



MMI 291 Seminar Series

Current Theme: Interdisciplinary Research

Spring Quarter 2021 – CRN 51367

Friday Seminar – 12:10-1 p.m.



“How Cholera toxin promotes pathogen acquisition of host-derived nutrients”

Research / Bio

Dr. Fabian Rivera-Chavez' lab is interested in understanding how microbial toxins modulate host-microbe metabolism to promote pathogen transmission during infection. We use animal models of disease coupled with bacterial and host genetics to study the molecular mechanisms of toxin-mediated pathogen growth and transmission. We have previously discovered that cholera toxin produced by the human enteric pathogen *Vibrio cholerae*, modulates host-pathogen metabolism, and creates a novel nutrient niche in the gut that promotes the explosive growth of the pathogen during infection. However, the molecular mechanisms by which cholera toxin modulates host cell metabolism and pathogen growth are not fully understood. We are interested in continuing to investigate how cholera toxin-induced disease modulates intestinal metabolism to confer a fitness advantage to *Vibrio cholerae* during infection and how these processes enhance the transmission of the pathogen during outbreaks. We are also interested in learning whether other microbial toxins also modulate host-microbe metabolism and pathogen growth. Our research may shed light into the development of novel and cost-effective therapeutics for treating and preventing infectious diseases

Publications

Rivera-Chávez F, Mekalanos JJ. *Cholera toxin promotes pathogen acquisition of host-derived nutrients*. *Nature*. 2019 Aug;572(7768):244-248. doi: 10.1038/s41586-019-1453-3. Epub 2019 Jul 31. PMID: 31367037; PMCID: PMC6727848.

Rivera-Chávez F, Zhang LF, Faber F, Lopez CA, Byndloss MX, Olsan EE, Xu G, Velazquez EM, Lebrilla CB, Winter SE, Bäumlér AJ. *Depletion of Butyrate-Producing Clostridia from the Gut Microbiota Drives an Aerobic Luminal Expansion of Salmonella*. *Cell Host Microbe*. 2016 Apr 13;19(4):443-54. doi: 10.1016/j.chom.2016.03.004. PMID: 27078066; PMCID: PMC4832419.

Rivera-Chávez F, Lopez CA, Zhang LF, García-Pastor L, Chávez-Arroyo A, Lokken KL, Tsois RM, Winter SE, Bäumlér AJ. *Energy Taxis toward Host-Derived Nitrate Supports a Salmonella Pathogenicity Island 1-Independent Mechanism of Invasion*. *mBio*. 2016 Jul 19;7(4):e00960-16. doi: 10.1128/mBio.00960-16. PMID: 27435462; PMCID: PMC4958259.

April
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Fabian Rivera-Chavez, PhD
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April 2, 2021
12:10 – 1 p.m.
ZOOM Meeting

Medical Microbiology
& Immunology
School of Medicine

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We hope to see you there!