

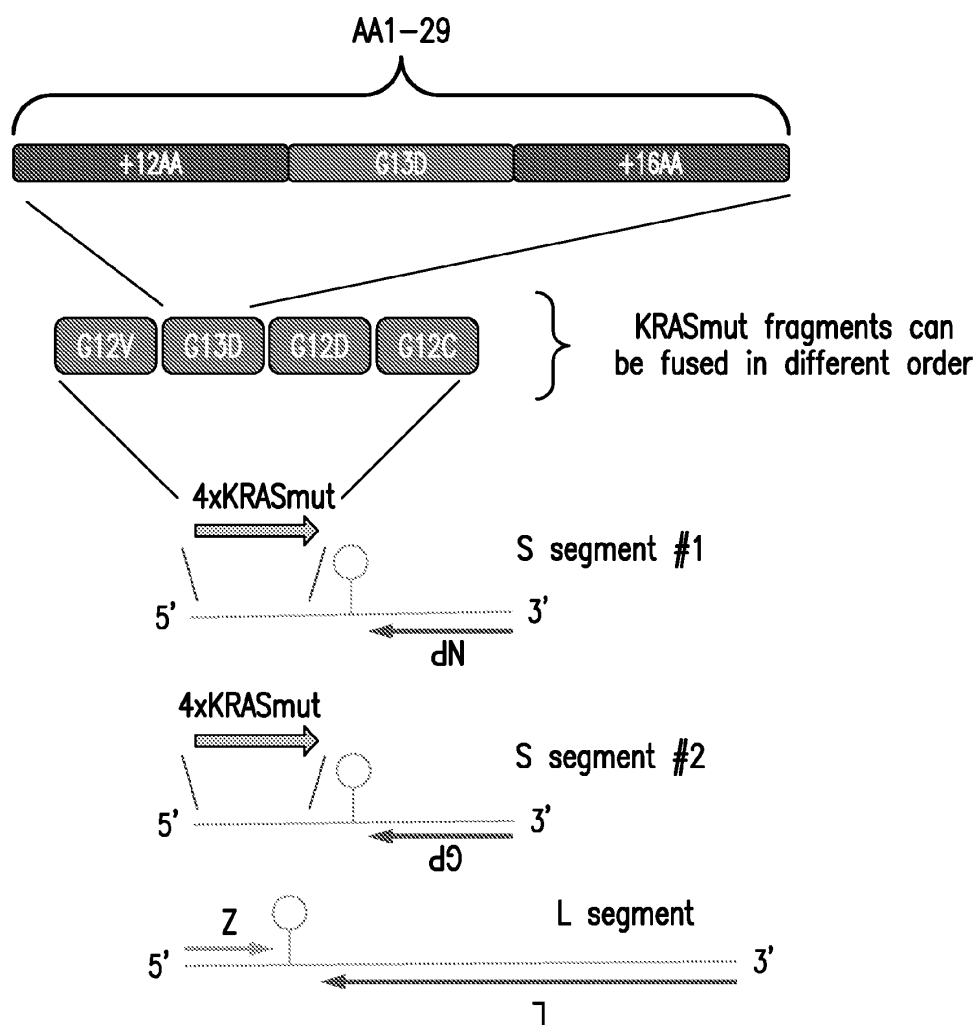


FIG. 1

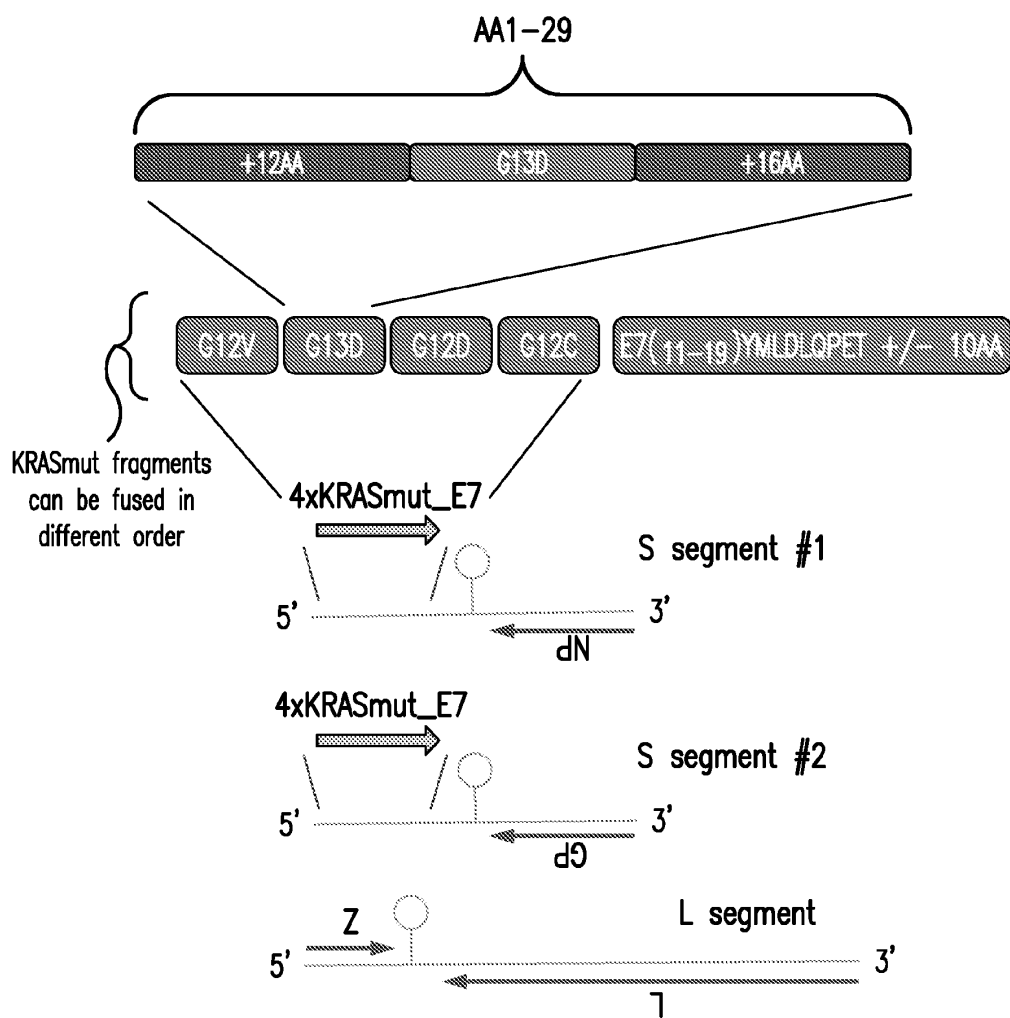


FIG. 2

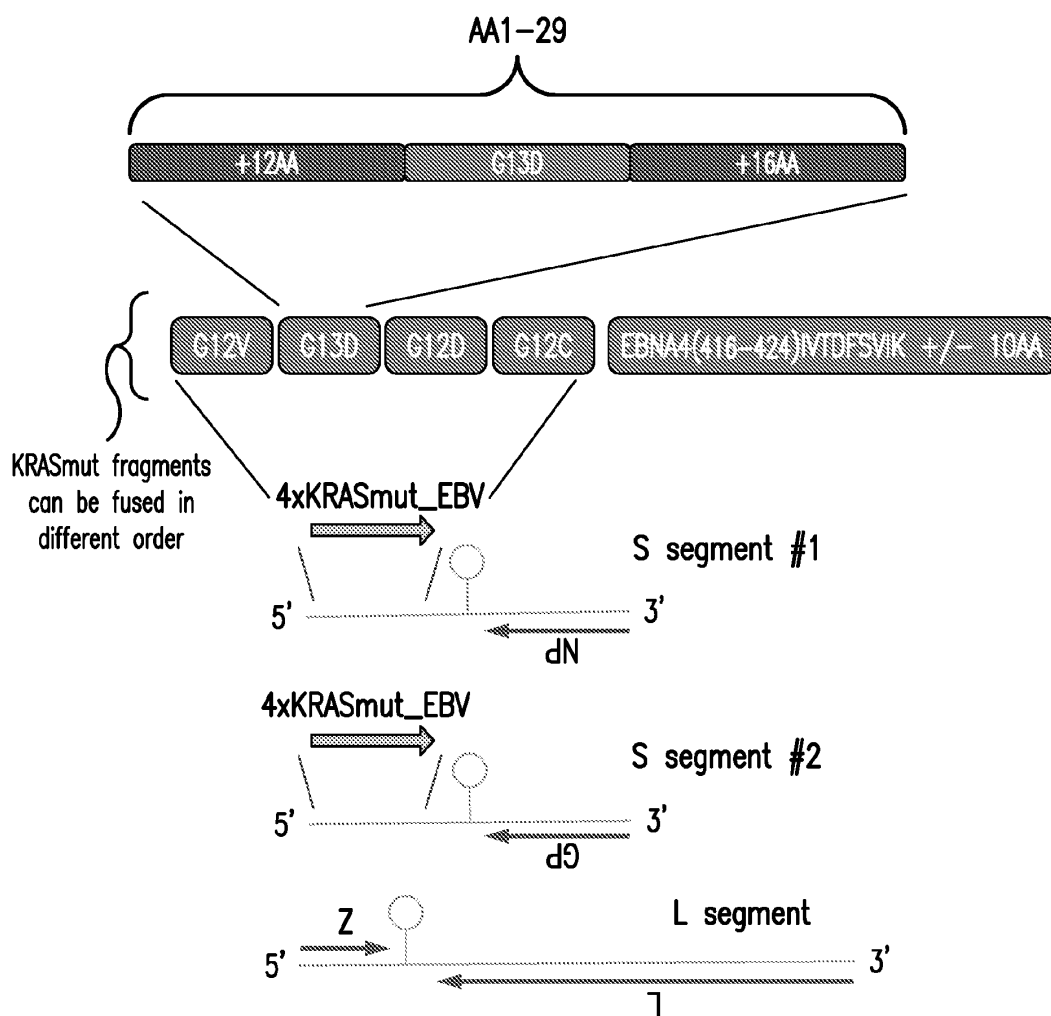


FIG. 3

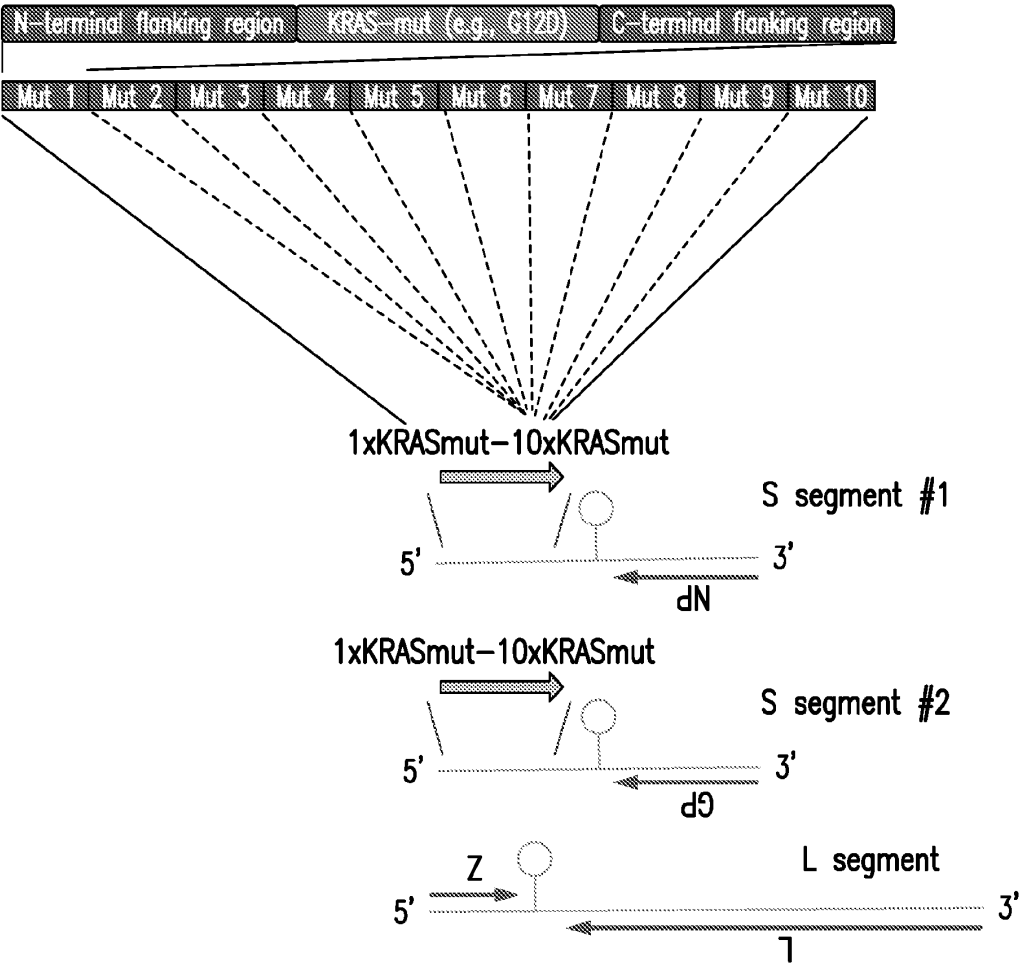


FIG. 4

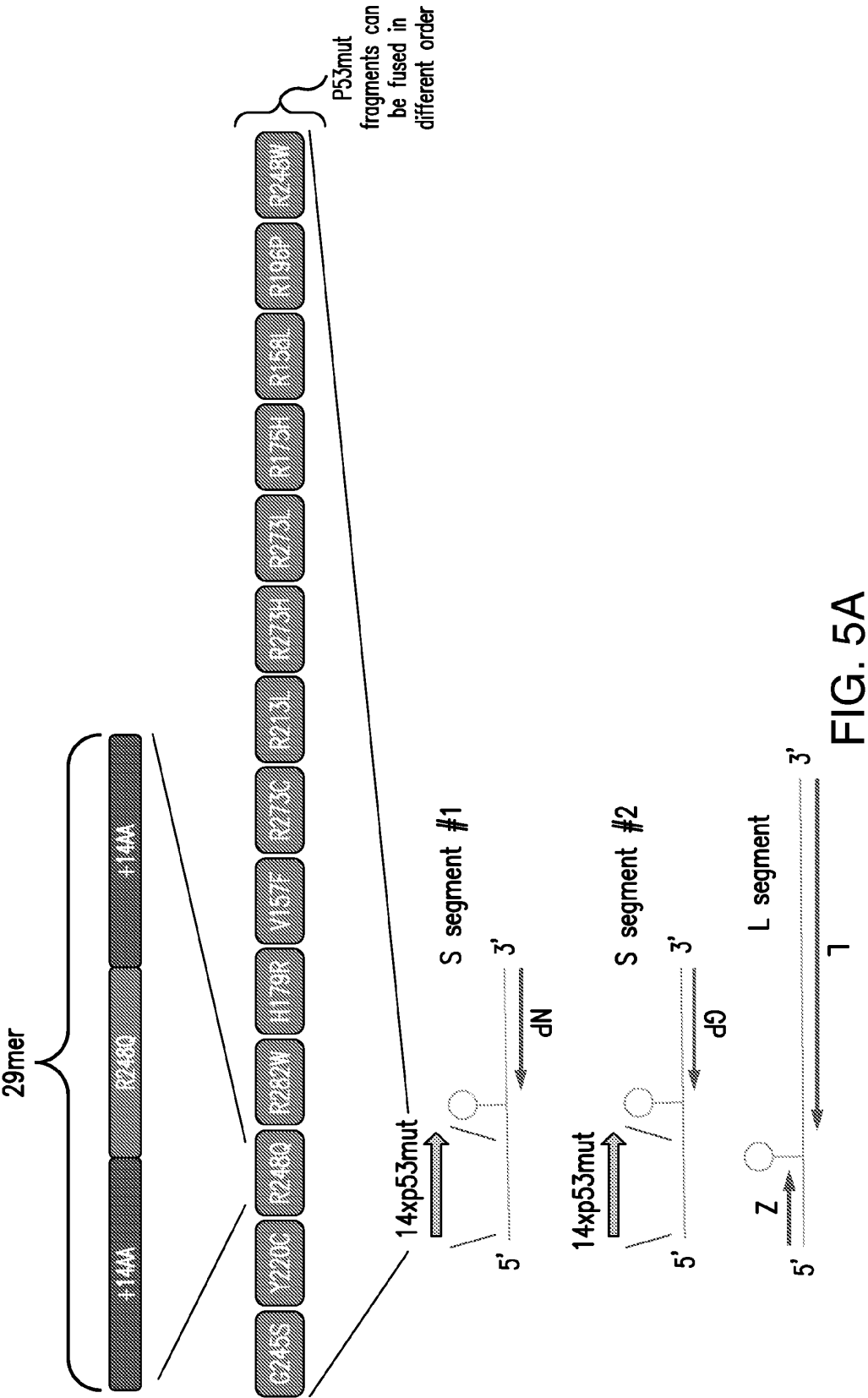
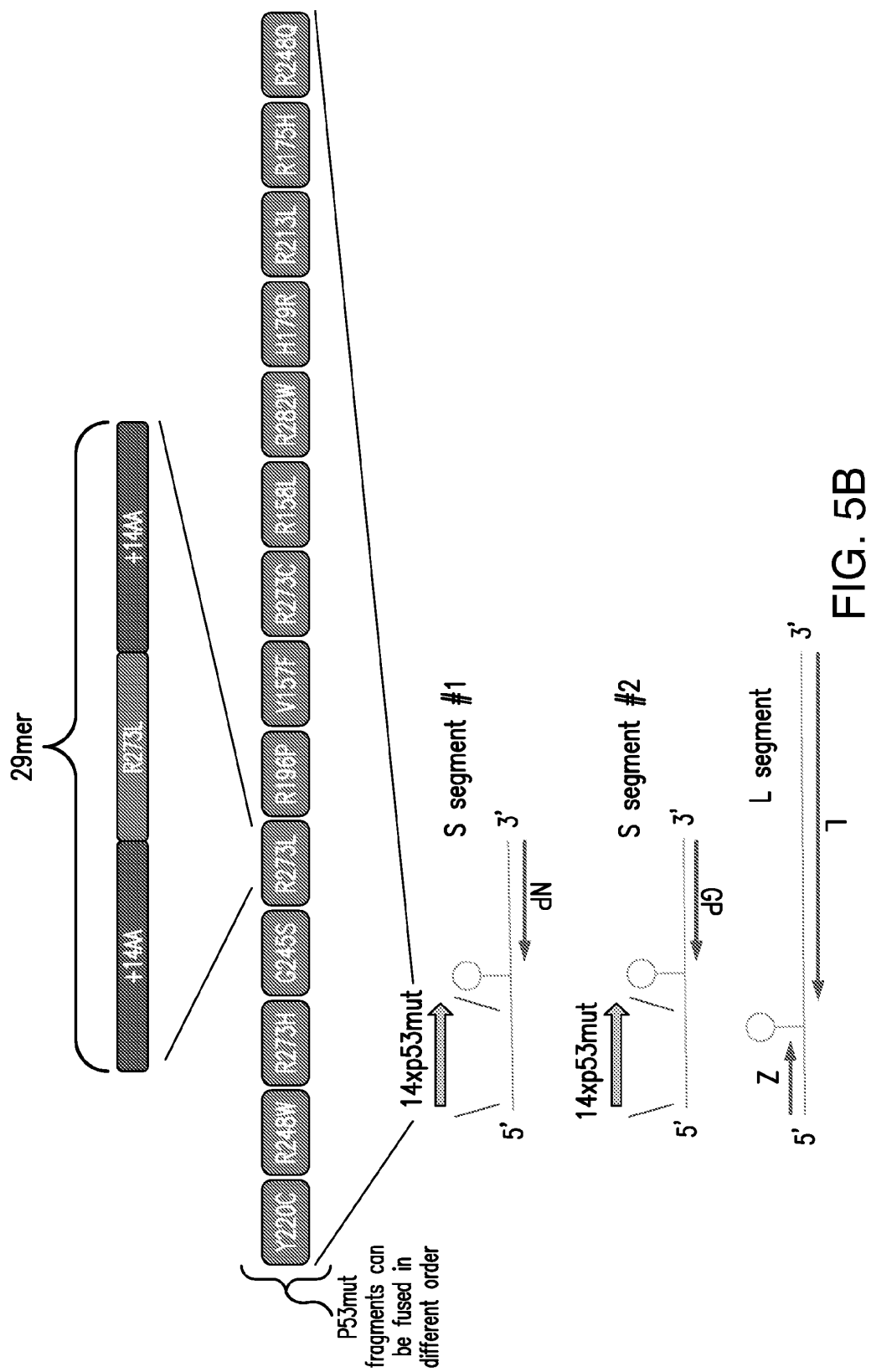


FIG. 5A



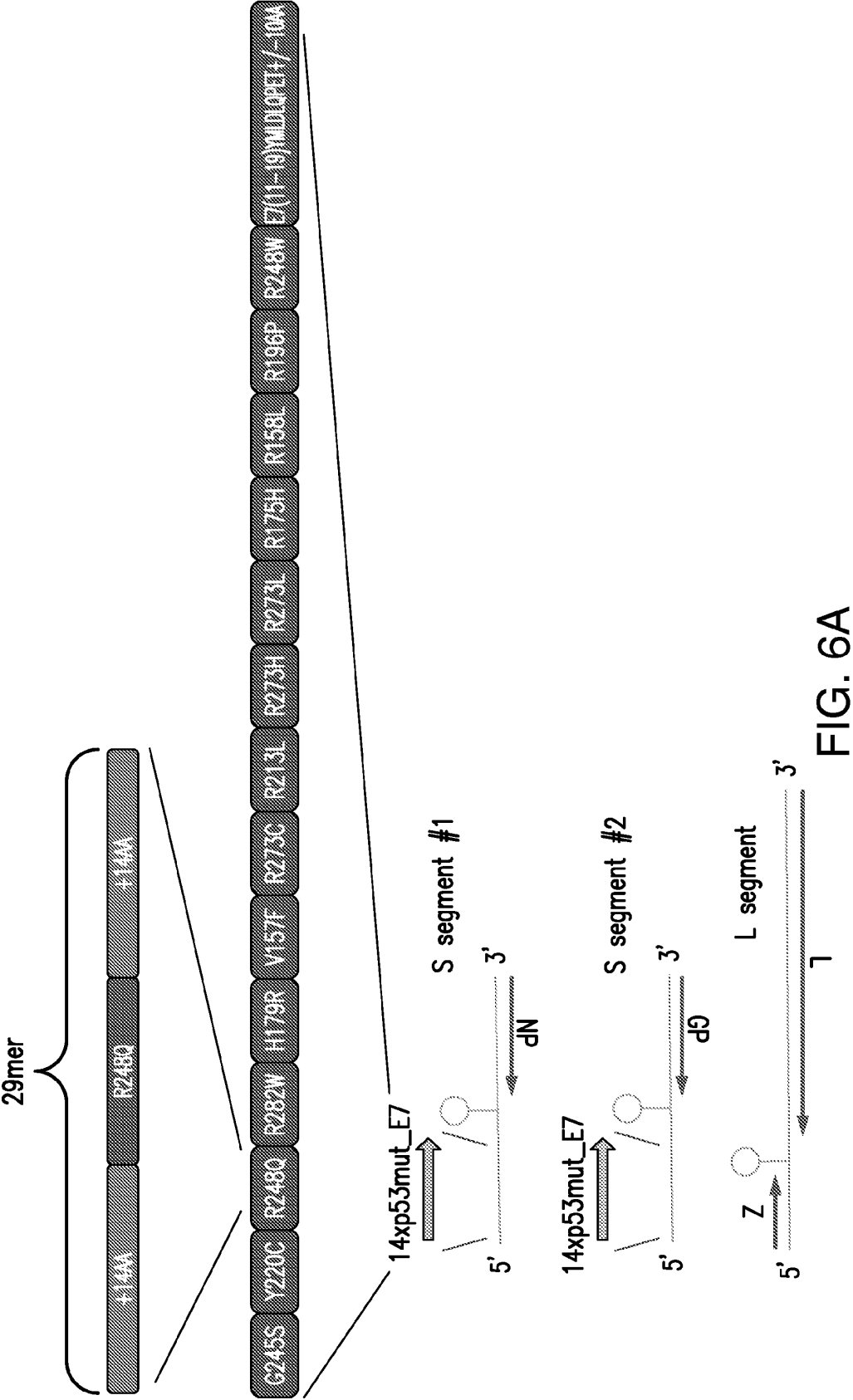
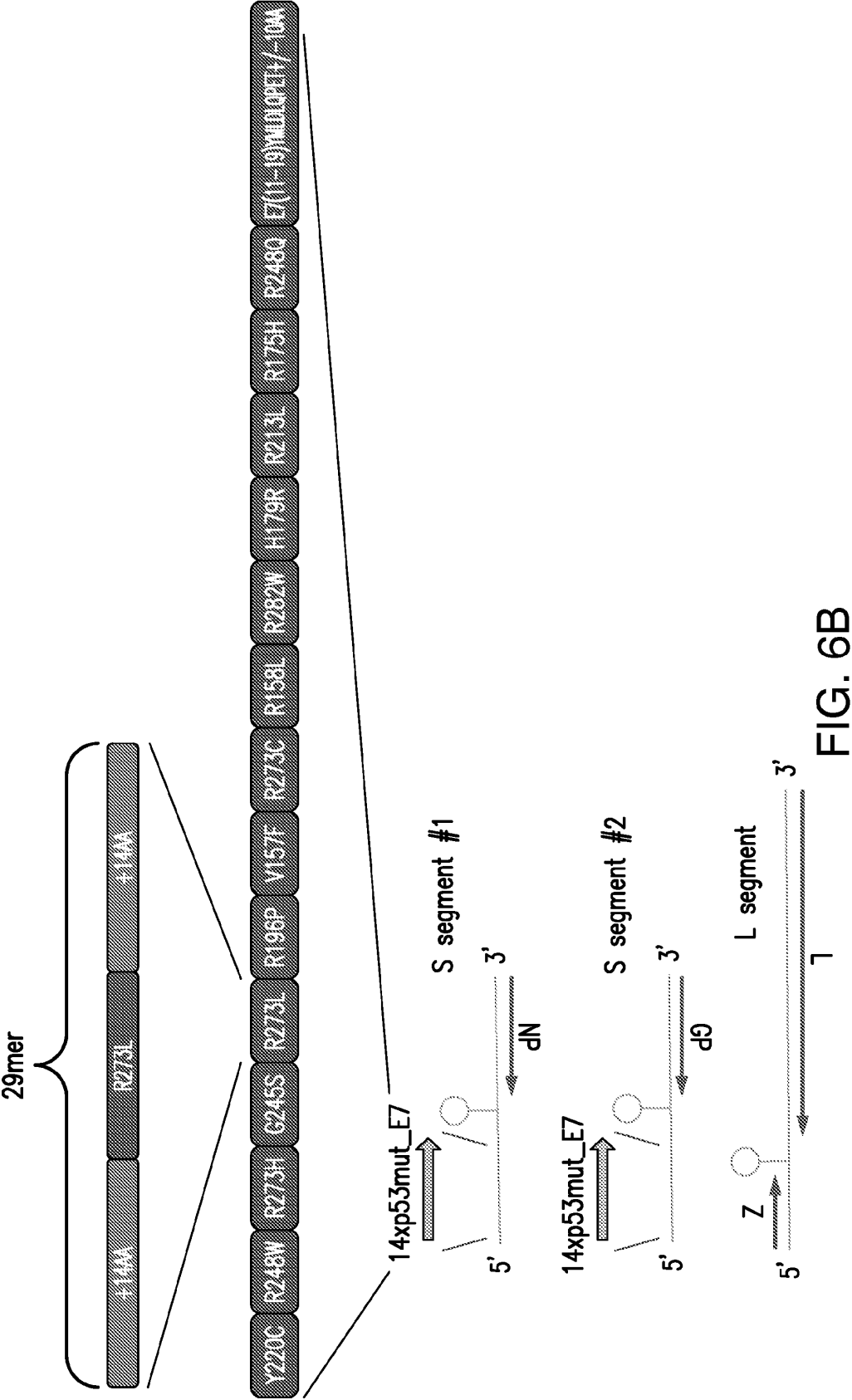
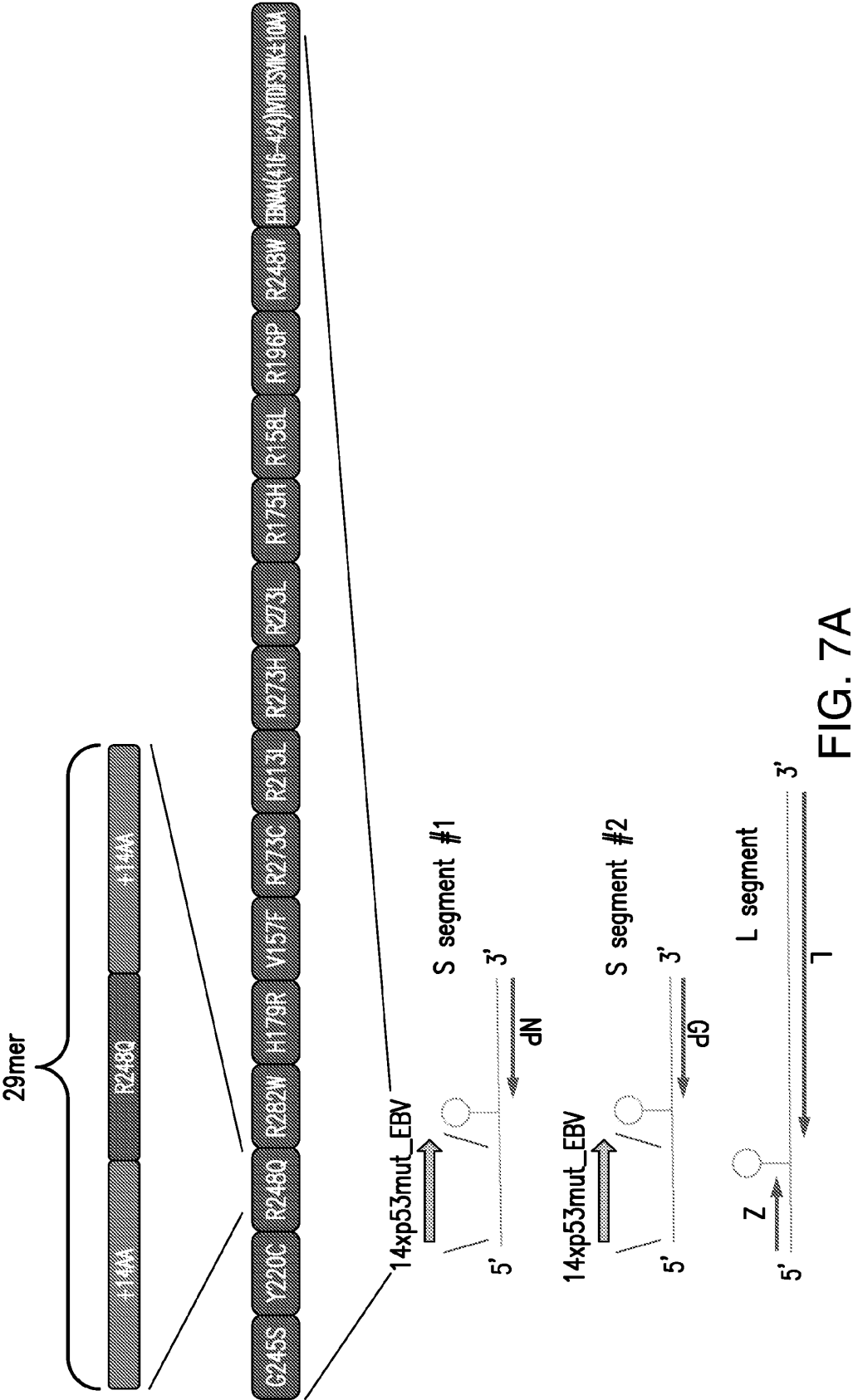


FIG. 6A





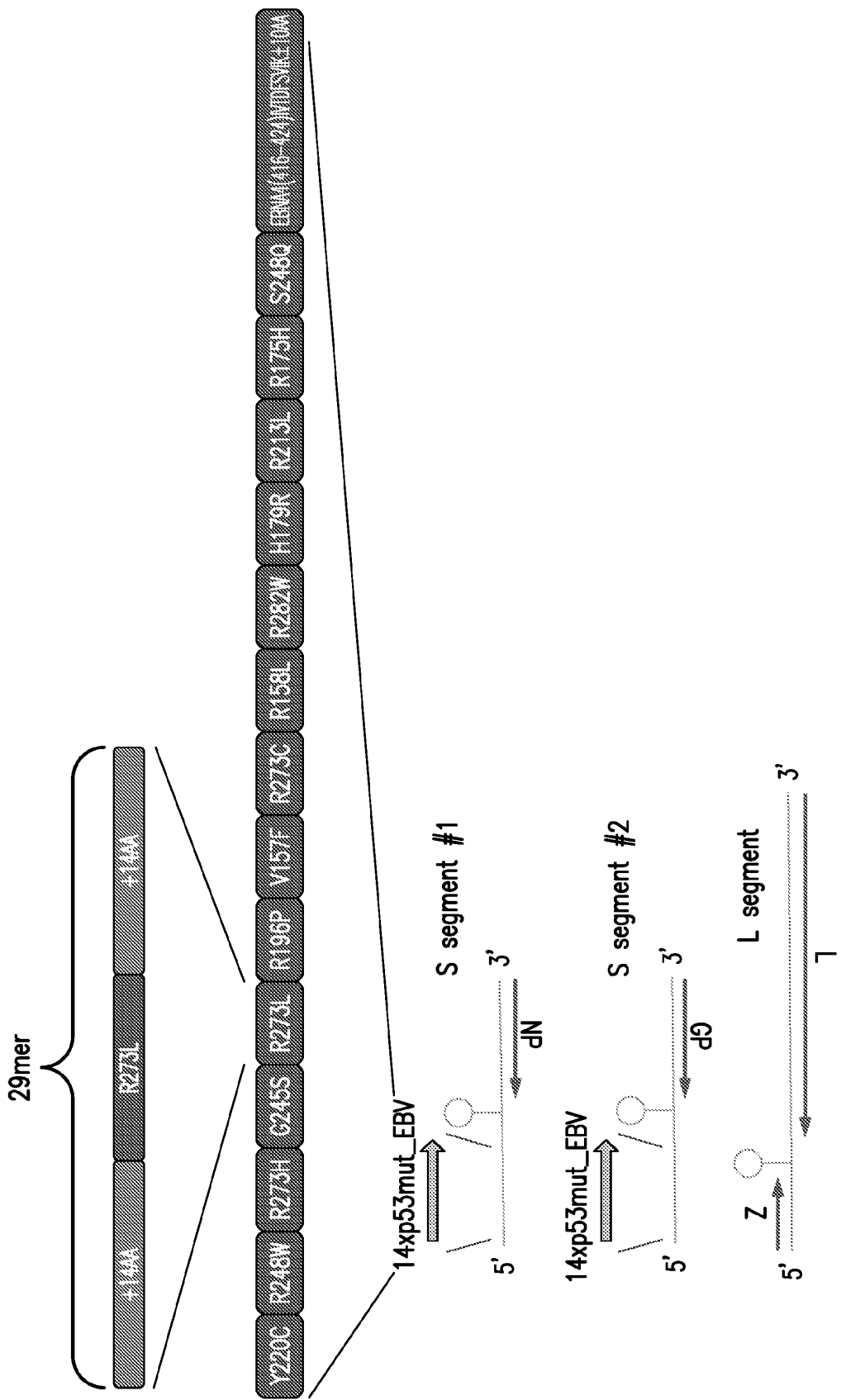


FIG. 7B

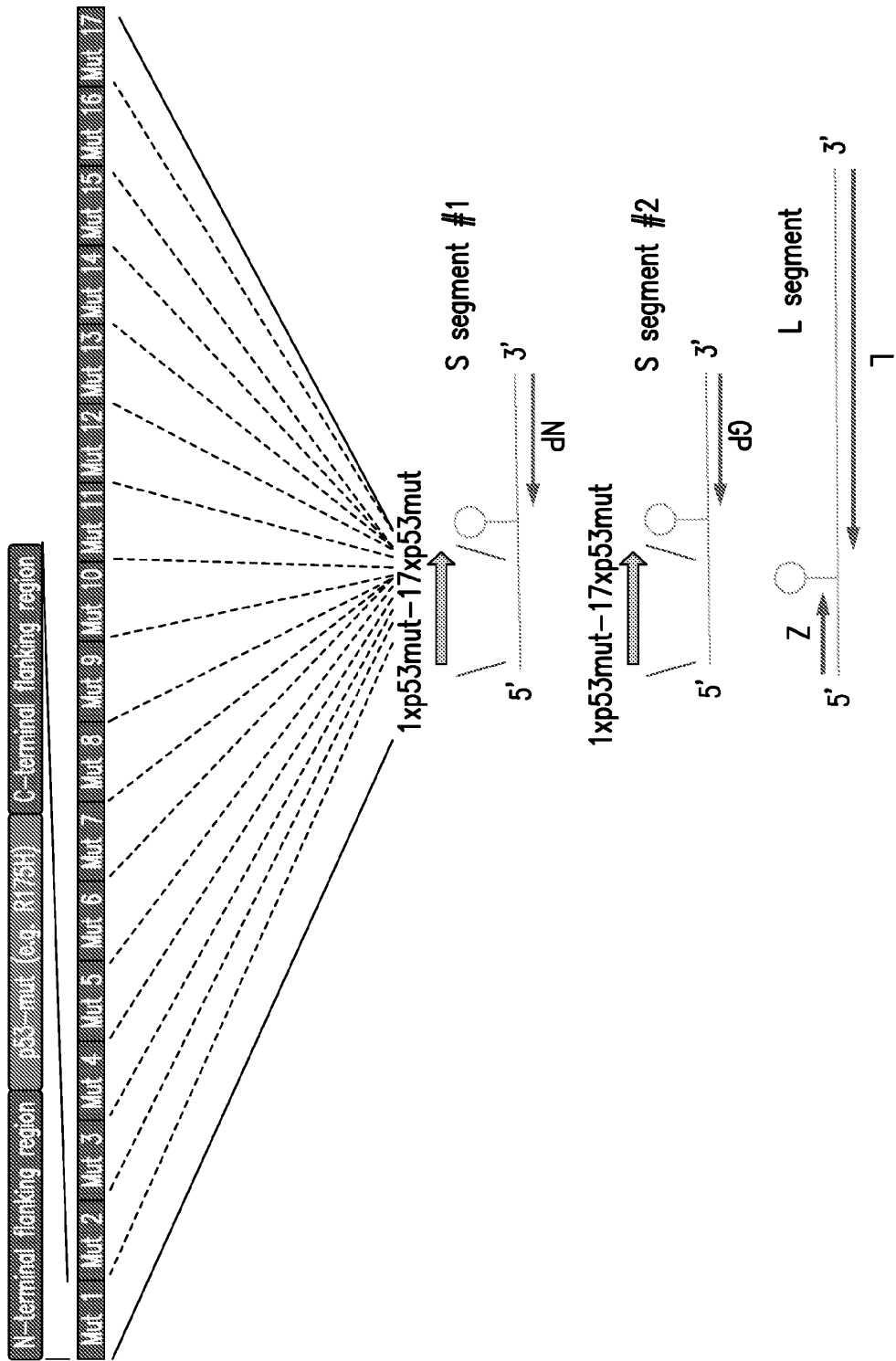


FIG. 8

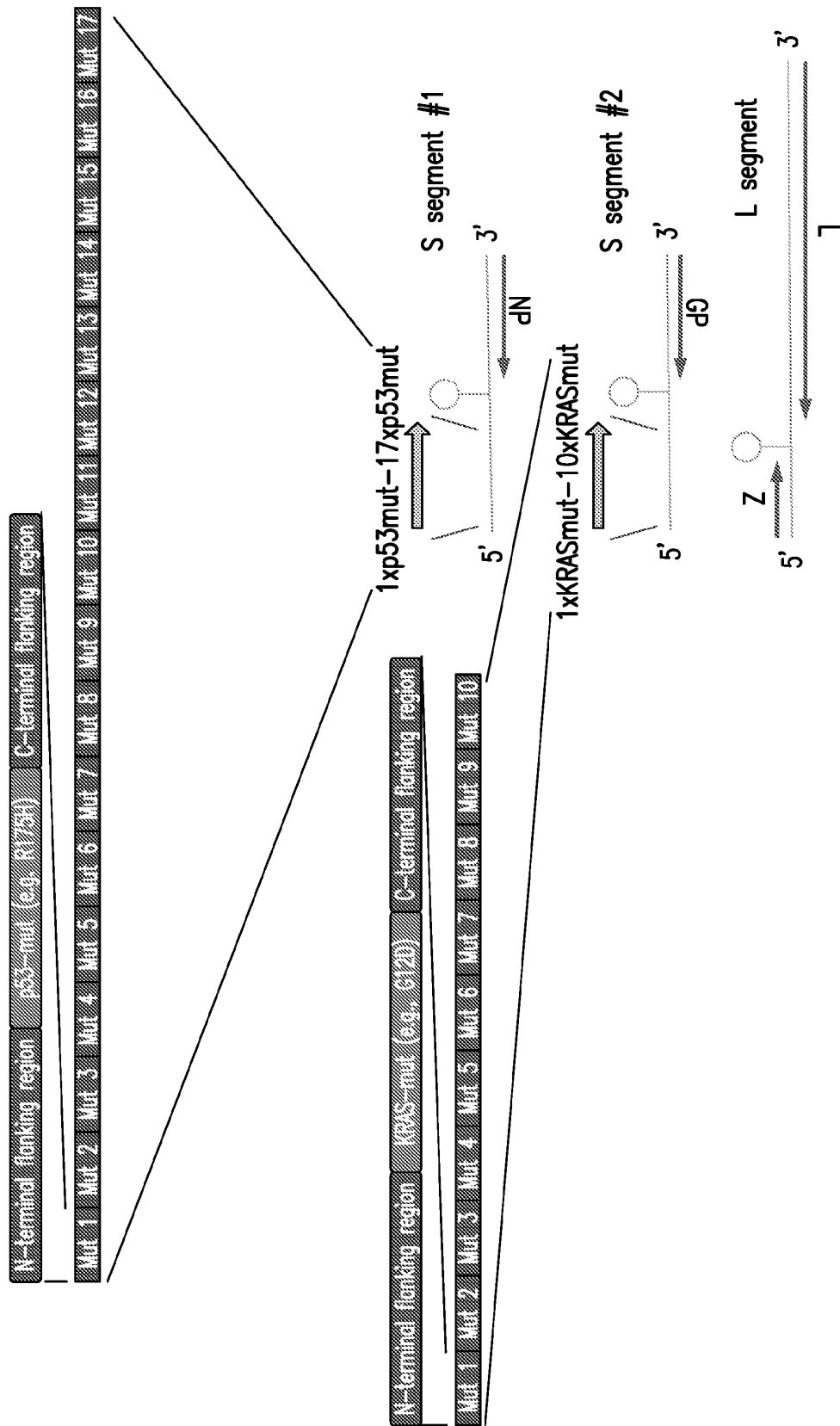


FIG. 9A

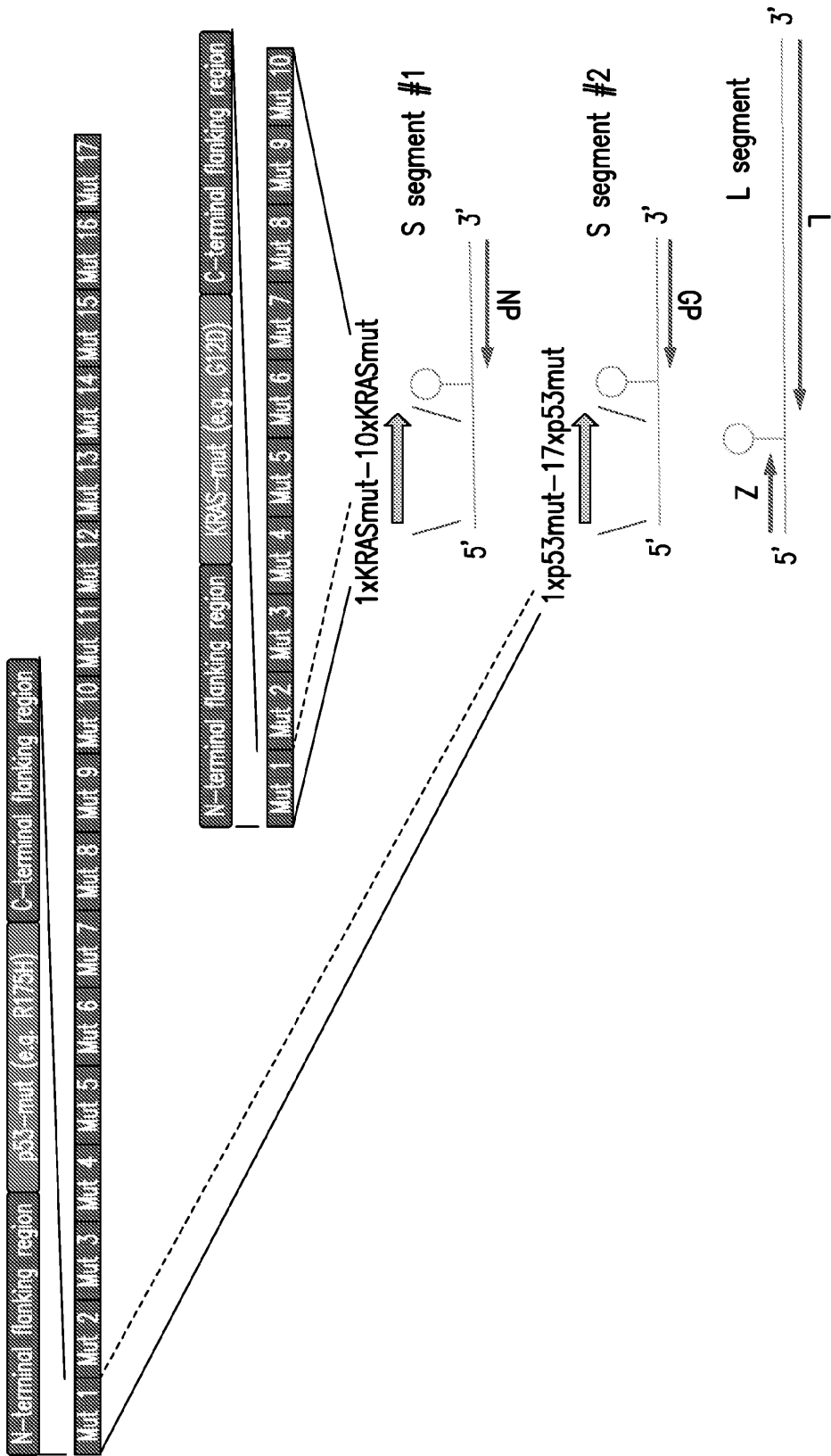


FIG. 9B

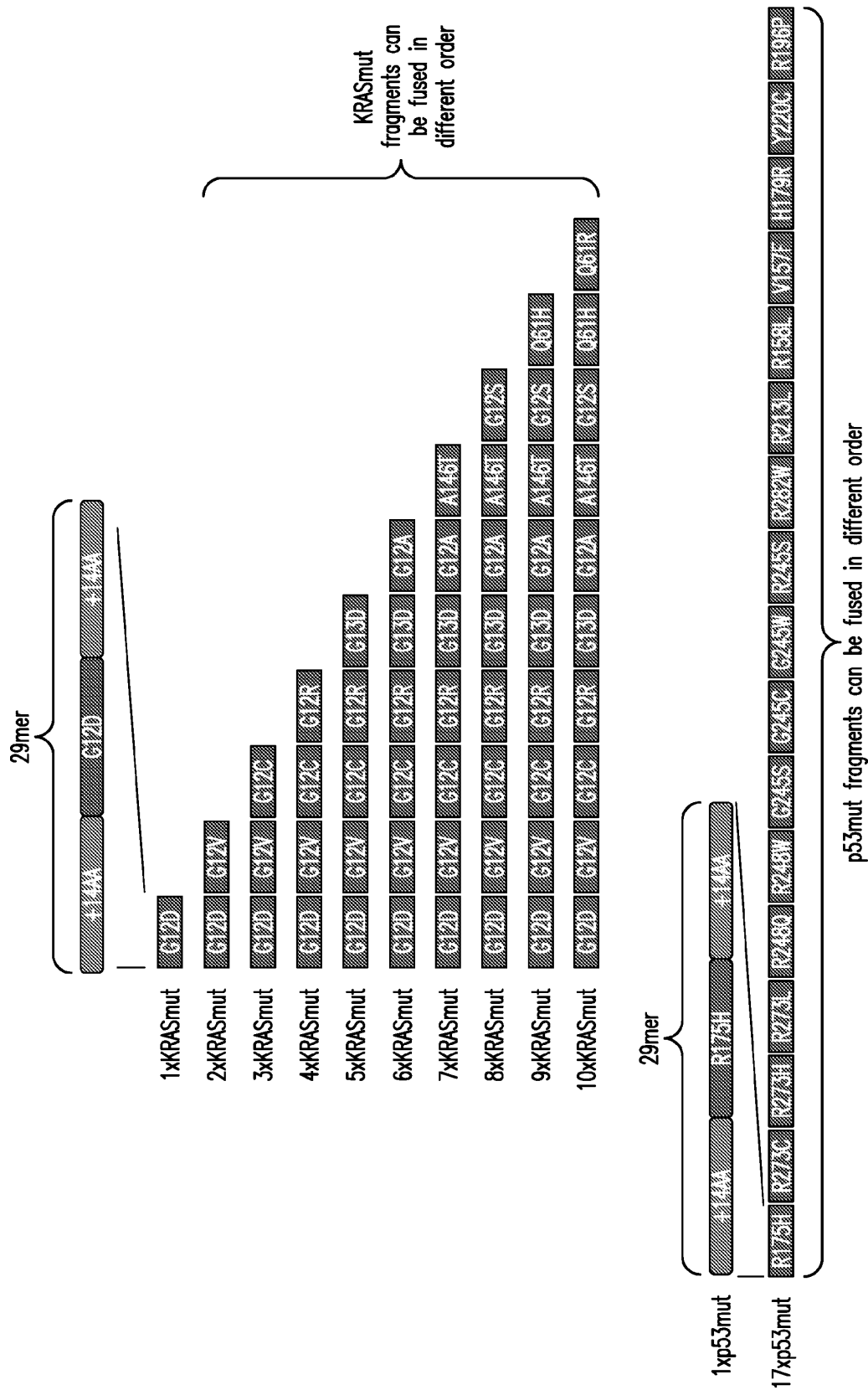


FIG. 9C

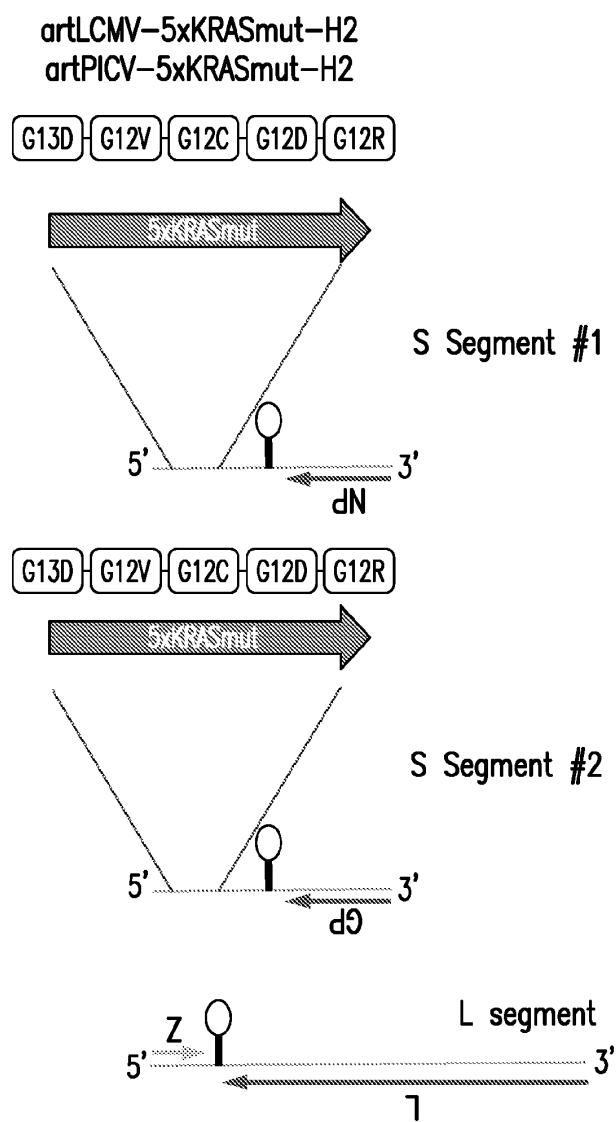


FIG. 10

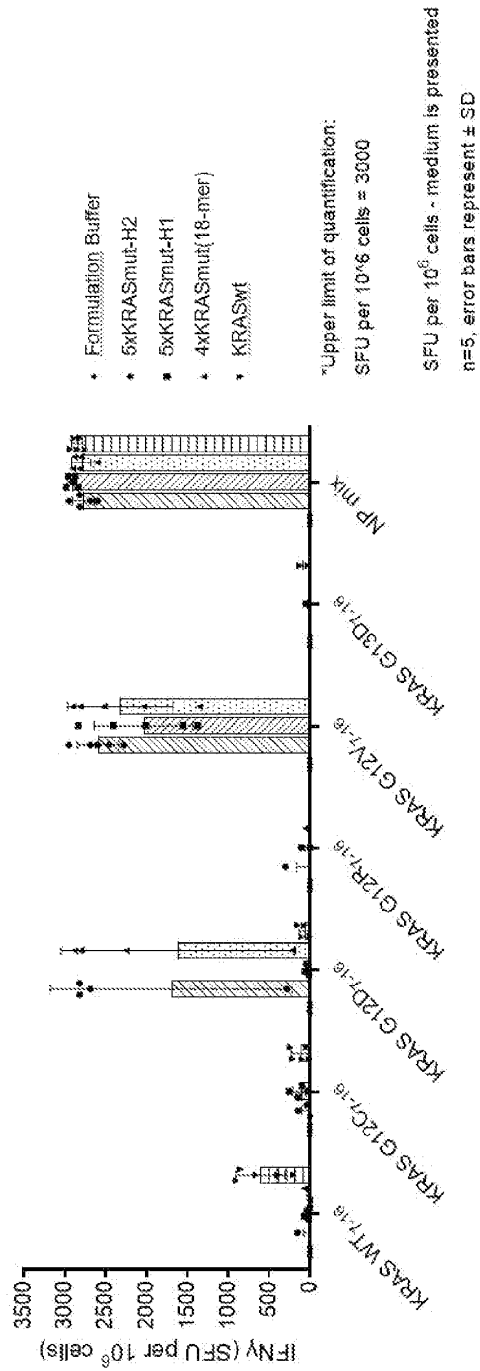


FIG. 11

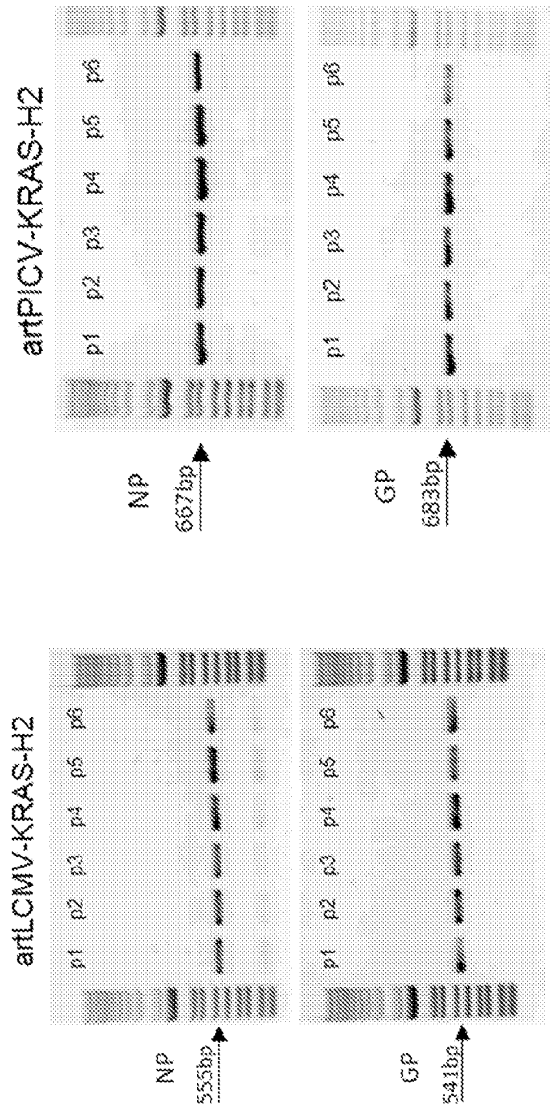


FIG. 12A

FIG. 12B

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gcgcaccggggatcctaggettttttgattgcgcttttctctagatcaactgggtgtcaggccctatcct
acagaagg**ATGTACAACTTGTGTGGTGGGAGCTGGGGATGTGGGAAAGTCAGCCCTCACAATCTACAA**
ATTGGTGGTTGTGGGTGCAGTTGGTGTGGCAAATCAGCCCTCACCATCTACAACTTGTGTAGTTGGT
GCCTGTGGAGTAGGGAATCAGCCCTCACCATCTACAAGCTGGTTGTGGTTGGTGTCTGATGGAGTGGGAA
AGTCAGCCCTCACCATCTACAAGTTGGTGGTTGTAGGTGCCAGAGGGGTGGGAAATCTGCCCTGACCAT
CTGAAGAACAGCGCCTCCCTGACTCTCCACCTCGAAAGAGGTGGAGAGTCAGGGAGGCCAGAGGGTCTT
AGAGTGTCAACAATTTGGGCCTCTAAAAATTAGGTCTGTGGCAGAATGTTGTGAACAGTTTTCAGATC
TGGGAGCCTTGCTTTGGAGGCGCTTTCAAAAATGATGCAGTCCATGAGTGCACAGTGCGGGGTGATCTCT
TTCTTCTTTTGTCCCTTACTATTCCAGTATGCATCTTACACAACCAGCCATATTTGTCCACACTTTaT
CTTCATACTCCCTCGAAGCTTCCCTGGTCATTTCAACATCGATAAGCTTAATGTCTTCTCTATTtTGTGA
GTCCAGAAGCTTTCTGATGTGCATCGGAGCCTTGACAGCTTAGAACCATCCCTGCGGAAGAGCACCTATA
ACTGACGAGGTCAACCCGGGTTCGCGATTGAAGAGGTTCGGCAAGATCCATGCCGTGTGAGTACTTGGAA
CTTGCTTGAATTGTTTTGATCAACGGGTTCCTGTAAAAAGTGTATGAACTGCCCGTTCTGTGGTTGGAA
AATTGCTATTTCCACTGGATCATTAATCTACCCTCAATGTCAATCCATGTAGGAGCGTTGGGGTCAATT
CCTCCATGAGGTCTTTTAAAGCATTGTCTGGCTGTAGCTTAAGCCACCTGAGGTGGACCTGCTGCTC
CAGGCGTGGCCTGGGTGAgTTGACTGCAGGTTTCTCGCTTGTGAGATCAATTGTTGTGTTTTCCCATGC
TCTCCCCACAATCGATGTTCTACAAGCTATGTATGGCCATCCTTCACCTGAAAGGCCAACTTTATAGAGG
ATGTTTTTCATAAGGGTTCCTGTCCCAACTTGGTCTGAAACAAACATGTTGAGTTTTCTCTTGGCCCCGA
GAACTGCCTTCAAGAGaTCCCTCGCTGTTGCTTGGCTTGATCAAAATTGACTCTAACATGTTACCCCCATC
CAACAGGGCTGCCCCTGCTTCACGGCAGCACCAAGACTAAAGTTATAGCCAGAAATGTTGATGCTGGAC
TGCTGTTCAGTGATGACCCCCAGAACTGGGTGCTTGCTTTTCAAGCTTTCAAGATCATTAAGATTGGAT
ACTTGACTGTGTAAAGCAAGCCAAGTCTGTGAGCGCTTGTAACAACGTCATTGAGCGGAGTCTGTGACTG
TTTGGCCATAACAAGCCATAGTTAGACTTGGCATTGTGCCAAATTGATTGTTCAAAAGTGATGAGTCTTTC
ACATCCCAAACTCTTACCACACCACTTGCACCCTGCTGAGGCTTTCTCATCCCACTATCTGTAGGATCT
GAGATCTTTGGTCTAGTTGCTGTGTTGTTAAGTTCCCCATATATACCCCTGAAGCCTGGGGCCTTTTCA
CCTCATGATCTTGGCCTTCAGCTTCTCAAGGTGAGCCGCAAGAGACATCAGTTCTTCTGCACTGAGCCTC
CCCACTTTCAAAACATTCTTCTTTGATGTTGACTTTAAATCCACAAGAGAATGTACAGTCTGGTTGAGAC
TTCTGAGTCTCTGTAGTCTTTGTCTCTCTCTTTTCTCTCATGATCCTCTGAACATTGCTGACCTC
AGAGAAGTCCAACCATTCAGAAGGTTGGTTGCATCCTTAATGACAGCAGCCTTCACATCTGATGTGAAG
CTCTGCAATTCTTCTCAATGCTTGGCTCCATTGGAAGCTCTTAACCTCCTTAGACAAGGACATcttgt
tgctcaatggtttctcaagacaaatgcgcaatcaaatgcctaggatccactgtgcg

Legend:

5'UTR and 3'UTR shown in lowercase letters)

KRAS-H2 transgene (shown in bold)

IGR (shown in box)

LCMV-NP (shown in underline)

FIG. 13

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gcgcaccggggatcctaggettttttgattgagcttttctctagatcaactgggtgtcaggccctatcct
 acagaagg**ATGTACAACTTGTGTGGTGGGAGCTGGGGATGTGGGAAAGTCAGCCCTCACAATCTACAA**
ATTGGTGGTTGTGGGTGCAGTTGGTGTGGCAAATCAGCCCTCACCATCTACAACTTGTGTAGTTGGT
GCCTGTGGAGTAGGAAATCAGCCCTCACCATCTACAAGCTGGTTGTGGTTGGTGTGATGGAGTGGGAA
AGTCAGCCCTCACCATCTACAAGTTGGTGGTTGTAGGTGCCAGAGGGGTGGGAAATCTGCCCTGACCAT
CTGAAGAACAGCGCCTCCCTGACTCTCCACCTCGAAAGAGGTGGAGAGTCAGGGAGGCCAGAGGGTCTC
AGCGTCTTTTCAGATAGTTTTTACACCAGGCACCTTGAATGCACCACAACTACAGATCCCTTGTGGT
CAAGCGGTGTGGCTTTGGACATGAACCGCCTTTATGTGTCTATGTGTGGTATCTTCACAAGATGCAGA
AAGATGCTGATTAGATATGCTGATGTTGAAAACATCAAAAGATCCATTAAGGCTAAAGGAGTACTCCCTT
GTCTTTTATGTAGTCTCTCCTCAACATCTCTGTGATCATGTTATCTGCTTCTTGTTCGATTTGATCACT
AAAGTGGGTCTCATTCAAGTAGGAGCCATTAGTGACAAGCCAGCACTTGGGTACACTAGTCTCACCAGTC
TTAGCATGTTCCAGATACCAGAACTTTGAGTAATTACAGTATGGTACCCCATTAGATCTCTTAGATGAT
TCCTCATCAACAGCTGATCGGAAATCAGAGAATTTACTGTTGTTTTGAATACATGCAAGGCAGACTCTAC
ATCTTGCTTGAACCTTACTCAGGGCGGCCTTGTGTAATCAATTAGTCGTAGCATGTACAGAACTCTTCA
TCATGATTGACATTACATTTTGCAACAGCTGTATTTCCAAAACATTTGAGCTCTGCAGCAAGGATCATCC
ATTTGGTCAGGCAATAACCACCTGGATTTTCTACTCTGAGGAGTCTGACAGGGTCCAGGTGAATGTGCC
TGCAAGTCTCCTAGTGAGAACTTTGTCTTTTCTGAGCAAAGAGGATTTAGACATCCCAAAGGGCCT
GCATATCTACAGTGGTTTTCCCAAGTCCTGTTTTGTATGATTAGGTACTGATAGCTTGTGGCTGCACC
AAGTGGTCTTGCCATCTGAACCTGCCCAGCCCCAGCCACTTCTCATGTATTTTCTCCAAAGGCAGTTCT
AAACATGTCCAAGACTCTACCTCTGAAAGTCCTACACTGGCTTATAGCGCTCTGTGGGTCCGAAAATGAC
AAGTTGTATTGAATGGTGATGCCATTGTTAAATCACAAGCACTGCTTTGTGGTTGGAATTCCTCTAA
TACTGAGGTGCAGACTCGAGACTATATCATGAGTGATGGTCAAAAGTCTTTTGTGTTGAAAGCGGAGGT
TAAGTTGCAAAAATTGTGATTAAGGATGGAGTCGTTAGTGAAAGTTAGCTCCAGTCCAGAGCTTCCATA
CTGATGTAGTGATGAGAGTTGTTGGCTGAGCACGCATTGGGCATCGTCAGATTTAAGTGAGACATATCAA
ACTCCACTGATTTGAACTGGTAAACCCCTTTATAGATGTCGGGACCATTAAAGCCGTACATGCCACAGGA
CCTACCAGCCAAAAAAGGAAGCTGACCAGTGCTAATATCCCACAGGTGGCGAAATTGTACACAGCTTTG
ATGCTCGTGATTATAATGAGCACAATAATGACAATGTTGATGACCTCATCAATGATGTGAGGCAAGCCT
CAAACATGTGCACAATCTGACCCATcttggtgctcaatgggttctcaagacaaatgcgcaatcaaatgcc
 taggatccactgtgcg

Legend:

5'UTR and 3'UTR (shown in lowercase letters)

KRAS-H2 transgene (shown in bold)

IGR (shown in box)

LCMV-GP (shown in underline)

FIG. 14

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gcgcaccggggatcctaggcataccttggacgcgcatacttctgacaaag**ATGTACAAACTTGTGTG**
GTGGGAGCTGGGGATGTGGGAAAGTCAGCCCTCACAATCTACAAATTGGTGGTTGTGGGTGCAGTTGGTG
TTGGCAAATCAGCCCTCACCATCTACAAACTTGTGTAGTTGGTGCCTGTGGAGTAGGGAAATCAGCCCT
CACCATCTACAAGCTGTTGTGTGTGTGCTGATGGAGTGGGAAAGTCAGCCCTCACCATCTACAAGTTG
GTGGTTGTAGGTGCCAGAGGGGTGGGAAATCTGCCCTGACCATCTGASCCCTAGCCTCGACATGGGCCT
CGACGTCACCTCCCAATAGGGGAGTGACGTCGAGGCCCTCTGAGGACTTGAGCTCAGAGGTTGATCAGATC
TGTGTTGTTCTGTACAGCGTGTCAATAGGCAAGCATCTCATCGGCTTCTGGTCCCTAACCCAGCCTGTC
ACTGTTGCATCAAACATGATGGTATCAAGCAATGCACAGTGAGGATTTCGAGTGGTTTGTGCAGCCCCCT
TCTTCTTCTTCTTTATGACCAAACCTTTATGTTTGGTGCAGAGTAGATTGTATCTCTCCAGATCTCATC
CTCAAAGGTGCGTGCTTGCTCGGCACTGAGTTTCACGTCAAGCACTTTTAAGTCTCTTCTCCCATGCATT
TCGAACAAACTGATTATATCATCTGAACCTTGAGCAGTGAAAACCATGTTTTGAGGTAAATGTCTGATGA
TTGAGGAAATCAGGCCCTGGTTGGGCATCAGCCAAGTCCTTTAAAAGGAGACCATGTGAGTACTTGCTTTG
CTCTTTGAAGGACTTCTCATCGTGGGGAATCTGTAACAATGTATGTAGTTGCCCGTGTGAGGCTGGTAG
ATGGCCATTTCCACCGGATCATTGGTGTTCCTTCAATGTCAATCCATGTGGTAGCTTTTGAATCAAGCA
TCTGAATTGAGGACACAACAGTaTCTTCTTCTCCTTAGGGATTTGTTAAGGTCCGGTGATCCTCCGT
TCTTACTGGTGGCTGGATAGCACTCGGCTTCGAATCTAAATCTACAGTGGTGTATCCCAAGCCCTCCCT
TGAACCTGAGACCTTGAGCCAATGTAGGCCAACCATCCCCTGAAAGACAAATCTTGTATAGTAAATTTT
CATAAGGATTTCTCTGTCCGGGTGTAGTGCTCACAAACATACTTACGATTCTTTATTTGCAATAGACT
CTTTATGAGAGTACTAAAATAGAGGCTTCACCTGGATGGTCTCAAGCATATTGCCACCATCAATCATG
CAAGCAGCTGCTTTGACTGCTGCAGACAACTGAGATTGTACCCTGAGATGTTTATGGCTGATGGCTCAT
TACTAATGATTTTTAGGGCACTGTGTTGCTGTGTGAGTTTCTCTAGATCTGTATGTTTCGGGAACCTTGAC
AGTGTAGAGCAAACCAAGTGCACTCAGCGCTTGGACAACATCATTAAGTTGTTACCCCTTGCTCAGTG
ATACAAGCGATGGTTAAGGCTGGCATTGATCCAAATTGATTGATCAACAATGTATTATCCTTGATGTCCC
AGATCTTCACAACCCCATCTCTGTTGCCTGTGGGTCTAGCATTAGCGAACCCCATTTGAGCGAAGGATTT
GGCTCTTTGTTCCAACCTGAGTGTGTTGTGAGATTGCCCCATAAACACCAGGCTGAGACAACTCTCAGTT
CTAGTGACTTTCTTTCTTAACCTTGCCAAATCAGATGCAAGCTCCATTAGCTCCTCTTTGGCTAAGCCTC
CCACCTAAGCACATTGTCCCTCTGGATTGATCTCATATTCATCAGAGCATCAACCTCTTTGTTTCATGTC
TCTTAACTTGGTCAGATCAGAATCAGTCCTTTTATCTTTGCGCATCATCTTTGAACTTGAGCAACTTTG
TGAAAGTCAAGAGCAGATAACAGTGCTCTTGTGTCCGACAACACATCAGCCTTCACAGGATGGGTCCAGT
TGGATAGACCCCTCCTAAGGGACTGTACCCAGCGGAATGATGGGATGTTGTCAGACATtttggggttggtt
tgcacttcctccgagtcagtgagaagtgaaagtcacagcgtgatctagaatcgccctaggatccactgtgc
g

Legend:

5'UTR and 3'UTR (shown in lowercase letters)

KRAS-H2 transgene (shown in bold)

IGR (shown in box)

PICV-NP (shown in underline)

FIG. 15

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gcgcaccggggagcctagccataccttggacgcgcatacttgcacaaag**ATGTACAAACTTGTGTG**
GTGGGAGCTGGGGATGTGGGAAAGTCAGCCCTCACAATCTACAAATTGGTGGTTGTGGGTGCAGTTGGTG
TTGGCAAATCAGCCCTCACCATCTACAAACTTGTGTAGTTGGTGCCTGTGGAGTAGGGAAATCAGCCCT
CACCATCTACAAGCTGGTTGTGGTTGGTGCTGATGGAGTGGGAAAGTCAGCCCTCACCATCTACAAGTTG
GTGGTTGTAGGTGCCAGAGGGGTGGGAAATCTGCCCTGACCATCTGACCCTAGCCTCGACATGGGCCT
CGACGTCACCTCCCAATAGGGGAGTGACGTCGAGGCCCTCTGAGGACTTGAGCTTATTTACCCAGTCTCAC
CCATTTGTAGGGTTTCTTTGGGATTTTATAATACCCACAGCTGCAAAGAGAGTTCCCTAGTAATCCTATGT
GGCTTCGGACAGCCATCACCAATGATGTGCCTATGAGTGGGTATTCCAATAAGTGGAGAAACACTGTGA
TGGTGTAACAAACACCAAGACCAGAAGCAAATGTCTGTCAATGCTAGTGGAGTCTTACCTTGTCTTTCTTC
ATATTTCTTTATCAGCATTTTCATTGTACAGATTCTGGCTCTCCACAAACCAATCATTTCTAAATGCGTT
TCATTGAGGTACGAGCCATTGTGAACTAACCAACACTGCGGTAAAGAATGTCTCCCTGTGATGGTATCAT
TGATGTACCAAATTTTGTATAGTTGCAATAAGGGATTTTGGCAAGCTGTTTGAGACTGTTTCTAATCAC
AAGTGAGTCAGAAATAAGTCCGTTGATAGTCTTTTTAAAGAGATTCAACGAATTCTCAACATTAAGTTGT
AAGGTTTTGATAGCATTCTGATTGAAATCAAATAACCTCATCGTATCGCAAATTTCTTATTGTGATCTT
TGTTGCATTTTGCCATCAGAGTGTATCAAAACATTTTATTCCAGCCCAAACAATAGCCCATTGCTCCAA
ACAGTAACCACTGGGACATGTTGCCAGTAGAGTCACTCAAGTCCCAAGTGAAAAAGCCAAGGAGTTTC
CTGCTCAGAACTATAAGCAGTTTTTTGGAGAGCCATCCTTATTGTTGCCATGGAGTATATGTACAGT
GATTTTCCCATGTGGTGTCTGTATGATCAGGAAATTGTAATGTGTCCACCTTCACAGTTTGTAGTCT
GCAAGACCTCCACTACAGTTATTGAAACATTTTCCAACCCACGCAATTTTGGGTCCCAATGATTTGA
GCAAGCGACGCAATAAGATGTCTGCCAACCTCACCTCCTCTATCCCCAACTGTCAAGTTGTACTGGATCA
ACACCCAGCACCTCAACTGTTTTGCATCTGGCACCCTACATGACGAGTGACATGGAGCACATTGAAGTG
TAATCATTAAGCAACCATTTTAATGTGTGACCTGCTTCTTCTGTCTTATCACAATTACTAATGTTACCA
TATGCAAGGCTTCTGATGTTGGAAAAGTTTCCAGTAGTTTCATTGCAATGGATGTGTTGTCAAAGTGA
GTTCAATTCCCATGTTGTGTAGATGGTCTTTGTAGTAATGATGTGTGTTGTTCTTGCTACATGATTG
TGGCAAGTTGTCAAACATTCTTGTGAGGTTGAACTCAACGTGGGTGAGATTGTGCCTCCTATCAATCATC
ATGCCATCAAACTTCTGCCAGCCAAAATGAGGAAGGTGATGAGTTGGAATAGGCCACATCTCATCAGAT
TGACAAATCCTTTGATGATGCATAGGGTTGAGACAATGATTAAGGCGACATTGAACACCTCCTGCAGGAC
TTCGGGTATAGACTGGATCAAAGTCACAACTTGTCCCATtttggggttggttgcaacttctccgagtcag
tgaagaagtgaacgtacagcgtgatctagaatcgcctaggatccactgtgcg

Legend:

5'UTR and 3'UTR (shown in lowercase letters)

KRAS-H2 transgene (shown in bold)

IGR (shown in box)

PICV-GP (shown in underline)

FIG. 16

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gcgcaccggggatcctaggetttttggattgcgcttttctctagatcaactgggtgtcaggccctatcct
 acagaagg**ATGTACAAGCTGGTGGTAGTTGGAGCAGTGGGAGTGGGCAAATCAGCCTTGACCATTGGAGG**
CTCAGGTGGTGGAGGCTCAGGAGGCTACAACTTGTGGTGGTGGAGCCAGAGGTGTAGGCAAAAGTGCA
CTCACCATAGGAGGAACTGGAGGCGGAGGTAGTGGAGGCTACAACTTGTGTGTTGGGGCCTGTGGGG
TGGGAAAGTCAGCACTCACCATTGGTGGCAGTGGAGGTGGAGGCAGTGGTGGCTACAAGTTGGTGGTCGT
AGGTGCTGGGGATGTGGGCAAATCTGCCCTCACAAATGGAGGCTCAGGAGGTGGAGGCAGTGGTGGCTAC
AAATTGGTTGTGGTGGTGCAGATGGTGTGGGCAAAGTGCTTTGACCATCTGAAGAACAGCGCCTCCCT
GACTCTCCACCTCGAAAGAGGTGGAGAGTCAGGGAGGCCAGAGGGTCTTAGAGTGTCAACATTTGGG
 CCTCTAAAAATTAGGTCATGTGGCAGAATGTTGTGAACAGTTTTTCAGATCTGGGAGCCTTGCTTTGGAGG
 CGCTTTCAAAAATGATGCAGTCCATGAGTGCACAGTGGGGGTGATCTCTTTCTTCTTTTGTCCCTTAC
 TATCCAGTATGCATCTTACACAACCAGCCATATTTGTCCACACTTTaTCTTCATACTCCCTCGAAGCT
 TCCCTGGTCATTTCAACATCGATAAGCTTAATGTCCTTCCATTTtGTGAGTCCAGAAGCTTTCTGATGT
 CATCGGAGCCTTGACAGCTTAGAACCATCCCCTGCGGAAGAGCACCTATAACTGACGAGGTCAACCCGGG
 TTGCGCATTGAAGAGGTGGCAAGATCCATGCCGTGTGAGTACTTGAATCTTGCTTGAATTGTTTTGA
 TCAACGGGTTCCTGTAAAAGTGTATGAACTGCCCGTTCTGTGGTTGGAAAATTGCTATTTCCACTGGAT
 CATTAAATCTACCTCAATGTCAATCCATGTAGGAGCGTTGGGGTCAATTCCTCCCATGAGGTCTTTTAA
 AAGCATGTGTCTGGCTGTAGCTTAAGCCACCTGAGGTGGACCTGCTGCTCCAGGCGCTGGCCTGGGTGA
 TTGACTGCAGGTTTTCTCGCTTGTGAGATCAATTGTTGTGTTTTCCCATGCTCTCCCCACAATCGATGTC
 TACAAGCTATGTATGGCCATCCTTCACCTGAAAGGCAAACCTTTATAGAGGATGTTTTCATAAGGGTTCCT
 GTCCCCAACTTGGTCTGAAACAAACATGTTGAGTTTTCTCTTGCCCCGAGAACTGCCTTCAAGAGaTCC
 TCGCTGTGCTTGGCTTGATCAAAATTGACTCTAACATGTTACCCCCATCCAACAGGGCTGCCCTGCCT
 TCACGGCAGCACCAAGACTAAAGTTATAGCCAGAAATGTTGATGCTGGACTGCTGTTCAAGTATGACCC
 CAGAACTGGGTGCTTGTCTTTAGCCTTTCAAGATCATTAAGATTTGGATACTTGAAGTGTAAAGCAAG
 CCAAGGTCTGTGAGCGCTTGTACAACGTCATTGAGCGGAGTCTGTGACTGTTTGGCCATACAAGCCATAG
 TTAGACTTGGCATTGTGCCAAATTGATTGTTCAAAAGTGATGAGTCTTTCACATCCCAAACCTTTACCAC
 ACCACTTGCACCTGCTGAGGCTTTCTCATCCCACTATCTGTAGGATCTGAGATCTTTGGTCTAGTTGC
 TGTGTTGTTAAGTTCCCATATATACCCCTGAAGCCTGGGGCCTTTGAGACCTCATGATCTTGGCCTTCA
 GCTTCTCAAGGTGAGCCGCAAGAGACATCAGTTCTTCTGCACTGAGCCTCCCCACTTTCAAAACATTCTT
 CTTTGATGTTGACTTTAAATCCACAAGAGAATGTACAGTCTGGTTGAGACTTCTGAGTCTCTGTAGGTCT
 TTGTCATCTCTCTTTTCTTCTCATGATCCTCTGAACATTGCTGACCTCAGAGAAGTCCAACCCATTCA
 GAAGGTGGTTGCATCCTTAATGACAGCAGCCTTACATCTGATGTGAAGCTCTGCAATTCTCTTCTCAA
 TGCTTGGCTCCATTGGAAGCTCTTAACCTCCTTAGACAAGGACATcttggtgctcaatgggtttctcaaga
 caaatgcgcaatcaaatgcctagatccactgtgcg

Legend:

5'UTR and 3'UTR (shown in lowercase letters)

KRAS-H1 transgene (shown in bold)

IGR (shown in box)

LCMV-NP shown in underline)

FIG. 17

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gcgcaccggggatcctagggctttttggattgcgcttttctctagatcaactgggtgtcagggccctatcct
 acagaagg**ATGTACAAGCTGGTGGTAGTTGGAGCAGTGGGAGTGGGCAAATCAGCCTTGACCATTGGAGG**
CTCAGGTGGTGGAGGCTCAGGAGGCTACAAACTTGTGGTGGTGGAGCCAGAGGTGTAGGCAAAAGTGCA
CTCACCATAGGAGGAAGTGGAGGCGGAGGTAGTGGAGGCTACAACTTGTTGTTGTTGGGGCCTGTGGGG
TGGGAAAGTCAGCACTCACCATTGGTGGCAGTGGAGGTGGAGGCAGTGGTGGCTACAAGTTGGTGGTCGT
AGGTGCTGGGGATGTGGGCAAATCTGCCCTCACAATTGGAGGCTCAGGAGGTGGAGGCAGTGGTGGCTAC
AAATTGGTTGTGGTGGGTGCAGATGGTGTGGGCAAAGTGCTTTGACCATCTGAAGAACAGCGCCTCCCT
GACTCTCCACCTCGAAAGAGGTGGAGAGTCAGGGAGGCCAGAGGGTCTCAGCGTCTTTTCCAGATAGTT
TTTACACCAGGCACCTTGAATGCACCACAACCTACAGATCCCCTTGTTGGTCAAGCGGTGTGGCTTTGGAC
ATGAACCGCCCTTTATGTGTCTATGTGTTGGTATCTTCACAAGATGCAGAAAGATGCTGATTAGATATGC
TGATGTTGAAAACATCAAAGATCCATTAAGGCTAAAGGAGTACTCCCTTGCTTTTATGTAGTCCCTC
CTCAACATCTCTGTGATCATGTTATCTGCTTCTTGTTGATTTGATCACTAAAGTGGGTCTCATTCAAGT
AGGAGCCATTAGTGACAAGCCAGCACTTGGGTACACTAGTCTCACCAGTCTTAGCATGTTCCAGATACCA
GAACCTTTGAGTAATTACAGTATGGTACCCCCATTAGATCTCTTAGATGATTCCCTCATCAACAGCTGATCG
GAAATCAGAGAATTTACTGTTGTTTTGAATACATGCAAGGCAGACTCTACATCTTGCTTGAACCTACTCA
GGGCGGCCTTGTTGTAATCAATTAGTCGTAGCATGTCAAGAACTCTTCATCATGATTGACATTACATTT
TGCAACAGCTGTATTCCCAAACATTTGAGCTCTGCAGCAAGGATCATCCATTTGGTCAGGCAATAACCA
CCTGGATTTTCTACTCCTGAGGAGTCTGACAGGGTCCAGGTGAATGTGCCTGCAAGTCTCCTAGTGAGAA
ACTTTGTCTTTTCTGAGCAAAGAGGATTCTAGACATCCCAAAGGGCCTGCATATCTACAGTGGTTTTC
CCAAGTCTGTTTTGTATGATTAGGTACTGATAGCTTGTTTGGCTGCACCAAGTGGTCTTGCCATCTGAA
CCTGCCCAGCCCCAGCCACTTCTCATGTATTTTCTCCAAAGGCAGTTCTAAACATGTCCAAGACTCTAC
CTCTGAAAGTCTTACTGGCTTATAGCGCTCTGTGGGTCCGAAAATGACAAGTTGTATTGAATGGTGAT
GCCATTGTTAAATCACAAGACACTGCTTTGTGGTTGGAATCCCTCTAATACTGAGGTGCAGACTCGAG
ACTATACTCATGAGTGTATGGTCAAAAGTCTTTTTTGTGAAAGCGGAGGTAAAGTTGCAAAAATTGTGAT
TAAGGATGGAGTCGTTAGTGAAAGTTAGTCCAGTCCAGAGCTTCCCATACTGATGTAGTGATGAGAGTT
GTTGGCTGAGCACGCATTGGGCATCGTCAGATTTAAGTGAGACATATCAAACCTCCACTGATTTGAACTGG
TAAACCCCTTTATAGATGTCGGGACCATTAAGGCCGTACATGCCACAGGACCTACCAGCCAAAAAAGGA
AGCTGACCAGTGCTAATATCCACAGGTGGCGAAATGTACACAGCTTTGATGCTCGTGATTATAATGAG
CACAATAATGACAATGTTGATGACCTCATCAATGATGTGAGGCAAAGCCTCAAACATTGTCACAATCTGA
CCCATcttggtgctcaatgggtttctcaagacaaatgcgcaatcaaatgcctaggatccactgtgcg

Legend:

5'UTR and 3'UTR (shown in lowercase letters)

KRAS-H1 transgene (shown in bold)

IGR (shown in box)

LCMV-GP (shown in underline)

FIG. 18

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gcgcaccggggatcctaggcataccttggacgcgcataattacttgatcaaag**ATGTACAAGCTGGTGGTA**
GTTGGAGCAGTGGGAGTGGGCAAATCAGCCTTGACCATTGGAGGCTCAGGTGGTGGAGGCTCAGGAGGCT
ACAACTTGTGGTGGTGGAGCCAGAGGTGTAGGCAAAAGTGCACCTACCATAGGAGGAAGTGGAGGCGG
AGGTAGTGGAGGCTACAACTTGTGTGTGGGGCCTGTGGGTGGGAAAGTCAGCACTACCATTGGT
GGCAGTGGAGGTGGAGGCAGTGGTGGCTACAAGTTGGTGGTCTAGGTGCTGGGGATGTGGGCAAATCTG
CCCTCACAATTGGAGGCTCAGGAGGTGGAGGCAGTGGTGGCTACAAATGGTTGTGGTGGGTGCAGATGG
TGTGGGCAAAAGTGCTTTGACCATCTGA3CCCTAGCCTCGACATGGGCCTCGACGTCACCTCCCAATAGG
GGAGTGACGTCGAGGCCCTCTGAGGACTTGAGCTCAGAGGTTGATCAGATCTGTGTTGTTCTGTACAGCG
TGTCAATAGGCAAGCATCTCATCGGCTTCTGGTCCCTAACCCAGCCTGTCACCTGTTGCATCAAACATGAT
GGTATCAAGCAATGCACAGTGAAGATTGCGAGTGGTTGTGCAGCCCCCTTCTTCTTCTTTATGACC
AAACCTTTATGTTTTGGTGCAGAGTAGATTGTATCTCTCCAGATCTCATCCTCAAAGGTGCGTGCTTGGT
CGGCACCTGAGTTTCACGTCAAGCACTTTAAGTCTCTTCTCCATGCATTTCAACAACTGATTATATC
ATCTGAACCTTGAGCAGTGAAAACCATGTTTTGAGGTAAATGTCTGATGATTGAGGAAATCAGGCCTGGT
TGGGCATCAGCCAAGTCCCTTTAAAAGGAGACCATGTGAGTACTTGCTTTGCTCTTTGAAGGACTTCTCAT
CGTGGGAAATCTGTAAATGTATGTAGTTGCCCGTGTGAGGCTGGTAGATGGCCATTTCCACCGGATC
ATTTGGTGTCTTCAATGTCAATCCATGTGGTAGCTTTGAATCAAGCATCTGAATTGAGGACACAACA
GTaTCTTCTTTCTCTTAGGGATTTGTTAAGGTCCGGTGATCCTCCGTTTCTTACTGGTGGCTGGATAG
CACTCGGCTTCGAATCTAAATCTACAGTGGTGTATCCCAAGCCCTCCCTTGAACCTTGAGACCTTGAGCC
AATGTAAGGCCAACCATCCCCTGAAAGACAAATCTTGATAGTAAATTTTCATAAGGATTTCTCTGTCCG
GGTGTAGTGCTCACAAACATACCTTACGATTCTTTATTTGCAATAGACTCTTTATGAGAGTACTAAACA
TAGAAGGCTTCACTGGATGGTCTCAAGCATATTGCCACCATCAATCATGCAAGCAGCTGCTTTGACTGC
TGCAGACAAACTGAGATTGTACCCTGAGATGTTTATGGCTGATGGCTCATTACTAATGATTTTTAGGGCA
CTGTGTGTGTGTGAGTTTCTCTAGATCTGTCTGTTCGGGAACCTGACAGTGTAGAGCAAACCAAGTG
CACTCAGCGCTTGGACAACATCATTAAGTTGTTACCCCTTGCTCAGTCATACAAGCGATGGTTAAGGC
TGGCATTGATCCAAATTGATTGATCAACAATGTATTATCCTTGATGTCCAGATCTTCACAACCCCATCT
CTGTTGCCTGTGGGTCTAGCATTAGCGAACCCATTGAGCGAAGGATTTGGCTCTTTGTTCCAACCTGAG
TGTTTGTGAGATTGCCCCATAAACACCAGGCTGAGACAACTCTCAGTTCTAGTGACTTTCTTTCTTAA
CTTGTCCAAATCAGATGCAAGCTCCATTAGCTCCTCTTTGGCTAAGCCTCCACCTTAAGCACATTGTCC
CTCTGGATTGATCTCATATTATCAGAGCATCAACCTCTTTGTTTCATGTCTCTTAACCTTGGTCAGATCAG
AATCAGTCCTTTTATCTTTGCGCATCATCTTTGAACTTGAGCAACTTTGTGAAAGTCAAGAGCAGATAA
CAGTGCTCTTGTGTCCGACAACATCAGCCTTCACAGGATGGGTCCAGTTGGATAGACCCCTCCTAAGG
GACTGTACCCAGCGGAATGATGGGATGTTGTCAGACATtttggggttggttgcaacttcctccgagtcagt
 gaagaagtgaacgtacagcgtgatctagaatcgcttaggatccactgtgcg

Legend:

5'UTR and 3'UTR (shown in lowercase letters)

KRAS-H1 transgene (shown in bold)

IGR (shown in box)

PICV-NP (shown in underline)

FIG. 19

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gcgcaccggggatcctagccataccttggacgcgcatacttctgatcaaag**ATGTACAAGCTGGTGGTA**
GTTGGAGCAGTGGGAGTGGGCAAATCAGCCTTGACCATTGGAGGCTCAGGTGGTGGAGGCTCAGGAGGCT
ACAAACTTGTGGTGGTTGGAGCCAGAGGTGTAGGCAAAAGTGCACTCACCATAGGAGGAAAGTGGAGGCGG
AGGTAGTGGAGGCTACAAACTTGTGTGTGGGGCCTGTGGGTGGGAAAGTCAGCACTCACCATTGGT
GGCAGTGGAGGTGGAGGCAGTGGTGGCTACAAGTTGGTGGTCTGTAGGTGCTGGGGATGTGGGCAAATCTG
CCCTCACAATTGGAGGCTCAGGAGGTGGAGGCAGTGGTGGCTACAAATGGTTGTGGTGGGTGCAGATGG
TGTGGGCAAAGTGCTTTGACCATCTGAGCCCTAGCCTCGACATGGGCCTCGACGTCACCTCCCAATAGG
GGAGTGACGTCGAGGCCTCTGAGGACTTGAGCTTATTTACCCAGTCTCACCATTGTAGGGTTTCTTTG
GGATTTTATAATACCCACAGCTGCAAGAGAGATTCCAGTAATCCTATGTGGCTTCGGACAGCCATCACC
AATGATGTGCCTATGAGTGGGTATTTCCAATAAGTGAGAAACACTGTGATGGTGTAAACACCAAGAC
CAGAAGCAAATGTCTGTCAATGCTAGTGGAGTCTTACCTTGTCTTTCTCATATTCTTTATCAGCATTT
CATTGTACAGATTCTGGCTCTCCACACCAATCATTCTTAAATGCGTTTCATTGAGGTACGAGCCATT
GTGAACCTAACCAACACTGCGGTAAAGAATGTCTCCTGTGATGGTATCATTGATGTACCAAAATTTGTA
TAGTTGCAATAAGGGATTTTGGCAAGCTGTTTGAGACTGTTTCTAATCACAAGTGAGTCAGAAATAAGTC
CGTTGATAGTCTTTTTAAAGAGATTCAACGAATTCTCAACATTAAGTTGTAAGGTTTTGATAGCATTCTG
ATTGAAATCAAATAACCTCATCGTATCGCAAAATTTCTTATTGTGATCTTTGTTGCATTTGCCATCACA
GTGTTATCAAACATTTTATTCCAGCCCAAACAATAGCCCATTTGCTCCAAACAGTAACCACCTGGGACAT
GTTGCCCAGTAGAGTCACTCAAGTCCCAAGTGAAAAAGCCAAGGAGTTTCTGCTCACAGAACTATAAGC
AGTTTTTTGGAGAGCCATCCTTATTGTGCCATGGAGTATATGTACAGTGATTTTCCCATGTGGTGTTC
TGTATGATCAGGAAATTGTAATGTGTCCACCTTCACAGTTTGTAGTCTGCAAGACCTCCACTACAGT
TATTGAAACATTTTCCAACCCACGCAATTTTGGGTCCCAATGATTTGAGCAAGCGACGCAATAAGATG
TCTGCCAACCTCACCTCCTCTATCCCCAACTGTCAAGTTGTACTGGATCAACACCCAGCACCTCAACT
GTTTTGCATCTGGCACCTACATGACGAGTGACATGGAGCACATTGAAGTGTAACCTATTAAGCAACCATT
TTAATGTGTGACCTGCTTCTTCTGTCTTATCACAATTACTAATGTTACCATATGCAAGGCTTCTGATGTT
GGAAAAGTTTCCAGTAGTTTCATTTGCAATGGATGTGTTTGTCAAAGTGAGTTCAATTCCCCATGTTGTG
TTAGATGGTCCTTTGTAGTAATGATGTGTGTTGTTCTTGCTACATGATTGTGGCAAGTTGTCAAACATTC
TTGTGAGGTTGAACTCAACGTGGGTGAGATTGTGCCTCCTATCAATCATCATGCCATCACAACCTCTGCC
AGCCAAAATGAGGAAGGTGATGAGTTGGAATAGGCCACATCTCATCAGATTGACAAATCCTTTGATGATG
CATAGGGTTGAGACAAATGATTAAGGCGACATTGAACACCTCCTGCAGGACTTCGGGTATAGACTGGATCA
AAGTCACAACCTTGTCCTATttggggttggttgacattcctccgagtcagtgagaagtgaaagtgacgtacagc
gtgatctagaatcgcttaggatccactgtg

Legend:

5'UTR and 3'UTR (shown in lowercase letters)

KRAS-H1 transgene (shown in bold)

IGR (shown in box)

PICV-GP (shown in underline)

FIG. 20

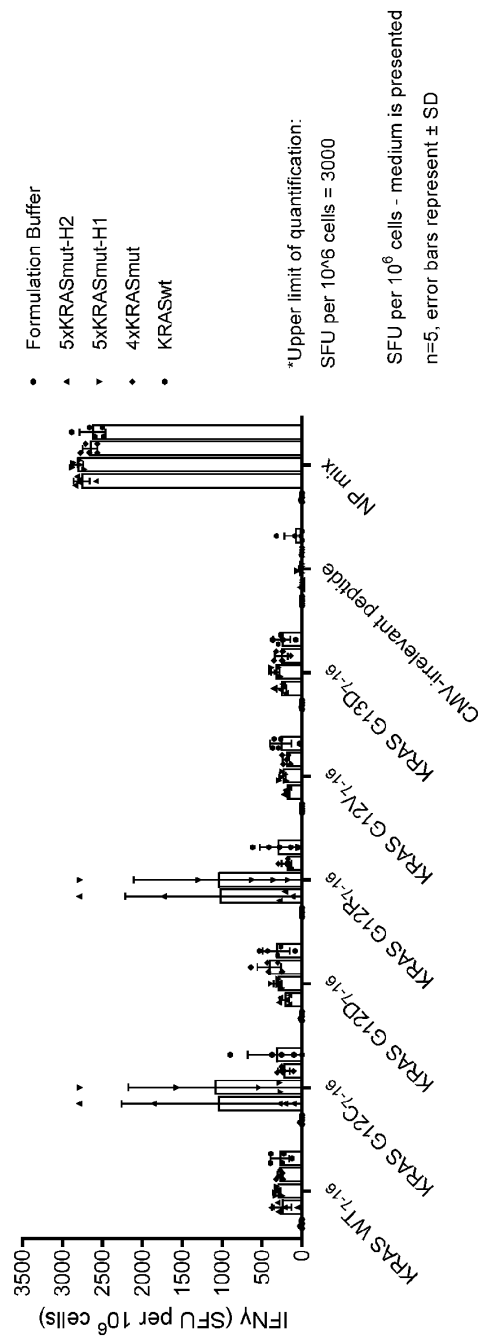


FIG. 21

Prime Boost vaccination								
Group	Vector Prime	Vector Boost	Dose	Day prime	Day boost	Route	Elispot	No of HLA B*07:02 mice
1	Formulation buffer	Formulation buffer	n.a.	day 0	day 21	i. v.	spleen day 26	5
2	artPICV-5xKRASmut-H2	artLCMV-5xKRASmut-H2	1×10 ⁵					5
3	artPICV-5xKRASmut-H1	artLCMV-5xKRASmut-H1						5
	4	artPICV-4xKRASmut	artLCMV-4xKRASmut					5
5	artPICV-KRASwt	artLCMV-KRASwt						5

FIG. 22

Prime Boost vaccination						
Group	Vector prime	Dose	Day prime	Route	Elispot	No of HLA-A*11:01 mice
1	Formulation buffer	n.a.	day 7	i. v.	spleen day 7	5
2	artLCMV-5xKRASmut-H2	1×10 ⁵				5
3	artLCMV-KRASwt					5
4	artPICV-5xKRASmut-H2					5
5	artPICV-KRASwt					5

FIG. 23

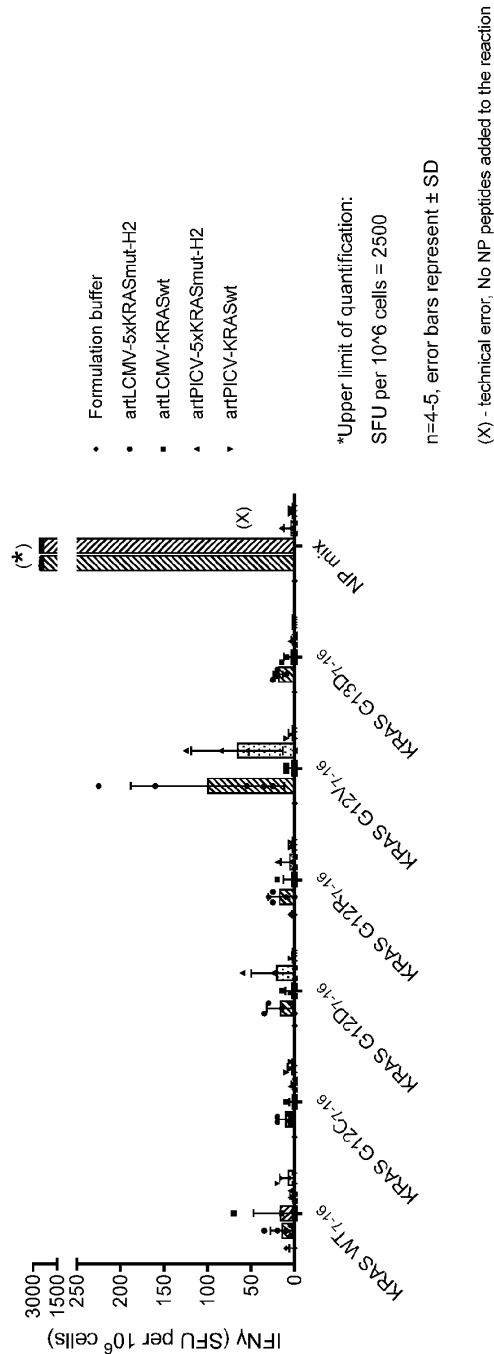


FIG. 24