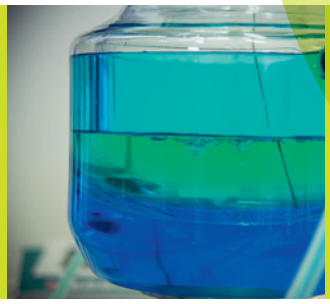
Platform Vaccsheet

Conjugate vaccine platform technology



Conjugate vaccines have been extremely successful in preventing morbidity and mortality caused by bacterial infections. Moreover, conjugate vaccines have an excellent safety record with few serious adverse events following immunization. Intravacc has a 20-year track record in designing, developing and characterizing conjugate vaccines.

What is a conjugate vaccine?

Conjugate vaccines are created by covalently attaching antigens, which by themselves are not able to induce immunological memory, to a protein carrier. This results in a stronger immunological response to the antigen including memory. Intravacc has access to various GMP grade carriers that can be used for conjugating polysaccharides, peptides and proteins.

Benefits

Intravacc has unique capabilities and provide its services for the development of conjugate vaccines:

- USP: State-of-the-art bioreactors for biomass production ranging from 0.5 L up to 70 L.
- DSP: In-depth knowledge on differential precipitations for purification of polysaccharides. State-of-the-art chromatography for different purification processes.
- Quality Control: Full array of HPLC, HPAEC-PAD, mass spectrometry, NMR and colorimetric assays to evaluate all production process steps and release of the vaccine.
- Technology transfer: Extensive, world-wide, experience in technology transfer of conjugate vaccines.
- GMP certified: Intermediate scale batch production for clinical phase I and II, including QC and QA.
- Clinical development: Providing support in early clinical development up to phase II.
- Access to GMP grade production facilities for synthetic saccharides and peptides

Track record

Intravacc has a long track record in the design, development and characterization of conjugate vaccines. With our state-of-the-art equipment, dedicated staff and years of development and technology transfer experience, Intravacc is your ideal partner to help you bring your conjugate vaccine(s) to the market. Our track record includes creating effective conjugate vaccine designs utilizing extracted capsular polysaccharides from *Streptococcus pneumoniae*, Meningococcus A, C, W and Y as well as *Haemophilus influenza* type b (Hib). The Hib conjugate vaccine was successfully transferred to multiple international partners.
Our most recent success is the development of a semi synthetic *Shigella flexneri* 2a conjugate vaccine from lab bench to phase-II clinical trials. Currently Intravacc is developing a pan-corona vaccine utilizing OMVs as a carrier and a peptide conjugate vaccine targeting C9orf72 ALS.

Carriers and Chemistry

To create effective conjugate vaccines, Intravacc has utilized many carriers. These include traditional tetanus toxoid but also diphtheria toxoid (CRM197) and outer membrane vesicles (OMVs). Intravacc has experience with different chemistry types for conjugation, new chemistries are constantly evaluated and can be introduced as well.

What is the current status?

- GMP production equipment for USP, DSP and conjugation
- Access to GMP before OMV add GMP grade carriers (TTd and CRM197)
- In house produced OMV carriers that can be genetically enhanced
- All IPC and QC tests in-house available
- >10 scientific peer reviewed publications
- 1 patent granted

What do we offer for partnering or licensing?

- We open our platform to further develop your conjugate vaccine
- Developing specific unit operation for conjugation to advance your development
- Analytical services available
- Out licensing of the platform

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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Platform Vaccsheet

Intravacc - innovating vaccines

Netherlands-based global CDMO
- Founded in 2013
- HQ at Utrecht Science Park Bilthoven
- Private company since 2021
- ~100 FTEs
- Leading OMV company

State-of-the-art facilities
- 1500+ m2 laboratories, incl. BSL-2 & GMP
- GMP certified
- ISO 14001:2015 certified
- In-house QA, QC and QP

Business focus
- Offering specialized CDMO services
- One-stop-shop for vaccine development
- Platforms & vaccines for partnering
- Bridge between bench- and large-scale manufacturing

Our proprietary scalable platform technologies

OMV
- Bacterial
- Viral

Cell-based viral
- Vero and HEK293
- Viral (vector)

Conjugation
- Infectious diseases
- Combination with OMV

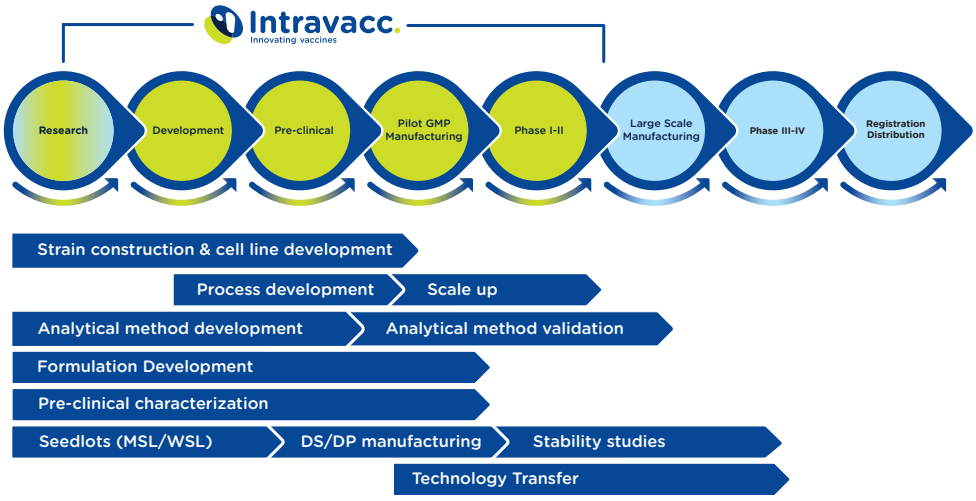
Adjuvant
- OMV
- LPS

Distinctive technology
- 4 proprietary vaccine platforms
- 11 patent families
- Viral rescue
- Mass spectrometry
- Intranasal vaccine development

In addition we offer
- Medium design
- Higher order structural analysis
- Physiochemical and immunological analysis
- Bench- and pilot-scale GMP

Stellar track record
- 2 OMV vaccines licensed
- 1 conjugate AMR vaccine licensed
- 3 cell-based viral vaccines licensed
- 300+ scientific publications
- 50+ customers worldwide
- >10 partnerships

Our services - from discovery to clinical proof of concept



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