

CLAIMS

1. An AAV capsid protein comprising at least 4 contiguous amino acids of an amino acid sequence set forth in any one of SEQ ID NO: 1-32 or at least 4 contiguous amino acids of an amino acid sequence set forth in any one of SEQ ID NO: 68-110.
2. The AAV capsid protein of claim 1, wherein the AAV capsid protein comprises serotype AAV1, AAV2, AAV3B, AAV5, AAV6, AAV8, AAV9, AAV3, AAV4, AAV7, AAV11, AAVrh10, AAVrh39, or AAVrh74.
3. The AAV capsid protein of claim 2, wherein the AAV capsid protein comprises serotype AAV2.
4. The AAV capsid protein of claim 3, wherein the AAV capsid comprises SEQ ID NO: 207.
5. The AAV capsid protein of claim 4, wherein the AAV capsid further comprises SEQ ID NO: 90.
6. The AAV capsid protein of claim 5, wherein SEQ ID NO: 90 is inserted into SEQ ID NO: 207 at a hypervariable and/or surface exposed loop of the AAV capsid protein.
7. The AAV capsid protein of claim 6, wherein the surface exposed loop comprises any of the VR-I, VR-II, VR-III, VR-IV, VR-V, VR-VI, VR-VII, VR-VIII and VR-IX regions of the capsid protein.
8. The AAV capsid protein of claim 6, wherein SEQ ID NO: 90 is inserted into SEQ ID NO: 207 at amino acid position 588.
9. The AAV capsid protein of claim 1, wherein the amino acid sequence is inserted into any of the VR-I, VR-II, VR-III, VR-IV, VR-V, VR-VI, VR-VII, VR-VIII and VR-IX regions of the capsid protein.

10. The AAV capsid protein of claim 1, wherein the amino acid sequence is inserted to any one or more of the VP1, VP2, and VP3 capsid proteins.
11. The AAV capsid of claim 2, wherein SEQ ID NO: 90 is inserted into any one of the serotypes AAV1, AAV3B, AAV5, AAV6, AAV8, AAV9, AAV3, AAV4, AAV7, AAV11, AAVrh10, AAVrh39, and AAVrh74.
12. The AAV capsid of claim 11, wherein AAV1 comprises SEQ ID NO: 206, and wherein SEQ ID NO: 90 is inserted into serotype AAV1 at amino acid position 590.
13. The AAV capsid of claim 11, wherein AAV3b comprises SEQ ID NO: 208, and wherein SEQ ID NO: 90 is inserted into serotype AAV3b at amino acid position 589.
14. The AAV capsid of claim 11, wherein AAV5 comprises SEQ ID NO: 209, and wherein SEQ ID NO: 90 is inserted into serotype AAV5 at amino acid position 578.
15. The AAV capsid of claim 11, wherein AAV6 comprises SEQ ID NO: 210, and wherein SEQ ID NO: 90 is inserted into AAV6 serotype at amino acid position 454 or 590.
16. The AAV capsid protein of claim 11, wherein AAV8 comprises SEQ ID NO: 211, and wherein SEQ ID NO: 90 is inserted into AAV8 serotype at amino acid position 591.
17. The AAV capsid protein of claim 11, wherein AAV9 comprises SEQ ID NO: 212, and wherein SEQ ID NO: 90 is inserted into any one of amino acid positions 266, 455, or 589.
18. The AAV capsid of claim 3, wherein SEQ ID NO: 90 is inserted into serotype AAV2.
19. An AAV capsid protein, comprising an amino acid sequence set forth in any one of SEQ ID NO: 1-32 or in any one of SEQ ID NO: 68-110, wherein the amino acid sequence

is inserted into the AAV capsid protein between amino acid positions 450 and 600.

20. The AAV capsid protein of claim 19, wherein the amino acid sequence is inserted into the AAV capsid protein at amino acid position 588.

21. The AAV capsid protein of claim 19, wherein the amino acid sequence comprises SEQ ID NO: 90.

22. The AAV capsid protein of claim 19, wherein the AAV capsid protein comprises serotype AAV1, AAV2, AAV3B, AAV5, AAV6, AAV8, AAV9, AAV3, AAV4, AAV7, AAV11, AAVrh10, AAVrh39, or AAVrh74.

23. An AAV capsid protein, comprising an amino acid sequence set forth in any one of SEQ ID NO: 1-32 or in any one of SEQ ID NO: 68-110, wherein the amino acid sequence is inserted into the AAV capsid protein at amino acid position 266, 454, 455, 578, 588, 589, 590, or 591.

24. The AAV capsid protein of claim 23, wherein the amino acid sequence comprises SEQ ID NO: 90.

25. The AAV capsid protein of claim 23, wherein the AAV capsid protein comprises serotype AAV1, AAV2, AAV3B, AAV5, AAV6, AAV8, AAV9, AAV3, AAV4, AAV7, AAV11, AAVrh10, AAVrh39, or AAVrh74.