

Discovering the Hidden Weapons of *Staphylococcus hyicus*

Resume:

Pig production in Quebec faces infections caused by *Staphylococcus hyicus*. This bacterium is responsible for exudative epidermitis, a disease that leads to skin lesions and joint problems in piglets. Current treatments are often ineffective due to increasing antibiotic resistance, and no commercial vaccine is available.

To better protect herds, we first need to understand how *S. hyicus* causes disease. This bacterium uses real “molecular weapons” to attack the skin and escape the pig’s immune defenses, but these weapons remain poorly characterized. My project seeks to identify the genes responsible for this virulence. To do so, I will develop a genome-editing tool based on CRISPR-Cas9 technology—a method that allows precise gene inactivation to study their role.

The first year of the project will focus on adapting and validating this technology in *S. hyicus*, a first for this species. The second year will involve creating mutant strains and assessing their virulence using cell-based laboratory models. These analyses will help determine which genes give the bacterium its pathogenic abilities and confirm their function.

Better understanding these virulence genes is an essential step toward developing new diagnostic tools and prevention strategies against exudative epidermitis. Ultimately, these advances will help design more targeted treatments, reduce on-farm losses, and improve piglet health and welfare.