



“A screen for drugs that reveal *Mycoplasma bovis* to the bovine immune system”

EXPLORING NON-ANTIBIOTIC TREATMENT OPTIONS TO MANAGE MYCOPLASMA BOVIS

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Background: *Mycoplasma bovis* is involved in bovine respiratory disease (BRD), and mycoplasma treatments are estimated to cost the beef industry \$30 to \$50 per head. *M. bovis* also causes significant welfare problems, usually in the form of chronic arthritis causing lameness. Despite several decades of research, there is no vaccine for *M. bovis*.

One challenge for vaccine development is that *Mycoplasma* can alternate which antigens it expresses on the cell membrane surface. This means that *M. bovis* antigens might stimulate an immune response, but the bacteria may be expressing different surface antigens by the time the animal's antibodies are circulating. As a result, the immune response is always playing catch-up and doesn't effectively combat *M. bovis* infections.

This project will explore molecules that may be able to interfere with the *M. bovis* cell membrane, so that it releases more of its cell membrane proteins, in this case lipoproteins. This would allow the animal's immune system to recognize more of the *M. bovis* surface antigens and help the animal to mount a more effective immune response. It will target an *M. bovis* enzyme that is involved in cell membrane growth, and use results recently obtained from other bacteria that also have lipoproteins associated with their cell membranes.

Objectives: The objectives of this study are to:

1. Develop an assay to screen for compounds that elicit the release of lipoproteins from *M. bovis* cells
2. Screen and validate safe, commercially available compounds for their ability to induce the release of *M. bovis* lipoproteins

Implications of the Research: *M. bovis* has long been a concern for producers, and we don't have effective solutions. While this project is very early stage drug discovery research, and will certainly not eliminate *M. bovis* infections immediately, it is exploring a new approach that potentially can improve the management of this bacteria in the future.

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