

## ***Many Hosts of Mycobacteria: A Comparative Symposium***

September 15-16, Gettysburg, PA

Supported by NIH/ORD and NIH/NIAID

### **Meeting Summary**

This comparative symposium was designed to bring together experts in mycobacterial diseases from a variety of disciplines – veterinary medicine, basic and applied science, human clinical research and animal models of human TB and leprosy. The symposium encouraged attendance by more junior investigators to introduce them to outstanding questions in comparative mycobacteriology and help establish connections and collaborations with colleagues in academic and human and veterinary medical communities.

The two-day symposium was led off on day one by overviews of immune pathology of mycobacterial disease in a variety of natural and model host/pathogen systems and was organized around organs that displayed primary pathological lesions. These overview presentations set the stage for targeted discussion panels on critical topics in immune pathologies for these pathogens.

To review pathologies elicited by mycobacterial infections of the respiratory tract, short presentations were provided for human, non-human primate, elephant, cattle, cervids, and badgers that summarized standard immune pathologies of these natural hosts, as well as provided an overview of the natural history of infection and disease in these species.

Systemic, skin and nerve pathologies were summarized in presentations on *Mycobacterium paratuberculosis* in cattle, *M. leprae* in humans and armadillos, *M. marinum* in fish and *M. ulcerans* in humans and lab systems.

Day one was concluded with a summary of the current state of the art in animal models of human tuberculosis, namely guinea pig, mouse and rabbit models and aspects of human pathology that are reflected in these species.

The working lunch on day one focused on zoonoses and cross species infection and pathologies elicited by *M. bovis* and *M. tuberculosis* in humans and cattle, anthroozoonoses by *M. tuberculosis* in African wildlife and the discovery of a new species of *M. leprae* that may be involved in a rare form of Leprosy – Lucio's Phenomenon.

Day two focused on targeted discussion panels to address critical, unanswered questions in mycobacterial immune pathology and to identify areas of similarities and differences between natural and artificial host/pathogen systems.

Four discussion panels took place sequentially and were structured to focus on comparing the nature of pathological events across the mycobacterial species and hosts introduced on day one.

Specifically, panels were focused on 1) granuloma pathology; 2) granuloma immunology; 3) immune relevancy; and 4) neonatal immune pathology.

These panels led to vigorous discussions and suggestions for collaborations and scientific projects to address what were determined to be critical and yet to be researched questions to better understand the natural history of infection and disease in humans.

Day 2 concluded with the organizers soliciting feedback on the meeting as well as topics for discussion for future meetings.

Overall, attendees considered this meeting to be a unique opportunity to interact with mycobacterial researchers in areas that are not usually overlapping, i.e. veterinary and human science, applied veterinary R&D and basic science in human mycobacterial infections and disease.

Based on the extent of discussion, the willingness to discuss difficult and controversial topics and arrive at creative interpretation and solutions for experiments to address somewhat dogmatic areas of science, the organizers felt that this meeting was successful and significantly contributed to advancing the field of comparative mycobacteriology and comparative pathology with the ultimate goal of better understanding human diseases caused by mycobacterial pathogens.

Based on the uniformly positive feedback and suggestions (written survey distributed at the meeting) we are already planning the next “Many Hosts of Mycobacteria” meeting for next year, to be held at the former US Leper Colony in Carville, LA, and are hoping to approach ORD for continued co-funding of this successful symposium series.

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