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Publications of the Week

Temporal Single-Cell Atlas of Non-Neuronal Retinal Cells Reveals Dynamic, Coordinated Multicellular Responses to Central Nervous System Injury

First Authors: Inbal Benhar and Jiarui Ding *(pictured)* | Senior Authors: Joshua Sanes and Aviv Regev
Nature Immunology | The Broad Institute, Harvard University, Boston Children's Hospital, and Howard Hughes Medical Institute

The authors generated a single-cell atlas of immune, glial, and retinal pigment epithelial cells from adult mouse retina before and at multiple time points after axonal transection. They identified rare subsets in naive retina, including interferon-response glia and border-associated macrophages, and delineated injury-induced changes in cell composition, expression programs, and interactions. **Abstract**

The Conserved Histone Chaperone Spt6 Is Strongly Required for DNA Replication and Genome Stability

First Author: Catherine Miller *(pictured)* | Senior Author: Fred Winston
Cell Reports | Blavatnik Institute and Harvard University

Histone chaperones are an important class of proteins that regulate chromatin accessibility for DNA-templated processes. Spt6 is a conserved histone chaperone and key regulator of transcription and chromatin structure. However, its functions outside of these roles have been little explored. The authors demonstrate a requirement for *S. cerevisiae* Spt6 in DNA replication and, more broadly, as a regulator of genome stability. **Abstract**

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Awards

PhD Candidate Kathleen Morrill Receives Harold M. Weintraub Graduate Student Award

UMass Chan Medical School

UMass Chan Medical School PhD candidate Kathleen Morrill *(pictured)* is one of 12 recipients nationally selected for the 2023 Harold M. Weintraub Graduate Student Award. The Weintraub Award recognizes graduate students in the life sciences on the basis of the quality, originality, and significance of their work. Morrill was nominated for her research on the behavioral genomics of domestic dogs. **Read More**

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Local News

Designing More Useful Bacteria

Harvard Medical School

In a step forward for genetic engineering and synthetic biology, researchers have modified a strain of *Escherichia coli* bacteria to be immune to natural viral infections while also minimizing the potential for the bacteria or their modified genes to escape into the wild. The work promises to reduce the threats of viral contamination when harnessing bacteria to produce medicines such as insulin as well as other useful substances, such as biofuels. **Read More**

Molecular Component of Caffeine May Play a Role in Gut Health

Brigham and Women's Hospital

Some types of microorganisms are thought to contribute to the development of inflammatory conditions, such as inflammatory bowel disease, but the exact cascade of events that leads from microbes to immune cells to disease remains mysterious. A new study by investigators from Brigham and Women's Hospital explores exactly what leads to the generation of Th17 cells — an important subtype of cells in the intestine — and uncovers some of the underappreciated molecular players and events that lead to cell differentiation in the gut. **Read More**

Astrocyte Cells Critical for Learning Skilled Movements

The Picower Institute

From steering a car to swinging a tennis racket, we learn to execute all kinds of skilled movements during our lives. You might think this learning is only implemented by neurons, but a new study by researchers at the Picower Institute shows the essential role of another brain cell type: astrocytes. "This finding is part of a body of work from our lab and other labs that elevate the importance of astrocytes to neuronal encoding and hence to behavior," said senior author Dr. Mriganka Sur *(pictured)*. **Read More**

Normalizing Tumor Blood Vessels May Improve Immunotherapy Against Brain Cancer

Massachusetts General Hospital

A type of immune therapy called chimeric antigen receptor (CAR) T cell therapy has revolutionized the treatment of multiple types of blood cancers but has shown limited efficacy against glioblastoma — the deadliest type of primary brain cancer — and other solid tumors. New research by Dr. *Rakesh Jain (pictured)* and others at Massachusetts General Hospital suggests that drugs that correct abnormalities in a solid tumor's blood vessels can improve the delivery and function of CAR T cell therapy. **Read More**

Graft Sculpting Brings New Approach to Stem Cell Therapy for Highest Risk AML Patients

Dana-Farber Cancer Institute

A novel hematopoietic stem cell transplantation method utilizing 'graft sculpting' is being tested in a phase 1 clinical trial in patients with refractory acute myeloid leukemia (AML) or myelodysplastic syndrome who are at the highest risk of relapse after 'standard' transplants. "We're addressing a worst case, highest need scenario," says lead investigator Dr. John Koreth *(pictured)*. **Read More**

A 14-Year Incubation

Harvard Medical School

Dr. Sam Wattrus *(pictured)* came to Harvard as an undergraduate thinking he would study chemistry. But he took an introductory course in human developmental and regenerative biology when it was a new interdisciplinary concentration in the Faculty of Arts and Sciences. Now, 14 years after the concentration's creation, Dr. Wattrus finds himself in a full-circle moment — as the first alum to establish an independent lab. **Read More**

New Insights into ALS

Harvard Medical School

For physicians, scientists, and patients, neurodegenerative diseases, which affect millions of people in this country and hundreds of millions across the world, remain a formidable foe. Now, researchers in Dr. Isaac Chiu's *(pictured)* lab at Harvard Medical School and Boston Children's Hospital have identified proteins involved in the innate immune system that could be at the root of a range of neurodegenerative conditions. **Read More**

Mass General Researchers Discover the Role of Intestinal Fibrosis in Inflammatory Bowel Disease

Massachusetts General Hospital

Intestinal fibrosis is a common feature of inflammatory bowel disease (IBD) and the primary cause of end-stage organ failure. Traditionally considered a bystander of inflammation, with negligible involvement in disease pathogenesis, new research published in *Gastroenterology* now shows that fibrosis has a direct bearing on disease progression in IBD. The investigation was spearheaded by Dr. Nima Saeidi *(pictured)*. **Read More**

Collaboration Propels Research on Untreatable Neurodegenerative Disease

Harvard Medical School (HMS)

In 2018, Dr. Peter Park *(pictured)*, Professor of Biomedical Informatics in the Blavatnik Institute at HMS, reached out to his childhood friend and longtime colleague Dr. Tim Yu, HMS Associate Professor of Pediatrics at Boston Children's Hospital. Dr. Park's request was straightforward: Could Dr. Yu spare a lab bench to test an idea for a new therapy for frontotemporal dementia? **Read More**

A4 Study Results: Investigational Anti-Amyloid Treatment Started Before Alzheimer's Symptoms Did Not Slow Memory Loss

Brigham and Women's Hospital

Topline results were announced from an international clinical trial to prevent Alzheimer's disease symptoms led by Brigham and Women's Hospital physician investigator Dr. Reisa Sperling *(pictured)*. Preliminary results from a landmark clinical trial to prevent Alzheimer's disease (AD) symptoms show that an investigational anti-amyloid drug, solanezumab, did not demonstrate a statistically significant slowing of cognitive decline associated with AD when initiated prior to the stage of clinical impairment. **Read More**

UMass Chan Investigators Identify New Pattern Recognition System That Monitors Disease-Causing Bacteria in *C. elegans*

UMass Chan Medical School

A study published in *Immunity* by physician-scientist Dr. Read Pukkila-Worley *(pictured)* and MD/PhD students Nicholas Peterson and Samantha Tse describes a new manner of detecting microbial infection that intercepts pathogen-derived signals of growth to assess the relative threat of virulent bacteria. A nuclear hormone receptor in the nematode *C. elegans* senses a toxic metabolite produced by the bacterial pathogen *Pseudomonas aeruginosa* to activate innate immunity. **Read More**

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Upcoming Events in Boston

March 21 4:30 PM — **Biomedical Informatics Entrepreneurs Salon: Isaac Kohane and David Shaywitz** — Online

March 24 12:30 PM — **Cell Therapies for Parkinson's Disease: How Far Have We Come, and Where Are We Going?** — Online

March 29 4:00 PM — **How Small RNAs Regulate Genes – And Could Treat Disease** — Online

April 6 5:00 PM — **STEMCELL Technologies Career Open House** — STEMCELL Technologies

April 26 12:00 PM — **Is It Possible to Bioprint Human Hearts?** — Online

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