

## **WHAT IS CLAIMED IS:**

1. A fusion protein comprising a nanocage monomer or a subunit thereof linked to a DR4 and/or DR5 antigen-binding moiety, wherein a plurality of the fusion proteins self-assemble to form a nanocage.
2. The fusion protein of claim 1, wherein the DR4 and/or DR5 antigen-binding moiety targets the DR4 and/or DR5 ectodomain.
3. The fusion protein of claim 1 or 2, wherein the DR4 and/or DR5 antigen-binding moiety comprises an antibody or fragment thereof.
4. The fusion protein of claim 3, wherein the antibody or fragment thereof comprises a Fab fragment.
5. The fusion protein of claim 3, wherein the antibody or fragment thereof comprises a single chain Fab (scFab) fragment, a single chain Fv (scFv) fragment, a single domain antibody (sdAb) fragment, a nanobody, a VHH domain or a combination thereof.
6. The fusion protein of claim 3, wherein the antibody or fragment thereof comprises a heavy chain and/or light chain of a Fab fragment.
7. The fusion protein of any one of claims 3 to 6, wherein the fusion protein comprises a DR4 antigen-binding moiety.
8. The fusion protein of claim 7, wherein the DR4 antigen-binding moiety comprises a DR4 antigen-binding moiety of CM005G08, CM059H03, CM084A02, T1014A04, T1014G03, T1014A02, T1014A12, T1014B01, T1014B11, T1014F08, T1014G04, T1015A02, T1015A07, T1006F07, 42/43, 44/45, and/or 46/47.
9. The fusion protein of any one of claims 3 to 8, wherein the fusion protein comprises a DR5 antigen-binding moiety.

10. The fusion protein of claim 9, wherein the DR5 antigen-binding moiety comprises an antigen-binding moiety of Tigatuzumab, Lexatumumab, Drozitumab, and/or Conatumumab.
11. The fusion protein of claim 10, wherein the DR5 antigen-binding moiety comprises the antigen-binding moiety of Conatumumab.
12. The fusion protein of any one of claims 1 to 11, wherein the DR4 and/or DR5 antigen-binding moiety is linked at the N- or C-terminus of the nanocage monomer or subunit thereof, or wherein there is a first DR4 and/or DR5 antigen-binding moiety linked at the N-terminus and a second DR4 and/or DR5 antigen-binding moiety linked at the C-terminus of the nanocage monomer or subunit thereof, wherein the first and second DR4 and/or DR5 antigen-binding moieties are the same or different.
13. The fusion protein of any one of claims 1 to 12, wherein the fusion protein comprises a first nanocage monomer subunit linked to the DR4 and/or DR5 antigen-binding moiety; wherein the first nanocage monomer subunit is capable of self-assembling with a second nanocage monomer subunit to form the nanocage monomer.
14. The fusion protein of any one of claims 1 to 13, wherein the nanocage monomer is selected from ferritin, apoferritin, encapsulin, SOR, lumazine synthase, pyruvate dehydrogenase, carboxysome, vault proteins, GroEL, heat shock protein, E2P, MS2 coat protein, fragments thereof, and variants thereof.
15. The fusion protein of claim 14, wherein the nanocage monomer is apoferritin, optionally human apoferritin.
16. The fusion protein of claim 14, wherein the nanocage monomer is an apoferritin light chain, optionally human apoferritin light chain.
17. The fusion protein of claim 15 or 16, wherein the fusion protein comprises a first apoferritin subunit, optionally a first human apoferritin subunit, and wherein the first apoferritin subunit is capable of self-assembling with a second apoferritin subunit.

18. The fusion protein of claim 17, wherein the first and second apoferritin monomer subunits interchangeably comprise the “N” and “C” regions of apoferritin.
19. The fusion protein of any one of claims 1 to 18 further comprising a bioactive moiety and an optional linker between the nanocage monomer or subunit thereof and the bioactive moiety.
20. The fusion protein of claim 19, wherein the linker is flexible or rigid and comprises from 1 to 30 amino acid residues, such as from 8 to 16 amino acid residues.
21. The fusion protein of claim 19 or 20, wherein the linker comprises at least one GGGGS repeat, such as 1, 2, 3, 4, or more GGGGS repeats.
22. The fusion protein of any one of claims 1 to 21, further comprising a C-terminal linker.
23. A nanocage comprising at least one fusion protein of any one of claims 1 to 22 and at least one second nanocage monomer or subunit thereof that self-assembles with the fusion protein.
24. The nanocage of claim 23, wherein the fusion protein comprises a first nanocage monomer subunit, the second nanocage monomer or subunit thereof is a second nanocage monomer subunit, and the second nanocage monomer subunit self-assembles with the fusion protein to form the nanocage monomer.
25. The nanocage of claim 23 or 24, wherein each nanocage monomer comprises the fusion protein of any one of claims 1 to 22.
26. The nanocage of any one of claims 23 to 25, wherein the nanocage is multivalent or multispecific.
27. The nanocage of any one of claims 23 to 26, wherein at least one DR4 and/or DR5 antigen-binding moiety decorates the exterior surface of the nanocage and at least one Fc fragment decorates the exterior surface of the nanocage.

28. The nanocage of claim 27, wherein at least two DR4 and/or DR5 antigen-binding moieties decorate the exterior surface of the nanocage and at least two Fc fragments decorate the exterior surface of the nanocage.
29. The nanocage of any one of claims 23 to 28, comprising a 4:1:1 ratio of an antigen-binding moiety, such as an Fab fragment, of Conatumumab fused to a first full length human ferritin light chain; an Fc fragment (optionally an scFc fragment) fused to a second full length human ferritin light chain; and a third human ferritin light chain.
30. The nanocage of any one of claims 23 to 28, comprising at least one DR4 and/or DR5 antigen-binding moiety fused to the N-terminus of a full ferritin monomer, at least one DR4 and/or DR5 antigen-binding moiety fused to the N-terminus of an N-ferritin monomer subunit, and an Fc fragment fused to the N-terminus of a C-ferritin monomer subunit.
31. The nanocage of claim 30, comprising a 2:1:1 ratio of the DR4 and/or DR5 antigen-binding moiety fused to the N-terminus of the full ferritin monomer: the DR4 and/or DR5 antigen-binding moiety fused to the N-terminus of the N-ferritin monomer subunit: the Fc fragment fused to the N-terminus of the C-ferritin monomer subunit.
32. The nanocage of any one of claims 23 to 31, carrying a cargo molecule, such as a pharmaceutical agent, a diagnostic agent, and/or an imaging agent.
33. A DR4 and/or DR5 therapeutic or prophylactic composition comprising the nanocage of any one of claims 23 to 32.
34. A nucleic acid molecule encoding the fusion protein of any one of claims 1 to 22.
35. A vector comprising the nucleic acid molecule of claim 34.
36. A host cell comprising the vector of claim 35 and producing the fusion protein of any one of claims 1 to 22.

37. Use of the nanocage of any one of claims 23 to 32 or the composition of claim 33 in the manufacture of a medicament for treating and/or preventing cancer.

38. The nanocage of any one of claims 23 to 32 or the composition of claim 33 for use in therapy.

39. The use according to claim 37, wherein the cancer is selected from the group consisting of breast cancer, colon cancer, lymphoma, and lung cancer.