

### Publications of the Week

#### Cell Type-Specific Inference of Differential Expression in Spatial Transcriptomics

First Author: Dylan Cable | Senior Authors: Fei Chen (pictured) and Rafael Irizarry Nature Methods | MIT, The Broad Institute, Dana-Farber Cancer Institute, Brigham and Women's Hospital, and Harvard



The authors introduce a statistical method, cell type-specific inference of differential expression (C-SIDE), that identifies cell type-specific differential expression in spatial transcriptomics, accounting for localization of other cell types. They apply C-SIDE to identify plaque-dependent immune activity in Alzheimer's disease and cellular interactions between tumor and immune cells. [Abstract](#)

#### PD-L1 and PD-1 Expression in Pediatric Central Nervous System Germ Cell Tumors

First Author: Jared Woods | Senior Author: Sanda Alexandrescu (pictured) Modern Pathology | Boston Children's Hospital, Brigham and Women's Hospital, and Dana-Farber Cancer Institute



Central nervous system (CNS) germ cell tumors (GCTs) represent 2–3% of all primary CNS tumors. The majority are germinomas, which are radiosensitive and have an excellent prognosis. Contranily, CNS non-germinomatous GCTs (NGGCTs) have less favorable prognosis and require more aggressive treatment. The expression of checkpoint/immune markers in CNS GCTs, particularly NGGCTs, is unknown. [Abstract](#)

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### Awards

#### 2022 Loren E. Wold Research Award Recipients

Boston University Biology



Douglas Alvarado, Erika Broeker (pictured, right), Evelyn Harper (left), and Judy Wong are the recipients of the Loren E. Wold Research Award for 2022. This award supports summer research projects in the amount of \$5,700 for salary and a \$200 Conference Travel Award. Recipients are chosen based on outstanding applications to the Boston University Undergraduate Research Opportunities Program. [Read More](#)

#### Two Dana-Farber Faculty Members Receive Prestigious Award from the National Institutes of Health

Dana-Farber Cancer Institute



Two Dana-Farber Cancer Institute physician scientists are being recognized by the Foundation for the National Institutes of Health (FNIH) for their considerable contributions to cancer research and care. Drs. Eliezer Van Allen (pictured, left) and Nikhil Wagle (right) have been awarded the Trailblazer Prize for Clinician-Scientists. The Trailblazer Prize, and a \$5,000 honorarium, will be presented to Drs. Van Allen and Wagle at the 2022 FNIH Awards Ceremony. [Read More](#)

#### Maya Woolfolk Receives Gilliam Fellowship

Harvard Molecular and Cellular Biology



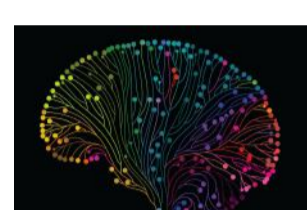
Maya Woolfolk (pictured), a PhD candidate in the lab of Dr. Hopi Hoekstra, has been awarded the 2022 Gilliam Fellowship for Advanced Study from the Howard Hughes Medical Institute. The Gilliam Fellowship is granted to students from populations underrepresented in science who have the promise to become leaders in their fields. [Read More](#)

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### Local News

#### Study Reveals Fentanyl's Effects on the Brain

Massachusetts General Hospital



Fentanyl is used to supplement sedation and to relieve severe pain during and after surgery, but it's also one of the deadliest drugs of the opioid epidemic. In research conducted by investigators at Massachusetts General Hospital, tests of the brain's electrical activity revealed fentanyl's effects over time and indicated that the drug stops people's breathing before other noticeable changes and before they lose consciousness. [Read More](#)

#### Humans of MGRI: Leidys Gutiérrez-Martínez

Bench Press



The Mass General Research Institute (MGRI) is home to a research community of 9,500+ individuals working to understand disease and develop solutions to medicine's most pressing challenges. But who are they and what do they do when they're not conducting research? This week, they speak with Dr. Leidys Gutiérrez-Martínez (pictured), a postdoctoral research fellow in the lab of Dr. Alessandro Biffi. [Read More](#)

#### Designing a Way to Make Oxygen Injectable

The Harvard Gazette



What if emergency medical personnel could treat a desperately ill patient in need of oxygen with a simple injection instead of having to rely on mechanical ventilation or rush to get them onto a heart-lung bypass machine? A new approach to transporting gases, from the lab of Dr. Jarad Mason (pictured), uses a class of materials called porous liquids and represents a big step toward artificial oxygen carriers. [Read More](#)

#### How the Brain Focuses on What's in Mind

The Picower Institute



Working memory, that handy ability to consciously hold and manipulate new information in the mind, takes work. In particular, participating neurons in the prefrontal cortex have to work together in synchrony to focus our thoughts, whether we're remembering a set of directions or tonight's menu specials. A new study by researchers based at the Picower Institute for Learning and Memory at MIT shows how that focus emerges. [Read More](#)

#### Researchers Expand and Upgrade the 1000 Genomes Project Resource

Broad Institute



Seven years ago, the 1000 Genomes Project (1kGP) published an open-access resource based primarily on low-coverage whole-genome sequencing data of 2,504 individuals from 26 populations representing five continental regions of the world, making it the first large-scale whole genome sequencing effort to deliver a catalog of human genetic variation. Now, researchers have expanded the 1kGP resource to include nearly all parent-child trios in the collection. [Read More](#)

#### Breaking and Entering

Harvard Medical School



In a first, scientists have captured on video all the steps a virus follows as it enters and infects a living cell in real time and in 3D. They achieved the feat by using advanced imaging called lattice light sheet microscopy as well as chemical and genetic manipulation. The findings provide new insights into the fundamental mechanics of viral infection and could point the way to new methods for intervening before the onset of COVID-19. [Read More](#)

#### Simple Animal Model Reveals How Environment and State Are Integrated to Control Behavior

The Picower Institute



A new study shows how stimuli and states such as smells, stressors, and satiety converge in an olfactory neuron to guide food-seeking behavior. "In this study, we dissected the mechanisms that control the levels of a single olfactory receptor in a single olfactory neuron, based on the ongoing state and stimuli the animal experiences," said senior author Dr. Steven Flavell (pictured). [Read More](#)

#### Using Machine Learning to Identify Undiagnosable Cancers

MIT News



A new deep-learning approach developed by researchers at the Koch Institute and Massachusetts General Hospital and led by Dr. Sallil Garg (pictured) may help classify cancers of unknown primary site by taking a closer look the gene expression programs related to early cell development and differentiation. [Read More](#)

#### Parasite Researchers Melt Down Proteins to Understand Their Roles in Infection

Whitehead Institute



Much like humans, plants, and bacteria, the single-celled parasite *T. gondii* uses calcium as a messenger to coordinate important cellular processes. But while the messenger is the same, the communication pathways that form around calcium differ significantly between organisms. "Since *Toxoplasma* parasites are so divergent from us, they have evolved their own sets of proteins that are involved in calcium signaling pathways," said Alice Heineisen (pictured), a graduate student at the Whitehead Institute. [Read More](#)

#### How the Brain Generates Rhythmic Behavior

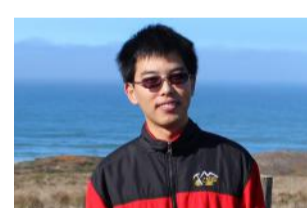
McGovern Institute



Many of our bodily functions, such as walking, breathing, and chewing, are controlled by brain circuits called central oscillators, which generate rhythmic firing patterns that regulate these behaviors. MIT neuroscientists, led by Dr. Fan Wang (pictured), have now discovered the neuronal identity and mechanism underlying one of these circuits: an oscillator that controls the rhythmic back-and-forth sweeping of tactile whiskers, or whisking, in mice. [Read More](#)

#### A Sensory Mystery

Harvard Medical School



A team led by Dr. Chen Ran (pictured) at Harvard Medical School has made new strides in understanding the basic biology of internal organ sensing, which involves a complicated cascade of communication between cells inside the body. In a study conducted in mice, the team used high-resolution imaging to reveal spatial maps of how neurons in the brain stem respond to feedback from internal organs. [Read More](#)

#### Microscopy Technique Reveals Hidden Nanostructures in Cells and Tissues

McGovern Institute



Inside a living cell, proteins and other molecules are often tightly packed together. These dense clusters can be difficult to image because the fluorescent labels used to make them visible can't wedge themselves in between the molecules. MIT researchers have now developed a novel way to overcome this limitation and make those "invisible" molecules visible. [Read More](#)

#### Researchers Use Single-Cell RNA-Sequencing to Better Understand Gut Inflammation Associated With Malnutrition

Ragon Institute



In a recent paper in *Science Translational Medicine*, researchers led by Dr. Conner Kummerlowe (pictured) used single-cell profiling to define the impact on the intestine of exposure to adverse environmental conditions in a disadvantaged community in Lusaka, Zambia. Their work provides a roadmap for future environmental enteropathy intervention studies. [Read More](#)

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### 📅 Upcoming Events in Boston

September 13 12:00 pm	<b>Finding Funding for Alzheimer's Disease Research: Meet BrightFocus Foundation</b> Online
September 15 - 16 8:00 am	<b>Forsyth Dentech 2022</b> Forsyth Institute and Online
September 15 12:30 pm	<b>2022 Patient Advocacy Summit</b> MassBioHub & Online
September 20 10:00 am	<b>Precision Medicine 2022: The New "Normal"?</b> Joseph B. Martin Conference Center & Online
September 20 2:30 pm	<b>Women in Medicine and Science Symposium</b> Brigham and Women's Hospital

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### 📁 Science Jobs in Boston

- Field Application Scientist, Primary and Cultured Cells**  
STEMCELL Technologies
- Scientific Inside Sales Representative**  
STEMCELL Technologies
- Postdoctoral Associate**  
The Broad Institute
- Immunology/Cancer Immunology Research Fellow**  
Dana-Farber Cancer Institute
- Research Assistant II, Neurodegenerative and Infectious Disease Biomarkers**  
Harvard University

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