CLAIMS

1. A pharmaceutical composition comprising:

(a) two or more neo-antigenic peptides or pharmaceutically acceptable salts thereof;

(b) a pH modifier, in which the pH modifier is a base;

(c) a tonicity adjusting agent selected from the group consisting of dextrose, trehalose and sucrose; and

(d) a pharmaceutically acceptable carrier;

in which each of the two or more neo-antigenic peptides or pharmaceutically acceptable salts thereof has an isoelectric point (Pi) and hydrophobicity (HYDRO) of Pi ≥5 and HYDRO ≥-6.0, Pi ≥8 and HYDRO ≥-8.0, Pi ≤5 and HYDRO ≥-5, or Pi ≥9 and HYDRO ≤-8.0; and

in which the two or more neo-antigenic peptides are soluble in the pharmaceutical composition.

2. A pharmaceutical composition according to Claim 1, in which the pharmaceutical composition is a vaccine composition.

3. A pharmaceutical composition according to Claim 1 or 2, in which the pharmaceutical composition comprises from two to five neo-antigenic peptides.

4. A pharmaceutical composition according to Claim 1, 2 or 3, in which the pharmaceutical composition comprises from five to 40 neo-antigenic peptides.

5. A pharmaceutical composition according to any preceding claim, in which each of the two or more neo-antigenic peptides or pharmaceutically acceptable salts thereof has an isoelectric point (Pi) and hydrophobicity (HYDRO) of: Pi ≥5 and HYDRO ≥-6.0, Pi ≥8 and HYDRO ≥-8.0, Pi ≥9 and HYDRO ≤-8.0, or Pi >7 and HYDRO ≥-5.

6. A pharmaceutical composition according to any preceding claim, in which the two or more neo-antigenic peptides each range from 5 to 50 amino acids in length.

7. A pharmaceutical composition according to any preceding claim, in which the pH modifier is a tricarboxylate salt.

8. A pharmaceutical composition according to any preceding claim, in which the pH modifier is a dicarboxylate salt.

9. A pharmaceutical composition according to any preceding claim, in which the pH modifier is citrate or a pharmaceutically acceptable salt thereof.

10. A pharmaceutical composition according to any preceding claim, in which the pH modifier is present at a concentration from 1 mM to 10 mM.

11. A pharmaceutical composition according to any preceding claim, in which each of the two or more neo-antigenic peptides or pharmaceutically acceptable salts thereof has an isoelectric point (Pi) and hydrophobicity (HYDRO) of: Pi >7 and HYDRO ≥-5.5, Pi ≥8 and HYDRO ≥-8.0, Pi ≤5 and HYDRO ≥-5, or Pi ≥9 and HYDRO ≤-8.0.

12. A pharmaceutical composition according to any preceding claim, in which the pharmaceutically acceptable carrier further comprises dimethylsulfoxide.

13. A pharmaceutical composition according to any preceding claim, in which the pharmaceutical composition further comprises an immunomodulator or adjuvant.

14. A pharmaceutical composition according to any preceding claim, in which each of the neo-antigenic peptides or pharmaceutically acceptable salts thereof are each present at an amount of from 10 to 500 μg/ml.

15. A method comprising combining a pharmaceutical composition according to any preceding claim with a solution of an immunodulator or adjuvant.

16. A vaccination or immunization kit comprising:

(a) a separately packaged freeze-dried immunogenic composition comprising two or more neo-antigenic peptides or pharmaceutically acceptable salts thereof; and

(b) a solution for the reconstitution of the freeze-dried immunogenic composition,

in which each of the two or more neo-antigenic peptides or pharmaceutically acceptable salts thereof has a Pi ≥5 and HYDRO ≥-6.0, Pi ≥8 and HYDRO ≥-8.0, Pi ≤5 and HYDRO ≥-5, Pi ≥9 and HYDRO ≤-8.0 or Pi >7 and HYDRO ≥-5.5.