

Project Title:

An investigation into symbiosis between virulent *Rhodococcus equi* and protozoa

Project Supervisor:

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One Sentence Project Summary:

Can virulent *Rhodococcus equi* replicate within protozoa found in the soil and gastrointestinal environment of the foal.

Project Synopsis:

The aim of this project is to ask (and hopefully answer) the question, can virulent *R. equi* replicate within foal gastrointestinal and soil protozoa? Given that the organism is a facultative intracellular parasite the likelihood of a symbiotic relationship existing between it and equine and soil associated protozoa is high. Such a relationship may provide a survival niche to facilitate amplification without the need for invasion into the alveolar macrophage, significantly increasing environmental levels and the likelihood for a substantial pulmonary insult from contaminated dust.

The project will involve the examination of fresh faecal samples from foals, post-mortem foal gastrointestinal samples and protozoal resuscitated soil samples from *R. equi* endemic farms. Utilizing monoclonal antibodies (mAbs) to VapA, a cell-surface virulence protein, immunohistochemistry will be used to hopefully reveal the true location of virulent *R. equi* in these samples. Complementary qPCR and PCR techniques using universal protozoal PCR and qPCR methods combined with established virulent *R. equi* PCR and qPCR methods will be used to reveal the extent if any of amplification of virulent *R. equi* associated with protozoal numbers. *In vitro* soil or pure protozoal culture experiments will be performed in concert with field and archival soil sample examinations.

The findings of this study will be of great significance in the equine veterinary community and the general infectious disease community. Findings may lead to prophylactic strategies focusing on modifying the protozoal environment in the developing foal and the use and development of specific antiprotozoal oral therapy targeting the protozoal amplifier.

Other Information:

Currently a pilot project in this field is funded through an internal Faculty of Veterinary Science bequest grant, with plans to apply for more funding in 2009 and beyond.
