

Publications of the Week

Optical Pooled Screens in Human Cells

First Author: David Feldman | Senior Author: Paul Blainey *(pictured)*
Cell | MIT, the Broad Institute and the Koch Institute



Genetic screens are critical for the systematic identification of genes underlying cellular phenotypes. Pooling gene perturbations greatly improves scalability but is not compatible with imaging of complex and dynamic cellular phenotypes. The authors introduce a pooled approach for optical genetic screens in mammalian cells. They use targeted *in situ* sequencing to demultiplex a library of genetic perturbations following image-based phenotyping. [Abstract](#)

Bacterial Variability in the Mammalian Gut Captured by a Single-Cell Synthetic Oscillator

First Author: David Riplar | Senior Author: Pamela Silver *(pictured)*
Nature Communications | Harvard Medical School and the Wyss Institute



Synthetic gene oscillators have the potential to control timed functions and periodic gene expression in engineered cells. Such oscillators have been refined in bacteria *in vitro*, however, these systems have lacked the robustness and precision necessary for applications in complex *in vivo* environments, such as the mammalian gut. The authors demonstrate the implementation of a synthetic oscillator capable of keeping robust time in the mouse gut over periods of days. [Abstract](#)

Structural Basis for the Docking of mTORC1 on the Lysosomal Surface

First Author: Kasper Rogala | Senior Author: David Sabatini *(pictured)*
Science | The Broad Institute, the Koch Institute, the Whitehead Institute and MIT



The mTORC1 protein kinase regulates growth in response to nutrients and growth factors. Nutrients promote its translocation to the lysosomal surface. Nutrients switch the heterodimeric Rag GTPases between four different nucleotide binding states, only one of which (RagA/B-GTP–RagC/D-GDP) permits mTORC1 association. The authors determined the structure of the supercomplex of Raptor with Rag-Ragulator to 3.2 Å resolution by cryo-electron microscopy. [Abstract](#)

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Awards

\$3.6M NIH Grant to Study Osteoarthritis, Musculoskeletal Pain

BU School of Medicine



Dr. David Felson *(pictured)*, Professor of Medicine and Epidemiology at Boston University Schools of Medicine and Public Health, was awarded a National Institutes of Health (NIH) P30 Center Grant. The five-year, \$3.6 million award will allow for further clinical research in rheumatology at the Boston University Core Center for Clinical Research, and will provide broad clinical research expertise to a large multidisciplinary group of investigators. [Read More](#)

MCO Grad Student Elizabeth May Named as Aramont Fund Fellow

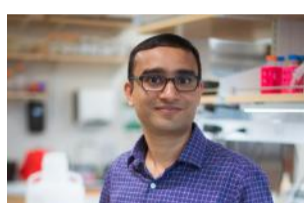
Harvard MCB



Molecular and Cellular Biology graduate student Elizabeth May *(pictured)*, of the Gaudet Lab has received a fellowship from the Aramont Fund for Emerging Science Research in support of a project called "Molecular Mechanisms for Establishing Neuronal Connectivity." The Aramont Fund provides funding to researchers across four Harvard schools—the medical school, the Harvard T.H. Chan School of Public Health, SEAS, and FAS. [Read More](#)

Whitehead Institute Member Ankur Jain Receives Packard Foundation Fellowship

Whitehead Institute



The David & Lucile Packard Foundation has announced that Whitehead Institute Member Dr. Ankur Jain *(pictured)* has been named a Packard Fellow for Science and Engineering. "We are extraordinarily pleased that Ankur has received such clear and substantive affirmation of his pioneering research on the role that RNAs play in devastating neurological diseases," said Whitehead Institute Director Dr. David C. Page. [Read More](#)

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Local News

Artificial Pancreas System Better Controls Blood Glucose Levels than Current Technology

Joslin Diabetes Center



A multi-center randomized clinical trial evaluating a new artificial pancreas system — which automatically monitors and regulates blood glucose levels — has found that the new system was more effective than existing treatments at controlling blood glucose levels in people with type 1 diabetes. The trial was based partly at Joslin Diabetes Center, an affiliate of Harvard Medical School, and a network of other research centers. [Read More](#)

Cause of Drug Resistance in a Type of Intestinal Tumors Identified

Dana-Farber Cancer Institute



Most cases of gastrointestinal stromal tumor, a type of soft-tissue cancer, are caused by mutations in genes that can be effectively targeted with drugs that inhibit the activity of rogue cancer-promoting enzymes. Now, investigators, led by Dr. George Demetri *(pictured)*, have clarified mechanisms that allow these hard-to-treat cancers to develop, and in lab experiments have identified strategies that could lead to effective new therapies. [Read More](#)

Scientists Pinpoint Neural Activity's Role in Human Longevity

Harvard Gazette



The brain's neural activity — long implicated in disorders ranging from dementia to epilepsy — also plays a role in human aging and life span, according to research led by Dr. Bruce Yankner *(pictured)* in the Blavatnik Institute at Harvard Medical School (HMS). The study, published in *Nature*, is based on findings from human brains, mice, and worms and suggests that excessive activity in the brain is linked to shorter life spans, while suppressing such overactivity extends life. [Read More](#)

Jerry Gurwitz to Lead Research Evaluating Alzheimer's Disease Treatments

UMass Med Now



UMass Medical School received a \$365,000 grant to collaborate with the Institute for Clinical and Economic Review to examine the clinical and economic value of future therapies to treat and prevent Alzheimer's disease. Dr. Jerry Gurwitz *(pictured)*, the Dr. John Meyers Professor of Primary Care Medicine, Professor of Medicine, Chief of the Division of Geriatric Medicine and Executive Director of the Meyers Primary Care Institute, will lead the research. [Read More](#)

Glowing Particles in the Blood May Help Diagnose and Monitor Brain Cancer

Mass General News



A chemical that has improved surgeries for brain cancer by making tumor cells fluorescent may also help doctors safely diagnose the disease and monitor its response to treatment, according to a new study led by Dr. Pamela Jones *(pictured)* at Massachusetts General Hospital. Brain cancer can be especially difficult to diagnose and to monitor after treatment because methods such as tissue biopsies and radiation can injure the brain. [Read More](#)

Study Reveals How Mucus Tames Microbes

MIT News



More than 200 square meters of our bodies — including the digestive tract, lungs, and urinary tract — are lined with mucus. A new study from Dr. Khatirina Ribbeck *(pictured)* at MIT reveals that glycans — branched sugar molecules found in mucus — are responsible for microbe-taming. These glycans can prevent bacteria from communicating with each other and forming infectious biofilms, effectively rendering them harmless. [Read More](#)

CRISPR Therapeutics and KSQ Therapeutics Announce License Agreement to Advance Companies' Respective Cell Therapy Programs in Oncology

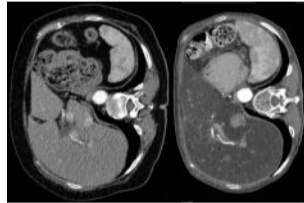
BioSpace



CRISPR Therapeutics and KSQ Therapeutics, today announced a license agreement whereby CRISPR Therapeutics will gain access to KSQ intellectual property (IP) for editing certain novel gene targets in its allogeneic oncology cell therapy programs, and KSQ will gain access to CRISPR Therapeutics' IP for editing novel gene targets identified by KSQ as part of its current and future eTIL™ (engineered tumor infiltrating lymphocyte) cell programs. [Read More](#)

Mass General Hospital Researchers Identify Potential Therapy for Liver Disease in People Living with HIV

Mass General News



A team of researchers at Massachusetts General Hospital has identified a novel therapeutic strategy to significantly improve a form of liver disease that affects many people living with human immunodeficiency virus (HIV). There is currently no treatment for non-alcoholic fatty liver disease (NAFLD) in HIV patients, but the results of this research could eventually lead to a first-in-class therapy for this serious condition. [Read More](#)

CRISPR Enzyme Programmed to Kill Viruses in Human Cells

Broad Institute



Many of the world's most common or deadly human pathogens are RNA-based viruses — Ebola, Zika and flu, for example — and most have no FDA-approved treatments. A team led by Dr. Pardis Sabeti *(pictured)* at the Broad Institute of MIT and Harvard has now turned a CRISPR RNA-cutting enzyme into an antiviral that can be programmed to detect and destroy RNA-based viruses in human cells. [Read More](#)

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Upcoming Events in Boston

October 22 8:30 AM	PerkinElmer Nexus East Coast User Meeting 2019 Merck Research Laboratories
October 24 8:30 AM	Advances in Preclinical & Translational CNS Research Royal Sonesta Boston
November 1 8:00 AM	Questrom's Seventh Annual Health & Life Sciences Conference Questrom School of Business
November 3 11:30 AM	PurpleStride Boston 2019: Walk with Elstar Therapeutics Boston Common – Parkman Bandstand
November 7 11:00 AM	Discover Brigham Brigham and Women's Hospital

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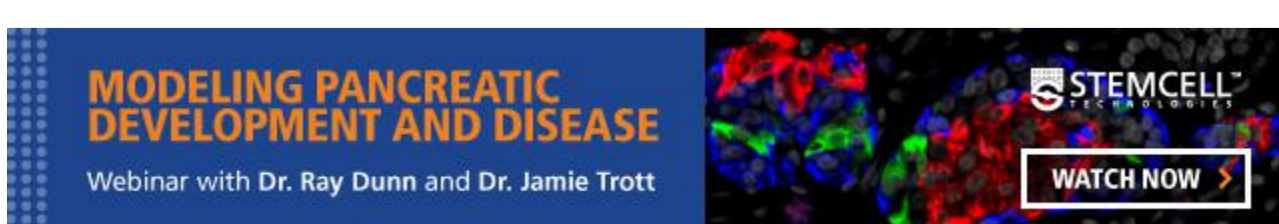
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