

Publications of the Week

Functionally Uncoupled Transcription–Translation in *Bacillus subtilis*

Co-First Author: Grace Johnson (pictured, front row, second from right) | Co-First Author: Jean-Benoit Lalanne (back row, third from left) | Senior Author: Gene-Wei Li (back row, left) | Nature | MIT



It remains unclear whether transcription–translation coupling — a defining feature of bacterial gene expression — is indeed a fundamental characteristic of bacteria other than *Escherichia coli*. The authors showed that RNA polymerases (RNAPs) outpace pioneering ribosomes in the Gram-positive model bacterium *Bacillus subtilis*, and that this ‘runaway transcription’ creates alternative rules for both global RNA surveillance and translational control of nascent RNA. [Profile](#) | [Abstract](#)

Ultra-Sensitive Serial Profiling of SARS-CoV-2 Antigens and Antibodies in Plasma to Understand Disease Progression in COVID-19 Patients with Severe Disease

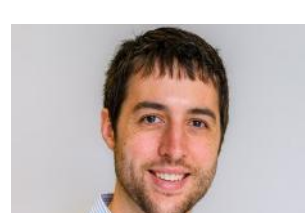
First Author: Alana Ogata | Senior Author: David Walt (pictured) | Clinical Chemistry | Brigham and Women’s Hospital, the Wyss Institute and Harvard Medical School



Severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) has infected over 21 million people worldwide since August 16, 2020. Compared to PCR and serology tests, SARS-CoV-2 antigen assays are underdeveloped, despite their potential to identify active infection and monitor disease progression. The authors used single molecule array assays to quantitatively detect SARS-CoV-2 spike, S1 subunit, and nucleocapsid antigens in the plasma of COVID-19 patients. [Abstract](#)

STING Cyclic Dinucleotide Sensing Originated in Bacteria

First Author: Benjamin Morehouse | Senior Author: Philip Kranzusch (pictured) | Nature | Harvard Medical School and Dana-Farber



Stimulator of interferon genes (STING) shares no structural homology with other known signaling proteins, limiting functional analysis and preventing explanation of the origin of cyclic dinucleotide signaling in mammalian innate immunity. The authors discovered functional STING homologs encoded within prokaryotic defence islands and revealed a conserved mechanism of signal activation. [Abstract](#)

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Awards

Catherine Dulac Wins 2021 Breakthrough Prize for Life Sciences

The Harvard Gazette



Dr. Catherine Dulac (pictured), Lee and Epeleta Professor of Arts and Sciences and Higgins Professor of Molecular and Cellular Biology at Harvard, has been awarded a 2021 Breakthrough Prize in Life Sciences for her pioneering work identifying the neural circuitry that regulates parenting behavior in both males and females. [Read More](#)

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Local News

Investigational ALS Drug Generates Promising Clinical Trial Results

Massachusetts General Hospital



An experimental medication slows the progression of the neurodegenerative disease called amyotrophic lateral sclerosis (ALS), or Lou Gehrig’s disease, according to recently released results from a clinical trial run by Dr. Sabrina Paganoni (pictured) and investigators at the Sean M. Hestley & AMG Center for ALS at Massachusetts General Hospital and Amylyx Pharmaceuticals, Inc., the company that manufactures the medication. [Read More](#)

Genetic Information Can Predict Predisposition to Rare and Common Blood Diseases

Broad Institute



Two large-scale genetic studies have identified the bulk of genetic variation that influences medically-important characteristics of our blood cells. Researchers from the Broad Institute, in collaboration with colleagues from 101 research institutions world-wide, have studied hundreds of thousands of participants and identified over 7,000 regions of the human genome that control blood cell characteristics, such as the numbers of red and white cells. [Read More](#)

Diabetes-In-a-Dish Model Uncovers New Insights into the Cause of Type 2 Diabetes

Joslin Diabetes Center



Using cells taken from patients with type 2 diabetes and new techniques to convert them into specialized precursors of muscle cells, Dr. C. Ronald Kahn (pictured) and colleagues at Joslin Diabetes Center have developed a novel ‘disease-in-a-dish’ model to study the basic molecular factors that lead to the development of type 2 diabetes. [Read More](#)

Lung ‘Organoids’ Capture Early-Stage Lung Cancer; Could Help Test Treatments

Boston Children’s Hospital



Lung cancer, the leading cancer killer in the U.S., is often missed in its earlier stages. While recent imaging advances offer earlier detection, early-stage lung cancers still have no targeted treatments — but that could change. Researchers at Boston Children’s Hospital, in collaboration with Boston University and UCLA, have created an accelerated platform for identifying and testing potential treatments: ‘organoids’ created from lung cells. [Read More](#)

Broad Institute Launches New Effort to Study Rare Neuromuscular Disorder

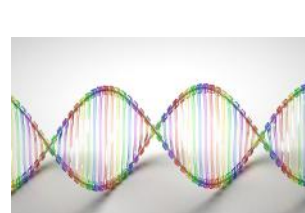
Broad Institute



A new research and drug discovery effort at the Broad Institute is taking aim at the rare, inherited movement disorder Friedrich’s ataxia (FA). The Friedrich’s Ataxia Accelerator, led by Dr. Vamsi Mootha (pictured), will help build a community of researchers at Broad focused on learning more about the molecular mechanisms underlying FA with the ultimate goal of developing therapeutic strategies for the disorder. [Read More](#)

GTEx Consortium Releases Fresh Insights into How DNA Differences Govern Gene Expression

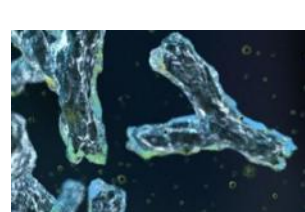
Broad Institute



Scientists from the Genotype-Tissue Expression (GTEx) project, a National Institutes of Health-funded consortium including researchers from the Broad Institute, have completed a wide-ranging set of studies documenting how small changes in DNA sequence can impact gene expression across more than four dozen tissues in the human body. [Read More](#)

Totent Partners with Ginkgo Bioworks to Apply Unique Discovery Platform to COVID-19 Antibody Efforts

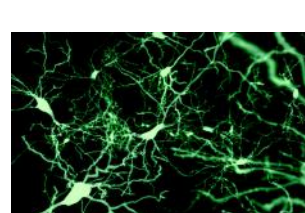
Ginkgo Bioworks via PR Newswire



Boston-based Ginkgo Bioworks has announced a partnership with Totient, a Cambridge-based AI-driven drug discovery company emerging from stealth, to rapidly identify neutralizing antibodies against COVID-19. Through this partnership, Totient will leverage Ginkgo’s bioengineering platform to express and screen thousands of antibody candidates with the aim of identifying broadly neutralizing therapeutic antibodies against COVID-19 for further development. [Read More](#)

New Gene Regulation Model Provides Insight into Brain Development

MIT News



More often than not, it seemed, Rbfox proteins bound to a very specific sequence of nucleotide bases, ‘GCAUG.’ Occasionally, binding analyses hinted that Rbfox proteins might attach to other RNA sequences as well, but these findings were usually discarded. Now, a team of biologists from MIT has found that Rbfox proteins actually bind less tightly — but no less frequently — to a handful of other RNA nucleotide sequences besides GCAUG. [Read More](#)

Dozier Gardner Family Announces Gift to Establish Fund at Dana-Farber Cancer Institute

Dana-Farber



Dana-Farber Cancer Institute Trustee, M. Dozier Gardner, along with his wife and family, have made a \$5 million gift to Dana-Farber to establish the Dozier Gardner Family Fund in support of the Presidential Initiatives Fund. This gift offers flexible support for Dana-Farber President and CEO Dr. Laurie H. Glimcher to direct toward cancer research priorities, and provides powerful momentum toward the Institute’s comprehensive campaign, currently in the quiet phase. [Read More](#)

What Sets off Deadly Levels of Lung Inflammation in Some COVID-19 Patients?

Boston University



A team of infectious disease and regenerative medicine researchers at Boston University studying human stem cell–derived lung tissue infected with SARS-CoV-2 are discovering new insights into how the novel coronavirus kicks off a cascade of tissue inflammation in the lungs. That reaction can be especially lethal for older people, who make up 8 out of every 10 deaths from COVID-19. [Read More](#)

Clinical Trial Finds Targeted Drug Effective in Patients Who Have Lung Cancer with Certain Gene Mutations

Massachusetts General Hospital



A targeted therapy called capmatinib can provide significant benefits to patients who have advanced lung cancer with specific gene mutations, according to recently published results from a phase two clinical trial. The trial was conducted by an international team led by investigators at Massachusetts General Hospital. [Read More](#)

A Single-Cell Atlas of Nerve Cells in the Gut Reveals Web of Connections

Broad Institute



Embedded throughout the gastrointestinal system is an extensive array of neurons that coordinates nearly all activities involved in digestion, gut motility, and response to noxious stimuli. These cells are rare and fragile, making them difficult to isolate and study. A team led by researchers at the Broad Institute and Massachusetts General Hospital has overcome these challenges with new methods to generate a single-cell map of the enteric nervous system in humans and mice. [Read More](#)

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Interesting Articles

Amid Broad Mistrust of FDA and Trump Administration, Drug Companies Seek to Reassure Public about COVID-19 Vaccine Safety

STAT News



A group of nine leading pharmaceutical and biotechnology companies, including Massachusetts-based Moderna, has pledged to only seek approval for COVID-19 vaccines demonstrated to be safe and effective — an apparent attempt to provide public reassurance despite the widely held view that the COVID-19 vaccine development process is politically tainted. [Read More](#)

Commission Charts Narrow Path for Editing Human Embryos

ScienceMag



No recent biomedical experiment has caused more consternation than He Jiankui’s creation of the first gene-edited babies, in 2018, which was widely seen as dangerous, unethical, and premature — and which led to his incarceration by China. Now, an international committee has concluded that gene-editing methods, despite substantial improvements, are still far from mature enough to safely introduce heritable DNA modifications into human embryos. [Read More](#)

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Upcoming Events in Boston

- September 15 3:15 PM Harvard Catalyst Research Day Poster Session Online
- September 17 1:00 PM Getting Real World Data about COVID-19 Online
- September 17 3:00 PM MIT Microbiome Club General Body Meeting + Prof. Sean Gibbons Online
- September 22 9:00 AM Aging Brain Initiative Symposium Online
- September 22 12:00 PM 2020 Visions: Lunch & Learn Lightning Talks Online

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Science Jobs in Boston

- Assistant/Associate Professor of Immunology and Infectious Diseases Harvard T.H. Chan School of Public Health
- Assistant/Associate Professor, Life Sciences Blavatnik Institute
- PhD Principal Scientist / Lab Head, Oncology Drug Discovery Novartis
- Research Associate II, Analytical Development Editas Medicine
- Research Associate, Immuno-Oncology Bicycle Therapeutics

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