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# Macrophage Extracellular Trap Formation in Response to M. Haemolytica or its Leukptoxin is altered by Co-Incubation with Bovine Herpes Virus-1 Infected Bronchiolar Epithelial Cells

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Appendix C

RESEARCH / CREATIVE PROJECT ABSTRACT / EXECUTIVE SUMMARY
FINAL REPORT FORM

Title of Project
Macrophage extracellular trap formation in response to M. haemolytica or its leukotoxin is altered by co-incubation with bovine herpes virus-1 infected bronchiolar epithelial cells

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Abstract
Bovine respiratory disease (BRD) is the primary cause of morbidity in the U.S. beef and dairy industry. BRD is a multifactorial disease that is caused by viral and bacterial agents leading to a severe pleuropneumonia in cattle. BRD is characterized by inflammation, intense neutrophil infiltration, consolidation and recently, extensive amounts of extracellular DNA in the lungs. One possible source of the DNA is from leukocytes that release fibrillar networks of antimicrobial protein-studded DNA matrices referred to as extracellular traps (ETs). Recently, we have demonstrated that neutrophils and macrophages produce ETs in response to Mannheimia haemolytica, an important member of the BRD complex. Previous data has demonstrated that conditioned media removed from bovine herpes virus (BHV)-1 infected bovine bronchiolar epithelial (BBE) cells contain several cytokines. Here, we examined if conditioned media from BHV-1 infected BBE cells could alter ET formation from bovine neutrophils and macrophages. We observed that bovine macrophages pre-incubated with conditioned media from BHV-1 infected BBE cells had a reduced ability to produce ETs when incubated with the leukotoxin (LKT) in comparison to the control macrophages pre-incubated with conditioned media from uninfected BBE cells. In contrast, we observed that bovine macrophages treated with conditioned media demonstrated an increase in ET formation in response to intact M. haemolytica cells. However, conditioned media-treated bovine neutrophils were unaltered in their ability to produce ETs in response to M. haemolytica or LKT. Our findings suggest that BHV infection may alter macrophage production of ETs in response to M. haemolytica or LKT, which could alter host defense.

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The end product of this project in electronic format has been submitted to the Provost/Vice President for Academic Affairs via the Office of Grants & Sponsored Projects Officer (Maxwell 161, npeterson@winona.edu).

Student Signature _____ Date _____

Faculty Sponsor Signature _____ Date _____