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STANDARD PATENT

I, Fatima Beattie, Commissioner of Patents, grant a Standard Patent with the following particulars:

Name and Address of Patentee:
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Names of Actual Inventors: Susan Weininger and Arthur M Weininger

Title of Invention: Method of detection of nucleic acids with a specific sequence composition

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F. BEATTIE
COMMISSIONER OF PATENTS

The claims defining the invention are as follows:

1. A probe nucleic acid (PNA) comprising:

(a) a single-stranded sequence, ½ target binding region (TBR), which is capable of forming, under hybridizing conditions, a hybrid, TBR, with a ½ TBR present in a target nucleic acid (TNA);

(b) a single-stranded sequence, ½ booster binding region (BBR), which is capable of forming, under hybridizing conditions, a hybrid, BBR, with about 0-10 ½ BBR present in a booster nucleic acid (BNA); and

(c) an optional support or attachment (OSA) selected from the group consisting of beads, polymers, peptides, surfaces, indicators, and combinations thereof;

wherein said TBR is capable of binding with high affinity to a target binding assembly (TBA), said TBA being a substance capable of discriminating between a paired TBR and a TBR having unpaired nucleotides, and further, wherein said BBR is capable of binding with high affinity to a booster binding assembly (BBA), said BBA being a substance capable of discriminating between a paired BBR and a BBR having unpaired nucleotides.

2. The PNA of claim 1 wherein the TBR is comprised of one or more recognition sites for a nucleic acid binding protein, a DNA binding protein, a DNA-RNA hybrid binding protein or an RNA binding protein.

3. The PNA of claim 2 wherein the TBR is a nucleic acid binding protein recognition site in the genome of a pathogen or is a binding site associated with a pathogenic condition in a vertebrate genome or is a nucleic acid binding protein recognition site present in the genome of an organism which contaminates a fermentation process.

4. The PNA of claim 3 wherein the TBR is the HIV-LTR or a portion thereof.

5. A method for detecting or localizing a specific TNA sequence, comprising the steps of:

(a) hybridizing said TNA with said PNA of claim 1;

(b) hybridizing said PNA with a BNA containing a ½ BBR whose sequence is complementary to a ½ BBR sequence in the PNA;

(c) adding the products of steps (a) and (b) containing a TBR and a BBR, to a surface, liquid or other medium containing a TBA;

(d) adding BBAs to the mixture in step (c) wherein said BBA comprises:

(i) a molecule or a portion of a molecule which is capable of selectively binding to a BBR;

(ii) a detectible indicator; and

(e) detecting signal produced by the indicator attached to the BBA.

6. The method of claim 5 wherein said indicator is a protein, including enzymes capable of catalyzing reactions leading to production of colored reaction products; a radionuclide; colored beads.

7. A probe nucleic acid, substantially as hereinbefore described with reference to any one of the examples.

8. A method for detecting or localizing a specific TNA sequence, substantially as hereinbefore described with reference to any one of the examples.

Dated 17 December, 2002
The Gene Pool, Inc.

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