



[12] Patent

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[21] Application No.: GCC/P/2000/788 [22] Filing Date: 05/08/2000 [30] Priority: [31] Priority No. [32] Priority date [33] State 9918319.9 03/08/1999 GB [72] Inventors: 1- Francois-Xavier Berthet, 2- Wilfried Lj Dalemans, 3- Philippe Denoel, 4- Guy Dequesne, 5- Christiane Feron, 6- Yves Lobet, 7- Jan Poolman, 8- Georges Thiry, 9- Joelle Thonnard, 10- Pierre Voet [73] Owner: Smithkline Beecham Biologicals S. A., Rue de l'Institute 89, B-1330 Rixensart, Belgium [74] Agent: Hasan AL-Mulla	[51] Int. Cl. ⁷ : C07K [56] Cited Documents: - "Immunogenicity and Reactogenicity in UK Infants of a Novel Meningococcal Vesicle Vaccine Containing Multiple Class 1 (Para) Outer Membrane Proteins" (K. CARTWRIGHT et al.) 17 June 1999 - "Production, Characterization and Control of a Neisseria Meningitidis Hexavalent Class 1 Outer Membrane Protein Containing Vesicle Vaccine" (CLAASSEN et al.) 14 October 1996 - "Construction of Neisseria Meningitidis Strains Carrying Multiple Chromosomal Copies of the Pora Gene for Use in the Production of a Multivalent Outer Membrane Vesicle Vaccine" (P. VAN DER LEY et al.) 13 April 1995 - "Phase I Clinical Trial with a Hexavalent Pora Containing Meningococcal Outer Membrane Vesicle Vaccine" (C.C. A.M. PEETERS et al.) 14 October 1996 - WO 90/06696 A (PRAXIS BIOLOGICES, INC) 28 June 1990

[54] A GENETICALLY ENGINEERED BLEB PREPARATION FOR PREVENTION OR TREATMENT OF GRAM-NEGATIVE BACTERIAL DISEASE

[57] Abstract: The present invention relates to an immuno-protective and non-toxic Gram-negative bleb vaccine suitable for paediatric use. Examples of the Gram-negative strains from which the blebs are made are *N. meningitidis*, *M. catarrhalis* and *H. influenzae*. The blebs of the invention are improved by one or more genetic changes to the chromosome of the bacterium, including up-regulation of protective antigens, down-regulation of immunodominant non-protective antigens, and detoxification of the Lipid A moiety of LPS.

No. of claims: 25

No. of figures: 17