

University of Maryland Baltimore Graduate School

Announcement of Doctoral Dissertation Defense*

Candidate: Charlotte Andreasen

Date, Time, and Place: 05/01/2008, 10 am, HSFII Auditorium

Dissertation Title: The Effect of Pertussis Toxin on the Innate Immune Response to *Bordetella pertussis*.

Dissertation Abstract**:

Bordetella pertussis is a small Gram-negative bacterium that infects the human respiratory tract and causes the disease pertussis. *B. pertussis* binds to ciliated cells in the trachea and proliferates within the upper and lower respiratory tract, where several toxins are released. Pertussis toxin (PT), produced exclusively by *B. pertussis*, and adenylate cyclase toxin (ACT) are important virulence factors of *B. pertussis*; however, their complete role(s) during infection is not yet clear. Our studies showed that PT inhibits early neutrophil recruitment to the lung tissue (d1) and airways (d1-2) in response to infection with 5×10^5 CFU of *B. pertussis* by inhibiting the early production of neutrophil-attracting chemokines (6 hrs). However, at the peak of infection, a strong inflammatory Th1/Th17 response is produced, in part by PT and ACT activity. The production of IL-17 results in induction of chemokine production as well as neutrophil recruitment to the airways. Neutrophil depletion experiments suggested that neutrophils are not important in response to *B. pertussis* in naïve mice. However, in an immune mouse model, neutrophils played a role in controlling the infection. Furthermore, in contrast to findings in naïve mice, neutrophils appear to be the main target for ACT activity in immune mice, suggesting that *B. pertussis* may have evolved to evade immune responses in previously infected (or vaccinated) individuals.

Dissertation Committee Chair (name and title): Nicholas Carbonetti, Ph.D

Dissertation Committee Members (names and titles): Stefanie Vogel, Ph.D
Suzana Radulovic, MD, Ph.D
Eileen Barry, Ph.D
Ann Jerse, Ph.D

**The Open Presentation is open to the university community and invitees of the candidate. Any member of the Graduate Faculty may observe the Final Examination. Only committee members may vote. For more information, see [Procedures for Examination of the Doctoral Dissertation](#).*

***You must type your abstract on this form in the space provided.*

Updated: February 24, 2006