PATHOBIOLOGY RESEARCH PROJECTS IN
# IMMUNO-GENETICS

## High Immunity Research Technology

### A Broad Based Approach to Disease Resistance in Commercial Swine Herds

## ABOUT

Pork is big business for Canadian producers, both domestically and internationally. In Canada, it is the second-most consumed meat.

Globally, Canadian pork is exported to more than 100 countries and it is consumed throughout the world more than any other source of protein.

Managing disease in pig populations is one of the most costly and difficult challenges for pork producers.

## Short Project Description and Project Goals

Since the HIR technology can identify food-producing animals with increased capacity for immune response, and subsequently increased disease resistance, its implementation and integration into pig breeding programs is timely.

It is expected that commercial adoption of this technology in the swine industry will lead to improvements in health and productivity by enhancing general resistance to recurring and newly emerging infectious disease, as exemplified in commercial dairy production. This approach will also complement more agent-specific approaches such as vaccination, while reducing reliance on high risk health management strategies, including the use of antibiotics and breeding for pathogen-specific host resistance.

This study, headed by Postdoctoral fellow Dr. Julie Schmied seeks to test the HIR technology in approximately 3600 commercial pigs. IR-phenotyping results will be correlated with herd health and production traits. Additionally, DNA samples will be used to derive useful genomic information associated with immunity.

## HIR Technology HISTORY

The High Immune Response Technology (HIR™) was initially developed by Professor Bonnie Mallard and Dr. Bruce Wilkie at the University of Guelph.

The technology was first successfully tested in pigs and allows for the identification of animals with more robust and balanced immune responses.

Previously, when Yorkshire pigs were selectively bred using this method it was found that high immune responder pigs had improved responses to vaccination and pathogen challenge compared to the control line and low responders.

Noteworthy is the fact that high responders were generally more robust pigs with increased average daily gain, reaching 100kg 10-12 days before low responders.

Although previous research in pigs clearly demonstrated favorable responses to breeding pigs for HIR, this method has not been tested in commercial herds as efforts shifted focus to the implementation of the technology for use in dairy cattle.

**Core Team:**
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