

Claims

[Claim 1]

A pharmaceutical composition for use in preventing or treating cancer, comprising, as active ingredients:

a fusion protein dimer comprising a CD80 protein or a fragment thereof, and an IL-2 protein or a variant thereof; and
an anticancer agent.

[Claim 2]

The pharmaceutical composition of claim 1, wherein the CD80 protein or fragment thereof and the IL-2 protein or variant thereof are bound to each other via a linker.

[Claim 3]

The pharmaceutical composition of claim 1, wherein the IL-2 protein has the amino acid sequence of SEQ ID NO: 10.

[Claim 4]

The pharmaceutical composition of claim 1, wherein the CD80 has the amino acid sequence of SEQ ID NO: 11.

[Claim 5]

The pharmaceutical composition of claim 1, wherein the anticancer agent is any one selected from the group consisting of an anticancer chemotherapeutic agent, a target anticancer agent, an anticancer virus, an antibody therapeutic agent, a cell therapeutic agent, and an immune checkpoint inhibitor.

[Claim 6]

The pharmaceutical composition of claim 5, wherein the anticancer chemotherapeutic agent is any one selected from the group consisting of an alkylating agent, a microtubule inhibitor, an anti-metabolite, and a topoisomerase inhibitor.

[Claim 7]

The pharmaceutical composition of claim 6, wherein the anticancer chemotherapeutic agent is any one selected from the group consisting of Mechlorethamine, Cyclophosphamide, Ifosfamide, Melphalan, Chlorambucil, Thiotepa, Altretamine, Procarbazine, Busulfan,

Streptozocin, Carmustine, Lomustine, Dacarbazine, Cisplatin, Carboplatin, Oxaliplatin, Docetaxel, Velban, Oncovin, Navelbine, Fluorouracil, Capecitabine, Cytarabine, Gemcitabine, Fludarabine, Methotrexate, Pemetrexed, Hycamtin, Camptosar, Vepesid, Paclitaxel, Blenoxane, Adriamycin, and Cerubidine.

[Claim 8]

The pharmaceutical composition of claim 5, wherein the target anticancer agent targets any one protein selected from the group consisting of EGFR, VEGFR, CD20, CD38, RNAK-L, BTK, Bcr-abl, PDGFR/FGFR family, MEK/RAF, HER2/Neu, Ubiquitin, JAK, ALK, PARP, TGF β R, Proteasome, Bcl-2, C-Met, VR1, VR2, VR3, c-kit, AXL, RET, Braf, DNMT, CDK4/6, and STING.

[Claim 9]

The pharmaceutical composition of claim 8, wherein the target anticancer agent is any one selected from the group consisting of Cetuximab, Trastuzumab, Pertuzumab, Axitinib, Lenvatinib, Bevacizumab, Ramucirumab, Aflibercept, Rituximab, Obinutuzumab, Daratumumab, Denosumab, Ibrutinib, Dasatinib, Nilotinib, Imatinib, Bosutinib, Galunisertib, Vactosertib, Nintedanib, Sunitinib, Sorafenib, Cabozantinib, Regorafenib, Masitinib, Semaxanib, Tivozanib, Vandetanib, Pazopanib, Trametinib, Dabrafenib, Afatinib, Lapatinib, Neratinib, Lenalidomide, Ixazomib, Ruxolitinib, Lestaurtinib, Pacritinib, Cobimethinib, Selumetinib, Trametinib, Binimetinib, Alectinib, Crizotinib, Venetoclax, Crizotinib, Cabozantinib, Bemcentinib, Gilteritinib, Selpercatinib, Pralsetinib, Vemurafenib, Olaparib, Talazoparib, Niraparib, Rucaparib, Azacitidine, Decitabine, Guadecitabine, Abemaciclib, Ribociclib, Palbociclib, CDNs, SB11285, and DMXAA.

[Claim 10]

The pharmaceutical composition of claim 5, wherein the anticancer virus is any one selected from the group consisting of Talimogenem and Laherparepvec.

[Claim 11]

The pharmaceutical composition of claim 5, wherein the antibody therapeutic agent is any one selected from the group consisting of Cetuximab, Trastuzumab, Pertuzumab, Panitumumab, Emtansine, Rituximab, Daratumumab, Denosumab, Ibritumomab, Tositumomab, Brentuximab, Ofatumumab, Obinutuzumab, Necitumumab, Bevacizumab, Ramucirumab, Nivolumab, Pembrolizumab, Atezolizumab, Durvalumab, and Ipilimumab.

[Claim 12]

The pharmaceutical composition of claim 5, wherein the cell therapeutic agent is any

one selected from the group consisting of Tisagenlecleucel and Axicabtagene Ciloleucel.

[Claim 13]

The pharmaceutical composition of claim 5, wherein the immune checkpoint inhibitor is any one selected from the group consisting of an anti-CTLA-4 antibody, an anti-PD-1 antibody, an anti-PD-L1 antibody, an anti-PD-L2 antibody, an anti-B7-H4 antibody, an anti-HVEM antibody, an anti-TIM3 antibody, an anti-GAL9 antibody, an anti-LAG3 antibody, an anti-VISTA antibody, an anti-KIR antibody, an anti-BTLA antibody, and an anti-TIGIT antibody.

[Claim 14]

The pharmaceutical composition of claim 13, wherein the immune checkpoint inhibitor is any one selected from the group consisting of Ipilimumab, Pembrolizumab, Nivolumab, Cemiplimab, Atezolizumab, Avelumab, and Durvalumab.

[Claim 15]

The pharmaceutical composition of claim 1, wherein the cancer is any one selected from the group consisting of gastric cancer, liver cancer, lung cancer, colorectal cancer, breast cancer, prostate cancer, ovarian cancer, pancreatic cancer, cervical cancer, thyroid cancer, laryngeal cancer, acute myeloid leukemia, brain tumor, neuroblastoma, retinoblastoma, head and neck cancer, salivary gland cancer, and lymphoma.

[Claim 16]

The pharmaceutical composition of claim 1, wherein the anticancer agent is an anticancer chemotherapeutic agent and a target anticancer agent; an anticancer chemotherapeutic agent and an immune checkpoint inhibitor; or an anticancer chemotherapeutic agent, a target anticancer agent, and an immune checkpoint inhibitor.

[Claim 17]

A composition for use in anticancer maintenance therapy, comprising, as an active ingredient:

a fusion protein dimer comprising a CD80 protein or a fragment thereof and an IL-2 protein or a variant thereof.

[Claim 18]

The composition of claim 17, wherein the composition further comprises an anticancer agent.

[Claim 19]

A kit for use in preventing or treating cancer, comprising, as active ingredients:
a fusion protein dimer comprising a CD80 protein or a fragment thereof and an IL-2 protein or a variant thereof; and
an anticancer agent.

[Claim 20]

A kit for use in anticancer maintenance therapy, comprising, as active ingredients:
a fusion protein dimer comprising a CD80 protein or a fragment thereof and an IL-2 protein or a variant thereof; and
an anticancer agent.

~~[Claim 21]~~

~~A method for preventing or treating cancer, comprising:
administering, to a subject, a fusion protein dimer comprising a CD80 protein or a fragment thereof and an IL-2 protein or a variant thereof, and an anticancer agent.~~

~~[Claim 22]~~

~~The method of claim 21, wherein the fusion protein dimer and the anticancer agent are administered simultaneously and/or sequentially.~~

[Claim 23]
~~21]~~

Use of a composition comprising a fusion protein dimer comprising a CD80 protein or a fragment thereof and an IL-2 protein or a variant thereof, and an anticancer agent in the manufacture of a medicament for the prevention or treatment of cancer.