

Publications of the Week

CRISPR Screens in *Drosophila* Cells Identify Vsg as a Tc Toxin Receptor

First Authors: Ying Xu and Raghavir Viswanatha | Senior Author: Min Dong (pictured)
 Nature | Boston Children's Hospital, Harvard Medical School, Blavatnik Institute, Howard Hughes Medical Institute, and Beth Israel Deaconess Medical Center



Entomopathogenic nematodes are widely used as biopesticides. Their insecticidal activity depends on symbiotic bacteria such as *Photorhabdus luminescens*, which produces toxin complex (Tc) toxins as major virulence factors. The authors use genome-wide CRISPR-Cas9-mediated knockout screening in *Drosophila melanogaster* S2R+ cells and identify Vsgun (Vsg) as a receptor for an archetypal *P. luminescens* Tc toxin. [Abstract](#)

Developmental Dynamics of RNA Translation in the Human Brain

First Author: Erin Duffy | Senior Author: Michael Greenberg (pictured)
 Nature Neuroscience | Harvard Medical School, Boston Children's Hospital, Broad Institute, Massachusetts General Hospital, and MIT



The precise regulation of gene expression is fundamental to neurodevelopment, plasticity, and cognitive function. Although several studies have profiled transcription in the developing human brain, there is a gap in the understanding of accompanying translational regulation. In this study, the authors performed ribosome profiling on 73 human prenatal and adult cortex samples. [Abstract](#)

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Awards

Dohlman Receives Antonio Champalimaud Vision Award

Harvard Medical School (HMS)



Dr. Claes Dohlman (pictured), HMS Professor of Ophthalmology, Emeritus, at Massachusetts Eye and Ear, has received the 2022 Antonio Champalimaud Vision Award in recognition of his contributions to vision research. The Champalimaud Vision Award, presented by the Portugal-based Champalimaud Foundation, is the highest distinction bestowed in ophthalmology and vision science. [Read More](#)

Awards & Recognitions: September 2022

Harvard Medical School



Dr. Arlene Sharpe (pictured), the George Fabyan Professor of Comparative Pathology and Head of the Department of Immunology in the Blavatnik Institute at Harvard Medical School, has been awarded a Lifetime Achievement Award from the Federation of American Societies for Experimental Biology (FASEB). FASEB's Excellence in Science Awards recognize female scientists who have demonstrated excellence and innovation in their research fields, exemplary leadership, and mentorship. [Read More](#)

Congratulations to Cynthia Bradford for Winning the 2022 Perkins Award

BU Biology



Congratulations to Cynthia Bradford (pictured) for winning the 2022 John S. Perkins Award for her outstanding long-term service at the College of Arts & Sciences, Department of Biology. As a proposal development specialist, Cindy has gathered grant proposals, which have received 70 awards, totaling over 12 million dollars in funding within the past year alone. [Read More](#)

Alt Named to Receive Paul Ehrlich and Ludwig Darmstaedter Prize

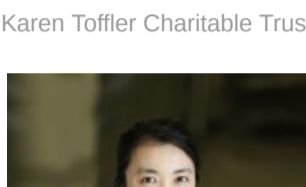
Harvard Medical School (HMS)



Dr. Frederick Alt (pictured), the HMS Charles A. Janeway Professor of Pediatrics at Boston Children's Hospital, will be awarded the 2023 Paul Ehrlich and Ludwig Darmstaedter Prize, Germany's highest medical award. Dr. Alt and co-winner Dr. David Schatz of Yale Medical School will be recognized for their discovery of molecules and mechanisms that enable the immune system to recognize billions of different antigens. [Read More](#)

Julia TCW Earned the Toffler Scholar Award in 2022 at Boston University

Karen Toffler Charitable Trust



Dr. Julia TCW (pictured) is an Assistant Professor in the Department of Pharmacology & Experimental Therapeutics and the Director of the Laboratory of Human Induced Pluripotent Stem Cell Therapeutics at Boston University. Her research is focused on a specific variation of the gene apolipoprotein E that is a major genetic risk factor for Alzheimer's disease. [Read More](#)

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Local News

Faculty Spotlight: Ryan Nett

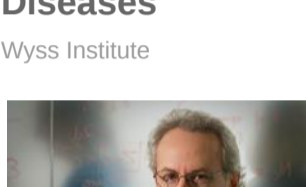
Harvard University Department of Molecular and Cellular Biology (MCB)



Plant biochemist Dr. Ryan Nett (pictured) has joined MCB as an Assistant Professor. His lab will investigate how plants build small molecules, including compounds with medicinal potential. He is also interested in how these molecules shape plant biology and how they may affect other organisms that eat, infect, or coexist alongside plants. [Read More](#)

Unravel Biosciences Licenses Wyss Institute Platform Technology from Harvard and Tufts University to Decode, Model, and Treat Complex Diseases

Wyss Institute



Unravel Biosciences and the Wyss Institute announced that Unravel has licensed a drug discovery platform technology from Harvard and Tufts University. The company will use the technology, invented at the Wyss Institute, to decode and model complex diseases to accelerate the development of new and more effective therapies. "I am extremely proud of this team for their ability to collaborate across disciplines and to develop this powerful first-of-its-kind drug discovery platform," said Dr. Don Ingber (pictured). [Read More](#)

The Kilachand Fund's Impact on Science's Biggest Challenges

The Brink



"Nearly all of the easy problems that a single investigator might look at with their special expertise have already been addressed. We're now confronting the harder problems that require interdisciplinary teams to solve them," says Dr. Christopher Chen (pictured), a BU William Fairfield Warren Distinguished Professor. In 2017, BU trustee Rajen Kilachand made a historic gift of \$115 million to the University with the goal of enabling that kind of multidisciplinary work. [Read More](#)

New "Triggers" in an Essential Pathway to Destroy microRNAs

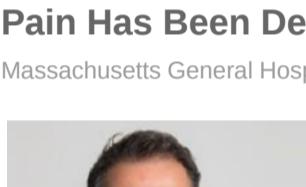
Whitehead Institute



In a study from the lab of Whitehead Institute Member Dr. David Bartel (pictured), researchers have identified genetic sequences that can lead to the degradation of cellular regulators called microRNAs in the fruit fly *Drosophila melanogaster*. "This is an exciting study that paves the way for a deeper understanding of the microRNA degradation pathway," says Dr. Bartel. [Read More](#)

A Hydrogel That Allows for Quick Burn Dressing Changes While Minimizing Pain Has Been Developed by Mass General

Massachusetts General Hospital



Bioengineers have developed a first-of-its-kind hydrogel for second-degree burns that can be dissolved quickly and easily for wound dressing changes using a solution that breaks apart the supramolecular structure of the hydrogel. "In collaboration with Tufts University, our team set out to create a supramolecular hydrogel that could be dissolved on demand for trauma-free and quick removal by the physician, thus reducing the need for analgesics and opioids as well as for hospital stays and costs," says Dr. O. Berk Usta (pictured). [Read More](#)

Drug-Resistant Gonorrhea Is No Match for a New Class of Antibiotics

MIT Chemistry



Untreated gonorrhea is a major health threat associated with pelvic inflammatory disease, infertility, and increased risk for HIV transmission. Infections are treatable, but the rise of multidrug-resistant (MDR) strains are threatening current treatment options. In a recent study published in *eLife*, researchers at PTC Therapeutics and MIT, including Dr. Catherine Drennan (pictured), discovered two compounds, PTC-847 and PTC-672, that target *N. gonorrhoeae* and its MDR isolates, but not other bacteria. [Read More](#)

Initiating Oral Contraception Does Not Change Gut Microbiome in Healthy Women

Advances in Motion



This longitudinal study of ten healthy women systematically examined whether initiation of oral contraception (OC) influences the diversity, composition, or function of the gut microbiome. No changes were noted in the diversity or composition of the gut microbiome within six months after OC initiation, but the relative abundance of the biosynthesis pathways of peptidoglycan and certain amino acids increased. [Read More](#)

Researchers Develop Strategy to Precisely Target Subtypes of Key Protein

Broad Institute



Cyclosporine is one of the most common and effective immunosuppressant drugs used to treat chronic diseases like arthritis and psoriasis, but it comes with a risk of serious side effects. Rather than targeting the active site of cyclophilin proteins, researchers in Dr. David Liu's (pictured) lab describe a process that finds compounds that bind to the "exo site," a small pocket next to the active site that varies in size and shape across different cyclophilins. [Read More](#)

Through Mentorship, a Deeper Understanding of Brain Cancer Metabolism Grows

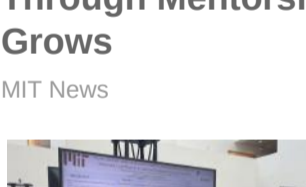
MIT News



Alejandra Rosario's (pictured) enthusiasm for research is infectious. When she talks about studying cancer cells, or the possibility of getting a PhD, her face lights up. "It's something I'm really passionate about," she says. As a Bernard S. and Sophie G. Gould MIT Summer Research Program in Biology student this past summer in the lab of Dr. Matt Vander Heiden, Rosario worked to understand cancer metabolism. [Read More](#)

Cell Rover: Exploring and Augmenting the Inner World of the Cell

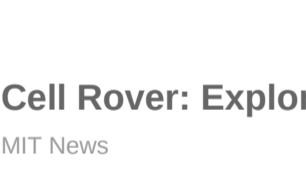
MIT News



Researchers at the MIT Media Lab have designed a miniature antenna that can operate wirelessly inside of a living cell, opening up possibilities in medical diagnostics and treatment and other scientific processes because of the antenna's potential for monitoring and even directing cellular activity in real-time. "The most exciting aspect of this research is we are able to create cyborgs at a cellular scale," says Dr. Debina Sarkar (pictured). [Read More](#)

Study Illuminates Precancerous "Clonal Outgrowth" in Blood Cells

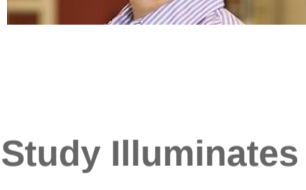
Dana-Farber Cancer Institute



A common, spontaneous mutation in blood stem cells, which has been linked to higher risks of blood cancer and cardiovascular disease, may promote these diseases by altering the stem cells' programming of gene activity and the mix of blood cells they produce. The study was a collaboration between the laboratory of Dr. Irene Ghobrial (pictured) at Dana-Farber Cancer Institute and the laboratory of Dr. Dan Landau at Weill Cornell Medicine. [Read More](#)

A "Golden Era" to Study the Brain

MIT News



As an undergraduate, Mitch Murdock (pictured) was a rare science-humanities double major, specializing in both English and molecular, cellular, and developmental biology at Yale University. Today, as a doctoral student in the MIT Department of Brain and Cognitive Sciences, he sees obvious ways that his English education expanded his horizons as a neuroscientist. "One of my favorite parts of English was trying to explore interiority, and how people have really complicated experiences inside their heads," Murdock explains. [Read More](#)

Gang Han and Colleagues Develop Superfluorescence, Light-Emitting, Nanocrystal Alternative to Lasers

UMass Chan Medical School



Dr. Gang Han (pictured) Professor of Biochemistry & Molecular Biotechnology at UMass Chan Medical School, and researchers at North Carolina State University have developed a superfluorescence crystal nanoparticle to safely produce laser-quality light at room temperature. "Our efforts are contributing to the next generation light source technology for biomedical applications," says Dr. Han. [Read More](#)

Preventing 'Chemo Brain' with Antioxidants Targeting the Spinal Fluid

Boston Children's Hospital



Up to three-quarters of patients receiving cancer chemotherapy suffer from "chemo brain" — a side effect that makes it harder to remember things, maintain attention, and learn new information. Drs. Maria Lehtinen (pictured) and Naama Kanarek's labs teamed up to investigate chemotherapy's effects on the cerebrospinal fluid that bathes the brain — and the possibility of a preventive treatment. [Read More](#)

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Upcoming Events in Boston

October 5-6 1:00 PM	Glial and Neuronal Biology of the Aging Brain Symposium Online
October 6 2:30 PM	Bristol Myers Squibb Pharma Day 2022 MassBioHub
October 7-8 8:00 AM	Forsyth Orthodontic Symposium: In Honor of Dr. Moorrees Forsyth Institute and Online
October 21 9:00 AM	BIDMC Cancer Symposium 2022 Online
November 3 8:00 AM	The Forsyth Institute 5 th Scientific Symposium: Craniofacial Biology, Disease, and Regeneration Forsyth Institute and Online

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