CLAIMS:

1. An antibody-drug conjugate (ADC) comprising a monoclonal antibody, or an antigen-binding fragment thereof, directed against B-cell maturation antigen (BCMA) conjugated to a cytotoxin, wherein the monoclonal antibody comprises (a) a heavy chain variable region comprising a complementarity determining region 1 (HCDR1) amino acid sequence of SEQ ID NO: 1, an HCDR2 amino acid sequence of SEQ ID NO: 2, and an HCDR3 amino acid sequence of SEQ ID NO: 3 and (b) a light chain variable region comprising a complementarity determining region 1 (LCDR1) amino acid sequence of SEQ ID NO: 4, an LCDR2 amino acid sequence of SEQ ID NO: 5, and an LCDR3 amino acid sequence of SEQ ID NO: 6.

2. The antibody-drug conjugate of claim 1, wherein the heavy chain variable region comprises the amino acid sequence of SEQ ID NO: 7.

3. The antibody-drug conjugate of claim 1 or claim 2, wherein the light chain variable region comprises the amino acid sequence of SEQ ID NO: 8.

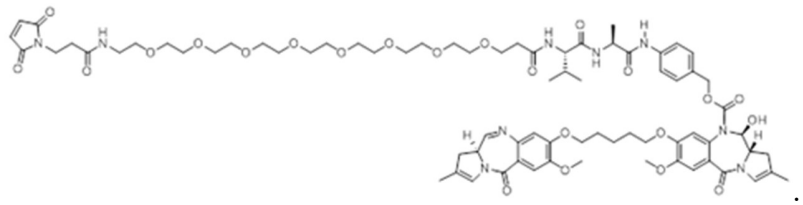
4. The antibody-drug conjugate of any one of claims 1-3, wherein the heavy chain variable region comprises the amino acid sequence of SEQ ID NO: 7 and the light chain variable region comprises the amino acid sequence of SEQ ID NO: 8.

5. The antibody-drug conjugate of any one of claims 1-4, wherein the cytotoxin is an anti-microtubule agent, a pyrrolobenzodiazepine (PBD), an RNA polymerase II inhibitor, or a DNA alkylating agent.

6. The antibody-drug conjugate of claim 5, wherein the cytotoxin is an anti-microtubule agent selected from the group consisting of a maytansinoid, an auristatin, and a tubulysin.

7. The antibody-drug conjugate of claim 5, wherein the cytotoxin is a pyrrolobenzodiazepine (PBD).

8. The antibody-drug conjugate of claim 7, wherein the pyrrolobenzodiapezine is SG3249 having the following formula:



9. A composition comprising the antibody-drug conjugate of any one of claims 1-8 and a pharmaceutically-acceptable carrier.

10. Use of the antibody-drug conjugate of any one of claims 1-8 in the manufacture of a medicament for killing multiple myeloma cells, wherein the multiple myeloma cells express BCMA.

11. Use of the composition of claim 9 in the manufacture of a medicament for killing multiple myeloma cells, wherein the multiple myeloma cells express BCMA.

12. The use of claim 10 or claim 11, wherein the multiple myeloma cells are in a human.

13. A method of killing multiple myeloma cells *in vitro* that express BCMA, comprising contacting the multiple myeloma cells with the antibody-drug conjugate of any one of claims 1-8 or the composition of claim 9, thereby killing the multiple myeloma cells.

14. Use of the antibody-drug conjugate of any one of claims 1-8 in the manufacture of a medicament for killing multiple myeloma stem cells, wherein the multiple myeloma stem cells express BCMA.

15. Use of the composition of claim 9 in the manufacture of a medicament for treating multiple myeloma.

16. A monoclonal antibody, or an antigen-binding fragment thereof, directed against B-cell maturation antigen (BCMA) which comprises (a) a heavy chain variable region comprising a complementarity determining region 1 (HCDR1) amino acid sequence of SEQ ID NO: 1, an HCDR2 amino acid sequence of SEQ ID NO: 2, and an HCDR3 amino acid sequence of SEQ ID NO: 3 and (b) a light chain variable region comprising a complementarity determining region 1 (LCDR1) amino acid sequence of SEQ ID NO: 4, an LCDR2 amino acid sequence of SEQ ID NO: 5, and an LCDR3 amino acid sequence of SEQ ID NO: 6.

17. The monoclonal antibody of claim 16, wherein the heavy chain variable region comprises the amino acid sequence of SEQ ID NO: 7.

18. The monoclonal antibody of claim 16 or claim 17, wherein the light chain variable region comprises the amino acid sequence of SEQ ID NO: 8.

19. The monoclonal antibody of any one of claims 16-18, wherein the heavy chain variable region comprises the amino acid sequence of SEQ ID NO: 7 and the light chain variable region comprises the amino acid sequence of SEQ ID NO: 8.

20. A composition comprising the monoclonal antibody of any one of claims 16-19 and a pharmaceutically-acceptable carrier.

21. A chimeric antigen receptor (CAR) comprising an antigen binding domain of the monoclonal antibody of any one of claims 16-19 linked to a T-cell activation moiety.

22. The chimeric antigen receptor of claim 21, wherein the antigen binding domain comprises a single chain Fv (scFv) fragment of the monoclonal antibody.

23. The antibody-drug conjugate of any one of claims 1-8 or the composition of claim 9 for use in therapy.