

**Publications of the Week**
**Interleukin-6 Produced by Enteric Neurons Regulates the Number and Phenotype of Microbe-Responsive Regulatory T Cells in the Gut**

 First author: Yiqing Yan | Senior Author: Christophe Benoist (pictured)  
 Immunity | Harvard Medical School and Boston Children's Hospital


The immune and enteric nervous (ENS) systems monitor the frontier with commensal and pathogenic microbes in the colon. The authors investigated whether FoxP3+ regulatory T (Treg) cells functionally interact with the ENS. Their findings suggest a regulatory circuit wherein microbial signals condition neuronal density and activation, thus tuning Treg cell generation and immunological tolerance in the gut. [Abstract](#)

**Cell-Derived Extracellular Matrix-Rich Biomimetic Substrate Supports Podocyte Proliferation, Differentiation, and Maintenance of Native Phenotype**

 First Author: Abhigyan Satyam | Senior Author: George Tsokos (pictured, right)  
 Advanced Functional Materials | Beth Israel Deaconess Medical Center and Harvard University


Current technologies and available scaffold materials do not support long-term cell viability, differentiation and maintenance of podocytes, the ultra-specialized kidney resident cells that are responsible for the filtration of the blood. The authors developed a new platform which imitates the native kidney microenvironment by decellularizing fibroblasts grown on surfaces with macromolecular crowding. The new platform can be used to study podocyte biology and test drug toxicity. [Abstract](#)

**Barcoded Oligonucleotides Ligated on RNA Amplified for Multiplexed and Parallel *In Situ* Analyses**

 First Author: Songlei Liu | Senior Author: George Church (pictured)  
 Nucleic Acids Research | Harvard Medical School, Wyss Institute, McGovern Institute, Broad Institute, Koch Institute, and MIT


The authors present barcoded oligonucleotides ligated on RNA amplified for multiplexed and parallel *in situ* analyses (BOLORAMIS), a reverse transcription-free method for spatially-resolved, targeted, *in situ* RNA identification of single or multiple targets. BOLORAMIS was demonstrated on a range of cell types and human cerebral organoids. Singleplex experiments to detect coding and non-coding RNAs in human iPSCs showed a stem-cell signature pattern. [Abstract](#)

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**Awards**
**Bruce Spiegelman Receives High Honor from American Diabetes Association**

Dana-Farber Cancer Institute



The American Diabetes Association has announced recipients of the 2021 National Scientific and Health Care Achievement Awards and Dr. Bruce Spiegelman (pictured), researcher at Dana-Farber Cancer Institute, received the 2021 Albert Renold Award. This award is presented to an individual whose career is distinguished by outstanding achievements in the training and mentorship of diabetes research scientists. [Read More](#)

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**Local News**
**Researchers Identify Basic Mechanisms that Regulate HIV Expression**

BU School of Medicine



Despite the positive advances that anti-human immunodeficiency virus (HIV) therapy has had on the life expectancy of HIV-positive people, finding a cure for HIV or acquired immunodeficiency syndrome (AIDS) has remained elusive. "One of the major challenges in curing HIV is that there is a persistent latent reservoir of virus that is not targeted by current antiretroviral treatments and is hidden from immune cells," explains Dr. Andrew Henderson (pictured). [Read More](#)

**Study Reveals New Clues about the Architecture of X Chromosomes**

Massachusetts General Hospital



Researchers at Massachusetts General Hospital have uncovered new clues that add to the growing understanding of how female mammals "silence" one X chromosome. Their new study, published in *Molecular Cell*, demonstrates how certain proteins alter the "architecture" of the X chromosome, which contributes to its inactivation. Better understanding of X chromosome inactivation could help scientists figure out how to reverse the process. [Read More](#)

**Catching Key Moments of Cancer Progression**

Whitehead Institute



Important moments of cancer — mutation, tumor formation, metastasis — are fleeting, easy-to-miss events. Even with modern medical technologies, they often happen unobserved, and are only realized later when these cells spawn life-threatening conditions. In recent years, however, new methods of tracking individual cells through time have allowed researchers such as Dr. Jonathan Weissman (pictured) to get closer to the origin of these events. [Read More](#)

**Innovative Gene Editing Could Cure Severe Congenital Neutropenia**

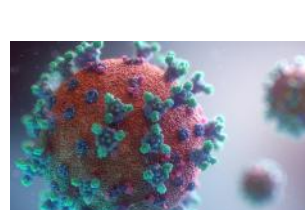
Dana-Farber Cancer Institute



Finn Mulrooney, a cheerful 11-month-old, in Plymouth, Massachusetts, has no idea he has a life-threatening genetic disease. Nor does he seem fazed by the daily subcutaneous injections his parents have learned how to give him. And little does he know that cells from his bone marrow are helping scientists develop an innovative gene-editing approach that could someday correct his disease, known as severe congenital neutropenia. [Read More](#)

**SARS-CoV-2 Hijacks Two Key Metabolic Pathways to Rapidly Replicate in Host Cells**

Broad Institute



When SARS-CoV-2 infects a human cell, it quickly begins to replicate by seizing the cell's existing metabolic machinery. The infected cells churn out thousands of viral genomes and proteins while halting the production of their own resources. Researchers studying cultured cells shortly after infecting them with the virus, now have more insight into the metabolic pathways co-opted by the virus. [Read More](#)

**Study: One Enzyme Dictates Cells' Response to a Probable Carcinogen**

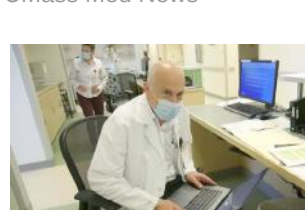
MIT News



In the past few years, several medications have been found to be contaminated with N-methyl-D-aspartate, a probable carcinogen. MIT researchers have now discovered a mechanism that helps explain whether this damage will lead to cancer in mice: the team found that too little activity of one enzyme necessary for DNA repair leads to much higher cancer rates, while too much activity can produce tissue damage, especially in the liver, which can be fatal. [Read More](#)

**Infectious Disease Expert Robert Finberg: COVID Reinfections Rare, but Caution Still Urged**

UMass Med News



Reinfection with the SARS-CoV-2 virus has occurred among people who previously were sick with COVID-19, but the number of reported cases is still very small, according to UMass Medical School infectious disease specialist Dr. Robert Finberg (pictured). Researchers are studying variants of the virus to track its infection patterns, hoping to identify whether reinfections might be from different strains. [Read More](#)

**"Selfish" DNA Helps Bacteria Cheat and Grow in Densely-Packed Microbial Communities**

MIT Biology



Scientists have a term for genes that spread themselves throughout a population at any cost: "selfish" DNA. One way that these genes transmit through bacterial communities is via a type of bacterial sex called conjugation. When one bacterium makes contact with another, DNA from the host cell can be injected into a recipient cell. Dr. Alan Grossman's lab at the MIT Department of Biology studies a small but selfish chunk of DNA called ICEBs1. [Read More](#)

**Moderna Begins Testing Its COVID-19 Vaccine in Young Children**

Moderna



Cambridge's Moderna Inc. has begun testing its Covid-19 vaccine in children between 6 months and 12 years old in recently initiated Phase 2/3 clinical trials. This expansion study will evaluate the safety, tolerability, reactogenicity and effectiveness of two doses of mRNA-1273 given 28 days apart and will enroll approximately 6,750 participants in the U.S. and Canada. [Read More](#)

**Of Mice and Men and Leveraging Their Different Tolerance to Pathogens**

Wyss Institute



A mouse intestine-on-chip discovery platform enables the modeling of host-microbiome relations, infectious disease modeling, and the identification of tolerance-promoting species. This raises the interesting possibility that analyzing differences between host-microbiome interactions in humans and other species, such as mice, could lead to entirely new types of therapeutic approaches. [Read More](#)

**Study of Synapse Strength Focuses on 'Active Zones'**

The Picower Institute



Job descriptions for the thousands of types of neurons in the brain typically include a common function: release chemicals called neurotransmitters to communicate across circuit connections called synapses. In a new study funded by the National Institutes of Health, the lab of MIT Professor Dr. Troy Littleton will seek to understand how neurons construct synapses of different strengths, a variety that may be key to the diversity of neural communication. [Read More](#)

**Intrigued by Immortality**

Whitehead Institute



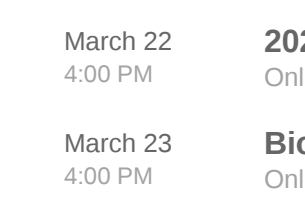
New Whitehead Institute Director Dr. Ruth Lehmann (pictured) and new Member Dr. Yukiko Yamashita study opposite sides of the germ cell life cycle. Yamashita's work in male germline cells shows how the cells are formed and maintained; Lehmann studies female germline cells to understand their fates. They join Member and former Director Dr. David Page in painting a fuller picture of how these seemingly immortal cell lines pass instructions uninterrupted from generation to generation. [Read More](#)

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**Interesting Articles**
**What's in the Huge Pandemic Relief Bill for Science?**

Science



A massive \$1.9 trillion pandemic relief bill now on its way to President Joe Biden's desk will deliver cash to a wide array of groups — including the scientific community. The bill is designed primarily to address the economic damage caused by the COVID-19 pandemic and accelerate the distribution of vaccines and treatments that have proved effective against the pandemic coronavirus. [Read More](#)

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**Upcoming Events in Boston**


March 22 4:00 PM	<b>2021 Phillip A. Sharp Lecture in Neural Circuits</b> Online
March 23 4:00 PM	<b>Biology Colloquium Series</b> Online
March 24 5:00 PM	<b>Biomedical Informatics Entrepreneurs Salon</b> Online
April 5 2:00 PM	<b>Ensuring Equitable Access to New Gene Therapies</b> Online
April 8 1:00 PM	<b>Seeing the Whole Blueprint: Uncovering the Purpose of "Genomic Junk"</b> Online

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Harvard University

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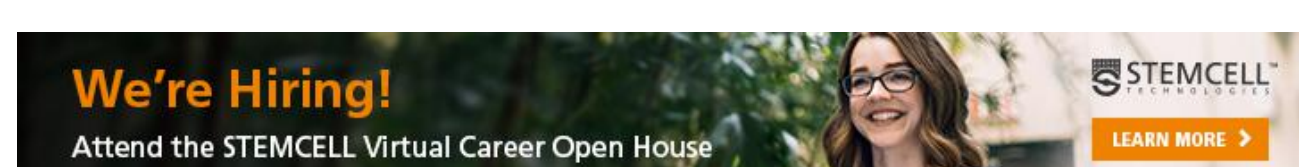
Johnson and Johnson

**Scientist/Senior Scientist, *In Vitro* Cell Biology**

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