

# **MICB 408: Advanced Bacterial Pathogenesis**

**Instructors: Dr. Erin Gaynor and Dr. Charles Thompson**

**Days/Time: MWF 11-12**

**Location: LSC 1410**

(\*note that this class will **NOT** be held in IRC4 as originally scheduled)

MICB 408 covers important and cutting-edge topics in the field of bacterial pathogenesis. The course is composed of seven “modules” with a range of sub-topics. In order to teach the most current themes and emerging concepts in the field, we will utilize the required textbook, as well as timely review articles and primary research publications. Readings will be released at the beginning of each module.

## **Tentative Course Outline**

<b>Module</b>	<b>Name and Topics</b>
1	Cell biology of bacteria as it pertains to pathogenesis <ul style="list-style-type: none"><li>• Secretion systems</li><li>• Flagella and motility</li><li>• The bacterial cytoskeleton</li><li>• Metabolism</li></ul>
2	Regulation of virulence factors <ul style="list-style-type: none"><li>• Global regulators</li><li>• Stringent response</li><li>• Bistability/non-genetic variation</li><li>• Biofilms</li><li>• Interbacterial signaling/quorum sensing</li><li>• Bacterial toxins/antitoxins</li></ul>
3	Antibiotics <ul style="list-style-type: none"><li>• Discovery</li><li>• Targets</li><li>• Resistance</li><li>• Persistence</li><li>• Cell death triggered by antibiotics</li></ul>

- 4 Challenging the dogmas
  - The *Helicobacter pylori* story: from ulcers to asthma
  - Fundamental processes: the importance of bacterial shape in pathogenesis
  - Type VI secretion and inter-bacterial warfare
  - Small RNAs and riboswitches modulating virulence
  
- 5 Cellular microbiology
  - Cell death pathways: necrosis, apoptosis, pyroptosis
  - Autophagy
  - Toxin trafficking
  
- 6 Mechanisms of host defense and bacterial evasion
  - Commensals/symbionts
  - Host antibacterials
  - Resistance/Persistence
  
- 7 Newly appreciated microbe and host interactions contributing to health and disease
  - Human microbiome
  - Evolution of bacterial pathogenicity