Lung infections

Nicholas Carbonetti (ncarbone@umaryland.edu):

Dr. Carbonetti studies the pathogenesis of infection and disease caused by *Bordetella pertussis*, the agent of the respiratory disease pertussis (whooping cough). His lab uses a combination of animal models and in vitro approaches to investigate this host-pathogen interaction, with an emphasis on the host response. Current projects include: (i) investigation of the role of type I interferons in lung inflammatory pathology; (ii) determining the mechanism of action and therapeutic potential of sphingosine-1-phosphate receptor-targeted drugs in reducing pertussis-induced lung pathogenesis; and (iii) investigation of pertussis pathogenesis in neonatal mouse models and age-dependent protective host responses.

Highlighted Publications:

Links:

**Alan Cross** ([across@som.umaryland.edu](mailto:across@som.umaryland.edu)):

Dr. Cross’ research focuses on the study of sepsis, including: (1) development of vaccines to prevent sepsis including development of multivalent vaccines for *P. aeruginosa*, *Klebsiella* and *E. coli* that progressed to phase 1 testing in human subjects; (2) study of glycobiology and sialic acid turnover as a druggable mechanism in innate host response and sepsis; (3) mechanisms of anthrax infection; (4) targeting the CD28/B7 axis to treat sepsis; and (5) mechanisms of Gram-negative bacterial sepsis.

**Highlighted Publications:**

Links: Faculty webpage: http://www.medschool.umaryland.edu/profiles/Cross-Alan/

Jeffrey Hasday (jhasday@som.umaryland.edu):

The Hasday lab has focused on how febrile-range hyperthermia and hypothermia modify biological processes relevant to disease pathogenesis with emphasis on acute lung injury/ARDS and fibrosis. Using approaches that span structural biology, gene and protein expression, cell culture, animal models and human trials, the Hasday laboratory has shown that hyperthermia worsens and hypothermia improves lung injury by modifying endothelial permeability, neutrophil recruitment, epithelial injury, and cytokine and heat shock protein expression. Dr. Hasday is expanding on his open-label trial of therapeutic hypothermia in ARDS by currently conducting a randomized clinical trial of hypothermia vs. standard temperature management in patients with ARDS. The p38 MAP kinase pathway appears to be a major contributor to the temperature-dependence of endothelial barrier function and expression of pro-inflammatory cytokines. The Hasday laboratory is following up on exciting data showing that the structure and function of p38alpha, the proinflammatory p38 family member, but not p38beta is temperature-dependent in the 33° to 39°C range. Finally, the Hasday laboratory in collaboration with Dr. Paul Shapiro in the School of Pharmacy is designing novel p38alpha inhibitors that target the substrate binding domain rather than the catalytic domain of p38alpha. These novel compounds modify rather than inactivate its downstream signaling, are superior to conventional catalytic p38 inhibitors in
preclinical testing, and are being developed into potential new drugs to treat ARDS and other inflammatory diseases. Dr. Hasday also directs the University of Maryland Cytokine Core Laboratory (www.cytokines.com).

Highlighted Publications:


Links:
Med School faculty page: http://www.medschool.umaryland.edu/profiles/Hasday-Jeffrey/