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Publications of the Week

Tripartite Motif 22 (TRIM22) Protein Restricts Herpes Simplex Virus 1 by Epigenetic Silencing of Viral Immediate-Early Genes

First Author: Teja Reddi *(pictured, right)* | Senior Author: David Knipe *(pictured, left)*
PLOS Pathogens | Blavatnik Institute, Beth Israel Deaconess Medical Center and Harvard Medical School

The authors report that Tripartite Ring Interaction Motif (TRIM)22 is a novel restriction factor of HSV-1 and limits infected cell polypeptide 0 (ICP0)-null virus replication by increasing histone occupancy and heterochromatin, thereby reducing immediate-early viral gene expression. The corresponding wild-type equivalent of the virus evaded the TRIM22-specific restriction by a mechanism independent of ICP0-mediated degradation. **Profile | Abstract**

Regulatory Genomic Circuitry of Human Disease Loci by Integrative Epigenomics

First Author: Carles A. Boix | Senior Author: Manolis Kellis *(pictured)*
Nature | The Broad Institute of MIT and Harvard

The authors present EpiMap, a compendium comprising 10,000 epigenomic maps across 800 samples, used to define chromatin states, high-resolution enhancers, enhancer modules, upstream regulators and downstream target genes. They used this resource to annotate 30,000 genetic loci that were associated with 540 traits, predicting trait-relevant tissues, putative causal nucleotide variants in enriched tissue enhancers and candidate tissue-specific target genes for each. **Abstract | Press Release**

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Awards

Dr. Robert Weinberg Receives 2021 Japan Prize

MIT

The Japan Prize Foundation has named MIT Professor Robert Weinberg *(pictured)* as one of the recipients of its 2021 awards in the category of Medical Science and Medicinal Science, citing Weinberg's contributions to the development of a multi-step model of how cancer begins and progresses, and the application of that model to improve cancer treatments and outcomes. **Read More**

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Local News

Machine-Learning Model Helps Determine Protein Structures

MIT

Cryo-electron microscopy allows scientists to produce high-resolution, three-dimensional images of tiny molecules such as proteins. This technique works best for imaging proteins that exist in only one conformation, but MIT researchers have now developed a machine-learning algorithm that helps them identify multiple possible structures that a protein can take. **Read More**

A Healthy Microbiome Builds a Strong Immune System that Could Help Defeat COVID-19

UMass Medical School

The community of bacteria that lives in and on us – called the microbiome – resembles a company, with each microbe species performing specialized jobs but all working to keep us healthy. In the gut, the bacteria balance the immune response against pathogens. These bacteria ensure the immune response is effective but not so violent that it causes collateral damage to the host. **Read More**

Genetic Link Found between Diabetes and Bone Fracture Risk

Broad Institute

Scientists have discovered thousands of genetic variants that are linked to increased risk of various diseases. Learning what these variants do in the body is key to translating genetic insights into new precision medicines. Researchers at the Broad Institute of MIT and Harvard, Beth Israel Deaconess Medical Center and Harvard Medical School have developed a set of techniques, which the researchers call a Variant-to-Function framework, that can help them to efficiently decipher the function of genetic variants. **Read More**

Tuber Locations Associated with Infantile Spasms Map to a Common Brain Network

Boston Children's Hospital

Infantile spasms occur more often in children who have more brain tubers, but we haven't known if tuber location was important. New research published in *Annals of Neurology* by Drs. Alexander Cohen *(pictured, left)* and Jurriaan Peters *(right)* of Boston Children's Department of Neurology found that the risk of infantile spasms increases when tubers disrupt a brain network connected to the globus pallidus, a structure deep in the brain. **Read More**

New Neuroscience Research Program Improves Access for BIPOC Students

McLean Hospital

McLean Hospital is launching a summer research program aimed at improving access to research-focused education and training for Black, Indigenous, and people of color (BIPOC) college students. The McLean Mental Health Research Summer Program seeks to engage scientific curiosity, create mental health research opportunities, and promote academic success in mental health research for promising BIPOC undergraduate students. **Read More**

Catching Key Moments of Cancer Progression

Whitehead Institute

Important moments of cancer are fleeting, easy-to-miss events. Even with modern medical technologies and methods, they often happen unobserved, and are only realized later when these cells spawn life-threatening conditions. New methods of tracking individual cells through time have allowed researchers to get closer to the origin of these events, and Whitehead Institute scientists are turning the power of these technologies to study cells involved in several different types of cancer.
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Dynamic, Delicate Grip between Protein Filaments Enables Hearing

Harvard Medical School

In a recent paper published in *Nature Communications*, researchers at Harvard Medical School and Boston Children's Hospital showed that a dynamic and delicate connection between two pairs of diminutive protein filaments plays a central role in hearing. The tension held by these filaments, together called a tip link, is essential for the activation of sensory cells in the inner ear. **Read More**

Three Questions: Lindsay Case on How Cells Organize and Sense the World

MIT

MIT Assistant Professor of Biology, Dr. Lindsay Case *(pictured)*, wants to understand the protein complexes called focal adhesions that let cells move and sense the world around them. She also aims to determine how cancer arises when focal adhesions malfunction. She sat down to discuss what her work means for cancer research, and her future plans for her new lab in the Department of Biology.
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Dana-Farber Cancer Institute and Deerfield Management Launch Riverway Discoveries

Dana-Farber Cancer Institute

Dana-Farber Cancer Institute and Deerfield Management Company, a healthcare investment management firm focused on advancing healthcare through investment, information and philanthropy, have formed a major translational research partnership to accelerate the development of therapeutics and diagnostics for cancer. (*Laurie H. Glimcher, Dana-Farber President and CEO, pictured*).
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How the Brain Helps Us Remember What We've Seen

MIT

We depend on our brain to hold what we see in mind, even as we shift our gaze around and even temporarily look away. This capability of "visual working memory" feels effortless, but a new MIT study shows that the brain works hard to keep up. Whenever a key object shifts across our field of view — either because it moved or our eyes did — the brain immediately transfers a memory of it by re-encoding it among neurons in the opposite brain hemisphere. **Read More**

First Patient Dosed in Clinical Trial of Gene Therapy for Tay-Sachs and Sandhoff Diseases

UMass Medical School

Utilizing gene therapy programs licensed from UMass Medical School (UMMS), Sio Gene Therapies has announced that the first patient with infantile Tay-Sachs disease has been dosed in a Phase I/II trial evaluating AXO-AAV-GM2, an investigational gene therapy for the treatment of GM2 gangliosidosis, which causes Tay-Sachs and Sandhoff diseases. Dr. Miguel Sena-Esteves (*pictured*) is Associate Professor of Neurology and a Principal Scientist of the research program at UMMS.
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Tumor-Suppressor Protein Dynamics Drive Cellular Radiation Survival

Harvard Medical School

Exposure to radiation can wreak indiscriminate havoc on cells, tissues, and organs. Curiously, however, some tissues are more vulnerable to radiation damage than others. Scientists have known these differences involve the protein p53, a well-studied tumor-suppressor protein that initiates a cell's auto-destruct programs. Yet, levels of this sentinel protein are often similar in tissues with vastly different sensitivities to radiation, posing the question: How is p53 involved? A new study by Boston researchers sheds light on this mystery. **Read More**

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Upcoming Events in Boston

February 17 9:00 AM	**MIT Microbiome Club Seminar: Dr. Daniela Vargas** Online	
February 18 12:30 PM	**Bioinformatics Sponsored Systems Biology Seminar** Online	
February 23 9:30 AM	**MIPS Seminar: Extracellular Vesicle: Novel Vaccination Platform against Viral infectious Disease** Online	
February 24 12:00 PM	**Biomanufacturing @ MIT-CBI: Research Seminar Series 2021** Online	
March 15 12:00 PM	**Research Connection Live: Virtual Edition** Online	

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Science Jobs in Boston

Senior Scientist/Associate Scientific Director
Moderna

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Dana-Farber Cancer Institute

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Novartis

Research Fellow, Novel Stress Biomarkers
Massachusetts General Hospital

Lead Staff Scientist, Biomaterials and Process Development
Harvard Medical School

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