

Genetics Grad Group Seminar

Monday, June 5, 2017

4:10 p.m. – 5:00 p.m.

LSA 1022

Dr. Christopher Mason

Associate Professor, Cornell University

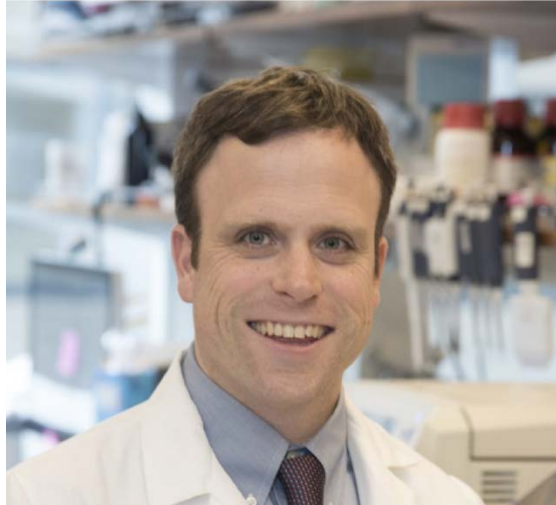
TEDMED Speaker

“Single-cell, City-scale, and Inter-planetary Genomics”

The avalanche of easy-to-create genomics data has impacted almost all areas of medicine and science, from cancer patients and microbial diagnostics to molecular monitoring for astronauts in space. Recent technologies and algorithms from our laboratory and others can now show single-cell and clonal resolution of phenotypes as they evolve and resist therapies, which manifest at the genome, epigenome, transcriptome, and epitranscriptome levels. To contextualize these molecular dynamics, we are piloting new methods across the central dogma (DNA, RNA, protein), including an integrative, cross-kingdom view of patients (precision metagenomics) and global citizen science projects that leverage longitudinal metagenome and microbiome profiles of the world's urban systems (MetaSUB.org) to map global dynamics of antimicrobial resistance (AMR) markers. All of these methods and molecular tools work together to guide the most comprehensive, longitudinal, multi-omic view of human physiology in the NASA Twins Study and the NASA Biomolecule Sequencer Mission, creating new technologies that can sequence, quantify, and engineer nucleic acids and entire genomes for long-term human space travel.

Host: Huaijun Zhou (hzhou@ucdavis.edu)

(If you would like to meet with the speaker, please contact the host)



Dr. Christopher Mason completed his dual B.S. in Genetics and Biochemistry from University of Wisconsin-Madison (2001), his Ph.D. in Genetics from Yale University (2006), and then completed his dual post-doctoral training at Yale Medical School in genetics and a fellowship at Yale Law School (2009). He is currently an Associate Professor at Weill Cornell Medicine, with appointments at the Tri-Institutional Program on Computational Biology and Medicine between Cornell, Memorial Sloan-Kettering Cancer Center and Rockefeller University, the Sandra and Edward Meyer Cancer Center, and

the Feil Family Brain and Mind Research Institute.

The Mason laboratory develops and deploys new biochemical and computational methods in functional genomics to elucidate the genetic basis of human disease and human physiology. They create novel techniques in next-generation sequencing and algorithms for: tumor evolution, genome evolution, DNA and RNA modifications, and genome/epigenome engineering. They work closely with NIST/FDA to build international standards for these methods, to ensure clinical-quality genome measurements/editing. They also work with NASA to build integrated molecular portraits of genomes, epigenomes, transcriptomes, and metagenomes for astronauts, as well as pioneered new genetic diagnostics on the International Space Station, which all help establish the molecular foundations and genetic defenses for enabling long-term human space travel.

Dr. Mason has won the NIH's Transformative R01 Award, the Pershing Square Sohn Cancer Research Alliance Young Investigator award, the Hirschl-Weill-Caulier Career Scientist Award, the Vallee Foundation Scholar Award, the CDC Honor Award for Standardization of Clinical Testing, and the WorldQuant Foundation Research Scholar Award. He was named as one of the "Brilliant Ten" Scientists by Popular Science, featured as a TEDMED speaker, and called "The Genius of Genetics" by 92Y. He has >130 peer-reviewed papers that have been featured on the covers of Nature, Science, Cell Host and Microbe, Nature Biotechnology, Nature Microbiology, and Neuron, and cited by U.S. District Courts and U.S. Supreme Court. His work has also appeared on the covers of the Wall Street Journal, the LA Times, TIME, the New York Times, and many media (ABC, NBC, CBS, Fox, CNN, PBS, NASA, NatGeo). He has co-founded three biotechnology start-up companies and serves as an advisor to many others.