



Channing Microbiome Seminar

December 1st (Friday), 2017, 11am @ 5th-floor conference room



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Nose Picking for Progress: Mining the Nasal Microbiome for New Insights into Pathobionts

The human microbiome is a rich, untapped source of discoveries that will generate new ways to prevent and treat disease. In the Lemon Lab, we focus on making discoveries that will lead to new microbiome-targeted and -derived approaches to manage the microbiome to prevent infections caused by *Staphylococcus aureus* and *Streptococcus pneumoniae*. We do this by elucidating the molecular mechanisms of interactions between these two species and harmless commensals. Both *S. aureus* and *S. pneumoniae* are common members of the nasal microbiome as well as important causes of infection, particularly in children and elders. People with either of these bacteria in their nose are at higher risk of infection and research implicates harmless nasal bacteria as influencing the likelihood that these infection-causing bacteria will reside in the nose. In the Lemon Lab, we focus on identifying molecular mechanisms by which harmless nasal bacteria interact with *S. aureus* and *S. pneumoniae* in order to identify bacteria and compounds that can inhibit or control these infection-causing bacteria. To do this, we use a multi-disciplinary approach, merging classical molecular biology, transcriptional and next-generation sequencing techniques with chemical and computational biology to identify genes and molecules that help shape the microbiome. Dr. Lemon is also a practicing Pediatric Infectious Diseases physician and clinical needs are a key motivator of research in her lab.

*Bio: Dr. Katherine P. Lemon is a physician-scientist trained in basic bacterial research. She received a Ph.D. in biology from the Massachusetts Institute of Technology where, under the mentorship of Dr. Alan Grossman, she studied chromosome replication in the gram-positive model organism *Bacillus subtilis*. After receiving an M.D. from Harvard Medical School, Dr. Lemon completed a pediatric residency and a fellowship in Pediatric Infectious Diseases at Boston Children's Hospital, where she is currently an Attending Physician in Infectious Diseases. After her clinical training, she did mentored research with Dr. Roberto Kolter at Harvard Medical School, where she initially focused on elucidating the molecular mechanisms of single species biofilm formation by *Listeria monocytogenes*. While working with Dr. Kolter and the other scientists in his lab, she became fascinated by the interspecies interactions that might occur in the microbial communities that are at home on humans. Building on this experience and her clinical expertise in infectious diseases, she and members of her lab at the Forsyth Institute in Cambridge, MA now explore the bacterial microbiota of the human nose and adjacent habitats. The Lemon Lab investigates interactions that occur between benign and/or beneficial members of the human microbiome and the important pathogens *Staphylococcus aureus* and *Streptococcus pneumoniae*. Lemon Lab Website: <https://forsyth.org/lab/lemon>*

Hosted by Yang-Yu Liu