PRODUCTION OF BACTERIAL OUTER MEMBRANE VESICLES AS VACCINE PLATFORM

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Key Words: Vaccine platform, Outer Membrane Vesicles, *Neisseria meningitidis*, Lyme disease

Bacterial outer membrane vesicles (OMVs) are non-infectious but highly immunogenic particles. These vesicles are used as vaccines against the disease of the source bacteria. Fascinatingly, the addition of heterologous antigens to these vesicles creates a versatile vaccine platform. Such a platform can be used as an alternative to subunit vaccines, during infectious disease outbreaks or for the development of vaccines against pathogens that require high containment. A unique aspect of this platform is the reusability of the production process for many different vaccines. This in turn could reduce the time to market for new vaccines significantly. We designed a heterologous OMV vaccine concept for Lyme disease based on spontaneous released OMVs from *Neisseria meningitidis* that express the Outer surface protein A (OspA) of *Borrelia burgdorferi* on the surface. The productivity of spontaneously released OMVs was improved by the introduction of oxidative stress to the bacterial culture. Increased dissolved oxygen concentrations during cultivation showed to be an excellent process parameter for enhanced release of OMVs, while the bacterial culture remains viable. This presentation will cover the development of the OMV-based vaccine platform and the impact of changes in the upstream process on the downstream process of the investigational OMV-based Lyme disease vaccine.

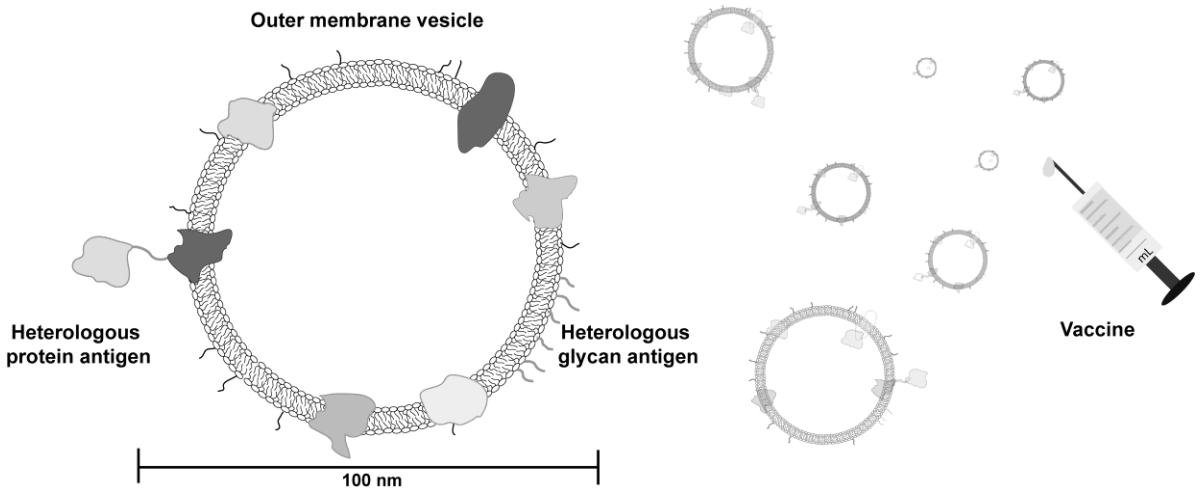

Figure 1 – Heterologous antigens on outer membrane vesicles as vaccine platform