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Profiling of the serological response to Gonococcus in healthy subjects receiving 4CmenB vaccine

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Background
Due to the emergence of anti-microbial resistant Neisseria gonorrhoeae (Ng) strains and the high burden of gonorrhea worldwide, Ng has been prioritized as an urgent public health threat for which the development of an effective vaccine represents a medical need [1]. Recent real-world observations from case-control retrospective studies conducted in several countries showed approximately 30% effectiveness of the 4CMenB vaccine against gonococcus infection, and could provide useful hints for gonococcal vaccine research [2]. Moreover, a comparative genomic analysis demonstrated that antigens exposed on Outer Membrane Vesicles from New Zealand MenB strain (OMVnz) and Ng strains show 80-90% homology.

Aim/Methods
Based on the above evidences, investigation to elucidate the role of the immune response induced by 4CMenB vaccine involved in mediating protection against Ng is underway. We conducted a serological analysis on pre and post vaccination sera from 100 adult subjects receiving two doses of 4CMenB. Specific anti-Ng IgG antibodies were measured by Luminex immunoassay using beads coupled with OMVs from F62 and MS11 Ng strains and antibody functional activity was assessed by Serum Bactericidal Assay in the presence of human complement (hSBA) against the OMV-deriving isolates.

Results
Binding and functional results showed a specific immune response induced by 4CMenB against F62 and MS11 Ng strains in about 30% of subjects. A correlation was observed between anti Ng OMV IgG titers against the 2 Ng strains. , We also measured IgG binding on whole bacteria by ELISA and assessed functional activity by deposition of C3b. Finally, serum IgG titers against recombinant 4CMenB proteins were measured to investigate the potential role of those antigens in mediating gonococcus cross-protection [3], alone or in synergy.

Conclusions
Our study revealed that Bexsero sera were cross-reactive against gonococcus for about 30 % of subjects evaluated, although no matching between cross-reaction and vaccine protection can be inferred. In addition,

dissection of the pattern of antigen recognition and implications of the induced antibody response in conferring a functional activity against Ng is under investigation. 1. Gottlieb SL, Johnston C. Curr Opin Infect Dis.2017;30(1):77-86. 2. Paynter J, et al. Vaccines. 2019;7(1):5. 3. Marjuki H et al. mBio. 2019;10(5):e01668-19.