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Publications of the Week

Spectroscopic Label-Free Microscopy of Changes in Live Cell Chromatin and Biochemical Composition in Transplantable Organoids

First Author: Giuseppi Pettinato | Senior Author: Lev Perelman *(pictured)*
Science Advances | Beth Israel Deaconess Medical Center and Harvard University

The authors introduced a new approach of rapid organoid formation from dissociated human induced pluripotent stem cells and endothelial cells using microfabricated cell-repellent microwell arrays. This approach, when combined with real-time label-free Raman spectroscopy of biochemical composition changes and confocal light scattering spectroscopic microscopy of chromatin transition, allows for monitoring live differentiating organoids without sacrificing samples. **Abstract**

Neutralizing Antibody Evasion and Transduction with Purified Extracellular Vesicle-Enveloped AAV Vectors

First Author: Ming Cheng | Senior Author: Casey Maguire *(pictured)*
Human Gene Therapy | Massachusetts General Hospital

Exosome-enveloped adeno-associated virus (exo-AAV) can enhance transduction *in vivo* as well as evade neutralizing antibodies. To accurately define the properties of exo-AAV, the authors used a density gradient method to purify exo-AAV. They performed head-to-head comparisons of standard AAV1, differential centrifuged exo-AAV1, and gradient purified exo-AAV1 for antibody evasion and transgene expression in the murine brain. **Abstract**

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Awards

Human Genome at Super Resolution

Harvard Medical School

A better understanding of the human genome can illuminate biological mysteries about genetic function and yield important clues about the origins of genetic changes that give rise to dysfunction and disease. To propel these efforts forward, the Centers of Excellence in Genomic Science of the National Institutes of Health has awarded a $11.2-million, five-year grant to a team of researchers led by Dr. Ting Wu *(pictured)* at Harvard and her collaborators. **Read More**

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Local News

HIV Vaccine Trial "Imbokodo" Will Not Progress to Next Steps

The Ragon Institute

Johnson & Johnson has announced results from the primary analysis of the HIV vaccine trial "Imbokodo," also called HVTN 705/HPX2008. Overall, the data showed the investigational HIV vaccine, which was tested in young women at high risk for HIV infection in sub-Saharan Africa, did not provide sufficient protection against HIV infection. **Read More**

The Dark Side of Parenting: Neural Circuits Governing Infanticide

Harvard Department of Molecular and Cellular Biology

Dr. Catherine Dulac's *(pictured)* lab has been focused on parental behavior, a set of naturalistic social behaviors involving interactions between infants and adults to support the survival of young. While the evolutionary and ecological pressures on infanticide are still a subject of active study in the wild, laboratory studies have focused on developing animal models in which to dissect the neurobiological mechanisms involved. **Read More**

Professor Emeritus Paul Schimmel Donates $50 Million to Support MIT Life Sciences Enterprise

MIT News

Professor Emeritus Dr. Paul Schimmel *(pictured)* and his family recently committed $50 million to support the life sciences at MIT. They provided an initial gift of $25 million to establish the Schimmel Family Program for Life Sciences. This gift matches $25 million secured from other sources in support of the Department of Biology. The remaining $25 million from the Schimmel family will go to support the Schimmel Family Program in the form of matching funds. **Read More**

Jordan Harrod: Brain Researcher and AI-Focused Youtuber

MIT News

MIT PhD student Jordan Harrod *(pictured)* is a scientist, writer, policy advocate, and YouTuber. She uses machine learning as a tool for studying pain and consciousness — and as subject matter for her popular videos. Harrod collaborates with Dr. Emery Brown, an anesthesiologist, and Dr. Ed Boyden, a neuroscientist, to study how different parts of the brain relate to consciousness and arousal. **Read More**

New Study Provides Insight into Lung Scarring Diseases without Risky Biopsy

BU School of Medicine

Idiopathic pulmonary fibrosis is the most common and severe form of lung disease characterized by relentless scarring leading to death within an average of four years of diagnosis. A team of researchers at Boston University (BU) and the University of Pennsylvania have created a model to show how dysfunction of a highly specialized cell of the air sacs, the type 2 pneumocyte, initiates the fibrotic cascade that characterizes a number of lung diseases. **Read More**

Drug Delivery Capsule Could Replace Injections for Protein Drugs

MIT News

Monoclonal antibodies are proteins that mimic the body's own immune defenses and can combat a variety of diseases. While these drugs work well, one drawback to them is that they have to be injected. A team of MIT engineers including Dr. Giovanni Traverso *(pictured)*, in collaboration with scientists from Brigham and Women's Hospital and Novo Nordisk, is working on an alternative delivery strategy. **Read More**

Researchers Discover Immune Cell "Hubs" Hiding in Tumors

The Broad Institute

A tumor in the human body is like a city at war, bustling with cancer cells, immune cells, blood vessels, signaling molecules, and surrounding tissue. A simple census of these players will provide some basic information on their battle, but won't tell you their organization or strategy. A team of researchers has gained new insight into this organization. **Read More**

This Mysterious On-Off Switch Holds Clues to New Cancer Treatments

News@Northeastern

Within each of our cells, there's an on-off switch that controls when cells divide and reproduce. The metaphorical finger that flips this switch is a protein called RAS. Under normal circumstances, RAS switches on to help our bodies repair wounds or replenish cells, to name a few of its functions. But sometimes, the switch gets stuck in the "on" position. "When that happens, that uncontrolled proliferation, that's a hallmark of cancer," says Dr. Carla Mattos *(pictured)*. **Read More**

Investing in the Power of Pathology and Genomics

Tufts University

A $2 million grant from the Mass Life Sciences Center has helped launch the Comparative Pathology and Genomics Shared Resource at Cummings School of Veterinary Medicine, a shared resource with state-of-the-art equipment that fills newly renovated laboratory space. For Dr. Cheryl London *(pictured)*, a Veterinary Oncologist and Associate Dean for Research and Graduate Education, it represents a long-time vision becoming reality. **Read More**

MassBio Industry Snapshot Predicts 40,000 New Biopharma Jobs Over the Next 10 Years

BioSpace

A report from the Massachusetts Biotechnology Council highlights the state of the industry in Massachusetts, including surging employment and projected launch of new companies and additional lab space in the state. Over the past 15 years, Massachusetts has seen a 92% increase in biopharma employment, MassBio said in its latest industry snapshot. **Read More**

Sex Drive Linked to Medication-Sensitive Neuronal Signaling Mechanism

Genetic Engineering & Biotechnology News

At the base of the brain, inside the hypothalamus, and coursing through specialized dopamine-releasing neurons, there is a signaling pathway that regulates the sex drive, that is, the motivation to engage in mating behavior. The specialized neurons and the signaling pathway were recently identified by researchers at Beth Israel Deaconess Medical Center. **Read More**

The Pain Switch

MIT Technology Review

Dr. Fan Wang *(pictured)*, an investigator at the McGovern Institute for Brain Research and a Professor of Brain and Cognitive Sciences, has spent much of her career researching sensory perception and how the brain interprets touch and pain. She and her team are now working to understand new pain suppression centers in the brain with the hope of finding relief that doesn't require opioids. **Read More**

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Topics in Bioengineering: Khuluod Al Jamal
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September 10
12:30 PM
A Fair Shot: Vaccine Patent Protections and Global Access
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September 13
4:30 PM
The Next Normal: Global Health
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September 17
8:30 AM
Engineering the Next Wave of Immunotherapy
Online

September 17
12:30 PM
Modifying Humans: Is Global Governance of Genome Editing Possible?
Online

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