CLAIMS

1. An adjuvant that comprises nanoparticles formed by the dispersion of ~~association of GM3 ganglioside comprising a synthetic fatty acid to~~ hydrophobic proteins of the outer membrane complex of bacterium *Neisseria meningitidis* in a solution and fully synthetic variants of GM3 ganglioside wherein the fatty acid in the ceramide of the GM3 ganglioside selected from the group consisting:~~.~~

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

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

~~4. The adjuvant according to claim 1 wherein the fatty acid in ceramide of the GM3 ganglioside is nervonic acid (24:1).~~

~~5. The adjuvant according to claim 1 wherein the fatty acid in ceramide of the GM3 ganglioside is lignoceric acid (24:0).~~

~~6~~2. A vaccine composition that comprises one any of the nano-particulated adjuvants ~~of any~~ of claim~~s~~ 1 ~~5~~ and any antigen selected from the group comprising: ~~peptides, polypeptides or proteins as antigen.~~

- the growth factor receptors are HER1, HER2, HER3 alone or in combination and

-PyrGnRHm1-TT peptide.

~~7~~3. The vaccine composition of claim ~~6~~ 2 which ~~optionally~~ comprises another adjuvant selected from the group comprising:

- alum; and

- an oily adjuvant.

~~8~~4. ~~The~~ Use of the vaccine composition according to any one of claims ~~6-7~~2-3 in the manufacture of a medicament for the treatment of HER1, HER2, HER3 and/or PyrGnRHm1-TT peptide expressing cancer.~~wherein the antigen is the extracellular domains of growth factor receptors or portions thereof.~~

~~9~~5. Use of the adjuvant according to claim 1 wherein the fatty acid is stearic acid (18:0) to stimulate the antigen-specific humoral immune response.~~The vaccine composition of claims 6-8 wherein the growth factor receptors are HER1, HER2, HER3 alone or in combination.~~

~~10~~6. Use of the adjuvant according to claim 1 wherein the fatty acid is oleic acid (18:1) to stimulate the antigen-specific cellular immune response. ~~The vaccine composition of claims 6-8 wherein the antigen is GnRHm1-TT peptide.~~

~~11~~7. Use of the adjuvants according to claim 1 to optimize the antigen specific humoral and cellular immune response in a patient, wherein the adjuvants consist of:

-nanoparticles formed by the dispersion of hydrophobic proteins of the outer membrane complex of the bacterium Neisseria meningitidis in a solution and fully synthetic variants of GM3 ganglioside wherein the fatty acid in the ceramide of the GM3 ganglioside is stearic acid (18:0) and

-nanoparticles formed by the dispersion of hydrophobic proteins of the outer membrane complex of the bacterium Neisseria meningitidis in a solution and fully synthetic variants of GM3 ganglioside wherein the fatty acid in the ceramide of the GM3 ganglioside is oleic acid (18:1).

~~The vaccine composition according to claims 6-10 for use in treatment of cancer.~~

~~12. The vaccine composition according to claims 6-10 for use in the treatment of chronic viral infections with oncogenic viruses.~~

~~13. The adjuvant according to claim 2 for use to stimulate the antigen-specific humoral immune response.~~

~~14. The adjuvant according to any of the claims 3-5 for use to stimulate the antigen-specific cellular immune response.~~

~~15. The combination of the adjuvants of claims 2 and any of the claims 3 to 5 for use to optimize the antigen-specific humoral and cellular immune response in a patient.~~

~~16~~8. The vaccine composition for use according to of any one of ~~the~~ claims ~~6-10~~2-4 in a subject in need thereof, ~~wherein the composition is~~comprising administration~~ered~~ by subcutaneously, intradermally, intramuscularly, intranodally, intratumorally ~~routes~~ or by direct application to mucous membranes of the vaccine compositions ~~of claims~~ every 15 days for at least a total of five induction doses and subsequently in monthly maintenance doses for at least six months.

~~17~~9. The vaccine composition for use according to claim ~~16~~ 8 wherein the vaccine compositions are ~~administration of the vaccines is~~ administered simultaneously, staggered or alternately.