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Publications of the Week

Comprehensive Characterization of Amino Acid Positions in Protein Structures Reveals Molecular Effect of Missense Variants

First Author: Sumaiya Iqbal *(pictured)* | Senior Author: Dennis Lal
PNAS | Broad Institute

The authors performed a wide-scale characterization of missense variants from 1,330 disease-associated genes using >14,000 protein structures. They identified 3D features associated with pathogenic and benign variants that unveiled the mutations' effect at the molecular level. They further extended their analysis to account for the different essential structural regions in proteins performing different functions. **Abstract**

Chromatin Potential Identified by Shared Single-Cell Profiling of RNA and Chromatin

First Author: Sai Ma | Senior Author: Jason Buenrostro *(pictured)*
Cell | The Broad Institute, the Koch Institute, and Harvard University

The authors developed simultaneous high-throughput ATAC and RNA expression with sequencing, a highly scalable approach for measurement of chromatin accessibility and gene expression in the same single cell, applicable to different tissues. Using 34,774 joint profiles from mouse skin, they developed a computational strategy to identify *cis*-regulatory interactions and define domains of regulatory chromatin that significantly overlap with super-enhancers. **Abstract**

Intestinal Organoid/Enteroid-Based Models for *Cryptosporidium*

First Author: Seema Bhalchandra | Senior Author: Honorine Ward *(pictured)*
Current Opinion in Microbiology | Tufts Medical Center

Cryptosporidium is a leading cause of diarrhea and death in young children and untreated AIDS patients in resource-poor settings, and of waterborne outbreaks of disease in developed countries. New advances in organoid/enteroid technology have contributed to improved platforms to culture and propagate *Cryptosporidium*. The authors discuss recent breakthroughs in the field and highlight different models for functional *ex vivo* organoid or enteroid-derived culture systems. **Abstract**

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Awards

Harvard Medical School Awards & Recognitions: November 2020

Harvard Medical School (HMS)

Dr. Catherine Wu *(pictured)* is among the fifteen HMS researchers to receive supplemental grants from the Chan Zuckerberg Initiative to expand the Human Cell Atlas, a global effort to map every cell in the human body. See which other HMS faculty, staff and students received honors in HMS' November award summary. **Read More**

Neuro-Immune Interactions Award for Dr. Xiqun Chen

Massachusetts General Hospital

Dr. Xiqun Chen *(pictured)*, Assistant Professor of Neurology at Mass General, has received a $6M Neuro-Immune Interactions award from the Aligning Science Across Parkinson's (ASAP) Collaborative Research Network, a program of the ASAP's initiative being implemented through the Michael J. Fox Foundation. Chen and her team received the award for their study, "From Cancer Associations to Altered Immunity in the Pathogenesis of Parkinson's Disease." **Read More**

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Local News

Scientists Sequence Genomes of 240 Animals to Understand Evolution at DNA Level

UMass Med News

A multidisciplinary team of scientists led by Dr. Elinor Karlsson, Associate Professor of Molecular Medicine at UMass Medical School, has captured biodiversity at a genetic level. By sequencing the genome of 240 mammalian species, 122 of which had never been sequenced, the researchers identified a correlation between regions of reduced genetic diversity in species with a higher risk extinction. **Read More**

Boston Children's Hospital and Deerfield Join Forces to Accelerate the Development of Novel Therapies to Patients

Business Wire

Boston Children's Hospital, which has the largest National Institutes of Health-funded pediatric research enterprise in the United States, and Deerfield Management Company, a healthcare investment firm, have announced a major research collaboration to advance promising therapeutics that will address unsolved medical needs and find cures for disease. **Read More**

Single-Cell Study of Ebola Highlights Virus' Lethal Maneuvers

Broad Institute

Ebola virus is one of the world's deadliest pathogens, and scientists now report new details of how the virus alters the host immune response for its own benefit during infection. A collaborative study co-led by researchers at the Broad Institute has identified antiviral defense genes that the virus suppresses, and other genes the virus activates to potentially boost its replication in cells. **Read More**

Reaching the Final Stage: Antibody Evolution in COVID-19 Response

Ragon Institute

For COVID-19, the difference between surviving and not surviving severe disease may be due to the quality, not the quantity, of the patients' antibody development and response. The study from Ragon Member Dr. Galit Alter used her systems serology approach to profile the antibody immune responses of 193 hospitalized COVID-19 patients, comparing responses from patients with moderate and severe disease and patients who passed away from COVID-19. **Read More**

A Viable Vaccine for Tough Tumors

Wyss Institute

A new, best-of-both-worlds approach developed by researchers at the Wyss Institute and Harvard's School of Engineering and Applied Sciences packages the cancer-killing power of chemotherapy and the long-term efficacy of immunotherapy into a biomaterial-based cancer vaccine that can be injected adjacent to a tumor site. **Read More**

Study Reveals How Premature Menopause Increases Risk of Cardiovascular Disease

Massachusetts General Hospital

Menopause that occurs before a woman is 40 years old accelerates aging and is a risk factor for cardiovascular disease. New research led by investigators at Massachusetts General Hospital reveals women with such premature menopause often exhibit certain blood cell changes that elevate their risk of developing coronary artery disease. **Read More**

Researchers Model How Novel Coronavirus Causes Severe Symptoms of COVID-19

Beth Israel Deaconess Medical Center

A new study led by scientists at Beth Israel Deaconess Medical Center sheds more light on how molecules of the immune and vascular systems interact to produce extensive damage to the lung and vascular tissues seen in patients with severe COVID-19. The team's findings help define the pathways by which the illness induces vascular disease and also point to potential therapeutic targets in the complement, coagulation and inflammatory pathways. **Read More**

Investigators Discover Unique Immune Cells in Patients with Checkpoint Inhibitor-Induced Arthritis

Hospital for Special Surgery

A study from the Rao lab *(pictured)* at Brigham and Women's Hospital, in collaboration with the Hospital for Special Surgery in New York, has found that the synovial fluid and blood of people experiencing checkpoint inhibitor-induced arthritis is populated by a type of T cells rarely seen in people with other types of inflammatory arthritis. **Read More**

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Upcoming Events in Boston

November 17-18, 9:00 AM — **Future Labs Live USA 2020**
Online

November 18, 10:00 AM — **MIT Neurotech 2020**
Online

November 18, 12:00 PM — **Webinar: Investigating Cellular Pathways Driving Severe COVID-19: Fresh Insights from Longitudinal Plasma Proteomics**
Online

November 18, 4:00 PM — **BU Research on Tap: Diverse Approaches to Understanding and Controlling COVID-19**
Online

November 19, 12:00 PM — **Dana Farber Targeted Protein Degradation Seminar: Dan Nomura**
Online

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Science Jobs in Boston

Scientist, Bioinspired Therapeutics and Diagnostics
Wyss Institute

Senior Scientist, Assay Development
Sherlock Biosciences

Senior Associate Scientist, Oncology Research
Bluebird Bio

Principle Research Associate, Proteomics & Rare Disease
Moderna

Research Scientist 1, Pathology and High-Plex Imaging Assay Development
Broad Institute

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