CLAIMS

1. A chimeric receptor comprising from N-terminal to C-terminal direction:

   an amyloid-reactive peptide;

   an extracellular domain;

   a transmembrane domain; and

   a cytoplasmic domain, wherein the cytoplasmic domain comprises a signaling domain.

2. The chimeric receptor of claim 1, wherein the extracellular domain comprises an antibody CH2 domain or fragment thereof.

3. The chimeric receptor of claim 2, wherein the antibody CH2 domain comprises an amino acid sequence having at least 80, 85, 90, 95, 97, 98, or 99% sequence identity to the amino acid sequence set forth in SEQ ID NO:33.

4. The chimeric receptor of any one of claims 1-3, wherein the amyloid-reactive peptide comprises the sequence set forth in any one of SEQ ID NOs:1-18.

5. The chimeric receptor of any one of claims 1-4, wherein the amyloid-reactive peptide comprises the sequence set forth in any one of SEQ ID NOs: 1, 2, 17, and 18.

6. The chimeric receptor of any one of claims 2-5, wherein the amyloid reactive peptide is joined directly or indirectly via a spacer to the antibody CH2 domain or fragment thereof.

7. The chimeric receptor of any one of claims 2-6, wherein the antibody CH2 domain or fragment thereof is joined directly or indirectly via a spacer to the transmembrane domain.

8. A chimeric receptor comprising from N-terminal to C-terminal direction:

   an extracellular domain comprising an antibody or antigen binding fragment thereof;
   a transmembrane domain; and

   a cytoplasmic domain, wherein the cytoplasmic domain comprises a signaling domain.

9. The chimeric receptor of claim 8, wherein the antibody fragment is an scFv.

10. The chimeric receptor of claim 8 or claim 9, wherein the antibody comprises a VL comprising a CDRL1, a CDRL2, and an CDRL3 and a VH comprising a CDRH1, a CDRH2, and a CDRH3, wherein:

    the CDRL1 comprises the amino acid sequence set forth in SEQ ID NO:24;

    the CDRL2 comprises the amino acid sequence set forth in SEQ ID NO:25;

    the CDRL3 comprises the amino acid sequence set forth in SEQ ID NO:26;

the CDRH1 comprises the amino acid sequence set forth in SEQ ID NO:21;

the CDRH2 comprises the amino acid sequence set forth in SEQ ID NO:22; and

the CDRH3 comprises the amino acid sequence set forth in SEQ ID NO:23.

11. The chimeric receptor of any one of claims 8-10, wherein the antibody comprises a VL comprising the amino acid sequence set forth in SEQ ID NOs:19 or 34 and a VH comprising the amino acid sequence set forth in SEQ ID NOs:20 or 35.

12. The chimeric receptor of claim 8, wherein the extracellular domain comprises an 11-1F4 antibody fragment.

13. The chimeric receptor of any one of claims 8-12, wherein the antibody or antigen-binding fragment thereof is humanized.

14. The chimeric receptor of any one of claims 1-13, wherein the cytoplasmic domain comprises a cytoplasmic domain I, cytoplasmic domain II, or functional fragment thereof.

15. The chimeric receptor of claim 14, wherein the cytoplasmic domain comprises an amino acid sequence having at least 80, 85, 90, 95, 97, 98, or 99% sequence identity to the amino acid sequence set forth in any one of SEQ ID NOs: 30, 31, 41, 42, and 45.

16. The chimeric receptor of any one of claims 1-15, wherein binding of an amyloid to the amyloid reactive peptide or the extracellular domain comprising an antibody or antigen binding fragment thereof activates the cytoplasmic domain of the chimeric receptor.

17. The chimeric receptor of any one of claims 1-7 and 14-16, wherein the chimeric receptor comprises an amino acid sequence having at least 80, 85, 90, 95, 97, 98, or 99% sequence identity to the amino acid sequence set forth in any one of SEQ ID NOs: 43, 52 and 53.

18. Nucleic acid(s) encoding the chimeric receptor of any one of claims 1-17.

19. An engineered cell comprising the nucleic acid(s) of claim 18.

20. An engineered cell expressing the chimeric receptor of any one of claims 1-17.

21. The engineered cell of claim 20, wherein the engineered cell is a macrophage or a monocyte, or a dendritic cell.

22. The chimeric receptor of any one of claims 1-17 or the engineered cell of any one of claims 19-21 for use in removing an amyloid, wherein an amyloid deposit is to be contacted with the chimeric receptor or the engineered cell.

23. The chimeric receptor or the engineered cell for use of claim 22, wherein the amyloid deposit is AA, AL, AH, ATTR, Aß2M, Wild type TTR, AApoAI, AApoAII, AGel, ALys, ALect2, Afib, ACys, ACal, AMedin, AIAPP, APro, AIns, APrP, Aβ, α-synuclein (AαSyn), tau (ATau), atrial natriuretic factor (AANF), IAAP, ALk4, or All1.

24. The chimeric receptor or the engineered cell for use of claim 22 or claim 23, wherein the amyloid-reactive peptide of the chimeric receptor has binding affinity to the amyloid deposit.

25. The chimeric receptor or the engineered cell for use of any one of claims 22-24, wherein contacting the amyloid deposit with the chimeric receptor results in at least partial clearance of the amyloid.

26. Use of the chimeric receptor of any one of claims 1-17 or the engineered cell of any one of claims 19-21 in the manufacture of a medicament for treating an amyloid disorder in a subject.

27. The use of claim 26, wherein a macrophage or monocyte expressing the chimeric receptor is to be administered to the subject.

28. The use of claim 26 or claim 27, wherein the amyloid disorder is systemic amyloidosis.

29. The use of claim 26 or claim 27, wherein the amyloid disorder is AA, AL, AH, ATTR, Aß2M, Wild type TTR, AApoAI, AApoAII, AGel, ALys, ALect2, Afib, ACys, ACal, AMedin, AIAPP, APro, AIns, APrP, Aβ, α-synuclein (AαSyn), tau (ATau), atrial natriuretic factor (AANF), IAAP, ALκ4, or Alλ1 amyloidosis.

30. The use of any of claims 26-29, wherein the subject has AA, AL, ATTR, or ALect2 amyloidosis.

31. The use of any one of claims 26-30, wherein the subject is a human.