primer comprises 28 to 29 bases, the concentration of the random primer is 6 to 10 microM; when the random primer comprises 30 bases, the concentration of the random primer is 6 microM; determining the nucleotide sequence of the obtained DNA fragments; and designing a DNA probe used for detecting a DNA fragment obtained in the above step on the basis of the nucleotide sequence of the DNA fragments, the DNA probe comprising a nucleotide sequence complementary to the nucleotide sequence the DNA fragment.

In another aspect, the present disclosure refers to a method for analyzing genomic DNA comprising steps of: conducting a nucleic acid amplification reaction with the use of the genomic DNA subjected to analysis and the random primer of claim 1 to obtain a DNA fragment; bringing the DNA probe produced by the method for producing a DNA probe as described herein into contact with the DNA fragment derived from the genomic DNA subjected to analysis; and detecting hybridization occurring between the DNA probe and the DNA fragment.

In another example, the present disclosure refers to an apparatus for DNA analysis comprising the DNA probe produced by the method for producing a DNA probe as described herein and a support comprising the DNA probe immobilized thereon.

The present invention includes the following.

(1) A method for producing a DNA probe comprising steps of: conducting a nucleic acid amplification reaction in a reaction solution containing genomic DNA and a random primer at a high concentration using genomic DNA as a template to obtain DNA fragments; determining the nucleotide sequences of the obtained DNA fragments; and designing a DNA probe used for detecting a DNA fragment obtained in the above step on the basis of the nucleotide sequences of such DNA fragments.

(2) The method for producing a DNA probe according to (1), wherein DNA fragments are obtained from a plurality of different genomic DNAs with the use of the random primers and, on the basis of the nucleotide sequences of the DNA fragments,

{CLAIMS}

{Claim 1}

A method for producing a DNA probe comprising steps of:

conducting a nucleic acid amplification reaction in a reaction solution containing genomic DNA and a random primer having 9-30 bases using genomic DNA as a template to obtain DNA fragments, wherein when the random primer comprises 9 to 10 bases, the concentration of the random primer is 40 to 60 microM; when the random primer comprises 10 to 14 bases, the concentration of the random primer satisfy the conditions defined by an inequation: $y > 3E + 08x^{-6.974}$ and be 100 microM or less, provided that the nucleotide length of the random primer is represented by "x" and the concentration of the random primer is represented by "y"; when the random primer comprises 14 to 18 bases, the concentration of the random primer is 4 to 100 microM; when the random primer comprises 18 to 28 bases, the concentration of such random primer be 4 microM or more and satisfy the conditions defined by an inequation: $y < 8E + 08x^{-5.533}$; when the random primer comprises 28 to 29 bases, the concentration of the random primer is 6 to 10 microM; when the random primer comprises 30 bases, the concentration of the random primer is 6 microM;

determining the nucleotide sequence of the obtained DNA fragments; and

designing a DNA probe used for detecting a DNA fragment obtained in the above step on the basis of the nucleotide sequence of the DNA fragments, the DNA probe comprising a nucleotide sequence complementary to the nucleotide sequence the DNA fragment.

{Claim 2}

The method for producing a DNA probe according to claim 1, wherein DNA fragments are obtained from a plurality of different genomic DNAs with the use of the random primers and, on the basis of the nucleotide sequence of the DNA fragments, the DNA probe containing regions different between the genomic DNAs is designed.

{Claim 3}

The method for producing a DNA probe according to claim 1, wherein the nucleotide sequence of the DNA fragment is compared with a known nucleotide sequence and the DNA probe containing a region different from that of the known nucleotide sequence is

designed.

{Claim 4}

The method for producing a DNA probe according to claim 1, wherein the DNA fragment contains100 to 500 nucleotides.

{Claim 5}

A method for analyzing genomic DNA comprising steps of: conducting a nucleic acid amplification reaction with the use of the genomic DNA subjected to analysis and the random primer of claim 1 to obtain a DNA fragment; bringing the DNA probe produced by the method for producing a DNA probe according to any one of claims 1 to 4 into contact with the DNA fragment derived from the genomic DNA subjected to analysis; and detecting hybridization occurring between the DNA probe and the DNA fragment.

{Claim 6}

The method for analyzing genomic DNA according to claim 5, wherein the DNA fragment derived from genomic DNA is a DNA marker and the presence or absence of the DNA marker is detected with the use of the DNA probe.