CLAIMS

1. Use of a pharmaceutical composition comprising a nucleic acid molecule encoding a human papillomavirus (HPV) antigen comprising a HPV6 antigenic domain and a HPV11 antigenic domain, wherein the HPV6 antigenic domain is an HPV6 E6-E7 fusion antigen and wherein the HPV11 antigenic domain is an HPV11 E6-E7 fusion antigen, wherein the HPV antigen comprises:

the amino acid sequence of SEQ ID NO:1;
the amino acid sequence of SEQ ID NO: 11;
an amino acid sequence that is at least 95% identical to SEQ ID NO:1; or
an amino acid sequence that is at least 95% identical to SEQ ID NO: 11

in the manufacture of a medicament to reduce the number of surgical interventions required to treat recurrent respiratory papillomatosis (RRP).

2. The use according to claim 1, wherein the reduction in the number of RRP surgical interventions occurs in the 52 weeks following the administration of the pharmaceutical composition relative to the number of RRP surgical interventions in the 52 weeks prior to the administration of the pharmaceutical composition.

3. The use according to claim 2, wherein the reduction in RRP surgical interventions in the 52 weeks following administration relative to the number of RRP surgical interventions in the 52 weeks prior to administration of the pharmaceutical composition in at least about 80% of a population of human subjects diagnosed with RRP.

4. The use according to any preceding claim, wherein the pharmaceutical composition is formulated for administration by intramuscular injection by standard needle.

5. The use of claim 4, wherein:
the reduction in RRP surgical interventions in the 52 weeks following administration of the pharmaceutical composition relative to the number of RRP surgical interventions in the 52 weeks

prior to administration of the pharmaceutical composition is in at least about 76% of a population of human subjects diagnosed with RRP; or
the reduction is median reduction of about three RRP surgical interventions in the 52 weeks following administration of the pharmaceutical composition relative to the number of RRP surgical interventions in the 52 weeks prior to administration of the pharmaceutical composition in a population of human subjects diagnosed with RRP.

6. The use according to claim 1, wherein the pharmaceutical composition is formulated for administration by intramuscular injection by side port needle.

7. The use according to claim 6, wherein the reduction in the number of RRP surgical interventions in the 52 weeks following administration relative to the number of RRP surgical interventions in the 52 weeks prior to administration is in at least about 90% of a population of human subjects diagnosed with RRP.

8. Use of a pharmaceutical composition comprising a nucleic acid molecule encoding a human papillomavirus (HPV) antigen comprising a HPV6 antigenic domain and a HPV11 antigenic domain, wherein the HPV6 antigenic domain is an HPV6 E6-E7 fusion antigen and wherein the HPV11 antigenic domain is an HPV11 E6-E7 fusion antigen, wherein the HPV antigen comprises:

the amino acid sequence of SEQ ID NO:1;
the amino acid sequence of SEQ ID NO: 11;
an amino acid sequence that is at least 95% identical to SEQ ID NO:1; or
an amino acid sequence that is at least 95% identical to SEQ ID NO: 11

in the manufacture of a medicament to improve the recurrent respiratory papillomatosis (RRP) Staging Assessment Score relative to baseline in a patient in need thereof.

9. The use according to claim 8, wherein the pharmaceutical composition is formulated for administration by intradermal or intramuscular injection with electroporation.

10. The use according to claim 8 or claim 9, wherein the pharmaceutical composition is formulated for administration by intramuscular injection by standard needle or by side port needle.

11. The use according to any preceding claim, wherein the nucleic acid molecule encoding a HPV antigen comprises:

a nucleotide sequence at least 95% identical to SEQ ID NO:2;

a nucleotide sequence at least 95% identical to SEQ ID NO:12;

the nucleotide sequence of SEQ ID NO: 2; or

the nucleotide sequence of SEQ ID NO 12.

12. The use according to any preceding claim, wherein the nucleic acid molecule encoding a HPV antigen is an expression vector, optionally a plasmid.

13. The use according to claim 12, wherein the expression vector comprises the nucleotide sequence of SEQ ID NO: 3.

14. The use according to any preceding claim, wherein the pharmaceutical composition further comprises an adjuvant.

15. The use according to claim 14, wherein the adjuvant comprises interleukin-12 (IL12), a nucleic acid molecule encoding IL12, a nucleic acid molecule comprising a nucleotide sequence encoding the p35 subunit of IL12, a nucleic acid molecule comprising a nucleotide sequence encoding the p40 subunit of IL12, a nucleic acid molecule comprising a nucleotide sequence encoding the p35 subunit of IL12 and a nucleic acid molecule comprising a nucleotide sequence encoding the p40 subunit of IL12, or a nucleic acid molecule comprising a nucleotide sequence encoding the p35 subunit of IL12 and the p40 subunit of IL12.

16. The use according to claim 15, wherein the nucleic acid molecule encoding IL12, the p35 subunit, or the p40 subunit is an expression vector.

17. The use of claim 16, wherein the expression vector comprises the nucleotide sequence of SEQ ID NO: 4.

18. The use according to any preceding claim, wherein the pharmaceutical composition further comprises a pharmaceutically acceptable excipient.

19. The use according to claim 18, wherein the pharmaceutically acceptable excipient comprises a buffer.

20. The use according to claim 19, wherein the buffer is a saline-sodium citrate buffer.

21. The use according to any preceding claim, wherein the pharmaceutical composition comprises 6 mg of an expression vector encoding the HPV antigen per milliliter of a buffer.

22. The use according to any preceding claim, wherein the pharmaceutical composition comprises 0.25 mg of a vector encoding the p35 subunit of IL12, the p40 subunit of IL12, or both, per milliliter of buffer.

23. The use according to any preceding claim, wherein pharmaceutical composition comprises 6 mg of a plasmid comprising the nucleotide sequence of SEQ ID NO: 3 per milliliter of a buffer and 0.25 mg of a plasmid comprising the nucleotide sequence of SEQ ID NO: 4 per milliliter of a buffer.