

Boosting the foal immune system

BY KATE JORDAN

researchers explore pneumonia's cause and prevention

"There's something special about foals," says Dr. Stephen Hines, professor of veterinary microbiology and pathology at Washington State University. A former member of Morris Animal Foundation's Scientific Advisory Board, Dr. Hines now has an MAF grant to conduct a study on pneumonia, a leading cause of death among foals.

"Most of what we do in research is hypothetical," he says. "What is exciting about working on foal pneumonia is that it's a very real, important disease that, given time, we will be able to do something about."

Dr. Brett Sponseller, assistant professor in veterinary clinical sciences at Iowa State University and a recipient of an MAF First Award Grant, agrees. Having been around horses his entire life, Dr. Sponseller was frustrated by the terrible toll he has seen foal pneumonia take on young horses. He was eager to research some of his solution ideas in a separate MAF-sponsored study.

"Even though there are treatments available, it is still perplexing that foals have such a vulnerable period in their immune development," Dr. Sponseller says. "There isn't much funding for equine research in the United States, and Morris Animal Foundation fills a critical gap by supporting these studies."

So what is foal pneumonia? Many organisms can cause the disease, but the primary culprit is *Rhodococcus equi*, a bacterium found in soil and manure. Foals typically ingest the bacterium via dust or the air. Often they exhibit few or no symptoms, making the disease difficult to detect. Because *R. equi* is ubiquitous to equine environments, the major question is, "Why do some foals succumb to the disease while others remain healthy?"

Both Drs. Hines and Sponseller are hoping to answer this question by focusing on the neonatal immune system and how it can be strengthened against pathogens like *R. equi*. By studying what constitutes a protective immune



response in adult horses, Dr. Hines hopes to understand whether this response can be induced at an earlier age in foals. Developments in human tuberculosis research have directed his work toward the unique lipids found in *R. equi*. He believes the relationship between these lipids and cytotoxic cells may be the key to creating an earlier immune response in foals.

Dr. Sponseller's research has zeroed in on dendritic cells and cell-mediated immunity. He proposes that foals are predisposed to *R. equi* because their immature immune systems are prone toward an antibody response rather than a cell-mediated response orchestrated by dendritic cells. This, he believes, helps to explain why adult horses, whose immune systems rely heavily on cell-mediated responses, are better able to fight off infected cells.

Given the collaborative research efforts on foal pneumonia that are being made by scientists like Drs. Hines and Sponseller, the odds of developing a vaccine look better than ever.

YOU CAN HELP MAF is focusing on equine health through studies like these and also our Equine Health Initiative. Please support our efforts by donating toward horse health at www.MorrisAnimalFoundation.org.