

What is claimed is:

1. A kit, which comprises a capture reagent, and the capture reagent is selected from an isolated polypeptide or variant thereof, wherein the isolated polypeptide is composed of 15~74 contiguous amino acid residues of a wild-type BNLF2b protein of Epstein-Barr virus (EBV), and comprises at least 2 sequences selected from the following: amino acid residues 5-11, amino acid residues 16-23, amino acid residues 31-39, or amino acid residues 53-60 with reference to amino acid positions set forth in SEQ ID NO: 101;

wherein the variant differs from the polypeptide from which it is derived only by one, two or three amino acid substitutions, and retains an activity of being recognized and bound by an anti-EBV antibody; and the variant does not comprise an amino acid substitution in amino acid positions corresponding to the following positions: 6, 9, 10, 11, 16, 31, 33, 38, 39, 53, 54, 56, 57, 58, 59, 95, 96, and 97 with reference to amino acid positions set forth in SEQ ID NO: 101.

2. The kit according to claim 1, wherein the wild-type BNLF2b protein of EBV has a sequence set forth in SEQ ID NO: 101.

3. The kit according to claim 1, wherein the isolated polypeptide comprises: amino acid residues 5-23, amino acid residues 16-39, amino acid residues 31-60, amino acid residues 5-39, amino acid residues 16-60, or amino acid residues 5-60 with reference to amino acid positions set forth in SEQ ID NO: 101.

4. The kit according to claim 1, wherein the isolated polypeptide comprises: amino acid residues 1-25, amino acid residues 14-52, amino acid residues 1-52, amino acid residues 14-74, amino acid residues 11-65, amino acid residues 11-74, or amino acid residues 1-74 with reference to amino acid positions set forth in SEQ ID NO: 101.

5. The kit according to claim 4, wherein the amino acid residues 1-25 have a sequence set forth in SEQ ID NO: 102; the amino acid residues 14-52 have a sequence set forth in SEQ ID NO: 88; the amino acid residues 1-52 have a sequence set forth in SEQ ID NO: 91; the amino acid residues 14-74 have a sequence set forth in SEQ ID NO: 90; the amino acid residues 11-65 have a sequence set forth in SEQ ID NO: 103; the amino acid residues 11-74 have a sequence set forth in SEQ ID NO: 104; the amino acid residues 1-74 have a sequence set forth in SEQ ID NO: 89.

6. The kit according to claim 1, wherein the isolated polypeptide consists of a sequence selected from the group consisting of amino acid residues 1-25, amino acid residues 14-52, amino acid residues 1-52, amino acid residues 14-74, amino acid residues 11-65, amino acid residue 11-74, or amino acid residues 1-74 with reference to amino acid positions set forth in SEQ ID NO: 101.

7. The kit according to claim 1, wherein the variant comprises an amino acid substitution at 1, 2, or 3 amino acid positions corresponding to the following positions: 5, 7, 8, 12, 13, 14, 15, 19, 22, 24, 25, 32, 34, 35, 36, 37, 40, 41, 42, 52, 55, 60, 61, 89, 91, 93 or 98 with reference to amino acid positions set forth in SEQ ID NO: 101.

8. The kit according to claim 1, wherein the variant comprises 1, 2, or 3 amino acid substitutions selected from the group consisting of: substitution of an amino acid at a position corresponding to position 5 with A, substitution of an amino acid at a position corresponding to position 7 with A, substitution of an amino acid at a position corresponding to position 8 with G, substitution of an amino acid at a position corresponding to position 12 with G, T, D or S, substitution of an amino acid at a position corresponding to position 13 with A, substitution of an amino acid at a position corresponding to position 14 with G, substitution of an amino acid at a position corresponding to position 15 with A, substitution of an amino acid at a position corresponding to position 22 with A, substitution of an amino acid at a position corresponding to position 24 with A, substitution of an amino acid at a position corresponding to position 25 with A, substitution of an amino acid at a position corresponding to position 32 with A, substitution of an amino acid at a position corresponding to position 34 with A, substitution of an amino acid at a position corresponding to position 35 with A, substitution of an amino acid at a position corresponding to position 36 with A, substitution of an amino acid at a position corresponding to position 37 with A, N, Q, S or R, substitution of an amino acid at a position corresponding to position 40 with A, substitution of an amino acid at a position corresponding to position 41 with A, substitution of an amino acid at a position corresponding to position 42 with A, substitution of an amino acid at a position corresponding to position 52 with K, H, A, S or D, substitution of an amino acid at a position corresponding to position 55 with S, substitution of an amino acid at a position corresponding to position 60 with A, substitution of an amino acid at a position corresponding to position 61 with K, H, S or A, substitution of an amino acid at a position corresponding to position 89 with A or T, substitution of an amino acid at a position corresponding

to position 91 with A, substitution of an amino acid at a position corresponding to position 93 with Q, substitution of an amino acid at a position corresponding to position 98 with A.

9. The kit according to claim 1, wherein the capture reagent is attached to a surface of a solid support, or has a modifying group capable of being attached to a solid support.

10. The kit according to claim 9, wherein the modifying group is biotin or avidin.

11. The kit according to claim 9, wherein the solid support is selected from the group consisting of magnetic bead or microtiter plate.

12. The kit according to any one of claims 1 to 11, which further comprises a detection reagent, wherein the detection reagent is selected from an isolated polypeptide or variant thereof bearing a detectable label; wherein the isolated polypeptide or variant thereof is defined in any one of claims 1-8.

13. The kit according to claim 12, wherein the detectable label is selected from the group consisting of enzyme, chemiluminescent reagent, fluorescent dye or biotin.

14. The kit according to any one of claims 1 to 13, which further comprises a detection reagent, wherein the detection reagent is selected from a secondary antibody bearing a detectable label.

15. The kit according to claim 14, wherein the detectable label is selected from the group consisting of enzyme, chemiluminescent reagent, fluorescent dye or biotin.

16. The kit according to claim 14, wherein the secondary antibody is specific to an antibody of a species from which the antibody to be detected is derived.

17. The kit according to claim 14, wherein the secondary antibody is anti-IgG antibody, anti-IgM antibody, or anti-IgA antibody.

18. The kit according to any one of claims 1 to 17, wherein the kit further comprises one or more reagents or devices selected from the group consisting of: (i) a device for collecting or storing the sample; (ii) an additional reagent required to perform the detection which is selected from buffer, diluent, blocking solution, and/or standard.

19. A method for determining whether a subject has nasopharyngeal cancer or is at risk for nasopharyngeal cancer, which comprises:

(1) determining a level of an antibody specific to wild-type BNLF2b protein of EBV in a blood sample from the subject by the following steps:

(1a) contacting the sample with a capture reagent to obtain an antigen-antibody immune complex; the capture reagent is selected from the isolated polypeptide or variant thereof as defined in any one of claims 1-8;

(1b) determining an amount of the antigen-antibody immune complex obtained in step (1a);
and,

(2) comparing the level to a reference value which can distinguish a subject with nasopharyngeal carcinoma from a healthy person.

20. The method according to claim 19, wherein the capture reagent is as defined in any one of claims 9-11.

21. The method according to claim 19, wherein, in step (1b), a detection reagent is used to detect the amount of the immune complex, and the detection reagent is selected from an isolated polypeptide or variant thereof bearing a detectable label, wherein the isolated polypeptide or variant thereof is defined in any one of claims 1-8.

22. The method according to claim 21, wherein the detectable label is selected from the group consisting of enzyme, chemiluminescent reagent, fluorescent dye or biotin.

23. The method according to claim 19, wherein, in step (1b), a detection reagent is used to detect the amount of the immune complex, and the detection reagent is selected from a secondary antibody bearing a detectable label.

24. The method according to claim 23, wherein the detectable label is selected from the group consisting of enzyme, chemiluminescent reagent, fluorescent dye or biotin.

25. The method according to claim 23, wherein the secondary antibody is specific to an antibody of a species from which the antibody to be detected is derived.

26. The method according to claim 23, wherein the secondary antibody is an anti-IgG antibody, anti-IgM antibody or anti-IgA antibody.

27. The method according to any one of claims 19 to 26, wherein the blood sample is a whole blood, a plasma or a serum.

28. The method according to any one of claims 19 to 27, wherein the subject is a human.

29. Use of a reagent capable of determining a level of an antibody specific to wild-type BNLF2b protein of EBV in the manufacture of a kit, wherein the kit is used for determining whether a subject has nasopharyngeal cancer or is at risk for nasopharyngeal cancer;

and wherein the reagent capable of determining the level of the antibody specific to wild-type BNLF2b protein of EBV comprises a capture reagent selected from the isolated polypeptide or variant thereof as defined in any one of claims 1-8.

30. The use according to claim 29, wherein the capture reagent is as defined in any one of claims 9-11.

31. The use according to claim 29, wherein the reagent capable of determining the level of the antibody specific to wild-type BNLF2b protein of EBV further comprises a detection reagent,

and the detection reagent is selected from an isolated polypeptide or variant thereof bearing a detectable label; wherein the isolated polypeptide or variant thereof is defined in any one of claims 1-8.

32. The use according to claim 31, wherein the detectable label is selected from the group consisting of enzyme, chemiluminescent reagent, fluorescent dye or biotin.

33. The use according to claim 29, wherein the reagent capable of determining the level of the antibody specific to wild-type BNLF2b protein of EBV further comprises a detection reagent, and the detection reagent is selected from a secondary antibody bearing a detectable label.

34. The use according to claim 33, wherein the detectable label is selected from the group consisting of enzyme, chemiluminescent reagent, fluorescent dye or biotin.

35. The use according to claim 33, wherein the secondary antibody is specific to the antibody of the species from which the antibody to be detected is derived.

36. The use according to claim 33, wherein the secondary antibody is anti-IgG antibody, anti-IgM antibody or anti-IgA antibody.

37. The use according to any one of claims 29 to 36, wherein the subject is a human.