

CLAIMS

1. Use of a composition in the preparation of a medicament for increasing metabolic rate or energy expenditure in a human subject,
wherein the composition comprises an antibody, or an antigen binding fragment thereof:
(a) comprises three heavy chain complementarity determining regions (CDRs) comprising amino acid sequences of SEQ ID NO: 1 (CDRH1), SEQ ID NO: 4 (CDRH2), and SEQ ID NO: 10 (CDRH3), and three light chain CDRs comprising amino acid sequences of SEQ ID NO: 12 (CDRL1), SEQ ID NO: 18 (CDRL2), and SEQ ID NO: 22 (CDRL3), as defined by the Kabat numbering system; or three heavy chain CDRs comprising amino acid sequences of SEQ ID NO: 2 (CDRH1), SEQ ID NO: 5 (CDRH2), and SEQ ID NO: 10 (CDRH3), and three light chain CDRs comprising amino acid sequences of SEQ ID NO: 13 (CDRL1), SEQ ID NO: 19 (CDRL2), and SEQ ID NO: 22 (CDRL3), as defined by the IMGT numbering system, or an antibody or antigen-binding fragment; or
(b) competes or cross-competes with the antibody or antigen-binding fragment thereof as defined in (a);
wherein the antibody or antigen binding fragment is in an amount effective to increase metabolic rate or energy expenditure.
2. The use of claim 1, wherein the antibody or antigen binding fragment is in an amount effective to increase the level of latent myostatin in a circulation serum sample, as compared to the level of latent myostatin in a control serum sample.
3. The use of claim 1 or claim 2, wherein the subject has spinal muscular atrophy (SMA) or spinal cord injury (SCI).
4. The use of claim 1 or claim 2, wherein the subject has a metabolic disease that is or comprises insulin resistance, inflammation, abnormal lipid metabolism, an increase in intramuscular fat infiltration, or a high ratio of adipose-to-muscle tissue.
5. The use of claim 1 or claim 2, wherein the subject has a metabolic disease selected from the group consisting of obesity; type I diabetes; type II diabetes; diabetes associated with obesity; metabolic syndrome; pre-diabetes; cardiovascular disease; non-alcoholic steatohepatitis (NASH); spinal cord injury (SCI); a hypo-metabolic state; double diabetes; Cushings disease; an obesity syndrome, such as Prader

Willi syndrome, an obesity syndrome associated with a genetic disorder, or an obesity syndrome associated with a hypothalamic disorder; insulin resistance; insulin insufficiency; hyperinsulinemia; impaired glucose tolerance (IGT); abnormal glycogen metabolism; hyperlipidemia; hypoalbuminemia; hypertriglyceridemia; syndrome X; fatty liver disease; a glycogen storage disease and a lipid storage disorder.

6. The use of claim 5, wherein the metabolic disease is pre-diabetes, type I diabetes, type II diabetes or double diabetes, or diabetes associated with obesity.
7. The use of claim 5, wherein the metabolic disease is obesity.
8. The use of claim 5, wherein the metabolic disease is Prader Willi syndrome.
9. The use of any one of claims 1-8, wherein the composition further comprises a second therapeutic agent.
10. The use of any one of claims 1-9, wherein the antibody or antigen binding fragment comprises a heavy chain variable region that is at least 90% identical to an amino acid sequence of SEQ ID NO: 25 and a light chain variable region that is at least 90% identical to an amino acid sequence of SEQ ID NO: 31
11. The use of any one of claims 1-10, wherein the antibody or antigen binding fragment comprises a heavy chain variable region comprising an amino acid sequence of SEQ ID NO: 25 and a light chain variable region comprising an amino acid sequence of SEQ ID NO: 31.
12. The use of any one of claims 1-11, wherein the antibody or antigen binding fragment is engineered to bind FcRn with greater affinity at pH 7.4 as compared to a non-engineered counterpart.
13. The use of any one of claims 1-11, wherein the antibody or antigen binding fragment comprises a heavy chain comprising an amino acid sequence of SEQ ID NO: 50, and a light chain comprising an amino acid sequence of SEQ ID NO: 51.
14. The use of any one of claims 1-13, wherein the composition is to be administered intravenously or subcutaneously.