Claims

Claim 1

A method for producing a complex of an RNA molecule encoding a peptide and the peptide encoded by the RNA molecule,

said method comprising the steps of:

(i) producing the RNA molecule from a DNA molecule via transcription, the DNA molecule (a) containing a promoter region and a region that is located downstream of the promoter region and encodes the peptide and (b) containing at least one 2'-modified nucleoside derivative on a 5' end side of an antisense strand that is located most downstream

(ii) binding, to a 3' end of the RNA molecule obtained in the step (i), a peptide receptor molecule with use of a splint polynucleotide as an anchorage; and

(iii) performing, in an *in vitro* translation system containing substantially no RNA polymerase having an activity on the DNA molecule, translation of the RNA molecule, to which the peptide receptor molecule has been bound through the step (ii), to produce the complex in which the receptor molecule and the peptide encoded by the RNA molecule are linked via the peptide receptor molecule, wherein

purification of the RNA molecule obtained in the step (i) is not carried out prior to the step (ii) and purification of the RNA molecule

obtained through the step (ii) to which the peptide receptor molecule has been bounded is not carried out prior to the step (iii).

Claim 2

The method as set forth in claim 1, wherein the DNA molecule contains two consecutive 2'-modified nucleoside derivatives.

Claim 3

The method as set forth in claim 1 or 2, wherein the at least one 2'-modified nucleoside derivative is 2'-O-methylguanosine.

Claim 4

The method as set forth in any one of claims 1 through 3, wherein the peptide receptor molecule is puromycin.

Claim 5

The method as set forth in any one of claims 1 through 4, wherein

a plurality of different complexes of an RNA molecule and a peptide, are produced with use of a plurality of respective different DNA molecules, each of which is the DNA molecule.

Claim 6

An mRNA display method comprising the method as set forth in

any one of claims 1 through 5,

the mRNA display method further comprising the step of:

(iv) selecting a desired complex from among the complex of the RNA molecule and the peptide obtained in the step (iii).

Claim 7

The mRNA display method as set forth in claim 6, wherein

the *in vitro* translation system contains substantially no RNase, and

purification of the complex of the RNA molecule and the peptide obtained in the step (iii) is not carried out prior to the step (iv).

Claim 8

The mRNA display method as set forth in claim 6 or 7, wherein a cycle consisting of the steps (i) through (iv) is repeated a plurality of times.

Claim 9

A DNA library for use in the mRNA display method as set forth in any one of claims 6 through 8, comprising:

a plurality of different candidate DNA molecules,

each of the plurality of different candidate DNA molecules (i) containing a promoter region and a region that is located downstream

of the promoter region and encodes a candidate peptide and (ii) containing at least one 2'-modified nucleoside derivative on a 5' end side of an antisense strand that is located most downstream.

Claim 10

The DNA library as set forth in claim 9, comprising 10^{13} or more different candidate DNA molecules.