CLAIMS

1. An adjuvant that comprises nanoparticles formed by association of fully synthetic variants of GM3 ganglioside to hydrophobic proteins of outer membrane complex of bacterium *Neisseria meningitidis*.

2. The adjuvant according to claim 1 wherein fatty acid in the ceramide of the GM3 ganglioside is stearic acid (18:0).

3. The adjuvant according to claim 1 wherein the fatty acid in the ceramide of the GM3 ganglioside is oleic acid (18:1).

4. A vaccine composition that comprises one of the nano-particulated adjuvants of any of claims 1-3 and peptides, polypeptides or proteins as antigen.

5. The vaccine composition of claim 4 which optionally comprises another adjuvant selected from a group comprising:

- alum and
- an oily adjuvant.

6. The vaccine composition of claims 4-5 wherein the antigen is the extracellular domains of growth factor receptors or portions thereof.

7. The vaccine composition of claims 4-6 wherein the growth factor receptors are HER1, HER2, HER3 alone or in combination.

8. The vaccine composition of claims 4-6 wherein the antigen is the PyrGnRHm1-TT peptide.

9. Use of the vaccine composition according to claims 4-8 in the manufacture of a medicament for the treatment of cancer.

10. Use of the vaccine composition according to claims 4-8 in the manufacture of a medicament for the treatment of chronic viral infections with oncogenic viruses.

11. Use of the adjuvant according to claim 2 in the manufacture of a medicament for stimulating the antigen-specific humoral immune response.

12. Use of the adjuvant according to claim 3 in the manufacture of a medicament for stimulating the antigen-specific cellular immune response.

13. Use of the combination of adjuvants of claim 2 and 3 in the manufacture of a medicament for optimizing the antigen specific humoral and cellular immune response in a patient in need thereof.

14. Use of the vaccine compositions of claims 4-8 in the manufacture of medicament for the treatment of cancer and/or chronic viral infections with oncogenic viruses in a subject in need thereof wherein the medicament is administrable by SC, intradermal, intramuscular, intranodal, intratumoral routes or by direct application to mucous membranes for at least a total of five induction doses and subsequently in monthly maintenance doses for at least six months.

15. The use according to claim 14 wherein the vaccine compositions are administrable simultaneously, staggered or alternately.