CLAIMS

1. A vaccine combination comprising:

a) a first vaccine comprising an immunologically effective amount of either

(i) a recombinant adenovirus vector comprising a first nucleic acid encoding a first polypeptide comprising the amino acid sequence of SEQ ID NO: 1 and a second nucleic acid encoding a second polypeptide comprising the amino acid sequence of SEQ ID NO: 20, or

(ii) a first recombinant adenovirus vector comprising a first nucleic acid encoding a first polypeptide comprising the amino acid sequence of SEQ ID NO: 1 and a second recombinant adenovirus vector comprising a second nucleic acid encoding a second polypeptide comprising the amino acid sequence of SEQ ID NO: 20, together with a pharmaceutically acceptable carrier; and

b) a second vaccine comprising an immunologically effective amount of a recombinant Modified Vaccinia Ankara (MVA) vector comprising a third nucleic acid encoding a third polypeptide comprising the amino acid sequence of SEQ ID NO: 1 and a fourth nucleic acid encoding a fourth polypeptide comprising SEQ ID NO: 20, together with a pharmaceutically acceptable carrier;

wherein the MVA vector comprises MVA-BN or derivatives thereof.

2. The vaccine combination according to claim 1, wherein the first vaccine and the second vaccine each further comprise a nucleic acid encoding a fifth polypeptide comprising the amino acid sequence of SEQ ID NO: 28 and a nucleic acid encoding a sixth polypeptide comprising the amino acid sequence of SEQ ID NO: 31.

3. The vaccine combination according to claim 1, wherein the first polypeptide and the third polypeptide each further comprise the amino acid sequence of SEQ ID NO:28 and wherein the second polypeptide and the fourth polypeptide each further comprise the amino acid sequence of SEQ ID NO: 31.

4. A vaccine combination according to claim 1, wherein the first nucleic acid and the third nucleic acid each encode a polypeptide comprising the amino acid sequence of SEQ ID NO: 3,

and wherein the second nucleic acid and the fourth nucleic acid each encode a polypeptide comprising the amino acid sequence of SEQ ID NO: 22.

5. The vaccine combination according to claim 1, wherein the first nucleic acid and the third nucleic acid each have at least 90% sequence identity to the polynucleotide sequence of SEQ ID NO: 2, and the second nucleic acid and the fourth nucleic acid each have at least 90% sequence identity to the polynucleotide sequence of SEQ ID NO: 21.

6. The vaccine combination according to claim 4, wherein the first nucleic acid and the third nucleic acid each have at least 90% sequence identity to the polynucleotide sequence of SEQ ID NO: 4 or SEQ ID NO: 24 and the second nucleic acid and the fourth nucleic acid each have at least 90% sequence identity to the polynucleotide sequence of SEQ ID NO: 23 or SEQ ID NO: 25.

7. The vaccine combination according to claim 1, wherein the recombinant adenovirus vector is rAd26.

8. The vaccine combination according to claim 1, wherein the first vaccine comprises a first recombinant adenovirus vector comprising the first nucleic acid and a second recombinant adenovirus comprising the second nucleic acid.

9. A recombinant Modified Vaccinia Ankara (MVA) vector comprising: (a) a first nucleic acid encoding at least one of a polypeptide comprising the amino acid sequence of SEQ ID NO: 1 and a polypeptide comprising the amino acid sequence of SEQ ID NO: 3, and (b) a second nucleic acid encoding at least one of a polypeptide comprising the amino acid sequence of SEQ ID NO: 20 and a polypeptide comprising the amino acid sequence of SEQ ID NO: 22;
wherein the MVA vector is MVA-BN or derivatives thereof.

10. The recombinant Modified Vaccinia Ankara (MVA) vector according to claim 9, wherein the first nucleic acid encodes the polypeptide comprising the amino acid sequence of SEQ ID NO: 1, and the second nucleic acid encodes the polypeptide comprising the amino acid sequence of SEQ ID NO: 20.

11. The recombinant MVA vector according to claim 9, wherein the first nucleic acid encodes the polypeptide comprising the amino acid sequence of SEQ ID NO: 3, and the second nucleic acid encodes the polypeptide comprising the amino acid sequence of SEQ ID NO: 22.

12. The recombinant MVA vector according to claim 10, wherein the first nucleic acid has at least 90% sequence identity to the polynucleotide sequence of SEQ ID NO: 2, and the second nucleic acid has at least 90% sequence identity to the polynucleotide sequence of SEQ ID NO: 21.

13. The recombinant MVA vector according to claim 11, wherein the first nucleic acid has at least 90% sequence identity to the polynucleotide sequence of SEQ ID NO: 4 or SEQ ID NO: 24, and the second nucleic acid has at least 90% sequence identity to the polynucleotide sequence of SEQ ID NO: 23 or SEQ ID NO: 25.

14. A recombinant MVA vector comprising at least one nucleic acid encoding at least one polypeptide selected from the group consisting of polypeptides comprising the amino acid sequences of SEQ ID NO: 1, SEQ ID NO: 3, SEQ ID NO: 20, and SEQ ID NO:22, wherein the at least one nucleic acid is operably linked to a promoter comprising at least one of the polynucleotide sequences of SEQ ID NO: 26 and SEQ ID NO: 27.

15. A vaccine comprising a recombinant MVA vector according to claim 9 and a pharmaceutically acceptable carrier.

16. Use of a vector, vaccine, or vaccine combination according to claim 1 for the preparation of a medicament for treating a persistent Human Papilloma Virus (HPV) infection, vulvar intraepithelial neoplasia (VIN), cervical intraepithelial neoplasia (CIN), vaginal intraepithelial neoplasia (VaIN), anal intraepithelial neoplasia (AIN), cervical cancer (such as cervical squamous cell carcinoma (SCC)), oropharyngeal cancer, penile cancer, vaginal cancer or anal cancer in a subject in need thereof.

17. Use of a first and second vaccine for the preparation of a medicament for inducing an immune response against Human Papilloma Virus (HPV) in a subject in need thereof, wherein:

(a) the first vaccine comprises an immunologically effective amount of either

(i) a recombinant adenovirus vector comprising a first nucleic acid encoding a first polypeptide comprising the amino acid sequence of SEQ ID NO:1 and a second nucleic acid encoding a second polypeptide comprising SEQ ID NO: 20, or

(ii) a first recombinant adenovirus vector comprising a first nucleic acid encoding a first polypeptide comprising the amino acid sequence of SEQ ID NO:1 and a second recombinant adenovirus vector comprising a second nucleic acid encoding a second polypeptide comprising the amino acid sequence of SEQ ID NO: 20, together with a pharmaceutically acceptable carrier;

and

(b) the second vaccine comprises an immunologically effective amount of a recombinant Modified Vaccinia Ankara (MVA) vector comprising a third nucleic acid encoding a third polypeptide comprising the amino acid sequence of SEQ ID NO:1 and a fourth nucleic acid encoding a fourth polypeptide comprising the amino acid sequence of SEQ ID NO: 20, together with a pharmaceutically acceptable carrier;

wherein the first vaccine is to be administered to the subject as a priming vaccine and the second vaccine is to be administered to the subject as a boosting vaccine.

18. The use according to claim 17, wherein the first polypeptide and the third polypeptide each further comprise the amino acid sequence of SEQ ID NO: 28 and wherein the second polypeptide and the fourth polypeptide each further comprise the amino acid sequence of SEQ ID NO: 31.

19. The use according to claim 17, wherein the first vaccine comprises the first recombinant adenovirus vector comprising the first nucleic acid encoding the first polypeptide comprising the amino acid sequence of SEQ ID NO: 1 and the second recombinant adenovirus vector comprising the second nucleic acid encoding the second polypeptide comprising the amino acid sequence of SEQ ID NO: 20.

20. The use according to claim 17, wherein the first vaccine comprises the first recombinant adenovirus vector comprising the first nucleic acid encoding the first polypeptide comprising the amino acid sequence of SEQ ID NO: 3 and the second recombinant adenovirus vector

comprising the second nucleic acid encoding the second polypeptide comprising the amino acid sequence of SEQ ID NO: 22.