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(71) Applicants: **APOVIA, INC.** [US/US]; 11125 Flintkote, Suite A, San Diego, CA 92121 (US). **VLAAMS INTERUNIVERSITAIR INSTITUUT VOOR BIOTECHNOLOGIE** [BE/BE]; Rijvisschestraat 118, Bus 1, B-9052 Zwijnaarde (BE).

(72) Inventors: **BIRKETT, Ashley**; 2409 Okd Ranch Road, Escondido, CA 92027 (US). **FIERS, Walter**; Beukendreef 3, B-9070 Destelbergen (BE).

(74) Agents: **GAMSON, Edward, P.** et al.; Welsh & Katz, Ltd., 120 South Riverside Plaza, 22nd Floor, Chicago, IL 60606 (US).

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(54) Title: INFLUENZA IMMUNOGEN AND VACCINE

(57) Abstract: A chimeric, carboxy-terminal truncated hepatitis B virus nucleocapsid (HBc) protein is disclosed that contains an immunogen for inducing the production of antibodies to the influenza M2 protein. An immunogenic influenza sequence in two to four copies is preferably expressed at or near the N-terminus or in the HBc immunogenic loop sequence. The HBc chimer preferably contains an influenzaspecific T cell epitope and is preferably engineered for both enhanced stability of self-assembled particles and enhanced yield of those chimeric particles. Methods of making and using the chimers are also disclosed.

A

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Ground Squirrel   mylfhlclvf acvpcptvqa sklclgwlwd

                  1
HBc AYW           mdidpykcfg atvellsflp sdffpsvrdl ldtasalyre
HBc ADW           mdidpykcfg atvellsflp sdffpsvrdl ldtasalyre
HBc ADW2          mdidpykefg atvellsflp sdffpsvrdl ldtasalyre
HBc ADYW          mdidpykefg atvellsflp sdffpsvrdl ldtaaalyrd
Woodchuck         mdidpykefg ssyqllnflp ldffpdlnal vdtatalyee
Ground Squirrel   mdidpykefg esyqllnflp ldffpdlnal vdtaaalyee

                  41
HBc AYW           alespehcsp hhtalrqail cwgelmtlat wvgvnledpa
HBc ADW           alespehcsp hhtalrqail cwgelmtlat wvgnnlqdpa
HBc ADW2          alespehcsp hhtalrqail cwgelmtlat wvgnnledpa
HBc ADYW          alespehcsp hhtalrqail cwgdlmtlat wvgtnledpa
Woodchuck         eltgrehcsp hhtairqalv cwdeltklia wmesnitseq
Ground Squirrel   eltgrehcsp hhtairqalv cweeltrlit wmsentteev

                                  B
                  81
HBc AYW           srdlvvsyvn tnmglkfrql lwfhiscltf gretvieylv
HBc ADW           srdlvvnyvn tnmglkirql lwfhiscltf gretvleylv
HBc ADW2          srdlvvnyvn tnvglkirql lwfhiscltf gretvleylv
HBc ADYW          srdlvvsyvn tnvglkfrql lwfhiscltf gretvleylv
Woodchuck         vrtiivnhvn dtwglkvrqs lwfhlsclff gqhtvqeflv
Ground Squirrel   rriivdhvnn twglkvrqtl wfhlscltfg qhtvqeflvs

                  121
HBc AYW           sfgvwirtpp ayrppnapil stlpettvvr rrgrsprrrt
HBc ADW           sfgvwirtpp ayrppnapil stlpettvvr rrdrgrsprr
HBc ADW2          sfgvwirtpp ayrppnapil stlpettvvr rrdrgrsprr
HBc ADYW          sfgvwirtpp ayrppnapil stlpettvvr rrgrsprrrt
Woodchuck         sfgvwirtpa pyrppnapil stlpehtvir rrggarasrs
Ground Squirrel   fgvwirtpap yrppnapils tlpehtvirr rggsraarsp

                  161
HBc AYW           psprrrrsqs prrrrsqsre sqc
HBc ADW           rtpsprrrrs qsprrrrsqs rcsqc
HBc ADW2          rtpsprrrps qsprrrrsqs rcsqc
HBc ADYW          psprrrrsqs prrrrsqsre sqc
Woodchuck         prrrtpsprr rrsqsprrrr sqc
Ground Squirrel   rrrtpsprrr rsqsprrrrs qspasnc
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