PROJECT SNAPSHOT

4B: Structure and Function Study of Glycopeptides as Anti-adhesive Agent

Pillar: Prevention of Transmission

Theme: Innovation and Commercialization

Keywords: Ovomucin; Glycopeptide; Anti-adhesive Agent; Piglet

AMR One Health Consortium

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AIM

The aim of this project is to develop egg protein derived glycopeptides as an anti-adhesive agent against swine infection. The focus is to test the efficacy of glycopeptides in a swine infection model.

WHY IS THIS IMPORTANT?

Infection of piglets with enterotoxigenic Escherichia coli (ETEC) is a major cause of diarrhea, leading to significant economic losses in pig production. Using antibiotic such as Colistin is known to cause highly resistant E.coli in swine.

OUTCOMES

1. A method to prepare glycopeptides from egg protein.
2. An anti-ahdesive agent with potential use as an alternative to antibiotics.

RESEARCH QUESTIONS

Can glycopeptides derived from ovomucin be applicable as an antibiotic alternative?

1. How to prepare glycopeptides?
2. How to determine the anti-adhesive activity in cells?
3. Will glycopeptides be effective in piglet model?
4. Will genes coding for resistant be reduced after the treatment?

OUR APPROACH

Glycopeptides will be prepared from egg white protein ovomucin, and then validated in piglet models in 5 groups: positive control (antibiotic), negative control, glycopeptides, probiotics, glycopeptides with probiotics.

1. Ovomucin will be first extracted from egg white and then glyopeptides will be prepared using proteolysis method
2. Anti-adhesive activity of glycopeptides will be studied in porcine endothelial cell with pathogen
3. Efficacy of glycopeptides will be validated in piglet models 4. Sequencing the fecal metagenome will be performed.

ALIGNMENT WITH THE AMR - ONE HEALTH CONSORTIUM

LEVERAGED SOURCES OF SUPPORT

CRC • China Scholarship Council • Egg Farmers of Canada • Natural Sciences and Engineering Research Council of Canada

KNOWLEDGE & TECHNOLOGY EXCHANGE AND EXPLOITATION

- New alternatives to antibiotics
- Reduced antibiotic resistance

TRAINING OF HIGHLY QUALIFIED PERSONNEL

- 2 PhD
- 1 MSc

AFFILIATIONS: EGG FARMERS OF CANADA Dedicated to Quality; China Scholarship Council; University of Alberta; NSERC CRSNG

Alberta Government

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