This research was funded by: USDA NIFA Evans Allen Program NIFA NC.X-300-5-16-120-1; NC.X320-5-19-120-1 and Integrative Bioinformatics for Investigating and Engineering Microbes.

NORTH CAROLINA AGRICULTURAL AND TECHNICAL STATE UNIVERSITY

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Program: Applied Science and Technology

Title: "Studies on the Expression and the Effect of Galectin-8 in Bovine Neutrophils"

Major Professor: Dr. Mulumebet Worku

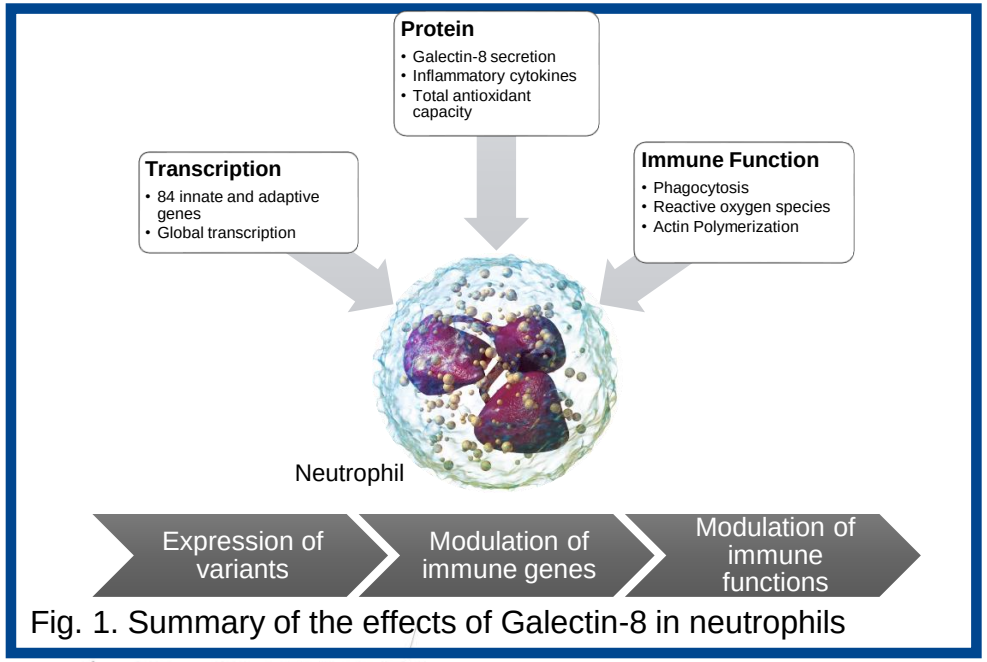

Fig. 1. Summary of the effects of Galectin-8 in neutrophils

RESEARCH QUESTIONS / PROBLEMS:

- Are genetic variants of Galectin-8 expressed in bovine neutrophils?
- Does the protein Galectin-8 affect global transcription and the response to bacteria endotoxin in bovine neutrophils?
- Does Galectin-8 affect neutrophil protein secretion and function?

METHODS:

- Expression of Galectin-8 variants, and 84 innate and adaptive immune response genes were analyzed using real-time quantitative polymerase chain reaction.
- Effects on global transcription were evaluated using Next Generation Sequencing - RNA sequencing and Bioinformatics tools.
- Immune functions were analyzed using confocal microscopy – actin polymerization, immunofluorescence reader – phagocytosis, and flow cytometer – reactive oxygen species (ROS).
- Protein analysis were on total protein concentration, Galectin-8 secretion, pro-inflammatory cytokines, total antioxidant capacity using BCA and ELISAs.

RESULTS / FINDINGS:

- Bovine neutrophils express LGALS8 variants
- Recombinant Galectin-8 modulated global transcription, specifically genes involved in innate and adaptive immunity.
- Recombinant Galectin-8 increased adhesion of bacteria and phagocytosis, however, did not stimulate actin polymerization or production of ROS.

SIGNIFICANCE / IMPLICATIONS:

- Galectin-8 may be important in adhesion of bacteria; it may be essential to define genetic markers, diagnostics, and therapeutics to control pathogens.

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