

Hyunji Song¹, Amy E. DeClue², Catherine E. Hagan³¹ College of Veterinary Medicine, University of Missouri, Columbia, MO² Comparative Internal Medicine Laboratory, University of Missouri, Columbia, MO³ Department of Veterinary Pathobiology, University of Missouri, Columbia, MO

Introduction

Cortisol is the primary glucocorticoid hormone secreted in response to many adverse conditions, such as chemical, physical, and emotional stress. It is well-known for its anti-inflammatory and immunosuppressive actions at high levels. Glucocorticoid resistance, a decrease in the sensitivity of immune cells to glucocorticoid that normally suppresses the inflammatory response, can lead to poor health outcomes; however, identifying glucocorticoid-resistant patients remains a challenge due to a great deal of variability in serum cortisol levels across individuals. Thus, it is more valuable to measure the functional responses to cortisol level. This study proposes an *in vitro* model for measuring glucocorticoid sensitivity of immune cells in whole blood under conditions that mimic acute stress.

Hypothesis

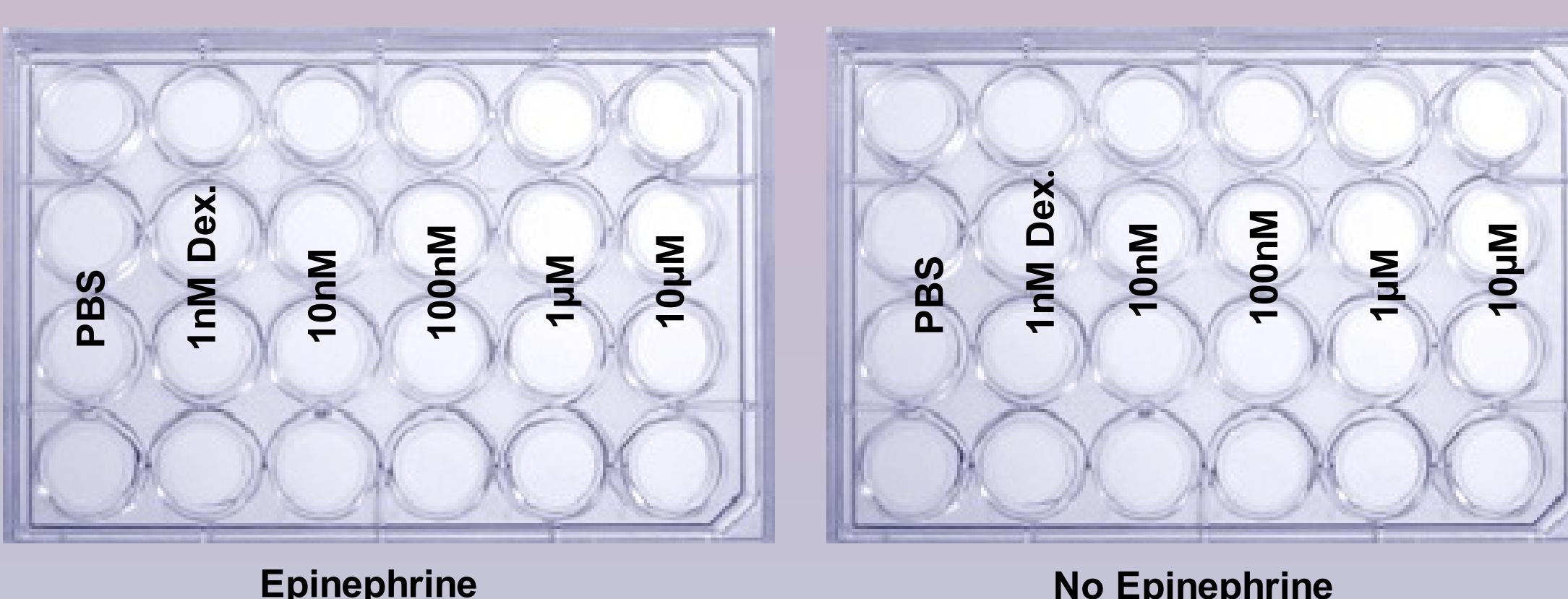
- Epinephrine will play a role in sensitization of immune cells to dexamethasone in blood from healthy dogs
- The concentration of dexamethasone that inhibits 50% of cytokine response (IC50) will be measured. Shifts in dexamethasone sensitivity (IC50) will predict patient outcomes.

Objective

To develop a whole-blood based assay that enables a functional quantification of glucocorticoid sensitivity.

Methods

- Whole blood culture



Each well contained the following:

- Whole blood diluted 1:2 with RPMI medium
- Lipopolysaccharide (100 ng/ml) or PBS
- 5 μM of Epinephrine or PBS
- Variable [Dexamethasone]
- Control (Phosphate buffered saline or PBS)

- ELISA and MFI for cytokines

