Claims

1. A monoclonal antibody that binds to a human SEZ6 protein and comprises a light chain variable region and a heavy chain variable region, wherein the antibody comprises:

(a) residues 24-34 of SEQ ID NO: 190 for CDR-Ll, residues 50-56 of SEQ ID NO: 190 for CDR-L2, residues 89-97 of SEQ ID NO: 190 for CDR-L3, residues 31-35 of SEQ ID NO: 191 for CDR-Hl, residues 50-65 of SEQ ID NO: 191 for CDR-H2 and residues 95- 102 of SEQ ID NO: 191 for CDR-H3, wherein the residues are numbered according to Kabat;

(b) residues 23-34 of SEQ ID NO: 190 for CDR-Ll, residues 50-56 of SEQ ID NO:190 for CDR-L2, residues 89-97 of SEQ ID NO: 190 for CDR-L3, residues 26-32 of SEQ ID NO: 191 for CDR-Hl, residues 50-58 of SEQ ID NO: 191 for CDR-H2 and residues 95-102 of SEQ ID NO: 191 for CDR-H3, wherein the residues are numbered according to Chothia; or

(c) residues 30-36 of SEQ ID NO: 190 for CDR-Ll, residues 46-55 of SEQ ID NO: 190 for CDR-L2, residues 89-96 of SEQ ID NO: 190 for CDR-L3, residues 30-35 of SEQ ID NO: 191 for CDR-Hl, residues 47-58 of SEQ ID NO: 191 for CDR-H2 and residues 93- 101 of SEQ ID NO: 191 for CDR-H3, wherein the residues are numbered according to MacCallum.

2. The antibody according to claim 1, comprising a light chain variable region set forth as SEQ ID NO: 190 and a heavy chain variable region set forth as SEQ ID NO: 191.

3. The antibody according to any one of claims 1 or 2, wherein said antibody comprises an antibody selected from the group consisting of a chimeric antibody, a CDR-grafted antibody, and a humanized antibody.

4. An antibody drug conjugate comprising a monoclonal antibody conjugated to a cytotoxic agent, wherein the antibody comprises the antibody of any one of claims 1-3.

5. The antibody drug conjugate of claim 4, wherein the antibody drug conjugate comprises the formula: M-[L-D]n wherein:

a) M comprises the monoclonal antibody;

b) L comprises an optional linker;

c) D comprises a drug, which is the cytotoxic agent; and

d) n is an integer from 1 to 20.

6. The antibody drug conjugate of claim 4 or 5, wherein the cytotoxic agent comprises a pyrrolobenzodiazepine, a duocarmycin, an amanitin, an auristatin, a maytansinoid, a calicheamicin, or a radioisotope.

7. The antibody drug conjugate of any one of claims 4-6, wherein the monoclonal antibody comprises residues 24-34 of SEQ ID NO: 190 for CDR-L1, residues 50-56 of SEQ ID NO: 190 for CDR-L2, residues 89-97 of SEQ ID NO: 190 for CDR-L3, residues 31-35 of SEQ ID NO: 191 for CDR-H1, residues 50-65 of SEQ ID NO: 191 for CDR-H2 and residues 95-102 of SEQ ID NO: 191 for CDR-H3, wherein the residues are numbered according to Kabat, and

wherein the cytotoxic agent is a calicheamicin.

8. The antibody drug conjugate of any one of claims 4-6, wherein the monoclonal antibody comprises residues 23-34 of SEQ ID NO: 190 for CDR-L1, residues 50-56 of SEQ ID NO: 190 for CDR-L2, residues 89-97 of SEQ ID NO: 190 for CDR-L3, residues 26-32 of SEQ ID NO: 191 for CDR-H1, residues 50-58 of SEQ ID NO: 191 for CDR-H2 and residues 95-102 of SEQ ID NO: 191 for CDR-H3, wherein the residues are numbered according to Chothia, and

wherein the cytotoxic agent is a calicheamicin.

9. The antibody drug conjugate of any one of claims 4-6, wherein the monoclonal antibody comprises residues 30-36 of SEQ ID NO: 190 for CDR-L1, residues 46-55 of SEQ ID NO: 190 for CDR-L2, residues 89-96 of SEQ ID NO: 190 for CDR-L3, residues 30-35 of SEQ ID NO: 191 for CDR-H1, residues 47-58 of SEQ ID NO: 191 for CDR-H2 and residues 93-101 of SEQ ID NO: 191 for CDR-H3, wherein the residues are numbered according to MacCallum, and

wherein the cytotoxic agent is a calicheamicin.

10. The antibody drug conjugate of any one of claims 4-9, wherein the antibody drug conjugate comprises a linker.

11. The antibody drug conjugate of claim 10, wherein the linker comprises a non-cleavable linker.

12. A pharmaceutical composition comprising the antibody drug conjugate of any one of claims 4-11.