

Student Lecture Title: *Rhodococcus equi* disease: Overview of contributing causative factors, diagnosis, treatment, control strategies and the discussion of a clinical case example

Abstract:

Rhodococcus equi is a Gram-positive, facultative intracellular bacterium that is a major cause of pneumonia in foals. It is also an opportunistic pathogen of immunocompromised people. The organism is found in the environment of virtually all horse farms, although the presence of disease is variable and likely dependent on such things as the number of virulent organisms in the environment, host age and immunity. Inhalation of virulent (Vap plasmid-containing) *R. equi* is the major route of pulmonary infection. Once inhaled, the bacterium is taken up by alveolar macrophages. Virulent *R. equi* modify the phagocytic vacuole to prevent acidification and fusion with lysosomes and replicate intracellularly, eventually leading to necrosis of the infected macrophage. Immunity to *R. equi* likely depends on both antibody and cell-mediated immune system components, with the latter being particularly critical. Early diagnosis of *R. equi* disease improves clinical outcome. In the last several years, many horse farms have turned to routine thoracic ultrasound screening of foals and initiation of antimicrobial therapy with the discovery of subclinical lesions (prior clinical signs) as a means to gain early control of *R. equi* disease. However, this practice is currently being questioned as it is now realized that subclinical lesions may resolve without therapy. Moreover, macrolide- and rifampin-resistant isolates of *R. equi* are being detected with greater frequency, likely because of their intensive use in treating subclinical disease. A clinical case of *R. equi* disease will be presented wherein various aspects of the above are discussed.