

CLAIMS

The invention claimed is:

1. A compound comprising a structure of:
VHH-L₁-A-L₂-B,
VHH-L₁-B-L₂-A,
A-L₂-B-L₁-VHH, or
B-L₂-A-L₁-VHH,
wherein VHH comprises an amino acid sequence selected from the group consisting of SEQ ID NOS:10, 11, 12 and 13 or a sequence having at least 90% sequence similarity thereto,
wherein A is a relaxin A chain comprising an amino acid sequence selected from the group consisting of SEQ ID NOS:2, 5 and 8 or a sequence having at least 90% sequence similarity thereto,
wherein B is a relaxin B chain comprising an amino acid sequence selected from the group consisting of SEQ ID NOS:3, 6 and 9 or a sequence having at least 90% sequence similarity thereto,
wherein L₁ is a first linker comprising an amino acid sequence selected from the group consisting of (GGGGQ)_n (SEQ ID NO:14), (PGPQ)_n (SEQ ID NO:17) and (PGPA)_n (SEQ ID NO:18), and wherein n can be from 1 to 10, and
wherein L₂ is a second linker comprising an amino acid sequence selected from the group consisting of SEQ ID NOS:22, 23 and 67; or
a pharmaceutically acceptable salt thereof.
2. The compound of Claim 1, wherein A is SEQ ID NO:2.
3. The compound of Claims 1 or 2, wherein B is SEQ ID NO:3.
4. The compound of Claim 1, wherein A is SEQ ID NO:5.
5. The compound of Claims 1 or 2, wherein B is SEQ ID NO:6.

6. The compound of Claim 1, wherein A is SEQ ID NO:5 and lacks the first four amino acids (desA1-4).
7. The compound of Claim 1, wherein B is SEQ ID NO:6 and lacks the first amino acid (desB1).
8. The compound of Claim 1, wherein A is SEQ ID NO:5 and lacks the first four amino acids (desA1-4), and wherein B is SEQ ID NO:6 and lacks the first amino acid (desB1).
9. The compound of Claim 1, wherein A is SEQ ID NO:8.
10. The compound of Claims 1 or 2, wherein B is SEQ ID NO:9.
11. The compound of any one of Claims 1 to 10, wherein L₁ is SEQ ID NO:19.
12. The compound of any one of Claims 1 to 10, wherein L₁ is SEQ ID NO:20.
13. The compound of any one of Claims 1 to 10, wherein L₁ is SEQ ID NO:21.
14. A compound comprising an amino acid sequence selected from the group consisting of SEQ ID NOS:24 to 39 or a sequence having at least 90% sequence similarity thereto or a pharmaceutically acceptable salt thereof.
15. A compound consisting essentially of an amino acid sequence selected from the group consisting of SEQ ID NOS:24 to 39 or a sequence having at least 90% sequence similarity thereto or a pharmaceutically acceptable salt thereof.
16. A compound consisting of an amino acid sequence selected from the group consisting of SEQ ID NOS:24 to 39 or a sequence having at least 90% sequence similarity thereto or a pharmaceutically acceptable salt thereof.

17. A pharmaceutical composition comprising:
a compound of any one of Claims 1 to 16 or a pharmaceutically acceptable salt thereof; and
a pharmaceutically acceptable buffer.
18. A method of treating cardiac, pulmonary and/or renal conditions, diseases and/or disorders in an individual, the method comprising the step of:
administering to the individual an effective amount of a compound of any one of Claims 1 to 16 or a pharmaceutical composition of Claim 17.
19. A compound of any one of Claims 1 to 16 for use in a therapy.
20. A compound of any one of Claims 1 to 16 for use in treating cardiac, pulmonary and/or renal conditions, diseases and/or disorders.
21. Use of a compound of any one of Claims 1 to 16 for manufacturing a medicament for treating cardiac, pulmonary and/or renal conditions, diseases and/or disorders.
22. A compound comprising an amino acid sequence of EVQLLES GGGLVQPGGSLRLSCAASGRYIDETAVAWFRQAPGKEREFVAGIGGGVDITYYADSVKGRFTISRDN SKNTLYLQMNSLRPEDTAVYYCAARPGRPLITSKVADLYPYWGQGTLVTVSS (SEQ ID NO:10) or a sequence having at least 90% sequence similarity thereto.
23. A compound comprising an amino acid sequence of EVQLLES GGGLVQPGGSLRLSCAASGRYIDETAVAWFRQAPGKEREFVAGIGGGVDITYYADSVKGRFTISRDN SKNTLYLQMNSLRPEDTAVYYCAARPGRPLITSKVADLYPYWGQGTLVTVSSPP (SEQ ID NO:11) or a sequence having at least 90% sequence similarity thereto.

24. A compound comprising an amino acid sequence of EVQLLES GGGLVQPGGSLRLSCAASGRYIDETAVAWFRQAPGKGREFVAGIGGG VDITYYADSVKGRFTISRDN SKNTLYLQMNSLRPEDTAVYYCAARPGRPLITSKV ADLYPYWGQGTLVTVSS (SEQ ID NO:12) or a sequence having at least 90% sequence similarity thereto.

25. A compound comprising an amino acid sequence of EVQLLES GGGLVQPGGSLRLSCAASGRYIDETAVAWFRQAPGKGREFVAGIGGG VDITYYADSVKGRFTISRDN SKNTLYLQMNSLRPEDTAVYYCAARPGRPLITSKV ADLYPYWGQGTLVTVSSPP (SEQ ID NO:13) or a sequence having at least 90% sequence similarity thereto.

26. A compound comprising an amino acid sequence of EVQLLES GGGLVQPGGSLRLSCAASGRTVSSTAVAWFRQAPGKERE FVAGIGGS VDITYYADSVKGRFTISRDN SKNTLYLQMNSLRPEDTAVYYCAVRPGRPLITSRD ANLYDYWGQGTLVTVSS (SEQ ID NO:45) or a sequence having at least 90% sequence similarity thereto.

27. A compound comprising an amino acid sequence of EVQLLES GGGLVQPGGSLRLSCAASGRYIDSTAVAWFRQAPGKERE FVAGIGGG VDITYYADSVKGRFTISRDN SKNTLYLQMNSLRPEDTAVYYCAARPGRPLITSRV ANLYPYWGQGTLVTVSS (SEQ ID NO:46) or a sequence having at least 90% sequence similarity thereto.

28. A compound comprising an amino acid sequence of EVQLLES GGGLVQPGGSLRLSCAASYRYIDETAVAWFRQAPGKERE FVAGIGGG VDITYYADSVKGRFTISRDN SKNTLYLQMNSLRPEDTAVYYCAARPGRPLITSKV ADLYPYWGQGTLVTVSS (SEQ ID NO:47) or a sequence having at least 90% sequence similarity thereto.

29. A compound comprising an amino acid sequence of EVQLLESGGGLVQPGGSLRLSCAASGAYIDETAVAWFRQAPGKEREFVAGIGGG VDITYYADSVKGRFTISRDN SKNTLYLQMNSLRPEDTAVYYCAARPGRPLITSKV ADLYPYWGQGTLVTVSS (SEQ ID NO:48) or a sequence having at least 90% sequence similarity thereto.

30. A compound comprising an amino acid sequence of EVQLLESGGGLVQPGGSLRLSCAASGRYIDETAVAWFRQAPGKEREFVAGIGGG VDETYYADSVKGRFTISRDN SKNTLYLQMNSLRPEDTAVYYCAARPGRPLITSKV ADLYPYWGQGTLVTVSS (SEQ ID NO:49) or a sequence having at least 90% sequence similarity thereto.

31. A compound comprising an amino acid sequence of EVQLLESGGGLVQPGGSLRLSCAASGRYIDETAVAWFRQAPGKEREFVAGIGGG VDQTYYADSVKGRFTISRDN SKNTLYLQMNSLRPEDTAVYYCAARPGRPLITSKV VADLYPYWGQGTLVTVSS (SEQ ID NO:50) or a sequence having at least 90% sequence similarity thereto.

32. A compound comprising an amino acid sequence of EVQLLESGGGLVQPGGSLRLSCAASGRYIDETAVAWFRQAPGKEREFVAGIGGG VDITAYADSVKGRFTISRDN SKNTLYLQMNSLRPEDTAVYYCAARPGRPLITSKV ADLYPYWGQGTLVTVSS (SEQ ID NO:51) or a sequence having at least 90% sequence similarity thereto.

33. A compound comprising an amino acid sequence of EVQLLESGGGLVQPGGSLRLSCAASGRYIDETAVAWFRQAPGKEREFVAGIGGG VDITEYADSVKGRFTISRDN SKNTLYLQMNSLRPEDTAVYYCAARPGRPLITSKV ADLYPYWGQGTLVTVSS (SEQ ID NO:52) or a sequence having at least 90% sequence similarity thereto.

34. A compound comprising an amino acid sequence of EVQLLESGGGLVQPGGSLRLSCAASGRYIDETAVAWFRQAPGKEREFVAGIGGGVDITQYADSVKGRFTISRDN SKNTLYLQMNSLRPEDTAVYYCAARPGRPLITSKVADLYPYWGQGTLVTVSS (SEQ ID NO:53) or a sequence having at least 90% sequence similarity thereto.

35. A compound comprising an amino acid sequence of EVQLLESGGGLVQPGGSLRLSCAASGRYIDETAVAWFRQAPGKEREFVAGIGGGVDITSYADSVKGRFTISRDN SKNTLYLQMNSLRPEDTAVYYCAARPGRPLITSKVADLYPYWGQGTLVTVSS (SEQ ID NO:54) or a sequence having at least 90% sequence similarity thereto.

36. A compound comprising an amino acid sequence of EVQLLESGGGLVQPGGSLRLSCAASGRYIDETAVAWFRQAPGKEREFVAGIGGGVDITTYADSVKGRFTISRDN SKNTLYLQMNSLRPEDTAVYYCAARPGRPLITSKVADLYPYWGQGTLVTVSS (SEQ ID NO:55) or a sequence having at least 90% sequence similarity thereto.

37. A compound comprising an amino acid sequence of EVQLLESGGGLVQPGGSLRLSCAASGRYIDETAVAWFRQAPGKEREFVAGIGGGVDITYYADSVKGRFTISRDN SKNTLYLQMNSLRPEDTAVYYCAARPGKPLITSKVADLYPYWGQGTLVTVSS (SEQ ID NO:56) or a sequence having at least 90% sequence similarity thereto.

38. A compound comprising an amino acid sequence of EVQLLESGGGLVQPGGSLRLSCAASGRYIDETAVAWFRQAPGKEREFVAGIGGGVDITYYADSVKGRFTISRDN SKNTLYLQMNSLRPEDTAVYYCAARPGQPLITSKVADLYPYWGQGTLVTVSS (SEQ ID NO:57) or a sequence having at least 90% sequence similarity thereto.

39. A compound comprising an amino acid sequence of EVQLLESGGGLVQPGGSLRLSCAASGRYIDETAVAWFRQAPGKEREVAGIGGGVDITYYADSVKGRFTISRDN SKNTLYLQMNSLRPEDTAVYYCAARPGSPLITSKVADLYPYWGQGTLVTVSS (SEQ ID NO:58) or a sequence having at least 90% sequence similarity thereto.

40. A compound comprising an amino acid sequence of EVQLLESGGGLVQPGGSLRLSCAASGRYIDETAVAWFRQAPGKEREVAGIGGGVDITYYADSVKGRFTISRDN SKNTLYLQMNSLRPEDTAVYYCAARPGRELITSKVADLYPYWGQGTLVTVSS (SEQ ID NO:59) or a sequence having at least 90% sequence similarity thereto.

41. A compound comprising an amino acid sequence of EVQLLESGGGLVQPGGSLRLSCAASGRYIDETAVAWFRQAPGKEREVAGIGGGVDITYYADSVKGRFTISRDN SKNTLYLQMNSLRPEDTAVYYCAARPGRLITSKVADLYPYWGQGTLVTVSS (SEQ ID NO:60) or a sequence having at least 90% sequence similarity thereto.

42. A compound comprising an amino acid sequence of EVQLLESGGGLVQPGGSLRLSCAASGRYIDETAVAWFRQAPGKEREVAGIGGGVDITYYADSVKGRFTISRDN SKNTLYLQMNSLRPEDTAVYYCAARPGRSLITSKVADLYPYWGQGTLVTVSS (SEQ ID NO:61) or a sequence having at least 90% sequence similarity thereto.

43. A compound comprising an amino acid sequence of EVQLLESGGGLVQPGGSLRLSCAASGRYIDETAVAWFRQAPGKEREVAGIGGGVDITYYADSVKGRFTISRDN SKNTLYLQMNSLRPEDTAVYYCAARPGRPEITSKVADLYPYWGQGTLVTVSS (SEQ ID NO:62) or a sequence having at least 90% sequence similarity thereto.

44. A compound comprising an amino acid sequence of EVQLLES GGGLVQPGGSLRLSCAASGRYIDETAVAWFRQAPGKEREFVAGIGGG VDITYYADSVKGRFTISRDN SKNTLYLQMNSLRPEDTAVYYCAARPGRPGITSKV ADLYPYWGQGTLVTVSS (SEQ ID NO:63) or a sequence having at least 90% sequence similarity thereto.

45. A compound comprising an amino acid sequence of EVQLLES GGGLVQPGGSLRLSCAASGRYIDETAVAWFRQAPGKEREFVAGIGGG VDITYYADSVKGRFTISRDN SKNTLYLQMNSLRPEDTAVYYCAARPGRPQITSKV ADLYPYWGQGTLVTVSS (SEQ ID NO:64) or a sequence having at least 90% sequence similarity thereto.

46. A compound comprising an amino acid sequence of EVQLLES GGGLVQPGGSLRLSCAASGRYIDETAVAWFRQAPGKEREFVAGIGGG VDITYYADSVKGRFTISRDN SKNTLYLQMNSLRPEDTAVYYCAARPGRPTITSKV ADLYPYWGQGTLVTVSS (SEQ ID NO:65) or a sequence having at least 90% sequence similarity thereto.

47. A compound comprising an amino acid sequence of EVQLLES GGGLVQPGGSLRLSCAASGRYIDETAVAWFRQAPGKEREFVAGIGGG VDITYYADSVKGRFTISRDN SKNTLYLQMNSLRPEDTAVYYCAARPGRPLITEKV ADLYPYWGQGTLVTVSS (SEQ ID NO:66) or a sequence having at least 90% sequence similarity thereto.