

WHAT IS CLAIMED IS:

1. A single-chain chimeric polypeptide, wherein the single-chain chimeric polypeptide comprises:
 - a transmembrane domain; and
 - a hormone receptor ligand binding domain;
 - wherein:
 - the transmembrane domain and the hormone receptor ligand binding domain directly abut each other or are separated by 1 to 500 amino acids; and
 - the transmembrane domain and the hormone receptor ligand binding domain are not both present in the same endogenous single-chain polypeptide in a mammal;
 - and wherein the hormone receptor ligand binding domain is a ligand binding domain of a steroid receptor.
2. A nucleic acid comprising a nucleotide sequence encoding the single-chain chimeric polypeptide of claim 1.
3. A vector comprising the nucleic acid of claim 2.
4. An isolated cell comprising the vector of claim 3.
5. A single-chain chimeric polypeptide, wherein the single-chain chimeric polypeptide comprises:
 - an extracellular hormone receptor ligand binding domain; and
 - a transmembrane domain,
 - wherein:
 - the hormone receptor ligand binding domain and the extracellular transmembrane domain directly abut each other or are separated by 1 to 700 amino acids; and
 - the transmembrane domain and the extracellular hormone receptor ligand binding domain are not both present in a single endogenous single-chain polypeptide in a mammal; and

wherein the extracellular hormone receptor ligand binding domain is a ligand binding domain of a steroid receptor.

6. A nucleic acid comprising a nucleotide sequence encoding the single-chain chimeric polypeptide of claim 5.

7. A vector comprising the nucleic acid of claim 6.

8. An isolated cell comprising the vector of claim 7.

9. The single-chain chimeric polypeptide of claim 1, wherein the transmembrane domain is a domain from: α chain of a T cell receptor, β chain of a T cell receptor, ζ chain of a T cell receptor, CD28, CD3 ϵ , CD3 δ , CD3 γ , CD33, CD37, CD64, CD80, CD45, CD4, CD5, CD8 α , CD9, CD16, CD22, CD86, CD134, CD137, or CD154.

10. The single-chain chimeric polypeptide of claim 1, wherein the hormone receptor ligand binding domain is a ligand binding domain from an estrogen receptor, a progesterone receptor, or an androgen receptor.

11. The single-chain chimeric polypeptide of claim 10, wherein the hormone receptor ligand binding domain is a ligand binding domain from an estrogen receptor.

12. The single-chain chimeric polypeptide of claim 1, wherein the transmembrane domain and the hormone receptor ligand binding domain directly abut each other.

13. The single-chain chimeric polypeptide of claim 1, wherein the transmembrane domain and the hormone receptor ligand binding domain are separated by 1 to 500 amino acids.

14. The single-chain chimeric polypeptide of claim 13, wherein the transmembrane domain and the hormone receptor ligand binding domain are separated by 1 to 250 amino acids.

15. The single-chain chimeric polypeptide of claim 14, wherein the transmembrane domain and the hormone receptor ligand binding domain are separated by 1 to 50 amino acids.

16. The single-chain chimeric polypeptide of claim 5, wherein the transmembrane domain is a domain from: α chain of a T cell receptor, β chain of a T cell receptor, ζ chain of a T cell receptor, CD28, CD3 ϵ , CD3 δ , CD3 γ , CD33, CD37, CD64, CD80, CD45, CD4, CD5, CD8 α , CD9, CD16, CD22, CD86, CD134, CD137, or CD154.

17. The single-chain chimeric polypeptide of claim 5, wherein the extracellular hormone receptor ligand binding domain is a ligand binding domain from an estrogen receptor, a progesterone receptor, or an androgen receptor.

18. The single-chain chimeric polypeptide of claim 17, wherein the extracellular hormone receptor ligand binding domain is a ligand binding domain from an estrogen receptor.

19. The single-chain chimeric polypeptide of claim 5, wherein the extracellular hormone receptor ligand binding domain is a ligand binding domain from an estrogen receptor.

20. The single-chain chimeric polypeptide of claim 19, wherein the extracellular hormone receptor ligand binding domain is a ligand binding domain from a human estrogen receptor.

21. The single-chain chimeric polypeptide of claim 20, wherein the ligand binding domain of the human estrogen receptor has a wildtype sequence, except that the ligand

binding domain comprises one or both of a substitution at amino acid position 521 and a substitution at amino acid position 537, each numbered relative to the full-length wildtype sequence of human hormone receptor.

22. The single-chain chimeric polypeptide of claim 5, wherein the extracellular hormone receptor ligand binding domain and the transmembrane domain directly abut each other.

23. The single-chain chimeric polypeptide of claim 22, wherein the extracellular hormone receptor ligand binding domain and the transmembrane domain are separated by 1 to 700 amino acids.

24. The single-chain chimeric polypeptide of claim 23, wherein the extracellular hormone receptor ligand binding domain and the transmembrane domain are separated by 1 to 500 amino acids.

25. The single-chain chimeric polypeptide of claim 24, wherein the extracellular hormone receptor ligand binding domain and the transmembrane domain are separated by 1 to 250 amino acids.

26. The single-chain chimeric polypeptide of claim 25, wherein the extracellular hormone receptor ligand binding domain and the transmembrane domain are separated by 1 to 100 amino acids.

27. The single-chain chimeric polypeptide of claim 26, wherein the extracellular hormone receptor ligand binding domain and the transmembrane domain are separated by 1 to 50 amino acids.

28. The single-chain chimeric polypeptide of claim 27, wherein the extracellular hormone receptor ligand binding domain and the transmembrane domain are separated by 1 to 25 amino acids.

29. The single-chain chimeric polypeptide of claim 5, wherein, when going in the N-terminal to C-terminal direction, the single-chain chimeric polypeptide comprises an extracellular antigen-binding domain, the extracellular hormone receptor ligand binding domain, and the transmembrane domain.

30. The single-chain chimeric polypeptide of claim 5, wherein, when going in the C-terminal to N-terminal direction, the single-chain chimeric polypeptide comprises an extracellular antigen-binding domain, the extracellular hormone receptor ligand binding domain, and the transmembrane domain.

31. The single-chain chimeric polypeptide of claim 5, wherein, when going in the N-terminal to C-terminal direction, the single-chain chimeric polypeptide comprises the extracellular hormone receptor ligand binding domain, an extracellular antigen-binding domain, and the transmembrane domain.

32. The single-chain chimeric polypeptide of claim 5, wherein, when going in the C-terminal to N-terminal direction, the single-chain chimeric polypeptide comprises the extracellular hormone receptor ligand binding domain, an extracellular antigen-binding domain, and the transmembrane domain.