

What is claimed is:

1. An isolated antibody, or antigen-binding fragment thereof, that binds the protein, Epsin 1, comprising a variable heavy chain (V_H) and a variable light chain (V_L), wherein:

A) the VHC comprises an amino acid that shares at least 90% ~~homology~~identity with the amino acid sequence corresponding to SEQ ID NO: 2; and

B) ~~t~~The VLC comprises an amino acid that shares at least 90% ~~homology~~identity with the amino acid sequence corresponding to SEQ ID NO: 4.

2. The antibody, or antigen-binding fragment of claim 1, comprising at least one of the following complementary determining region (CDR) amino acid sequences:

CDR-H1, corresponding to SEQ ID NO: 9;

CDR-H2, corresponding to SEQ ID NO: 10;

CDR-H3, corresponding to SEQ ID NO: 11;

CDR-L1, corresponding to SEQ ID NO: 12;

CDR-L2 corresponding to SEQ ID NO: 13; and

CDR-L3 corresponding to SEQ ID NO: 14.

3. The antibody, or antigen-binding fragment of claim 1 or 2, wherein the antibody, or antigen-binding fragment, binds to Epsin-1 (EPN1).

4. The antibody, or antigen-binding fragment of claim 3, wherein the K_D between the antibody or antigen-binding fragment and EPN1 is 50 nM or less.

5. The antibody, or antigen-binding fragment of claim 4, wherein the K_D is 1 nM or less.

~~6.—The antibody or antigen-binding fragment of any one of claims 1-5, wherein the antibody or fragment, is internalized by a cell, after binding to the antigen expressed on the surface of the cell.~~

~~7.—The antigen-binding fragment of any one of claims 1-6, wherein the antigen-binding fragment is an isolated variable heavy (V_H) single domain monoclonal antibody.~~

~~8.—The antigen-binding fragment of any one of claims 1-6, wherein the antigen-binding fragment is a single chain (sc)Fv-Fc fragment.~~

~~9.—The antibody or antigen-binding fragment of claim 7 or 8, wherein the antibody or antigen-binding fragment comprises a CH3 scaffold, comprising at least one modification of the wild-type amino acid sequence of the CH3 domain derived from an immunoglobulin Fc region.~~

~~10. The antigen-binding fragment of any one of claims 1-9, wherein the isolated antigen-binding fragment comprises an Fv, scFv, Fab, F(ab')₂, or Fab' fragment, diabody, or any fragment whose half-life may have been increased.~~

~~11. The antibody or antigen-binding fragment of any one of claims 1-10, wherein the antibody or fragment is monoclonal.~~

~~12. The antibody or antigen-binding fragment of claim 11, wherein the antibody or antigen-binding fragment is human or humanized~~

~~13. The antibody or antigen-binding fragment of claim 12, wherein the antibody or antigen-binding fragment is bi-specific.~~

~~14. An isolated immunoconjugate comprising the antibody or antigen-binding fragment of claim 13, and an effector molecule.~~

~~15. The isolated immunoconjugate of claim 14, wherein the effector molecule is a drug.~~

~~16. The isolated immunoconjugate of claim 14, wherein the effector molecule is a toxin.~~

~~17. The isolated immunoconjugate of claim 14, wherein the effector molecule is a radioactive drug.~~

~~18. A composition comprising a therapeutically effective amount of an isolated antibody or antigen-binding fragment, or isolated immunoconjugate according to any one of the preceding claims, in a pharmaceutically acceptable carrier.~~

~~19. The antibody or antigen-binding fragment of any one of claims 1-16, wherein the antibody or antigen-binding fragment is labeled.~~

~~20. The antibody or antigen-binding fragment of claim 18, wherein the label is a fluorescent, enzymatic, or radioactive label.~~

~~21. A method of treating a subject suffering from at least one type of cancer, comprising selecting the subject suffering from the cancer, wherein cells of the cancer expresses EPN1, and administering to the subject, a therapeutically effective amount of the composition of claim 18, thereby treating the cancer in the subject.~~

~~22. A method of inhibiting tumor growth or metastasis, comprising selecting a subject suffering from at least one type of cancer, comprising selecting the subject suffering from the cancer, wherein cells of the~~

~~cancer expresses EPN1, and administering to the subject, a therapeutically effective amount of the composition of claim 18, thereby inhibiting tumor growth or metastasis.~~

~~23. The method according to claim 21 or 22, wherein the type of cancer is a lung carcinoma, melanoma or hepatocellular carcinoma.~~

246. An isolated nucleic acid molecule encoding ~~a~~the V_H according to claim 1.

257. An isolated nucleic acid molecule encoding the V_L according to claim 1.

268. The isolated nucleic acid molecule of claim ~~23~~6, operably linked to a promoter.

279. The isolated nucleic acid molecule of claim ~~24~~7, operably linked to a promoter.

~~28~~10. An expression vector comprising the isolated nucleic acid molecule of ~~claim 29~~at least one of claims 8 and 9.

2911. An isolated expression vector comprising the isolated nucleic acid molecule of at least one of claims ~~27~~8 and ~~28~~9.

~~30~~12. An isolated host cell transformed with the nucleic acid molecule or expression vector of claim ~~29~~11.