from the group consisting of SEQ ID NO. 1/SEQ ID NO. 2 (called H6B1L-EM herein) and SEQ ID NO. 1/SEQ ID NO. 3 (called H6B1L-EV herein). Preferably, the fully human antibody Fab fragment has both a heavy chain variable domain region and a light chain variable domain region wherein the antibody has a heavy chain/light chain variable domain sequence selected from the group consisting of SEQ ID NO. 1/SEQ ID NO. 2 (called H6B1L-EM herein) and SEQ ID NO. 1/SEQ ID NO. 3 (called H6B1L-EV herein). Preferably, the fully human single chain antibody has both a heavy chain variable domain region and a light chain variable domain region, wherein the single chain fully human antibody has a heavy chain/light chain variable domain sequence selected from the group consisting of SEQ ID NO. 1/SEQ ID NO. 2 and SEQ ID NO. 1/SEQ ID NO. 3.

In one embodiment, the invention provides a fully human antibody of an IgG class that binds to a PD-L1 epitope, wherein the antibody comprises a heavy chain variable domain comprising an amino acid sequence that is at least 95% identical to the amino acid sequence set forth in SEQ ID NO. 1, and comprises a light chain variable domain comprising an amino acid sequence as set forth in SEQ ID NO. 2 or SEQ ID NO. 3.

In one embodiment, the invention provides a fully human antibody of an IgG class that binds to a PD-L1 epitope, wherein the antibody comprises a heavy chain variable domain comprising an amino acid sequence set forth in SEQ ID NO. 1, and comprises a light chain variable domain comprising an amino acid sequence as set forth in SEQ ID NO. 2.

In other embodiments, the invention provides a fully human antibody of an IgG class that binds to a PD-L1 epitope, wherein the antibody comprises a heavy chain variable domain comprising a CDR1 domain, a CDR2 domain, and a CDR3 domain as set forth in the amino acid sequences of SEQ ID NO: 5, SEQ ID NO: 6, and SEQ ID NO: 7, respectively, and comprises a light chain variable domain comprising an amino acid sequence as set forth in SEQ ID NO. 2 or SEQ ID NO. 3.

In other embodiments, the invention provides a fully human antibody of an IgG class that binds to a PD-L1 epitope, wherein the antibody comprises a heavy chain variable domain comprising a CDR1 domain, a CDR2 domain, and a CDR3 domain as set forth in the amino acid sequences of SEQ ID NO: 5, SEQ ID NO: 6, and SEQ ID NO: 7, respectively, and comprises a light chain variable domain comprising an amino acid sequence as set forth in SEQ ID NO. 2

In one embodiment, the invention provides an anti-PD-Ll Fab fully human antibody fragment having a variable domain from a heavy chain and a variable domain from a light chain, wherein the heavy chain variable domain comprises a heavy chain variable domain comprising a CDR3, a CDR2 and a CDR1 having the amino acid sequences of SEQ ID NOs: 7, 6, and 5, respectively, and wherein the light chain variable domain comprises an amino acid sequence as set forth in SEQ ID NO. 2

In one embodiment, the invention provides an anti-PD-Ll single chain human antibody having a heavy chain variable domain and a light chain variable domain connected via a peptide linker, wherein the heavy chain variable domain comprises a heavy chain variable domain comprising a CDR3, a CDR2 and a CDR1 having the amino acid sequences of SEQ ID NOs: 7, 6, and 5, respectively, and wherein the light chain variable domain comprises an amino acid sequence as set forth in SEQ ID NO. 2.

In one embodiment, the invention provides a use of the antibody or antibody fragment as described herein, or the single chain human antibody as described herein, in the manufacture of a medicament for the treatment of cancer or an autoimmune or inflammatory disease.

The fully human antibody of the invention may, in certain embodiments, be an IgG1 or an IgG4.

In one embodiment, the invention also includes a pharmaceutical composition comprising an anti-PD-L1 antibody (or fragment thereof) of the invention, and a pharmaceutically acceptable carrier.

The invention also includes a method for treating a human subject having cancer or an autoimmune or inflammatory disease, said method comprising administering an effective amount of an anti-PD-L1 fully human antibody, Fab fragment, or scFv. In one embodiment, the broad spectrum of mammalian cancers to be treated is selected from the group consisting of ovarian, colon, breast, lung cancers, myelomas, neuroblastic-derived CNS tumors, monocytic leukemias, B-cell derived leukemias, T-cell derived leukemias, B-cell derived lymphomas, T-cell derived lymphomas, mast cell derived tumors, and combinations thereof. In one embodiment, the autoimmune disease or inflammatory disease is selected from the group consisting of intestinal mucosal inflammation, wasting disease associated with colitis, multiple sclerosis, systemic lupus erythematosus, viral infections, rheumatoid arthritis, osteoarthritis, psoriasis, Crohn's disease, and inflammatory bowel disease.

Claims

We claim:

1. A fully human antibody of an IgG class that binds to a PD-L1 epitope, wherein the antibody comprises a heavy chain variable domain comprising an amino acid sequence set forth in SEQ ID NO. 1, and comprises a light chain variable domain comprising an amino acid sequence as set forth in SEQ ID NO. 2.

2. A fully human antibody of an IgG class that binds to a PD-L1 epitope, wherein the antibody comprises a heavy chain variable domain comprising a CDR1 domain, a CDR2 domain, and a CDR3 domain as set forth in the amino acid sequences of SEQ ID NO: 5, SEQ ID NO: 6, and SEQ ID NO: 7, respectively, and comprises a light chain variable domain comprising an amino acid sequence as set forth in SEQ ID NO. 2.

3. The fully human antibody of any one of claims 1-2, which is an IgGl or an IgG4.

4. An anti-PD-Ll Fab fully human antibody fragment having a variable domain from a heavy chain and a variable domain from a light chain, wherein the heavy chain variable domain comprises a heavy chain variable domain comprising a CDR3, a CDR2 and a CDR1 having the amino acid sequences of SEQ ID NOs: 7, 6, and 5, respectively, and wherein the light chain variable domain comprises an amino acid sequence as set forth in SEQ ID NO. 2.

5. The fully human antibody Fab fragment of claim 4, wherein the antibody has a heavy chain/light chain variable domain amino acid sequence combination of SEQ ID NO. 1/SEQ ID NO. 2.

6. An anti-PD-Ll single chain human antibody having a heavy chain variable domain and a light chain variable domain connected via a peptide linker, wherein the heavy chain variable domain comprises a heavy chain variable domain comprising a CDR3, a CDR2 and a CDR1 having the amino acid sequences of SEQ ID NOs: 7, 6, and 5, respectively, and wherein the light chain variable domain comprises an amino acid sequence as set forth in SEQ ID NO. 2.

7. The fully human single chain antibody of claim 6, wherein the single chain fully human antibody has a heavy chain/light chain variable domain amino acid sequence combination of SEQ ID NO. 1/SEQ ID NO. 2.

8. Use of the antibody or antibody fragment of any one of claims 1-5, or the single chain human antibody of any one of claims 6-7, in the manufacture of a medicament for the treatment of cancer or an autoimmune or inflammatory disease.

9.The use of claim 8, wherein the cancer is selected from the group consisting of ovarian cancer, colon cancer, breast cancer, lung cancer, myeloma, a neuroblastic-derived CNS tumor, monocytic leukemia, B-cell derived leukemia, T-cell derived leukemia, B-cell derived lymphoma, T-cell derived lymphoma, and a mast cell derived tumor.

10. The use of claim 8, wherein the autoimmune or inflammatory disease is selected from the group consisting of intestinal mucosal inflammation, wasting disease associated with colitis, multiple sclerosis, systemic lupus erythematosus, a viral infection, rheumatoid arthritis, osteoarthritis, psoriasis, Crohn's disease, and inflammatory bowel disease.

11. The antibody of any one of claims 1-3, which is produced in a mammalian host cell.

12. The antibody of claim 11, wherein the mammalian host cell is a Chinese hamster ovary (CHO) cell.

13. A pharmaceutical composition comprising the antibody of any one of claims 1-3, and a pharmaceutically acceptable carrier.