

Center for the Study of Inflammatory Bowel Disease (CSIBD) and the  
Center for Computational and Integrative Biology (CCIB)  
Co-host: Center for Microbiome Informatics and Therapeutics at MIT  
28<sup>th</sup> Annual Workshop

**Molecules, Machines, and Medicines**  
**November 9 – 10, 2018**

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**November 9, 2018**

7:30 – 8:00 Registration and Continental Breakfast  
Opening Remarks  
Ramnik J. Xavier, M.D., Director, CSIBD

**Session I:** Moderators: Kate Jeffrey, Ph.D. and Hans-Christian Reinecker, M.D.

8:00 – 8:25 ***Mechanotherapeutics: Targeting Mechanical Signaling Pathways in Fibrosis***  
David Lagares, Ph.D., Massachusetts General Hospital, Boston, MA

8:25 – 8:50 ***Long noncoding RNAs regulating liver fibrosis***  
Alan Mullen, M.D., Ph.D., Massachusetts General Hospital, Boston, MA

8:50 – 9:15 ***Antigen Discovery and Specification of Immunodominance Hierarchies for MHCII-Restricted Epitopes***  
Daniel Graham, Ph.D., Broad Institute of MIT and Harvard, Cambridge, MA

9:15– 9:40 ***De novo peptide design for targeted therapeutic applications***  
Gaurav Bhardwaj, Ph.D., University of Washington, Seattle, WA

9:40 – 9:55 **BREAK**

**Session II:** Moderators: Cox Terhorst, Ph.D. and Ursula Weiss, Ph.D.

9:55 – 10:20 ***Inflammatory tuning of epithelial stem cells***  
Shruti Naik, Ph.D., New York University, New York, NY

10:20 – 10:45 ***De-Orphanizing Olfactory Receptors***  
Hiroaki Matsunami, Ph.D., Duke University School of Medicine, Durham, NC

10:45 – 11:10 ***Protection of immunological memory during nutritional stress***  
Yasmine Belkaid, Ph.D., NIH: National Institute of Allergy and Infectious Diseases, Bethesda, MD

11:10 – 11:35 ***Development of CRISPR-Cas Systems for Genome Editing***  
Feng Zhang, Ph.D., Broad Institute of MIT and Harvard, Cambridge, MA

11:35 – 12:35

**LUNCH**

**Session III:**

Moderators: Thaddeus Stappenbeck, M.D., Ph.D. and Andrew Chan, M.D.

12:35 – 1:00

***3D intact-tissue sequencing of single-cell transcriptional states***

Xiao Wang, Ph.D., Stanford University, Stanford, CA

1:00 – 1:25

***Machine Learning on Molecules: Predicting Mass Spectra and Perceptual Qualities of Small Organic Molecules***

Alex Wiltschko, Ph.D., Google Brain, Cambridge, MA

1:25 – 1:50

***Understanding the histology and genetic of complex disease with random composite experiments***

Brian Cleary, Broad Institute of MIT and Harvard, Cambridge, MA

1:50 – 2:15

***Interpretable deep learning to decipher the dynamic gene regulation***

Anshul Kundaje, Ph.D., Stanford University, Stanford, CA

2:15 – 2:40

***Development and functions of resident macrophages***

Frederic Geissmann, M.D., Ph.D., Memorial Sloan Kettering Cancer Center, New York, NY

2:40 – 2:55

**BREAK**

**Session IV:**

Moderators: Atul Bhan, M.D. and Gail Hecht, M.D.

2:55 – 3:20

***Phenotypic screening for small molecules in the gut microbiome***

Jon Clardy, Ph.D., Harvard Medical School, Boston, MA

3:20 – 3:45

***Disentangling host and microbiome contributions to drug metabolism***

Andrew Goodman, Ph.D., Yale University, New Haven, CT

3:45 – 4:10

***Using cell atlases as maps for human disease***

Aviv Regev, Ph.D., Broad Institute of MIT and Harvard, Cambridge, MA

4:10 – 4:35

***Role of serum amyloid A proteins in Th17-mediated inflammation***

Dan Littman, M.D., Ph.D., New York University, New York, NY

4:35 – 5:00

***Plant chemistry in the molecular diet***

Elizabeth Sattely, Ph.D., Stanford University, Stanford, CA

## **November 10, 2018**

7:30 – 8:00 Registration and Continental Breakfast

**Session V:** Moderators: Theresa Pizarro, Ph.D. and Charles Elson, M.D.

8:00 – 8:25 ***ST2\* tissue Tregs regulate innate immune responses at mucosal barriers***  
Andrew Luster, M.D., Ph.D., Massachusetts General Hospital, Boston, MA

8:25 – 8:50 ***Myeloid Cells in Cancer***  
Mikael Pittet, Ph.D., Massachusetts General Hospital, Boston, MA

8:50 – 9:15 ***Tuft cells in type 2 immunity***  
Richard Locksley, M.D., University of California San Francisco, San Francisco, CA

9:15 – 9:40 ***Microglial impact in neurodegeneration***  
Marco Colonna, M.D., Washington University School of Medicine in St. Louis, St. Louis, MO

9:40 – 9:55 **BREAK**

**Session VI:** Moderators: Shiv Pillai, M.D., Ph.D., and Balfour Sartor, M.D.

9:55 – 10:20 ***Role of microbial signals in myeloproliferative disease***  
Bana Jabri, M.D., Ph.D., The University of Chicago, Chicago, IL

10:20 – 10:45 ***De novo mutations in microbiomes***  
Tami Lieberman, Ph.D., MIT, Cambridge, MA

10:45 – 11:10 ***Bacterial modifications of bile acids alter host physiology***  
Sloan Devlin, Ph.D., Harvard Medical School, Boston, MA

11:10 – 11:35 ***Rules that govern the gut microbiome in health and disease***  
Eric Alm, Ph.D., MIT, Cambridge, MA

11:35 – 12:05 ***Discussion***

12:05 – 1:05 **LUNCH**

***Simches Research Building at Charles River Plaza  
185 Cambridge Street, 3<sup>rd</sup> floor  
The Workshop is open to the research community at no charge  
To register, please e-mail [CSIBDworkshop@partners.org](mailto:CSIBDworkshop@partners.org)***