CAMB 705-301 Course Title: Advanced Topics in Bacterial-Host Interactions

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Course Description: This course will delve into specific topics in general area of bacterial pathogenesis and bacteria-host interactions. We will exploring key historical and current papers on topics related to bacterial invasion of and replication within host cells, bacterial interference with host cell signaling pathways, bacterial interactions with host mucosal tissues, and the role of bacterial colonization in shaping and instructing host immune responses. Each week, a student will lead the class in the discussion of published papers on a specific topic. The format of each class will be a 10-15-minute introduction of the key background and underlying questions to be presented by the student, followed by an in-depth analysis by all members of the class of one to two articles. Students will be graded based on their introductory presentation and active participation in the paper discussions.

Prerequisites: Strong background in cell biology, immunology and/or bacteriology fulfilled by 1st yr CAMB (previous BGS courses). Course is limited to 2nd-3rd year graduate students or advanced undergraduates with course director’s permission.

The class will meet once per week on Wednesdays from 3:30-5pm, and will discuss 1-2 key papers for each topic, as well as relevant background.

Topics to be discussed:

(1) bacterial invasion of host cells
(2) bacterial secretion systems: intra-kingdom communication devices
(3) Life within the cell Part I: bacterial manipulation of membrane trafficking pathways
(4) Life within the cell Part II: bacterial survival within the host cell cytosol
(5) Bacterial-Host Immune Response part I: Bacterial engagement of host innate immune receptors (TLRs)
(6) Bacterial-Host Immune Response part II: Bacterial engagement of cytosolic receptors
(7) Bacterial evasion of TLR signaling
(8) Bacterial evasion of NLR signaling
(9) Bacterial-Host interactions: Mucosal immunity and the microbiota