

CLAIMS

What is claimed is:

1. An isolated antibody or antigen-binding fragment thereof, wherein the antibody or fragment thereof has specificity to a human granulocyte macrophage colony-stimulating factor (GM-CSF) protein and comprises a heavy chain variable region (VH) complementarity determining region (CDR) 1 (CDR1) of SEQ ID NO: 1, a VH CDR2 of SEQ ID NO: 2, a VH CDR3 of SEQ ID NO: 3, a VL CDR1 of SEQ ID NO: 4, a VL CDR2 of SEQ ID NO: 5, and a VL CDR3 of SEQ ID NO: 6.
2. The antibody or antigen-binding fragment thereof of claim 1, further comprising a heavy chain constant region, a light chain constant region, an Fc region, or the combination thereof.
3. The antibody or antigen-binding fragment thereof of claim 1, wherein the light chain constant region is a kappa or lambda chain constant region.
4. The antibody or antigen-binding fragment thereof of claim 1, wherein the antibody or fragment thereof is of an isotype of IgG, IgM, IgA, IgE or IgD.
5. The antibody or antigen-binding fragment thereof of claim 1, wherein the antibody or fragment thereof is a humanized antibody.
6. The antibody or antigen-binding fragment thereof of claim 5, comprising a heavy chain variable region comprising one or more amino acid residues selected from the group consisting of:
 - (a) Glu at position 1,
 - (b) Arg at position 98,
 - (c) Ser at position 72,

- (d) Ala at position 68,
 - (e) Leu at position 70,
 - (f) Ile at position 48,
 - (g) Asp at position 26, and
 - (h) Leu at position 29, according to Kabat numbering and with reference to SEQ ID NO:7, and combinations thereof.
7. The antibody or antigen-binding fragment thereof of claim 6, wherein the heavy chain variable region comprises at least (a) Glu at position 1.
8. The antibody or antigen-binding fragment thereof of claim 6, wherein the heavy chain variable region comprises a fragment of DYTLLT (SEQ ID NO: 42) or GYTFT (SEQ ID NO: 43) starting at position 26 according to Kabat numbering.
9. The antibody or antigen-binding fragment thereof of claim 5, comprising a light chain variable region comprising one or more amino acid residues selected from the group consisting of:
- (a) Ala at position 46,
 - (b) Asp at position 60,
 - (c) Asp at position 70,
 - (d) Ser at position 43, and
 - (f) Phe at position 87, according to Kabat numbering and with reference to SEQ ID NO: 18, and combinations thereof.
10. The antibody or antigen-binding fragment thereof of claim 1, comprising a heavy chain variable region comprising an amino acid sequence selected from the group consisting of SEQ ID NO: 8-17.

11. The antibody or antigen-binding fragment thereof of claim 1, comprising a light chain variable region comprising an amino acid sequence selected from the group consisting of SEQ ID NO: 19-22.

12. The antibody or antigen-binding fragment thereof of claim 1, wherein the heavy chain variable region comprises the amino acid sequence of SEQ ID NO: 14 and the light chain variable region comprises the amino acid sequence of SEQ ID NO: 22.

13. A composition comprising the antibody or antigen-binding fragment thereof of claim 1 and a pharmaceutically acceptable carrier.

14. An isolated cell comprising one or more polynucleotide encoding the antibody or antigen-binding fragment thereof of claim 1.