

CLAIMS

1. A peptide that binds to a transferrin receptor,
wherein
the peptide is:
a peptide that comprises, as part of its amino acid
sequence, a 1st to 10th amino acid sequence of a peptide
or a peptide-linker conjugate having an amino acid sequence
set forth in any one of SEQ ID NOs: 1 to 157, 159 to 448,
and 450 to 552, and that constitutes a partial sequence of
a peptide having a cyclic structure formed by linkage
between an N-terminal residue and a C-terminal residue of a
peptide moiety consisting of an amino acid sequence set
forth in any one of SEQ ID NOs: 1 to 157 and 159 to 200; or
a peptide comprising a peptide moiety consisting of an
amino acid sequence in which a chloroacetyl group is added
to Ala or MeAla, being an N-terminal residue of a peptide
moiety consisting of an amino acid sequence set forth in
any one of SEQ ID NOs: 1 to 157 and 159 to 200,
wherein the peptide moiety forms a cyclic structure by
linkage between the N-terminal residue and Cys as a C-
terminal residue.
2. The peptide according to claim 1, wherein,
the peptide consists of
an amino acid sequence represented by any of SEQ ID

NOs: 2 to 157, and 159 to 200, and the peptide has a cyclic structure in which Ala or MeAla of an N-terminal residue is combined to Cys of a C-terminal residue, or,

the peptide consists of an amino acid sequence in which a chloroacetyl group is added to Ala or MeAla, being an N-terminal residue in an amino acid sequence represented by any of SEQ ID NOs: 2 to 157, and 159 to 200, and the peptide is to form a cyclic structure by combining the N-terminal residue and Cys, being a C-terminal residue.

3. The peptide according to claim 1, wherein

the peptide consists of an amino acid sequence represented by any of SEQ ID NOs: 2 to 157, and 159 to 200, and the peptide has a cyclic structure in which Ala or MeAla, being an N-terminal residue, is combined to Cys, being a C-terminal residue.

4. The peptide according to claim 1, wherein,

the peptide consists of an amino acid sequence represented by:

X¹-X²-X³-Val-X⁵-Asn-Tyr-X⁸-Ile-X¹⁰-X¹¹-Cys,

X¹ is Ala or MeAla,

X² is Val or Glu,

X³ is Phe, MeF3C or MeF,

X⁵ is Trp or MeW,

X⁸ is Tyr or F40me,

X¹⁰ is Ile or Val,

X¹¹ is Arg, Ser or Pro, and

1 to 3 amino acid residues may be inserted between X¹¹ and Cys of C-terminal.

5. The peptide according to claim 1, wherein the peptide is capable of passing through a blood-brain barrier.

6. The peptide according to claim 1, wherein the peptide has directivity to a muscle tissue.

7. The peptide according to claim 1, wherein the peptide has a cell-penetrating property.

8. A conjugate comprising the peptide according to claim 1, and a linker bound to said peptide.

9. A conjugate comprising the peptide according to claim 1, a linker bound to the peptide, and a substance bound to the linker.

10. The conjugate according to claim 9, wherein the substance is capable of passing through the blood-brain barrier.

11. The conjugate according to claim 9, wherein the linker has an amino acid length of from 1 to 15 and includes one or more glycine (Gly) or serine (Ser).

12. The conjugate according to claim 9, wherein an N-terminus of the linker is cysteine (Cys) that may be modified or lysine (Lys) that may be modified.

13. The conjugate according to claim 9, wherein the linker has an amino acid length of from 1 to 5 and includes

either one or both of D-configuration glutamic acid (de) and methylated glycine (MeG).

14. The conjugate according to claim 9, wherein the N-terminus of the linker is Cys that may be modified or lysine (Lys) that may be modified.

15. The conjugate according to claim 9, wherein the linker is a PEG linker including polyethylene glycol (PEG) or a derivative of polyethylene glycol.

16. The conjugate according to claim 15, wherein the PEG linker further includes glycine (Gly), serine (Ser), glutamic acid (Glu), arginine (Arg), or lysine (Lys).

17. The conjugate according to claim 15 or 16, wherein the N-terminus of the linker is cysteine (Cys) that may be modified or lysine (Lys) that may be modified.

18. The conjugate according to claim 9, wherein the linker has a sequence represented by any of SEQ ID NOs: 201 and 553 to 642.

19. The conjugate according to claim 9, wherein,
the linker is:
polyethylene glycol (PEG);
a G linker or a GS linker; or
a linker having an amino acid sequence represented by any of SEQ ID NOs: 201 and 553 to 644.

20. A preventive or therapeutic agent for brain-related disease comprising the conjugate according to claim 9,

wherein the substance is an active ingredient.

21. A method for producing the preventive or therapeutic agent for brain-related disease comprising a step of obtaining the conjugate according to claim 9.

22. The method according to claim 21, wherein,

the linker is:

polyethylene glycol (PEG);

the G linker or the GS linker; or

the linker having the amino acid sequence represented by any of SEQ ID NOs: 201 and 553 to 644.

23. A diagnostic agent for brain-related disease, comprising the conjugate according to claim 9.

24. The conjugate according to claim 9, having directivity to the muscle tissue.

25. A preventive or therapeutic agent for neuromuscular disease comprising the conjugate according to claim 9, wherein the substance is an active ingredient.

26. A diagnostic agent for neuromuscular disease comprising the conjugate according to claim 9.