

Publications of the Week

Sensory Transduction Is Required for Normal Development and Maturation of Cochlear Inner Hair Cell Synapses

First Author: John Lee | Senior Author: Gwenaelle Gelléoc (pictured) et al. | Harvard Medical School and Boston Children's Hospital



Acoustic overexposure and aging can damage auditory synapses in the inner ear by a process known as synaptopathy. These insults may also damage hair bundles and the sensory transduction apparatus in auditory hair cells. To evaluate the potential contributions of sensory transduction to synapse formation and development, the authors assessed inner hair cell synapses in several genetic models of dysfunctional sensory transduction. **Abstract**

Indoleamine 2,3-Dioxygenase-1, a Novel Therapeutic Target for Post-Vascular Injury Thrombosis in CKD

First Author: Joshua Walker | Senior Author: Vipul Chitalia (pictured) et al. | Journal of the American Society of Nephrology | Boston University, MIT, and Veterans Affairs Boston Healthcare System



Patients with chronic kidney disease (CKD) are at a markedly higher risk of thrombosis after vascular procedures. Uremic solutes, such as indoxyl sulfate and kynurenic acid, are important contributors to this complication through tissue factor, a trigger of the extrinsic coagulation cascade. This study examines the role of indoleamine 2,3-dioxygenase-1, a key enzyme in kynurenine biogenesis, in thrombotic complications in CKD. **Abstract | Press Release**

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Awards

Nancy Hopkins, Pioneering Biologist and Advocate for Gender Equity in Science, Wins STAT Biomedical Innovation Award

STAT



Dr. Nancy Hopkins (pictured), an MIT Professor who has made significant strides in molecular biology and is a tireless advocate for gender equity in science, was named the recipient of STAT's 2021 Biomedical Innovation Award. "It's very easy to forget how much progress there has been because we haven't arrived where we'd like to be. So we see the problems that still lie ahead. But you periodically have to pause and say, "Oh, my gosh, look how far we came," said Dr. Hopkins. **Read More**

Four Tufts Faculty Are Among Top Researchers in the World

Tufts Now



Four Tufts researchers have been named to the Clarivate 2021 list of the world's most highly cited researchers. The researchers included in the list "have demonstrated significant and broad influence reflected in their publication of multiple highly cited papers over the last decade," according to Clarivate, an information and analytics firm focused on research. Named to the list are Drs. David Kaplan (pictured), Andrew Levey, Dariush Mozaffarian, and John Wong. **Read More**

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Local News

Diet, Gut Microbes, and Immunity

Harvard Medical School



The cliché "you are what you eat" has been used for hundreds of years to illustrate the link between diet and health. Now, an international team of researchers has found the molecular proof of this concept, demonstrating how diet ultimately affects immunity through the gut microbiome. The team's work, conducted in mice, reveals that what animals consume initiates the release of a metabolic byproduct from a specific gut microbe that, in turn, modulates the animals' gut immunity. **Read More**

Between Burgers and the Human Eye, a World of Opportunity

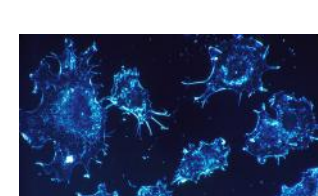
The Harvard Gazette



In some ways, says Dr. Ritu Raman (pictured), an inchworm is similar to a smartphone. Both are machines that can sense changes in their environments and light up, change color, or make a sound. But there's one major difference on which Dr. Raman built her career. Living cells can heal, grow, get stronger, and learn, making them a promising foundation not just for biofabricated machines, but also for tissue created from a patient's cells, organ-on-a-chip for rapid drug development, and lab-made meat. **Read More**

Researchers Discover Unique Metabolic Vulnerabilities of Subsets of Triple-Negative Breast Cancer

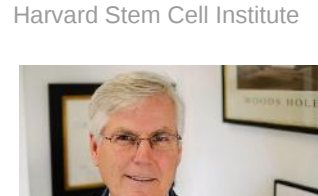
BU School of Medicine



Researchers have identified a metabolic enzyme and pathway in some triple-negative breast cancer patients, which they hope could serve as a biomarker to select patients to receive targeted therapy. Triple-negative breast cancer is the most aggressive form of breast cancer, disproportionately affecting young Black women. The disease metastasizes quickly with high relapse and mortality rates. **Read More**

A New Study Illuminates the Therapy Resistance of Metastatic Prostate Cancer

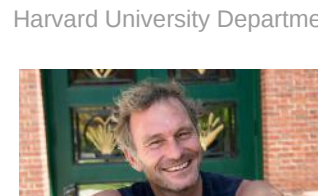
Harvard Stem Cell Institute



Bone metastases are devastating developments of cancers that originate in other organs. In the case of metastatic prostate cancer, bone metastases represent an incurable, painful, and often deadly development, killing more than 30,000 American men every year. Unlike many other tumor types, metastatic prostate cancer responds poorly to immune-based therapies, but a new study, originating in part from Dr. David Scadden's (pictured) lab at the Harvard Stem Cell Institute, has uncovered a key mechanism for why such therapies fail to work. **Read More**

How Zebrafish Use "Simple Hacks" to Swim in a School

Harvard University Department of Molecular and Cellular Biology



Schools of zebrafish move in complex patterns, but individual zebrafish use simple visual cues to decide where to swim, according to a new *Nature Communications* paper from Dr. Florian Engert's (pictured) lab. The research team, led by postdoctoral fellow Dr. Roy Harpaz, used virtual reality technology to project blobs of light that move like zebrafish into the water alongside real zebrafish. **Read More**

Lessons in Regeneration by Light of Glowing Worms

The Harvard Gazette



The three-banded panther worm is one of the greatest of all time when it comes to regeneration, which is why scientists started studying this Tic-Tac-sized worm in earnest over the past decade or so to learn exactly how it can regrow its head and tail. Now, a team of researchers has taken the study of these worms to the next level by making them glow in the dark. The work is led by Dr. Mansi Srivastava (pictured), who has been studying three-banded panthers for more than a decade. **Read More**

A Key Brain Region Responds to Faces Similarly in Infants and Adults

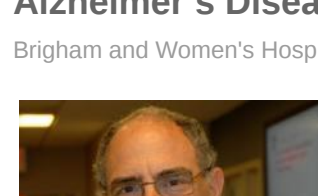
MIT News



Within the visual cortex of the adult brain, a small region is specialized to respond to faces, while nearby regions show strong preferences for bodies or for scenes such as landscapes. Neuroscientists have long hypothesized that it takes many years of visual experience for these areas to develop in children. However, a new MIT study suggests that these regions form much earlier than previously thought. **Read More**

Brigham and Women's Hospital Launches Clinical Trial of Nasal Vaccine for Alzheimer's Disease

Brigham and Women's Hospital



Brigham and Women's Hospital is set to begin a clinical trial that will test the safety and efficacy of a new vaccine delivered nasally intended to prevent and slow the progression of Alzheimer's disease. The trial represents the culmination of nearly 20 years of research led by Dr. Howard Weiner (pictured), Co-Director of the Ann Romney Center for Neurologic Diseases at the Brigham. **Read More**

Young Picower Scientists Present Projects at SfN

The Picower Institute



Even though this year's Society for Neuroscience (SfN) Annual Meeting was entirely online, it remained an important opportunity for young scientists to share their work with the world. Picower postdocs and graduate students presented numerous research projects at the conference. "I always encourage my students and postdocs to present their work at SfN and other meetings. Their careers will depend on not just doing science but also communicating science," said Professor Earl Miller. **Read More**

Scientists Identify Second HIV Patient Whose Body Appears to Have Rid Itself of the Virus

Massachusetts General Hospital



Dr. Xu Yu studies how HIV stores copies of its genome in human cells, resulting in lifelong infection. In 2020, she identified an untreated HIV patient with no intact copies of HIV genomes in more than 1.5 billion blood cells analyzed, suggesting the virus had been cleared from the patient's body. Her team now reports a second untreated person living with HIV who had no evidence of intact HIV genomes in more than 1.5 billion blood and tissue cells analyzed. **Read More**

For Stem Cells, Bigger Doesn't Mean Better

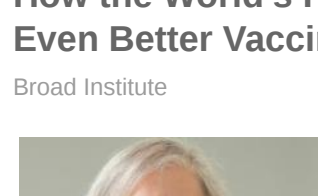
MIT News



MIT biologists have answered an important biological question: Why do cells control their size? Cells of the same type are strikingly uniform in size, while cell size differs between different cell types. This raises the question of whether cell size is important for cellular physiology. "We have discovered cellular enlargement as a new aging factor in vivo, and now we can explore if we can treat cellular enlargement to delay aging and aging-related diseases," says Dr. Jette Lengefeld, a former MIT postdoc. **Read More**

How the World's First Malaria Vaccine Will Save Lives and Pave the Way for Even Better Vaccines

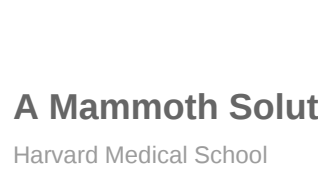
Broad Institute



In October 2021, the World Health Organization (WHO) recommended widespread use of the world's first vaccine for malaria, a disease that kills 400,000 people each year globally. The vaccine is the first ever to be approved for a human parasitic disease, and is the result of more than 30 years of work by scientists in both academia and industry. Dr. Dyan Wirth (pictured) chairs the WHO's Malaria Policy Advisory Group and also led a global expert committee that made this recommendation. **Read More**

A Mammoth Solution

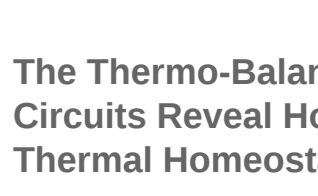
Harvard Medical School



The first time geneticist Dr. George Church (pictured) visited Siberia was the first summer the permafrost melted. The sight reinforced Dr. Church's determination to combat climate change by ensuring that the world's permafrost stays frozen, keeping its estimated 1.4 trillion tons of stored carbon tucked safely away. His plan for doing so: genetically modifying a group of elephants to thrive in the cold and moving them north so their daily activities contribute to preserving and restoring Arctic environments. **Read More**

The Thermo-Balancing Act: New Molecular Thermoreceptors, Cells, and Circuits Reveal How Cooling and Warming Pathways Integrate to Mediate Thermal Homeostasis

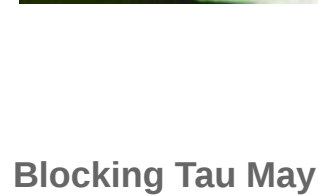
Harvard Brain Science Initiative



Cold blooded animals cannot generate significant internal heat and so depend primarily on their navigation skills to find regions with favorable temperatures. Some have evolved sensors that enable them to measure temperature changes as small as a few millidegrees Celsius per second, undetectable to humans and most mammals. A recent study uncovered new molecular receptors, cells, circuits, and behavioral strategies that underlie the exquisite thermosensitivity of fly larvae. **Read More**

Blocking Tau May Help ALS Patients

The Harvard Gazette



New research may have identified a potential treatment for amyotrophic lateral sclerosis (ALS), also known as Lou Gehrig's disease. The study, published in the journal *Molecular Neurobiology*, was led by investigators at the Healey Center for ALS at Massachusetts General Hospital. ALS, a degenerative condition without a cure, attacks brain and spinal cord nerve cells and progressively eats away at individuals' ability to move, speak, eat, and even breathe. **Read More**

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Upcoming Events in Boston

November 30 12:00 PM	Regulatory Science Forum: New Funding and Business Models for Accelerating Biomedical Innovation Online
November 30 4:00 PM	How Cancer Spreads Online
November 30 4:00 PM	Biology Colloquium Series: Dr. Omer Yilmaz Online
December 6 3:00 PM	MIT.nano Seminar: Lipid Nanoparticles for RNA Delivery: SARS-CoV-2 Vaccines, Chemistry, and Beyond Online
December 7 1:00 PM	Aligning Financial Management Systems to the Biotech Lifecycle: From Pre-Commercial to High Growth Online

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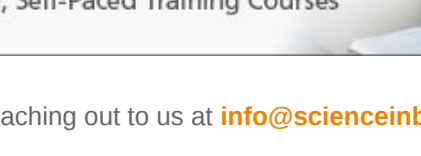
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