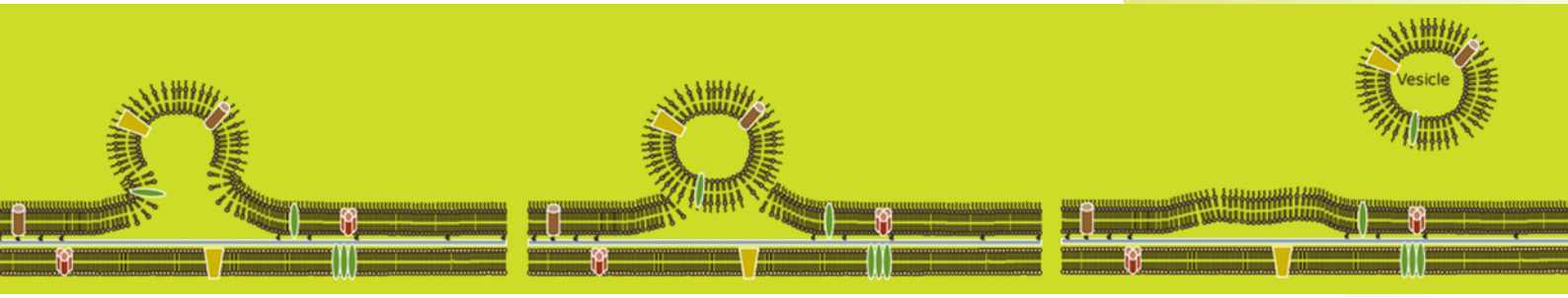
Vaccsheet

Outer Membrane Vesicles (OMV)



Introduction

A novel approach for vaccines is the use of Outer Membrane Vesicles (OMV). Gram-negative bacteria naturally release OMV's. OMVs are spherical particles (±20-200 nm) that harbour many bacterial antigens which play a role in establishing the infection and survival of the bacterium within the host. The strongest asset of OMV vaccines is the native conformation of protective antigens. Intravacc has extensive expertise developing OMV vaccines and uses this as a platform technology for various vaccines.

Benefits:

- Immunogenic properties
- Self-adjuvanticity
- Ability to be taken up by mammalian cells
- Possibilities to influence properties by genetic engineering.

Homologous or heterologous approach

We use two approaches to develop OMV vaccines: homologous and heterologous. Homologous OMV vaccines are in general the best choice if multiple antigens of the pathogen are needed to induce immunity. Not all bacteria are suited for OMV generation. This may be due to the inability to cultivate these bacteria under laboratory conditions or impractical if a bacterium is classified as a BSL-3 or 4 organism. In these cases heterologous OMV vaccines are generated.

Homologous approach

An example of a homologous candidate OMV vaccine against Neisseria meningitidis based on nine PorA proteins (NonaMen). To achieve broad protection against different circulation serotypes of Neisseria, multiple porA genes have been placed into the bacterium using genetic engineering.

Heterologous approach

For heterologous OMV vaccines multiple foreign antigens are being expressed in a bacterium that is easily cultivated and purified and gives high OMV yields.

Genetic engineering

Genetic engineering is used to improve the characteristics of bacterial vaccines, for example the enhancement of vesicle formation or reduction of lipopolysaccharides (LPS) related toxicity without affecting the intrinsic adjuvant properties of the target OMVs.
Our processes are preferentially detergent free, which keeps the highly immunogenic lipoproteins attached to the OMVs. Genetic engineering techniques are also used to achieve the required composition of virulence factors and the type of immune response.

Production process

The robust production process is designed to be scalable, achieve high yields and is compatible with GMP requirements. With the equipment in place we can produce batches of approximately 50.000 doses per run which is sufficient for phase 1 and phase 2 clinical trials.

Our key assets:

- Over xx OMV scientific publications published
- 7 OMV patents granted, 2 pending patents
- Developed x candidate OMV candidate vaccines
- OMV vaccines safe for humans

Intravacc.
Innovating vaccines

The Netherlands-based Intravacc is one of the world's leading organizations with many years of experience in translational vaccinology. As an established independent clinical development and manufacturing organization (CDMO) in the vaccine industry, Intravacc has transferred its technology and know-how world-wide, including oral polio vaccines, measles vaccines, and DPT, Hib and influenza vaccines. Intravacc offers a wide range of expertise and is the bridge between discovery and pilot scale GMP biomanufacturing up to phase I/II clinical trials for partners such as academia, public health organizations (WHO, BMGF), and biotech and pharmaceutical companies.

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