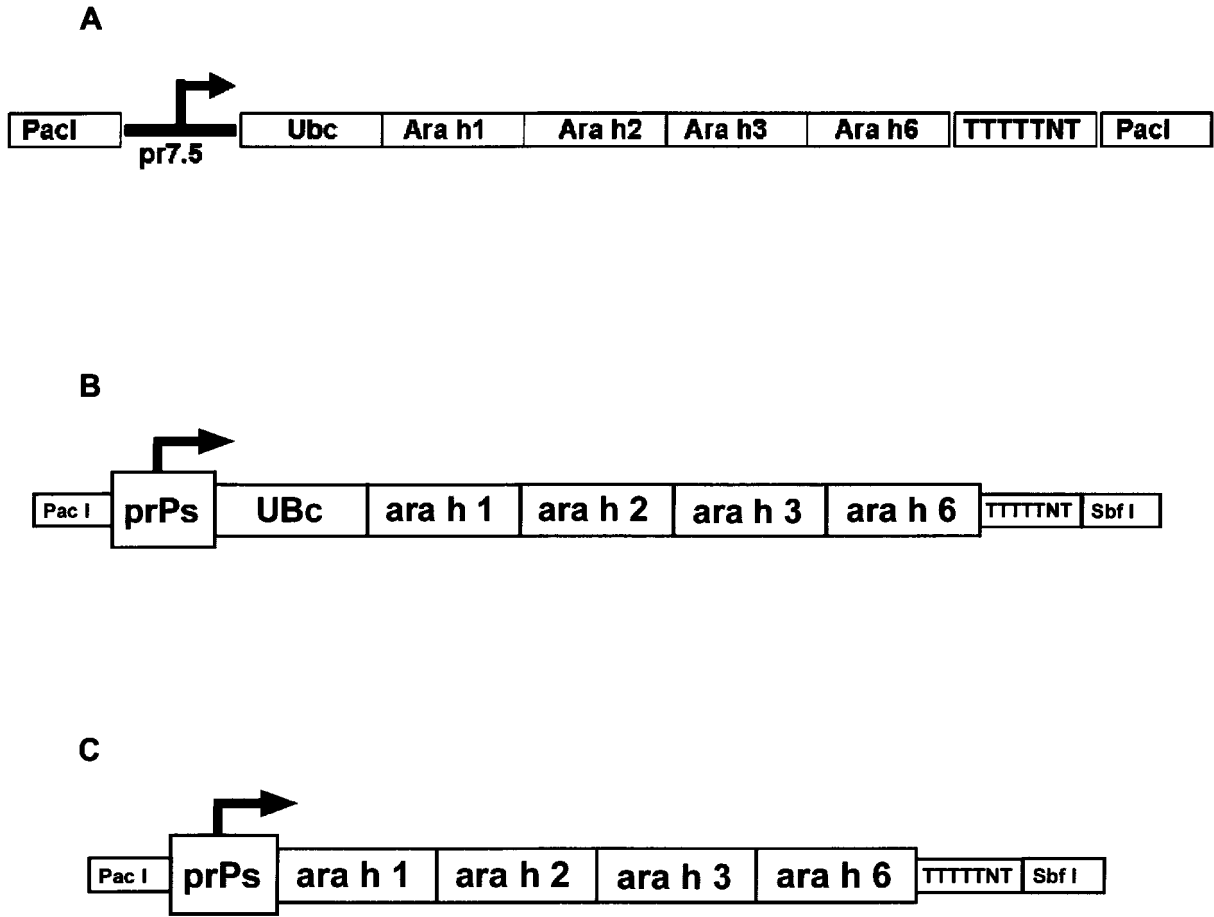


FIGURE 1



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FIGURE 2***UBc.PHAVag Expression Cassette***

LOCUS UBc.PHAVag expression cassette 4705 bp DNA linear SYN
10-MAR-2014
DEFINITION SCV-UBcPHAVag expression cassette
ORGANISM Vaccinia Virus
COMMENT Textco/File created by Gene Construction Kit (TextcoBioSoftware)
FEATURES Location/Qualifiers
misc_feature 9..52
/label="prPs"
/note="Vaccinia early/late promoter"
CDS 53..4690
/label="UBc.PHAV"
/note="Protein coding sequence of the ubiquitinated peanut
hypoallergy vaccine antigen"
CDS 53..280
/label="Ubc"
/note="Ubiquitin C monomer. Terminal amino acid changed to
""A""
CDS 281..2155
/label="ara h1"
/note="protein coding sequence of ara h 1"
CDS 2156..2668
/label="ara h2"
/note="Protein coding sequence of ara h 2"
CDS 2669..4255
/label="ara h3"
/note="Protein coding sequence of ara h 3"
CDS 4256..4690
/label="ara h6"
/note="Protein coding sequence of ara h 6"
misc_feature 4691..4697
/label="T5NT"
/note="Pox virus early transcriptional stop sequence"
ORIGIN
1 TTAattaaca AAAAATTGAA ATTTTATTTT TTTTTTTGG AATATAAATA AtATGCAGAT
61 CTTTGTGAAA ACACTCACGG GAAAACTAT AACTCTTGAG GTGGAGCCCT CTGACACAAT
121 CGAAAATGTG AAAGCCAAGA TCCAAGATAA GGAAGGCATC CCTCCAGACC AGCAACGGCT
181 CATCTTTGCG GGCAACAAC TGGAGGATGG GCGCACTCTC AGTGATTACA ATATTCAAAA
241 GGAATCTACA CTGCACCTGG TTCTTAGGCT GCGGGGAGCC CGAGGCAGAG TCAGCCCTCT
301 GATGCTGCTG TTGGGGATCT TGTTTCTTGC ATCCGTTTCA GCCACACATG CCAAGTCCAG
361 CCCATACCAG AAAAAGACCG AGAACCCATG TGCTCAGCGG TGCCTCCAGT CATGTCAGCA
421 GGAACCCGAT GACCTCAAGC AAAAGGCGTG TGAAAGCAGA TGTACGAAAC TGGAAATACGA
481 CCCCAGATGC GTGTACGATC CACGAGGCCA TACTGGCACC ACCAATCAAA GATCACCACC
541 TGGCGAGCGA ACCAGGGGAC GACAGCCAGG GGATTACGAT GACGATAGAC GACAGCCTCG
601 CCGGGAAGAG GGTGGGCGCT GGGGTCCAGC CGGTCCCAGA GAGCGAGAAC GGGAAAGAGGA
661 CTGGCGCCAA CCCCGGGAGG ACTGGCGCAG ACCTTCACAC CAGCAGCCCC GGAAAATACG
721 CCCGAGGGGC AGAGAGGGTG AACAGGAATG GGGAAACCCCT GGCAGTCACG TCAGGGAAGA
781 AACCAGCCGG AACAACCCCT TCTATTTCCT CTCCCGGAGG TTTAGCACTC GGTACGGGAA
841 CCAAAACGGA CGCATTCGCG TACTTCAGAG ATTTGATCAA CGCTCACGCG AGTTCCAGAA
901 CCTTCAAAAC CATCGGATTG TTCAGATCGA GGCCAAACCA AACACTTTGG TTCTGCCAAA
961 ACATGCTGAT GCAGACAACA TACTGGTGAT ACAGCAGGGT CAAGCCACAG TGACAGTAGC
1021 CAATGGGAAC AATCGCAAAT CATTCAATCT CGATGAGGGA CACGCACTGA GGATCCCTTC
1081 TGGCTTTATC TCCTATATAC TGAATCGGCA CGACAATCAA AATCTCAGGG TTGCTAAGAT
1141 CTCTATGCCA GTCAACACTC CGGGTCAGTT CGAGGATTTC TTTCCCGCGT CCTCACGGGA
1201 CCAGTCTAGT TATCTTCAAG GATTTCAGCAG AAACACCTTG GAAGCGGCCT TTAACGCCGA
1261 GTTTAACGAG ATCAGGCGGG TGCTTCTCGA GGAGAACGCT GGCGGGGAAC AGGAGGAGAG
1321 AGGCCAACGG CGGTGGTCTA CCAGGTCCAG TGAGAACAAT GAGGGCGTGA TCGTCAAGGT

FIGURE 2 (CONTINUED)

```

1381 ATCTAAGGAG CATGTCGAGG AACTGACCAA ACATGCAAAG TCCGTTTCCA AGAAAGGCTC
1441 CGAGGAGGAA GGGGACATTA CGAATCCGAT CAACCTTCGG GAGGGCGAGC CGGATCTGTC
1501 AAATAACTTT GGAAACTCT TCGAAGTCAA GCCCGACAAA AAGAATCCGC AGTTGCAAGA
1561 TCTGGACATG ATGCTCACGT GTGTCGAGAT TAAGGAAGGA GCACTGATGT TGCCTCACTT
1621 TAACTCCAAA GCCATGGTGA TAGTCGTAGT AAACAAAGGA ACCGGCAATC TGGAGTTGGT
1681 GGCTGTCCGA AAGGAACAAC AGCAAAGAGG GCGGAGGGAA GAAGAGGAAG ATGAGGACGA
1741 GGAGGAGGAG GGATCAAACC GGGAGGTACG CCGATACACA GCGAGGCTGA AAGAGGGAGA
1801 CGTGTTTATC ATGCCGGCAG CACATCCTGT CGCTATCAAC GCCTCTAGCG AGCTCCATTT
1861 GCTGGGGTTC GGGATCAATG CGGAGAACAA TCATCGCATT TTCCTGGCAG GCGACAAGGA
1921 CAACGTTATT GACCAAATTG AGAAGCAAGC CAAGGACCTG GCCTTCCCTG GATCAGGTGA
1981 ACAGGTCGAG AAGCTCATCA AAAACCAGAA GGAATCCAC TTTGTATCTG CCAGACCACA
2041 GTCACAGTCC CAGAGCCCCC TAGTCCCGA GAAGGAGAGC CCCGAAAAGG AAGATCAAGA
2101 GGAGGAGAAC CAGGTTGGAA AGGGCCCCCT GCTTTCCATT CTCAAAGCCT TCAATGCTAA
2161 GCTGACAATA TTGGTGGCAC TGGCACTGTT CCTTCTTGCT GCACACGCGT CAGCCCGGCA
2221 GCAGTGGGAA TTGCAGGGCG ATCGAAGGTG TCAGTCACAG CTGGAGAGGG CGAACCTCCG
2281 GCCTTGTGAA CAGCACCTGA TGCAGAAGAT TCAGCGGGAC GAGGATTCTT ACGGGCGAGA
2341 TCCTTACAGT CCTCCCAAG ATCCATATAG CCCGTCTCAA GACCCAGATC GCAGGGACCC
2401 ATATAGCCCC AGCCCTATG ATCGAAGAGG TGCCGGAAGC AGCCAGCATC AGGAAAGGTG
2461 CTGCAATGAG CTGAACGAGT TCGAGAACAA CCAGAGATGT ATGTGCGAGG CTCTGCAGCA
2521 GATTATGGAA AATCAATCTG ACCGGCTGCA GGGACGGCAG CAGGAGCAGC AGTTCAAAAG
2581 GGAGTCCGC AACCTTCCAC AGCAGTGCAG TTTGCGCGCA CCTCAGCGCT CCGACTTGGA
2641 GGTGGAAAGC GGAGGTAGAG ACAGATACGC GAAGCTGCTG GAACTCAGCT TCTGTTTCTG
2701 TTTCTGGTGA CTCGGCGCTT CATCAATATC TTTTAGGCAG CAGCCAGAGG AAAATGCCTG
2761 CCAGTTCCAA CGGCTGAACG CTCAGCGACC AGACAATAGG ATCGAATCAG AAGGTGGATA
2821 CATCGAGACT TGGAAACCGA ATAACCAGGA GTTCGAATGT GCAGGCGTGG CACTGTCTCG
2881 CCTTGTCTC CGACGCAATG CGCTCAGGCG CCCATCTAT TCCAATGCAC CCCAAGAAAT
2941 CTTTATCCAA CAGGGCAGAG GGTACTTCGG GCTGATCTTT CCCGGCTGTC CCCGGCACTA
3001 TGAGGAACCC CACACACAGG GCAGAAGGAG CCAGAGCCAG CGGCCTCCCC GGAGATTGCA
3061 AGGGGAGGAT CAGAGCCAGC AGCAGAGAGA TTCTCATCAG AAAGTACATA GGTTCGATGA
3121 GGGTGACCTG ATAGCTGTGC CAACCGGTGT TGCTTTTGG TTGTATAATG ACCACGACAC
3181 AGACGTGGTG GCTGTGTCTC TGACCGATAC AAACAACAAT GACAATCAGC TTGATCAGTT
3241 CCCTAGGCGC TTTAACCTGG CTGGCAACAC CGAACAGGAG TTCTTGAGAT ATCAGCAGCA
3301 GTCTAGGCAG TCTAGGAGGA GGTCCCTGCC ATACTCCCCT TACAGCCCTC AGAGTCAGCC
3361 TAGGCAGGAA GAGAGAGAAT TCAGTCCCAG AGGCCAGCAC TCTAGGCGGG AGCGGGCTGG
3421 GCAGGAGGAG GAAAACGAAG GTGGCAATAT CTTTAGCGGC TCACTCCAG AGTTTCTGGA
3481 ACAGGCATT CAGTAGATG ACAGACAGAT CGTCCAGAAC CTTAGGGGCG AGACTGAATC
3541 AGAAGAGGAA GGGGCAATCG TGACGGTGCG CGGAGGCTTG CGCATCTGT CCCCTGACCG
3601 CAAACGCAGG GCCGACGAGG AAGAAGAGTA TGACGAGGAT GAATATGAAT ATGATGAGGA
3661 GGATCGAAGG CGCGGAAGGG GCAGTAGGGG ACGAGGGAAC GGCATAGAAG AAACATTTTG
3721 TACCGCGTCC GCCAAGAAGA ATATTGGGCG AAACCGCAGT CCCGACATAT ACAATCTCA
3781 AGCCGCGCAG CTTAAACCG CCAACGATCT GAACCTGCTG ATCCTCCGCT GGCTGGGGCC
3841 AAGCGCCGAA TATGGGAATC TGTACCGAAA TGCTCTGTTT GTGGCCCACT ACAATACAAA
3901 TGCCCACTCT ATTATCTACC GCCTCAGAG GAGGGCTCAT GTGCAAGTGG TCGACAGCAA
3961 TGGGAATCGC GTGTACGATG AGGAGCTCCA AGAAGGGCAT GTCCTTGTGT TGCCTCAGAA
4021 TTTTCGAGTT GCGGGCAAAT CACAGAGTGA GAACTTCGAG TACGTTGCCT TTAAGACCGA
4081 TTCCAGACCC TCCATTGCAA ACCTGGCCGG AGAGAACAGT GTTATTGACA ATCTGCCGGA
4141 GGAAGTGGTT GCTAACAGTT ATGGGCTTCA GCGCGAACAG GCTCGGCAGC TGAAGAACAA
4201 CAATCCGTT CAGTTTTCG TCCCTCCATC CCAGCAGTCA CCCAGAGCTG TGGCCGCCAA
4261 ATCCACTATT CTGTGGGCC TCTTGGCACT CGTGTGGTTC GCCCATGCTT CTGCTATGCG
4321 AAGGGAGAGA GGGCGCCAAG GTGACTCAAG CAGTTGCGAA CGACAAGTGG ACAGAGTGAA
4381 CCTCAAACCT TGCGAACAGC ACATTATGCA GAGAATTATG GGAGAGCAAG AGCAGTATGA
4441 TAGTTATGAT ATCAGATCAA CACGCTCTTC CGATCAGCAA CAGCGGTGTT GCGATGAACT
4501 CAACGAAATG GAGAATACGC AGCGGTGCAT GTGTGAGGCT CTTACAGCAA TCATGGAAAA
4561 CCAATGCGAT CGGCTCCAAG ATCGACAGAT GGTGCAGCAG TTTAAGCGCG AGCTGATGAA
4621 TTTGCCACAA CAGTGCAACT TTCGGGCTCC CCAGAGATGC GACCTCGATG TCAGCGGAGG
4681 GAGATGCTAA TTTTATCCT GCAGG

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FIGURE 3

PHAVag Expression Cassette

LOCUS PHAVag expression cassette 4480 bp DNA linear SYN 10-MAR-2014

DEFINITION PHAVag expression cassette

ORGANISM Vaccinia virus

Unclassified.

COMMENT Textco/File created by Gene Construction Kit (TextcoBioSoftware)

FEATURES Location/Qualifiers

misc_feature 9..52

/label="prPs"

/note="Vaccinia early/late promoter"

/note="Pox virus early transcriptional stop"

CDS 53..1930

/label="ara h1"

/note="Protein coding sequence of ara h 1"

CDS 1931..2443

/label="ara h2"

/note="Protein coding sequence of ara h 2"

CDS 2444..4030

/label="ara h3"

/note="Protein coding sequence of ara h 3"

CDS 4031..4465

/label="ara h6"

/note="Protein coding sequence of ara h 6"

CDS 53..4465

/label="PHAVag"

/note="Protein coding sequence of the peanut hypoallergen vaccine antigen"

misc_feature 4466..4472

/label="Transcription stop"

ORIGIN

1 TTAattaaca AAAAATTGAA ATTTTATTTT TTTTTTTGG AATATAAATA AtatgCGAGG

61 CAGAGTCAGC CCTCTGATGC TGCTGTGGG GATCTTGTT CTTGCATCCG TTTCAGCCAC

121 ACATGCCAAG TCCAGCCCAT ACCAGAAAA GACCGAGAAC CCATGTGCTC AGCGGTGCCT

181 CCAGTCATGT CAGCAGGAAC CCGATGACCT CAAGCAAAAG GCGTGTGAAA GCAGATGTAC

241 GAAACTGGAA TACGACCCCA GATGCGTGTA CGATCCACGA GGCCATACTG GCACCACCAA

301 TCAAAGATCA CCACCTGGCG AGCGAACCAG GGGACGACAG CCAGGGGATT ACGATGACGA

361 TAGACGACAG CCTCGCCGGG AAGAGGGTGG GCGCTGGGGT CCAGCCGGTC CCAGAGAGCG

421 AGAACGGGAA GAGGACTGGC GCCAACCCCG GGAGGACTGG CGCAGACCTT CACACCAGCA

481 GCCCCGAAA ATACGCCCGG AGGGCAGAGA GGGTGAACAG GAATGGGGAA CCCCTGGCAG

541 TCACGTCAGG GAAGAAACCA GCCGGAACAA CCCCTTCTAT TTCCCCTCCC GGAGGTTTAG

601 CACTCGGTAC GGAACCAAAA ACGGACGCAT TCGCGTACTT CAGAGATTTG ATCAACGCTC

661 ACGGCAGTTC CAGAACCTTC AAAACCATCG GATTGTTTCA ATCGAGGCCA AACCACACAC

721 TTTGGTTCTG CCAAAACATG CTGATGCAGA CAACATACTG GTGATACAGC AGGGTCAAGC

781 CACAGTGACA GTAGCCAATG GGAACAATCG CAAATCATTC AATCTCGATG AGGGACACGC

841 ACTGAGGATC CCTTCTGGCT TTATCTCCTA TATACTGAAT CGGCACGACA ATCAAAATCT

901 CAGGGTTGCT AAGATCTCTA TGCCAGTCAA CACTCCGGGT CAGTTCGAGG ATTTCTTTCC

961 CGCGTCCTCA CGGGACCATG CTAGTTATCT TCAAGGATTC AGCAGAAACA CCTTGAAGC

1021 GGCCTTTAAC GCCGAGTTTA ACGAGATCAG GCGGGTGCTT CTCGAGGAGA ACGCTGGCGG

1081 GGAACAGGAG GAGAGAGGCC AACGGCGGTG GTCTACCAGG TCCAGTGAGA ACAATGAGGG

1141 CGTGATCGTC AAGGTATCTA AGGAGCATGT CGAGGAATG ACCAAACATG CAAAGTCCGT

1201 TTCCAAGAAA GGCTCCGAGG AGGAAGGGGA CATTACGAAT CCGATCAACC TTCGGGAGGG

1261 CGAGCCGGAT CTGTCAAATA ACTTTGAAAA ACTCTTCGAA GTCAAGCCCG ACAAAAAGAA

1321 TCCGAGTTTG CAAGATCTGG ACATGATGCT CACGTGTGTC GAGATTAAAG AAGGAGCACT

1381 GATGTTGCCT CACTTTAACT CCAAAGCCAT GGTGATAGTC GTAGTAAACA AAGGAACCGG

1441 CAATCTGGAG TTGGTGGCTG TCCGAAAGGA ACAACAGCAA AGAGGGCGGA GGAAGAAGA

1501 GGAAGATGAG GACGAGGAGG AGGAGGGATC AAACCGGGAG GTACGCCGAT ACACAGCGAG

FIGURE 3 (CONTINUED)

```

1561 GCTGAAAGAG GGAGACGTGT TTATCATGCC GGCAGCACAT CCTGTCGCTA TCAACGCCTC
1621 TAGCGAGCTC CATTGTCTGG GGTTCGGGAT CAATGCGGAG AACAAATCAT GCATTTTCCT
1681 GGCAGGCGAC AAGGACAACG TTATTGACCA AATTGAGAAG CAAGCCAAGG ACCTGGCCTT
1741 CCCTGGATCA GGTGAACAGG TCGAGAAGCT CATCAAAAAC CAGAAGGAAT CCCACTTTGT
1801 ATCTGCCAGA CCACAGTCAC AGTCCCAGAG CCCCTCTAGT CCCGAGAAGG AGAGCCCCGA
1861 AAAGGAAGAT CAAGAGGAGG AGAACCAGGG TGGAAAGGGC CCACTGCTTT CCATTCTCAA
1921 AGCCTTCAAT GCTAAGCTGA CAATATTGGT GGCCTGGCA CTGTTCTTTC TTGCTGCACA
1981 CGCGTCAGCC CGGCAGCAGT GGAATTGCA GGGCGATCGA AGGTGTCAGT CACAGCTGGA
2041 GAGGGCGAAC CTCCGGCCTT GTGAACAGCA CCTGATGCAG AAGATTCAGC GGGACGAGGA
2101 TTCTTACGGG CGAGATCCTT ACAGTCCCCT CCAAGATCCA TATAGCCCGT CTCAAGACCC
2161 AGATCGCAGG GACCCATATA GCCCCAGCCC CTATGATCGA AGAGGTGCCG GAAGCAGCCA
2221 GCATCAGGAA AGGTGCTGCA ATGAGCTGAA CGAGTTCGAG AACAAACAGA GATGTATGTG
2281 CGAGGCTCTG CAGCAGATTA TGGAAAATCA ATCTGACCGG CTGCAGGGAC GGCAGCAGGA
2341 GCAGCAGTTC AAAAGGGAGC TCCGCAACCT TCCACAGCAG TCGGTTTTCG GCGCACCTCA
2401 GCGCTGCGAC TTGGAGGTGG AAAGCGGAGG TAGAGACAGA TACGCGAAGC TGCTGGAACT
2461 CAGCTTCTGT TTCTGTTTCC TGGTACTCGG CGCTTCATCA ATATCTTTTA GGCAGCAGCC
2521 AGAGGAAAAT GCCTGCCAGT TCCAACGGCT GAACGCTCAG CGACCAGACA ATAGGATCGA
2581 ATCAGAAGGT GGATACATCG AGACTTGGA CCCGAATAAC CAGGAGTTCG AATGTGCAGG
2641 CGTGGCACTG TCTCGCCTTG TTCTCCGACG CAATGCGCTC AGGCGCCCAT TCTATTCCAA
2701 TGCACCCCAA GAAATCTTTA TCCAACAGGG CAGAGGGTAC TTCGGGCTGA TCTTTCCCGG
2761 CTGTCCCCGG CACTATGAGG AACCACACAC ACAGGGCAGA AGGAGCCAGA GCCAGCGGCC
2821 TCCCCGAGGA TTGCAAGGGG AGGATCAGAG CCAGCAGCAG AGAGATTCTC ATCAGAAAGT
2881 ACATAGGTTT GATGAGGGTG ACCTGATAGC TGTGCCAACC GGTGTTGCCT TTTGGTTGTA
2941 TAATGACCAC GACACAGACG TGGTGGCTGT GTCTCTGACC GATACAAACA ACAATGACAA
3001 TCAGCTTGAT CAGTTCCTTA GCGCTTTTAA CCTGGCTGGC AACACCGAAC AGGAGTTCCT
3061 GAGATATCAG CAGCAGTCTA GGCAGTCTAG GAGGAGGTCC CTGCCATACT CCCCTTACAG
3121 CCCTCAGAGT CAGCCTAGGC AGGAAGAGAG AGAATTCAGT CCCAGAGGCC AGCACTCTAG
3181 GCGGGAGCGG GCTGGGCAGG AGGAGGAAAA CGAAGGTGGC AATATCTTTA GCGGCTTCAC
3241 TCCAGAGTTT CTGGAACAGG CATTCCAAGT AGATGACAGA CAGATCGTCC AGAACCTTAG
3301 GGGCGAGACT GAATCAGAAG AGGAAGGGGC AATCGTGACG GTGCGCGGAG GCTTGCGCAT
3361 CCTGTCCCCT GACCGCAAAC GCAGGGCCGA CGAGGAAGAA GAGTATGACG AGGATGAATA
3421 TGAATATGAT GAGGAGGATC GAAGGCGCGG AAGGGGCAGT AGGGGACGAG GGAACGGCAT
3481 AGAAGAAACT ATTTGTACCG CGTCCGCCAA GAAGAATATT GGGCGAAACC GCAGTCCCGA
3541 CATATACAAT CCTCAAGCCG GCAGCCTTAA AACCGCCAAC GATCTGAACC TGCTGATCCT
3601 CCGCTGGCTG GGGCCAAGCG CCGAATATGG GAATCTGTAC CGAAATGCTC TGTTTGTGGC
3661 CCACTACAAT ACAAATGCCC ACTCTATTAT CTACCGCTC AGAGGGAGGG CTCATGTGCA
3721 AGTGGTCGAC AGCAATGGGA ATCGCGTGTA CGATGAGGAG CTCCAAGAAG GGCATGTCCT
3781 TGTTGTGCCT CAGAATTTTCG CAGTTGCGGG CAAATCACAG AGTGAGAACT TCGAGTACGT
3841 TGCTTTAAG ACCGATTCCA GACCTCCAT TGCAAACCTG GCCGGAGAGA ACAGTGTAT
3901 TGACAACTCT CCGAGGAAG TGGTTGCTAA CAGTTATGGG CTTCAGCGCG AACAGGCTCG
3961 GCAGCTGAAG AACAAACAAT CGTTCAAGTT TTTCGTCCCT CCATCCCAGC AGTCACCCAG
4021 AGCTGTGGCC GCCAAATCCA CTATTCTTGT GGCCCTCTTG GCACTCGTGC TGGTCGCCCC
4081 TGCTTCTGCT ATGCGAAGGG AGAGAGGGCG CCAAGGTGAC TCAAGCAGTT GCGAACGACA
4141 AGTGGACAGA GTGAACCTCA AACCTTGCGA ACAGCACATT ATGCAGAGAA TTATGGGAGA
4201 GCAAGAGCAG TATGATAGTT ATGATATCAG ATCAACACGC TCTTCCGATC AGCAACAGCG
4261 GTGTTGCGAT GAACTCAACG AAATGGAGAA TACGCAGCGG TGCATGTGTG AGGCTCTTCA
4321 GCAAATCATG GAAAACCAAT GCGATCGGCT CCAAGATCGA CAGATGGTGC AGCAGTTTAA
4381 GCGCGAGCTG ATGAATTTGC CACAACAGTG CAACTTTCGG GCTCCCCAGA GATGCGACCT
4441 CGATGTCAGC GGAGGGAGAT GCTAATTTTT ATCCTGCAGG

```

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FIGURE 4

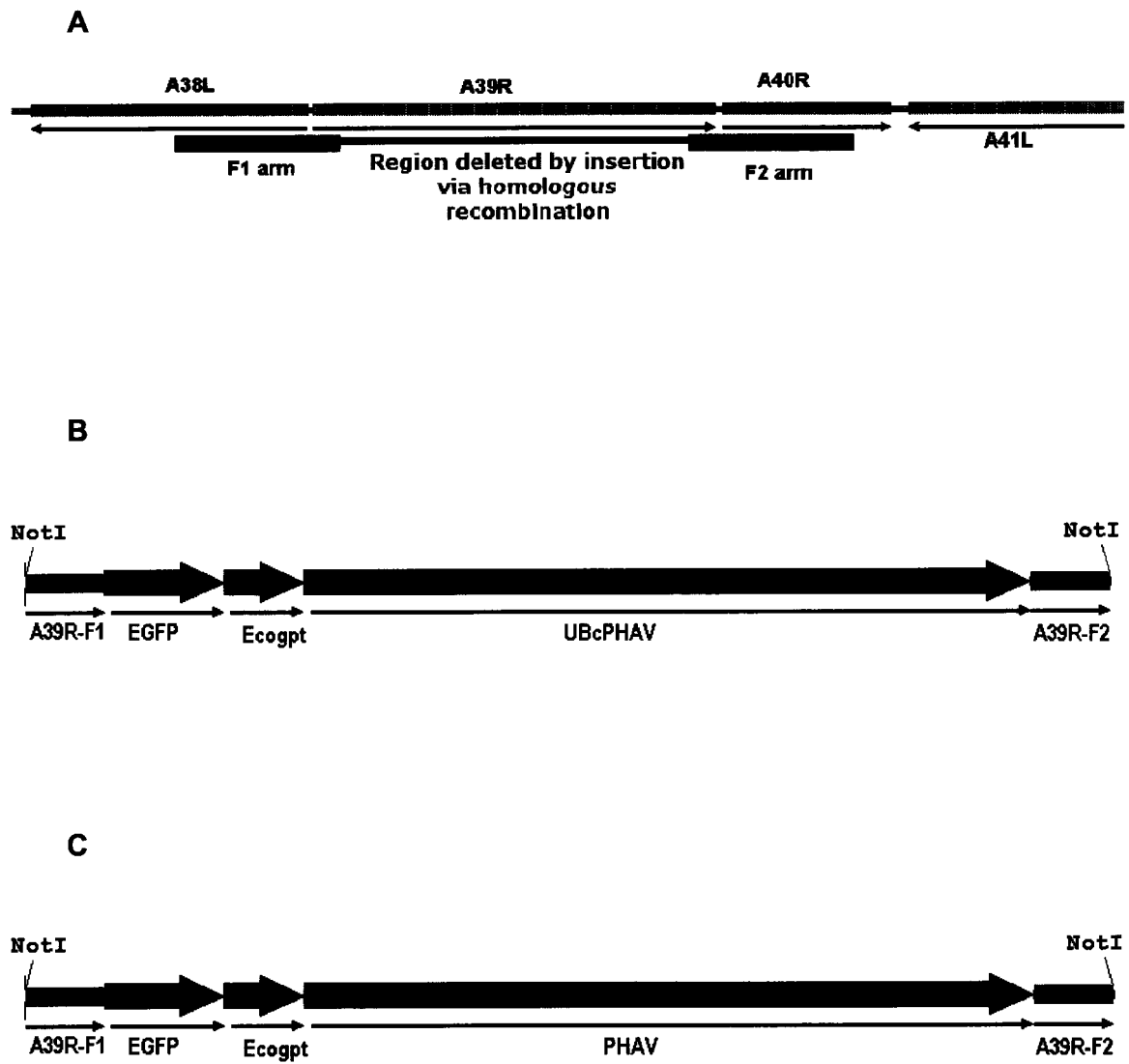


FIGURE 5***Homologous recombination cassette feature table***

Element	Description	Size
Not 1	RE site flanking homologous recombination cassette	8 bp
A39R-F1	Homologous recombination arm 1	501 bp
EGFP	Enhance Fluorescent Green Protein expression cassette consisting of a vaccinia early/late promoter followed by the protein coding sequence of EGFP and terminated with the poxvirus early transcriptional stop sequence (TTTTTNT)	771 bp
Ecogpt	E. coli guanine phosphoribosyltransferase expression cassette consisting of a vaccinia early/late promoter followed by the protein coding sequence of Ecogpt and terminated with the poxvirus early transcriptional stop sequence (TTTTTNT)	510 bp
prPs	Vaccinia strong synthetic early/late promoter	44 bp
UbcPHAVag Or PHAV	Peanut hypoallergen vaccine antigen expression cassette UBc.PHAV PHAV	4705bp 4480 bp
A39R-F2	Homologous recombination arm 2	501 bp
Not I	RE site flanking homologous recombination cassette	8 bp

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FIGURE 6***Ubiquitinated Peanut HypoAllergen Vaccine (UBc.PHAV) antigen homologous recombination cassette***

```

LOCUS      UBcPHAV HR Cassette      7010 bp      DNA      linear      SYN 10-MAR-
2014
DEFINITION UBcPHAV Homologous Recombination Cassette
COMMENT     Textco/File created by Gene Construction Kit (TextcoBioSoftware)
ORGANISM    Vaccinia virus Copenhagen strain
FEATURES
    CDS      1849..6486
              /label="UBcPHAV"
              /note="Ubiquitinated PHAV antigen protein coding sequence"
misc_feature 9..509
              /label="A39R-F1"
              /note=" VACV-COP A39R homologous recombination arm F1"
misc_feature 517..560
              /label="prPS"
              /note=" Vaccinia virus early/late promoter"
    CDS      561..1280
              /label="EGFP"
              /note="Enhanced Green Fluorescent Protein coding sequence"
misc_feature 1281..1287
              /label="T5NT"
              /note=" Poxvirus early transcriptional stop sequence"
misc_feature 1288..1331
              /label="prPs"
              /note="Vaccinia virus early/late promoter"
    CDS      1332..1790
              /label="Ecogpt"
              /note="Ecogpt protein coding sequence: E. coli guanine
phosphoribosyltransferase"
misc_feature 1791..1797
              /label="T5NT"
              /note=" Poxvirus early transcriptional stop sequence"
misc_feature 1805..1848
              /label="prPs"
              /note="Vaccinia virus early/late promoter"
    CDS      1849..2076
              /label="UBc"
              /note=" Human Ubiquitin C monomer. Terminal amino acid
changed [A] "
    CDS      2077..3951
              /label="arah1"
              /note=" Peanut allergen ara h 1 protein coding sequence"
    CDS      3952..4464
              /label="arah2"
              /note=" Peanut allergen ara h 2 protein coding sequence"
    CDS      4465..6051
              /label="arah3"
              /note="Peanut allergen ara h 3 protein coding sequence"
    CDS      6052..6486
              /label="arah6"
              /note=" Peanut allergen ara h 6 protein coding sequence"
misc_feature 6487..6493
              /label="T5NT"
              /note=" Pox virus early transcriptional stop"
misc_feature 6502..7002
              /label="A39R-F2"
              /note=" VACV-COP A39R homologous recombination arm F2"

```

FIGURE 6 (CONTINUED)

ORIGIN

```

1 GCGGCCGCaatgcccgtaaagataaacatcaacattgtttggtaatcattaaccaatta
61 gtatgaagttgaactaatttcacagtagattttattccagtggtatcctcgcatgtataa
121 gtacctggtgaagatatctttatattctataatcaatgagacatcactatccgataacgaa
181 tgaagtctagcactagtagtccatttactttaattgtcgtcttggaagttttattataa
241 gttaaaatatcatggttatccaatttccatctaatactttgtcggattatctatagta
301 cacggaataatgatggtatcattacatgctgtatactctatggtctttgtagttgtata
361 acaaccaacgtatagaggtatatcaacgatattctaactcttgacattttttatttattt
421 aaaatgatacctttgttattttattttattctattttgctaacggatttgatggcataag
481 tttgaaacgagtgaagaaataatttctacGCGCGCCcaAA AAATTGAAAT TTTATTTTTT
541 TTTTTTGGAA TATAAATAA ATGGTGAGCA AGGGCGAGGA GCTGTTACCC GGGGTGGTGC
601 CCATCTGGT CGAGCTGGAC GGCACGTAA ACGGCCACAA GTTCAGCGTG TCCGGCGAGG
661 GCGAGGGCGA TGCCACCTAC GGCAAGCTGA CCCTGAAGTT CATCTGCACC ACCGGCAAGC
721 TGCCCGTGCC CTGGCCACC CTCGTGACCA CCCTGACCTA CGGCGTGACG TGCTTCAGCC
781 GCTACCCCGA CCACATGAAG CAGCAGACT TCTTCAAGTC CGCCATGCCG GAAGGCTACG
841 TCCAGGCGG CACCATCTTC TTCAAGGACG ACGGCAACTA CAAGACCCGC GCCGGTACTG
901 AGTTCGAGGG CGACACCCTG GTGAACCGCA TCGAGCTGAA GGGCATCGAC TTCAAGGAGG
961 ACGGCAACAT CCTGGGGCAC AAGCTGGAGT ACAACTACAA CAGCCACAAC GTCTATATCA
1021 TGGCCGACAA GCAGAAGAAC GGCATCAAGG TGAACCTCAA GATCCGCCAC AACATCGAGG
1081 ACGGCAGCGT GCAGCTCGCC GACCACTACC AGCAGAACAC CCCCATCGGC GACGGCCCCG
1141 TGCTGCTGCC CGACAACCAC TACCTGAGCA CCCAGTCCGC CCTGAGCAAA GACCCCAACG
1201 AGAAGCGCGA TCACATGGTC CTGCTGGAGT TCGTGACCGC CGCCGGGATC ACTCTCGGCA
1261 TGGACGAGCT GTACAAGTAA tttttatcaA AAAATTGAAA TTTTATTTTT TTTTTTGGAA
1321 ATATAAATAA tATGAGCGAA AAATACATCG TCACCTGGGA CATGTTGCAG ATCCATGCAC
1381 GTAAACTCGC AAGCCGACTG ATGCCTTCTG AACAATGGAA AGGCATTATT GCCGTAAGCC
1441 GTGGCGGTCT GGTACCGGT GCGTTACTGG CGCGTGAAC TGGTATTCTG CATGTCGATA
1501 CCGTTTGTAT TTCCAGCTAC GATCAGACA ACCAGCGCGA GCTTAAAGTG CTGAAACGCG
1561 CCAAGGCGA TGGCGAAGGC TTCATCGTTA TTGATGACCT GGTGGATACC GTTGGTACTG
1621 CGGTTGCGAT TCGTGAAATG TATCCAAAAG CGCACTTTGT CACCATCTTC GCAAAACCGG
1681 CTGGTCTGCC GCTGTTGAT GACTATGTTG TTGATATCCC GCAAGATACC TGGATTGAAC
1741 AGCCGTGGGA TATGGGCGTC GTATTCTGTC CGCCAATCTC CGGTCGCTAA tttttatATT
1801 TTAACAaaaa ATTGAAATTT TATTTTTTTT TTTTGAATA TAAATAaAT GCAGATCTTT
1861 GTGAAAACAC TCACGGGAAA AACTATAACT CTTGAGGTGG AGCCCTCTGA CACAATCGAA
1921 AATGTGAAAG CCAAGATCCA AGATAAGGAA GGCATCCCTC CAGACCAGCA ACGGCTCATC
1981 TTTGCGGGCA ACAAACCTGA GGATGGGCGC ACTCTCAGTG ATTACAATAT TCAAAAGGAA
2041 TCTACACTGC ACCTGGTCTT TAGGCTGCGG GGAGCCGAG GCAGAGTCAG CCCTCTGATG
2101 CTGCTGTTGG GGATCTTGGT TCTTGATCC GTTTCAGCCA CACATGCCAA GTCCAGCCCA
2161 TACCAGAAAA AGACCGAGAA CCCATGTGCT CAGCGGTGCC TCCAGTCATG TCAGCAGGAA
2221 CCCGATGACC TCAAGCAAAA GGCGTGTGAA AGCAGATGTA CGAAACTGGA ATACGACCCC
2281 AGATGCGTGT ACATCCACG AGGCCATACT GGCACCACCA ATCAAAGATC ACCACCTGGC
2341 GAGCGAACCA GGGGACGACA GCCAGGGGAT TACGATGACG ATAGACGACA GCCTCGCCGG
2401 GAAGAGGGTG GGCCTGGGG TCCAGCCGCT CCCAGAGAGC GAGAACGGGA AGAGGACTGG
2461 CGCCAACCCC GGGAGGACTG GCGCAGACCT TCACACCAGC AGCCCGGGA AATACGCCCC
2521 GAGGCGAGAG AGGTTGAACA GGAATGGGGA ACCCTGGCA GTCACGTCAG GGAAGAAACC
2581 AGCCGGAACA ACCCTTCTA TTTCCCTCC CGGAGGTTTA GCACTCGGTA CGGGAACCAA
2641 AACGGACGCA TTCGCTACT TCAGAGATTT GATCAACGCT CACGGCAGTT CCAGAACCTT
2701 CAAAACCATC GGATTGTTCA GATCGAGGCC AAACCAACA CTTTGTTTCT GCCAAAACAT
2761 GCTGATGCAG ACAACATACT GGTGATACAG CAGGGTCAAG CCACAGTGAC AGTAGCCAAT
2821 GGGAAACAAT GCAAAATCAT CAATCTCGAT GAGGGACACG CACTGAGGAT CCCTTCTGGC
2881 TTTATCTCCT ATATACTGAA TCGGCACGAC AATCAAAATC TCAGGTTTGC TAAGATCTCT
2941 ATGCCAGTCA AACTCCGGG TCAGTTCGAG GATTCTTTT CCGCGTCTCT ACGGGACCAG
3001 TCTAGTTATC TTCAAGGATT CAGCAGAAAC ACCTTGAAG CGGCCTTTAA CGCCGAGTTT
3061 AACGAGATCA GCGGGGTGCT TCTCGAGGAG AACGCTGGCG GGAACAGGA GGAGAGAGGC
3121 CAACGGCGGT GGTCTACCA GTCCAGTGAG AACAATGAGG GCGTGATCGT CAAGGTATCT
3181 AAGGAGCATG TCGAGGAAT GACCAACAT GCAAAGTCCG TTTCCAAGAA AGGCTCCGAG
3241 GAGGAAGGGG ACATTACGAA TCCGATCAAC CTTCCGGAGG GCGAGCCGGA TCTGTCAAAT
3301 AACTTTGGAA AACTCTTCGA AGTCAAGCCC GACAAAAGA ATCCGAGTT GCAAGATCTG
3361 GACATGATGC TCAGTGTGT CGAGATTAAAG GAAGGAGCAC TGATGTTGCC TCACTTTAAC
3421 TCCAAAGCCA TGGTGATAGT CGTAGTAAAC AAAGGAACCG GCAATCTGGA GTTGGTGGCT
3481 GTCCGAAAGG AACAACAGCA AAGAGGGCGG AGGGAAGAAG AGGAAGATGA GGACGAGGAG

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FIGURE 6 (CONTINUED)

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3541 GAGGAGGGAT CAAACCGGGA GGTACGCCGA TACACAGCGA GGCTGAAAGA GGGAGACGTG

3601 TTTATCATGC CGGCAGCACA TCCTGTGCGT ATCAACGCCT CTAGCGAGCT CCATTTGCTG
3661 GGGTTCGGGA TCAATGCGGA GAACAATCAT CGCATTTTCC TGGCAGGCGA CAAGGACAAC
3721 GTTATTGACC AAATTGAGAA GCAAGCCAAG GACCTGGCCT TCCCTGGATC AGGTGAACAG
3781 GTCGAGAAGC TCATCAAAAA CCAGAAGGAA TCCCACTTTG TATCTGCCAG ACCACAGTCA
3841 CAGTCCCAGA GCCCTCTAG TCCCGAGAAG GAGAGCCCCG AAAAGGAAGA TCAAGAGGAG
3901 GAGAACCAGG GTGGAAGGG CCCACTGCTT TCCATTCTCA AAGCCTTCAA TGCTAAGCTG
3961 ACAATATTGG TGGCACTGGC ACTGTTCCCTT CTTGCTGCAC ACGCGTCAGC CCGGCAGCAG
4021 TGGGAATTGC AGGGCGATCG AAGGTGTGAG TCACAGCTGG AGAGGGCGAA CCTCCGGCCT
4081 TGTGAACAGC ACCTGATGCA GAAGATTGAG CGGGACGAGG ATTCTTACGG GCGAGATCCT
4141 TACAGTCCCT CCCAAGATCC ATATAGCCCG TCTCAAGACC CAGATCGCAG GGACCCATAT
4201 AGCCCCAGCC CCTATGATCG AAGAGGTGCC GGAAGCAGCC AGCATCAGGA AAGGTGCTGC
4261 AATGAGCTGA ACGAGTTCGA GAACAACCAG AGATGTATGT GCGAGGCTCT GCAGCAGATT
4321 ATGGAAAATC AATCTGACCG GCTGCAGGGA CGGCAGCAGG AGCAGCAGTT CAAAAGGGAG
4381 CTCCGCAACC TTCCACAGCA GTGCGGTTTG CGCGCACCTC AGCGCTGCGA CTTGGAGGTG
4441 GAAAGCGGAG GTAGAGACAG ATACGCGAAG CTGCTGGAAC TCAGCTTCTG TTTCTGTTTC
4501 CTGGTACTCG GCGCTTCATC AATATCTTTT AGGCAGCAGC CAGAGGAAAA TGCCTGCCAG
4561 TTCCAACGGC TGAACGCTCA GCGACCAGAC AATAGGATCG AATCAGAAGG TGGATACATC
4621 GAGACTTGGA ACCCGAATAA CCAGGAGTTC GAATGTGCAG GCGTGGCACT GTCTCGCCTT
4681 GTTCTCCGAC GCAATGCGCT CAGGCGCCCA TTCTATTCCA ATGCACCCCA AGAAATCTTT
4741 ATCCAACAGG GCAGAGGGTA CTTGCGGCTG ATCTTTCCCG GCTGTCCCCG GCACTATGAG
4801 GAACCCACA CACAGGGCAG AAGGAGCCAG AGCCAGCGGC CTCCCCGGAG ATTGCAAGGG
4861 GAGGATCAGA GCCAGCAGCA GAGAGATTCT CATCAGAAAG TACATAGGTT CGATGAGGGT
4921 GACCTGATAG CTGTGCCAAC CGGTGTTGCC TTTTGGTTGT ATAATGACCA CGACACAGAC
4981 GTGGTGGCTG TGTCTCTGAC CGATACAAAC AACAATGACA ATCAGCTTGA TCAGTTCCCT
5041 AGGCGCTTTA ACCTGGCTGG CAACACCGAA CAGGAGTTCT TGAGATATCA GCAGCAGTCT
5101 AGGCAGTCTA GGAGGAGGTC CCTGCCATAC TCCCCTTACA GCCCTCAGAG TCAGCCTAGG
5161 CAGGAAGAGA GAGAATTGAG TCCCAGAGGC CAGCACTCTA GGCGGGAGCG GGCTGGGCAG
5221 GAGGAGGAAA ACGAAGGTGG CAATATCTTT AGCGCTTCA CTCCAGAGTT TCTGGAACAG
5281 GCATTCCAAG TAGATGACAG ACAGATCGTC CAGAACCCTA GGGGCGAGAC TGAATCAGAA
5341 GAGGAAGGGG CAATCGTGAC GGTGCGCGGA GGCTTGCGCA TCCTGTCCCC TGACCGCAAA
5401 CGCAGGGCCG ACGAGGAAGA AGAGTATGAC GAGGATGAAT ATGAATATGA TGAGGAGGAT
5461 CGAAGGCGCG GAAGGGGCG TAGGGGACGA GGGAACGCGA TAGAAGAAAC TATTTGTACC
5521 GCGTCCGCCA AGAAGAATAT TGGGCGAAAC CGCAGTCCCG ACATATACAA TCCTCAAGCC
5581 GGCAGCCTTA AAACCGCCAA CGATCTGAAC CTGCTGATCC TCCGCTGGCT GGGGCCAAGC
5641 GCCGAATATG GGAATCTGTA CCGAAATGCT CTGTTTGTGG CCCACTACAA TACAAATGCC
5701 CACTCTATTA TCTACGCCTT CAGAGGGAGG GCTCATGTGC AAGTGCTCGA CAGCAATGGG
5761 AATCGCGTGT ACGATGAGGA GCTCCAAGAA GGGCATGTCC TTGTTGTGCC TCAGAAATTC
5821 GCAGTTGCGG GCAAAACACA GAGTGAGAAC TTCGAGTACG TTGCCTTTAA GACCGATTCC
5881 AGACCTCCA TTGCAAACCT GGCCGGAGAG AACAGTGTTA TTGACAATCT GCCGGAGGAA
5941 GTGGTTGCTA ACAGTTATGG GCTTCAGCGC GAACAGGCTC GGCAGCTGAA GAACAACAAT
6001 CCGTTCAAGT TTTTCGTCCC TCCATCCCAG CAGTCACCCA GAGCTGTGGC CGCCAAATCC
6061 ACTATTCTTG TGGCCCTCTT GGCACCTGTG CTGGTCGCCC ATGCTTCTGC TATGCCAAGG
6121 GAGAGAGGGC GCCAAGGTGA CTCAAGCAGT TGCGAACGAC AAGTGACAG AGTGAACTC
6181 AAACCTTGCG AACAGCACAT TATGCAGAGA ATTATGGGAG AGCAAGAGCA GTATGATAGT
6241 TATGATATCA GATCAACAGC CTCTTCCGAT CAGCAACAGC GGTGTTGCGA TGAACCTAAC
6301 GAAATGAGAG ATACGCAGCG GTGCATGTGT GAGGCTCTTC AGCAAATCAT GGAACCAAC
6361 TGCGATCGGC TCCAAGATCG ACAGATGGTG CAGCAGTTTA AGCGCGAGCT GATGAATTTG
6421 CCACAACAGT GCAACTTTTC GGCTCCCCAG AGATGCGACC TCGATGTCAG CGGAGGGAGA
6481 TGCTAATTTT TATCCTGCAG Gacttcgaaaccgttatattatagcagatatagggatagga
6541 gtaggaatgccacaaatgaaaaaataacttaaaatgtaactttaatcgagtacaccacac
6601 gacaatgaacaaacctaagacagattatgctggttatgcttgctgctgtaatatgctgctt
6661 aattgtcgggaattatttttacagcgacactattaaaaagttgtagaacgtaaatagttca
6721 tacaccatcaatagataaaaacgataaaaagatgcatatattagagaagattgtcctactga
6781 ctggataagctataataataaaatgtatccatttatctactgatcgaaaaacctgggagga
6841 aggacgtaatacatgcaaagctctaaatccaaattcggatctaattaagatagagactcc
6901 aaacgagttaagttttttaagaagccttagacgaggctattgggtaggagaatccgaat
6961 attaaaccagacaaccccatataattttatagctaaaaatgcGCGGCCG

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FIGURE 7***Peanut HypoAllergen Vaccine (PHAV) antigen homologous recombination cassette***

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LOCUS  PHAV HR cassette          6785 bp    DNA        linear    SYN 10-MAR-2014
DEFINITION  PHAV homologous recombination cassette
ORGANISM  Vaccinia virus Copenhagen strain
COMMENT    Textco/File created by Gene Construction Kit (TextcoBioSoftware)
FEATURES             Location/Qualifiers
     CDS             1849..6261
                     /label="PHAV"
                     /note=" PHAV antigen protein coding sequence"
misc_feature         9..509
                     /label="A39R-F1"
                     /note=" VACV-COP A39R homologous recombination arm 1"
misc_feature         517..560
                     /label="prPs"
                     /note="Vaccinia virus early/late promoter"
     CDS             561..1280
                     /label="EGFP"
                     /note=" Enhanced Green Fluorescent Protein coding sequence"
misc_feature         1281..1287
                     /label="T5NT"
                     /note=" Poxvirus early transcriptional stop sequence"
misc_feature         1288..1331
                     /label="prPs"
                     /note=" Vaccinia virus early/late promoter"
     CDS             1332..1790
                     /label="Ecogpt"
                     /note="Ecogpt protein coding sequence: E. coli guanine
phosphoribosyltransferase"
misc_feature         1791..1797
                     /label="T5NT"
                     /note=" Poxvirus early transcriptional stop sequence"
misc_feature         1805..1848
                     /label="prPs"
                     /note=" Vaccinia virus early/late promoter"
     CDS             1849..3726
                     /label="arah1"
                     /note="Peanut allergen ara h 1 protein coding sequence"
     CDS             3727..4239
                     /label="arah2"
                     /note=" Peanut allergen ara h 2 protein coding sequence"
     CDS             4240..5826
                     /label="arah3"
                     /note="Peanut allergen ara h 3 protein coding sequence"
     CDS             5827..6261
                     /label="arah6"
                     /note=" Peanut allergen ara h 6 protein coding sequence"
misc_feature         6262..6268
                     /label="T5NT"
                     /note=" Pox virus early transcriptional stop"
misc_feature         6277..6777
                     /label="A39R-F2"
                     /note=" VACV-COP A39R homologous recombination arm 2"

ORIGIN
      1  GCGGCCGCaatgcccgtaaagataaacatcaacattgtttggtaatcattaaaccaatta
     61  gtatgaagttgaactaatttcacagtagattttattccagtgttatcctcgcatgtataa
    121  gtacctggtgaagatatctttatattctataatcaatgagacatcactatccgataacgaa
    181  tgaagtctagcactagtagtgcatttacttaatatattgtcgtcttgaagttttattataa

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FIGURE 7 (CONTINUED)

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241 gttaaaaatatcatggttatccaatttccatctaataactttgtcggattatctatagta
301 cacggaataatgatggtatcattacatgctgtatactctatggtctttgtagttgttata
361 acaaccaacgtatagaggtatatcaacgatattctaactcttgacattttttatttattt
421 aaaatgatacctttgttattttatttctattttgtctaacggtattgaaatggcataag
481 tttgaaacgagtgaagaaataattttctacGCGCGCCcaAA AAATTGAAAT TTTATTTTTT
541 TTTTTTGGAA TATAAATAAT ATGGTGAGCA AGGGCGAGGA GCTGTTACC GGGTGGTGC
601 CCATCTGGT CGAGCTGGAC GGCGACGTAA ACGGCCACAA GTTCAGCGTG TCCGGCGAGG
661 GCGAGGGCGA TGCCACCTAC GGCAAGCTGA CCTGAAGTT CATCTGCACC ACCGGCAAGC
721 TGCCCCTGCC CTGGCCACC CTCGTGACCA CCTGACCTA CGGCGTGCA TGCTTCAGCC
781 GCTACCCCGA CCACATGAAG CAGCAGACT TCTTCAAGTC CGCCATGCC GAAGGCTACG
841 TCCAGGAGCG CACCATCTTC TTCAAGGACG ACGGCAACTA CAAGACCCGC GCCGAGGTGA
901 AGTTCGAGGG CGACACCCTG GTGAACCGCA TCGAGCTGAA GGCATCGAC TTCAAGGAGG
961 ACGGCAACAT CCTGGGGCAC AAGCTGGAGT ACAACTACAA CAGCCACAAC GTCTATATCA
1021 TGGCCGACAA GCAGAAGAAC GGCATCAAGG TGAACCTCAA GATCCGCCAC AACATCGAGG
1081 ACGGCAGCGT GCAGCTCGCC GACCACTACC AGCAGAACAC CCCCATCGGC GACGGCCCCG
1141 TGCTGCTGCC CGACAACCAC TACCTGAGCA CCCAGTCCGC CCTGAGCAA GACCCCAACG
1201 AGAAGCGCGA TCACATGGTC CTGCTGGAGT TCGTGACCGC CGCCGGGATC ACTCTCGGCA
1261 TGGACGAGCT GTACAAGTAA tttttatcaA AAAATTGAAA TTTTATTTTT TTTTTTGGAA
1321 ATATAAATAA tATGAGCGAA AAATACATCG TCACCTGGGA CATGTTGCAG ATCCATGCAC
1381 GTAAACTCGC AAGCCGACTG ATGCCTTCTG AACAATGGAA AGGCATTATT GCCGTAAGCC
1441 GTGGCGGTCT GGTACCGGGT GCGTTACTGG CGCGTGAAC TGGTATTCT CATGTGATA
1501 CCGTTTGTAT TTCCAGCTAC GATCACGACA ACCAGCGCGA GCTTAAAGTG CTGAAACGCG
1561 CAGAAGCGGA TGGCGAAGGC TTCATCGTTA TTGATGACCT GGTGGATACC GGTGGTACTG
1621 CGGTTGCGAT TCGTGAAATG TATCCAAAAG CGCACTTTGT CACCATCTTC GCAAAACCGG
1681 CTGGTCGTCC GCTGGTTGAT GACTATGTTG TTGATATCCC GCAAGATACC TGGATTGAAC
1741 AGCCGTGGGA TATGGGCGTC GTATTCTGTC CGCCAATCTC CGGTCGCTAA tttttatATT
1801 TTAACAaaaa ATTGAAATTT TATTTTTTTT TTTTGAATA TAAATAAtatgCGAGGCAGA
1861 GTCAGCCCTC TGATGCTGCT GTTGGGGATC TTGGTCTTG CATCCGTTTC AGCCACACAT
1921 GCCAAGTCCA GCCCATACCA GAAAAAGACC GAGAACCCAT GTGCTCAGCG GTGCCTCCAG
1981 TCATGTCAGC AGGAACCCGA TGACCTCAAG CAAAAGGCGT GTGAAAGCAG ATGTACGAAA
2041 CTGGAATACG ACCCCAGATG CGTGTAAGAT CCACGAGGCC ATACTGGCAC CACCAATCAA
2101 AGATCACAC CTGGCGAGCG AACAGGGGA CGACAGCCAG GGGATTACGA TGACGATAGA
2161 CGACAGCCTC GCCGGGAAGA GGGTGGGCGC TGGGGTCCAG CCGGTCCCAG AGAGCGAGAA
2221 CGGGAAGAGG ACTGGCGCCA ACCCGGGGAG GACTGGCGCA GACCTTCACA CCAGCAGCCC
2281 CGGAAATAC GCCCGGAGGG CAGAGAGGGT GAACAGGAAT GGGGAACCCC TGGCAGTCAC
2341 GTCAGGGAAG AAACCAGCCG GAACAACCCC TTCTATTTCC CCTCCCGGAG GTTTAGCACT
2401 CGGTACGGGA ACCAAAACGG ACGCATTGCG GTACTTCAGA GATTGATCA ACGCTCACGG
2461 CAGTTCCAGA ACCTTCAAAA CCATCGGATT GTTCAGATCG AGGCCAAACC AAACACTTTG
2521 GTTCTGCCAA AACATGCTGA TGCAGACAAC ATACTGGTGA TACAGCAGGG TCAAGCCACA
2581 GTGACAGTAG CCAATGGGAA CAATCGCAA TCATTCAATC TCGATGAGGG ACACGCACTG
2641 AGGATCCCTT CTGGCTTTAT CTCCTATATA CTGAATCGGC ACGACAATCA AAATCTCAGG
2701 GTTGCTAAGA TCTCTATGCC AGTCAACACT CCGGGTCAGT TCGAGGATTT CTTTCCCGCG
2761 TCCTCACGGG ACCAGTCTAG TTATCTTCAA GGATTCAGCA GAAACACCTT GGAAGCGGCC
2821 TTTAACGCCG AGTTTAACGA GATCAGCGCG GTGCTTCTCG AGGAGAACGC TGGCGGGGAA
2881 CAGGAGGAGA GAGGCAACG GCGGTGGTCT ACCAGGTCCA GTGAGAACAA TGAGGCGGTG
2941 ATCGTCAAGG TATCTAAGGA GCATGTCGAG GAACTGACCA AACATGCAAA GTCCGTTTCC
3001 AAGAAAGGCT CCGAGGAGGA AGGGGACATT ACGAATCCGA TCAACCTTCG GGAGGGCGAG
3061 CCGGATCTGT CAAATAACTT TGGAAAACTC TTCGAAGTCA AGCCCGACAA AAAGAATCCG
3121 CAGTTGCAAG ATCTGGACAT GATGCTCAGG TGTGTCGAGA TTAAGGAAGG AGCACTGATG
3181 TTGCCTCACT TTAACCTCAA AGCCATGGTG ATAGTCGTAG TAAACAAAGG AACCGGCAAT
3241 CTGGAGTTGG TGGCTGTCCG AAAGGAACAA CAGCAAAGAG GCGGAGGGA AGAAGAGGAA
3301 GATGAGGACG AGGAGGAGGA GGGATCAAAC CGGGAGGTAC GCCGATACAC AGCGAGGCTG
3361 AAAGAGGGAG ACGTGTTTAT CATGCCGGCA GCACATCTG TCGTATCAA CGCCTCTAGC
3421 GAGCTCCATT TGCTGGGGTT CGGGATCAAT CCGGAGAACA ATCATCGCAT TTCTCTGCA
3481 GCGGACAAGG ACAACGTTAT TGACCAAATT GAGAAGCAAG CCAAGGACCT GGCCTTCCCT
3541 GGATCAGGTG AACAGGTCGA GAAGCTCATC AAAAACCAGA AGGAATCCCA CTTTGTATCT
3601 GCCAGACCAC AGTCACAGTC CCAGAGCCCC TCTAGTCCCG AGAAGGAGAG CCCCGAAAAG
3661 GAAGATCAAG AGGAGGAGAA CCAGGGTGGA AAGGGCCCAC TGCTTTCCAT TCTCAAAGCC
3721 TTCAATGCTA AGCTGACAAAT ATTGGTGGCA CTGGCACTGT TCCTTCTTGC TGCACACGCG
3781 TCAGCCCGGC AGCAGTGGGA ATTGCAGGGC GATCGAAGGT GTCAGTCACA GCTGGAGAGG

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FIGURE 7 (CONTINUED)

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3841 GCGAACCTCC GGCCTTGTGA ACAGCACCTG ATGCAGAAGA TTCAGCGGGA CGAGGATTCT
3901 TACGGGCGAG ATCCTTACAG TCCCTCCCAA GATCCATATA GCCCGTCTCA AGACCCAGAT
3961 CGCAGGGACC CATATAGCCC CAGCCCCTAT GATCGAAGAG GTGCCGGAAG CAGCCAGCAT
4021 CAGGAAAGGT GCTGCAATGA GCTGAACGAG TTCGAGAACA ACCAGAGATG TATGTGCGAG
4081 GCTCTGCAGC AGATTATGGA AAATCAATCT GACCGGCTGC AGGGACGGCA GCAGGAGCAG
4141 CAGTTCAAAA GGGAGCTCCG CAACCTTCCA CAGCAGTGCG GTTTCGCGC ACCTCAGCGC
4201 TGCGACTTGG AGGTGGAAAG CGGAGGTAGA GACAGATACG CGAAGCTGCT GGAACCTCAGC
4261 TTCTGTTTCT GTTTCCTGGT ACTCGGCGCT TCATCAATAT CTTTTAGGCA GCAGCCAGAG
4321 GAAAATGCCT GCCAGTTCCA ACGGCTGAAC GCTCAGCGAC CAGACAATAG GATCGAATCA
4381 GAAGGTGGAT ACATCGAGAC TTGGAACCCG AATAACCAGG AGTTCGAATG TGCAGGCGTG
4441 GCACTGTCTC GCCTTGTTCT CCGACGCAAT GCGCTCAGGC GCCCATCTTA TTCCAATGCA
4501 CCCCAGAAA TCTTTATCCA ACAGGGCAGA GGGTACTTCG GGCTGATCTT TCCCGGCTGT
4561 CCCCGGCACT ATGAGGAACC CCACACACAG GGCAGAAGGA GCCAGAGCCA GCGGCCTCCC
4621 CGGAGATTGC AAGGGGAGGA TCAGAGCCAG CAGCAGAGAG ATTCTCATCA GAAAGTACAT
4681 AGGTTTCGATG AGGTGACCTT GATAGCTGTG CCAACCGGTG TTGCCTTTTG GTTGTATAAT
4741 GACCACGACA CAGACGTGGT GGCTGTGTCT CTGACCGATA CAAACAACAA TGACAATCAG
4801 CTTGATCAGT TCCCTAGGCG CTTTAACCTG GCTGGCAACA CCGAACAGGA GTTCTTGAGA
4861 TATCAGCAGC AGTCTAGGCA GTCTAGGAGG AGGTCCCTGC CATACTCCCC TTACAGCCCT
4921 CAGAGTCAGC CTAGGCAGGA AGAGAGAGAA TTCAGTCCCA GAGGCCAGCA CTCTAGGCGG
4981 GAGCGGGCTG GGCAGGAGGA GGAAAACGAA GGTGGCAATA TCTTTAGCGG CTTCACTCCA
5041 GAGTTTCTGG AACAGGCATT CCAAGTAGAT GACAGACAGA TCGTCCAGAA CCTTAGGGGC
5101 GAGACTGAAT CAGAAGAGGA AGGGGCAATC GTGACGGTGC GCGGAGGCTT GCGCATCCTG
5161 TCCCCTGACC GCAAACGAGG GGCCGACGAG GAAGAAGAGT ATGACGAGGA TGAATATGAA
5221 TATGATGAGG AGGATCGAAG GCGCGGAAGG GGCAGTAGGG GACGAGGGAA CGGCATAGAA
5281 GAAACTATTT GTACCGCGTC CGCCAAGAAG AATATTGGGC GAAACCGCAG TCCCACATA
5341 TACAATCTC AAGCCGGCAG CCTTAAAACC GCCAACGATC TGAACCTGCT GATCCTCCGC
5401 TGGCTGGGGC CAAGCGCCGA ATATGGGAAT CTGTACCGAA ATGCTCTGTT TGTGGCCAC
5461 TACAATACAA ATGCCCACTC TATTATCTAC CGCCTCAGAG GGAGGGCTCA TGTGCAAGTG
5521 GTCGACAGCA ATGGGAATCG CGTGTACGAT GAGGAGCTCC AAGAAGGGCA TGTCTTGTT
5581 GTGCCTCAGA ATTTGCGAGT TGCGGGCAAA TCACAGAGTG AGAACTTCGA GTACGTTGCC
5641 TTTAAGACCG ATTCCAGACC CTCCATTGCA AACCTGGCCG GAGAGAACAG TGTATTGAC
5701 AATCTGCCGG AGGAAGTGGT TGCTAACAGT TATGGGCTTC AGCGCAACA GGCTCGGCAG
5761 CTGAAGAACA ACAATCCGTT CAAGTTTTTC GTCCCTCCAT CCCAGCAGTC ACCCAGAGCT
5821 GTGGCCGCCA AATCCACTAT TCTTGTGGCC CTCTTGGCAC TCGTGCTGGT CGCCCATGCT
5881 TCTGCTATGC GAAGGGAGAG AGGGCGCCAA GGTGACTCAA GCAGTTGCGA ACGACAAGTG
5941 GACAGAGTGA ACCTCAAACC TTGCGAACAG CACATTATGC AGAGAATTAT GGGAGAGCAA
6001 GAGCAGTATG ATAGTTATGA TATCAGATCA ACACGCTCTT CCGATCAGCA ACAGCGGTGT
6061 TGCGATGAAC TCAACGAAAT GGAGAATACG CAGCGGTGCA TGTGTGAGGC TCTTCAGCAA
6121 ATCATGGAAA ACCAATGCGA TCGGCTCCAA GATCGACAGA TGGTGCAGCA GTTTAAGCGC
6181 GAGCTGATGA ATTTGCCACA ACAGTGCAAC TTTCGGGCTC CCCAGAGATG CGACCTCGAT
6241 GTCAGCGGAG GGAGATGCTA ATTTTATCC TGCAGGacttcgaaaccggtatttatagca
6301 gatatagggataggagtaggaatgccacaaatgaaaaaaataacttaaaatgtaatcttaa
6361 tcgagtacaccacacgacaatgaacaaacctaagacagattatgctggttatgcttgctg
6421 cgtaatatgcggtctaattgtcggaattatttttacagcgacactattaaaagtgttaga
6481 acgtaaaattagttcatacaccatcaatagataaaacgataaaagatgcatatattagaga
6541 aattgtctactgactggataagctataataataaatgtatccatttatctactgctcg
6601 aaaaacctgggaggaaggacgtaatacatgcaaagctctaaatccaaattcggatcta
6661 taagatagagactccaaacgagtttaagtttttaagaagccttagacgaggctattgggt
6721 aggagaatccgaaatattaaccagacaaccccatataattttatagctaaaaatgcGCG
6781 GCCGC

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FIGURE 8

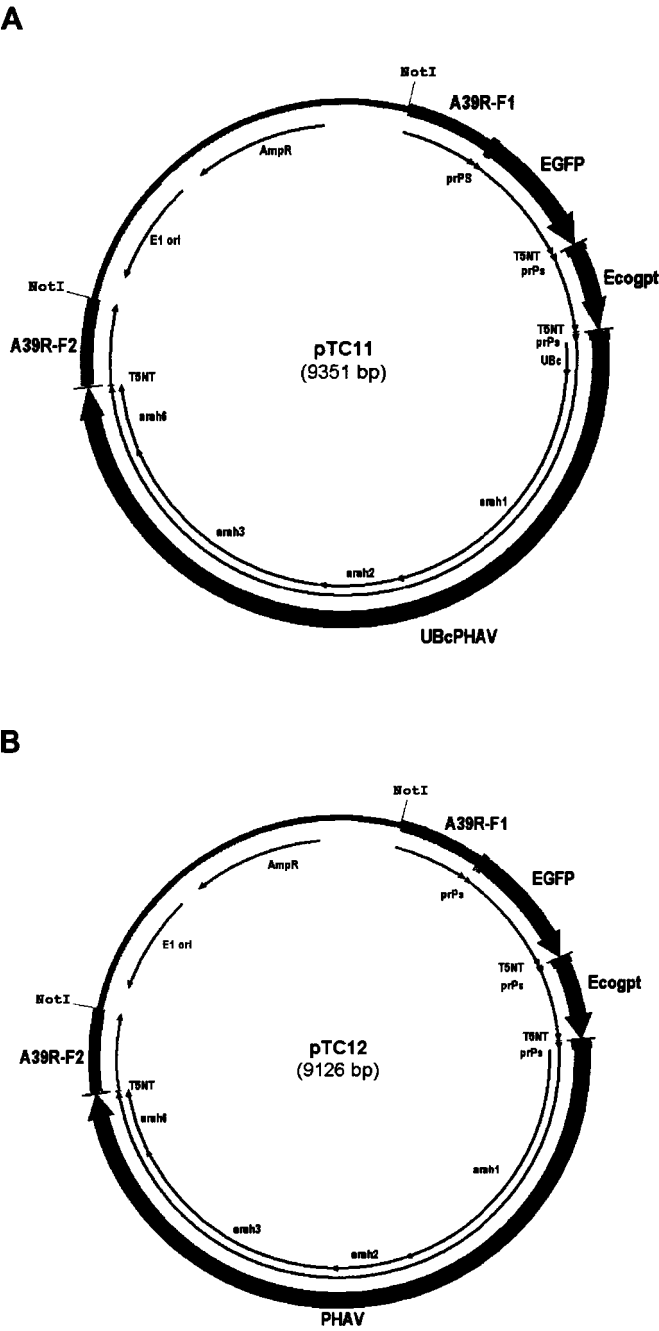
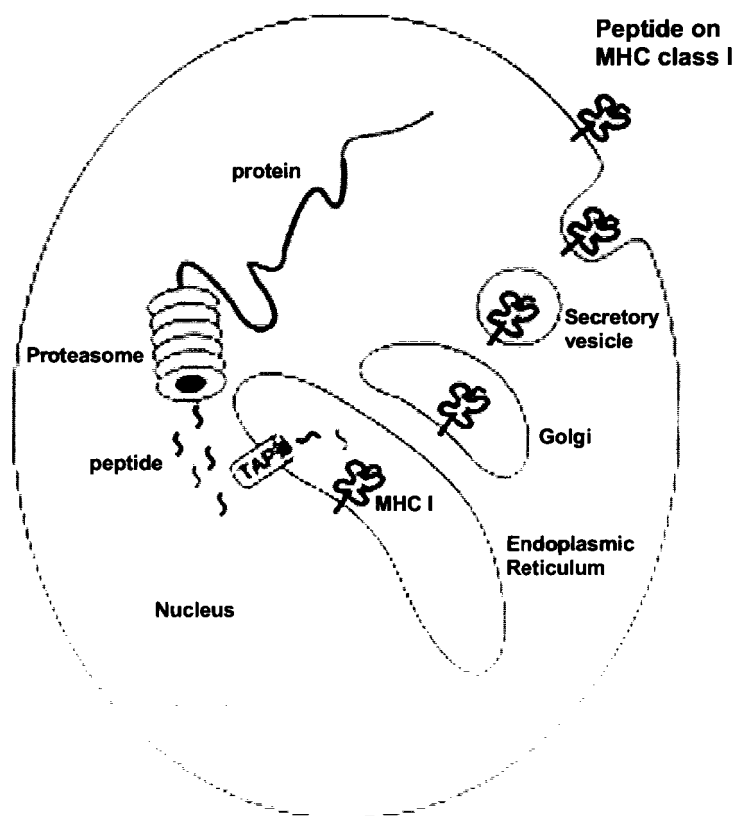


FIGURE 9

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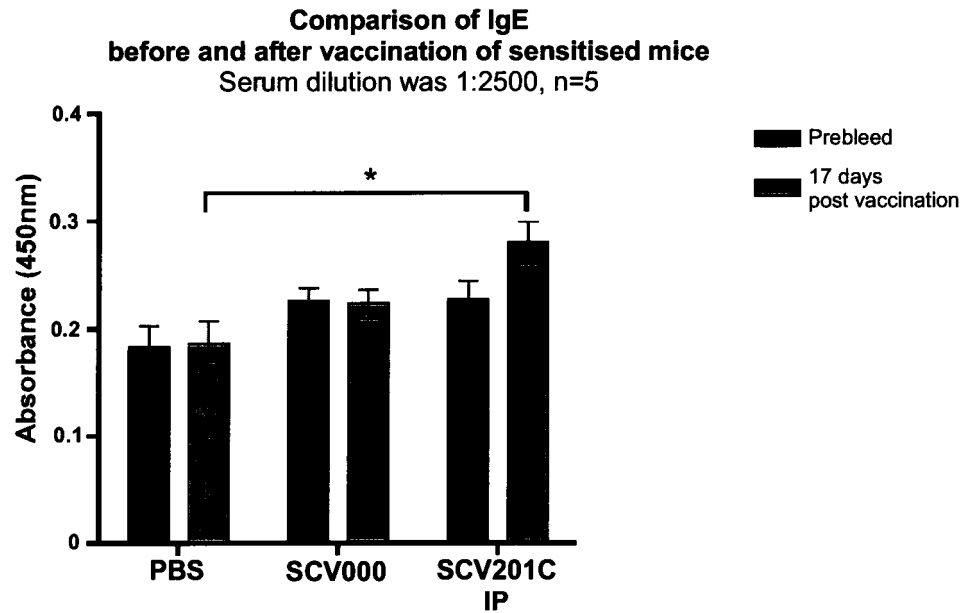
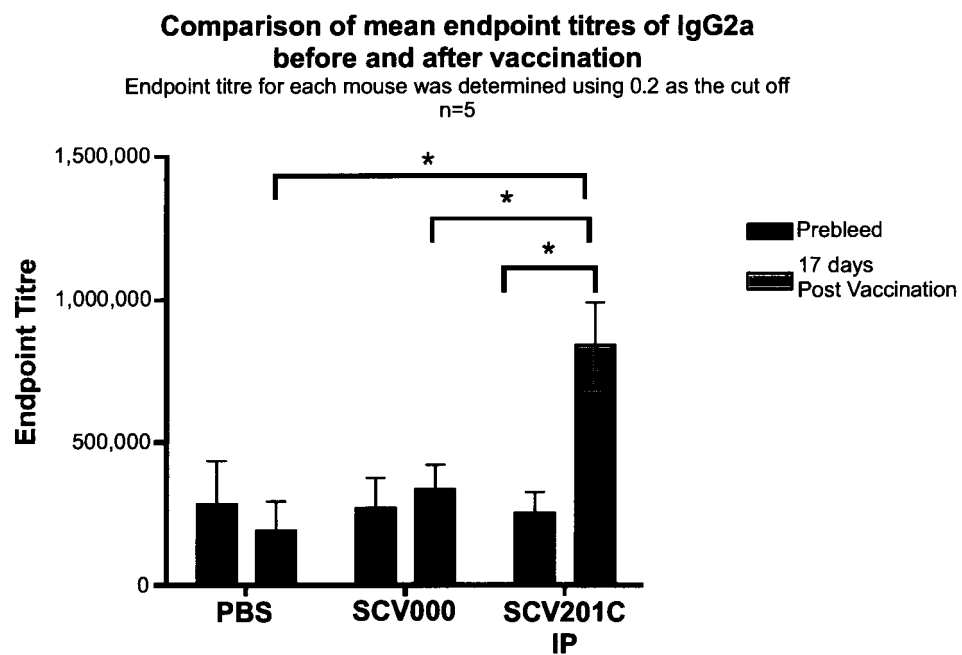
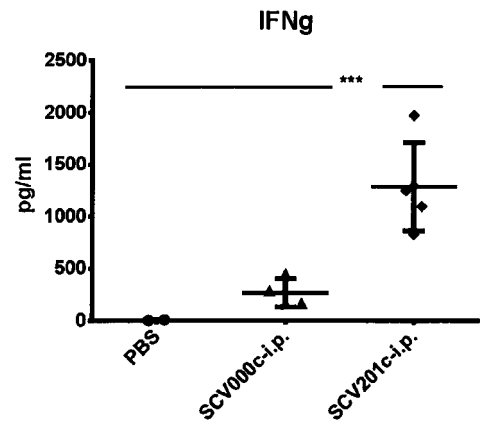
FIGURE 10**A****B**

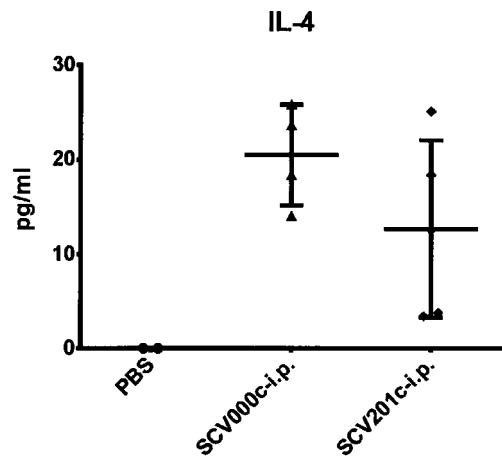
FIGURE 11

A



Group B is significantly greater than group A ($p < 0.005$)

B



C

