CLAIMS

1. An isolated antibody, or antigen-binding fragment thereof, that specifically binds human interferon β (IFNβ) with a binding affinity (K_D) value that is at least 1000-fold less than the K_D value of said antibody for a human IFNα, said antibody comprising:

(i) a heavy chain variable region (VH) that comprises:

(a) a VH complementarity determining region one (CDR -H1) comprising the amino acid sequence of SEQ ID NO: 37,

(b) a CDR-H2 comprising the amino acid sequence of SEQ ID NO: 38; and

(c) a CDR-H3 comprising the amino acid sequence of SEQ ID NO: 39; and

(ii) a light chain variable region (VL) that comprises:

(a) a VL complementarity determining region one (CDR-L1) comprising the amino acid sequence of SEQ ID NO: 34,

(b) a CDR-L2 comprising the amino acid sequence of SEQ ID NO: 35; and

(c) a CDR-L3 comprising the amino acid sequence of SEQ ID NO: 36.

2. An isolated antibody, or antigen-binding fragment thereof, that specifically binds human IFNβ, comprising (a) the CDR-H1, CDR-H2, and CDR-H3 sequences of SEQ ID NO: 28, and (b)

i) the CDR-L1, CDR-L2, and CDR-L3 sequences of SEQ ID NO: 2;

ii) the CDR-L1, CDR-L2, and CDR-L3 sequences of SEQ ID NO: 3;

iii) the CDR-L1, CDR-L2, and CDR-L3 sequences of SEQ ID NO: 4;

iv) the CDR-L1, CDR-L2, and CDR-L3 sequences of SEQ ID NO: 5;

v) the CDR-L1, CDR-L2, and CDR-L3 sequences of SEQ ID NO: 6;

vi) the CDR-L1, CDR-L2, and CDR-L3 sequences of SEQ ID NO: 7;

vii) the CDR-L1, CDR-L2, and CDR-L3 sequences of SEQ ID NO: 8;

viii) the CDR-L1, CDR-L2, and CDR-L3 sequences of SEQ ID NO: 9;

ix) the CDR-L1, CDR-L2, and CDR-L3 sequences of SEQ ID NO: 10;

x) the CDR-L1, CDR-L2, and CDR-L3 sequences of SEQ ID NO: 11;

xi) the CDR-L1, CDR-L2, and CDR-L3 sequences of SEQ ID NO: 12;

xii) the CDR-L1, CDR-L2, and CDR-L3 sequences of SEQ ID NO: 13;
xiii) the CDR-L1, CDR-L2, and CDR-L3 sequences of SEQ ID NO: 14;
xiv) the CDR-L1, CDR-L2, and CDR-L3 sequences of SEQ ID NO: 15;
xv) the CDR-L1, CDR-L2, and CDR-L3 sequences of SEQ ID NO: 16;
xvi) the CDR-L1, CDR-L2, and CDR-L3 sequences of SEQ ID NO: 17;
xvii) the CDR-L1, CDR-L2, and CDR-L3 sequences of SEQ ID NO: 18;
xviii) the CDR-L1, CDR-L2, and CDR-L3 sequences of SEQ ID NO: 19;
xix) the CDR-L1, CDR-L2, and CDR-L3 sequences of SEQ ID NO: 20;
xx) the CDR-L1, CDR-L2, and CDR-L3 sequences of SEQ ID NO: 21;
xxi) the CDR-L1, CDR-L2, and CDR-L3 sequences of SEQ ID NO: 22;
xxii) the CDR-L1, CDR-L2, and CDR-L3 sequences of SEQ ID NO: 23;
xxiii) the CDR-L1, CDR-L2, and CDR-L3 sequences of SEQ ID NO: 24;
xxiv) the CDR-L1, CDR-L2, and CDR-L3 sequences of SEQ ID NO: 25;
xxv) the CDR-L1, CDR-L2, and CDR-L3 sequences of SEQ ID NO: 26;
xxvi) the CDR-L1, CDR-L2, and CDR-L3 sequences of SEQ ID NO: 27; or
xxvii) the CDR-L1, CDR-L2, and CDR-L3 sequences of SEQ ID NO: 1.

3. An antibody, or antigen binding fragment thereof, that specifically binds to human IFNβ, comprising a VH sequence encoded by:

a. the DNA insert in the plasmid deposited at the ATCC and having ATCC Accession No. PTA-122727; or

b. a nucleic acid comprising the sequence of SEQ ID NO:166;

and further comprising a VL sequence encoded by:

a. the DNA insert in the plasmid deposited at the ATCC and having ATCC Accession No. PTA-122726; or

b. a nucleic acid comprising the sequence of SEQ ID NO:167.

4. A pharmaceutical composition comprising an antibody, or antigen-binding fragment thereof, of claim 1, and a pharmaceutically acceptable excipient.

5. An isolated antibody, or antigen-binding fragment thereof, that specifically binds human IFNβ, comprising:

(a) a CDR -H1 comprising the amino acid sequence of SEQ ID NO: 37;

(b) a CDR-H2 comprising the amino acid sequence of SEQ ID NO: 38;

(c) a CDR-H3 comprising the amino acid sequence of SEQ ID NO: 39;

(d) a CDR-L1 comprising the amino acid sequence of SEQ ID NO: 34;

(e) a CDR-L2 comprising the amino acid sequence of SEQ ID NO: 35; and

(f) a CDR-L3 comprising the amino acid sequence of SEQ ID NO: 36.

6. An antibody, or antigen binding fragment thereof, that specifically binds human IFNβ, comprising a VH that comprises the amino acid sequence of SEQ ID NO: 28 and a VL that comprises the amino acid sequence of SEQ ID NO: 1.

7. An antibody, or antigen binding fragment thereof, that specifically binds human IFNβ, comprising a heavy chain that comprises the amino acid sequence of SEQ ID NO: 33 and a light chain that comprises the amino acid sequence of SEQ ID NO: 32.

8. The antibody of claim 5, wherein said antibody binds human interferon β (IFNβ) with a binding affinity (K_D) value that is at least 1000-fold less than the K_D value of said antibody for a human IFNα.

9. The antibody or antigen-binding fragment thereof, of claim 1 that specifically binds an epitope in human IFNβ, wherein said epitope comprises one or more residues from amino acid residues 85 through 100, according to the numbering of SEQ ID NO:41.

10. A pharmaceutical composition comprising an antibody, or antigen-binding fragment thereof, of claim 5, and a pharmaceutically acceptable excipient.

11. A pharmaceutical composition comprising an antibody, or antigen-binding fragment thereof, of claim 2, and a pharmaceutically acceptable excipient.

12. An antibody, or antigen binding fragment thereof, that specifically binds to human IFNβ, comprising a VH sequence encoded by the DNA insert in the plasmid deposited at the ATCC and having ATCC Accession No. PTA-122727; and further comprising a VL sequence encoded by the DNA insert in the plasmid deposited at the ATCC and having ATCC Accession No. PTA-122726.

13. An antibody, or antigen binding fragment thereof, that specifically binds to human IFNβ, comprising a VH sequence encoded by the nucleic acid sequence of SEQ ID NO:166 ; and further comprising a VL sequence encoded by the nucleic acid sequence of SEQ ID NO:167.

14. A pharmaceutical composition comprising an antibody, or antigen-binding fragment thereof, of claim 12, and a pharmaceutically acceptable excipient.

15. A pharmaceutical composition comprising an antibody, or antigen-binding fragment thereof, of claim 13, and a pharmaceutically acceptable excipient.

16. A pharmaceutical composition comprising an antibody, or antigen-binding fragment thereof, of claim 6, and a pharmaceutically acceptable excipient.

17. A pharmaceutical composition comprising an antibody, or antigen-binding fragment thereof, of claim 7, and a pharmaceutically acceptable excipient.