CLAIMS

1. A modified biotin-binding protein comprising an amino acid sequence represented by SEQ ID NO: 2, ~~an amino acid sequence having one or more amino acid mutations in the amino acid sequence of SEQ ID NO: 2,~~ or an amino acid sequence having an identity of not less than ~~80~~95% to the amino acid sequence of SEQ ID NO: 2 and having biotin-binding activity, ~~wherein~~ provided that the modified biotin-binding has an asparagine residue at position 115 of SEQ ID NO: 2 ~~is~~ replaced with cysteine~~,~~.

~~2. The modified biotin-binding protein according to Claim 1,~~ wherein the modified biotin-binding protein maintains biotin-binding activity of not less than 75% after a heat treatment at 99.9°C for 30 min, compared with that of before the treatment.

~~3~~2. The modified biotin-binding protein according to Claim 1 ~~or Claim 2~~, wherein the modified biotin-binding protein maintains biotin-binding activity of not less than 50% after a treatment in 60% aprotic polar organic solvent for 30 min, compared with that of before the treatment.

43. The modified biotin-binding protein according to Claim ~~3~~2, wherein the aprotic polar organic solvent is dimethyl sulfoxide.

~~5~~4. The modified biotin-binding protein according to any one of Claims 1 to 43, wherein the modified biotin-binding protein comprises an amino acid having an identity of not less than ~~90~~98% to the amino acid sequence of SEQ ID NO: 2.

~~6~~5. ~~The~~ A modified biotin-binding protein~~,~~ ~~wherein~~ comprising an amino acid sequence represented by SEQ ID NO: 2, provided that the modified biotin-binding protein has an asparagine residue at position 115 of SEQ ID NO: 2 ~~is~~ replaced with cysteine (TM2 N115C).

~~7~~6. A support to which the protein according to any one of Claims 1 to ~~6~~5 is immobilized.

~~8~~7. A nucleic acid encoding the protein according to any one of Claims 1 to ~~6~~5.

~~9~~8. A vector containing the nucleic acid according to Claim ~~8~~7.

~~10~~9. A method for separation, concentration, capture, purification, and/or detection of the protein according to any one of Claims 1 to ~~6~~5, which comprises the following steps:

1) heat-treating a sample containing the protein at a temperature of at least 90°C for

at least 10 min; and

2) collecting the protein which does not receive heat-denature in step 1) to thereby separate, concentrate, capture, or purify the protein, and/or detect the protein.

~~11~~10. A method for separation, concentration, capture, purification and/or detection of a biotin-linked substance, which comprises the following steps:

1) contacting the support according to Claim ~~7~~6 with a biotin-linked substance, whereby the biotin-linked substance is bound to the support;

2) washing off contaminants which are not bound to the support with a solution containing 60% to 80% of aprotic polar organic solvent; and

3) collecting the biotin-linked substance which is bound to the support to thereby separate, concentrate, capture or purify the substance and/or detect the substance.

~~12~~11. The method according to Claim ~~11~~10, wherein the aprotic polar organic solvent is dimethyl sulfoxide.