UCDAVIS HEALTH | SCHOOL OF MEDICINE

Medical Microbiology & Immunol
MMI 291 Seminar Series
Emerging Challenges in Microbiology and Immunol

MMI 291 Seminar Series

Current Theme: Interdisciplinary Research
Spring Quarter 2022 – CRN 51421

Friday Seminar – 12:10-1 PM

"Heterogeneity of Discrete Biogeographical Nutrient-Niches Dictate Intestinal Microbial Homeostasis"

Research / Bio

The gut microbiota is comprised of trillions of diverse and densely populated microbial species. The coexistence of these microbial species requires many different nutrient niches not only support microbial diversity, but also limit overgrowth of any particular species. However, foodborne pathogens, like *Salmonella enterica* serovar Typhimurium, overcome this competitive environment by triggering sweeping physiological changes to establish new niches for outgrowth. Here, we present novel evidence that nutrient-niches in the gut are subdivided into discrete host cell-derived microhabitats. We use *Salmonella* and *E. coli*, to show how 1. different bacteria exhibit biogeographical localization to these distinct luminal nutrient-niches and 2. pathogens modulate the host to promote pro-inflammatory landscapes and outcompete commensal microbial members. Overall, we provide evidence that the host limits access to valuable host-derived nutrients by subdividing availability of these critical resources into discrete biogeographical niches. This heterogeneity of nutrient-niches maintains microbial homeostasis in the large gut and generates new niche opportunities for distinct bacterial species.

Publications

Liou MJ. *Host cells subdivide nutrient-niches into discrete biogeographical microhabitats for gut microbes.* (Manuscript accepted in principle to Cell Host Microbe)

Liou MJ. *The longitudinal and cross-sectional heterogeneity of the intestinal microbiota. Current Opinion in Microbiology*. 2021 Aug 21. 63: 221-230, doi: 10.1016/j.mib.2021.08.004.

Liou MJ. *Anaerobic Respiration of NOX1-Derived Hydrogen Peroxide Licenses Bacterial Growth at the Colonic Surface*. Cell Host Microbe. 2020 Dec 9;28(6):789-797.e5. doi: 10.1016/j.chom.2020.10.009. PMID: 33301718.

Liou MJ. *Commensal Enterobacteriaceae Protect against Salmonella Colonization through Oxygen Competition.* Cell Host Microbe. 2019 Jan 9;25(1):128-139.e5. doi: 10.1016/j.chom.2018.12.003. PMID: 30629913.

May 13

Megan Liou
Ph.D. Scholar
Biochemistry, Molecular, Ce
and Development Biology Gradu

May 13, 202
12:10 – 1 PM
ZOOM Meetin

Medical Microbiol
& Immunology
School of Medicin

Seminar Contact:
Autumn Vega
530-752-9401
advega@ucdavis.e

We hope to see you t