A new generation glycoconjugate vaccine against *Streptococcus suis*

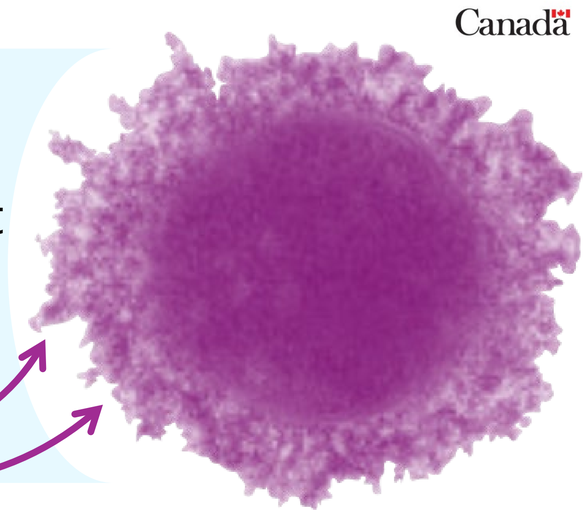
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CONTEXT

- *Streptococcus suis* is an important swine bacterial pathogen and emergent zoonotic agent. Serotype 2: most clinically important serotypes worldwide.
- **No efficacious commercial vaccine is available** to prevent *S. suis* infections.
- *S. suis* is covered by a serotype-specific capsular polysaccharide (**CPS**).

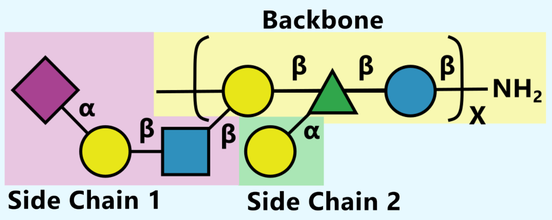


GOAL Desgin & test the first chemically-synthesized CPS (glycoconjugate) vaccine against *S. suis*

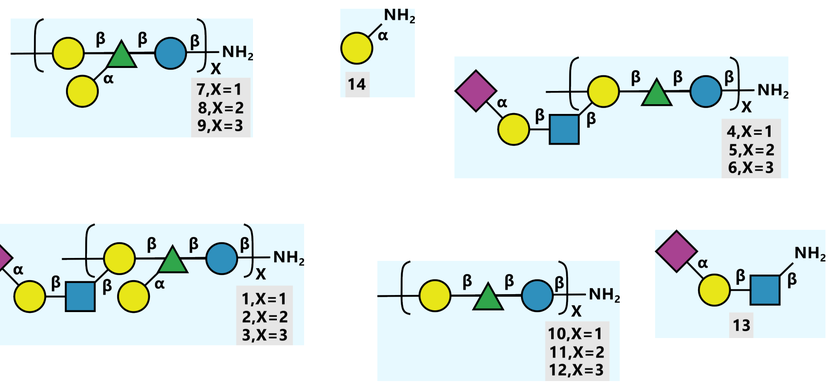
1. Design CPS fragments and pre-screening in mice

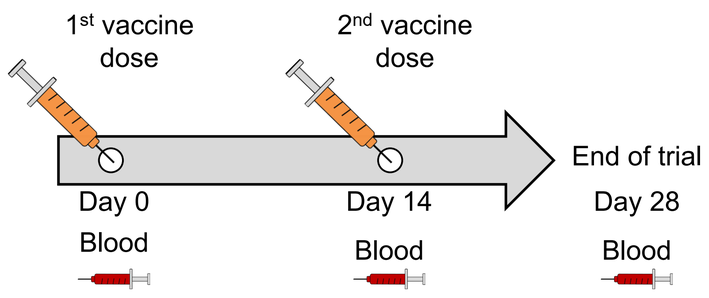


Schematic representation of CPS

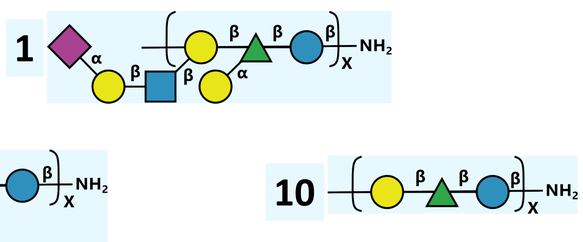


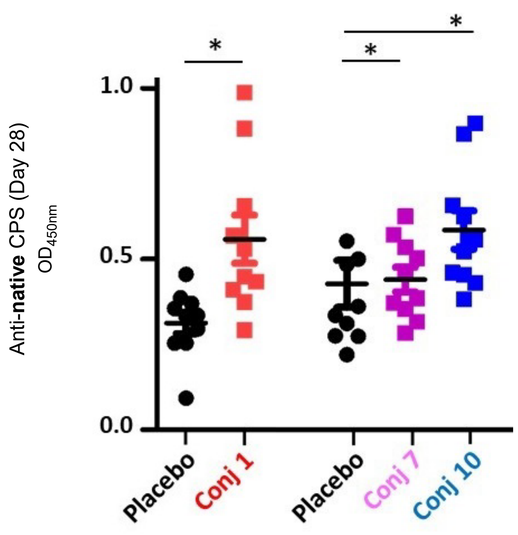
I. Synthesized CPS fragments → II. Immunization studies in mice → III. Pre-selection of candidates





Antibody production (Day 28) in mice after immunization with produced CPS



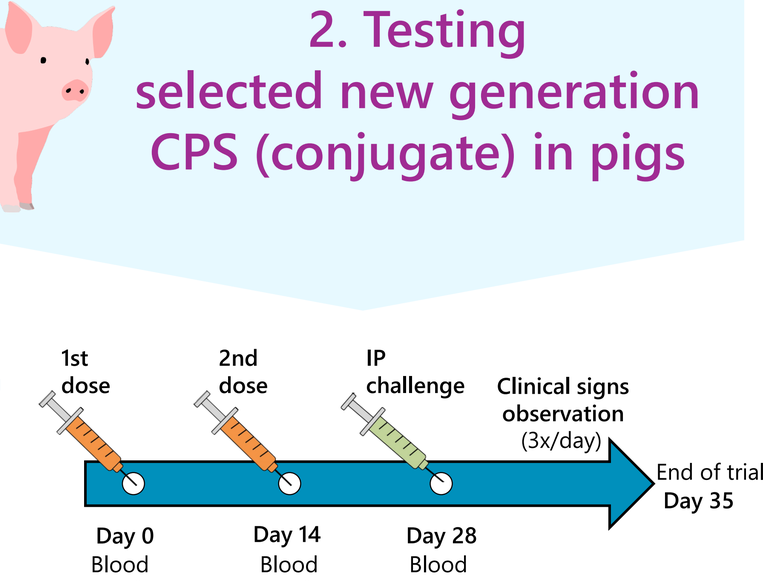


✓ Antibodies generated by immunization with the conjugates recognize the native CPS of *S. suis*

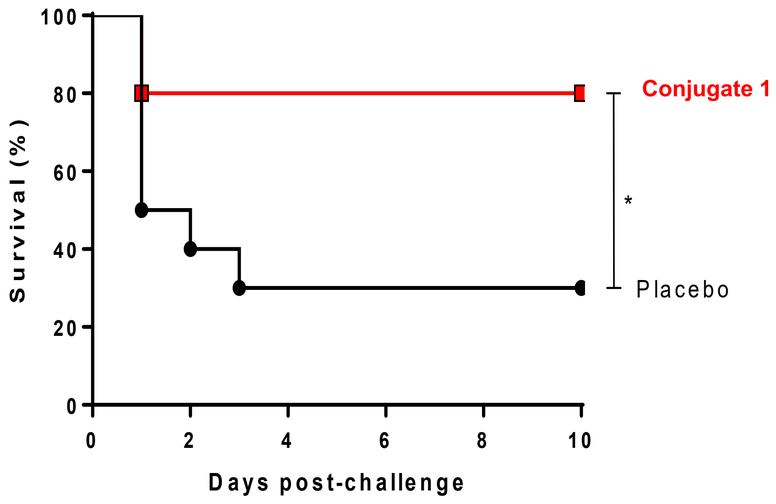
✓Antibodies generated against the synthesized CPS (Conj 1, Conj 7, Conj 10) after vaccination.

✓**Antibody kinetics post-vaccination: best response with two vaccine doses**. Similar results were obtained for conjugates 7 and 10.

2. Testing selected new generation CPS (conjugate) in pigs



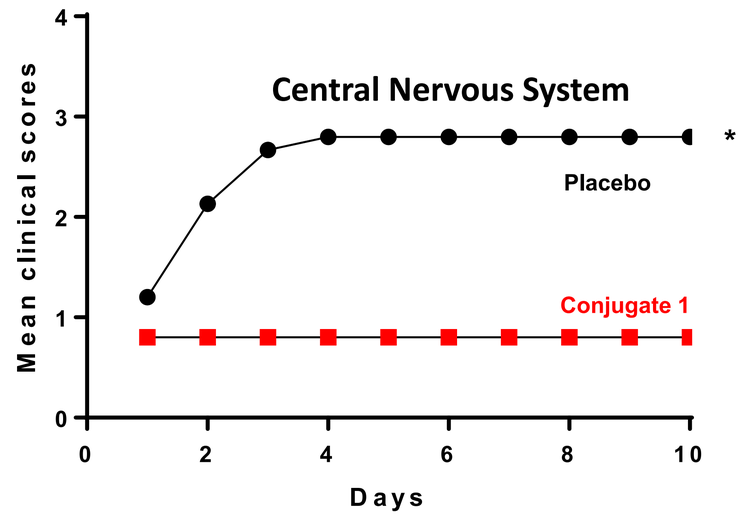
Timeline of immunizations, sample collection and challenge employed in weaned pigs.
IP: intraperitoneal.



✓ Survival of pigs vaccinated with conjugate 1 following challenge with *S. suis*

✓ Animals vaccinated with conjugate 1 are protected against central nervous system clinical signs after challenge with *S. suis*

Results were similar for locomotion and behavior.



FIRST PROOF OF CONCEPT

- **Conjugate 1 induced marked protection in pigs and is the most promising candidate**.
- **New generation vaccine in veterinary medicine: Chemically-synthesized glycoconjugate vaccine easier to produce, and has the potential to reduce the use of antimicrobials in swine production.**