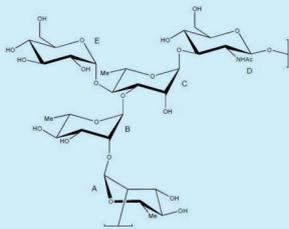
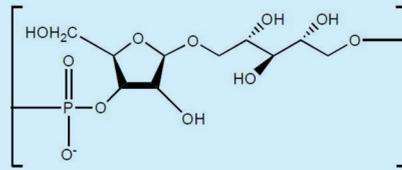


# Polysaccharide conjugate vaccines



Shigella flexneri SF2a



Haemophilus influenzae type b

$$\rightarrow\text{O}-\text{P}-(\text{O}\rightarrow 3)-\beta\text{-D-Ribf}-(1\rightarrow 1)-\text{D-Ribol}-(5\rightarrow$$

$$\text{C}_{10}\text{H}_{19}\text{O}_{11}\text{P} = 346.228$$

$$\text{C}_{10}\text{H}_{18}\text{NaO}_{11}\text{P} = 368.210$$

## Introduction

Conjugate vaccines have been extremely successful in preventing disease and death caused by bacterial infections. Moreover, conjugate vaccines have a superb safety record with very few serious adverse events following immunization. Intravacc has a 20-year track record in designing, developing and characterizing conjugate vaccines. A conjugate vaccine is created by covalently attaching a bacterial polysaccharide, which by itself is not able to induce immunological memory, to a protein carrier antigen, thereby eliciting a stronger immunological response to the antigen.

## Benefits

Intravacc offers unique capabilities and services in the scope of conjugate vaccines:

- **Seed lot:** Fully defined seed lots for R&D and GMP
- **USP:** State-of-the-art bioreactors for biomass production ranging from 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, 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. Possibility of tailoring Technology.
- **GMP certified:** Intermediate scale batch production for clinical phase I and II, QC, QA.
- **Clinical development:** Providing support in early clinical development up to phase II.

## 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 influenzae* type b (Hib). The Hib conjugate vaccine was successfully transferred to multiple international partners world-wide. Our most recent success is the co-development of a semi synthetic *Shigella flexneri* 2a conjugate vaccine.

## Carriers

To create effective conjugate vaccines, Intravacc has utilized many carriers. These include tetanus toxoid but also diphtheria toxoid (CRM197) and outer membrane vesicles (OMVs).

## Partnering opportunity

Consider Intravacc to help you develop and produce the next generation conjugate vaccines.

## Selected Publications

- Safety and immunogenicity of a synthetic carbohydrate conjugate vaccine against *Shigella flexneri* 2a in healthy adult volunteers: a phase 1, dose escalating, single-blind, randomised, placebo-controlled study. Cohen et al. 2020 in press.
- A Synthetic Carbohydrate Conjugate Vaccine Candidate against Shigellosis: Improved Bioconjugation and Impact of Alum on Immunogenicity. Van der Put et al, 2016. *Bioconj. Chem.*
- Process development of a New *Haemophilus influenzae* type b conjugate vaccine and the use of mathematical modeling to identify process optimization possibilities. Hamidi et al, 2016. *Biotechnol. Prog.*