

CLAIMS

1. A binding polypeptide complex consisting of a dimer of a first heavy chain and a second heavy chain wherein:
each heavy chain comprises two V_H binding domains linked by a dimerisation domain;
and each dimerisation domain comprises at least C_H2 and C_H3 chain antibody constant domains from any class of immunoglobulin heavy chain gene.
2. A binding polypeptide complex of claim 1, wherein each dimerisation domain comprises C_H4 chain antibody constant domains from any class of Immunoglobulin heavy chain gene.
3. A binding polypeptide complex of claim 1 wherein the V_H binding domains present at the amino termini of the first and second heavy chain are identical, and the V_H binding domains present at the carboxyl termini of the first and second heavy chains are identical.
4. A binding polypeptide complex of claim 1 wherein the V_H binding domains maybe derived from natural V_H binding domains including camelid V_{HH} binding domains, or modified V_H binding domains from any vertebrate.
5. The binding polypeptide complex of claim 1, wherein the constant domains of the dimerisation domains are altered or partially omitted.
6. The binding polypeptide complex of claim 1, wherein the V_H domains are human V_H domains.
7. An isolated polynucleotide encoding both heavy chains of a polypeptide binding complex according to any one of claims 1 to 6.
8. A cloning or expression vector containing the isolated polynucleotide of claim 7 encoding the first and second heavy chains.

9. A host cell transformed with an expression vector of claim 8.
10. A method for the production of a binding polypeptide complex of any one of claims 1 to 6, comprising culturing the host cell of claim 9 and isolating the polypeptide complex.
11. A composition comprising the binding polypeptide complex of any one of claims 1-6 and a pharmacologically appropriate carrier, for the treatment of wound healing; cell proliferative disorders, such as neoplasm, melanoma, lung, colorectal, osteosarcoma, rectal, ovarian, sarcoma, cervical, oesophageal, breast, pancreas, bladder, head and neck and other solid tumours; myeloproliferative disorders, such as leukemia, non-Hodgkin lymphoma, leukopenia, thrombocytopenia, angiogenesis disorder, Kaposi's sarcoma; autoimmune/inflammatory disorders, such as allergy, inflammatory bowel disease, arthritis, psoriasis and respiratory tract inflammation, asthma, immunodisorders and organ transplant rejection; cardiovascular and vascular disorders, such as hypertension, oedema, angina, atherosclerosis, thrombosis, sepsis, shock, reperfusion injury, and ischemia; neurological disorders such as central nervous system disease, Alzheimer's disease, brain injury, amyotrophic lateral sclerosis, and pain; developmental disorders; metabolic disorders such as diabetes mellitus, osteoporosis, and obesity, AIDS and renal disease; infections such as viral infection, bacterial infection, fungal infection and parasitic infection, pathological conditions associated with the placenta and other pathological conditions; and for use in immunotherapy.
12. The binding polypeptide complex of any one of claims 1-6, for use in the treatment of wound healing; cell proliferative disorders, such as neoplasm, melanoma, lung, colorectal, osteosarcoma, rectal, ovarian, sarcoma, cervical, oesophageal, breast, pancreas, bladder, head and neck and other solid tumours; myeloproliferative disorders, such as leukemia, non-Hodgkin lymphoma, leukopenia, thrombocytopenia, angiogenesis disorder, Kaposi's sarcoma; autoimmune/inflammatory disorders, such as allergy, inflammatory bowel disease, arthritis, psoriasis and respiratory tract inflammation, asthma, immunodisorders and organ transplant rejection; cardiovascular and vascular disorders, such as hypertension, oedema, angina, atherosclerosis, thrombosis, sepsis, shock, reperfusion injury, and ischemia; neurological disorders such as central nervous system disease, Alzheimer's disease, brain injury, amyotrophic lateral sclerosis, and pain; developmental disorders; metabolic disorders such as diabetes mellitus, osteoporosis, and obesity, AIDS and renal disease; infections such as viral

infection, bacterial infection, fungal infection and parasitic infection, pathological conditions associated with the placenta and other pathological conditions; and for use in immunotherapy.

13. The binding polypeptide complex of any one of claims 1-6, for use in diagnosing wound healing; cell proliferative disorders, such as neoplasm, melanoma, lung, colorectal, osteosarcoma, rectal, ovarian, sarcoma, cervical, oesophageal, breast, pancreas, bladder, head and neck and other solid tumours; myeloproliferative disorders, such as leukemia, non-Hodgkin lymphoma, leukopenia, thrombocytopenia, angiogenesis disorder, Kaposi's sarcoma; autoimmune/inflammatory disorders, such as allergy, inflammatory bowel disease, arthritis, psoriasis and respiratory tract inflammation, asthma, immunodisorders and organ transplant rejection; cardiovascular and vascular disorders, such as hypertension, oedema, angina, atherosclerosis, thrombosis, sepsis, shock, reperfusion injury, and ischemia; neurological disorders such as central nervous system disease, Alzheimer's disease, brain injury, amyotrophic lateral sclerosis, and pain; developmental disorders; metabolic disorders such as diabetes mellitus, osteoporosis, and obesity, AIDS and renal disease; infections such as viral infection, bacterial infection, fungal infection and parasitic infection, pathological conditions associated with the placenta and other pathological conditions.

THE CLAIMS DEFINING THE INVENTION ARE AS FOLLOWS:

1. A binding polypeptide complex consisting of a dimer of a first heavy chain and a second heavy chain wherein:
each heavy chain comprises two V_H binding domains linked by a dimerisation domain;
and each dimerisation domain comprises at least C_{H2} , C_{H3} and optionally C_{H4} antibody constant domains from any class of immunoglobulin heavy chain gene.
2. A binding polypeptide complex of claim 1 wherein the V_H binding domains present at the amino termini of the first and second heavy chain are identical, and the V_H binding domains present at the carboxyl termini of the first and second heavy chains are identical.
3. A binding polypeptide complex of claim 1 or claim 2 wherein the V_H binding domains are derived from natural V_H binding domains including camelid V_{HH} binding domains, or modified V_H binding domains from any vertebrate.
4. The binding polypeptide complex of any one of the preceding claims, wherein the V_H domains are human V_H domains.
5. An isolated polynucleotide encoding both heavy chains of a polypeptide binding complex according to any one of claims 1 to 4.
6. A cloning or expression vector containing the isolated polynucleotide of claim 5 encoding the first and second heavy chains.
7. A host cell transformed with an expression vector of claim 6.
8. A method for the production of a binding polypeptide complex of any one of claims 1 to 4, comprising culturing the host cell of claim 7 and isolating the binding polypeptide complex.

9. A composition comprising the binding polypeptide complex of any one of claims 1 to 4 and a pharmacologically appropriate carrier.
10. The binding polypeptide complex of any one of claims 1 to 4 or the composition of claim 9, for use in therapy.
11. The binding polypeptide complex of any one of claims 1 to 4, for use in diagnosing a disease.