CLAIMS

1. An antigen binding protein which specifically binds to BCMA and which inhibits the binding of BAFF and/or APRIL to BCMA wherein the antigen binding protein is capable of binding to FCYRMIA or is capable of FCYRM IA mediated effector function and wherein the antigen binding protein is capable of internalisation.

2. An antigen binding protein according to claim 1 wherein the antigen binding protein has enhanced binding to FCYRM IA or has enhanced FCYRM IA mediated effector function.

3. The antigen binding protein of claim 2 wherein the antigen binding fragment has enhanced ADCC effector function.

4. The antigen binding protein according to any preceding claim wherein the antigen binding protein is defucosylated.

5. The antigen binding protein according to any preceding claim wherein the antigen binding fragment does not bind to Taci.

6. The antigen binding protein according to any preceding claim wherein the antigen binding protein comprises CDRH3 of SEQ ID NO.3 or a variant of SEQ ID NO. 3.

7. The antigen binding protein according to claim 6 wherein the antigen binding protein further comprises one or more of: CDR H1 of SEQ. ID. NO: 1 , CDRH2: SEQ. ID. NO: 2: CDRL1 : SEQ. ID. NO: 4, CDRL2: SEQ. ID. NO: 5 and/or CDRL3: SEQ. ID. NO: 6.

8. The antigen binding protein according to claim 7 wherein the antigen binding protein comprises:
i) CDRH3 as set out in SEQ ID NO. 3
ii) CDRH1 as set out in SEQ ID NO. 1 ; and
iii) CDRH2 as set out in SEQ ID NO. 2

9. The antigen binding protein according to claim 8 wherein the antigen binding protein comprises:
i) CDRH3 as set out in SEQ ID NO. 3
ii) CDRH1 as set out in SEQ ID NO. 1
iii) CDRH2 as set out in SEQ ID NO. 2
iv) CDRL1 as set out in SEQ ID NO. 4
v) CDRL2 as set out in SEQ ID NO. 5; and
vi) CDRL3 as set out in SEQ ID NO. 6.

10. The antigen binding protein according to any preceding claim which comprises a heavy chain variable region encoded by any one of SEQ. ID. NO:23 or SEQ. ID. NO:27 Or SEQ. ID. NO:29.

11. The antigen binding protein according to any preceding claim which comprises a light chain variable region encoded by any one of SEQ. ID. NO:31 or SEQ. ID. NO:33.

12. The antigen binding protein according to claims 1-1 1 wherein the antigen binding protein comprises a heavy chain variable region encoded by SEQ. ID. NO:23 and a light chain variable region encoded by SEQ. ID. NO:31.

13. The antigen binding protein according to claims 1-1 1 wherein the antigen binding protein comprises a heavy chain encoded by SEQ. ID. NO:27 and a light chain encoded by SEQ. ID. NO:31.

14. The antigen binding protein according to any preceding claim wherein the antigen binding protein is a humanised monoclonal antibody.

15. The antigen binding protein according to claim 14 wherein the antibody is an IgG1 isotype.

16. The antigen binding protein comprising the CDR's of any one of claims 6 to 9 wherein the antigen binding protein is a fragment which is a Fab, Fab', $F(ab')_2$, Fv, diabody, triabody, tetrabody, miniantibody, minibody, isolated VH or isolated VL.

17. The antigen binding protein according to any preceding claim wherein the antigen binding protein additionally binds non-human primate BCMA.

18. The antigen binding protein according to any one of the preceding claims and wherein the antigen binding protein binds BCMA with an affinity of stronger than 150pM.

19. An immunoconjugate comprising the antigen binding protein of any one of claims 1 to18 and a cytotoxic agent.

20. The immunoconjugate of claim 19 wherein the antigen binding protein is linked to the cytotoxic agent via a linker.

21. The immunoconjugate of claim 19 or 20 wherein the cytotoxic agent is an auristatin or a dolostatin.

22. The immunoconjugate of any one of claims 19 to 21 wherein the cytotoxic agent is selected from MMAE and MMAF.

23. The immunoconjugate of any one of claims 19 to 22 wherein the cytotoxic agent is covalently bound to said antigen binding protein.

24. The immunoconjugate of any one of claims 20 to 23 wherein said linker is a cleavable linker.

25. The immunoconjugate of any one of claims 20 to 23 wherein said linker is a non-cleavable linker.

26. The immunoconjugate of any one of claims 20 to 25 wherein the linker is selected from 6-maleimidocaproyl (MC), maleimidopropanoyl (MP), valine-citrulline (val-cit), alanine-phenylalanine (ala-phe), p-aminobenzyloxycarbonyl (PAB), N-Succinimidyl 4-(2-pyridylthio)pentanoate (SPP), N-succinimidyl 4-(N-maleimidomethyl)cyclohexane-1 carboxylate (SMCC), and N-Succinimidyl (4-iodo-acetyl) aminobenzoate (SIAB).

27. The immunoconjugate of any one of claims 19 to 26 wherein said immnuoconjugate is engulfed by a tumor cell when contacted with a tumor cell.

28. A pharmaceutical composition comprising an antigen binding protein or immunoconjugate according to any preceding claim and a pharmaceutically acceptable carrier.

29. Use of the composition of claim 28 in the manufacture of a medicament for treating a human patient afflicted with an inflammatory disorder or disease.

30. Use of the composition of claim 27 in the manufacture of a medicament for treating a human patient afflicted with a B cell lymphoma such as Multiple myeloma (MM) or Chronic Lymphocytic Leukaemia (CLL).

31. An antigen binding protein or immunoconjugate according to any one of claims 1 to 27 for use in treating a human patient afflicted with a B cell lymphoma such as Multiple Myeloma (MM) or Chronic Lymphocytic Leukaemia (CLL).

CLAIMS

1. An immunoconjugate comprising an antigen binding protein and a cytotoxic agent wherein the antigen binding protein specifically binds to BCMA and inhibits the binding of BAFF and/or APRIL to BCMA and wherein the antigen binding protein has enhanced binding to FcγRIIIA or has enhanced FcγRIIIA mediated effector function.

2. The immunoconjugate according to claim 1 wherein the antigen binding protein does not bind to Taci.

3. The immunoconjugate according to any preceding claim wherein the antigen binding protein comprises CDRH3 of SEQ ID NO.3 or a variant of SEQ ID NO. 3.

4. The immunoconjugate according to claim 3 wherein the antigen binding protein further comprises one or more of: CDR H1 of SEQ. ID. NO: 1, CDRH2: SEQ. ID. NO: 2: CDRL1: SEQ. ID. NO: 4, CDRL2: SEQ. ID. NO: 5 and/or CDRL3: SEQ. ID. NO: 6.

5. The immunoconjugate according any preceding claim wherein the antigen binding protein comprises:
   i) CDRH3 as set out in SEQ ID NO. 3
   ii) CDRH1 as set out in SEQ ID NO. 1
   iii) CDRH2 as set out in SEQ ID NO. 2
   iv) CDRL1 as set out in SEQ ID NO. 4
   v) CDRL2 as set out in SEQ ID NO. 5; and
   vi) CDRL3 as set out in SEQ ID NO. 6.

6. The immunoconjugate according to any preceding claim which comprises a heavy chain variable region encoded by any one of SEQ. ID. NO:23 or SEQ. ID. NO:27 Or SEQ. ID. NO:29.

7. The immunoconjugate according to any preceding claim which comprises a light chain variable region encoded by any one of SEQ. ID. NO:31 or SEQ. ID. NO:33.

8. The immunoconjugate according to any preceding claim wherein the antigen binding protein comprises a heavy chain variable region encoded by SEQ. ID. NO:23 and a light chain variable region encoded by SEQ. ID. NO:31.

9. The immunoconjugate according to any preceding claim wherein the antigen binding protein comprises a heavy chain encoded by SEQ. ID. NO:27 and a light chain encoded by SEQ. ID. NO:31.

10. The immunoconjugate according to any preceding claim wherein the antigen binding protein additionally binds non-human primate BCMA.

11. The immunoconjugate according to any one of the preceding claims and wherein the antigen binding protein binds BCMA with an affinity of stronger than 150pM.

12. The immunoconjugate of any preceding claim wherein the antigen binding protein is linked to the cytotoxic agent via a linker.

13. The immunoconjugate of any preceding claim wherein the cytotoxic agent is an auristatin or a dolostatin.

14. The immunoconjugate of any preceding claim wherein the cytotoxic agent is selected from MMAE and MMAF.

15. The immunoconjugate of any preceding claim wherein said linker is a non-cleavable linker

16. The immunoconjugate of any preceding claim wherein the linker is selected from 6-maleimidocaproyl (MC), maleimido*propano*yl (MP), valine-citrulline (val-cit), alanine-phenylalanine (ala-phe), p-aminobenzyloxycarbonyl (PAB), N-Succinimidyl 4-(2-pyridylthio)pentanoate (SPP), N-succinimidyl 4-(N-maleimidomethyl)cyclohexane-1 carboxylate (SMCC), and N-Succinimidyl (4-iodo-acetyl) aminobenzoate (SIAB).

17. A pharmaceutical composition comprising an immunoconjugate according to any preceding claim and a pharmaceutically acceptable carrier.

18. Use of the composition of claim 17, in the manufacture of a medicament for treating a human patient afflicted with an inflammatory disorder or disease.

19. Use of the composition of claim 17 in treating a human patient afflicted with a B cell lymphoma such as Multiple myeloma (MM) or Chronic Lymphocytic Leukaemia (CLL).