

Patent Claims

1. A fusion polypeptide specifically binding to a target comprising a first part of a binding domain, a second part of a binding domain and a spacer domain, wherein
 - 5 - the spacer domain is a polypeptide and comprises at least 25 amino acid residues,
 - the first part of the binding domain is a polypeptide that is fused either directly or via a first linker to the N-terminus of the spacer domain,
 - the second part of the binding domain is a polypeptide that is fused either
10 directly or via a second linker to the C-terminus of the spacer domain,
 - the first part of the binding domain and the second part of the binding domain (of the same single chain fusion polypeptide) form a functional binding site that specifically binds to a target.
- 15 2. The fusion polypeptide according to claim 1, wherein the first part of the binding domain is an antibody heavy chain variable domain and the second part of the binding domain is an antibody light chain variable domain or vice versa.
- 20 3. The fusion polypeptide according to any one of claims 1 to 2, wherein the first part of the binding domain is an antibody heavy chain Fab fragment and the second part of the binding domain is an antibody light chain Fab fragment or vice versa.
4. The fusion polypeptide according to claim 1, wherein the fusion polypeptide is free of antibody variable domains.
- 25 5. The fusion polypeptide according to any one of claims 1 to 4, wherein the first part of the binding domain and the second part of the binding domain are associated covalently by a disulfide bond with each other.
- 30 6. The fusion polypeptide according to any one of claims 1 to 5, wherein the spacer domain comprises an antibody hinge region or a (C-terminal) fragment thereof and an antibody CH2 domain or a (N-terminal) fragment thereof.

7. The fusion polypeptide according to any one of claims 1 to 6, wherein the spacer domain comprises an antibody hinge region or a fragment thereof, an antibody CH2 domain, and an antibody CH3 domain or a fragment thereof.
8. The fusion polypeptide according to any one of claims 1 to 7, wherein the
5 first and/or the second linker is/are a peptidic linker.
9. A dimeric fusion polypeptide comprising a first fusion polypeptide according to any one of claims 1 to 8 and a second fusion polypeptide according to any one of claims 1 to 8, wherein the first and the second fusion polypeptide are identical or different and wherein the spacer domain of the first fusion
10 polypeptide is covalently conjugated to the spacer domain of the second fusion polypeptide.
10. An isolated nucleic acid encoding the fusion polypeptide according to any one of claims 1 to 8.
11. A pair of isolated nucleic acids together encoding the dimeric fusion
15 polypeptide according to claim 9.
12. A host cell comprising the nucleic acid according to claim 10 or the pair of nucleic acids according to claim 11.
13. A method of producing a fusion polypeptide comprising culturing the host cell of claim 12 so that the fusion polypeptide or the dimeric fusion polypeptide is produced and recovering the fusion polypeptide or the dimeric
20 fusion polypeptide from the cell or the cultivation medium.
14. An immunoconjugate comprising the fusion polypeptide according to any one of claims 1 to 8 and a cytotoxic agent.
15. A pharmaceutical formulation comprising the fusion polypeptide according to any one of claims 1 to 8 or the dimeric fusion polypeptide according to claim 9 and a pharmaceutically acceptable carrier.
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16. The fusion polypeptide according to any one of claims 1 to 8 or the dimeric fusion polypeptide according to claim 9 for use as a medicament.

17. Use of the fusion polypeptide according to any one of claims 1 to 8 or the dimeric fusion polypeptide according to claim 9 in the manufacture of a medicament.