATCGGGAGCCAGTGTTCGAATAATACATCTCTTCAATATTCCTGATT
60	AGTAATGTCCTTTAGAGCTGTTTTCTCCTCGAAGGGCTGGTTGTACTGCGGAGGAGGAAG
61	AAGGCAGGCAGATCACTAGGTCAGGAGTTCGAAACCCACACTGCAAGTATCAACAGGCAA
62	GAGGCAGGCGGATCACGAGGTCAATAGATCGATAGGAAACAAACATTTGATCCGTTAGTA
63	AGTGGCATGATCATAGTTCACTGCAGCCTCGATACACATTTTCAAAGTGCTTTTCAAAAA
64	GGCAGGAGAATTGCTTGAGCCCAGAAGTTCGAGTTTTCCCCTTGCTCCTAAATCCCAGTC
65	GGCAGGCAGATCACTTGAGGTAAGGAGTTCGAAAATTAGCAGAAAAAAGCAAGTAAAGAT
66	GGCAGGCGGATCACCTGAGTTCAGGAGTTCGAGATGACAGCTAAACATAAAATGAACCAA
67	GTGTTTCCTAGTTAGCTCAGAGCCTCAGTCGAGTCATATTTGAATGTCTACTACATCATC
68	AGGCAGGCAGATCACTTGAGGTTAGGGTTCGACCAGCAGCAAAGACAGCAAGTATTCCAG
69	GCAGTGAGCCGAGATCATGCCATTATACTCGAAACAGGAAAAAAAGAAGTCTGCTTCTGA
70	GGCAGGAGGATCACTTGAGCCTAGGAAGTCGATGTTTCTTGAATTGTTTTATTTGTGTTG
71	AGGCAAGAGAATCACTTGAACCCGGGAGTCGAGATCAGCCTGACCAACATGAAACCCCGT
72	AGCAGGCAGATCACTTGAGGTCAGAAATTCGAAACGAAGGGCTAAGCCCCCCTCGCCCGG
73	AGCAGGAGGATCACTTGAGGCCAGGGATTCGATCCTCAAGCTAAGAATAAAAACACCAAG
74	CAAAGGCAAATGCGTCCTGTCACTCTCCTCGAGGTTATATTTATTCTAATTATTATTATC
75	GTTAAAGTGATTCTCCTGCCTCAGACTCTCGATACATAAGGACTTAGGAAAAATGATAAA
76	GAGGGAGGGAGATAAGCTTAAGAAGAGTTCGAGACACTTATTTTGGAGATGGCATCTTGC
77	GGCAGGTGGATCACCTGAGGTCAGGAATTCGAAAAAAAAAAAAAAAAAGAAATAAAGAAAA
78	GTGTTTCCTAGTTAGCTCAGAGCCTCAGTCGAATACACACTCATTGAAGGCCCACTATGT
79	GAGGTGGGCAGATCACGAGGACAGGAGATCGAGCCTGTAAACAAAAAGCAAACAACTACT
80	CCCACACAATTTAAATCTGTCTTGTACATCGAGGTGAGAGTGAGCTGAGATGGCGCCACT
81	AGCAGGCAGATCATCTGAGGTTGGGAGTTCGAAGACACAATTTCTTGTTAGTGACTCTAT
82	TAAAGCTATGCATAAGACTAAGGTTCTGTCGATACATATTTGTTTAATGAACAAACATCC
83	AGGTTTCTCCATGTTGGTCAGTCTGGTCTCGAAGTCACTCCTAACTCATAGAAAATGTGT
84	AGGCAGCTTGTCTAGGTAAAGTTCCGGGTCGAATAGGCCTAAGTTTGTGGAATGATAGAT
85	AAGGCAGGTGGATCACGAGGTCAGCAGATCGATACATAATTTTACAAAACCAAACACATT
86	GGCAGGCAGATCACCTGAGGCCAGGAATTCGAAATACTATGCTAAGATTCAACATTACTC
87	CTGGGGGTACCGTGATCGGGGGTAGGCCTCGAAAGGTCATTATAAGGATGGAGTGAGATG
88	TGACACAGTCAAACATTAACTTGGTGTATCGAAGGGCTGGTTGTACTGCGGAGGAGGAAG
89	TTTGCAGGTGTGTGGTTAACACTATCCTTCGACCTGTACTATCTGATGGACCTCTCCTAC
90	AGTGGTGCCATCATAGCTCACTGCAGCCTCGAATAAAAGAAAATAAAAAGACATGATTAA
91	CCAAGTGCACCACGTGAACAAAACAATCTCGATTGGGAATAACTCACCTTTTTTATGCCA
92	AGGCAGGTGGATCACTTGAGCTCAGGATTCGAAAACATTAACTGAAAGAAATTGGACACA
93	TCAGACAGATCAGGAAAACGGAATGACATCGAGAAAGTGGAACTGGTAAGCATAGGGGTC
94	CTACCCAGCCCCTGGTGGGCAGGTGAGTTCGAGCTGCCGTGTGTCCCATAGCCACCAGCT
95	GTGGTCGTACAGGTGCTATGCTTATGACTCGAGCTTGCACTCCGGTACCCGACCCGGCGC
96	GAGGCTGAGGCAAGAGAATTGCTTGAACTCGATTCAGCATATGAAGGGGAAGTGATACAG
97	GGTGGGAGGATTGCTTGAGCCTGAAAGGTCGAAAAATAAAAATGAAAATAAAAAAAAGGC

98	GGCAGGAGGATCGCTTGAACCCAGGAGTTCGAAATAAAAAAAAAAAAAAAAAGAAAAGAA
99	CTCCAGCCGCAAGAAGTACAGCAGCACCTCGATCTCACTAGTAATTAGGAAAATGAAAAT
100	CAGCAGTGCCAGCCTACCGGTGCTGCACTCGACAGAAAGCTTAAGGGCAAAGATGGTTTT

Table 6.b3

51	1	40252970	40252999	40397737	40397766	1	40249000	40252999	40397737	40401736
52	3	128892196	128892225	129068056	129068085	3	128892196	128896195	129064086	129068085
53	4	113710899	113710928	113830836	113830865	4	113710899	113714898	113826866	113830865
54	19	54632150	54632179	54828539	54828568	19	54628180	54632179	54828539	54832538
55	12	15255	15284	97423	97452	12	11285	15284	93453	97452
56	13	27789093	27789122	27938127	27938156	13	27789093	27793092	27934157	27938156
57	19	6507878	6507907	6736181	6736210	19	6507878	6511877	6736181	6740180
58	5	71466177	71466206	71719442	71719471	5	71466177	71470176	71715472	71719471
59	22	50205080	50205109	50374496	50374525	22	50201110	50205109	50370526	50374525
60	2	233815079	233815108	233853897	233853926	2	233811109	233815108	233853897	233857896
61	4	168187958	168187987	168319616	168319645	4	168183988	168187987	168315646	168319645
62	2	101335487	101335516	101393513	101393542	2	101331517	101335516	101389543	101393542
63	1	221106645	221106674	221187902	221187931	1	221106645	221110644	221183932	221187931
64	15	31340660	31340689	31558712	31558741	15	31336690	31340689	31554742	31558741
65	7	43795676	43795705	44021440	44021469	7	43795676	43799675	44017470	44021469
66	13	99497771	99497800	99738307	99738336	13	99493801	99497800	99734337	99738336
67	12	15255	15284	202823	202852	12	11285	15284	198853	202852
68	10	3653750	3653779	3866570	3866599	10	3653750	3657749	3866570	3870569
69	2	74448295	74448324	74574099	74574128	2	74444325	74448324	74574099	74578098
70	6	154995125	154995154	155128767	155128796	6	154995125	154999124	155124797	155128796
71	19	9082209	9082238	9202789	9202818	19	9082209	9086208	9202789	9206788
72	13	27938127	27938156	27961369	27961398	13	27934157	27938156	27961369	27965368
73	6	158943912	158943941	159080065	159080094	6	158943912	158947911	159080065	159084064
74	22	44267556	44267585	44330706	44330735	22	44263586	44267585	44326736	44330735
75	3	32385456	32385485	32554963	32554992	3	32385456	32389455	32550993	32554992
76	19	20562778	20562807	20680602	20680631	19	20562778	20566777	20680602	20684601
77	9	127594201	127594230	127769658	127769687	9	127590231	127594230	127769658	127773657
78	12	134196	134225	15255	15284	12	134196	138195	11285	15284
79	3	167598071	167598100	167742389	167742418	3	167594101	167598100	167738419	167742418
80	20	2115672	2115701	2369886	2369915	20	2111702	2115701	2369886	2373885
81	2	53656196	53656225	53766351	53766380	2	53652226	53656225	53766351	53770350
82	16	70113537	70113566	70283032	70283061	16	70109567	70113566	70279062	70283061
83	1	35949131	35949160	35992798	35992827	1	35945161	35949160	35988828	35992827
84	11	3591395	3591424	3782209	3782238	11	3587425	3591424	3778239	3782238
85	13	40912654	40912683	40990075	40990104	13	40908684	40912683	40990075	40994074
86	17	46177015	46177044	46197409	46197438	17	46177015	46181014	46193439	46197438
87	11	33667895	33667924	33693898	33693927	11	33667895	33671894	33693898	33697897
88	2	233760188	233760217	233853897	233853926	2	233756218	233760217	233853897	233857896
89	21	44875225	44875254	44903451	44903480	21	44871255	44875254	44899481	44903480
90	1	39712318	39712347	39938212	39938241	1	39712318	39716317	39934242	39938241
91	20	51452690	51452719	51487691	51487720	20	51448720	51452719	51483721	51487720

92	11	10336379	10336408	10435293	10435322	11	10332409	10336408	10435293	10439292
93	17	1308074	1308103	1405060	1405089	17	1304104	1308103	1405060	1409059
94	6	14278436	14278465	14395328	14395357	6	14274466	14278465	14395328	14399327
95	19	54461248	54461277	54574946	54574975	19	54461248	54465247	54570976	54574975
96	2	227725778	227725807	227932126	227932155	2	227721808	227725807	227932126	227936125
97	20	20121192	20121221	20274661	20274690	20	20121192	20125191	20274661	20278660
98	15	90843217	90843246	91002631	91002660	15	90843217	90847216	91002631	91006630
99	22	24259984	24260013	24453448	24453477	22	24256014	24260013	24453448	24457447
100	4	102483301	102483330	102522762	102522791	4	102479331	102483330	102522762	102526761

Table 6.b4

51	ORF1_1_40249894_40253001_40397735_40401055_FR	OBD168-1737
52	ORF1_3_128892194_128893890_129064130_129068087_RF	OBD168-1989
53	ORF1_4_113710897_113723443_113810658_113830867_RF	OBD168-2005
54	ORF1_19_54627987_54632181_54828537_54832427_FR	OBD168-1521
55	ORF1_12_14189_15286_93751_97454_FF	OBD168-1369
56	ORF1_13_27789091_27791217_27935736_27938158_RF	OBD168-1137
57	ORF1_19_6507876_6510412_6736179_6739196_RR	OBD168-1885
58	ORF1_5_71466175_71468826_71713282_71719473_RF	OBD168-953
59	ORF1_22_50201186_50205111_50373464_50374527_FF	OBD168-577
60	ORF1_2_233813067_233815110_233853895_233857139_FR	OBD168-1937
61	ORF1_4_168182554_168187989_168317980_168319647_FF	OBD168-2013
62	ORF1_2_101327421_101335518_101390331_101393544_FF	OBD168-549
63	ORF1_1_221106643_221120931_221185158_221187933_RF	OBD168-717
64	ORF1_15_31334951_31340691_31546136_31558743_FF	OBD168-929
65	ORF1_7_43795674_43802582_44019092_44021471_RF	OBD168-2061
66	ORF1_13_99494037_99497802_99735907_99738338_FF	OBD168-1401
67	ORF1_12_14189_15286_200475_202854_FF	OBD168-1373
68	ORF1_10_3653748_3655479_3866568_3872650_RR	OBD168-1745
69	ORF1_2_74446225_74448326_74574097_74579710_FR	OBD168-1253
70	ORF1_6_154995123_154998831_155125636_155128798_RF	OBD168-1673
71	ORF1_19_9082207_9087550_9202787_9208911_RR	OBD168-1241
72	ORF1_13_27935736_27938158_27961367_27964197_FR	OBD168-1297
73	ORF1_6_158943910_158945125_159080063_159084244_RR	OBD168-2041
74	ORF1_22_44263290_44267587_44326770_44330737_FF	OBD168-1969
75	ORF1_3_32385454_32386698_32541292_32554994_RF	OBD168-1601
76	ORF1_19_20562776_20567807_20680600_20685168_RR	OBD168-1493
77	ORF1_9_127592507_127594232_127769656_127771134_FR	OBD168-2097
78	ORF1_12_134194_137994_14189_15286_RF	OBD168-1789
79	ORF1_3_167588699_167598102_167735969_167742420_FF	OBD168-1225
80	ORF1_20_2111595_2115703_2369884_2374210_FR	OBD168-741
81	ORF1_2_53649025_53656227_53766349_53775695_FR	OBD168-957
82	ORF1_16_70112537_70113568_70281463_70283063_FF	OBD168-1421
83	ORF1_1_35943227_35949162_35991655_35992829_FF	OBD168-1309
84	ORF1_11_3589286_3591426_3777994_3782240_FF	OBD168-505
85	ORF1_13_40903938_40912685_40990073_40992867_FR	OBD168-593

86	ORF1_17_46177013_46180826_46195798_46197440_RF	OBD168-1449
87	ORF1_11_33667893_33674633_33693896_33698608_RR	OBD168-537
88	ORF1_2_233756599_233760219_233853895_233857139_FR	OBD168-1945
89	ORF1_21_44873351_44875256_44901291_44903482_FF	OBD168-609
90	ORF1_1_39712316_39716819_39935069_39938243_RF	OBD168-1289
91	ORF1_20_51449039_51452721_51482831_51487722_FF	OBD168-801
92	ORF1_11_10332545_10336410_10435291_10442726_FR	OBD168-1753
93	ORF1_17_1305781_1308105_1405058_1407538_FR	OBD168-713
94	ORF1_6_14276298_14278467_14395326_14400003_FR	OBD168-1069
95	ORF1_19_54461246_54463256_54564139_54574977_RF	OBD168-1513
96	ORF1_2_227722929_227725809_227932124_227939987_FR	OBD168-1933
97	ORF1_20_20121190_20124157_20274659_20278486_RR	OBD168-1949
98	ORF1_15_90843215_90845291_91002629_91006437_RR	OBD168-1000
99	ORF1_22_24255117_24260015_24453446_24457028_FR	OBD168-541
100	ORF1_4_102481630_102483332_102522760_102539034_FR	OBD168-2001

Table 6.b5

51	GCTGCTCAACAAGACACAATGTAAGG	OBD168-1739	CACCATTCTTTCTACCTGGAATGGCT
52	CCACCCACATCCTGCTGATTGGTCCA	OBD168-1991	TACACTTAAGAATTTTTGTATACATG
53	CTATCGGAGACTCTAAATGTA	OBD168-2007	ACCTAAAGGCTCTTTAACGTA
54	GTAAGGAAGGAGAAGATGAACAC	OBD168-1523	TCTTCCTGTTCTTCCTGGAGGAG
55	TGGCTCGTGGCTCTCACTGCA	OBD168-1371	TGCCTTCTGTCATACATTTTG
56	CACAGCAGGTGGGAAAATGTAGCC	OBD168-1139	CTGGCACATAGCAGGTGGCTCGT
57	ACACACAAGCTGACACAGCAA	OBD168-1887	GGCAACATAGTGAGAACCCCG
58	ATCTACTCTGCCGTGGATGATGCCTC	OBD168-955	CAGCCTGACTCAATGACCAGTAAAGA
59	TAGAGACAAAGTAGAATGGTGGGTCC	OBD168-579	GCGGATGGATGGCTTGAGTCTGAAAG
60	CCACGGATAGCTGCAGACATCCAGA	OBD168-1939	TTGGTGGGGCTGGGGGTGCTCCTGA
61	AAATAAGTAAAGACGTAAACCAGCA	OBD168-2015	TATGTAACAATACATGAACTTTGAG
62	TGGTGAAAACCTATCTCGGCTGGGCA	OBD168-551	GAAGTGTGATGTGCCTCTCTTTCTGT
63	CCAGCAGACAAATCCCAGTTCAATGC	OBD168-719	TCACAAAGCAGGAGGGAGAACAGGTT
64	AGAAACAGTCCTGCTAACATCACCCC	OBD168-931	CTTTCATTCAACACCCACGGAGGAGT
65	CATTCTGCAACAGCCCCACACAGAA	OBD168-2063	CCCAAAATGCTGGGATTACAGGCGT
66	AAGAAAAAGAAAAAAAGACACAAAT	OBD168-1403	ATTCATGTAACAACTTAATTAGGGA
67	CAGACTGGGGTGAAGAGTTCAGTCAC	OBD168-1375	AGGGGCTGAAATGATGGATACCTGTG
68	ACTCCGTCTCAAAAAAAAAGAAAAAA	OBD168-1747	TAAAATAACTGTATTTAAGGGCTACT
69	TTGGGAGGCTGAGGCAGGAGAAT	OBD168-1255	GGGAGTGAGAAAGAGGAAGTATCAAA
70	GGAGTTCAAGACCAGCCTGGAGC	OBD168-1675	TTACGGTTACCGCTGCCCCAGCC
71	TACACAGGTTGGAAAGACGAAGAAAA	OBD168-1243	GAGTAGTTGGGATTACAGGCGGGT
72	CTCACGCCTGTAATCCCAGCACT	OBD168-1299	CCCTTCCAACCCAATCACCCCAC
73	AAATTACAATATACAAATTACATACA	OBD168-2043	TGTGCCTGCTGCTATGCCCAAATGCC
74	CCCCACCACCACCCTCAGCCAAGCC	OBD168-1971	GGCAGCTAGCAAGAGTGGGGGAGAC
75	ACTTTAATAACATCTGGTAAT	OBD168-1603	TCCTTCTCTGTAAAGAGGAAC
76	GCAAACGGAGAGTGAAAAAGTCAT	OBD168-1495	AAGTGCCCTATTTTCATATCCCCT
77	GGAAGAATTTGAGGGTTAAGGAGA	OBD168-2099	CCTCACTATTTGATCCCAGGCCTG
78	AACGGGAAAGCCACAGACTGGGGTGA	OBD168-1791	TAACCCTAGGAGACTCCGTGTACTAC
79	TTGAAATGTGAGAAGGTTGGGCTGGG	OBD168-1227	AGAACAAGAAGTCTGAGGAGAGTAG

80	GCCCAGCCTCTCCTCATCAGTGA	OBD168-743	GACACCCTCAAGCACACACTCAG
81	TATTCCGAGACCATTGTGTGTGAGTC	OBD168-959	AGGGCATTCTCCTAATAACTGTGATG
82	GATAGTGTGGCCCAAGATGCAA	OBD168-1423	CGACTCAGGTGAGCTGTTTGAT
83	GTATGCAATGGCACGATCTCG	OBD168-1311	AAATGTTTGGATGGTTAAGTC
84	CATAGTTCTCATAGACCAGGGTTTGC	OBD168-507	AAGTTGTGCCAAAGCCACCTGTGCCA
85	CCCTTTTCTCAGCACAGCAGTGGAAT	OBD168-595	AAAGACCTGATGTATTTCCTACCAGC
86	ATGTTATCCTCTTATATTCCACCA	OBD168-1451	GGGAAGGCTCTGTTACTTGTAGAT
87	TTTTCTGCCAGGCTCTGCTGCGA	OBD168-539	GAAGAGTTCACAATACACTAAGGGAA
88	ATAAAGCTCCACCTTCTTTAT	OBD168-1947	GGGGCTGGGGGTGCTCCTGAG
89	GGGCTGGAGTTGAGGCTTGGTTT	OBD168-611	CAGGGTCTGGGAAAGGACTGGGT
90	AATCCTCCTGCCTCAGCCTCCCG	OBD168-1291	TTTCTTCTTCCATCCCCATCATTGC
91	TCCCCACACAGACCTCCTCTCCT	OBD168-803	GAACCCCAAGATGGTGAAGAGGC
92	CCCAGGCTTGTCTTCAACTTCTG	OBD168-1755	CTCCTAGAAACCATTAATCTACT
93	GGACAAGGAGGCAGAGTGACACG	OBD168-715	CTGTCTTCACTGCTCCTCTCAGG
94	GGGCACCCTCTCCTGTTTCACTC	OBD168-1071	TGGGCAGTGGAAATAAGGCAGGC
95	GCTTCATTCTGTGTAAGGAAGGAG	OBD168-1515	CCCCAAACACGGAGGCCCCAAGGG
96	GCTCACACCTGTAATCCCAGCAC	OBD168-1935	TCATTTTTAAGCTTCTAAGTAAC
97	TAATCCCAGCACTTTGGGAGGCTGA	OBD168-1951	TAATATAATGTTATATTAAATAAAT
98	TTTTGAAAGAGGCAAGAGAAGTGG	OBD168-998	TTTATGAAGCACACACGATACCAG
99	AGGATGCTCTGTCTCTTGCTGTCCAG	OBD168-543	GTTGGCTGACTGTGAATGGTGGTAAA
100	ACCAGGGCACTTGCGGGCCAGCTGGA	OBD168-2003	TTTTCAGTTATAAGAAGAATACTAGT

Table 6.b6

51	OBD168-q1737	GGCTATGCTGCTCAACAAGACAC	OBD168-q1739
52	OBD168-q1989	ACATCCTGCTGATTGGTCCATT	OBD168-q1991
53	OBD168-q2005	ATGTAGCCATCATTCTTATGC	OBD168-q2007
54	OBD168-q1521	TGATGGCTTCATTCTGTGTAAGG	OBD168-q1523
55	OBD168-q1369	TGAAGAGATCCGACATCAAGTGCCCA	OBD168-q1371
56	OBD168-q1137	GGAGTTACACGATGCCTGCTTACACCTC	OBD168-q1139
57	OBD168-q1885	CACAAGCTGACACAGCAAGCA	OBD168-q1887
58	OBD168-q953	GCCGCCCTGCTGCTGATGCTACC	OBD168-q955
59	OBD168-q577	CTGGTCACAGAGAGACAAATCCTGGGTG	OBD168-q579
60	OBD168-q1937	CATCTTTTGAACCACGGATAGCTG	OBD168-q1939
61	OBD168-q2013	CCTAGTTTGGGGAATTTTTGAGACTC	OBD168-q2015
62	OBD168-q549	GTGAAAACCTATCTCGGCTGGGCACGGG	OBD168-q551
63	OBD168-q717	GACCAGCAGACAAATCCCAGTTCAATGC	OBD168-q719
64	OBD168-q929	CTGCGGTTGGGTGGCACAGGGCTG	OBD168-q931
65	OBD168-q2061	GAAATCTCATTCTGCAACAGCCCCAC	OBD168-q2063
66	OBD168-q1401	ACAGAGTGAGATTCTGTTTCAAAA	OBD168-q1403
67	OBD168-q1373	CAACGGGAAAGCCACAGACTGGGG	OBD168-q1375
68	OBD168-q1745	AGCTAAACTCCGTCTCAAAAAA	OBD168-q1747
69	OBD168-q1253	TTGGGAGGCTGAGGCAGGTGGAT	OBD168-q1255
70	OBD168-q1673	AGGAGTTCAAGACCAGCCTGGAGCA	OBD168-q1675
71	OBD168-q1241	GTGAACAAACAGACCTCCAGATGTGGC	OBD168-q1243
72	OBD168-q1297	GCGGCTCACGCCTGTAATCCCAGCAC	OBD168-q1299
73	OBD168-q2041	TTATAATGATTTTATAAATGTACT	OBD168-q2043

74	OBD168-q1969	CTCAGCCAAGCCACAGACATGGCTG	OBD168-q1971
75	OBD168-q1601	TTTGAATTTTTTTTTTTTTTTTTTT	OBD168-q1603
76	OBD168-q1493	AAATCAGCATGTTCTTAGGAGGGA	OBD168-q1495
77	OBD168-q2097	TAGGATGTATTCATAGGGGATG	OBD168-q2099
78	OBD168-q1789	CTCGTGGCTCTCACTGCAACG	OBD168-q1791
79	OBD168-q1225	TTTTGAAATGTGAGAAGGTTGGGCTGGG	OBD168-q1227
80	OBD168-q741	ACCACCCAGAACAAGCCAGCACATTTGC	OBD168-q743
81	OBD168-q957	GTTATTCCGAGACCATTGTGTGTGAGTC	OBD168-q959
82	OBD168-q1421	TGAATCCAACAAACGGGAACTGGAT	OBD168-q1423
83	OBD168-q1309	CTGGGTTCAAGCAATTCTCCT	OBD168-q1311
84	OBD168-q505	ATCATAGTTCTCATAGACCAGGGTTTGC	OBD168-q507
85	OBD168-q593	CATACCCTTTTCTCAGCACAGCAGTGGA	OBD168-q595
86	OBD168-q1449	CCTCATTACCACCATTCCTTGTTAAT	OBD168-q1451
87	OBD168-q537	TCTGCCAGGCTCTGCTGCGAGGC	OBD168-q539
88	OBD168-q1945	ATTAAGAAACCTAATAAAGCTCCAC	OBD168-q1947
89	OBD168-q609	GTTCCGCCTACCCAGGTCCACACC	OBD168-q611
90	OBD168-q1289	TTAGGCTGGTCTTGAACTCCTGGGCTCA	OBD168-q1291
91	OBD168-q801	GCCCAACCTCATCCCCACACAGACCTCC	OBD168-q803
92	OBD168-q1753	TGCTATGTTGCCCAGGCTTGTCTTC	OBD168-q1755
93	OBD168-q713	GCCTCCAGGAAGGTGTGGGTGGC	OBD168-q715
94	OBD168-q1069	GTGGCAGGCTTCAGGGTGGTAGGACAGG	OBD168-q1071
95	OBD168-q1513	ATGAACACCCACAACGCCTGAACT	OBD168-q1515
96	OBD168-q1933	GTGGCTCACACCTGTAATCCC	OBD168-q1935
97	OBD168-q1949	ACACCTATAATCCCAGCACTTT	OBD168-q1951
98	OBD168-q997	TCCCCTGCCTCATCTTCCTCACCTGGC	OBD168-q999
99	OBD168-q541	GGACCTTTAGACATCGGTGGAGAACAGG	OBD168-q543
100	OBD168-q2001	GGCCAGCTGGAGTTCCAGGTGA	OBD168-q2003

Table 6.b7

51	AATCTCTTTGACTACACCATTCT	OBD168-p1737
52	CAAACCCTTCATTTTTTATCCT	OBD168-p1989
53	TCATTGAAATCTAAAATTCAG	OBD168-p2005
54	TCCTTTAGAGCAACAAAAATGGA	OBD168-p1521
55	CTTTCCTAGTCTATCATGTGTCTTTT	OBD168-p1369
56	GCCCCTCACTTCCGCCACACTCCGTG	OBD168-p1137
57	TGGGAGGCCAAGGTGGGAGGA	OBD168-p1885
58	CAACAGCCTGACTCAATGACCAGTAAAG	OBD168-p953
59	GCTGGGCGGATGGATGGCTTGAGTCTG	OBD168-p577
60	CTCGGGTGCAGAGAGGAGGGTTTG	OBD168-p1937
61	TAATTGGTACTTTCATGGGCCAAGAA	OBD168-p2013
62	GCTTTCCACCCCTACAATCCCAAGTGTT	OBD168-p549
63	GAGTCACAAAGCAGGAGGGAGAACAGGT	OBD168-p717
64	GGGTGGTGAGGAAACACTAAGGAGAAGG	OBD168-p929
65	CCCGGCCGACTCTTTTTTTTCTTAAT	OBD168-p2061
66	ATTGAAATATCTGCCTTTATCTTA	OBD168-p1401
67	CAGGCAACATCCCAGGGGCTGAAA	OBD168-p1373

68	AAAACAACAAAACCCATAAAAT	OBD168-p1745
69	GGGAGTGAGAAAGAGGAAGTATCAAATA	OBD168-p1253
70	CTCCCGCCCCGCCCCGCCCCGGACA	OBD168-p1673
71	CGCATAATCAAAGCCATCAGTGAC	OBD168-p1241
72	CCCCTTCCAACCCAATCACCCCAC	OBD168-p1297
73	AGAGCTAACATTTTATTCTGTGTT	OBD168-p2041
74	GGGGGCATGGACCCGGCCTTGTTTG	OBD168-p1969
75	AACAATAGAAATGACCCCTCAGGGTA	OBD168-p1601
76	GCCTTTATGAGAAACCAGGCATTA	OBD168-p1493
77	GGGGAAGGGACTCTCCTGGGGT	OBD168-p2097
78	CTCCGTGTACTACTGGGCAAT	OBD168-p1789
79	AGAACAAGAAGTCTGAGGAGAGTAG	OBD168-p1225
80	CCCACCCACCTCCACCTGCCCACG	OBD168-p741
81	TAAGGGCATTCTCCTAATAACTGTGATG	OBD168-p957
82	CACAAGACTTCTGGCTTCTCAAGCC	OBD168-p1421
83	GGAATCTGTGACATAGCATAT	OBD168-p1309
84	TGAAGTTGTGCCAAAGCCACCTGTGCCA	OBD168-p505
85	TAAAAGACCTGATGTATTTCCTACCAGC	OBD168-p593
86	ACTTAAAGAACAGAATAGTTAAGTAA	OBD168-p1449
87	GCTCTTGTGGAGAACTGGAGACCTTA	OBD168-p537
88	CGGGTGCAGAGAGGAGGGTTTGGTG	OBD168-p1945
89	GGACCTGAGTGCGAGGAGTTGTGTGGGC	OBD168-p609
90	CTGTCTGGCTGGTGCTGGTGTCTCTG	OBD168-p1289
91	GCGGGAGCCAGGGCAGAGAGACT	OBD168-p801
92	CTAGAAACCATTAATCTACTATCTG	OBD168-p1753
93	AGCCACGGCAGCCCCTGTAATCAACCCG	OBD168-p713
94	GCTGCCTGCTGTTCCCGTGCCAG	OBD168-p1069
95	ACCCCAAACACGGAGGCCCCAAGG	OBD168-p1513
96	CCATATACTCATTTTTAAGCT	OBD168-p1933
97	TGATAATATAATGTTATATTAA	OBD168-p1949
98	CCTTGTTTCACCCCACACACTGACGGCG	OBD168-p997
99	GTTGGCTGACTGTGAATGGTGGTAAAAT	OBD168-p541
100	TACTAGTAAAAACATTACACTT	OBD168-p2001

Table 6.b8

51	TTGCTTGAGTTCAGGAGTTCGAACAAGATATTAAGTATTA	OBD168-p1739
52	GTAGCTAGATACAGAGTGTCGATTGTCATGTTTTCACTGA	OBD168-p1991
53	TCACCTGAGGTTTGGAGTTCGAATGTTTCTCTAATGCATG	OBD168-p2007
54	AGGTGCTATGCTTATGACTCGAGACATGTGGAGTCACCCC	OBD168-p1523
55	GTTAGCTCAGAGCCTCAGTCGAAGGAAGCTTAGGAATATA	OBD168-p1371
56	AGGTCAGAAATTCGACCTCCTTGCTCAACTGTC	OBD168-p1139
57	GTGTATGTCAACAATTTCTCGAACTCCCAGGTTCAAACGA	OBD168-p1887
58	AGCTGGTCGGTATTCCCCTCGCTCTCGAGTAA	OBD168-p955
59	AGGGAGTAGAGGAATCGGGAGCCAGTGTTCGAATAA	OBD168-p579
60	TTTAGAGCTGTTTTCTCCTCGAAGGGCTGGTTGTACTGCG	OBD168-p1939
61	GATCACTAGGTCAGGAGTTCGAAACCCACACTGCAAGTAT	OBD168-p2015

62	AGGCAGGCGGATCACGAGGTCAATAGATCGATAGGA	OBD168-p551
63	AGTTCACTGCAGCCTCGATACACATTTTCAAAGTGC	OBD168-p719
64	TGAGCCCAGAAGTTCGAGTTTTCCCCTTGCTCC	OBD168-p931
65	TCACTTGAGGTAAGGAGTTCGAAAATTAGCAGAAAAAAGC	OBD168-p2063
66	TCACCTGAGTTCAGGAGTTCGAGATGACAGCTAAACATAA	OBD168-p1403
67	GTTAGCTCAGAGCCTCAGTCGAGTCATATTTGAATGTCTA	OBD168-p1375
68	ATCACTTGAGGTTAGGGTTCGACCAGCAGCAAAGACAGCA	OBD168-p1747
69	TGCAGTGAGCCGAGATCATGCCATTATACTCGAAACAG	OBD168-p1255
70	TCACTTGAGCCTAGGAAGTCGATGTTTCTTGAATTGTTTT	OBD168-p1675
71	ATCACTTGAACCCGGGAGTCGAGATCAGCCTG	OBD168-p1243
72	TGAGGTCAGAAATTCGAAACGAAGGGCTAAGCCCC	OBD168-p1299
73	TCACTTGAGGCCAGGGATTCGATCCTCAAGCTAAGAATAA	OBD168-p2043
74	TGCGTCCTGTCACTCTCCTCGAGGTTATATTTATTCTAAT	OBD168-p1971
75	TTCTCCTGCCTCAGACTCTCGATACATAAGGACTTAGGAA	OBD168-p1603
76	GATAAGCTTAAGAAGAGTTCGAGACACTTATTTTGGAGAT	OBD168-p1495
77	TCACCTGAGGTCAGGAATTCGAAAAAAAAAAAAAAAAGAA	OBD168-p2099
78	GTTAGCTCAGAGCCTCAGTCGAATACACACTCATTGAAGG	OBD168-p1791
79	TGGGCAGATCACGAGGACAGGAGATCGAGCCT	OBD168-p1227
80	TGTACATCGAGGTGAGAGTGAGCTGAGATGGCG	OBD168-p743
81	AGGCAGATCATCTGAGGTTGGGAGTTCGAAGACAC	OBD168-p959
82	CATAAGACTAAGGTTCTGTCGATACATATTTGTTTAATGA	OBD168-p1423
83	ATGTTGGTCAGTCTGGTCTCGAAGTCACTCCTAACTCATA	OBD168-p1311
84	AGCTTGTCTAGGTAAAGTTCCGGGTCGAATAGGCC	OBD168-p507
85	AAGGCAGGTGGATCACGAGGTCAGCAGATCGATACATA	OBD168-p595
86	TCACCTGAGGCCAGGAATTCGAAATACTATGCTAAGATTC	OBD168-p1451
87	TAGGCCTCGAAAGGTCATTATAAGGATGGAGTGAG	OBD168-p539
88	AAACATTAACTTGGTGTATCGAAGGGCTGGTTGTACTGCG	OBD168-p1947
89	TGCAGGTGTGTGGTTAACACTATCCTTCGACCTGTAC	OBD168-p611
90	AGTGGTGCCATCATAGCTCACTGCAGCCTCGAATAA	OBD168-p1291
91	TGGCCAAGTGCACCACGTGAACAAAACAATCTCGATTGG	OBD168-p803
92	ATCACTTGAGCTCAGGATTCGAAAACATTAACTGAAAGAA	OBD168-p1755
93	ACGGAATGACATCGAGAAAGTGGAACTGGTAAGCATAGG	OBD168-p715
94	AGGTGAGTTCGAGCTGCCGTGTGTCCCATAG	OBD168-p1071
95	AGGTGCTATGCTTATGACTCGAGCTTGCACTCCGGTACCC	OBD168-p1515
96	CAAGAGAATTGCTTGAACTCGATTCAGCATATGAAGGGGA	OBD168-p1935
97	TTGCTTGAGCCTGAAAGGTCGAAAAATAAAAATGAAAATA	OBD168-p1951
98	AGGCAGGAGGATCGCTTGAACCCAGGAGTTCGAAATA	OBD168-p999
99	AGCCGCAAGAAGTACAGCAGCACCTCGATCTC	OBD168-p543
100	AGCCTACCGGTGCTGCACTCGACAGAAAGCTTAAGGGCAA	OBD168-p2003

Table 6.b9

51	TAATACTTAATATCTTGTTCGAACTCCTGAACTCAAGCAA	ORF1_1_40249894_40253001_40397735_40401055_FR
52	TCAGTGAAAACATGACAATCGACACTCTGTATCTAGCTAC	ORF1_3_128892194_128893890_129064130_129068087_RF
53	CATGCATTAGAGAAACATTCGAACTCCAAACCTCAGGTGA	ORF1_4_113710897_113723443_113810658_113830867_RF
54	GGGGTGACTCCACATGTCTCGAGTCATAAGCATAGCACCT	ORF1_19_54627987_54632181_54828537_54832427_FR
55	TATATTCCTAAGCTTCCTTCGACTGAGGCTCTGAGCTAAC	ORF1_12_14189_15286_93751_97454_FF

56	AGACAGTTGAGCAAGGAGGTCGAATTTCTGACC	ORF1_13_27789091_27791217_27935736_27938158_RF
57	TCGTTTGAACCTGGGAGTTCGAGAAATTGTTGACATACAC	ORF1_19_6507876_6510412_6736179_6739196_RR
58	ACCATCTTCTGCCACTTTTACTCGAGAGCGAGGG	ORF1_5_71466175_71468826_71713282_71719473_RF
59	TTATTCGAACACTGGCTCCCGATTCCTCTACTCCC	ORF1_22_50201186_50205111_50373464_50374527_FF
60	CGCAGTACAACCAGCCCTTCGAGGAGAAAACAGCTCTAAA	ORF1_2_233813067_233815110_233853895_233857139_FR
61	ATACTTGCAGTGTGGGTTTCGAACTCCTGACCTAGTGATC	ORF1_4_168182554_168187989_168317980_168319647_FF
62	TCCTATCGATCTATTGACCTCGTGATCCGCCTGC	ORF1_2_101327421_101335518_101390331_101393544_FF
63	AGCACTTTGAAAATGTGTATCGAGGCTGCAGTGAAC	ORF1_1_221106643_221120931_221185158_221187933_RF
64	AAACTCGAACTTCTGGGCTCAAGCAATTCTCCTGCC	ORF1_15_31334951_31340691_31546136_31558743_FF
65	GCTTTTTTCTGCTAATTTTCGAACTCCTTACCTCAAGTGA	ORF1_7_43795674_43802582_44019092_44021471_RF
66	TTATGTTTAGCTGTCATCTCGAACTCCTGAACTCAGGTGA	ORF1_13_99494037_99497802_99735907_99738338_FF
67	TAGACATTCAAATATGACTCGACTGAGGCTCTGAGCTAAC	ORF1_12_14189_15286_200475_202854_FF
68	TGCTGTCTTTGCTGCTGGTCGAACCCTAACCTCAAGTGAT	ORF1_10_3653748_3655479_3866568_3872650_RR
69	TCCTGTTTCGAGTATAATGGCATGATCTCGGCTCACTG	ORF1_2_74446225_74448326_74574097_74579710_FR
70	AAAACAATTCAAGAAACATCGACTTCCTAGGCTCAAGTGA	ORF1_6_154995123_154998831_155125636_155128798_RF
71	TCAGGCTGATCTCGACTCCCGGGTTCAAGTGA	ORF1_19_9082207_9087550_9202787_9208911_RR
72	AGCCCTTCGTTTCGAATTTCTGACCTCAAGTGATCTGC	ORF1_13_27935736_27938158_27961367_27964197_FR
73	TTATTCTTAGCTTGAGGATCGAATCCCTGGCCTCAAGTGA	ORF1_6_158943910_158945125_159080063_159084244_RR
74	ATTAGAATAAATATAACCTCGAGGAGAGTGACAGGACGCA	ORF1_22_44263290_44267587_44326770_44330737_FF
75	TTCCTAAGTCCTTATGTATCGAGAGTCTGAGGCAGGAGAA	ORF1_3_32385454_32386698_32541292_32554994_RF
76	ATCTCCAAAATAAGTGTCTCGAACTCTTCTTAAGCTTATC	ORF1_19_20562776_20567807_20680600_20685168_RR
77	TTCTTTTTTTTTTTTTTTTCGAATTCCTGACCTCAGGTGA	ORF1_9_127592507_127594232_127769656_127771134_FR
78	CCTTCAATGAGTGTGTATTCGACTGAGGCTCTGAGCTAAC	ORF1_12_134194_137994_14189_15286_RF
79	TACAGGCTCGATCTCCTGTCCTCGTGATCTGC	ORF1_3_167588699_167598102_167735969_167742420_FF
80	TCTCAGCTCACTCTCACCTCGATGTACAAGACAG	ORF1_20_2111595_2115703_2369884_2374210_FR
81	TGTCTTCGAACTCCCAACCTCAGATGATCTGCCTG	ORF1_2_53649025_53656227_53766349_53775695_FR
82	TCATTAAACAAATATGTATCGACAGAACCTTAGTCTTATG	ORF1_16_70112537_70113568_70281463_70283063_FF
83	TATGAGTTAGGAGTGACTTCGAGACCAGACTGACCAACAT	ORF1_1_35943227_35949162_35991655_35992829_FF
84	AGGCCTATTCGACCCGGAACTTTACCTAGACAAG	ORF1_11_3589286_3591426_3777994_3782240_FF
85	TGTATCGATCTGCTGACCTCGTGATCCACCTGC	ORF1_13_40903938_40912685_40990073_40992867_FR
86	GAATCTTAGCATAGTATTTCGAATTCCTGGCCTCAGGTGA	ORF1_17_46177013_46180826_46195798_46197440_RF
87	ACTCCATCCTTATAATGACCTTTCGAGGCCTACCCC	ORF1_11_33667893_33674633_33693896_33698608_RR
88	CGCAGTACAACCAGCCCTTCGATACACCAAGTTAATGTTT	ORF1_2_233756599_233760219_233853895_233857139_FR
89	AGTACAGGTCGAAGGATAGTGTTAACCACACACCTGC	ORF1_21_44873351_44875256_44901291_44903482_FF
90	TTATTCGAGGCTGCAGTGAGCTATGATGGCACCAC	ORF1_1_39712316_39716819_39935069_39938243_RF
91	TCCCAATCGAGATTGTTTTGTTCACGTGGTGCACTTGG	ORF1_20_51449039_51452721_51482831_51487722_FF
92	TTCTTTCAGTTAATGTTTTCGAATCCTGAGCTCAAGTGAT	ORF1_11_10332545_10336410_10435291_10442726_FR
93	ACCCCTATGCTTACCAGTTCCACTTTCTCGATGTCATTC	ORF1_17_1305781_1308105_1405058_1407538_FR
94	TATGGGACACACGGCAGCTCGAACTCACCTG	ORF1_6_14276298_14278467_14395326_14400003_FR
95	GGGTACCGGAGTGCAAGCTCGAGTCATAAGCATAGCACCT	ORF1_19_54461246_54463256_54564139_54574977_RF
96	TCCCCTTCATATGCTGAATCGAGTTCAAGCAATTCTCTTG	ORF1_2_227722929_227725809_227932124_227939987_FR
97	TATTTTCATTTTTATTTTTCGACCTTTCAGGCTCAAGCAA	ORF1_20_20121190_20124157_20274659_20278486_RR
98	TATTTCGAACTCCTGGGTTCAAGCGATCCTCCTGC	ORF1_15_90843215_90845291_91002629_91006437_RR
99	TGAGATCGAGGTGCTGCTGTACTTCTTGCGGC	ORF1_22_24255117_24260015_24453446_24457028_FR
100	TTGCCCTTAAGCTTTCTGTCGAGTGCAGCACCGGTAGGCT	ORF1_4_102481630_102483332_102522760_102539034_FR

Table 6.b10

51	OBD168-1737.1739	OBD168-q1737.q1739 .p1737/p1739
52	OBD168-1989.1991	OBD168-q1989.q1991 .p1989/p1991
53	OBD168-2005.2007	OBD168-q2005.q2007 .p2005/p2007
54	OBD168-1521.1523	OBD168-q1521.q1523 .p1521/p1523
55	OBD168-1369.1371	OBD168-q1369.q1371 .p1369/p1371
56	OBD168-1137.1139	OBD168-q1137.q1139 .p1137/p1139
57	OBD168-1885.1887	OBD168-q1885.q1887 .p1885/p1887
58	OBD168-953.955	OBD168-q953.q955 .p953/p955
59	OBD168-577.579	OBD168-q577.q579 .p577/p579
60	OBD168-1937.1939	OBD168-q1937.q1939 .p1937/p1939
61	OBD168-2013.2015	OBD168-q2013.q2015 .p2013/p2015
62	OBD168-549.551	OBD168-q549.q551 .p549/p551
63	OBD168-717.719	OBD168-q717.q719 .p717/p719
64	OBD168-929.931	OBD168-q929.q931 .p929/p931
65	OBD168-2061.2063	OBD168-q2061.q2063 .p2061/p2063
66	OBD168-1401.1403	OBD168-q1401.q1403 .p1401/p1403
67	OBD168-1373.1375	OBD168-q1373.q1375 .p1373/p1375
68	OBD168-1745.1747	OBD168-q1745.q1747 .p1745/p1747
69	OBD168-1253.1255	OBD168-q1253.q1255 .p1253/p1255
70	OBD168-1673.1675	OBD168-q1673.q1675 .p1673/p1675
71	OBD168-1241.1243	OBD168-q1241.q1243 .p1241/p1243
72	OBD168-1297.1299	OBD168-q1297.q1299 .p1297/p1299
73	OBD168-2041.2043	OBD168-q2041.q2043 .p2041/p2043
74	OBD168-1969.1971	OBD168-q1969.q1971 .p1969/p1971
75	OBD168-1601.1603	OBD168-q1601.q1603 .p1601/p1603
76	OBD168-1493.1495	OBD168-q1493.q1495 .p1493/p1495
77	OBD168-2097.2099	OBD168-q2097.q2099 .p2097/p2099
78	OBD168-1789.1791	OBD168-q1789.q1791 .p1789/p1791
79	OBD168-1225.1227	OBD168-q1225.q1227 .p1225/p1227
80	OBD168-741.743	OBD168-q741.q743 .p741/p743
81	OBD168-957.959	OBD168-q957.q959 .p957/p959
82	OBD168-1421.1423	OBD168-q1421.q1423 .p1421/p1423
83	OBD168-1309.1311	OBD168-q1309.q1311 .p1309/p1311
84	OBD168-505.507	OBD168-q505.q507 .p505/p507
85	OBD168-593.595	OBD168-q593.q595 .p593/p595
86	OBD168-1449.1451	OBD168-q1449.q1451 .p1449/p1451
87	OBD168-537.539	OBD168-q537.q539 .p537/p539
88	OBD168-1945.1947	OBD168-q1945.q1947 .p1945/p1947
89	OBD168-609.611	OBD168-q609.q611 .p609/p611
90	OBD168-1289.1291	OBD168-q1289.q1291 .p1289/p1291
91	OBD168-801.803	OBD168-q801.q803 .p801/p803
92	OBD168-1753.1755	OBD168-q1753.q1755 .p1753/p1755
93	OBD168-713.715	OBD168-q713.q715 .p713/p715
94	OBD168-1069.1071	OBD168-q1069.q1071 .p1069/p1071

95	OBD168-1513.1515	OBD168-q1513.q1515 .p1513/p1515
96	OBD168-1933.1935	OBD168-q1933.q1935 .p1933/p1935
97	OBD168-1949.1951	OBD168-q1949.q1951 .p1949/p1951
98	OBD168-1000.998	OBD168-q997.q999 .p997/p999
99	OBD168-541.543	OBD168-q541.q543 .p541/p543
100	OBD168-2001.2003	OBD168-q2001.q2003 .p2001/p2003

Table 6.b11

	Probe	E_SHAPLEY	L_SHAPLEY
1	ORF1_chr6_31267448_31269252_31531115_31534994_RF_1	-0.009976177	0.009998253
2	ORF1_chr20_50280026_50281924_50437155_50439548_FF_1	-0.009046157	0.008905677
3	ORF1_chr19_2777060_2780381_2901738_2905384_RF_1	-0.008997425	0.008934787
4	ORF1_chr6_134102628_134113539_134393136_134395072_RF_1	-0.008843093	0.008908626
5	ORF1_chr21_29092829_29094361_29164018_29174520_FF_1	-0.008293347	0.008303626
6	ORF1_chr22_23665784_23673822_23711932_23713061_FR_1	-0.008166664	0.007845365
7	ORF1_chrY_18283408_18293202_18412555_18418411_RR_1	-0.008048342	0.007931165
8	ORF1_chr2_218162078_218164150_218253352_218257050_FF_1	-0.007932293	0.008034599
9	ORF1_chr9_134315578_134321630_134391769_134398405_RF_1	-0.007471656	0.007517793
10	ORF1_chr20_31989698_31994926_32038678_32045816_RF_1	-0.007474616	0.007497921
11	ORF1_chr17_81104538_81109597_81345804_81351809_RR_1	-0.007517468	0.007307065
12	ORF1_chr22_41776313_41777375_42031915_42033846_RF_1	-0.007370587	0.007409419
13	ORF1_chr11_10637008_10641060_10826892_10830503_FR_1	-0.007053792	0.007073053
14	ORF1_chr19_4264058_4265818_4341821_4342968_FR_1	-0.006933495	0.007060193
15	ORF1_chr3_51243406_51244925_51388915_51391864_FF_1	-0.007031162	0.006920945
16	ORF1_chr11_10637008_10641060_10678778_10685244_FR_1	-0.006833814	0.007048394
17	ORF1_chr11_10562525_10569392_10617125_10621846_RR_1	-0.006834039	0.007008485
18	ORF1_chr2_74503923_74507137_74519716_74521847_RF_1	-0.006920385	0.00691651
19	ORF1_chr8_73772858_73775783_73991731_73996964_RF_1	-0.006876044	0.006887353
20	ORF1_chr21_29039171_29043861_29092829_29094361_FF_1	-0.006945565	0.006784607
21	ORF1_chr3_101887192_101889071_101943010_101950739_RF_1	-0.006443814	0.006422371
22	ORF1_chr6_29844477_29850988_29921307_29925901_FF_1	-0.006005131	0.0059717
23	ORF1_chr11_47655428_47658417_47713810_47715533_RF_1	-0.005980292	0.005963403
24	ORF1_chr11_10637008_10641060_10871146_10872290_FR_1	-0.005962386	0.005929696
25	ORF1_chr19_7270757_7273737_7367544_7370291_FR_1	-0.005914296	0.005944901
26	ORF1_chr19_4252394_4257822_4336234_4339292_FF_1	-0.005861622	0.005979582
27	ORF1_chr1_161657362_161661864_161734762_161740896_RF_1	-0.005903164	0.005937478
28	ORF1_chr11_65044650_65046952_65060361_65063993_FF_1	-0.00587029	0.005934313
29	ORF1_chr12_47686852_47690553_47817317_47827238_RF_1	-0.005913599	0.005865812
30	ORF1_chr5_690177_692906_744214_749963_FR_1	-0.00548768	0.005562214
31	ORF1_chr1_53182248_53184895_53364674_53371789_RF_1	-0.005434164	0.005505088
32	ORF1_chr15_62681808_62691633_62730771_62732716_RR_1	-0.005498198	0.005387668
33	ORF1_chr7_1769382_1772142_1917082_1921849_RF_1	-0.004998178	0.005090942
34	ORF1_chr16_57546345_57549019_57808053_57811713_RF_1	-0.005033509	0.004962031
35	ORF1_chr2_70887659_70889000_70979229_70981565_FF_1	-0.005071083	0.004911433
36	ORF1_chr9_123259504_123263022_123339568_123345302_FR_1	-0.004932313	0.005024139
37	ORF1_chrX_48750795_48754365_48796124_48801821_FF_1	-0.005047329	0.004865913

38	ORF1_chr1_158181667_158187628_158243613_158252050_FF_1	-0.005001278	0.004859194
39	ORF1_chr2_91859085_91863356_92122473_92125698_RF_1	-0.004818038	0.005041727
40	ORF1_chr10_62056179_62058893_62096285_62100217_RR_1	-0.004920712	0.00492838
41	ORF1_chr17_27740779_27745632_27849258_27851150_FR_1	-0.005001185	0.004828046
42	ORF1_chr7_41457346_41461355_41488360_41491403_FF_1	-0.004417621	0.004430348
43	ORF1_chr21_29039171_29043861_29092829_29094361_RF_1	-0.004357641	0.0043654
44	ORF1_chr20_50192390_50194162_50280026_50281924_RF_1	-0.004385046	0.00427953
45	ORF1_chr15_74686122_74687597_74772372_74779791_FR_1	-0.004043082	0.003898205
46	ORF1_chr18_63921019_63923125_64068334_64074049_RR_1	-0.003835619	0.004088603
47	ORF1_chr4_186172696_186175767_186190828_186192765_FF_1	-0.003992969	0.003894199
48	ORF1_chr17_67419703_67421985_67604580_67609081_RR_1	-0.003838843	0.004030484
49	ORF1_chr5_140242642_140251155_140386390_140387430_FF_1	-0.003891098	0.003961009
50	ORF1_chr22_42713609_42716051_42864112_42866876_FR_1	-0.003934205	0.003914943

Table 7.a1

	SHAPLEY_diff	RPs_class1_class2	RPrank_class1_class2	pfp_class1_class2
1	0.019974429	1095.305893	157	0.577069248
2	0.017951834	2212.25714	373	0.86431007
3	0.017932212	519.5921477	45	0.507750192
4	0.017751719	3237.196304	617	1.028118327
5	0.016596973	2338.87323	398	0.894701668
6	0.016012029	1286.837245	184	0.660136988
7	0.015979506	1545.88146	237	0.714351228
8	0.015966892	3812.00956	787	1.075173947
9	0.014989449	3730.532291	754	1.08039358
10	0.014972536	2973.092177	554	0.984923145
11	0.014824533	3166.187603	602	1.013212781
12	0.014780006	1915.600527	295	0.844353538
13	0.014126846	877.5566621	110	0.549057283
14	0.013993688	1462.635611	221	0.693140095
15	0.013952108	2161.353049	355	0.871099423
16	0.013882208	693.4429129	81	0.483049755
17	0.013842524	489.4037173	40	0.510408273
18	0.013836895	1139.344398	164	0.593584457
19	0.013763397	1188.857634	172	0.611542481
20	0.013730173	954.7111896	119	0.592329774
21	0.012866185	2281.449083	388	0.877911423
22	0.011976832	1854.11491	283	0.830066012
23	0.011943696	3360.825526	652	1.039518475
24	0.011892083	1629.314725	248	0.750594179
25	0.011859196	1122.566671	160	0.592200913
26	0.011841204	1414.449942	207	0.696494413
27	0.011840641	3341.384869	644	1.041707676
28	0.011804603	1538.948472	234	0.717660029
29	0.011779411	2485.195218	433	0.916381838
30	0.011049895	2340.89338	400	0.891601211

31	0.010939252	3294.7368	635	1.030563723
32	0.010885866	2954.724442	551	0.979467819
33	0.01008912	1465.773343	223	0.689591095
34	0.009995541	1026.72489	138	0.583437831
35	0.009982517	1455.232994	218	0.696259246
36	0.009956452	1242.495673	181	0.629677907
37	0.009913242	1020.280557	136	0.585246077
38	0.009860472	1130.926813	162	0.592850241
39	0.009859766	1980.300976	310	0.852847711
40	0.009849092	590.6246291	63	0.460927015
41	0.00982923	1226.644201	179	0.622029308
42	0.00884797	1511.98957	230	0.70719786
43	0.008723041	2252.095813	380	0.875891636
44	0.008664576	2050.835647	326	0.863503709
45	0.007941287	576.6524083	58	0.478789454
46	0.007924222	2662.422604	474	0.946326887
47	0.007887168	567.5154132	56	0.481315009
48	0.007869327	520.8353844	47	0.488329576
49	0.007852107	702.8036709	83	0.483257957
50	0.007849148	993.9971762	127	0.597522112

Table 7.a2

	pval_class1_class2	LogFC	FC
1	0.000641938	0.54937122	1.46344773
2	0.00228425	0.514945922	1.42894058
3	0.000161893	0.734344848	1.66364181
4	0.004494626	0.527718822	1.44164787
5	0.002523054	0.492868642	1.40724024
6	0.000860631	0.517930598	1.43189986
7	0.001199569	0.48437531	1.39897997
8	0.005995408	0.483966176	1.39858329
9	0.005771898	0.494706192	1.40903377
10	0.003866138	0.597891561	1.51350303
11	0.004321778	0.545525036	1.45955142
12	0.001764866	0.53251218	1.44644572
13	0.000427933	0.611536519	1.52788559
14	0.001085372	0.4930395	1.40740691
15	0.002191096	0.535811103	1.449757
16	0.000277231	0.659020889	1.57901064
17	0.000144658	0.752486415	1.68469382
18	0.00068975	0.560959056	1.47524959
19	0.000745282	0.535735898	1.44968143
20	0.000499431	0.581573552	1.49648058
21	0.002413502	0.544133362	1.45814416
22	0.001664425	0.490257282	1.40469536
23	0.004802253	0.500493244	1.41469715

24	0.001318931	0.479953317	1.39469854
25	0.000671358	0.553684926	1.46783004
26	0.001021535	0.50212467	1.41629782
27	0.004753319	0.476374762	1.39124332
28	0.001189871	0.551237787	1.46534237
29	0.002811445	0.484667612	1.39926345
30	0.002526946	0.486152531	1.4007044
31	0.004636752	0.516035312	1.43001999
32	0.003823905	0.485297628	1.39987463
33	0.001089587	0.625064051	1.5422793
34	0.000570478	0.568005704	1.48247287
35	0.001075456	0.837265288	1.78666021
36	0.000807537	0.536000079	1.44994691
37	0.000563953	0.945939143	1.92644252
38	0.000680496	0.551565466	1.46567524
39	0.001873262	0.4917699	1.40616891
40	0.000205749	0.698897588	1.62326393
41	0.000788913	0.527326662	1.44125605
42	0.001152482	0.530273219	1.44420267
43	0.002358301	0.503295496	1.41744769
44	0.00199456	0.564237138	1.47860545
45	0.00019676	0.70669135	1.63205689
46	0.003178226	0.602479145	1.51832343
47	0.000190978	0.863602854	1.81957668
48	0.000162621	0.735559411	1.66504297
49	0.000284199	0.651399619	1.57069125
50	0.000537679	0.582993211	1.49795389

Table 7.a3

51	ORF1_chr19_53278181_53279831_53467555_53470239_FR_1	-0.003954476	0.003893624
52	ORF1_chr2_43086424_43092123_43178166_43179822_FF_1	-0.003899592	0.003872897
53	ORF1_chr21_29066989_29073149_29092829_29094361_RF_1	-0.003923032	0.003835069
54	ORF1_chr8_143363265_143368758_143397073_143399812_RR_1	-0.00348763	0.00354438
55	ORF1_chr3_32625993_32627699_32683326_32685449_FF_1	-0.003954396	0.002939267
56	ORF1_chr4_2639345_2642002_2800083_2804902_RR_1	-0.003409863	0.003468774
57	ORF1_chr6_52573576_52576507_52715481_52719514_FR_1	-0.002975625	0.003038734
58	ORF1_chrX_39624253_39627672_39748652_39756826_RR_1	-0.002950236	0.00301894
59	ORF1_chr13_28585301_28589104_28625877_28627714_FR_1	-0.002980592	0.00293983
60	ORF1_chr6_15165975_15168155_15248586_15249747_RF_1	-0.002979075	0.002914552
61	ORF1_chr4_102249197_102251493_102344820_102348626_FR_1	-0.002967096	0.00286827
62	ORF1_chr2_10016688_10020163_10069588_10070662_RF_1	-0.00282852	0.002999057
63	ORF1_chr7_151781262_151783710_151930364_151932111_RR_1	-0.002913771	0.00290113
64	ORF1_chr1_26201425_26205480_26333363_26336159_FR_1	-0.002798864	0.002984421
65	ORF1_chr12_52037813_52040902_52237944_52243119_FR_1	-0.002718844	0.002481841
66	ORF1_chr19_41422837_41424323_41672917_41678014_RR_1	-0.001958392	0.002928286
67	ORF1_chr5_75205085_75210191_75236091_75239565_FR_1	-0.002368141	0.002475733

68	ORF1_chr10_104325690_104332059_104442837_104447074_RR_1	-0.002480304	0.00207251
69	ORF1_chr16_85533210_85536278_85655930_85660237_FR_1	-0.001991499	0.002031361
70	ORF1_chr17_43300561_43304860_43353578_43358798_RR_1	-0.002056182	0.001965593
71	ORF1_chr2_166059673_166070002_166163002_166177651_RF_1	-0.001980001	0.001951355
72	ORF1_chr20_50280026_50281924_50309417_50313312_FR_1	-0.002011549	0.001887113
73	ORF1_chr17_43300561_43304860_43444308_43448547_RR_1	-0.001970743	0.001916479
74	ORF1_chr11_10376885_10382511_10637008_10641060_RF_1	-0.001949356	0.001899915
75	ORF1_chr17_35363623_35366998_35578150_35580887_FF_1	-0.001890538	0.001940668
76	ORF1_chr8_41806799_41808430_41845432_41849175_RF_1	-0.001900878	0.001918939
77	ORF1_chrX_20268599_20270341_20456973_20459740_RR_1	-0.002228408	0.001583268
78	ORF1_chr15_76885704_76887654_76983002_76985852_RF_1	-0.001424651	0.002248747
79	ORF1_chr1_3073908_3076056_3169997_3177404_FF_1	-0.001298227	0.002291357
80	ORF1_chr2_112539682_112540702_112816387_112823836_RR_1	-0.001408891	0.001734693
81	ORF1_chr14_67469788_67473491_67514914_67519335_FR_1	-0.001714218	0.001424876
82	ORF1_chr17_20844189_20846843_20895269_20898565_RF_1	-0.001475033	0.001468452
83	ORF1_chr19_41422837_41424323_41597548_41599628_RR_1	-0.001986899	0.000912203
84	ORF1_chr11_35040602_35047084_35078579_35084103_FR_1	-0.001430648	0.001433826
85	ORF1_chr2_25155910_25160743_25292182_25293890_FR_1	-0.001507045	0.001322379
86	ORF1_chr9_70371691_70373189_70454780_70468182_RR_1	-0.001420456	0.001407628
87	ORF1_chr7_135917157_135920025_136070982_136076106_FR_1	-0.001514277	0.000868748
88	ORF1_chr18_45762052_45766373_45829537_45837293_FF_1	-0.000956263	0.001417419
89	ORF1_chr2_129732845_129738418_129813191_129815478_RF_1	-0.000901332	0.001449501
90	ORF1_chr3_122768838_122771609_122793452_122794847_FR_1	-0.001347621	0.000921063
91	ORF1_chr2_143119651_143128757_143274179_143284059_FR_1	-0.001054557	0.001019704
92	ORF1_chr19_19361989_19364321_19458777_19462243_RF_1	-0.000988302	0.00107419
93	ORF1_chr19_41422837_41424323_41692451_41693876_RR_1	-0.000745499	0.001251804
94	ORF1_chrX_101616906_101623004_101715574_101717864_FF_1	-0.000996972	0.000984386
95	ORF1_chr20_63754820_63756674_63899802_63901328_FF_1	-0.000492369	0.000626577
96	ORF1_chrX_39735882_39738523_39748652_39756826_FR_1	-0.000676176	0.000418924
97	ORF1_chr15_90688752_90691260_90881362_90884735_RF_1	-0.000453442	0.000629736
98	ORF1_chr16_8770523_8772703_8938508_8943672_RF_1	-0.000319011	0.00074919
99	ORF1_chr17_43300561_43304860_43406585_43411982_RF_1	0	0
100	ORF1_chr7_1901148_1902503_2033188_2038434_RF_1	0	0

Table 7.b1

51	0.0078481	2987.902851	560	0.982988691
52	0.007772489	493.6790445	43	0.48264036
53	0.007758101	2111.667632	341	0.869890982
54	0.00703201	1022.182606	137	0.582954788
55	0.006893663	2572.971635	459	0.919601928
56	0.006878637	1534.145351	233	0.716682261
57	0.00601436	1975.310453	307	0.857292939
58	0.005969176	3811.777698	786	1.076426753
59	0.005920422	886.7494008	112	0.549667601
60	0.005893626	1736.571207	266	0.784983374
61	0.005835366	3820.755115	790	1.075414102

62	0.005827578	1950.081799	300	0.857296534
63	0.005814901	2142.221032	350	0.869597722
64	0.005783285	367.3594761	26	0.452448159
65	0.005200686	1762.228575	269	0.79699158
66	0.004886678	1632.926185	249	0.75057046
67	0.004843873	2099.567055	337	0.871205394
68	0.004552814	2255.373656	383	0.871292473
69	0.00402286	1702.530556	259	0.777966877
70	0.004021776	1018.405989	133	0.59643941
71	0.003931356	1504.981553	228	0.707437155
72	0.003898662	1558.884246	241	0.713200465
73	0.003887222	2506.508269	436	0.924029095
74	0.003849271	1086.637744	154	0.579847865
75	0.003831206	2463.77808	427	0.915034411
76	0.003819816	1525.067865	232	0.712096468
77	0.003811676	3868.038973	811	1.070456089
78	0.003673398	2890.294194	533	0.97372438
79	0.003589584	3771.044431	770	1.078233722
80	0.003143584	2408.255424	414	0.906180999
81	0.003139094	2676.769491	478	0.947418348
82	0.002943484	3968.695995	832	1.091590126
83	0.002899102	1554.462101	239	0.715489386
84	0.002864474	1888.328908	290	0.837079106
85	0.002829424	3317.320304	640	1.034924223
86	0.002828085	3635.071398	727	1.070547766
87	0.002383025	2112.969893	342	0.868305311
88	0.002373682	2676.14117	477	0.949008348
89	0.002350832	3819.174236	789	1.075994131
90	0.002268684	2999.066738	563	0.984233204
91	0.002074262	2861.529024	528	0.965656771
92	0.002062493	3761.457058	768	1.07621306
93	0.001997303	3759.146475	766	1.077857615
94	0.001981358	3249.214339	622	1.026554835
95	0.001118946	4053.634633	867	1.087179498
96	0.001095099	3797.26634	778	1.080227905
97	0.001083178	2871.807678	529	0.969982617
98	0.0010682	4048.304309	865	1.08718107
99	0	4007.706758	846	1.092114447
100	0	2193.315447	362	0.876984215

Table 7.b2

51	0.003900334	0.489216266	1.40368213
52	0.000147047	0.74800396	1.6794676
53	0.002101767	0.521228516	1.43517684
54	0.000565875	1.172614248	2.25419801
55	0.002990734	0.49395581	1.40830109

56	0.001183172	0.537822012	1.45177916
57	0.001864803	0.560842558	1.47513047
58	0.005994767	0.526005779	1.43993709
59	0.000436198	0.618357963	1.53512695
60	0.001479474	0.552749686	1.46687881
61	0.006019606	0.477736691	1.3925573
62	0.00182229	0.530384363	1.44431394
63	0.002156511	0.562928095	1.47726443
64	8.33504E-05	0.839848798	1.78986255
65	0.001519047	0.788957054	1.72782494
66	0.001324208	0.488237425	1.40273008
67	0.002080251	0.480510844	1.39523762
68	0.002364438	0.555512609	1.46969074
69	0.001427664	0.573206678	1.48782689
70	0.000562061	0.610410685	1.52669374
71	0.001142847	0.518873573	1.43283608
72	0.00121785	0.482684355	1.39734122
73	0.002854548	0.719268743	1.64634734
74	0.000632703	0.553790771	1.46793773
75	0.002768411	0.520600136	1.43455187
76	0.001170556	0.501327357	1.41551531
77	0.006151131	0.491230225	1.40564299
78	0.003677295	0.689699991	1.61294807
79	0.005882594	0.49954823	1.41377078
80	0.002658157	0.791898345	1.73135113
81	0.003208743	0.5045375	1.41866849
82	0.006434995	0.508093184	1.42216927
83	0.00121162	0.482788771	1.39744235
84	0.001720005	0.587861355	1.50301703
85	0.004693035	0.563342168	1.47768849
86	0.005514495	0.480939987	1.39565271
87	0.002104088	0.528981192	1.44290988
88	0.003207404	0.585560668	1.50062206
89	0.006015229	0.520597798	1.43454955
90	0.003926193	0.652299468	1.57167124
91	0.003612618	0.642186187	1.56069236
92	0.005856319	0.505858365	1.41996795
93	0.005849994	0.497102018	1.41137564
94	0.004524158	0.57508128	1.48976139
95	0.006678603	0.479306005	1.3940729
96	0.005954705	0.480400377	1.39513079
97	0.003635674	0.520258621	1.43421233
98	0.006663206	0.474795884	1.38972158
99	0.006546419	0.486119667	1.4006725
100	0.002249394	0.53324977	1.44718541

Table 7.b3

	Probe	E_SHAPLEY	L_SHAPLEY
1	ORF1_chr4_47908113_47912137_48013964_48015665_FF_1	-0.010852058	0.010954909
2	ORF1_chr2_230319552_230322976_230433766_230436650_RR_1	-0.009918733	0.009925799
3	ORF1_chr7_137931629_137933966_137981878_137983291_FR_1	-0.009045837	0.008931235
4	ORF1_chr12_5915876_5919160_6059110_6067436_FF_1	-0.008949611	0.008980494
5	ORF1_chr11_10776569_10779775_10900691_10903608_FF_1	-0.008550855	0.008518259
6	ORF1_chr10_45820548_45823847_45898343_45903899_RF_1	-0.008438127	0.008469107
7	ORF1_chr12_5915876_5919160_6152139_6154132_FF_1	-0.008369285	0.008533464
8	ORF1_chr3_124942088_124944537_125145442_125149201_RR_1	-0.00807357	0.007991612
9	ORF1_chr7_4620261_4621735_4724415_4726417_FR_1	-0.008054585	0.007998688
10	ORF1_chr1_7774817_7777030_7966809_7968736_FF_1	-0.007973644	0.007968817
11	ORF1_chr11_61042263_61044402_61243450_61246026_FF_1	-0.007958072	0.007940873
12	ORF1_chr5_55186470_55190634_55308382_55310405_FR_1	-0.007008968	0.007035201
13	ORF1_chr17_31222339_31224131_31324781_31330350_RR_1	-0.007000437	0.007002552
14	ORF1_chr4_38161792_38166364_38180538_38182770_FR_1	-0.007017001	0.006967113
15	ORF1_chr11_115616166_115618345_115711125_115715158_FF_1	-0.00694982	0.007014028
16	ORF1_chr8_7882531_7883805_7954782_7966362_FF_1	-0.006887804	0.006999378
17	ORF1_chr19_52960383_52965476_52976109_52979684_FR_1	-0.006868407	0.006971455
18	ORF1_chr12_7858281_7862390_7932397_7933511_RF_1	-0.006878897	0.00695852
19	ORF1_chr2_102051982_102057593_102268036_102274328_RR_1	-0.006534163	0.006411507
20	ORF1_chr2_27481760_27484387_27626184_27635183_RF_1	-0.006497626	0.006363409
21	ORF1_chr4_38133158_38135017_38161792_38166364_RF_1	-0.00607496	0.005977457
22	ORF1_chrX_2888191_2891631_3046105_3049187_RF_1	-0.005996756	0.005958155
23	ORF1_chr11_61224624_61227200_61378098_61379415_FF_1	-0.005920792	0.00600365
24	ORF1_chr10_13707193_13712319_13854651_13857653_FR_1	-0.005932342	0.005964538
25	ORF1_chr17_43832124_43833485_43905109_43906650_FF_1	-0.005938095	0.005921624
26	ORF1_chr11_12091217_12094358_12153671_12160688_FR_1	-0.005949517	0.005909779
27	ORF1_chr19_47777294_47778517_47957709_47959307_RF_1	-0.005842488	0.005936168
28	ORF1_chr13_30408291_30410407_30585632_30589891_RR_1	-0.005735973	0.005672687
29	ORF1_chr2_102100064_102105009_102374574_102377537_FR_1	-0.005476339	0.005537616
30	ORF1_chr8_97253466_97261198_97345458_97357412_RF_1	-0.005440885	0.005548031
31	ORF1_chr9_131999122_132006607_132139741_132142158_FR_1	-0.005501932	0.005485202
32	ORF1_chr22_16907330_16914217_17087415_17089015_RR_1	-0.005393312	0.005512478
33	ORF1_chr1_36159277_36165949_36303183_36304407_RF_1	-0.005429147	0.005441681
34	ORF1_chr11_61243450_61246026_61472770_61474691_FR_1	-0.00527996	0.005431125
35	ORF1_chr11_61152527_61154904_61243450_61246026_RF_1	-0.005116399	0.004960923
36	ORF1_chr13_94395452_94397500_94478315_94481582_FR_1	-0.005019903	0.005001963
37	ORF1_chr16_9911562_9916434_9954809_9955829_RF_1	-0.004889205	0.005011129
38	ORF1_chr2_174610120_174616390_174648154_174652062_RR_1	-0.004979364	0.004908114
39	ORF1_chr17_27477797_27480875_27629083_27630392_RR_1	-0.004903841	0.004973785
40	ORF1_chr10_91056658_91062643_91164372_91168358_RF_1	-0.004802954	0.004928032
41	ORF1_chr7_87727621_87737484_87868535_87872727_FF_1	-0.004547573	0.004509927
42	ORF1_chr15_30288521_30290733_30544055_30547496_FR_1	-0.004473355	0.004505817
43	ORF1_chr5_124631740_124634000_124857558_124858678_FR_1	-0.004411595	0.00452833
44	ORF1_chr22_17921708_17928023_17999187_18001605_FF_1	-0.004480753	0.004446964

45	ORF1_chr11_61243450_61246026_61388261_61391790_FR_1	-0.004431923	0.004387812
46	ORF1_chr4_74078231_74079386_74117911_74125141_FR_1	-0.003947617	0.004031373
47	ORF1_chr16_46899253_46904082_47060044_47061469_FF_1	-0.003957876	0.004020226
48	ORF1_chr11_17097711_17100441_17188135_17191681_RR_1	-0.003990419	0.003979875
49	ORF1_chrX_49053496_49056424_49286142_49288605_RF_1	-0.004047095	0.003914997
50	ORF1_chr12_51666821_51670814_51862305_51869704_FR_1	-0.003954848	0.003996917

Table 8.a1

	SHAPLEY_diff	RPs_class2_class1	RPrank_class2_class1	pfp_class2_class1
1	0.021806967	2796.807098	354	1.382985423
2	0.019844531	3095.482353	403	1.454244682
3	0.017977072	2644.935118	323	1.372546527
4	0.017930105	1190.76143	112	0.941892109
5	0.017069114	2691.77054	332	1.37767433
6	0.016907234	2598.185801	311	1.380989039
7	0.016902749	973.1243446	95	0.768375125
8	0.016065182	3118.518158	406	1.462565011
9	0.016053273	3166.931042	416	1.466844799
10	0.015942461	2534.406731	294	1.397614445
11	0.015898945	2203.942492	245	1.307037927
12	0.014044168	1277.819011	119	1.007768197
13	0.014002989	2501.124218	288	1.393528599
14	0.013984114	2829.764831	357	1.400184107
15	0.013963848	2842.705641	359	1.403705162
16	0.013887182	2337.981624	266	1.337778105
17	0.013839862	1105.727185	105	0.877882311
18	0.013837417	2568.815685	304	1.384488035
19	0.01294567	3724.636088	543	1.496046282
20	0.012861035	2452.218225	281	1.378853794
21	0.012052417	1684.416661	158	1.250937648
22	0.011954912	2093.173181	220	1.327259391
23	0.011924443	3162.182868	415	1.466482296
24	0.01189688	2875.544458	365	1.409057391
25	0.011859719	2395.722643	273	1.361478188
26	0.011859296	2559.990469	298	1.403736871
27	0.011778656	2875.54375	364	1.41292781
28	0.01140866	2592.51634	310	1.380068244
29	0.011013955	2033.960539	207	1.339926641
30	0.010988917	3139.677711	411	1.462162948
31	0.010987134	2077.891178	216	1.334213022
32	0.01090579	1885.344261	189	1.280763297
33	0.010870828	2319.480175	260	1.349373491
34	0.010711085	1776.408098	173	1.257251246
35	0.010077322	2615.722841	316	1.375504908
36	0.010021866	3181.350595	421	1.461116048
37	0.009900333	2003.48294	204	1.323326956

38	0.009887477	2020.977518	205	1.337558365
39	0.009877626	2916.46944	373	1.413834843
40	0.009730986	1780.548073	174	1.255271302
41	0.009057501	2722.114145	339	1.376378475
42	0.008979172	2927.700157	375	1.415911341
43	0.008939924	2362.930803	269	1.348160178
44	0.008927717	3062.496857	398	1.444849909
45	0.008819734	683.7987722	65	0.586539786
46	0.00797899	2461.265909	284	1.373274177
47	0.007978102	3384.670678	459	1.495157038
48	0.007970294	2640.403311	322	1.372615939
49	0.007962092	2072.613711	214	1.34056185
50	0.007951765	3075.288832	401	1.444662839

Table 8.a2

	pval_class2_class1	LogFC	FC
1	0.003468855	-0.482121919	-1.396796568
2	0.004152482	-0.466844878	-1.382083594
3	0.003141195	-0.522871523	-1.436812218
4	0.000747454	-0.619840252	-1.536705015
5	0.003240783	-0.497705955	-1.411966593
6	0.003043098	-0.500765128	-1.414963784
7	0.000517204	-0.638093589	-1.556271307
8	0.004207329	-0.467041118	-1.382271601
9	0.004323573	-0.502142409	-1.416315236
10	0.002911387	-0.494101348	-1.408443165
11	0.002268922	-0.521931704	-1.435876536
12	0.000849714	-0.58873139	-1.503923716
13	0.002843634	-0.502460069	-1.416627122
14	0.003541756	-0.478629571	-1.393419416
15	0.003570554	-0.518782064	-1.432745201
16	0.002521338	-0.506772102	-1.420867576
17	0.000653117	-0.619600182	-1.536449321
18	0.00298214	-0.493596886	-1.407950766
19	0.005755859	-0.463278915	-1.378671665
20	0.0027453	-0.553510489	-1.467652572
21	0.001400419	-0.567918634	-1.482383403
22	0.00206892	-0.519656066	-1.433613438
23	0.004312114	-0.464461297	-1.379802039
24	0.003644071	-0.476478708	-1.391343564
25	0.002633532	-0.581254338	-1.496149497
26	0.002963925	-0.503800653	-1.417944096
27	0.003644069	-0.507956161	-1.422034199
28	0.00303129	-0.490480928	-1.404913131
29	0.001965245	-0.532607428	-1.446541214
30	0.004257973	-0.495952972	-1.41025199

31	0.002041946	-0.621694416	-1.538681271
32	0.001715126	-0.623590728	-1.540705079
33	0.002485826	-0.577493645	-1.492254542
34	0.001541109	-0.558860668	-1.47310541
35	0.003079743	-0.489308066	-1.403771448
36	0.00435845	-0.466018016	-1.381291697
37	0.001912769	-0.637003815	-1.555096184
38	0.001942817	-0.585003283	-1.500042403
39	0.003736567	-0.476938298	-1.391786866
40	0.001547576	-0.537725962	-1.451682509
41	0.003306	-0.525337688	-1.439270427
42	0.00376212	-0.489523503	-1.403981089
43	0.002569562	-0.568458803	-1.482938536
44	0.00407447	-0.511994268	-1.426020051
45	0.000270132	-0.910817454	-1.880110497
46	0.002763382	-0.579204267	-1.494024976
47	0.004862558	-0.484711613	-1.399306124
48	0.003131628	-0.529384666	-1.443313466
49	0.002032665	-0.558880721	-1.473125886
50	0.00410465	-0.523083909	-1.437023753

Table 8.a3

51	ORF1_chr7_105801948_105809991_105902395_105905257_RF_1	-0.003928487	0.004016509
52	ORF1_chr11_95040575_95045594_95230445_95231653_FF_1	-0.003774582	0.004068817
53	ORF1_chr3_18693806_18695229_18731498_18743005_FR_1	-0.003863946	0.003960599
54	ORF1_chr10_44948033_44949598_44963508_44966433_RR_1	-0.003433927	0.003436903
55	ORF1_chr20_62658422_62663845_62934812_62935956_RF_1	-0.003375218	0.003474561
56	ORF1_chr12_131862265_131863764_132122269_132123632_RF_1	-0.002996489	0.002955092
57	ORF1_chr14_81530269_81532452_81602546_81604597_FF_1	-0.002954625	0.002994667
58	ORF1_chr11_61224624_61227200_61388261_61391790_FR_1	-0.002931396	0.002976283
59	ORF1_chr2_74503923_74507137_74519716_74521847_FF_1	-0.002721172	0.002494579
60	ORF1_chr14_74588744_74593680_74780483_74782393_FF_1	-0.002345795	0.002725221
61	ORF1_chr6_6745894_6751892_6983650_6986668_FR_1	-0.002489329	0.002493657
62	ORF1_chr17_27395089_27399400_27471513_27474666_RR_1	-0.003013145	0.001942483
63	ORF1_chr1_42817616_42818863_42949613_42952408_FF_1	-0.002429653	0.002517371
64	ORF1_chr6_113632952_113639716_113727754_113732296_RF_1	-0.002419275	0.002404141
65	ORF1_chr1_109681178_109683602_109788010_109790308_FF_1	-0.002316192	0.002187152
66	ORF1_chr17_48576277_48578280_48760984_48766661_FF_1	-0.001974644	0.002472355
67	ORF1_chr1_203288566_203291154_203473865_203477190_FR_1	-0.00239949	0.001969166
68	ORF1_chr1_151547581_151552501_151755108_151762446_RF_1	-0.002009281	0.002002169
69	ORF1_chr12_109959287_109961500_109999941_110004320_FF_1	-0.002045869	0.001951532
70	ORF1_chr2_159230477_159238639_159250572_159255062_FF_1	-0.00201036	0.001971956
71	ORF1_chr12_121447890_121451709_121468997_121471919_FF_1	-0.001954788	0.002009469
72	ORF1_chr15_79006295_79007772_79123113_79127341_RF_1	-0.001994597	0.001909468
73	ORF1_chr5_40609009_40613245_40692971_40695207_FR_1	-0.001862688	0.001974054
74	ORF1_chr2_118112112_118113416_118185366_118187110_FR_1	-0.001898732	0.001926152

75	ORF1_chr7_22482163_22488443_22587350_22592472_RR_1	-0.002213316	0.001441208
76	ORF1_chr13_45338339_45340076_45393094_45398989_FR_1	-0.001757898	0.001500113
77	ORF1_chr17_82434207_82440644_82511425_82512972_FR_1	-0.001779463	0.001444869
78	ORF1_chr6_26459325_26460705_26493174_26499033_RR_1	-0.001473288	0.001723885
79	ORF1_chr16_81474879_81476453_81607034_81611259_RR_1	-0.001444902	0.001747472
80	ORF1_chr1_229299065_229300173_229506871_229512794_FR_1	-0.001258617	0.001690872
81	ORF1_chrX_77646855_77652042_77915112_77916580_RF_1	-0.001439152	0.001489301
82	ORF1_chr18_10287457_10291556_10505933_10507774_FF_1	-0.001351442	0.001505109
83	ORF1_chr16_18252588_18255195_18400348_18402976_RR_1	-0.001457488	0.001379485
84	ORF1_chr17_64322183_64329531_64384310_64385587_RF_1	-0.001468917	0.000970412
85	ORF1_chr1_109681178_109683602_109741801_109745521_FR_1	-0.000854978	0.001473621
86	ORF1_chr7_2130888_2136507_2376124_2377913_FF_1	-0.000994991	0.001015707
87	ORF1_chr6_86970655_86977787_87154540_87156275_RR_1	-0.000999112	0.000981636
88	ORF1_chr18_75155500_75159840_75214354_75217340_RF_1	-0.000995619	0.000984043
89	ORF1_chr5_179455074_179456297_179632102_179634386_RF_1	-0.000963515	0.001005826
90	ORF1_chr19_9777468_9779791_9828343_9833999_FF_1	-0.000956186	0.000971537
91	ORF1_chr7_100090606_100091968_100119089_100121546_RR_1	-0.000846998	0.000978609
92	ORF1_chr1_199677018_199683841_199811400_199820398_RR_1	-0.000524121	0.000747654
93	ORF1_chr14_81120330_81122262_81268937_81270783_RF_1	-0.000751335	0.000481971
94	ORF1_chr17_59893718_59895987_59916319_59918152_FR_1	-0.000440873	0.000782713
95	ORF1_chr5_94419239_94427299_94505842_94514405_FR_1	-0.000742688	0.000456672
96	ORF1_chr5_148804534_148807399_148901266_148906110_RF_1	-0.000761756	0.000426533
97	ORF1_chr1_185482953_185486658_185569901_185571399_FF_1	-0.00070862	0.000438242
98	ORF1_chr12_7868599_7870934_7932397_7933511_FF_1	-0.000723781	0.000392015
99	ORF1_chr2_111366352_111370512_111529947_111533147_FF_1	-0.000252546	0.000793345
100	ORF1_chr17_75411072_75413612_75649583_75651419_RF_1	0	0

Table 8.b1

51	0.007944996	3184.944399	423	1.457114043
52	0.007843399	1598.706819	145	1.240602908
53	0.007824546	1311.207619	121	1.03860777
54	0.00687083	2075.653386	215	1.337834051
55	0.006849779	3172.19168	419	1.460623768
56	0.005951582	1895.333542	192	1.272773307
57	0.005949292	2604.836014	313	1.378421017
58	0.005907678	1898.912573	193	1.270475422
59	0.005215751	3577.121944	514	1.471925259
60	0.005071017	2923.537449	374	1.416119903
61	0.004982986	2654.348688	324	1.37698371
62	0.004955628	1345.935183	123	1.071320657
63	0.004947023	1670.587608	156	1.248294422
64	0.004823416	2749.196717	345	1.37644207
65	0.004503344	2769.148458	352	1.36651033
66	0.004447	3523.786793	500	1.473610575
67	0.004368655	3888.735935	577	1.518746877
68	0.00401145	2616.065515	317	1.371485397

69	0.0039974	2522.263056	292	1.39520081
70	0.003982317	3520.298247	498	1.476947968
71	0.003964256	676.3740979	64	0.583773394
72	0.003904066	3719.882512	541	1.498207138
73	0.003836743	2735.33663	341	1.380138694
74	0.003824884	424.4713289	42	0.371293764
75	0.003654525	3548.464077	504	1.480005974
76	0.003258011	2241.882572	247	1.336623574
77	0.003224333	3825.12433	567	1.501385344
78	0.003197172	3319.91788	449	1.477210974
79	0.003192374	3398.382345	463	1.49285337
80	0.002949489	2125.739433	224	1.340092929
81	0.002928453	3219.053584	430	1.46064713
82	0.002856551	2969.774836	382	1.425572936
83	0.002836973	2399.456066	274	1.360282508
84	0.002439329	3472.308017	483	1.486407014
85	0.002328598	2722.247784	340	1.372450033
86	0.002010698	2576.79482	308	1.374072688
87	0.001980748	2708.303887	335	1.380279235
88	0.001979662	2622.075007	319	1.368461872
89	0.001969341	3614.075373	525	1.467409322
90	0.001927724	2978.506253	383	1.429267903
91	0.001825607	3137.941194	410	1.464295228
92	0.001271775	3048.106352	395	1.443731983
93	0.001233306	2139.947545	225	1.35013943
94	0.001223586	3830.891167	568	1.50271561
95	0.001199359	3764.075451	551	1.501894245
96	0.001188289	2610.322544	315	1.374806784
97	0.001146861	3194.213302	426	1.45430681
98	0.001115797	1979.138215	201	1.313952351
99	0.001045891	2454.310373	282	1.376054571
100	0	3237.927886	434	1.462217536

Table 8.b2

51	0.004367161	-0.465030208	-1.380346255
52	0.001274577	-0.550027026	-1.464113123
53	0.000890435	-0.847682935	-1.799608311
54	0.002038008	-0.563172098	-1.477514304
55	0.004336283	-0.512834609	-1.426850922
56	0.00173148	-0.680153457	-1.602310181
57	0.003056972	-0.557987109	-1.472213708
58	0.001737356	-0.542374915	-1.456367968
59	0.005360609	-0.485905118	-1.400464213
60	0.00375264	-0.553770679	-1.467917288
61	0.003161106	-0.548534801	-1.462599528
62	0.000933662	-0.737833914	-1.667670091

63	0.001379771	-0.56444409	-1.47881757
64	0.003364669	-0.543728094	-1.457734612
65	0.003408167	-0.552774164	-1.4669037
66	0.005220571	-0.472696176	-1.387700446
67	0.006209069	-0.462631594	-1.378053209
68	0.003080461	-0.559438786	-1.473695833
69	0.002886588	-0.587009685	-1.502130011
70	0.005211465	-0.485685281	-1.400250828
71	0.000264722	-0.672937759	-1.594316169
72	0.005742942	-0.474534292	-1.389469621
73	0.00333459	-0.483440859	-1.39807413
74	0.000110492	-0.832350253	-1.780583699
75	0.005285174	-0.477990632	-1.392802437
76	0.002339221	-0.643549918	-1.56216833
77	0.006031711	-0.464128291	-1.379483586
78	0.004699527	-0.48742988	-1.401945125
79	0.004897376	-0.49969168	-1.413911362
80	0.002126906	-0.61090833	-1.527220454
81	0.004450195	-0.515065261	-1.429058783
82	0.003858496	-0.553179285	-1.467315677
83	0.002640857	-0.605487251	-1.52149253
84	0.005086864	-0.488999758	-1.403471491
85	0.003306288	-0.49514089	-1.409458393
86	0.002998649	-0.587378889	-1.502514474
87	0.00327625	-0.568025828	-1.48249355
88	0.003093062	-0.561193944	-1.475489797
89	0.005458532	-0.466388598	-1.381646553
90	0.003878624	-0.473948075	-1.388905146
91	0.004253807	-0.528130529	-1.442059337
92	0.004040629	-0.529009247	-1.442937935
93	0.002152417	-0.665123047	-1.585703511
94	0.006047702	-0.463962152	-1.379324736
95	0.00586349	-0.464405972	-1.379749126
96	0.003068439	-0.586469733	-1.50156792
97	0.00438966	-0.46538094	-1.380681871
98	0.001871289	-0.527285374	-1.441214801
99	0.002749477	-0.603571085	-1.519473048
100	0.004496421	-0.464773079	-1.380100261

Table 8.b3

	Probe	pHC_SHAPLEY	SSc_SHAPLEY
1	ORF1_chr7_77473907_77477977_77652906_77658625_RR_1	-0.015828606	0.015940502
2	ORF1_chr12_117309542_117310883_117405729_117409691_FF_1	-0.012158462	0.012202838
3	ORF1_chr6_17759689_17762431_17990489_17995237_RR_1	-0.011949649	0.011946795
4	ORF1_chr11_11984245_11993733_12153671_12160688_RF_1	-0.011885664	0.011918505
5	ORF1_chr4_928981_931161_985198_989096_FF_1	-0.01121672	0.011230981

6	ORF1_chr6_10510556_10512653_10613542_10617081_RR_1	-0.010471457	0.010499011
7	ORF1_chr10_107634434_107636773_107740167_107742400_RR_1	-0.009887937	0.010009661
8	ORF1_chr12_117381529_117383570_117405729_117409691_FF_1	-0.00991751	0.009875486
9	ORF1_chr1_192936077_192944754_193111803_193113272_FF_1	-0.00990311	0.009872441
10	ORF1_chr7_8143002_8149481_8335072_8341646_RR_1	-0.009424715	0.009402
11	ORF1_chr6_109242018_109247965_109423758_109426226_RR_1	-0.009397736	0.009406413
12	ORF1_chr19_52598706_52601696_52670081_52671998_RR_1	-0.008977625	0.00894306
13	ORF1_chr20_45815058_45818479_46007260_46009918_FF_1	-0.008796119	0.008978085
14	ORF1_chr4_138242151_138246996_138326681_138334943_FF_1	-0.008778706	0.008938522
15	ORF1_chr11_12153671_12160688_12204447_12211177_FR_1	-0.008841968	0.008870926
16	ORF1_chr16_75377735_75379311_75564971_75566881_FF_1	-0.008689436	0.008589716
17	ORF1_chr11_11944920_11948043_12153671_12160688_RF_1	-0.008026278	0.007972134
18	ORF1_chr2_60549072_60551678_60708542_60711616_RF_1	-0.007979329	0.007950747
19	ORF1_chr12_57601753_57604119_57758134_57764996_FR_1	-0.00783032	0.007933108
20	ORF1_chr16_56302242_56305491_56354996_56357979_RF_1	-0.007890141	0.007847278
21	ORF1_chr5_126558745_126564482_126687692_126691508_FR_1	-0.007703695	0.007744797
22	ORF1_chr1_155206612_155209922_155288575_155290398_FR_1	-0.006881006	0.007045115
23	ORF1_chr7_37779378_37787306_37904027_37907035_FR_1	-0.006984828	0.006941154
24	ORF1_chr2_200711316_200714252_200958736_200960996_FR_1	-0.006985272	0.006921379
25	ORF1_chr6_17488412_17494115_17602256_17605423_FF_1	-0.006944044	0.006954802
26	ORF1_chr8_7810112_7811114_7862332_7864865_FR_1	-0.006909953	0.006980468
27	ORF1_chr11_36263501_36265092_36503363_36509375_RR_1	-0.006916816	0.006930077
28	ORF1_chr5_180083035_180085563_180303025_180304376_RF_1	-0.006900089	0.006928636
29	ORF1_chr20_45852988_45854096_46007260_46009918_FF_1	-0.006886217	0.006939839
30	ORF1_chr11_118438429_118442280_118496275_118499072_RR_1	-0.006900764	0.006901984
31	ORF1_chr11_57374233_57377459_57426633_57429019_FR_1	-0.006854882	0.006939198
32	ORF1_chr5_95749524_95751329_95836578_95843620_RF_1	-0.006854744	0.006925527
33	ORF1_chr2_233770451_233776693_233851260_233853895_RF_1	-0.006350682	0.006440211
34	ORF1_chr9_96135943_96140879_96269701_96274236_FF_1	-0.006157529	0.006194649
35	ORF1_chr14_90485762_90489489_90636665_90642057_FR_1	-0.006049934	0.005992254
36	ORF1_chr5_179958098_179961598_180083035_180085563_FR_1	-0.005935888	0.006035068
37	ORF1_chr5_74469407_74475515_74537627_74543794_RF_1	-0.00589508	0.006021401
38	ORF1_chr2_230865528_230871371_230949383_230957363_RR_1	-0.005984927	0.005912069
39	ORF1_chr2_60549072_60551678_60585452_60591312_RR_1	-0.005875185	0.005979651
40	ORF1_chr11_12153671_12160688_12359781_12366018_FR_1	-0.005915796	0.005926733
41	ORF1_chr1_192936077_192944754_193066855_193069148_FF_1	-0.005908584	0.005912109
42	ORF1_chr15_31214670_31223381_31397997_31400727_RF_1	-0.00567441	0.005707802
43	ORF1_chr7_102513081_102515918_102618627_102620296_RF_1	-0.005113095	0.005142326
44	ORF1_chr10_76940960_76942733_76997164_76999885_FF_1	-0.005021227	0.004891893
45	ORF1_chr1_20115093_20117021_20174195_20175240_RR_1	-0.00494684	0.004951814
46	ORF1_chr16_21532877_21535918_21626611_21627744_RR_1	-0.004899085	0.004989605
47	ORF1_chr10_103675840_103680824_103756732_103768333_FR_1	-0.004951437	0.004880611
48	ORF1_chr17_36104009_36106111_36150024_36152875_RR_1	-0.004891181	0.004926395
49	ORF1_chr12_124112544_124115693_124251083_124252846_FF_1	-0.004938332	0.004867703
50	ORF1_chr2_60549072_60551678_60704331_60707715_RR_1	-0.004868576	0.004900767

Table 9.a1

	SHAPLEY_diff	RPs_class1_class2	RPrank_class1_class2	pfp_class1_class2
1	0.031769108	4142.290351	671	0.088474811
2	0.0243613	799.5396006	102	0.00167783
3	0.023896444	6061.245091	1133	0.178943249
4	0.023804169	2024.157273	292	0.01756551
5	0.022447701	2294.052797	329	0.024204606
6	0.020970468	4986.41428	861	0.126289423
7	0.019897598	1498.254177	218	0.008022575
8	0.019792997	915.966393	126	0.00226586
9	0.019775551	3134.512644	475	0.049161058
10	0.018826715	2740.467886	399	0.03697672
11	0.018804148	2895.083912	434	0.041038607
12	0.017920684	2788.031445	410	0.038177056
13	0.017774204	2099.941321	305	0.019145107
14	0.017717228	1689.640917	240	0.011235739
15	0.017712894	1195.365584	175	0.004383924
16	0.017279152	1608.653115	232	0.009743215
17	0.015998412	1868.062483	269	0.014346301
18	0.015930076	1675.8149	239	0.010955144
19	0.015763427	1814.399786	257	0.013535854
20	0.01573742	2542.016781	360	0.031615997
21	0.015448492	1843.189907	264	0.013937125
22	0.013926121	247.895163	27	6.29435E-05
23	0.013925981	3030.39315	454	0.045852249
24	0.013906651	3000.314558	449	0.044813002
25	0.013898845	577.5597894	73	0.000676047
26	0.013890421	1193.63032	172	0.004436615
27	0.013846893	1213.237849	177	0.004577452
28	0.013828725	2971.913692	445	0.043772158
29	0.013826055	1561.169981	227	0.00893888
30	0.013802748	1915.265338	276	0.015278779
31	0.01379408	2583.552924	371	0.032448855
32	0.013780272	3218.60268	488	0.052345849
33	0.012790893	2715.586333	393	0.036381223
34	0.012352178	3195.533146	485	0.051401642
35	0.012042188	3140.736349	476	0.049389272
36	0.011970956	3412.75877	520	0.0598673
37	0.011916482	2886.148978	432	0.040794748
38	0.011896996	3687.643417	588	0.068646104
39	0.011854836	2741.589992	400	0.036936253
40	0.011842529	1843.29157	265	0.013887258
41	0.011820693	2773.668969	406	0.03787522
42	0.011382212	3926.448123	629	0.07907398
43	0.010255421	2330.127212	336	0.025028005
44	0.00991312	1559.386392	226	0.008941487

45	0.009898653	1621.68179	233	0.00998706
46	0.00988869	2371.450535	340	0.026297675
47	0.009832049	3074.121972	460	0.047516156
48	0.009817576	3316.432305	509	0.055533477
49	0.009806035	504.1606399	60	0.000485193
50	0.009769342	1396.243105	203	0.006670746

Table 9.a2

	pval_class1_class2	LogFC	FC
1	0.000420637	0.44835068	1.364479462
2	1.21259E-06	0.622852779	1.539917198
3	0.001436516	0.622890966	1.539957959
4	3.6342E-05	0.507729916	1.421811212
5	5.64234E-05	1.005402106	2.007502947
6	0.000770434	0.427235363	1.344654345
7	1.23918E-05	0.52763826	1.441567369
8	2.02287E-06	0.595409615	1.510901505
9	0.000165455	0.426126481	1.343621216
10	0.000104536	0.483446371	1.398079472
11	0.000126197	0.448649187	1.364761815
12	0.000110905	0.441703694	1.358207302
13	4.13736E-05	0.479805041	1.3945552
14	1.91064E-05	0.515839018	1.429825432
15	5.43584E-06	0.561251237	1.475548393
16	1.60161E-05	0.534293195	1.448232463
17	2.73437E-05	0.515451081	1.429441007
18	1.85516E-05	0.524198	1.438133894
19	2.46481E-05	0.497471982	1.411737622
20	8.06445E-05	0.4514874	1.367449353
21	2.60701E-05	0.506296473	1.420399219
22	1.20415E-08	0.889807992	1.852929501
23	0.000147497	0.4436473	1.36003832
24	0.000142566	0.444190489	1.360550483
25	3.49675E-07	0.68443876	1.607076672
26	5.40686E-06	0.609011321	1.525213622
27	5.74067E-06	1.029600795	2.041459285
28	0.000138014	0.434077621	1.351046773
29	1.43772E-05	0.535011201	1.448953404
30	2.98788E-05	0.680580383	1.602784411
31	8.52979E-05	0.488098626	1.402595132
32	0.000180995	0.426429649	1.343903594
33	0.000101306	0.461288903	1.376771276
34	0.000176638	0.894733956	1.859266991
35	0.000166573	0.435112034	1.352015821
36	0.000220576	0.427789885	1.345171283
37	0.000124869	0.439979319	1.35658488

38	0.000285995	0.562968191	1.477305491
39	0.000104683	0.444287578	1.360642047
40	2.60752E-05	0.513498689	1.42750786
41	0.000108955	0.442026428	1.35851117
42	0.000352411	0.712879497	1.639072304
43	5.95842E-05	0.476336314	1.391206245
44	1.4318E-05	0.520855441	1.434805759
45	1.64877E-05	0.517907331	1.431876764
46	6.33522E-05	0.468615577	1.383780942
47	0.000154869	0.430435851	1.34764065
48	0.00020028	0.431443728	1.348582449
49	2.06268E-07	0.71006533	1.635878194
50	9.5948E-06	0.54514192	1.459163877

Table 9.a3

51	ORF1_chr16_23959562_23960563_24103092_24104963_RR_1	-0.004284513	0.004386812
52	ORF1_chr11_68953615_68955511_69110685_69112785_FR_1	-0.003933599	0.003924377
53	ORF1_chr2_187296012_187300600_187333661_187349760_FF_1	-0.003930151	0.003924756
54	ORF1_chr17_79647743_79650208_79779269_79782236_RF_1	-0.003873256	0.003917798
55	ORF1_chr13_80048989_80053962_80108036_80110958_RR_1	-0.00409337	0.003425493
56	ORF1_chr11_12136334_12141132_12153671_12160688_FF_1	-0.003573071	0.003044491
57	ORF1_chr17_46172500_46175294_46370925_46372131_RF_1	-0.002869624	0.003728354
58	ORF1_chr7_127648061_127651700_127781428_127785589_RF_1	-0.002831936	0.003651762
59	ORF1_chr17_47945779_47949526_48160816_48163394_RR_1	-0.002757089	0.00317307
60	ORF1_chr1_67685932_67691400_67707953_67710845_RR_1	-0.002884741	0.002956606
61	ORF1_chr13_41335196_41337563_41355649_41358912_RR_1	-0.002924545	0.002876178
62	ORF1_chr1_2986093_2988416_3070581_3073621_RF_1	-0.002938286	0.002820793
63	ORF1_chr20_35273707_35277578_35323324_35324547_RR_1	-0.002912582	0.002828771
64	ORF1_chr8_72866427_72867681_72985368_72989505_FF_1	-0.002480746	0.002887786
65	ORF1_chr8_62981921_62989688_63002922_63008042_FF_1	-0.002813177	0.002223156
66	ORF1_chr2_112933066_112936593_113031116_113032593_RF_1	-0.002179145	0.002847051
67	ORF1_chr3_129012383_129018436_129244687_129248922_FR_1	-0.002383172	0.002403262
68	ORF1_chr12_10092308_10096371_10157054_10158072_RF_1	-0.002404718	0.002074074
69	ORF1_chr1_185478961_185481250_185562847_185565090_FF_1	-0.00188049	0.00231512
70	ORF1_chr11_12153671_12160688_12216760_12220209_FR_1	-0.001981254	0.002049577
71	ORF1_chr12_4049880_4053103_4104763_4106745_RF_1	-0.001864302	0.001994257
72	ORF1_chr4_123369547_123373273_123505935_123508246_RR_1	-0.00189108	0.001848332
73	ORF1_chr11_123648319_123653877_123684415_123688115_FF_1	-0.001843695	0.001411908
74	ORF1_chr17_46588843_46590052_46655874_46660167_FF_1	-0.001432877	0.001729084
75	ORF1_chr6_169127198_169132046_169290790_169293970_RF_1	-0.001539251	0.001187329
76	ORF1_chr1_160215823_160220940_160398180_160400303_FR_1	-0.001542736	0.001158313
77	ORF1_chr6_169127198_169132046_169286051_169290790_RF_1	-0.001558311	0.001004034
78	ORF1_chr14_106703042_106707057_106732214_106736829_RR_1	-0.001236396	0.001311146
79	ORF1_chr3_13931883_13934230_14046920_14054882_RR_1	-0.001436492	0.000904925
80	ORF1_chr12_12889292_12890821_12982042_12990253_FR_1	-0.001257732	0.00084723
81	ORF1_chrX_2276455_2282906_2372831_2374536_FF_1	-0.000921368	0.000640653

82	ORF1_chr12_427695_429020_611557_612617_FF_1	-0.000569961	0.000952561
83	ORF1_chr17_27528031_27530003_27672414_27678224_RR_1	-0.000863285	0.000620921
84	ORF1_chr16_11305532_11309621_11461548_11463016_RF_1	-0.000536708	0.000727365
85	ORF1_chr2_160492996_160495482_160608080_160611872_FF_1	-0.000511574	0.000666378
86	ORF1_chr10_5798770_5800647_6041802_6045506_RF_1	-0.000538916	0.000607875
87	ORF1_chr22_50531145_50533032_50776978_50783308_FR_1	-0.000448306	0.000500907
88	ORF1_chr8_140596381_140598037_140783960_140789447_RR_1	-0.000406612	0.000371577
89	ORF1_chr14_93886681_93889278_93972230_93975078_FR_1	-0.000426731	0.00024599
90	ORF1_chr1_93609850_93612271_93677337_93680831_FF_1	-0.000384362	0.00014821
91	ORF1_chr2_113266536_113267636_113504184_113510749_FF_1	-0.000333362	0.000181115
92	ORF1_chr6_36126333_36131280_36222214_36228907_RR_1	-0.000292434	0.000215727
93	ORF1_chr3_123064243_123067734_123161904_123162916_RF_1	-0.000259212	7.66072E-05
94	ORF1_chr7_143815670_143817160_143832880_143837398_FF_1	0	3.1633E-05
95	ORF1_chr18_75239929_75247051_75392542_75394957_FF_1	-1.94964E-05	0
96	ORF1_chr9_37463569_37466721_37580276_37583007_RF_1	-3.7519E-06	0
97	ORF1_chr22_42535866_42536905_42603122_42604347_RR_1	0	2.54517E-06
98	ORF1_chr16_30340361_30342037_30569930_30571793_FF_1	0	-1.12902E-06
99	ORF1_chr14_88868042_88879418_89003053_89008734_FF_1	0	9.75217E-07
100	ORF1_chr1_21177377_21179201_21360997_21362872_RF_1	0	0

Table 9.b1

51	0.008671324	4519.649801	754	0.10481268
52	0.007857976	2444.640804	346	0.028725693
53	0.007854907	3062.446524	458	0.047109718
54	0.007791053	2880.594219	429	0.040809999
55	0.007518863	2825.713915	419	0.039118584
56	0.006617562	1842.300047	263	0.013966084
57	0.006597977	3570.187804	557	0.065030297
58	0.006483699	5955.410877	1111	0.172610563
59	0.005930159	5412.489422	976	0.144987137
60	0.005841347	2011.449609	291	0.0172379
61	0.005800723	2982.959423	446	0.04423046
62	0.005759079	2470.335537	353	0.029197732
63	0.005741353	4585.205636	773	0.107154223
64	0.005368532	8881.585714	1969	0.335260652
65	0.005036332	6990.773109	1388	0.228289907
66	0.005026196	2546.429792	361	0.0317184
67	0.004786434	5541.80804	1005	0.151829671
68	0.004478793	7266.928609	1461	0.244545841
69	0.004195611	4271.30051	698	0.09408723
70	0.004030831	2226.338597	320	0.022407716
71	0.003858558	5249.941945	930	0.137999299
72	0.003739412	2894.809412	433	0.04112004
73	0.003255603	8318.413763	1775	0.304798022
74	0.003161961	2706.432558	391	0.036144627
75	0.002726581	1298.641194	194	0.005359081

76	0.002701048	7258.1481	1459	0.243967232
77	0.002562345	1109.170033	159	0.003661224
78	0.002547542	2223.082668	318	0.022433273
79	0.002341417	6875.273187	1351	0.222707957
80	0.002104962	4871.786943	831	0.121371898
81	0.001562021	3330.494838	511	0.056111863
82	0.001522522	6696.150841	1295	0.213997083
83	0.001484206	8356.225976	1789	0.30662177
84	0.001264073	10326.79147	2558	0.405690362
85	0.001177953	3774.294445	604	0.07220987
86	0.001146792	9736.38043	2312	0.376527839
87	0.000949213	8884.98958	1970	0.335479296
88	0.000778189	7143.652507	1434	0.236300225
89	0.000672721	11190.0887	2931	0.44902263
90	0.000532572	9652.970143	2270	0.37373372
91	0.000514477	7740.65394	1601	0.271112479
92	0.000508161	9560.939689	2228	0.369992569
93	0.00033582	11062.72759	2877	0.442278174
94	3.1633E-05	9517.746791	2208	0.368303263
95	1.94964E-05	5160.683472	911	0.133327303
96	3.7519E-06	8845.11861	1954	0.333652548
97	2.54517E-06	8336.699623	1781	0.305811136
98	1.12902E-06	5157.748755	907	0.133670574
99	9.75217E-07	4056.574955	647	0.085636774
100	0	8927.194783	1984	0.337922691

Table 9.b2

51	0.000559952	0.558649887	1.472890202
52	7.04226E-05	0.461871033	1.377326917
53	0.000152877	0.433791266	1.350778635
54	0.000124048	0.446075437	1.362329268
55	0.000116135	1.086848359	2.124095099
56	2.60253E-05	0.531412381	1.445343477
57	0.000256647	0.430040949	1.347271817
58	0.001358772	0.438276048	1.354984218
59	0.001002639	0.502224438	1.416395767
60	3.55421E-05	0.506724611	1.420820804
61	0.000139772	0.443199851	1.359616571
62	7.30279E-05	0.461479348	1.37695303
63	0.000586886	0.687683842	1.610695569
64	0.004677282	0.471794302	1.386833222
65	0.00224513	0.485572699	1.400141562
66	8.11304E-05	0.465214916	1.380522992
67	0.001081155	0.528459363	1.442388064
68	0.002531487	0.576268801	1.49098816
69	0.00046532	0.806605403	1.749091064

70	5.08057E-05	0.477341221	1.392175625
71	0.000909338	0.440182229	1.356775693
72	0.000126156	0.445571731	1.361853703
73	0.003833326	0.453615745	1.36946818
74	0.000100135	0.466067817	1.38133938
75	7.36643E-06	0.682695326	1.605135763
76	0.002522041	0.513378254	1.427388698
77	4.12467E-06	0.730988573	1.659776024
78	5.05458E-05	0.494873283	1.409196975
79	0.002131849	0.585302776	1.500353833
80	0.000714635	0.712422477	1.638553157
81	0.000203161	0.625281885	1.542512184
82	0.001963554	0.676867771	1.59866513
83	0.003886678	0.471014905	1.386084205
84	0.007352931	0.426007491	1.343510402
85	0.000309029	0.443981092	1.360353024
86	0.006168083	0.499525378	1.413748387
87	0.00468271	0.635619575	1.553604813
88	0.002400925	0.481023399	1.395733401
89	0.00932501	0.428795249	1.346109013
90	0.006011093	0.443625903	1.360018148
91	0.003075432	0.508132818	1.422208337
92	0.005840815	0.511154296	1.425190029
93	0.009015725	0.427129951	1.3445561
94	0.005761956	0.566380861	1.480804168
95	0.000860603	0.726262608	1.654347844
96	0.004619386	0.605470447	1.521474808
97	0.003859069	0.563812911	1.478170729
98	0.00085903	0.786926352	1.725394607
99	0.000392582	0.674090801	1.5955909
100	0.004750336	0.611416743	1.527758749

Table 9.b3

	Probe	pHC_SHAPLEY	SSc_SHAPLEY
1	ORF1_chr2_8316756_8318269_8515734_8517409_RF_1	-0.010970627	0.010951545
2	ORF1_chr5_77940215_77942645_77971521_77974256_FF_1	-0.010003787	0.009977067
3	ORF1_chr4_113710897_113723443_113810658_113830867_RF_1	-0.00997599	0.009952217
4	ORF1_chr19_56561558_56564720_56759775_56765600_RF_1	-0.009006777	0.009031113
5	ORF1_chr2_92108138_92110573_92210006_92223089_FF_1	-0.009012221	0.009019466
6	ORF1_chr19_9082207_9087550_9202787_9208911_RR_1	-0.008964267	0.009008719
7	ORF1_chr6_14206770_14210218_14395326_14400003_RR_1	-0.00874859	0.008702539
8	ORF1_chr20_2111595_2115703_2369884_2374210_FR_1	-0.00848945	0.008494726
9	ORF1_chr10_3653748_3655479_3866568_3872650_RR_1	-0.008511447	0.008398582
10	ORF1_chr1_234729070_234732599_234814122_234817959_RF_1	-0.008248522	0.00814939
11	ORF1_chr13_40903938_40912685_40990073_40992867_FR_1	-0.007988989	0.008046608
12	ORF1_chr16_29013007_29015111_29280587_29285290_RF_1	-0.007998535	0.008015258

13	ORF1_chr3_32385454_32386698_32541292_32554994_RF_1	-0.007954575	0.008047802
14	ORF1_chr2_53649025_53656227_53766349_53775695_FR_1	-0.00797809	0.008009025
15	ORF1_chr1_165695181_165697826_165952803_165953958_FF_1	-0.007968527	0.007940343
16	ORF1_chrX_44917246_44925908_44940640_44941996_RR_1	-0.007963647	0.007879094
17	ORF1_chr1_221106643_221120931_221185158_221187933_RF_1	-0.007992987	0.007810124
18	ORF1_chr15_69554282_69555739_69599001_69607474_RF_1	-0.007756475	0.007695703
19	ORF1_chr15_90843215_90845291_91002629_91006437_RR_1	-0.007731073	0.007687359
20	ORF1_chr9_98247819_98251791_98381297_98383610_FR_1	-0.007706678	0.007649644
21	ORF1_chr19_6507876_6510412_6736179_6739196_RR_1	-0.007483783	0.007411948
22	ORF1_chr9_127592507_127594232_127769656_127771134_FR_1	-0.00698097	0.007022252
23	ORF1_chr4_168182554_168187989_168317980_168319647_FF_1	-0.007014178	0.006934029
24	ORF1_chr13_27789091_27791217_27935736_27938158_RF_1	-0.00700985	0.006926581
25	ORF1_chr8_57997832_57999789_58156560_58160085_FF_1	-0.006989782	0.006917929
26	ORF1_chr19_20562776_20567807_20680600_20685168_RR_1	-0.006707615	0.006762372
27	ORF1_chr1_39712316_39716819_39935069_39938243_RF_1	-0.006729643	0.006693952
28	ORF1_chr4_24971631_24973362_25125726_25129421_RR_1	-0.006458105	0.006472968
29	ORF1_chr1_234593513_234598020_234817959_234822547_FR_1	-0.006243387	0.006170204
30	ORF1_chr3_167588699_167598102_167735969_167742420_FF_1	-0.006016394	0.006064867
31	ORF1_chr20_20121190_20124157_20274659_20278486_RR_1	-0.005995429	0.005970127
32	ORF1_chr20_4141331_4145409_4240264_4242807_RF_1	-0.006038388	0.00591904
33	ORF1_chr2_28424743_28426988_28597316_28599022_FF_1	-0.006004439	0.005917689
34	ORF1_chr6_13871589_13875376_13978828_13980695_RR_1	-0.006005242	0.005912011
35	ORF1_chr1_117001584_117004481_117080679_117085351_RF_1	-0.005995606	0.005921562
36	ORF1_chr15_31334951_31340691_31546136_31558743_FF_1	-0.006016007	0.005897539
37	ORF1_chr19_54627987_54632181_54828537_54832427_FR_1	-0.006012441	0.005879114
38	ORF1_chr12_62435376_62437096_62567854_62572530_RR_1	-0.005243132	0.005147521
39	ORF1_chr6_14276298_14278467_14395326_14400003_FR_1	-0.005212195	0.005137516
40	ORF1_chr11_10332545_10336410_10435291_10442726_FR_1	-0.005019572	0.00497803
41	ORF1_chr1_35943227_35949162_35991655_35992829_FF_1	-0.00498646	0.00497037
42	ORF1_chr12_52899110_52901976_53003793_53005352_FF_1	-0.004992319	0.004914104
43	ORF1_chr6_154995123_154998831_155125636_155128798_RF_1	-0.004995788	0.004902421
44	ORF1_chr17_46177013_46180826_46195798_46197440_RF_1	-0.004966559	0.004923055
45	ORF1_chr14_74374067_74376797_74492554_74493993_RF_1	-0.004990128	0.004857526
46	ORF1_chr2_227722929_227725809_227932124_227939987_FR_1	-0.004995629	0.004812622
47	ORF1_chr15_69599001_69607474_69822688_69824653_FF_1	-0.004973978	0.004830942
48	ORF1_chr13_57155089_57159703_57172839_57181375_RR_1	-0.004701299	0.004731776
49	ORF1_chr6_14018522_14021640_14102931_14109639_RR_1	-0.004732201	0.004690627
50	ORF1_chr5_141346067_141348820_141380617_141383700_RR_1	-0.004730581	0.004689889

Table 10.a1

	SHAPLEY_diff	RPs_class2_class1	RPrank_class2_class1	pfp_class2_class1
1	0.021922172	2511.182773	159	0.068618829
2	0.019980854	2437.102121	153	0.064267578
3	0.019928208	2550.222683	166	0.069334424
4	0.01803789	699.403305	17	0.006055278
5	0.018031687	2380.232566	151	0.059981014

6	0.017972987	2935.649237	221	0.084519141
7	0.017451129	1813.287964	83	0.041820736
8	0.016984176	3175.82756	251	0.097260863
9	0.016910029	2880.834449	209	0.083791812
10	0.016397912	1642.123836	73	0.033344725
11	0.016035597	3199.669699	256	0.097809856
12	0.016013793	2210.422483	134	0.052181746
13	0.016002377	2979.923877	226	0.086983939
14	0.015987115	3112.832366	243	0.093857745
15	0.01590887	2535.270897	162	0.069613977
16	0.015842741	2034.612448	108	0.04836415
17	0.015803111	3457.695551	309	0.105280142
18	0.015452178	2523.803019	160	0.069385444
19	0.015418432	3285.787482	274	0.099977846
20	0.015356321	2639.438668	178	0.07282288
21	0.014895731	2684.363335	186	0.073868068
22	0.014003221	3053.776723	233	0.091712649
23	0.013948207	2678.622211	184	0.074121954
24	0.013936431	2611.734713	175	0.07142062
25	0.013907711	1277.907063	40	0.024505154
26	0.013469987	3074.794125	238	0.091906279
27	0.013423595	3274.528209	270	0.100288669
28	0.012931073	1204.291508	37	0.021309875
29	0.012413592	2105.950769	120	0.049152691
30	0.012081261	3070.236279	236	0.092218553
31	0.011965557	3330.318405	282	0.101659702
32	0.011957427	1907.921601	95	0.043787621
33	0.011922129	2263.050952	138	0.055023231
34	0.011917253	1968.695864	103	0.045136366
35	0.011917168	1818.554381	85	0.041261081
36	0.011913546	2745.03243	193	0.076882938
37	0.011891555	2600.984915	173	0.071223807
38	0.010390654	1932.678217	99	0.043985399
39	0.010349712	3398.290266	298	0.102982649
40	0.009997602	3268.369829	268	0.100396086
41	0.00995683	3168.607921	250	0.096899096
42	0.009906423	1844.510613	92	0.040095608
43	0.009898209	2915.081526	220	0.082886988
44	0.009889614	3200.455689	257	0.097510393
45	0.009847654	2363.728795	147	0.060136926
46	0.009808251	3350.237008	289	0.101213262
47	0.00980492	767.4793963	19	0.007714111
48	0.009433075	1450.88541	60	0.025946264
49	0.009422828	2550.977959	167	0.068989954
50	0.00942047	1843.602649	91	0.040465222

Table 10.a2

	pval_class2_class1	LogFC	FC
1	7.73047E-05	-0.48226793	-1.396937941
2	6.96705E-05	-0.489625593	-1.404080442
3	8.15497E-05	-0.479250266	-1.394019039
4	7.29371E-07	-0.682527783	-1.604949366
5	6.41735E-05	-0.492286246	-1.406672271
6	0.000132347	-0.461085729	-1.376577399
7	2.45943E-05	-0.553372605	-1.46751231
8	0.000172973	-0.454844133	-1.370634715
9	0.000124083	-0.466095029	-1.381365435
10	1.72471E-05	-0.585160477	-1.500205854
11	0.000177414	-0.450599782	-1.366608289
12	4.95437E-05	-0.499997327	-1.414210942
13	0.000139288	-0.45967456	-1.375231562
14	0.0001616	-0.454799064	-1.370591898
15	7.99055E-05	-0.481363125	-1.396062108
16	3.70094E-05	-0.509211229	-1.423271831
17	0.0002305	-0.472781967	-1.387782969
18	7.86599E-05	-0.483983089	-1.398599688
19	0.000194097	-0.445661056	-1.361938026
20	9.18445E-05	-0.481187162	-1.395891843
21	9.73498E-05	-0.477206877	-1.392045991
22	0.000151409	-0.457567534	-1.37322453
23	9.6634E-05	-0.473176258	-1.388162304
24	8.85578E-05	-0.477917751	-1.392732078
25	6.94517E-06	-0.575231366	-1.489916383
26	0.000154984	-0.458590251	-1.374198345
27	0.000191858	-0.447831463	-1.363988483
28	5.5866E-06	-0.624037056	-1.541181801
29	4.17921E-05	-0.517889633	-1.431859199
30	0.000154204	-0.455910163	-1.371647873
31	0.000203125	-0.44583572	-1.362102923
32	2.94741E-05	-0.520094882	-1.434049558
33	5.3801E-05	-0.497014203	-1.411289737
34	3.29404E-05	-0.545605491	-1.459632816
35	2.48499E-05	-0.523354058	-1.437292865
36	0.000105136	-0.470542609	-1.385630516
37	8.73045E-05	-0.479169234	-1.393940744
38	3.08538E-05	-0.526377578	-1.440308223
39	0.000217443	-0.446976729	-1.363180618
40	0.000190641	-0.447477712	-1.363654072
41	0.000171643	-0.452052508	-1.367985092
42	2.61366E-05	-0.543175273	-1.457176135
43	0.000129204	-0.462069059	-1.377515984
44	0.000177562	-0.450330176	-1.366352925

45	6.2636E-05	-0.495100573	-1.409419005
46	0.000207253	-0.446404322	-1.362639868
47	1.0385E-06	-0.66472302	-1.585263892
48	1.10304E-05	-0.621733538	-1.538722995
49	8.16333E-05	-0.496666608	-1.41094975
50	2.60909E-05	-0.559476508	-1.473734365

Table 10.a3

51	ORF1_chr21_44873351_44875256_44901291_44903482_FF_1	-0.004503859	0.004600811
52	ORF1_chr11_33667893_33674633_33693896_33698608_RR_1	-0.004478153	0.004366546
53	ORF1_chr1_89127656_89129856_89172214_89177508_RR_1	-0.004254783	0.004311819
54	ORF1_chr2_233813067_233815110_233853895_233857139_FR_1	-0.004241178	0.004324562
55	ORF1_chr2_101327421_101335518_101390331_101393544_FF_1	-0.004033275	0.00395755
56	ORF1_chr2_74446225_74448326_74574097_74579710_FR_1	-0.003993608	0.003972901
57	ORF1_chr13_99494037_99497802_99735907_99738338_FF_1	-0.003979494	0.003967993
58	ORF1_chr19_54789678_54792948_54890303_54892564_RF_1	-0.003994289	0.003899119
59	ORF1_chr11_3589286_3591426_3777994_3782240_FF_1	-0.003982896	0.003890388
60	ORF1_chr1_224094766_224099331_224328317_224334418_FF_1	-0.003967915	0.003902095
61	ORF1_chr5_54687073_54701690_54895820_54899919_RF_1	-0.003934966	0.003930505
62	ORF1_chr2_54954222_54956881_55045882_55048981_FF_1	-0.003962377	0.003875283
63	ORF1_chr16_70112537_70113568_70281463_70283063_FF_1	-0.003722041	0.003780142
64	ORF1_chr1_89127656_89129856_89152351_89155427_RR_1	-0.003742763	0.003444532
65	ORF1_chr22_29467180_29469328_29549133_29556322_FR_1	-0.003511432	0.003502623
66	ORF1_chr4_24971631_24973362_25161538_25167741_RR_1	-0.003426172	0.003412223
67	ORF1_chr6_33982531_33984798_34087216_34091346_RF_1	-0.003018538	0.003374011
68	ORF1_chr1_16764579_16768424_17044824_17050263_RR_1	-0.002974774	0.003374112
69	ORF1_chr19_54461246_54463256_54564139_54574977_RF_1	-0.00298649	0.0030144
70	ORF1_chr3_128892194_128893890_129064130_129068087_RF_1	-0.003027572	0.002930318
71	ORF1_chr8_8984061_8987615_9203064_9212772_RR_1	-0.003009832	0.002941725
72	ORF1_chr16_70112537_70113568_70359934_70360962_FR_1	-0.002959526	0.002989236
73	ORF1_chr13_112765663_112769601_112883502_112886179_FR_1	-0.002760106	0.003186397
74	ORF1_chr2_92108138_92110573_92242402_92244832_FF_1	-0.00301196	0.002900616
75	ORF1_chr22_24255117_24260015_24453446_24457028_FR_1	-0.002807104	0.002724808
76	ORF1_chr5_71466175_71468826_71713282_71719473_RF_1	-0.002236045	0.00279856
77	ORF1_chr22_44263290_44267587_44326770_44330737_FF_1	-0.002217184	0.002806291
78	ORF1_chr2_233756599_233760219_233853895_233857139_FR_1	-0.002232479	0.002440345
79	ORF1_chr5_77232748_77239462_77325709_77329000_RF_1	-0.002455558	0.002195437
80	ORF1_chr7_43795674_43802582_44019092_44021471_RF_1	-0.001987004	0.002067425
81	ORF1_chr13_112592963_112600705_112765663_112769601_RF_1	-0.002016484	0.002005472
82	ORF1_chr19_54627987_54632181_54748746_54753675_FF_1	-0.001940709	0.00203635
83	ORF1_chr4_102481630_102483332_102522760_102539034_FR_1	-0.001978781	0.001923158
84	ORF1_chr6_158943910_158945125_159080063_159084244_RR_1	-0.001961303	0.001933679
85	ORF1_chr22_50201186_50205111_50373464_50374527_FF_1	-0.00196373	0.001893493
86	ORF1_chr9_98247819_98251791_98368594_98373451_FF_1	-0.001727011	0.00169324
87	ORF1_chr1_33081752_33087352_33257774_33262528_RR_1	-0.001501051	0.001889256
88	ORF1_chr12_134194_137994_14189_15286_RF_1	-0.00149159	0.001885713

89	ORF1_chr5_77219829_77221017_77232748_77239462_FR_1	-0.001687268	0.001671906
90	ORF1_chr5_76987562_76988733_77232748_77239462_RR_1	-0.001478176	0.001851719
91	ORF1_chr1_40249894_40253001_40397735_40401055_FR_1	-0.001902953	0.001370112
92	ORF1_chr6_33937395_33940607_33982531_33984798_RF_1	-0.001501752	0.001504049
93	ORF1_chr20_51449039_51452721_51482831_51487722_FF_1	-0.001492636	0.00144743
94	ORF1_chr12_14189_15286_93751_97454_FF_1	-0.00124942	0.001308707
95	ORF1_chr13_27935736_27938158_27961367_27964197_FR_1	-0.001006841	0.000936839
96	ORF1_chr6_33846691_33848820_33982531_33984798_RF_1	-0.000722866	0.000940477
97	ORF1_chr6_34087216_34091346_34298424_34301201_FR_1	-0.000722143	0.000925297
98	ORF1_chr17_1305781_1308105_1405058_1407538_FR_1	0	5.39744E-05
99	ORF1_chr12_14189_15286_200475_202854_FF_1	-2.95539E-05	0
100	ORF1_chr16_86891168_86894116_87066023_87067839_FF_1	0	-5.49626E-07

Table 10.b1

51	0.009104671	3277.035573	271	0.100177474
52	0.008844699	3274.351845	269	0.100643162
53	0.008566602	2141.773756	128	0.048898615
54	0.00856574	2795.051917	200	0.078941759
55	0.007990825	2686.831942	187	0.073706177
56	0.007966509	2938.850856	222	0.084452402
57	0.007947488	2781.085401	197	0.078776945
58	0.007893408	1442.042553	56	0.027189805
59	0.007873284	3336.811355	285	0.101252915
60	0.007870009	1350.536348	47	0.02552298
61	0.007865471	1300.310218	42	0.024870375
62	0.00783766	2359.189043	145	0.060559097
63	0.007502183	3242.712372	262	0.099993659
64	0.007187296	2053.131489	113	0.047726672
65	0.007014055	1839.627708	89	0.041057794
66	0.006838395	1797.933673	82	0.04106626
67	0.006392549	2550.07527	165	0.069740672
68	0.006348886	1194.412603	35	0.021855405
69	0.00600089	3339.709353	287	0.100842256
70	0.005957889	2643.521301	179	0.07280341
71	0.005951557	2528.041334	161	0.06935665
72	0.005948762	2539.648071	163	0.069601611
73	0.005946503	2289.180838	140	0.05645962
74	0.005912576	2251.709055	137	0.054458544
75	0.005531912	3177.329191	252	0.097030319
76	0.005034605	2707.443468	190	0.074477563
77	0.005023475	2827.501658	204	0.080520984
78	0.004672824	3324.060521	281	0.101375894
79	0.004650995	2605.038446	174	0.071196654
80	0.004054429	2772.676516	195	0.078761241
81	0.004021956	2050.285091	112	0.047917611
82	0.003977058	2692.859066	188	0.073882381

83	0.003901939	3816.059579	369	0.122607616
84	0.003894981	2988.023125	227	0.087406474
85	0.003857223	2781.252576	198	0.078395267
86	0.003420251	1421.889222	53	0.027297778
87	0.003390308	2434.427905	152	0.064443897
88	0.003377303	3316.092388	279	0.101278707
89	0.003359174	1610.458742	71	0.031965768
90	0.003329895	2796.081245	201	0.078648377
91	0.003273064	3261.962157	266	0.100481915
92	0.003005801	1906.49428	94	0.044136012
93	0.002940066	3296.630806	278	0.099642396
94	0.002558126	3025.599211	230	0.090021457
95	0.00194368	2992.736336	228	0.087492255
96	0.001663344	2295.859761	143	0.055840999
97	0.001647439	1821.743189	87	0.040565048
98	5.39744E-05	4046.661111	405	0.135705371
99	2.95539E-05	3107.068033	242	0.093653852
100	5.49626E-07	1940.201045	101	0.043712476

Table 10.b2

51	0.000192356	-0.449176835	-1.365261052
52	0.000191824	-0.449219316	-1.365301253
53	4.43478E-05	-0.520758958	-1.434709807
54	0.000111867	-0.474511576	-1.389447743
55	9.76587E-05	-0.472816754	-1.387816432
56	0.00013284	-0.462833217	-1.378245812
57	0.000109959	-0.468441416	-1.383613903
58	1.07885E-05	-0.55536248	-1.469537812
59	0.000204464	-0.45184733	-1.367790553
60	8.49952E-06	-0.564485474	-1.478859991
61	7.40111E-06	-0.580204473	-1.495061128
62	6.22175E-05	-0.505076705	-1.41919881
63	0.000185626	-0.453123914	-1.369001392
64	3.82124E-05	-0.528006825	-1.441935693
65	2.58911E-05	-0.531999561	-1.445931854
66	2.38597E-05	-0.540379372	-1.454354906
67	8.15334E-05	-0.484410541	-1.399014137
68	5.41991E-06	-0.659803184	-1.57986708
69	0.000205064	-0.446723303	-1.362941181
70	9.23358E-05	-0.479857462	-1.394605873
71	7.91187E-05	-0.481407534	-1.396105081
72	8.03845E-05	-0.483910947	-1.398529753
73	5.60056E-05	-0.499967174	-1.414181385
74	5.2863E-05	-0.502676692	-1.416839847
75	0.00017325	-0.445141393	-1.36144754
76	0.000100264	-0.476969815	-1.391817271

77	0.000116387	-0.46082316	-1.376326886
78	0.00020184	-0.449207918	-1.365290466
79	8.77757E-05	-0.486416934	-1.400961136
80	0.000108821	-0.469997222	-1.385106801
81	3.80258E-05	-0.528321867	-1.442250604
82	9.84156E-05	-0.48526633	-1.399844261
83	0.00032056	-0.444816849	-1.361141308
84	0.000140584	-0.460873187	-1.376374612
85	0.000109982	-0.476574037	-1.391435503
86	1.02511E-05	-0.586479796	-1.501578393
87	6.9405E-05	-0.490494408	-1.404926258
88	0.000200211	-0.456776921	-1.372472194
89	1.60808E-05	-0.577246597	-1.49199903
90	0.000112009	-0.482269181	-1.396939152
91	0.00018938	-0.480626838	-1.395349802
92	2.93959E-05	-0.539584708	-1.453554039
93	0.00019627	-0.447705069	-1.36386899
94	0.000146703	-0.479164296	-1.393935973
95	0.000141342	-0.46100762	-1.376502872
96	5.65789E-05	-0.496397318	-1.41068641
97	2.50056E-05	-0.538371295	-1.452332007
98	0.000389419	-0.447100658	-1.363297723
99	0.000160585	-0.467352681	-1.382570148
100	3.12818E-05	-0.510132363	-1.424180854

Table 10.b3

CLAIMS

1. A process for detecting a chromosome state which represents a subgroup in a population comprising determining whether a chromosome interaction relating to that chromosome state is present or absent within a defined region of the genome; and

- wherein the subgroup relates to the stage of fibrosis and the chromosome interaction either:

(i) corresponds to any one of the chromosome interactions represented by any probe shown in Table 1, 3 or 4; and/or

(ii) is present in a 4,000 base region which comprises or which flanks (i);

and/or

- wherein the subgroup relates to the presence of fibrosis and the chromosome interaction either:

(a) corresponds to any one of the chromosome interactions represented by any probe shown in Table 2, 5 or 6; and/or

(b) is present in a 4,000 base region which comprises or which flanks (a).

2. A process according to claim 1 wherein the subgroup relates to the stage of sclerosis or the presence of sclerosis.

3. A process according to claim 1 or 2 wherein a specific combination of chromosome interactions are typed comprising at least 3, 5, 8, 10 or 20 chromosome interactions selected from all the chromosome interactions represented by the probes in all of Table 1, 3 or 4.

4. A process according to any one of the preceding claims wherein a specific combination of chromosome interactions are typed comprising at least 3, 5, 8, 10 or 20 chromosome interactions selected from all chromosome interactions represented by the probes in all of Table 2, 5 or 6.

5. A process according to any one of the preceding claims which is carried out to detect the whether the fibrosis is early stage or late stage fibrosis.

6. A process according to any one of the preceding claims which is carried out to determine the stage of fibrosis in an individual and wherein at least 10 chromosome interactions represented by the probes of any of Tables 1, 3 or 4 are typed.

7. A process according to any one of the preceding claims which is carried out to determine the stage of presence of fibrosis in an individual and wherein at least 10 chromosome interactions represented by the probes of any of Table 2, 5 or 6 are typed.

8. A process according to any one of the preceding claims in which the chromosome interactions are typed:

- in a sample from an individual, and/or

- by detecting the presence or absence of a DNA loop at the site of the chromosome interactions, and/or

- detecting the presence or absence of distal regions of a chromosome being brought together in a chromosome conformation, and/or

- by detecting the presence of a ligated nucleic acid which is generated during said typing and whose sequence comprises two regions each corresponding to the regions of the chromosome which come together in the chromosome interaction, wherein detection of the ligated nucleic acid is preferably by:

(i) by a probe that has at least 70% identity to any of the specific probe sequences mentioned in Table 1, 2, 3, 4, 5 or 6; and/or

(ii) by a primer pair which has at least 70% identity to any primer pair in Table 1, 2, 3, 4, 5 or 6.

9. A process according to any one of the preceding claims, wherein said determining of whether the chromosome interaction is present or absent by a process comprising the steps of: -

(i) cross-linking of chromosome regions which have come together in a chromosome interaction;

(ii) subjecting said cross-linked regions to cleavage, optionally by restriction digestion cleavage with an enzyme;

(iii) ligating said cross-linked cleaved DNA ends to form ligated DNA; and

(iv) detecting the presence or absence of the ligated nucleic acid to thereby determine presence or absence of the chromosome interaction.

10. A process according to any one of the preceding claims in which the presence or absence of at least the following markers is determined:

(a) the first 5, 8, 10 or 20 markers shown at the top of any of Tables 7, 8, 9 or 10; and/or

(b) 5 markers from the first 10 markers shown at the top of any of Tables 7, 8, 9 or 10; and/or

(c) 5 markers from the first 20, 30, 40 or 50 markers shown at the top of any of Tables 7, 8, 9 or 10; and/or

(d) 10 markers from the first 30, 40 or 50 markers shown at the top of any of Tables 7, 8, 9 or 10.

11. A process according to any one of the preceding claims in which the presence or absence of at least the following combinations of markers is determined:

(a) at least 5, 8, 10, 12, 15, 20 chromosome interactions selected from 1, 2, 3, 4, 5 of or all of the Tables 1, 2, 3, 4, 5 or 6; and/or

(b) at least 5, 8, 10, 12, 15, 20 chromosome interactions selected from all of Tables 3, 4, 5 and 6; and/or

(c) at least 3, 5, 8 or 10 chromosome interactions selected from each of Tables 3 and 4; and/or

(d) at least 3, 5, 8 or 10 chromosome interactions selected from each of Tables 5 and 6; and/or

(e) at least 10 chromosome interactions selected from each of Tables 3 and 4; and/or

(f) at least 10 chromosome interactions selected from each of Tables 5 and 6.

12. A process according to any one of the preceding claims wherein the presence or absence of at least one marker is determined from any one of Tables 1, 2, 3, 4, 5 or 6 and additionally the presence or absence of any number or combination chromosome interactions as defined in the preceding claims is determined.

13. A process according to any one of the preceding claims wherein:

- the result of the process is provided in a report; and/or

- the result of the process is used to select a treatment schedule; and/or

- the result of the process is used to select a specific therapy for the individual; and/or

- the process is carried out to select an individual for a medical treatment.

14. A process according to any one of the preceding claims which is carried out to identify or design a therapeutic agent for fibrosis;

- wherein preferably said process is used to detect whether a candidate agent is able to cause a change to a chromosome state which is associated with fibrosis;

- wherein the chromosomal interaction is as defined in claim 1 or is any number or combination of chromosome interactions defined in the preceding claims;

and wherein optionally:

- the change in chromosomal interaction is monitored using (i) a probe that has at least 70% identity to any of the probe sequences mentioned in Table 1, 2, 3, 4, 5 or 6, and/or (ii) by a primer pair which has at least 70% identity to any primer pair in Table 1, 2, 3, 4, 5 or 6.

15. A process according to claim 14 which comprises selecting a target based on detection of the chromosome interactions, and preferably screening for a modulator of the target to identify a therapeutic agent for fibrosis, wherein said target is optionally a protein.

16. A process according to any one of the preceding claims, wherein the typing or detecting comprises specific detection of the ligated product by quantitative PCR (qPCR) which uses primers capable of amplifying the ligated product and a probe which binds the ligation site during the PCR reaction, wherein said probe comprises sequence which is complementary to sequence from each of the chromosome regions that have come together in the chromosome interaction, wherein preferably said probe comprises:

an oligonucleotide which specifically binds to said ligated product, and/or

a fluorophore covalently attached to the 5' end of the oligonucleotide, and/or

a quencher covalently attached to the 3' end of the oligonucleotide, and

optionally

said fluorophore is selected from HEX, Texas Red and FAM; and/or

said probe comprises a nucleic acid sequence of length 10 to 40 nucleotide bases, preferably a length of 20 to 30 nucleotide bases.

17. A process according to claim 16 in which:

(a) the probe is the same as any probe listed in any of Tables 1, 2, 3, 4, 5 or 6, or has at least 70% identity with such a probe; and/or

(b) at least one primer is the same as any primer listed in any of Tables 1, 2, 3, 4, 5 or 6, or has at least 70% identity with such a primer; and/or

(c) both primers are the same as any pair of primers listed in any of Tables 1, 2, 3, 4, 5 or 6 or both primers have at least 70% identity with a such a primer pair.

18. A therapeutic agent for use in a method of treating fibrosis in an individual that has been identified as being in need of the therapeutic agent by a process according to any one of claims 1 to 13, 16 and 17.

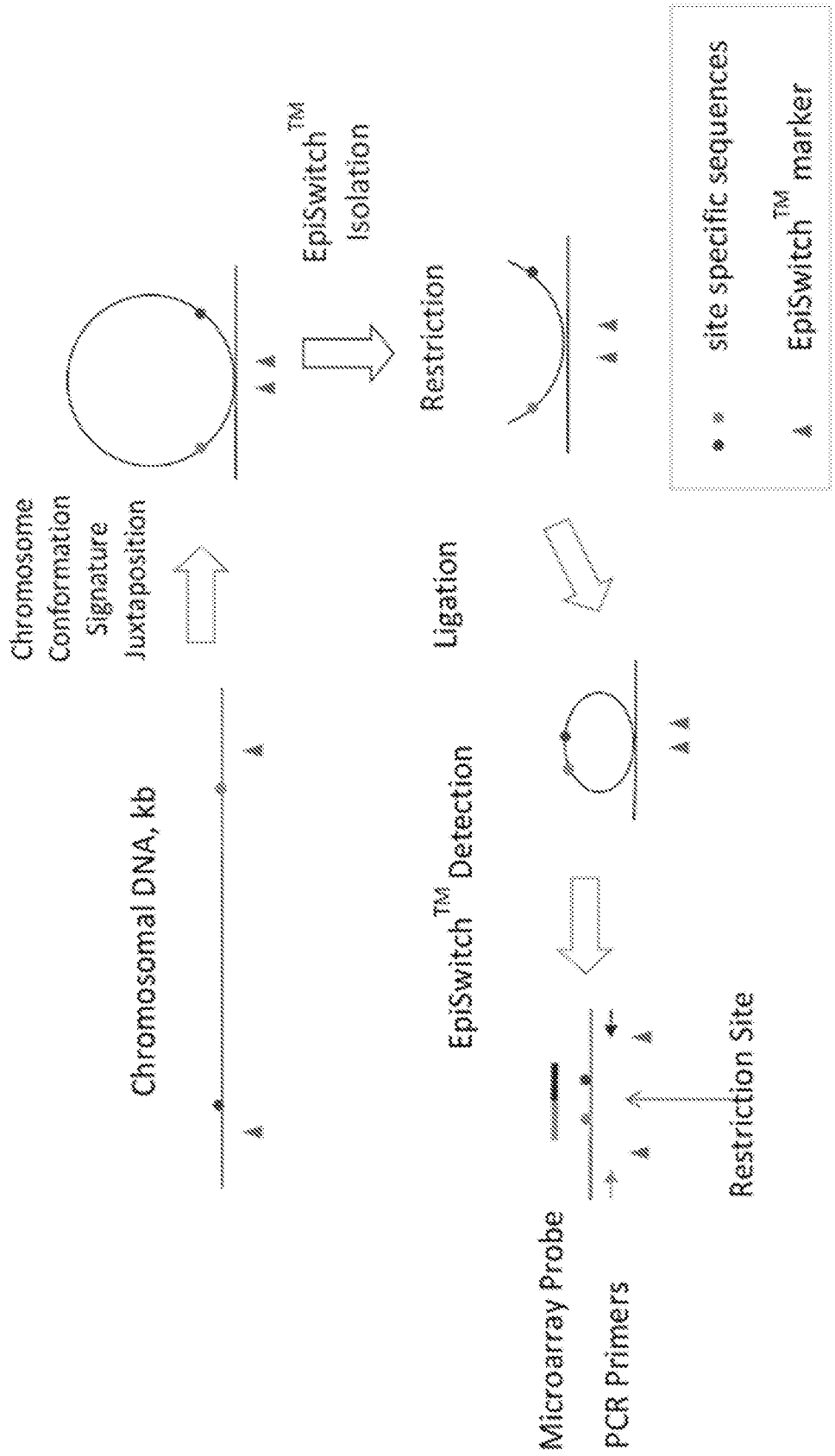
FIG. 1

	A	B	C	D
			Proteins from FDR	Nodes
1	GeneSet			
2	Natural killer cell mediated cytotoxicity(K)		12	2.05E-08 TNF,FCGR3A,HLA-B,HLA-C,KIR3DL1,KIR2DS4,PTK2B,MICA,MICB,KIR3DL2,KIR3DS1
3	Immunoregulatory interactions between a lymphoid and a non-lymphoid cell(K)		12	6.10E-07 FCGR3A,HLA-B,HLA-C,KIR3DL1,KIR3DS1,KIR2DS4,MICA,MICB,KLRC1,KIR3DL2,KIR3DL3,FCGR2B
4	Antigen processing and presentation(K)		7	7.86E-05 TNF,HLA-B,HLA-C,KIR2DS4,KIR3DL1,KIR3DL2,TAPBP
5	Proteasome(K)		8	5.12E-04 FCAR,FCGR3A,ATP6V1G2,HLA-B,HLA-C,TLR6,MS4A7,FCGR2B
6	Graft-versus-host disease(K)		5	5.12E-04 TNF,HLA-B,HLA-C,KIR2DS1,KIR3DL2
7	Type I diabetes mellitus(K)		4	9.70E-03 TNF,HLA-B,HLA-C,CIITA
8	Osteoclast differentiation(K)		6	9.70E-03 TNF,FCGR3A,TGFBR2,TNFRSF11A,JUN,FCGR2B
9	Class I MHC mediated antigen processing & presentation(R)		7	9.70E-03 WDR61,PDIA3,HLA-B,HLA-C,TAP1,TAP2,TAPBP
10	Rheumatoid arthritis(K)		5	0.0114 TNF,ATP6V1G1,ITB,TNFRSF11A,JUN
11	Gnrh signaling pathway(K)		5	0.0114 CAMK2B,PLD1,PTK2B,JUN,GNAQ
12	Chagas disease (American trypanosomiasis)(K)		5	0.0178 TNF,TGFBR2,TLR6,JUN,GNAQ
13	Tuberculosis(K)		6	0.0298 TNF,FCGR3A,TLR1,TLR6,CAMK2D,FCGR2B
14	HTLV-I infection(K)		7	0.0335 TNF,ETS2,HLA-B,HLA-C,TGFBR2,ITA,JUN
15	pertussis toxin-mediated cd3 signaling in macrophage(R)		2	0.0335 JUN,GNAQ
16	Allograft rejection(K)		3	0.0471 TNF,HLA-B,HLA-C
17	Toll-like Receptors Cascades(R)		5	0.0488 TLR2,TLR10,TLR6,JUN,LGMN
18	Fc gamma R-mediated phagocytosis(K)		4	0.0541 FCGR3A,PLD1,SCIN,FCGR2B
19	NF-kappa B signaling pathway(K)		4	0.0541 TNF,ITA,ITB,TNFRSF11A
20	TNFR2 non-canonical NF-kB pathway(R)		4	0.0739 TNF,ITA,ITB,TNFRSF11A
21	Toll-like receptor signaling pathway(K)		4	0.0854 TNF,TLR1,TLR6,JUN
22	Cholinergic synapse(K)		4	0.0909 KCNQ2,CAMK2B,GNAI3,GNAQ
23	Staphylococcus aureus infection(K)		3	0.0909 FCAR,FCGR3A,FCGR2B
24	mmu affect on macrophage differentiation(R)		2	0.0994 ETS2,JUN
25	Herpes simplex infection(K)		5	0.0994 TNF,HLA-B,HLA-C,ITA,JUN
26	Fc epsilon receptor I signaling in mast cells(K)		3	0.1034 KLRC1,JUN,FCGR2B
27	Endothelin(N)		3	0.1034 PTK2B,JUN,GNAQ
28	EPA receptor mediated events(N)		3	0.1034 PTK2B,JUN,GNAQ
29	BCR signaling pathway(K)		3	0.1089 PAG1,JUN,FCGR2B
30	Angiogenesis(P)		3	0.1089 PLD1,JUN,ANGPT2
31	Inks between pyk2 and map kinases(R)		2	0.1089 JUN,GNAQ
32	Endogenous TLR signaling(N)		2	0.1089 TLR1,TLR6
33	Leishmaniasis(K)		3	0.1089 TNF,FCGR3A,JUN
34	Interferon gamma signaling(R)		3	0.1299 HLA-B,HLA-C,CAMK2B
35	S1P2 pathway(N)		2	0.1299 JUN,GNAQ
36	Cell adhesion molecules (CAMs)(K)		4	0.1444 HLA-B,HLA-C,ICOS,CADM3

FIG. 2

	A	B	C	D
	GeneSet	Proteinfrom FDR		Nodes
2	Surfactant metabolism(R)	3	0.1283	PGA3,PGA5,PGA4
3	IL12 signaling mediated by STAT4(N)	3	0.1283	CD86,IFNG,JUN
4	Protein digestion and absorption(K)	4	0.1763	CO14A1,PGA3,PGA5,PGA4
5	Calcineurin-regulated NFAT-dependent transcription in lymphocytes(N)	3	0.1763	IFNG,PTPN1,JUN
6	Transcriptional misregulation in cancer(K)	5	0.1763	CD86,CEBPB,KLF3,NR4A3,ID2
7	Kaposi's sarcoma-associated herpesvirus infection(K)	5	0.1763	CD86,PREX1,PIK3C3,JUN,CLEC7B
8	IL2-mediated signaling events(N)	3	0.1763	IRS2,IFNG,JUN
9	Inflammatory bowel disease (IBD)(K)	3	0.209	IL22,IFNG,JUN
10	Interleukin-20 family signaling(R)	2	0.209	IL22,IL26
11	AP-1 transcription factor network(N)	3	0.209	IFNG,TGIF2,JUN
12	Inflammation mediated by chemokine and cytokine signaling pathway(P)	3	0.209	PREX1,VWF,IFNG
13	Growth hormone receptor signaling(R)	2	0.209	IRS2,PTPN1
14	Interferon gamma signaling(R)	3	0.209	IFNG,CD44,PTPN1
15	Regulation of nuclear beta catenin signaling and target gene transcription(N)	3	0.209	TGIF2,JUN,ID2
16	Calcium signaling in the CD4+ TCR pathway(N)	2	0.209	IFNG,JUN
17	Integrin signaling(R)	3	0.209	VWF,PTPN1
18	T cell activation(P)	3	0.209	CD86,PIK3C3,JUN
19	ECM-receptor interaction(K)	3	0.209	VWF,CO1A1,CD44
20	Osteopontin-mediated events(N)	2	0.209	CD44,JUN
21	EGF1 pathway(N)	2	0.209	IRS2,PTPN1
22	Rheumatoid arthritis(K)	3	0.209	CD86,IFNG,JUN
23	IL-17 signaling pathway(K)	3	0.209	IFNG,CEBPB,JUN
24	Signaling mediated by p38-alpha and p38-beta(N)	2	0.209	CEBPB,JUN
25	Platelet Aggregation (Plug Formation)(R)	2	0.209	VWF,PTPN1
26	Allograft rejection(K)	2	0.209	CD86,IFNG
27	Signaling events regulated by Ret tyrosine kinase(N)	2	0.209	IRS2,JUN
28	IFN-gamma pathway(K)	2	0.209	IFNG,CEBPB
29	Autophagy(K)	2	0.209	IFNG,PIK3C3
30	Graft-versus-host disease(K)	2	0.209	CD86,IFNG
31	Th17 cell differentiation(K)	3	0.209	IL22,IFNG,JUN
32	FOXA1 transcription factor network(N)	2	0.209	CEBPB,JUN
33	Type I diabetes mellitus(K)	2	0.209	CD86,IFNG
34	ILS-mediated signaling events(N)	2	0.209	CEBPB,JUN
35	Class A/1 (Rhodopsin-like receptors)(R)	5	0.209	GPR65,CAMK1G,P2RY12,P2RY13,AGTR

FIG. 3


Chromosomal DNA, kb
Chromosome Conformation Signature Juxtaposition
EpiSwitch™ Isolation
Restriction
Ligation
EpiSwitch™ Detection
Microarray Probe
PCR Primers
Restriction Site
site specific sequences
EpiSwitch™ marker

INTERNATIONAL SEARCH REPORT

International application No
PCT/GB2021/051356

A. CLASSIFICATION OF SUBJECT MATTER
INV. C12Q1/6883
ADD.

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)
C12Q

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)
EPO-Internal

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X Y	US 2018/274015 A1 (AKOULITCHEV ALEXANDRE [GB] ET AL) 27 September 2018 (2018-09-27) paragraphs [0060], [0085], [0193], [0451] - [0454]; tables 7a-7c,8a-8d -----	1-13 14-18
Y	WO 2019/086898 A2 (OXFORD BIODYNAMICS LTD [GB]) 9 May 2019 (2019-05-09) page 31; claim 16 -----	14-18
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[X] Further documents are listed in the continuation of Box C.

[X] 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	Date of mailing of the international search report
8 September 2021	20/09/2021

Name and mailing address of the ISA/	Authorized officer
European Patent Office, P.B. 5818 Patentlaan 2 NL - 2280 HV Rijswijk Tel. (+31-70) 340-2040, Fax: (+31-70) 340-3016	Knudsen, Henrik

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Form PCT/ISA/210 (second sheet) (April 2005)

INTERNATIONAL SEARCH REPORT

International application No.
PCT/GB2021/051356

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

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

   a. ☐ forming part of the international application as filed:

      ☐ in the form of an Annex C/ST.25 text file.

      ☐ on paper or in the form of an image file.

   b. ☐ furnished together with the international application under PCT Rule 13*ter*.1(a) for the purposes of international search only in the form of an Annex C/ST.25 text file.

   c. ☒ furnished subsequent to the international filing date for the purposes of international search only:

      ☒ in the form of an Annex C/ST.25 text file (Rule 13*ter*.1(a)).

      ☐ on paper or in the form of an image file (Rule 13*ter*.1(b) and Administrative Instructions, Section 713).

2. ☐ In addition, in the case that more than one version or copy of a sequence listing has been filed or furnished, the required statements that the information in the subsequent or additional copies is identical to that forming part of the application as filed or does not go beyond the application as filed, as appropriate, were furnished.

3. Additional comments:

C(Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT

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INTERNATIONAL SEARCH REPORT

International application No
PCT/GB2021/051356

C(Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
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INTERNATIONAL SEARCH REPORT

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PCT/GB2021/051356

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INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No
PCT/GB2021/051356

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