Claims

1. An immunogenic composition comprising at least one isolated human rhinovirus (RV) VP0 peptide, or an isolated polynucleotide encoding the peptide, wherein the peptide is selected from a group consisting of: an RV-C VP0 peptide; an RV-B VP0 peptide; RV-A28 VP0; and RV-A89 VP0, or a variant or fragment thereof.

2. The immunogenic composition according to claim 1, wherein the immunogenic composition comprises at least two isolated human rhinovirus (RV) VP0 peptides, or isolated polynucleotides encoding the peptides, wherein the peptides are selected from a group consisting of: an RV-C VP0 peptide; an RV-B VP0 peptide; RV-A28 VP0; and RV-A89 VP0.

3. The immunogenic composition according to either claim 1 or claim 2, wherein the immunogenic composition comprises at least three isolated human rhinovirus (RV) VP0 peptides, or isolated polynucleotides encoding the peptides, wherein the peptides are selected from a group consisting of: an RV-C VP0 peptide; an RV-B VP0 peptide; RV-A28 VP0; and RV-A89 VP0.

4. The immunogenic composition according to any preceding claim, wherein the RV-C VP0 peptide is selected from a group consisting of: RV-C07 VP0; RV-C19 VP0; RV-C24 VP0; and RV-C01 VP0, or a variant or fragment thereof.

5. The immunogenic composition according to any preceding claim, wherein the RV-B VP0 peptide is RV-B06 VP0.

6. The immunogenic composition according to any preceding claim, wherein the immunogenic composition further comprises an isolated RV-A16 VP0 peptide and/or an isolated RV-A29 VP0 peptide, or an isolated polynucleotide encoding the peptide, or a variant or fragment thereof.

7. The immunogenic composition according to any preceding claim, wherein the fragment of the at least one RV VP0 peptide comprises or consists of the corresponding VP2 peptide and/or VP4 peptide.

8. The immunogenic composition according to any preceding claim, wherein at least two or more of the RV VP0 peptides form a fusion peptide.

9. The immunogenic composition according to any preceding claim, wherein the polynucleotide comprises a nucleic acid sequence encoding the peptide, preferably wherein the nucleic acid sequence is placed under the control of the elements necessary for its expression in a mammalian cell.

10. The immunogenic composition according to claim 9, wherein the nucleic acid is DNA or RNA, optionally wherein the RNA is messenger RNA (mRNA) or self-amplifying RNA (saRNA).

11. The immunogenic composition according to any preceding claim, wherein the isolated polynucleotide encodes at least two or more of the RV VP0 peptides, or wherein at least two or more of the RV VP0 peptides are encoded by a plurality of separate polynucleotides.

12. The immunogenic composition according to any preceding claim, wherein the immunogenic composition comprises an isolated polynucleotide encoding the RV-C24 VP0 peptide, an isolated polynucleotide encoding the RV-A16 VP0 peptide, and an isolated polynucleotide encoding the RV-B06 VP0 peptide.

13. The immunogenic composition according to any preceding claim, wherein the at least one RV VP0 peptide comprises an amino acid sequence substantially as set out in any of SEQ ID Nos: 1, 4, 7, 10, 13, 16, 19, 22 and/or 25, or a variant or fragment thereof.

14. The immunogenic composition according to any preceding claim, wherein the isolated polynucleotide comprises a nucleotide sequence substantially as set out in any of SEQ ID Nos: 2, 3, 5, 6, 8, 9, 11, 12, 14, 15, 17, 18, 20, 21, 23, 24, 26 and/or 27, or a variant or fragment thereof.

15. The immunogenic composition according to any preceding claim, wherein the immunogenic composition further comprises an adjuvant.

16. The immunogenic composition according to any preceding claim, wherein the immunogenic composition is a vaccine.

17. The immunogenic composition according to any preceding claim, for use in therapy or prophylaxis.

18. Use of the immunogenic composition according to any one of claims 1-16 in the manufacture of a medicament for eliciting an immune response, preferably against a rhinovirus infection.

19. The use according to claim 18, wherein the immunogenic composition elicits an immune response against at least one, at least two, or at least three species of rhinoviruses, more particularly, against RV-A, RV-B, and/or RV-C.

20. The use according to claim 18 or claim 19, wherein the immunogenic composition elicits an immune response against at least one strain of RV-A, at least one strain of RV-B, and/or at least one strain of RV-C.

21. The use according to any one of claims 18-20, wherein the immunogenic composition elicits an immune response against common colds, virus-induced wheezing illnesses, exacerbations of asthma, bronchiectasis, chronic obstructive pulmonary disease (COPD), cystic fibrosis and/or chronic fibrosing lung disease.