

WHAT IS CLAIMED IS:

1. A leukemia tumor antigen peptide (TAP) comprising one of the following amino acid sequences:

Sequence (SEQ ID NO)	Sequence (SEQ ID NO)	Sequence (SEQ ID NO)	Sequence (SEQ ID NO.)
RQISVQASL (1)	SIQRNLSL (49)	AQDIILQAV (97)	RYLANKIHI (145)
DRELNRNLEL (2)	NVSSHVHTV (50)	PPRPLGAQV (98)	LLLSGLLRA (146)
GARQQIHSW (3)	ALASHLIEA (51)	FNVALNARY (99)	SRIHLVVL (147)
SGKLRVAL (4)	ALDDITIQL (52)	GPGRSTL (100)	SSSPVRGPSV (148)
RSASSATQVHK (5)	ALGNTVPAV (53)	IPHQRSSL (101)	STFSLYLKK (149)
SASSATQVHK (6)	ALLPAVPSL (54)	LTDRIYLT (102)	SLDLLPLSI (150)
FLLEFKPVS (7)	APAPPPVAV (55)	NLKEKKALF (103)	VTDLLALT (151)
GPQVRGSI (8)	APDKKITL (56)	VLFGGKVSGA (104)	RTQITKVSLLK (152)
IRMKAQAL (9)	AQMNLQKY (57)	VVFPFVNK (105)	ILRSPKWL (153)
KIKVFSKVY (10)	DQVIRLAGL (58)	SLLIIPKKK (106)	LSTGHLSTV (154)
LLSRGLLFRI (11)	ETTSQVRKY (59)	APGAAGQRL (107)	TVEEYLVNI (155)
LPIASALL (12)	GGSLIHPQW (60)	KLQDKEIGL (108)	QIKTKLLGSL (156)
LYFLGHGSI (13)	GLYYKLHNV (61)	SLREPQPAL (109)	LPSFSHFLL (157)
NPLQLSLSI (14)	GQKPVILTY (62)	TPGRSTQAI (110)	CLRIGPVT (158)
DLMLRESL (15)	GSLDFQRGW (63)	APRGTAAL (111)	HVSDGSTALK (159)
VTFKLSLF (16)	HHLVETLKF (64)	IASPIALL (112)	IAYSVRALR (160)
IALYKQVL (17)	HLLSETPQL (65)	ILFQNSALK (113)	PRGFLSAL (161)
IVATGSLLK (18)	HQLYRASAL (66)	ILKKNISI (114)	ISSWLISSL (162)
KIKNKTKNK (19)	HTDDIENAKY (67)	IPLAVRTI (115)	IPLNPFSSL (163)
KLLSLTIYK (20)	IAAPILHV (68)	LPRNKPLL (116)	LSDRQLSL (164)
NILKKTIVL (21)	KAFPFHIF (69)	PAPHPAAL (117)	LSPHAPSSL (165)
NPKLKDIL (22)	KATEYVHSL (70)	SPVVRVGL (118)	LRKAVDPIL (166)
NQKKVRIL (23)	KFSNVTMLF (71)	TLNQGINVYI (119)	ILLEEQLSI (167)
PFPLVQVEPV (24)	KLLEKAISI (72)	RPRGPRTAP (120)	LTSISIRPV (168)
SPQSGPAL (25)	KPMPTKVVF (73)	SVQLLEQAIHK (121)	TISECPLLI (169)
TSRLPKIQK (26)	NVNRPLTMK (74)	RTPKNYQHW (122)	TLKLLKIFF (170)
LLDNILQSI (27)	REPYELTPAL (75)	ALPVALPSL (123)	ILLSNFSSL (171)
RLEVRKVL (28)	SEAEAAKNAL (76)	SLQILVSSL (124)	LGGAWKAVF (172)
LSWGYFLFK (29)	SLWGQPAEA (77)	ISNKVPKLF (125)	LSASHLSSL (173)
TILPRILT (30)	SPADHRGYASL (78)	TVIRIAIVNK (126)	AGDIIARLI (174)
EGKIKRNI (31)	SPQSAAAEEL (79)	KEIFLELRL (127)	DRGILRNLL (175)
FLASFVEKTVL (32)	SPVVHQSL (80)	TLRSPGSSL (128)	GLRLIHVSL (176)
ILASHNLTV (33)	SPYRTPVL (81)	TVRGDVSSL (129)	GLRLHVSLL (177)
IQLTSVHLL (34)	SVFAGVGV (82)	ALDPLLLRI (130)	LHNEKGLSL (178)
LELISFLPVL (35)	SYSPAHLARL (83)	ISLIVTGLK (131)	LPSFSRPSGII (179)
NFCMLHQL (36)	THGSEQLHL (84)	KILDVNLRI (132)	LSSRLPLGK (180)
PARPAGSL (37)	TQAPPNVVL (85)	ERVYIRASL (133)	MIGIKRL (181)
PLPIVPAL (38)	VLVPYEPPQV (86)	ILDLESRY (134)	NLKKREIL (182)
SNLIRTGSH (39)	VSFDPVRKV (87)	KTFVQQKTL (135)	RMVAYLQQL (183)
VPAPAQAI (40)	VVFDKSDLAKY (88)	LYIKSLPAL (136)	SPARALPSL (184)
KGHGGPRSW (41)	YSHHSGLEY (89)	VLKEKNASL (137)	TVPGIQRY (185)
ITSSAVTTALK (42)	YYLDWIHHY (90)	LGISLTLKY (138)	VSRNYVLLI (186)
LLLPESPSI (43)	SVYKYLKAK (91)	DLLPKKLL (139)	LTVPLSVFW (187)
VILIPLPPK (44)	IYQFIMDRF (92)	HSLISIVYL (140)	KLNQAFVL (188)
AVLLPKPPK (45)	GTLQGIRAW (93)	IAGALRSVL (141)	RLVSSTLLQK (189)
TQVSMAESI (46)	AQKVSQVQAA (94)	IGNPILRVL (142)	LPSHSLLI (190)

LNHLRTSI (47)	LYPSKLTHF (95)	IYAPHIRLS (143)
NTSHLPLIY (48)	ATQNTIIGK (96)	LRSQILSY (144)

2. The leukemia TAP of claim 1, comprising one of the amino acid sequences set forth in SEQ ID NOs: 97-154.

3. The leukemia TAP of claim 1 or 2, wherein said leukemia TAP binds to an HLA-A*01:01 molecule and comprises the amino acid sequence NTSHLPLIY (SEQ ID NO:48), HTDDIENAKY (SEQ ID NO:67), YSHHSGLEY (SEQ ID NO:89), ILDLESRY (SEQ ID NO:134), VTDLLALTV (SEQ ID NO:151) or LSDRQLSL (SEQ ID NO:164), preferably ILDLESRY (SEQ ID NO:134) or VTDLLALTV (SEQ ID NO:151).

4. The leukemia TAP of claim 1 or 2, wherein said leukemia TAP binds to an HLA-A*02:01 molecule and comprises the amino acid sequence FLLEFKPVS (SEQ ID NO:7), LLSRGLLFRI (SEQ ID NO:11), LLDNILQSI (SEQ ID NO:27), FLASFVEKTVL (SEQ ID NO:32), ILASHNLTV (SEQ ID NO:33), IQLTSVHLL (SEQ ID NO:34), LELISFLPVL (SEQ ID NO:35), LLLPESPSI (SEQ ID NO:43), ALASHLIEA (SEQ ID NO:51), ALDDITIQL (SEQ ID NO:52), ALGNTVPAV (SEQ ID NO:53), ALLPAVPSL (SEQ ID NO:54), GLYYKLHNV (SEQ ID NO:61), HLLSETPQL (SEQ ID NO:65), KLEKAFSI (SEQ ID NO:72), SLWGQPAAE (SEQ ID NO:77), SVFAGVVG (SEQ ID NO:82), VLPYEPQV (SEQ ID NO:86), VLFGGKVS (SEQ ID NO:104), KLQDKEIGL (SEQ ID NO:108), TLNQGINVYI (SEQ ID NO:119), ALPVALPSL (SEQ ID NO:123), ALDPLLLRI (SEQ ID NO:130), KILDVNLRI (SEQ ID NO:132), SLLSGLLRA (SEQ ID NO:146), SLDLLPLSI (SEQ ID NO:150), ILLEEQLSI (SEQ ID NO:167), LTSISIRPV (SEQ ID NO:168), TISECPILLI (SEQ ID NO:169), ILLSNFSSL (SEQ ID NO:171), RMVAYLQQL (SEQ ID NO:183), or KLNQAFLVL (SEQ ID NO:188), preferably VLFGGKVS (SEQ ID NO:104), KLQDKEIGL (SEQ ID NO:108), TLNQGINVYI (SEQ ID NO:119), ALPVALPSL (SEQ ID NO:123), ALDPLLLRI (SEQ ID NO:130), KILDVNLRI (SEQ ID NO:132), SLLSGLLRA (SEQ ID NO:146) or SLDLLPLSI (SEQ ID NO:150).

5. The leukemia TAP of claim 1 or 2, wherein said leukemia TAP binds to an HLA-A*03:01 molecule and comprises the amino acid sequence RSASSATQVHK (SEQ ID NO:5), IVATGSLLK (SEQ ID NO:18), KIKNKTKNK (SEQ ID NO:19), KLLSLTIYK (SEQ ID NO:20), ITSSAVTTALK (SEQ ID NO:42), VILIPLPPK (SEQ ID NO:44), NVNRPLTMK (SEQ ID NO:74), SVYKYLKAK (SEQ ID NO:91), VVFPFPVVK (SEQ ID NO:105), ILFQNSALK (SEQ ID NO:113), TVIRIAIVNK (SEQ ID NO:126), ISLIVTGLK (SEQ ID NO:131), HVSDGSTALK (SEQ ID NO:159), IAYSVRALR (SEQ ID NO:160), LSSRLPLGK (SEQ ID NO:180) or RLVSTLLQK (SEQ ID NO:189), preferably VVFPFPVVK (SEQ ID NO:105), ILFQNSALK (SEQ ID NO:113), TVIRIAIVNK (SEQ ID NO:126) or ISLIVTGLK (SEQ ID NO:131).

6. The leukemia TAP of claim 1 or 2, wherein said leukemia TAP binds to an HLA-A*11:01 molecule and comprises the amino acid sequence SASSATQVHK (SEQ ID NO:6), AVLLPKPPK (SEQ ID NO:45), ATQNTIIGK (SEQ ID NO:96), SLLIIPKKK (SEQ ID NO:106), SVQLLEQAIHK (SEQ ID NO:121), STFSLYLKK (SEQ ID NO:149) or RTQITKVSLKK (SEQ ID NO:152), preferably SLLIIPKKK (SEQ ID NO:106), SVQLLEQAIHK (SEQ ID NO:121), STFSLYLKK (SEQ ID NO:149) or RTQITKVSLKK (SEQ ID NO:152).
7. The leukemia TAP of claim 1 or 2, wherein said leukemia TAP binds to an HLA-A*24:02 molecule and comprises the amino acid sequence LYFLGHGSI (SEQ ID NO:13), NFCMLHQSI (SEQ ID NO:36), KFSNVTMLF (SEQ ID NO:71), IYQFIMDRF (SEQ ID NO:92), LYPSKLTHF (SEQ ID NO:95) or RYLANKIHI (SEQ ID NO:145), preferably RYLANKIHI (SEQ ID NO:145).
8. The leukemia TAP of claim 1 or 2, wherein said leukemia TAP binds to an HLA-A*26:01 molecule and comprises the amino acid sequence ETTSQVRKY (SEQ ID NO:59) or TVPGIQRY (SEQ ID NO:185).
9. The leukemia TAP of claim 1 or 2, wherein said leukemia TAP binds to an HLA-A*29:02 molecule and comprises one of the amino acid sequence VVFDKSDLAKY (SEQ ID NO:88), FNVALNARY (SEQ ID NO:99) or LGISLTLKY (SEQ ID NO:138), preferably FNVALNARY (SEQ ID NO:99) or LGISLTLKY (SEQ ID NO:138).
10. The leukemia TAP of claim 1 or 2, wherein said leukemia TAP binds to an HLA-A*30:01 molecule and comprises the amino acid sequence TSRLPKIQK (SEQ ID NO:26), LSWGYFLFK (SEQ ID NO:29) or LSHPAPSSL (SEQ ID NO:165).
11. The leukemia TAP of claim 1 or 2, wherein said leukemia TAP binds to an HLA-A*68:02 molecule and comprises the amino acid sequence NVSSHVHTV (SEQ ID NO:50) or SSSPVRGPSV (SEQ ID NO:148), preferably SSSPVRGPSV (SEQ ID NO:148).
12. The leukemia TAP of claim 1 or 2, wherein said leukemia TAP binds to an HLA-B*07:02 molecule and comprises the amino acid sequence GPQVRGSI (SEQ ID NO:8), SPQSGPAL (SEQ ID NO:25), VPAPAQAI (SEQ ID NO:40), APAPPPVAV (SEQ ID NO:55), APDKKITL (SEQ ID NO:56), KPMPKVVV (SEQ ID NO:73), SPADHRGYASL (SEQ ID NO:78), SPQSAAAE (SEQ ID NO:79), SPVVHQSL (SEQ ID NO:80), SPYRTPVL (SEQ ID NO:81), PPRPLGAQV (SEQ ID NO:98), GPGSRESTL (SEQ ID NO:100), APGAAGQRL (SEQ ID NO:107), TPGRSTQAI (SEQ ID NO:110), APRGTAAL (SEQ ID NO:111), SPVVRVGL (SEQ ID NO:118), RPRGPRTAP (SEQ ID NO:120), TLRSPGSSL (SEQ ID NO:128), TVRGDVSSL (SEQ ID NO:129), LPSFSHFLLL (SEQ ID NO:157), PRGFLSAL (SEQ ID NO:161), IPLNPFSSL (SEQ ID NO:163), LPSFSRPSGII (SEQ ID NO:179) or

SPARALPSL (SEQ ID NO:184), preferably PPRPLGAQV (SEQ ID NO:98), GPGSRESTL (SEQ ID NO:100), APGAAGQRL (SEQ ID NO:107), TPGRSTQAI (SEQ ID NO:110), APRGTAAL (SEQ ID NO:111), SPVVRVGL (SEQ ID NO:118), RPRGPRTAP (SEQ ID NO:120), TLRSPGSSL (SEQ ID NO:128) or TVRGDVSSL (SEQ ID NO:129).

5 13. The leukemia TAP of claim 1 or 2, wherein said leukemia TAP binds to an HLA-B*08:01 molecule and comprises the amino acid sequence SGKLRVAL (SEQ ID NO:4), NPLQLSLSI (SEQ ID NO:14), DLMLRESL (SEQ ID NO:15), IALYKQVL (SEQ ID NO:17), NILKKTVL (SEQ ID NO:21), NPKLKDIL (SEQ ID NO:22), NQKKVRIL (SEQ ID NO:23), RLEVRKVIL (SEQ ID NO:28), EGKIKRNI (SEQ ID NO:31), LNHLRTSI (SEQ ID NO:47), SIQRNLSL (SEQ ID NO:49), IPHQRSSL (SEQ ID NO:101), NLKEKKALF (SEQ ID NO:103), ILKKNISI (SEQ ID NO:114), VLKEKNASL (SEQ ID NO:137), DLLPKKLL (SEQ ID NO:139), SRIHLVVL (SEQ ID NO:147), QIKTKLLGSL (SEQ ID NO:156), TLKLK KIFF (SEQ ID NO:170), MIGIKRLL (SEQ ID NO:181) or NLKKREIL (SEQ ID NO:182), preferably IPHQRSSL (SEQ ID NO:101), NLKEKKALF (SEQ ID NO:103), ILKKNISI (SEQ ID NO:114), VLKEKNASL (SEQ ID NO:137), DLLPKKLL (SEQ ID NO:139) or SRIHLVVL (SEQ ID NO:147).

14. The leukemia TAP of claim 1 or 2, wherein said leukemia TAP binds to an HLA-B*14:01 molecule and comprises the amino acid sequence DRELRLNEL (SEQ ID NO:2), SNLIRTGSH (SEQ ID NO:39), DQVIRLAGL (SEQ ID NO:58), HQLYRASAL (SEQ ID NO:66), SLQILVSSL (SEQ ID NO:124), ERVYIRASL (SEQ ID NO:133), LYIKSLPAL (SEQ ID NO:136), IAGALRSVL (SEQ ID NO:141), ISSWLISSL (SEQ ID NO:162), DRGILRNLL (SEQ ID NO:175), GLRLIHVSL (SEQ ID NO:176) or GLRLLHVSL (SEQ ID NO:177), preferably SLQILVSSL (SEQ ID NO:124), ERVYIRASL (SEQ ID NO:133), LYIKSLPAL (SEQ ID NO:136) or IAGALRSVL (SEQ ID NO:141).

15. The leukemia TAP of claim 1 or 2, wherein said leukemia TAP binds to an HLA-B*15:01 molecule and comprises the amino acid sequence KIKVFSKVY (SEQ ID NO:10), AQMNLLQKY (SEQ ID NO:57), GQKPVILTY (SEQ ID NO:62) or AQKVS VGQAA (SEQ ID NO:94).

16. The leukemia TAP of claim 1 or 2, wherein said leukemia TAP binds to an HLA-B*27:05 molecule and comprises the amino acid sequence RQISVQASL (SEQ ID NO:1) or LRSQILSY (SEQ ID NO:144), preferably LRSQILSY (SEQ ID NO:144).

17. The leukemia TAP of claim 1 or 2, wherein said leukemia TAP binds to an HLA-B*38:01 molecule and comprises the amino acid sequence TQVSMAESI (SEQ ID NO:46), HHLVETLKF (SEQ ID NO:64) or THGSEQLHL (SEQ ID NO:84).

18. The leukemia TAP of claim 1 or 2, wherein said leukemia TAP binds to an HLA-B*40:01 molecule and comprises the amino acid sequence REPYELTVPAL (SEQ ID NO:75) or SEAEAAKNAL (SEQ ID NO:76).
19. The leukemia TAP of claim 1 or 2, wherein said leukemia TAP binds to an HLA-B*44:03 molecule and comprises the amino acid sequence KEIFLELRL (SEQ ID NO:127).
20. The leukemia TAP of claim 1 or 2, wherein said leukemia TAP binds to an HLA-B*51:01 molecule and comprises the amino acid sequence LPIASASLL (SEQ ID NO:12), PFPLVQVEPV (SEQ ID NO:24), PLPIVPAL (SEQ ID NO:38), IAAPILHV (SEQ ID NO:68), IPLAVRTI (SEQ ID NO:115), LPRNKPLL (SEQ ID NO:116) or LPSHSLLI (SEQ ID NO:190), preferably IPLAVRTI (SEQ ID NO:115) or LPRNKPLL (SEQ ID NO:116).
21. The leukemia TAP of claim 1 or 2, wherein said leukemia TAP binds to an HLA-B*57:01 molecule and comprises the amino acid sequence GARQQIHSW (SEQ ID NO:3), VTFKLSLF (SEQ ID NO:16), KGHGGPRSW (SEQ ID NO:41), GSLDFQRGW (SEQ ID NO:63), KAFPFHIIF (SEQ ID NO:69), GTLQGIRAW (SEQ ID NO:93), RTPKNYQHW (SEQ ID NO:122), ISNKVPKLF (SEQ ID NO:125), KTFVQQKTL (SEQ ID NO:135), ILRSPLKW (SEQ ID NO:153) or LTVPLSVFW (SEQ ID NO:183), preferably RTPKNYQHW (SEQ ID NO:122), ISNKVPKLF (SEQ ID NO:125), KTFVQQKTL (SEQ ID NO:135) or ILRSPLKW (SEQ ID NO:153).
22. The leukemia TAP of claim 1 or 2, wherein said leukemia TAP binds to an HLA-B*57:03 molecule and comprises the amino acid sequence GGSLIHPQW (SEQ ID NO:60) or LGGAWKAVF (SEQ ID NO:172).
23. The leukemia TAP of claim 1 or 2, wherein said leukemia TAP binds to an HLA-C*03:03 molecule and comprises the amino acid sequence PARPAGPL (SEQ ID NO:37), IASPIALL (SEQ ID NO:112) or HSLISIVYL (SEQ ID NO:140), preferably IASPIALL (SEQ ID NO:112) or HSLISIVYL (SEQ ID NO:140).
24. The leukemia TAP of claim 1 or 2, wherein said leukemia TAP binds to an HLA-C*05:01 molecule and comprises the amino acid sequence SLDLLPLSI (SEQ ID NO:150).
25. The leukemia TAP of claim 1 or 2, wherein said leukemia TAP binds to an HLA-C*06:02 molecule and comprises the amino acid sequence IRMKAQAL (SEQ ID NO:9), KATEYVHSL (SEQ ID NO:70), VSFPDVRKV (SEQ ID NO:87), IGNPILRVL (SEQ ID NO:142), LSTGHLSTV (SEQ ID NO:154) or LRKAVDPIIL (SEQ ID NO:166), preferably IGNPILRVL (SEQ ID NO:142) or LSTGHLSTV (SEQ ID NO:154).

26. The leukemia TAP of claim 1 or 2, wherein said leukemia TAP binds to an HLA-C*07:01 molecule and comprises the amino acid sequence IGNPILRVL (SEQ ID NO:142), IYAPHIRLS (SEQ ID NO:143), TVEEYLVNI (SEQ ID NO:155), LHNEKGLSL (SEQ ID NO:178) or VSRNYVLLI (SEQ ID NO:186), preferably IGNPILRVL (SEQ ID NO:142) or IYAPHIRLS (SEQ ID NO:143).
- 5 27. The leukemia TAP of claim 1 or 2, wherein said leukemia TAP binds to an HLA-C*07:02 molecule and comprises the amino acid sequence TILPRILTL (SEQ ID NO:30), SYSPAHARL (SEQ ID NO:83), TQAPPNVVL (SEQ ID NO:85), YYLDWIHHY (SEQ ID NO:90), SLREPQPAL (SEQ ID NO:109), PAPPHPAAL (SEQ ID NO:117) or CLRIGPVTI (SEQ ID NO:158) , preferably SLREPQPAL (SEQ ID NO:109) or PAPPHPAAL (SEQ ID NO:117).
- 10 28. The leukemia TAP of claim 1 or 2, wherein said leukemia TAP binds to an HLA-C*08:02 molecule and comprises the amino acid sequence AQDILQAV (SEQ ID NO:97), LTDRIYLT (SEQ ID NO:102) or AGDIARLI (SEQ ID NO:174), preferably AQDILQAV (SEQ ID NO:97) or LTDRIYLT (SEQ ID NO:102).
29. The leukemia TAP of claim 1 or 2, wherein said leukemia TAP binds to an HLA-C*12:03
15 molecule and comprises the amino acid sequence LSASHLSSL (SEQ ID NO:173).
30. The leukemia TAP of any one of claims 1-29, which is encoded by a sequence located a non-protein coding region of the genome.
31. The leukemia TAP of claim 30, wherein said non-protein coding region of the genome is an untranslated transcribed region (UTR).
- 20 32. The leukemia TAP of claim 30, wherein said non-protein coding region of the genome is an intron.
33. The leukemia TAP of claim 30, wherein said non-protein coding region of the genome is an intergenic region.
34. A combination comprising at least two of the leukemia TAPs defined in any one of claims 1-
25 33
35. A nucleic acid encoding the leukemia TAP of any one of claims 1-33 or the combination of claim 34.
36. The nucleic acid of claim 35, which is an mRNA or a viral vector.
37. A liposome comprising the leukemia TAP of any one of claims 1-33, the combination of claim
30 34, or the nucleic acid of claim 35 or 36.

38. A composition comprising the leukemia TAP of any one of claims 1-33, the combination of claim 34, the nucleic acid of claim 35 or 36, or the liposomes of claim 37, and a pharmaceutically acceptable carrier.
39. A vaccine comprising the leukemia TAP of any one of claims 1-33, the combination of claim 34, the nucleic acid of claim 35 or 36, the liposomes of claim 37, or the composition of claim 38, and an adjuvant.
40. An isolated major histocompatibility complex (MHC) class I molecule comprising the leukemia TAP of any one of claims 1-33 in its peptide binding groove.
41. The isolated MHC class I molecule of claim 40, which is in the form of a multimer.
42. The isolated MHC class I molecule of claim 41, wherein said multimer is a tetramer.
43. An isolated cell comprising (i) the leukemia TAP of any one of claims 1-33, (ii) the combination of claim 34 or (iii) a vector comprising a nucleotide sequence encoding TAP of any one of claims 1-33 or the combination of claim 34.
44. An isolated cell expressing at its surface major histocompatibility complex (MHC) class I molecules comprising the leukemia TAP of any one of claims 1-33 or the combination of claim 34 in their peptide binding groove.
45. The cell of claim 44, which is an antigen-presenting cell (APC).
46. The cell of claim 45, wherein said APC is a dendritic cell.
47. A T-cell receptor (TCR) that specifically recognizes the isolated MHC class I molecule of any one of claims 40-42 and/or MHC class I molecules expressed at the surface of the cell of any one of claims 44-46.
48. The TCR of claim 47, wherein said TCR comprises a TCRbeta (TCR β) chain comprising a complementary determining region 3 (CDR3) comprising one of the amino acid sequences set forth in SEQ ID NO: 191-219.
49. An isolated cell expressing at its cell surface the TCR of claim 47 or 48.
50. The isolated cell of claim 49, which is a CD8⁺ T lymphocyte.
51. A cell population comprising at least 0.5% of the isolated cell as defined in claim 49 or 50.
52. A method of treating leukemia in a subject comprising administering to the subject an effective amount of: (i) the leukemia TAP of any one of claims 1-33; (ii) the combination of claim 34; (iii) the nucleic acid of claim 35 or 36; (iv) the liposome of claim 37; (v) the composition of claim 38; (vi) the

vaccine of claim 39; (vii) the cell of any one of claims 43-46, 49 and 50; or (viii) the cell population of claim 51.

53. The method of claim 52, wherein said leukemia is a myeloid leukemia.

54. The method of claim 53, wherein said myeloid leukemia is acute myeloid leukemia (AML).

5 55. The method of any one of claims 52-54, further comprising administering at least one additional antitumor agent or therapy to the subject.

56. The method of claim 55, wherein said at least one additional antitumor agent or therapy is a chemotherapeutic agent, immunotherapy, an immune checkpoint inhibitor, radiotherapy or surgery.

10 57. Use of: (i) the leukemia TAP of any one of claims 1-33; (ii) the combination of claim 34; (iii) the nucleic acid of claim 35 or 36; (iv) the liposome of claim 37; (v) the composition of claim 38; (vi) the vaccine of claim 39; (vii) the cell of any one of claims 43-46, 49 and 50; or (viii) the cell population of claim 51, for treating leukemia in a subject.

15 58. Use of: (i) the leukemia TAP of any one of claims 1-33; (ii) the combination of claim 34; (iii) the nucleic acid of claim 35 or 36; (iv) the liposome of claim 37; (v) the composition of claim 38; (vi) the vaccine of claim 39; (vii) the cell of any one of claims 43-46, 49 and 50; or (viii) the cell population of claim 51, for the manufacture of a medicament for treating leukemia in a subject.

59. The use of claim 57 or 58, wherein said leukemia is a myeloid leukemia.

60. The use of claim 59, wherein said myeloid leukemia is acute myeloid leukemia (AML).

20 61. The use of any one of claims 57-60, further comprising the use of at least one additional antitumor agent or therapy.

62. The use of claim 61, wherein said at least one additional antitumor agent or therapy is a chemotherapeutic agent, immunotherapy, an immune checkpoint inhibitor, radiotherapy or surgery.

25 63. The: (i) leukemia TAP of any one of claims 1-33; (ii) combination of claim 34; (iii) nucleic acid of claim 35 or 36; (iv) liposome of claim 37; (v) composition of claim 38; (vi) vaccine of claim 39; (vii) cell of any one of claims 43-46, 49 and 50; or (viii) cell population of claim 51, for use in the treatment of leukemia in a subject.

64. The leukemia TAP, combination, nucleic acid, liposome, composition, vaccine, cell or cell population for use according to claim 63, wherein said leukemia is a myeloid leukemia.

65. The leukemia TAP, combination, nucleic acid, liposome, composition, vaccine, cell or cell population for use according to claim 64, wherein said myeloid leukemia is acute myeloid leukemia (AML).

66. The leukemia TAP, combination, nucleic acid, liposome, composition, vaccine, cell or cell
5 population for use according to any one of claims 63-65, which is for use in combination with at least one additional antitumor agent or therapy.

67. The leukemia TAP, combination, nucleic acid, liposome, composition, vaccine, cell or cell
population for use according to claim 66, wherein said at least one additional antitumor agent or
therapy is a chemotherapeutic agent, immunotherapy, an immune checkpoint inhibitor, radiotherapy
10 or surgery.