

Identification of a genetic predisposition for Equine Protozoal Myeloencephalitis (EPM) susceptibility and associated gene dysregulation in clinically affected horses

Purpose

To determine if there is an underlying genetic predisposition for horses that develop EPM, including chronically affected horses who either fail to respond to treatment or suffer recurrent disease after ceasing treatment.

Background

Equine protozoal myeloencephalitis (EPM), due to *Sarcocystis neurona* infection, is one of the most common and devastating equine neurologic diseases in the United States. Estimated costs are \$55-110 million annually, with expenses incurred from travel costs to the farm, diagnostic testing, medications, and loss of use. While up to 50-90% of horses are exposed to *S. neurona*, depending on geographic location, less than 1% of horses show clinical signs of disease.

For those horses who show clinical signs, EPM can limit their athletic performance and can be emotionally devastating to owners and trainers as well. Risk factors regulating disease outcomes are not well known. We're hoping to identify whether genetic changes in the host immune response are present in EPM affected horses. This knowledge is critical to understanding the mechanisms of immune dysfunction. With this information, we aim to identify immune therapeutics to restore protective immunity and improve clinical outcomes.

Eligibility

Two groups of horses aged over 1 year will be included in this study:

1. EPM-affected horses. We will include horses with a positive test for antibodies in the CSF.
2. Control horses. We will include sound, healthy horses with no history of EPM.

Exclusion

- Any uncontrolled medical condition that may disrupt study intent and objectives
- Horse is pregnant

Study Design

For this study, we are looking to see if there are differences in immune markers from blood samples collected from EPM vs. control horses. We are also looking at differences in gene expression from samples collected from chronically affected EPM horses vs. controls. The groups of horses that we need:

- EPM horses that have relapsed at least once, after being taken off treatment.
- EPM horses that are being or have been treated for EPM, that have positive CSF results for *S. neurona*
- Neurologically normal horses that owners have decided to euthanize will serve as controls.

Unless previously arranged, all euthanasia procedures will take place at the Veterinary Teaching Hospital in Blacksburg, VA.

Compensation

At the discretion of the study investigator, euthanasia, testing for EPM (if needed), necropsy, and disposal fees may be included.

Contact

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