Preferably, the binding molecule of the invention is for use in the prevention, treatment or amelioration of B cell disorders that correlate with BCMA (over)expression such as plasma cell disorders, and/or autoimmune diseases. The autoimmune disease is, for example, systemic lupus erythematodesus or rheumatoid arthritis.

Also provided by the present invention is a method for the treatment or amelioration of B cell disorders that correlate with BCMA (over)expression such as plasma cell disorders, and/or autoimmune diseases, comprising the step of administering to a subject in need thereof the binding molecule of the invention. The autoimmune disease is, for example, systemic lupus erythematodesus or rheumatoid arthritis.

In plasma cell disorders, one clone of plasma cells multiplies uncontrollably. As a result, this clone produces vast amounts of a single (monoclonal) antibody known as the M-protein. In some cases, such as with monoclonal gammopathies, the antibody produced is incomplete, consisting of only light chains or heavy chains. These abnormal plasma cells and the antibodies they produce are usually limited to one type. Preferably, the plasma cell disorder is selected from the group consisting of multiple myeloma, plasmacytoma, plasma cell leukemia, macroglobulinemia, amyloidosis, Waldenstrom's macroglobulinemia, solitary bone plasmacytoma, extramedullary plasmacytoma, osteosclerotic myeloma, heavy chain diseases, monoclonal gammopathy of undetermined significance, and smoldering multiple myeloma.

In another aspect, kits are provided comprising a binding molecule of the invention, a nucleic acid molecule of the invention, a vector of the invention, or a host cell of the invention. The kit may comprise one or more vials containing the binding molecule and instructions for use. The kit may also contain means for administering the binding molecule of the present invention such as a syringe, pump, infuser or the like, means for reconstituting the binding molecule of the invention and/or means for diluting the binding molecule of the invention.

Furthermore, the present invention relates to the use of epitope cluster 3 of BCMA, preferably human BCMA, for the generation of a binding molecule, preferably an antibody, which is capable of binding to BCMA, preferably human BCMA. The epitope cluster 3 of BCMA preferably corresponds to amino acid residues 24 to 41 of the sequence as depicted in SEQ ID NO: 1002.

Claims

1. A binding molecule which is at least bispecific comprising a first and a second binding domain, wherein
   (a) the first binding domain is capable of binding to epitope cluster 3 of BCMA (CQLRCSSNTPPLTCQRYC); and
   (b) the second binding domain is capable of binding to the T cell CD3 receptor complex; and

   wherein epitope cluster 3 of BCMA corresponds to amino acid residues 24 to 41 of the sequence as depicted in SEQ ID NO: 1002.

2. The binding molecule according to claim 1, wherein the first binding domain is further capable of binding to epitope cluster 3 of macaque BCMA (CQLRCSSTPPLTCQRYC).

3. The binding molecule according to claim 1 or 2, wherein the second binding domain is capable of binding to CD3 epsilon.

4. The binding molecule according to any one of the preceding claims, wherein the second binding domain is capable of binding to human CD3 and to macaque CD3.

5. The binding molecule according to any one of the preceding claims, wherein the first and/or the second binding domain are derived from an antibody.

6. The binding molecule according to claim 5, which is selected from the group consisting of $(scFv)_2$, $(single\ domain\ mAb)_2$, scFv-single domain mAb, diabodies and oligomers thereof.

7. The binding molecule according to any one of the preceding claims, wherein the first binding domain comprises a VH region comprising CDR-H1, CDR-H2 and CDR-H3 and a VL region comprising CDR-L1, CDR-L2 and CDR-L3 selected from the group consisting of:
   (1) CDR-H1 as depicted in SEQ ID NO: 1, CDR-H2 as depicted in SEQ ID NO: 2, CDR-H3 as depicted in SEQ ID NO: 3, CDR-L1 as depicted in SEQ ID NO: 4, CDR-L2 as depicted in SEQ ID NO: 5 and CDR-L3 as depicted in SEQ ID NO: 6;

(2) CDR-H1 as depicted in SEQ ID NO: 11, CDR-H2 as depicted in SEQ ID NO: 12, CDR-H3 as depicted in SEQ ID NO: 13, CDR-L1 as depicted in SEQ ID NO: 14, CDR-L2 as depicted in SEQ ID NO: 15 and CDR-L3 as depicted in SEQ ID NO: 16;

(3) CDR-H1 as depicted in SEQ ID NO: 21, CDR-H2 as depicted in SEQ ID NO: 22, CDR-H3 as depicted in SEQ ID NO: 23, CDR-L1 as depicted in SEQ ID NO: 24, CDR-L2 as depicted in SEQ ID NO: 25 and CDR-L3 as depicted in SEQ ID NO: 26;

(4) CDR-H1 as depicted in SEQ ID NO: 31, CDR-H2 as depicted in SEQ ID NO: 32, CDR-H3 as depicted in SEQ ID NO: 33, CDR-L1 as depicted in SEQ ID NO: 34, CDR-L2 as depicted in SEQ ID NO: 35 and CDR-L3 as depicted in SEQ ID NO: 36;

(5) CDR-H1 as depicted in SEQ ID NO: 41, CDR-H2 as depicted in SEQ ID NO: 42, CDR-H3 as depicted in SEQ ID NO: 43, CDR-L1 as depicted in SEQ ID NO: 44, CDR-L2 as depicted in SEQ ID NO: 45 and CDR-L3 as depicted in SEQ ID NO: 46;

(6) CDR-H1 as depicted in SEQ ID NO: 51, CDR-H2 as depicted in SEQ ID NO: 52, CDR-H3 as depicted in SEQ ID NO: 53, CDR-L1 as depicted in SEQ ID NO: 54, CDR-L2 as depicted in SEQ ID NO: 55 and CDR-L3 as depicted in SEQ ID NO: 56;

(7) CDR-H1 as depicted in SEQ ID NO: 61, CDR-H2 as depicted in SEQ ID NO: 62, CDR-H3 as depicted in SEQ ID NO: 63, CDR-L1 as depicted in SEQ ID NO: 64, CDR-L2 as depicted in SEQ ID NO: 65 and CDR-L3 as depicted in SEQ ID NO: 66;

(8) CDR-H1 as depicted in SEQ ID NO: 71, CDR-H2 as depicted in SEQ ID NO: 72, CDR-H3 as depicted in SEQ ID NO: 73, CDR-L1 as depicted in SEQ ID NO: 74, CDR-L2 as depicted in SEQ ID NO: 75 and CDR-L3 as depicted in SEQ ID NO: 76;

(9) CDR-H1 as depicted in SEQ ID NO: 161, CDR-H2 as depicted in SEQ ID NO: 162, CDR-H3 as depicted in SEQ ID NO: 163, CDR-L1 as depicted in SEQ ID NO: 164, CDR-L2 as depicted in SEQ ID NO: 165 and CDR-L3 as depicted in SEQ ID NO: 166;

(10) CDR-H1 as depicted in SEQ ID NO: 171, CDR-H2 as depicted in SEQ ID NO: 172, CDR-H3 as depicted in SEQ ID NO: 173, CDR-L1 as depicted in SEQ ID NO: 174,

CDR-L2 as depicted in SEQ ID NO: 175 and CDR-L3 as depicted in SEQ ID NO: 176;

(11) CDR-H1 as depicted in SEQ ID NO: 181, CDR-H2 as depicted in SEQ ID NO: 182, CDR-H3 as depicted in SEQ ID NO: 183, CDR-L1 as depicted in SEQ ID NO: 184, CDR-L2 as depicted in SEQ ID NO: 185 and CDR-L3 as depicted in SEQ ID NO: 186;

(12) CDR-H1 as depicted in SEQ ID NO: 191, CDR-H2 as depicted in SEQ ID NO: 192, CDR-H3 as depicted in SEQ ID NO: 193, CDR-L1 as depicted in SEQ ID NO: 194, CDR-L2 as depicted in SEQ ID NO: 195 and CDR-L3 as depicted in SEQ ID NO: 196;

(13) CDR-H1 as depicted in SEQ ID NO: 201, CDR-H2 as depicted in SEQ ID NO: 202, CDR-H3 as depicted in SEQ ID NO: 203, CDR-L1 as depicted in SEQ ID NO: 204, CDR-L2 as depicted in SEQ ID NO: 205 and CDR-L3 as depicted in SEQ ID NO: 206;

(14) CDR-H1 as depicted in SEQ ID NO: 211, CDR-H2 as depicted in SEQ ID NO: 212, CDR-H3 as depicted in SEQ ID NO: 213, CDR-L1 as depicted in SEQ ID NO:214 , CDR-L2 as depicted in SEQ ID NO: 215 and CDR-L3 as depicted in SEQ ID NO: 216;

(15) CDR-H1 as depicted in SEQ ID NO: 221, CDR-H2 as depicted in SEQ ID NO: 222, CDR-H3 as depicted in SEQ ID NO: 223, CDR-L1 as depicted in SEQ ID NO: 224, CDR-L2 as depicted in SEQ ID NO: 225 and CDR-L3 as depicted in SEQ ID NO: 226;

(16) CDR-H1 as depicted in SEQ ID NO: 311, CDR-H2 as depicted in SEQ ID NO: 312, CDR-H3 as depicted in SEQ ID NO: 313, CDR-L1 as depicted in SEQ ID NO: 314, CDR-L2 as depicted in SEQ ID NO: 315 and CDR-L3 as depicted in SEQ ID NO: 316;

(17) CDR-H1 as depicted in SEQ ID NO: 321, CDR-H2 as depicted in SEQ ID NO: 322, CDR-H3 as depicted in SEQ ID NO: 323, CDR-L1 as depicted in SEQ ID NO: 324, CDR-L2 as depicted in SEQ ID NO: 325 and CDR-L3 as depicted in SEQ ID NO: 326;

(18) CDR-H1 as depicted in SEQ ID NO: 331, CDR-H2 as depicted in SEQ ID NO: 332, CDR-H3 as depicted in SEQ ID NO: 333, CDR-L1 as depicted in SEQ ID NO: 334, CDR-L2 as depicted in SEQ ID NO: 335 and CDR-L3 as depicted in SEQ ID NO: 336;

(19) CDR-H1 as depicted in SEQ ID NO: 341, CDR-H2 as depicted in SEQ ID NO: 342, CDR-H3 as depicted in SEQ ID NO: 343, CDR-L1 as depicted in SEQ ID NO: 344, CDR-L2 as depicted in SEQ ID NO: 345 and CDR-L3 as depicted in SEQ ID NO: 346;

(20) CDR-H1 as depicted in SEQ ID NO: 351, CDR-H2 as depicted in SEQ ID NO: 352, CDR-H3 as depicted in SEQ ID NO: 353, CDR-L1 as depicted in SEQ ID NO: 354, CDR-L2 as depicted in SEQ ID NO: 355 and CDR-L3 as depicted in SEQ ID NO: 356;

(21) CDR-H1 as depicted in SEQ ID NO: 361, CDR-H2 as depicted in SEQ ID NO: 362, CDR-H3 as depicted in SEQ ID NO: 363, CDR-L1 as depicted in SEQ ID NO: 364, CDR-L2 as depicted in SEQ ID NO: 365 and CDR-L3 as depicted in SEQ ID NO: 366;

(22) CDR-H1 as depicted in SEQ ID NO: 371, CDR-H2 as depicted in SEQ ID NO: 372, CDR-H3 as depicted in SEQ ID NO: 373, CDR-L1 as depicted in SEQ ID NO: 374, CDR-L2 as depicted in SEQ ID NO: 375 and CDR-L3 as depicted in SEQ ID NO: 376;

(23) CDR-H1 as depicted in SEQ ID NO: 381, CDR-H2 as depicted in SEQ ID NO: 382, CDR-H3 as depicted in SEQ ID NO: 383, CDR-L1 as depicted in SEQ ID NO: 384, CDR-L2 as depicted in SEQ ID NO: 385 and CDR-L3 as depicted in SEQ ID NO: 386;

(24) CDR-H1 as depicted in SEQ ID NO: 581, CDR-H2 as depicted in SEQ ID NO: 582, CDR-H3 as depicted in SEQ ID NO: 583, CDR-L1 as depicted in SEQ ID NO: 584, CDR-L2 as depicted in SEQ ID NO: 585 and CDR-L3 as depicted in SEQ ID NO: 586;

(25) CDR-H1 as depicted in SEQ ID NO: 591, CDR-H2 as depicted in SEQ ID NO: 592, CDR-H3 as depicted in SEQ ID NO: 593, CDR-L1 as depicted in SEQ ID NO: 594, CDR-L2 as depicted in SEQ ID NO: 595 and CDR-L3 as depicted in SEQ ID NO: 596;

(26) CDR-H1 as depicted in SEQ ID NO: 601, CDR-H2 as depicted in SEQ ID NO: 602, CDR-H3 as depicted in SEQ ID NO: 603, CDR-L1 as depicted in SEQ ID NO: 604, CDR-L2 as depicted in SEQ ID NO: 605 and CDR-L3 as depicted in SEQ ID NO: 606;

(27) CDR-H1 as depicted in SEQ ID NO: 611, CDR-H2 as depicted in SEQ ID NO: 612, CDR-H3 as depicted in SEQ ID NO: 613, CDR-L1 as depicted in SEQ ID NO: 614,

CDR-L2 as depicted in SEQ ID NO: 615 and CDR-L3 as depicted in SEQ ID NO: 616;

(28) CDR-H1 as depicted in SEQ ID NO: 621, CDR-H2 as depicted in SEQ ID NO: 622, CDR-H3 as depicted in SEQ ID NO: 623, CDR-L1 as depicted in SEQ ID NO: 624, CDR-L2 as depicted in SEQ ID NO: 625 and CDR-L3 as depicted in SEQ ID NO: 626;

(29) CDR-H1 as depicted in SEQ ID NO: 631, CDR-H2 as depicted in SEQ ID NO: 632, CDR-H3 as depicted in SEQ ID NO: 633, CDR-L1 as depicted in SEQ ID NO: 634, CDR-L2 as depicted in SEQ ID NO: 635 and CDR-L3 as depicted in SEQ ID NO: 636;

(30) CDR-H1 as depicted in SEQ ID NO: 641, CDR-H2 as depicted in SEQ ID NO: 642, CDR-H3 as depicted in SEQ ID NO: 643, CDR-L1 as depicted in SEQ ID NO: 644, CDR-L2 as depicted in SEQ ID NO: 645 and CDR-L3 as depicted in SEQ ID NO: 646;

(31) CDR-H1 as depicted in SEQ ID NO: 651, CDR-H2 as depicted in SEQ ID NO: 652, CDR-H3 as depicted in SEQ ID NO: 653, CDR-L1 as depicted in SEQ ID NO: 654, CDR-L2 as depicted in SEQ ID NO: 655 and CDR-L3 as depicted in SEQ ID NO: 656;

(32) CDR-H1 as depicted in SEQ ID NO: 661, CDR-H2 as depicted in SEQ ID NO: 662, CDR-H3 as depicted in SEQ ID NO: 663, CDR-L1 as depicted in SEQ ID NO: 664, CDR-L2 as depicted in SEQ ID NO: 665 and CDR-L3 as depicted in SEQ ID NO: 666;

(33) CDR-H1 as depicted in SEQ ID NO: 671, CDR-H2 as depicted in SEQ ID NO: 672, CDR-H3 as depicted in SEQ ID NO: 673, CDR-L1 as depicted in SEQ ID NO: 674, CDR-L2 as depicted in SEQ ID NO: 675 and CDR-L3 as depicted in SEQ ID NO: 676;

(34) CDR-H1 as depicted in SEQ ID NO: 681, CDR-H2 as depicted in SEQ ID NO: 682, CDR-H3 as depicted in SEQ ID NO: 683, CDR-L1 as depicted in SEQ ID NO: 684, CDR-L2 as depicted in SEQ ID NO: 685 and CDR-L3 as depicted in SEQ ID NO: 686;

(35) CDR-H1 as depicted in SEQ ID NO: 691, CDR-H2 as depicted in SEQ ID NO: 692, CDR-H3 as depicted in SEQ ID NO: 693, CDR-L1 as depicted in SEQ ID NO: 694, CDR-L2 as depicted in SEQ ID NO: 695 and CDR-L3 as depicted in SEQ ID NO: 696;

(36) CDR-H1 as depicted in SEQ ID NO: 701, CDR-H2 as depicted in SEQ ID NO: 702, CDR-H3 as depicted in SEQ ID NO: 703, CDR-L1 as depicted in SEQ ID NO: 704, CDR-L2 as depicted in SEQ ID NO: 705 and CDR-L3 as depicted in SEQ ID NO: 706;

(37) CDR-H1 as depicted in SEQ ID NO: 711, CDR-H2 as depicted in SEQ ID NO: 712, CDR-H3 as depicted in SEQ ID NO: 713, CDR-L1 as depicted in SEQ ID NO: 714, CDR-L2 as depicted in SEQ ID NO: 715 and CDR-L3 as depicted in SEQ ID NO: 716;

(38) CDR-H1 as depicted in SEQ ID NO: 721, CDR-H2 as depicted in SEQ ID NO: 722, CDR-H3 as depicted in SEQ ID NO: 723, CDR-L1 as depicted in SEQ ID NO: 724, CDR-L2 as depicted in SEQ ID NO: 725 and CDR-L3 as depicted in SEQ ID NO: 726;

(39) CDR-H1 as depicted in SEQ ID NO: 731, CDR-H2 as depicted in SEQ ID NO: 732, CDR-H3 as depicted in SEQ ID NO: 733, CDR-L1 as depicted in SEQ ID NO: 734, CDR-L2 as depicted in SEQ ID NO: 735 and CDR-L3 as depicted in SEQ ID NO: 736;

(40) CDR-H1 as depicted in SEQ ID NO: 741, CDR-H2 as depicted in SEQ ID NO: 742, CDR-H3 as depicted in SEQ ID NO: 743, CDR-L1 as depicted in SEQ ID NO: 744, CDR-L2 as depicted in SEQ ID NO: 745 and CDR-L3 as depicted in SEQ ID NO: 746;

(41) CDR-H1 as depicted in SEQ ID NO: 751, CDR-H2 as depicted in SEQ ID NO: 752, CDR-H3 as depicted in SEQ ID NO: 753, CDR-L1 as depicted in SEQ ID NO: 754, CDR-L2 as depicted in SEQ ID NO: 755 and CDR-L3 as depicted in SEQ ID NO: 756;

(42) CDR-H1 as depicted in SEQ ID NO: 761, CDR-H2 as depicted in SEQ ID NO: 762, CDR-H3 as depicted in SEQ ID NO: 763, CDR-L1 as depicted in SEQ ID NO: 764, CDR-L2 as depicted in SEQ ID NO: 765 and CDR-L3 as depicted in SEQ ID NO: 766;

(43) CDR-H1 as depicted in SEQ ID NO: 771, CDR-H2 as depicted in SEQ ID NO: 772, CDR-H3 as depicted in SEQ ID NO: 773, CDR-L1 as depicted in SEQ ID NO: 774, CDR-L2 as depicted in SEQ ID NO: 775 and CDR-L3 as depicted in SEQ ID NO: 776;

(44) CDR-H1 as depicted in SEQ ID NO: 781, CDR-H2 as depicted in SEQ ID NO: 782, CDR-H3 as depicted in SEQ ID NO: 783, CDR-L1 as depicted in SEQ ID NO: 784,

CDR-L2 as depicted in SEQ ID NO: 785 and CDR-L3 as depicted in SEQ ID NO: 786;

(45) CDR-H1 as depicted in SEQ ID NO: 791, CDR-H2 as depicted in SEQ ID NO: 792, CDR-H3 as depicted in SEQ ID NO: 793, CDR-L1 as depicted in SEQ ID NO: 794, CDR-L2 as depicted in SEQ ID NO: 795 and CDR-L3 as depicted in SEQ ID NO: 796;

(46) CDR-H1 as depicted in SEQ ID NO: 801, CDR-H2 as depicted in SEQ ID NO: 802, CDR-H3 as depicted in SEQ ID NO: 803, CDR-L1 as depicted in SEQ ID NO: 804, CDR-L2 as depicted in SEQ ID NO: 805 and CDR-L3 as depicted in SEQ ID NO: 806;

(47) CDR-H1 as depicted in SEQ ID NO: 811, CDR-H2 as depicted in SEQ ID NO: 812, CDR-H3 as depicted in SEQ ID NO: 813, CDR-L1 as depicted in SEQ ID NO: 814, CDR-L2 as depicted in SEQ ID NO: 815 and CDR-L3 as depicted in SEQ ID NO: 816;

(48) CDR-H1 as depicted in SEQ ID NO: 821, CDR-H2 as depicted in SEQ ID NO: 822, CDR-H3 as depicted in SEQ ID NO: 823, CDR-L1 as depicted in SEQ ID NO: 824, CDR-L2 as depicted in SEQ ID NO: 825 and CDR-L3 as depicted in SEQ ID NO: 826;

(49) CDR-H1 as depicted in SEQ ID NO: 831, CDR-H2 as depicted in SEQ ID NO: 832, CDR-H3 as depicted in SEQ ID NO: 833, CDR-L1 as depicted in SEQ ID NO: 834, CDR-L2 as depicted in SEQ ID NO: 835 and CDR-L3 as depicted in SEQ ID NO: 836;

(50) CDR-H1 as depicted in SEQ ID NO: 961, CDR-H2 as depicted in SEQ ID NO: 962, CDR-H3 as depicted in SEQ ID NO: 963, CDR-L1 as depicted in SEQ ID NO: 964, CDR-L2 as depicted in SEQ ID NO: 965 and CDR-L3 as depicted in SEQ ID NO: 966;

(51) CDR-H1 as depicted in SEQ ID NO: 971, CDR-H2 as depicted in SEQ ID NO: 972, CDR-H3 as depicted in SEQ ID NO: 973, CDR-L1 as depicted in SEQ ID NO: 974, CDR-L2 as depicted in SEQ ID NO: 975 and CDR-L3 as depicted in SEQ ID NO: 976;

(52) CDR-H1 as depicted in SEQ ID NO: 981, CDR-H2 as depicted in SEQ ID NO: 982, CDR-H3 as depicted in SEQ ID NO: 983, CDR-L1 as depicted in SEQ ID NO: 984, CDR-L2 as depicted in SEQ ID NO: 985 and CDR-L3 as depicted in SEQ ID NO: 986; and

(53) CDR-H1 as depicted in SEQ ID NO: 991, CDR-H2 as depicted in SEQ ID NO: 992, CDR-H3 as depicted in SEQ ID NO: 993, CDR-L1 as depicted in SEQ ID NO: 994, CDR-L2 as depicted in SEQ ID NO: 995 and CDR-L3 as depicted in SEQ ID NO: 996.

8. The binding molecule according to any one of the preceding claims, wherein the first binding domain comprises a VH region selected from the group consisting of VH regions as depicted in SEQ ID NO: 7, SEQ ID NO: 17, SEQ ID NO: 27, SEQ ID NO: 37, SEQ ID NO: 47, SEQ ID NO: 57, SEQ ID NO: 67, SEQ ID NO: 77, SEQ ID NO: 167, SEQ ID NO: 177, SEQ ID NO: 187, SEQ ID NO: 197, SEQ ID NO: 207, SEQ ID NO: 217, SEQ ID NO: 227, SEQ ID NO: 317, SEQ ID NO: 327, SEQ ID NO: 337, SEQ ID NO: 347, SEQ ID NO: 357, SEQ ID NO: 367, SEQ ID NO: 377, SEQ ID NO: 387, SEQ ID NO: 587, SEQ ID NO: 597, SEQ ID NO: 607, SEQ ID NO: 617, SEQ ID NO: 627, SEQ ID NO: 637, SEQ ID NO: 647, SEQ ID NO: 657, SEQ ID NO: 667, SEQ ID NO: 677, SEQ ID NO: 687, SEQ ID NO: 697, SEQ ID NO: 707, SEQ ID NO: 717, SEQ ID NO: 727, SEQ ID NO: 737, SEQ ID NO: 747, SEQ ID NO: 757, SEQ ID NO: 767, SEQ ID NO: 777, SEQ ID NO: 787, SEQ ID NO: 797, SEQ ID NO: 807, SEQ ID NO: 817, SEQ ID NO: 827, SEQ ID NO: 837, SEQ ID NO: 967, SEQ ID NO: 977, SEQ ID NO: 987, and SEQ ID NO: 997.

9. The binding molecule according to any one of the preceding claims, wherein the first binding domain comprises a VL region selected from the group consisting of VL regions as depicted in SEQ ID NO: 8, SEQ ID NO: 18, SEQ ID NO: 28, SEQ ID NO: 38, SEQ ID NO: 48, SEQ ID NO: 58, SEQ ID NO: 68, SEQ ID NO: 78, SEQ ID NO: 168, SEQ ID NO: 178, SEQ ID NO: 188, SEQ ID NO: 198, SEQ ID NO: 208, SEQ ID NO: 218, SEQ ID NO: 228, SEQ ID NO: 318, SEQ ID NO: 328, SEQ ID NO: 338, SEQ ID NO: 348, SEQ ID NO: 358, SEQ ID NO: 368, SEQ ID NO: 378, SEQ ID NO: 388, SEQ ID NO: 588, SEQ ID NO: 598, SEQ ID NO: 608, SEQ ID NO: 618, SEQ ID NO: 628, SEQ ID NO: 638, SEQ ID NO: 648, SEQ ID NO: 658, SEQ ID NO: 668, SEQ ID NO: 678, SEQ ID NO: 688, SEQ ID NO: 698, SEQ ID NO: 708, SEQ ID NO: 718, SEQ ID NO: 728, SEQ ID NO: 738, SEQ ID NO: 748, SEQ ID NO: 758, SEQ ID NO: 768, SEQ ID NO: 778, SEQ ID NO: 788, SEQ ID NO: 798, SEQ ID NO: 808, SEQ ID NO: 818, SEQ ID NO: 828, SEQ ID NO: 838, SEQ ID NO: 968, SEQ ID NO: 978, SEQ ID NO: 988, and SEQ ID NO: 998.

10. The binding molecule according to any one of the preceding claims, wherein the first binding domain comprises a VH region and a VL region selected from the group consisting of:

(1) a VH region as depicted in SEQ ID NO: 7, and a VL region as depicted in SEQ ID NO: 8;

(2) a VH region as depicted in SEQ ID NO: 17, and a VL region as depicted in SEQ ID NO: 18;

(3) a VH region as depicted in SEQ ID NO: 27, and a VL region as depicted in SEQ ID NO: 28;

(4) a VH region as depicted in SEQ ID NO: 37, and a VL region as depicted in SEQ ID NO: 38;

(5) a VH region as depicted in SEQ ID NO: 47, and a VL region as depicted in SEQ ID NO: 48;

(6) a VH region as depicted in SEQ ID NO: 57, and a VL region as depicted in SEQ ID NO: 58;

(7) a VH region as depicted in SEQ ID NO: 67, and a VL region as depicted in SEQ ID NO: 68;

(8) a VH region as depicted in SEQ ID NO: 77, and a VL region as depicted in SEQ ID NO: 78;

(9) a VH region as depicted in SEQ ID NO: 167, and a VL region as depicted in SEQ ID NO: 168;

(10) a VH region as depicted in SEQ ID NO: 177, and a VL region as depicted in SEQ ID NO: 178;

(11) a VH region as depicted in SEQ ID NO: 187, and a VL region as depicted in SEQ ID NO: 188;

(12) a VH region as depicted in SEQ ID NO: 197, and a VL region as depicted in SEQ ID NO: 198;

(13) a VH region as depicted in SEQ ID NO: 207, and a VL region as depicted in SEQ ID NO: 208;

(14) a VH region as depicted in SEQ ID NO: 217, and a VL region as depicted in SEQ ID NO: 218;

(15) a VH region as depicted in SEQ ID NO: 227, and a VL region as depicted in SEQ ID NO: 228;

(16) a VH region as depicted in SEQ ID NO: 317, and a VL region as depicted in SEQ ID NO: 318;

(17) a VH region as depicted in SEQ ID NO: 327, and a VL region as depicted in SEQ ID NO: 328;

(18) a VH region as depicted in SEQ ID NO: 337, and a VL region as depicted in SEQ ID NO: 338;

(19) a VH region as depicted in SEQ ID NO: 347, and a VL region as depicted in SEQ ID NO: 348;

(20) a VH region as depicted in SEQ ID NO: 357, and a VL region as depicted in SEQ ID NO: 358;

(21) a VH region as depicted in SEQ ID NO: 367, and a VL region as depicted in SEQ ID NO: 368;

(22) a VH region as depicted in SEQ ID NO: 377, and a VL region as depicted in SEQ ID NO: 378;

(23) a VH region as depicted in SEQ ID NO: 387, and a VL region as depicted in SEQ ID NO: 388;

(24) a VH region as depicted in SEQ ID NO: 587, and a VL region as depicted in SEQ ID NO: 588;

(25) a VH region as depicted in SEQ ID NO: 597, and a VL region as depicted in SEQ ID NO: 598;

(26) a VH region as depicted in SEQ ID NO: 607, and a VL region as depicted in SEQ ID NO: 608;

(27) a VH region as depicted in SEQ ID NO: 617, and a VL region as depicted in SEQ ID NO: 618;

(28) a VH region as depicted in SEQ ID NO: 627, and a VL region as depicted in SEQ ID NO: 628;

(29) a VH region as depicted in SEQ ID NO: 637, and a VL region as depicted in SEQ ID NO: 638;

(30) a VH region as depicted in SEQ ID NO: 647, and a VL region as depicted in SEQ ID NO: 648;

(31) a VH region as depicted in SEQ ID NO: 657, and a VL region as depicted in SEQ ID NO: 658;

(32) a VH region as depicted in SEQ ID NO: 667, and a VL region as depicted in SEQ ID NO: 668;

(33) a VH region as depicted in SEQ ID NO: 677, and a VL region as depicted in SEQ ID NO: 678;

(34) a VH region as depicted in SEQ ID NO: 687, and a VL region as depicted in SEQ ID NO: 688;

(35) a VH region as depicted in SEQ ID NO: 697, and a VL region as depicted in SEQ ID NO: 698;

(36) a VH region as depicted in SEQ ID NO: 707, and a VL region as depicted in SEQ ID NO: 708;

(37) a VH region as depicted in SEQ ID NO: 717, and a VL region as depicted in SEQ ID NO: 718;

(38) a VH region as depicted in SEQ ID NO: 727, and a VL region as depicted in SEQ ID NO: 728;

(39) a VH region as depicted in SEQ ID NO: 737, and a VL region as depicted in SEQ ID NO: 738;

(40) a VH region as depicted in SEQ ID NO: 747, and a VL region as depicted in SEQ ID NO: 748;

(41) a VH region as depicted in SEQ ID NO: 757, and a VL region as depicted in SEQ ID NO: 758;

(42) a VH region as depicted in SEQ ID NO: 767, and a VL region as depicted in SEQ ID NO: 768;

(43) a VH region as depicted in SEQ ID NO: 777, and a VL region as depicted in SEQ ID NO: 778;

(44) a VH region as depicted in SEQ ID NO: 787, and a VL region as depicted in SEQ ID NO: 788;

(45) a VH region as depicted in SEQ ID NO: 797, and a VL region as depicted in SEQ ID NO: 798;

(46) a VH region as depicted in SEQ ID NO: 807, and a VL region as depicted in SEQ ID NO: 808;

(47) a VH region as depicted in SEQ ID NO: 817, and a VL region as depicted in SEQ ID NO: 818;

(48) a VH region as depicted in SEQ ID NO: 827, and a VL region as depicted in SEQ ID NO: 828;

(49) a VH region as depicted in SEQ ID NO: 837, and a VL region as depicted in SEQ ID NO: 838;

(50) a VH region as depicted in SEQ ID NO: 967, and a VL region as depicted in SEQ ID NO: 968;

(51) a VH region as depicted in SEQ ID NO: 977, and a VL region as depicted in SEQ ID NO: 978;

(52) a VH region as depicted in SEQ ID NO: 987, and a VL region as depicted in SEQ ID NO: 988; and

(53) a VH region as depicted in SEQ ID NO: 997, and a VL region as depicted in SEQ ID NO: 998.

11. The binding molecule according to claim 10, wherein the first binding domain comprises an amino acid sequence selected from the group consisting of SEQ ID NO: 9, SEQ ID NO: 19, SEQ ID NO: 29, SEQ ID NO: 39, SEQ ID NO: 49, SEQ ID NO: 59, SEQ ID NO: 69, SEQ ID NO: 79, SEQ ID NO: 169, SEQ ID NO: 179, SEQ ID NO: 189, SEQ ID NO: 199, SEQ ID NO: 209, SEQ ID NO: 219, SEQ ID NO: 229, SEQ ID NO: 319, SEQ ID NO: 329, SEQ ID NO: 339, SEQ ID NO: 349, SEQ ID NO: 359, SEQ ID NO: 369, SEQ ID NO: 379, SEQ ID NO: 389, SEQ ID NO: 589, SEQ ID NO: 599, SEQ ID NO: 609, SEQ ID NO: 619, SEQ ID NO: 629, SEQ ID NO: 639, SEQ ID NO: 649, SEQ ID NO: 659, SEQ ID NO: 669, SEQ ID NO: 679, SEQ ID NO: 689, SEQ ID NO: 699, SEQ ID NO: 709, SEQ ID NO: 719, SEQ ID NO: 729, SEQ ID NO: 739, SEQ ID NO: 749, SEQ ID NO: 759, SEQ ID NO: 769, SEQ ID NO: 779, SEQ ID NO: 789, SEQ ID NO: 799, SEQ ID NO: 809, SEQ ID NO: 819, SEQ ID NO: 829, SEQ ID NO: 839, SEQ ID NO: 969, SEQ ID NO: 979, SEQ ID NO: 989, and SEQ ID NO: 999.

12. The binding molecule according to any one of claims 1-6 having the amino acid sequence shown in SEQ ID NO:340 or SEQ ID NO: 980.

13. The binding molecule according to any one of the preceding claims, characterized by an EC50 (pg/ml) of 350 or less, preferably 320 or less.

14. The binding molecule according to any one of the preceding claims, characterized by an EC50 (pg/ml) which equates to the EC50 (pg/ml) of any one of BC E5 33-B11-B8, BC 5G9 92-E10, BC 5G9 91-D2-B10, BC B12 33-A4-B2, BC 3A4 37-A11-G1, BC A7-27 C4-G7, BC C3 33-D7-B1, BC C3 33-F8-E6 B1.

15. A nucleic acid sequence encoding a binding molecule as defined in any one of claims 1 to 14

16. A vector comprising a nucleic acid sequence as defined in claim 15.

17. A host cell transformed or transfected with the nucleic acid sequence as defined in claim 15 or with the vector as defined in claim 16.

18. A process for the production of a binding molecule according to any one of claims 1 to 14, said process comprising culturing a host cell as defined in claim 17 under conditions allowing the expression of the binding molecule as defined in any one of claims 1 to 14 and recovering the produced binding molecule from the culture.

19. A pharmaceutical composition comprising a binding molecule according to any one of claims 1 to 14, or produced according to the process of claim 18.

20. The binding molecule according to any one of claims 1 to 14, or produced according to the process of claim 18 for use in the prevention, treatment or amelioration of a disease selected from the group consisting of plasma cell disorders, other B cell disorders that correlate with BCMA expression and autoimmune diseases.

21. A method for the treatment or amelioration of a disease selected from the group consisting of plasma cell disorders, other B cell disorders that correlate with BCMA expression and autoimmune diseases, comprising the step of administering to a subject in need thereof the binding molecule according to any one of claims 1 to 14, or produced according to the process of claim 18.

22. The method according to claim 21, wherein the plasma cell disorder is selected from the group consisting of multiple myeloma, plasmacytoma, plasma cell leukemia, macroglobulinemia, amyloidosis, Waldenstrom's macroglobulinemia , solitary bone plasmacytoma, extramedullary plasmacytoma, osteosclerotic myeloma, heavy chain diseases, monoclonal gammopathy of undetermined significance, and smoldering multiple myeloma.

23. The method according to claim 21, wherein the autoimmune disease is systemic lupus erythematodes.

24. A kit comprising a binding molecule as defined in any one of claims 1 to 14, a nucleic acid molecule as defined in claim 15, a vector as defined in claim 16, and/or a host cell as defined in claim 17.

25. Use of epitope cluster 3 of BCMA for the generation of a binding molecule, preferably an antibody, which is capable of binding to BCMA, wherein epitope cluster 3 of BCMA corresponds to amino acid residues 24 to 41 of the sequence as depicted in SEQ ID NO: 1002.

26. A method for the generation of an antibody, preferably a bispecific binding molecule, which is capable of binding to BCMA, comprising

(a) immunizing an animal with a polypeptide comprising epitope cluster 3 of BCMA, wherein epitope cluster 3 of BCMA corresponds to amino acid residues 24 to 41 of the sequence as depicted in SEQ ID NO: 1002,

(b) obtaining said antibody, and

(c) optionally converting said antibody into a bispecific binding molecule which is capable of binding to human BCMA and preferably to the T cell CD3 receptor complex.

Claims

1. A binding molecule which is at least bispecific comprising a first and a second binding domain, wherein

(a) the first binding domain comprises a variable heavy chain and a variable light chain and is capable of binding to epitope cluster 3 of B cell maturation antigen (BCMA) (CQLRCSSNTPPLTCQRYC),

wherein the first binding domain comprises a VH region comprising CDR-H1, CDR-H2 and CDR-H3 and a VL region comprising CDR-L1, CDR-L2 and CDR-L3 selected from the group consisting of:

(1) CDR-H1 as depicted in SEQ ID NO: 1, CDR-H2 as depicted in SEQ ID NO: 2, CDR-H3 as depicted in SEQ ID NO: 3, CDR-L1 as depicted in SEQ ID NO: 4, CDR-L2 as depicted in SEQ ID NO: 5 and CDR-L3 as depicted in SEQ ID NO: 6;

(2) CDR-H1 as depicted in SEQ ID NO: 11, CDR-H2 as depicted in SEQ ID NO: 12, CDR-H3 as depicted in SEQ ID NO: 13, CDR-L1 as depicted in SEQ ID NO: 14, CDR-L2 as depicted in SEQ ID NO: 15 and CDR-L3 as depicted in SEQ ID NO: 16;

(3) CDR-H1 as depicted in SEQ ID NO: 21, CDR-H2 as depicted in SEQ ID NO: 22, CDR-H3 as depicted in SEQ ID NO: 23, CDR-L1 as depicted in SEQ ID NO: 24, CDR-L2 as depicted in SEQ ID NO: 25 and CDR-L3 as depicted in SEQ ID NO: 26;

(4) CDR-H1 as depicted in SEQ ID NO: 31, CDR-H2 as depicted in SEQ ID NO: 32, CDR-H3 as depicted in SEQ ID NO: 33, CDR-L1 as depicted in SEQ ID NO: 34, CDR-L2 as depicted in SEQ ID NO: 35 and CDR-L3 as depicted in SEQ ID NO: 36;

(5) CDR-H1 as depicted in SEQ ID NO: 41, CDR-H2 as depicted in SEQ ID NO: 42, CDR-H3 as depicted in SEQ ID NO: 43, CDR-L1 as depicted in SEQ ID NO: 44, CDR-L2 as depicted in SEQ ID NO: 45 and CDR-L3 as depicted in SEQ ID NO: 46;

(6) CDR-H1 as depicted in SEQ ID NO: 51, CDR-H2 as depicted in SEQ ID NO: 52, CDR-H3 as depicted in SEQ ID NO: 53, CDR-L1 as depicted in SEQ ID NO: 54, CDR-L2 as depicted in SEQ ID NO: 55 and CDR-L3 as depicted in SEQ ID NO: 56;

(7) CDR-H1 as depicted in SEQ ID NO: 61, CDR-H2 as depicted in SEQ ID NO: 62, CDR-H3 as depicted in SEQ ID NO: 63, CDR-L1 as depicted in SEQ ID NO: 64, CDR-L2 as depicted in SEQ ID NO: 65 and CDR-L3 as depicted in SEQ ID NO: 66;

(8) CDR-H1 as depicted in SEQ ID NO: 71, CDR-H2 as depicted in SEQ ID NO: 72, CDR-H3 as depicted in SEQ ID NO: 73, CDR-L1 as depicted in SEQ ID NO: 74, CDR-L2 as depicted in SEQ ID NO: 75 and CDR-L3 as depicted in SEQ ID NO: 76;

(9) CDR-H1 as depicted in SEQ ID NO: 161, CDR-H2 as depicted in SEQ ID NO: 162, CDR-H3 as depicted in SEQ ID NO: 163, CDR-L1 as depicted in SEQ ID NO: 164, CDR-L2 as depicted in SEQ ID NO: 165 and CDR-L3 as depicted in SEQ ID NO: 166;

(10) CDR-H1 as depicted in SEQ ID NO: 171, CDR-H2 as depicted in SEQ ID NO: 172, CDR-H3 as depicted in SEQ ID NO: 173, CDR-L1 as depicted in SEQ ID NO: 174, CDR-L2 as depicted in SEQ ID NO: 175 and CDR-L3 as depicted in SEQ ID NO: 176;

(11) CDR-H1 as depicted in SEQ ID NO: 181, CDR-H2 as depicted in SEQ ID NO: 182, CDR-H3 as depicted in SEQ ID NO: 183, CDR-L1 as depicted in SEQ ID NO: 184, CDR-L2 as depicted in SEQ ID NO: 185 and CDR-L3 as depicted in SEQ ID NO: 186;

(12) CDR-H1 as depicted in SEQ ID NO: 191, CDR-H2 as depicted in SEQ ID NO: 192, CDR-H3 as depicted in SEQ ID NO: 193, CDR-L1 as depicted in SEQ ID NO: 194, CDR-L2 as depicted in SEQ ID NO: 195 and CDR-L3 as depicted in SEQ ID NO: 196;

(13) CDR-H1 as depicted in SEQ ID NO: 201, CDR-H2 as depicted in SEQ ID NO: 202, CDR-H3 as depicted in SEQ ID NO: 203, CDR-L1 as depicted in SEQ ID NO: 204, CDR-L2 as depicted in SEQ ID NO: 205 and CDR-L3 as depicted in SEQ ID NO: 206;

(14) CDR-H1 as depicted in SEQ ID NO: 211, CDR-H2 as depicted in SEQ ID NO: 212, CDR-H3 as depicted in SEQ ID NO: 213, CDR-L1 as depicted in SEQ ID NO:214 , CDR-L2 as depicted in SEQ ID NO: 215 and CDR-L3 as depicted in SEQ ID NO: 216;

(15) CDR-H1 as depicted in SEQ ID NO: 221, CDR-H2 as depicted in SEQ ID NO: 222, CDR-H3 as depicted in SEQ ID NO: 223, CDR-L1 as depicted in

SEQ ID NO: 224, CDR-L2 as depicted in SEQ ID NO: 225 and CDR-L3 as depicted in SEQ ID NO: 226;

(16) CDR-H1 as depicted in SEQ ID NO: 311, CDR-H2 as depicted in SEQ ID NO: 312, CDR-H3 as depicted in SEQ ID NO: 313, CDR-L1 as depicted in SEQ ID NO: 314, CDR-L2 as depicted in SEQ ID NO: 315 and CDR-L3 as depicted in SEQ ID NO: 316;

(17) CDR-H1 as depicted in SEQ ID NO: 321, CDR-H2 as depicted in SEQ ID NO: 322, CDR-H3 as depicted in SEQ ID NO: 323, CDR-L1 as depicted in SEQ ID NO: 324, CDR-L2 as depicted in SEQ ID NO: 325 and CDR-L3 as depicted in SEQ ID NO: 326;

(18) CDR-H1 as depicted in SEQ ID NO: 331, CDR-H2 as depicted in SEQ ID NO: 332, CDR-H3 as depicted in SEQ ID NO: 333, CDR-L1 as depicted in SEQ ID NO: 334, CDR-L2 as depicted in SEQ ID NO: 335 and CDR-L3 as depicted in SEQ ID NO: 336;

(19) CDR-H1 as depicted in SEQ ID NO: 341, CDR-H2 as depicted in SEQ ID NO: 342, CDR-H3 as depicted in SEQ ID NO: 343, CDR-L1 as depicted in SEQ ID NO: 344, CDR-L2 as depicted in SEQ ID NO: 345 and CDR-L3 as depicted in SEQ ID NO: 346;

(20) CDR-H1 as depicted in SEQ ID NO: 351, CDR-H2 as depicted in SEQ ID NO: 352, CDR-H3 as depicted in SEQ ID NO: 353, CDR-L1 as depicted in SEQ ID NO: 354, CDR-L2 as depicted in SEQ ID NO: 355 and CDR-L3 as depicted in SEQ ID NO: 356;

(21) CDR-H1 as depicted in SEQ ID NO: 361, CDR-H2 as depicted in SEQ ID NO: 362, CDR-H3 as depicted in SEQ ID NO: 363, CDR-L1 as depicted in SEQ ID NO: 364, CDR-L2 as depicted in SEQ ID NO: 365 and CDR-L3 as depicted in SEQ ID NO: 366;

(22) CDR-H1 as depicted in SEQ ID NO: 371, CDR-H2 as depicted in SEQ ID NO: 372, CDR-H3 as depicted in SEQ ID NO: 373, CDR-L1 as depicted in SEQ ID NO: 374, CDR-L2 as depicted in SEQ ID NO: 375 and CDR-L3 as depicted in SEQ ID NO: 376;

(23) CDR-H1 as depicted in SEQ ID NO: 381, CDR-H2 as depicted in SEQ ID NO: 382, CDR-H3 as depicted in SEQ ID NO: 383, CDR-L1 as depicted in SEQ ID NO: 384, CDR-L2 as depicted in SEQ ID NO: 385 and CDR-L3 as depicted in SEQ ID NO: 386;

(24) CDR-H1 as depicted in SEQ ID NO: 581, CDR-H2 as depicted in SEQ ID NO: 582, CDR-H3 as depicted in SEQ ID NO: 583, CDR-L1 as depicted in SEQ ID NO: 584, CDR-L2 as depicted in SEQ ID NO: 585 and CDR-L3 as depicted in SEQ ID NO: 586;

(25) CDR-H1 as depicted in SEQ ID NO: 591, CDR-H2 as depicted in SEQ ID NO: 592, CDR-H3 as depicted in SEQ ID NO: 593, CDR-L1 as depicted in SEQ ID NO: 594, CDR-L2 as depicted in SEQ ID NO: 595 and CDR-L3 as depicted in SEQ ID NO: 596;

(26) CDR-H1 as depicted in SEQ ID NO: 601, CDR-H2 as depicted in SEQ ID NO: 602, CDR-H3 as depicted in SEQ ID NO: 603, CDR-L1 as depicted in SEQ ID NO: 604, CDR-L2 as depicted in SEQ ID NO: 605 and CDR-L3 as depicted in SEQ ID NO: 606;

(27) CDR-H1 as depicted in SEQ ID NO: 611, CDR-H2 as depicted in SEQ ID NO: 612, CDR-H3 as depicted in SEQ ID NO: 613, CDR-L1 as depicted in SEQ ID NO: 614, CDR-L2 as depicted in SEQ ID NO: 615 and CDR-L3 as depicted in SEQ ID NO: 616;

(28) CDR-H1 as depicted in SEQ ID NO: 621, CDR-H2 as depicted in SEQ ID NO: 622, CDR-H3 as depicted in SEQ ID NO: 623, CDR-L1 as depicted in SEQ ID NO: 624, CDR-L2 as depicted in SEQ ID NO: 625 and CDR-L3 as depicted in SEQ ID NO: 626;

(29) CDR-H1 as depicted in SEQ ID NO: 631, CDR-H2 as depicted in SEQ ID NO: 632, CDR-H3 as depicted in SEQ ID NO: 633, CDR-L1 as depicted in SEQ ID NO: 634, CDR-L2 as depicted in SEQ ID NO: 635 and CDR-L3 as depicted in SEQ ID NO: 636;

(30) CDR-H1 as depicted in SEQ ID NO: 641, CDR-H2 as depicted in SEQ ID NO: 642, CDR-H3 as depicted in SEQ ID NO: 643, CDR-L1 as depicted in SEQ ID NO: 644, CDR-L2 as depicted in SEQ ID NO: 645 and CDR-L3 as depicted in SEQ ID NO: 646;

(31) CDR-H1 as depicted in SEQ ID NO: 651, CDR-H2 as depicted in SEQ ID NO: 652, CDR-H3 as depicted in SEQ ID NO: 653, CDR-L1 as depicted in SEQ ID NO: 654, CDR-L2 as depicted in SEQ ID NO: 655 and CDR-L3 as depicted in SEQ ID NO: 656;

(32) CDR-H1 as depicted in SEQ ID NO: 661, CDR-H2 as depicted in SEQ ID NO: 662, CDR-H3 as depicted in SEQ ID NO: 663, CDR-L1 as depicted in

SEQ ID NO: 664, CDR-L2 as depicted in SEQ ID NO: 665 and CDR-L3 as depicted in SEQ ID NO: 666;

(33) CDR-H1 as depicted in SEQ ID NO: 671, CDR-H2 as depicted in SEQ ID NO: 672, CDR-H3 as depicted in SEQ ID NO: 673, CDR-L1 as depicted in SEQ ID NO: 674, CDR-L2 as depicted in SEQ ID NO: 675 and CDR-L3 as depicted in SEQ ID NO: 676;

(34) CDR-H1 as depicted in SEQ ID NO: 681, CDR-H2 as depicted in SEQ ID NO: 682, CDR-H3 as depicted in SEQ ID NO: 683, CDR-L1 as depicted in SEQ ID NO: 684, CDR-L2 as depicted in SEQ ID NO: 685 and CDR-L3 as depicted in SEQ ID NO: 686;

(35) CDR-H1 as depicted in SEQ ID NO: 691, CDR-H2 as depicted in SEQ ID NO: 692, CDR-H3 as depicted in SEQ ID NO: 693, CDR-L1 as depicted in SEQ ID NO: 694, CDR-L2 as depicted in SEQ ID NO: 695 and CDR-L3 as depicted in SEQ ID NO: 696;

(36) CDR-H1 as depicted in SEQ ID NO: 701, CDR-H2 as depicted in SEQ ID NO: 702, CDR-H3 as depicted in SEQ ID NO: 703, CDR-L1 as depicted in SEQ ID NO: 704, CDR-L2 as depicted in SEQ ID NO: 705 and CDR-L3 as depicted in SEQ ID NO: 706;

(37) CDR-H1 as depicted in SEQ ID NO: 711, CDR-H2 as depicted in SEQ ID NO: 712, CDR-H3 as depicted in SEQ ID NO: 713, CDR-L1 as depicted in SEQ ID NO: 714, CDR-L2 as depicted in SEQ ID NO: 715 and CDR-L3 as depicted in SEQ ID NO: 716;

(38) CDR-H1 as depicted in SEQ ID NO: 721, CDR-H2 as depicted in SEQ ID NO: 722, CDR-H3 as depicted in SEQ ID NO: 723, CDR-L1 as depicted in SEQ ID NO: 724, CDR-L2 as depicted in SEQ ID NO: 725 and CDR-L3 as depicted in SEQ ID NO: 726;

(39) CDR-H1 as depicted in SEQ ID NO: 731, CDR-H2 as depicted in SEQ ID NO: 732, CDR-H3 as depicted in SEQ ID NO: 733, CDR-L1 as depicted in SEQ ID NO: 734, CDR-L2 as depicted in SEQ ID NO: 735 and CDR-L3 as depicted in SEQ ID NO: 736;

(40) CDR-H1 as depicted in SEQ ID NO: 741, CDR-H2 as depicted in SEQ ID NO: 742, CDR-H3 as depicted in SEQ ID NO: 743, CDR-L1 as depicted in SEQ ID NO: 744, CDR-L2 as depicted in SEQ ID NO: 745 and CDR-L3 as depicted in SEQ ID NO: 746;

(41) CDR-H1 as depicted in SEQ ID NO: 751, CDR-H2 as depicted in SEQ ID NO: 752, CDR-H3 as depicted in SEQ ID NO: 753, CDR-L1 as depicted in SEQ ID NO: 754, CDR-L2 as depicted in SEQ ID NO: 755 and CDR-L3 as depicted in SEQ ID NO: 756;

(42) CDR-H1 as depicted in SEQ ID NO: 761, CDR-H2 as depicted in SEQ ID NO: 762, CDR-H3 as depicted in SEQ ID NO: 763, CDR-L1 as depicted in SEQ ID NO: 764, CDR-L2 as depicted in SEQ ID NO: 765 and CDR-L3 as depicted in SEQ ID NO: 766;

(43) CDR-H1 as depicted in SEQ ID NO: 771, CDR-H2 as depicted in SEQ ID NO: 772, CDR-H3 as depicted in SEQ ID NO: 773, CDR-L1 as depicted in SEQ ID NO: 774, CDR-L2 as depicted in SEQ ID NO: 775 and CDR-L3 as depicted in SEQ ID NO: 776;

(44) CDR-H1 as depicted in SEQ ID NO: 781, CDR-H2 as depicted in SEQ ID NO: 782, CDR-H3 as depicted in SEQ ID NO: 783, CDR-L1 as depicted in SEQ ID NO: 784, CDR-L2 as depicted in SEQ ID NO: 785 and CDR-L3 as depicted in SEQ ID NO: 786;

(45) CDR-H1 as depicted in SEQ ID NO: 791, CDR-H2 as depicted in SEQ ID NO: 792, CDR-H3 as depicted in SEQ ID NO: 793, CDR-L1 as depicted in SEQ ID NO: 794, CDR-L2 as depicted in SEQ ID NO: 795 and CDR-L3 as depicted in SEQ ID NO: 796;

(46) CDR-H1 as depicted in SEQ ID NO: 801, CDR-H2 as depicted in SEQ ID NO: 802, CDR-H3 as depicted in SEQ ID NO: 803, CDR-L1 as depicted in SEQ ID NO: 804, CDR-L2 as depicted in SEQ ID NO: 805 and CDR-L3 as depicted in SEQ ID NO: 806;

(47) CDR-H1 as depicted in SEQ ID NO: 811, CDR-H2 as depicted in SEQ ID NO: 812, CDR-H3 as depicted in SEQ ID NO: 813, CDR-L1 as depicted in SEQ ID NO: 814, CDR-L2 as depicted in SEQ ID NO: 815 and CDR-L3 as depicted in SEQ ID NO: 816;

(48) CDR-H1 as depicted in SEQ ID NO: 821, CDR-H2 as depicted in SEQ ID NO: 822, CDR-H3 as depicted in SEQ ID NO: 823, CDR-L1 as depicted in SEQ ID NO: 824, CDR-L2 as depicted in SEQ ID NO: 825 and CDR-L3 as depicted in SEQ ID NO: 826;

(49) CDR-H1 as depicted in SEQ ID NO: 831, CDR-H2 as depicted in SEQ ID NO: 832, CDR-H3 as depicted in SEQ ID NO: 833, CDR-L1 as depicted in

SEQ ID NO: 834, CDR-L2 as depicted in SEQ ID NO: 835 and CDR-L3 as depicted in SEQ ID NO: 836;

(50) CDR-H1 as depicted in SEQ ID NO: 961, CDR-H2 as depicted in SEQ ID NO: 962, CDR-H3 as depicted in SEQ ID NO: 963, CDR-L1 as depicted in SEQ ID NO: 964, CDR-L2 as depicted in SEQ ID NO: 965 and CDR-L3 as depicted in SEQ ID NO: 966;

(51) CDR-H1 as depicted in SEQ ID NO: 971, CDR-H2 as depicted in SEQ ID NO: 972, CDR-H3 as depicted in SEQ ID NO: 973, CDR-L1 as depicted in SEQ ID NO: 974, CDR-L2 as depicted in SEQ ID NO: 975 and CDR-L3 as depicted in SEQ ID NO: 976;

(52) CDR-H1 as depicted in SEQ ID NO: 981, CDR-H2 as depicted in SEQ ID NO: 982, CDR-H3 as depicted in SEQ ID NO: 983, CDR-L1 as depicted in SEQ ID NO: 984, CDR-L2 as depicted in SEQ ID NO: 985 and CDR-L3 as depicted in SEQ ID NO: 986; and

(53) CDR-H1 as depicted in SEQ ID NO: 991, CDR-H2 as depicted in SEQ ID NO: 992, CDR-H3 as depicted in SEQ ID NO: 993, CDR-L1 as depicted in SEQ ID NO: 994, CDR-L2 as depicted in SEQ ID NO: 995 and CDR-L3 as depicted in SEQ ID NO: 996; and

(b) the second binding domain comprises a variable heavy chain and a variable light chain and is capable of binding to the T cell CD3 receptor complex; and

wherein epitope cluster 3 of BCMA corresponds to amino acid residues 24 to 41 of the sequence as depicted in SEQ ID NO: 1002.

2. The binding molecule according to claim 1, wherein the first binding domain is further capable of binding to epitope cluster 3 of macaque BCMA (CQLRCSSTPPLTCQRYC) as depicted in SEQ ID NO: 1017.

3. The binding molecule according to claim 1 wherein the second binding domain is capable of binding to CD3 epsilon.

4. The binding molecule according to claim 1, wherein the second binding domain is capable of binding to human CD3 and to macaque CD3.

5. The binding molecule according to claim 1, wherein the first and/or the second binding domain are from an antibody.

6. The binding molecule according to claim 5, wherein the binding molecule is selected from the group consisting of $(scFv)_2$, diabodies and oligomers thereof.

7. The binding molecule according to claim 1, wherein the first binding domain comprises a VH region selected from the group consisting of VH regions as depicted in SEQ ID NO: 7, SEQ ID NO: 17, SEQ ID NO: 27, SEQ ID NO: 37, SEQ ID NO: 47, SEQ ID NO: 57, SEQ ID NO: 67, SEQ ID NO: 77, SEQ ID NO: 167, SEQ ID NO: 177, SEQ ID NO: 187, SEQ ID NO: 197, SEQ ID NO: 207, SEQ ID NO: 217, SEQ ID NO: 227, SEQ ID NO: 317, SEQ ID NO: 327, SEQ ID NO: 337, SEQ ID NO: 347, SEQ ID NO: 357, SEQ ID NO: 367, SEQ ID NO: 377, SEQ ID NO: 387, SEQ ID NO: 587, SEQ ID NO: 597, SEQ ID NO: 607, SEQ ID NO: 617, SEQ ID NO: 627, SEQ ID NO: 637, SEQ ID NO: 647, SEQ ID NO: 657, SEQ ID NO: 667, SEQ ID NO: 677, SEQ ID NO: 687, SEQ ID NO: 697, SEQ ID NO: 707, SEQ ID NO: 717, SEQ ID NO: 727, SEQ ID NO: 737, SEQ ID NO: 747, SEQ ID NO: 757, SEQ ID NO: 767, SEQ ID NO: 777, SEQ ID NO: 787, SEQ ID NO: 797, SEQ ID NO: 807, SEQ ID NO: 817, SEQ ID NO: 827, SEQ ID NO: 837, SEQ ID NO: 967, SEQ ID NO: 977, SEQ ID NO: 987, and SEQ ID NO: 997.

8. The binding molecule according to claim 1, wherein the first binding domain comprises a VL region selected from the group consisting of VL regions as depicted in SEQ ID NO: 8, SEQ ID NO: 18, SEQ ID NO: 28, SEQ ID NO: 38, SEQ ID NO: 48, SEQ ID NO: 58, SEQ ID NO: 68, SEQ ID NO: 78, SEQ ID NO: 168, SEQ ID NO: 178, SEQ ID NO: 188, SEQ ID NO: 198, SEQ ID NO: 208, SEQ ID NO: 218, SEQ ID NO: 228, SEQ ID NO: 318, SEQ ID NO: 328, SEQ ID NO: 338, SEQ ID NO: 348, SEQ ID NO: 358, SEQ ID NO: 368, SEQ ID NO: 378, SEQ ID NO: 388, SEQ ID NO: 588, SEQ ID NO: 598, SEQ ID NO: 608, SEQ ID NO: 618, SEQ ID NO: 628, SEQ ID NO: 638, SEQ ID NO: 648, SEQ ID NO: 658, SEQ ID NO: 668, SEQ ID NO: 678, SEQ ID NO: 688, SEQ ID NO: 698, SEQ ID NO: 708, SEQ ID NO: 718, SEQ ID NO: 728, SEQ ID NO: 738, SEQ ID NO: 748, SEQ ID NO: 758, SEQ ID NO: 768, SEQ ID NO: 778, SEQ ID NO: 788, SEQ ID

NO: 798, SEQ ID NO: 808, SEQ ID NO: 818, SEQ ID NO: 828, SEQ ID NO: 838, SEQ ID NO: 968, SEQ ID NO: 978, SEQ ID NO: 988, and SEQ ID NO: 998.

9. The binding molecule according to claim 1, wherein the first binding domain comprises a VH region and a VL region selected from the group consisting of:

(1) a VH region as depicted in SEQ ID NO: 7, and a VL region as depicted in SEQ ID NO: 8;

(2) a VH region as depicted in SEQ ID NO: 17, and a VL region as depicted in SEQ ID NO: 18;

(3) a VH region as depicted in SEQ ID NO: 27, and a VL region as depicted in SEQ ID NO: 28;

(4) a VH region as depicted in SEQ ID NO: 37, and a VL region as depicted in SEQ ID NO: 38;

(5) a VH region as depicted in SEQ ID NO: 47, and a VL region as depicted in SEQ ID NO: 48;

(6) a VH region as depicted in SEQ ID NO: 57, and a VL region as depicted in SEQ ID NO: 58;

(7) a VH region as depicted in SEQ ID NO: 67, and a VL region as depicted in SEQ ID NO: 68;

(8) a VH region as depicted in SEQ ID NO: 77, and a VL region as depicted in SEQ ID NO: 78;

(9) a VH region as depicted in SEQ ID NO: 167, and a VL region as depicted in SEQ ID NO: 168;

(10) a VH region as depicted in SEQ ID NO: 177, and a VL region as depicted in SEQ ID NO: 178;

(11) a VH region as depicted in SEQ ID NO: 187, and a VL region as depicted in SEQ ID NO: 188;

(12) a VH region as depicted in SEQ ID NO: 197, and a VL region as depicted in SEQ ID NO: 198;

(13) a VH region as depicted in SEQ ID NO: 207, and a VL region as depicted in SEQ ID NO: 208;

(14) a VH region as depicted in SEQ ID NO: 217, and a VL region as depicted in SEQ ID NO: 218;

(15) a VH region as depicted in SEQ ID NO: 227, and a VL region as depicted in SEQ ID NO: 228;

(16) a VH region as depicted in SEQ ID NO: 317, and a VL region as depicted in SEQ ID NO: 318;

(17) a VH region as depicted in SEQ ID NO: 327, and a VL region as depicted in SEQ ID NO: 328;

(18) a VH region as depicted in SEQ ID NO: 337, and a VL region as depicted in SEQ ID NO: 338;

(19) a VH region as depicted in SEQ ID NO: 347, and a VL region as depicted in SEQ ID NO: 348;

(20) a VH region as depicted in SEQ ID NO: 357, and a VL region as depicted in SEQ ID NO: 358;

(21) a VH region as depicted in SEQ ID NO: 367, and a VL region as depicted in SEQ ID NO: 368;

(22) a VH region as depicted in SEQ ID NO: 377, and a VL region as depicted in SEQ ID NO: 378;

(23) a VH region as depicted in SEQ ID NO: 387, and a VL region as depicted in SEQ ID NO: 388;

(24) a VH region as depicted in SEQ ID NO: 587, and a VL region as depicted in SEQ ID NO: 588;

(25) a VH region as depicted in SEQ ID NO: 597, and a VL region as depicted in SEQ ID NO: 598;

(26) a VH region as depicted in SEQ ID NO: 607, and a VL region as depicted in SEQ ID NO: 608;

(27) a VH region as depicted in SEQ ID NO: 617, and a VL region as depicted in SEQ ID NO: 618;

(28) a VH region as depicted in SEQ ID NO: 627, and a VL region as depicted in SEQ ID NO: 628;

(29) a VH region as depicted in SEQ ID NO: 637, and a VL region as depicted in SEQ ID NO: 638;

(30) a VH region as depicted in SEQ ID NO: 647, and a VL region as depicted in SEQ ID NO: 648;

(31) a VH region as depicted in SEQ ID NO: 657, and a VL region as depicted in SEQ ID NO: 658;

(32) a VH region as depicted in SEQ ID NO: 667, and a VL region as depicted in SEQ ID NO: 668;

(33) a VH region as depicted in SEQ ID NO: 677, and a VL region as depicted in SEQ ID NO: 678;

(34) a VH region as depicted in SEQ ID NO: 687, and a VL region as depicted in SEQ ID NO: 688;

(35) a VH region as depicted in SEQ ID NO: 697, and a VL region as depicted in SEQ ID NO: 698;

(36) a VH region as depicted in SEQ ID NO: 707, and a VL region as depicted in SEQ ID NO: 708;

(37) a VH region as depicted in SEQ ID NO: 717, and a VL region as depicted in SEQ ID NO: 718;

(38) a VH region as depicted in SEQ ID NO: 727, and a VL region as depicted in SEQ ID NO: 728;

(39) a VH region as depicted in SEQ ID NO: 737, and a VL region as depicted in SEQ ID NO: 738;

(40) a VH region as depicted in SEQ ID NO: 747, and a VL region as depicted in SEQ ID NO: 748;

(41) a VH region as depicted in SEQ ID NO: 757, and a VL region as depicted in SEQ ID NO: 758;

(42) a VH region as depicted in SEQ ID NO: 767, and a VL region as depicted in SEQ ID NO: 768;

(43) a VH region as depicted in SEQ ID NO: 777, and a VL region as depicted in SEQ ID NO: 778;

(44) a VH region as depicted in SEQ ID NO: 787, and a VL region as depicted in SEQ ID NO: 788;

(45) a VH region as depicted in SEQ ID NO: 797, and a VL region as depicted in SEQ ID NO: 798;

(46) a VH region as depicted in SEQ ID NO: 807, and a VL region as depicted in SEQ ID NO: 808;

(47) a VH region as depicted in SEQ ID NO: 817, and a VL region as depicted in SEQ ID NO: 818;

(48) a VH region as depicted in SEQ ID NO: 827, and a VL region as depicted in SEQ ID NO: 828;

(49) a VH region as depicted in SEQ ID NO: 837, and a VL region as depicted in SEQ ID NO: 838;

(50) a VH region as depicted in SEQ ID NO: 967, and a VL region as depicted in SEQ ID NO: 968;

(51) a VH region as depicted in SEQ ID NO: 977, and a VL region as depicted in SEQ ID NO: 978;

(52) a VH region as depicted in SEQ ID NO: 987, and a VL region as depicted in SEQ ID NO: 988; and

(53) a VH region as depicted in SEQ ID NO: 997, and a VL region as depicted in SEQ ID NO: 998.

10. The binding molecule according to claim 9, wherein the first binding domain comprises an amino acid sequence selected from the group consisting of SEQ ID NO: 9, SEQ ID NO: 19, SEQ ID NO: 29, SEQ ID NO: 39, SEQ ID NO: 49, SEQ ID NO: 59, SEQ ID NO: 69, SEQ ID NO: 79, SEQ ID NO: 169, SEQ ID NO: 179, SEQ ID NO: 189, SEQ ID NO: 199, SEQ ID NO: 209, SEQ ID NO: 219, SEQ ID NO: 229, SEQ ID NO: 319, SEQ ID NO: 329, SEQ ID NO: 339, SEQ ID NO: 349, SEQ ID NO: 359, SEQ ID NO: 369, SEQ ID NO: 379, SEQ ID NO: 389, SEQ ID NO: 589, SEQ ID NO: 599, SEQ ID NO: 609, SEQ ID NO: 619, SEQ ID NO: 629, SEQ ID NO: 639, SEQ ID NO: 649, SEQ ID NO: 659, SEQ ID NO: 669, SEQ ID NO: 679, SEQ ID NO: 689, SEQ ID NO: 699, SEQ ID NO: 709, SEQ ID NO: 719, SEQ ID NO: 729, SEQ ID NO: 739, SEQ ID NO: 749, SEQ ID NO: 759, SEQ ID NO: 769, SEQ ID NO: 779, SEQ ID NO: 789, SEQ ID NO: 799, SEQ ID NO: 809, SEQ ID NO: 819, SEQ ID NO: 829, SEQ ID NO: 839, SEQ ID NO: 969, SEQ ID NO: 979, SEQ ID NO: 989, and SEQ ID NO: 999.

11. The binding molecule according to claim 1 having the amino acid sequence shown in SEQ ID NO:340 or SEQ ID NO: 980.

12. The binding molecule according to claim 1, wherein the binding molecule has an EC50 (pg/ml) of less than 350 in a cell-based cytotoxicity assay.

13. A composition comprising the binding molecule according to claim 1 and a pharmaceutically acceptable carrier.

14. A kit comprising the binding molecule as defined in claim 1.

15. The binding molecule according to claim 1, wherein the first binding domain comprises a VH region comprising

(a) CDR-H1 as depicted in SEQ ID NO: 1, SEQ ID NO: 161, or SEQ ID NO: 311;

(b) CDR-H2 as depicted in SEQ ID NO: 2, SEQ ID NO: 12, SEQ ID NO: 162, SEQ ID NO: 212, SEQ ID NO: 312, SEQ ID NO: 322, SEQ ID NO: 352, SEQ ID NO: 362, SEQ ID NO: 582, SEQ ID NO: 622, or SEQ ID NO: 752; and

(c) CDR-H3 as depicted in SEQ ID NO: 3, SEQ ID NO: 163, SEQ ID NO: 313, SEQ ID NO: 323, or SEQ ID NO: 623; and

a VL region comprising

(a) CDR-L1 as depicted in SEQ ID NO: 4, SEQ ID NO: 164, SEQ ID NO: 314, SEQ ID NO: 624, SEQ ID NO: 774, SEQ ID NO: 974, or SEQ ID NO: 994;

(b) CDR-L2 as depicted in SEQ ID NO: 5, SEQ ID NO: 165, SEQ ID NO: 315, or SEQ ID NO: 625; and

(c) CDR-L3 as depicted in SEQ ID NO: 6, SEQ ID NO: 166, SEQ ID NO: 176, SEQ ID NO: 316, SEQ ID NO: 626, SEQ ID NO: 656, SEQ ID NO: 676, SEQ ID NO: 776, SEQ ID NO: 816, SEQ ID NO: 966, or SEQ ID NO: 996.

16. A nucleic acid sequence encoding a binding molecule as defined in any one of claims 1 to 12 and 15

17. A vector comprising a nucleic acid sequence as defined in claim 16.

18. A host cell transformed or transfected with the nucleic acid sequence as defined in claim 16 or with the vector as defined in claim 17.

19. A process for the production of a binding molecule according to any one of claims 1 to 12 and 15, said process comprising culturing a host cell as defined in claim 18 under conditions allowing the expression of the binding molecule as defined in any one of claims 1 to 12 and 15 and recovering the produced binding molecule from the culture.

20. A pharmaceutical composition comprising a binding molecule according to any one of claims 1 to 12 and 15, or produced according to the process of claim 19.

21. The binding molecule according to any one of claims 1 to 12 and 15, or produced according to the process of claim 19 for use in the prevention, treatment or amelioration of a disease selected from the group consisting of plasma cell disorders, other B cell disorders that correlate with BCMA expression and autoimmune diseases.

22. The binding molecule according to claim 21, wherein the plasma cell disorder is selected from the group consisting of multiple myeloma, plasmacytoma, plasma cell leukemia, macroglobulinemia, amyloidosis, Waldenstrom's macroglobulinemia , solitary bone plasmacytoma, extramedullary plasmacytoma, osteosclerotic myeloma, heavy chain diseases, monoclonal gammopathy of undetermined significance, and smoldering multiple myeloma.

23. The binding molecule according to claim 21, wherein the autoimmune disease is systemic lupus erythematosus.

24 Use of the binding molecule according to any one of claims 1 to 12 and 15, or produced according to the process of claim 19 in the preparation of a medicament for the treatment or amelioration of a disease selected from the group consisting of plasma cell disorders, other B cell disorders that correlate with BCMA expression and autoimmune diseases.

25. The use according to claim 24, wherein the plasma cell disorder is selected from the group consisting of multiple myeloma, plasmacytoma, plasma cell leukemia, macroglobulinemia, amyloidosis, Waldenstrom's macroglobulinemia , solitary bone plasmacytoma, extramedullary plasmacytoma, osteosclerotic myeloma, heavy chain diseases, monoclonal gammopathy of undetermined significance, and smoldering multiple myeloma.

26. The use according to claim 24, wherein the autoimmune disease is systemic lupus erythematosus.

27. A kit comprising a binding molecule as defined in any one of claims 1 to 12 and 15, a nucleic acid sequence as defined in claim 16, a vector as defined in claim 17, and/or a host cell as defined in claim 18.