

Genetically modified *Neisseria* for producing vaccines and therapies against *N. meningitidis* and *N. gonorrhoeae*

Technology Summary

Neisseria is a genus of gram-negative bacteria that colonize the mucosal surfaces of many animals and can be caused by meningococcal serogroup B (MenB) strains, which in the United States account for one-third of all invasive *N. meningitidis* infections and 60% of those in infants. *N. meningitidis* remains a significant cause of global morbidity and mortality, despite the availability of serogroup A-, C-, W-, and Y-specific capsular polysaccharide (Ps) vaccines.

This invention is an immunogenic composition comprising the outer membrane vesicles (OMV) from Δ PorA/ Δ PorB/ Δ RmpM *N. meningitidis*. The bacteria's adaptation to the removal of these proteins results in the expression of outer membrane protein (OMP) profiles that are more antigenic and more immunogenic. Antibodies from rabbits immunized with Δ PorA/ Δ PorB/ Δ RmpM exhibited the bactericidal capacity to kill wild type meningococcal strains MC58, Cu395, BB1350, Ch501, BB1473. OMV vaccines from these deletion mutants also induce a cross-protective immune response against *N. gonorrhoeae*.

Potential Commercial Applications

- A therapy against *N. meningitidis* and *N. gonorrhoeae*
- A protective vaccine against *N. meningitidis* and *N. gonorrhoeae*

Competitive Advantages

- Cross protective antibody responses between *N. meningitidis* and *N. gonorrhoeae*
- Cost effective alternative to BEXSERO

Development Stage: In vitro data, preclinical

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Publication(s):

Matthias KA, Connolly KL, Begum AA, Jerse AE, Macintyre AN, Sempowski GD, Bash MC. Meningococcal Detoxified Outer Membrane Vesicle Vaccines Enhance Gonococcal Clearance in a Murine Infection Model. *J Infect Dis.* 2022 Feb 15;225(4):650-660. doi: 10.1093/infdis/jiab450.

Intellectual Property:

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Product Area: vaccine candidate, infectious disease therapy

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