

-continued

<400> SEQUENCE: 34

Tyr Gly Ala Pro Gly Ser Pro Thr Asn Leu Glu Phe Ile Asn Thr Gly
 1 5 10 15

Ser Ser Lys

<210> SEQ ID NO 35

<211> LENGTH: 19

<212> TYPE: PRT

<213> ORGANISM: Variola virus

<400> SEQUENCE: 35

Tyr Gly Ala Pro Gly Ser Pro Thr Asn Leu Glu Phe Ile Asn Thr Gly
 1 5 10 15

Ser Ser Lys

1. A vaccine against poxviruses comprising at least two purified recombinant monkeypox virus proteins or peptides selected from the group consisting of

- (i) a protein or peptide encoded by the open reading frame of the monkeypox ortholog M1R gene,
- (ii) a protein or peptide encoded by the open reading frame of an ortholog of the monkeypox ortholog M1R gene, which protein or peptide has 90% amino acid sequence identity to a protein or peptide encoded by the open reading frame of an ortholog of the monkeypox ortholog M1R gene;
- (iii) a protein or peptide encoded by the open reading frame of the monkeypox ortholog A29L gene,
- (iv) a protein or peptide encoded by the open reading frame of an ortholog of the monkeypox ortholog A29L gene, which protein or peptide has 90% amino acid sequence identity to a protein or peptide encoded by the open reading frame of an ortholog of the monkeypox ortholog A29L gene;
- (v) a protein or peptide encoded by the open reading frame of the monkeypox ortholog A35R gene,
- (vi) a protein or peptide encoded by the open reading frame of an ortholog of the monkeypox ortholog A35R gene, which protein or peptide has 90% amino acid sequence identity to a protein or peptide encoded by the open reading frame of an ortholog of the monkeypox ortholog A35R gene;
- (vii) a protein or peptide encoded by the open reading frame of the monkeypox ortholog B6R gene, and
- (viii) a protein or peptide encoded by the open reading frame of an ortholog of the monkeypox ortholog B6R gene, which protein or peptide has 90% amino acid sequence identity to a protein or peptide encoded by the open reading frame of an ortholog of the monkeypox ortholog B6R gene;

wherein at least one protein or peptide is (i), (ii), (iii) or (iv) and at least one protein or peptide is (v), (vi), (vii) or (viii), and an adjuvant.

2. The vaccine of claim 1 wherein said poxvirus protected against is an orthopoxvirus selected from the group consisting of: camelpox virus, ectromelia virus, raccoon poxvirus, skunk poxvirus, Tatera poxvirus, Uasin Gishu virus, Volepox

virus, variola virus, vaccinia virus, monkeypox virus, gerbilpox and cowpox virus, or genetically engineered versions thereof.

3. The vaccine of claim 1 wherein the proteins or peptides of the orthologs of (ii), (iv), (vi) and (viii) are derived from an orthopoxvirus selected from the group consisting of: camelpox virus, ectromelia virus, raccoon poxvirus, skunk poxvirus, Tatera poxvirus, Uasin Gishu virus, Volepox virus, variola virus, vaccinia virus, monkeypox virus, gerbilpox and cowpox virus, or genetically engineered versions thereof.

4. The vaccine of claim 1, wherein the adjuvant is selected from the group consisting of CpG, alum, immune modulatory molecules, Toll-like receptor stimulators and co-stimulatory markers.

5. The vaccine of claim 1, wherein the vaccine comprises a protein or peptide encoded by the open reading frame of the monkeypox ortholog M1R gene, a protein or peptide encoded by the open reading frame of the monkeypox ortholog A35R gene, a protein or peptide encoded by the open reading frame of the monkeypox ortholog A29L gene, a protein or peptide encoded by the open reading frame of the monkeypox ortholog B6R gene, and an adjuvant.

6. The vaccine of claim 1, wherein the recombinant monkeypox virus proteins or peptides contain B cell epitopes.

7. The vaccine of claim 6 wherein the B cell epitope is selected from the group consisting of amino acids 49-64 or 237-263 within the protein or peptide encoded by the open reading frame of the monkeypox ortholog B6R gene, amino acids 97-127 within the a protein or peptide encoded by the open reading frame of the monkeypox ortholog A35R gene, and amino acids 69-91 or 137-155 within the protein or peptide encoded by the open reading frame of the monkeypox ortholog M1R gene.

8. The vaccine of claim 1, wherein the purified recombinant monkeypox virus proteins or peptides are expressed from prokaryotic host cells or synthesized in vitro.

9. The vaccine of claim 8, wherein the prokaryotic host cells are *E. coli* cells.

10. A method for inducing in a subject an immune response against poxvirus infection comprising administering to said subject an immunologically effective amount of the vaccine of claim 1, in a pharmaceutically acceptable carrier.