SCIENCE in BOSTON

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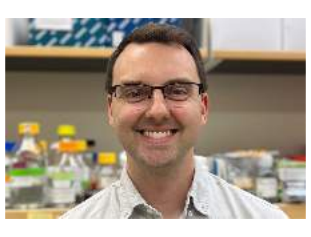
Publications of the Week

Signaling and Transcriptional Dynamics Underlying Early Adaptation to Oncogenic BRAF Inhibition

First Authors: Cameron Flower *(pictured)* and Chunmei Liu | Senior Author: James Heath, Wei Wei, and Forest White
Cell Systems | Koch Institute and MIT



A major contributor to poor sensitivity to anti-cancer kinase inhibitor therapy is drug-induced cellular adaptation, whereby remodeling of signaling and gene regulatory networks permits a drug-tolerant phenotype. Here, researchers resolve the scale and kinetics of critical subcellular events following oncogenic kinase inhibition and preceding cell cycle re-entry. **Abstract**

Differential Aortic Aneurysm Formation Provoked by Chemogenetic Oxidative Stress

First Author: Apabrita Ayan Das | Senior Author: Thomas Michel *(pictured)*
The Journal of Clinical Investigation | Brigham and Women's Hospital and Harvard University

Aortic aneurysms are potentially fatal focal enlargements of the aortic lumen; the disease burden is increasing as the human population ages. Pathological oxidative stress is implicated in the development of aortic aneurysms. Researchers pursued a chemogenetic approach to create an animal model of aortic aneurysm formation using a transgenic mouse line, DAAO-TG^{Tie2}. **Abstract | Press Release**

LINE-1 ORF1p Mimics Viral Innate Immune Evasion Mechanisms in Pancreatic Ductal Adenocarcinoma

First Author: Eunae You | Senior Author: David Ting *(pictured)*
Cancer Discover | Harvard Medical School and Massachusetts General Hospital

Repeat element viral mimicry is a common feature in pancreatic ductal adenocarcinoma (PDAC) that requires mechanisms to manage this repeat “viral” load and attenuate innate immune responses. In this study, researchers show that the long interspersed nuclear element 1 (LINE-1) open reading frame 1 protein (ORF1p) in PDAC cells plays a role in shielding repeat RNAs from activating a pathogen recognition receptor–mediated antiviral response. **Abstract**

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Awards

Five from Harvard Medical School Elected to National Academy of Sciences

Harvard Medical School

Five Harvard Medical School researchers are among the 150 newly elected members of the National Academy of Sciences in recognition of their distinguished and continuing achievements in original research. Election to the Academy is considered one of the highest honors a scientist can receive. Among the awardees is Dr. Paola Arlotta *(pictured)*. **Read More**

Biology Major Wins Prestigious Goldwater Prize

UMass Boston

Kurt Jancsy *(pictured)*, a junior majoring in Biology and Cognitive Science at UMass Boston, has been named a 2025 Goldwater Scholar. The Goldwater Scholarship Program is widely considered the most prestigious award in America for undergraduates in natural sciences, mathematics, and engineering. He is the sixth UMass Boston student in the past seven years to be named a Goldwater Scholar. **Read More**

Pulmonologist Darrell Kotton Is BU’s Innovator of the Year

The Brink

Dr. Darrell Kotton *(pictured)* and his team imagine a future where they can use a patient’s own cells to fix lung damage caused by disease—reprogramming cells in a laboratory dish and transplanting them back into the patient. For this cutting-edge work, which could eventually help cure diseases like pulmonary fibrosis and cystic fibrosis, Dr. Kotton has been named Boston University's Innovator of the Year. **Read More**

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Local News

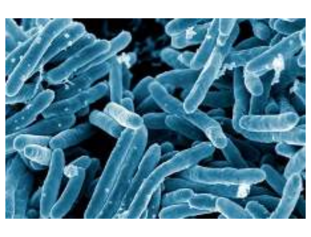
How the Novo Nordisk Foundation Center at Broad Is Using Scalable Technologies and AI to Find the Root Cause of Diabetes

Broad Institute

Since the earliest days of her scientific career, Dr. Melina Claussnitzer *(pictured)*, a metabolic disease researcher at the Novo Nordisk Foundation Center for Genomic Mechanisms of Disease at the Broad Institute, has been thinking about how to accelerate the discovery of the biological mechanisms driving diabetes and obesity. She knows first-hand how slow and painstaking it can be to translate genetic variants linked to increased disease risk into biological insight. **Read More**

New Molecular Label Could Lead to Simpler, Faster Tuberculosis Tests

MIT News



MIT chemists have demonstrated that they can label a glycan called ManLAM using an organic molecule that reacts with specific sulfur-containing sugars. These sugars are found in only three bacterial species, the most notorious and prevalent of which is *Mycobacterium tuberculosis*. The researchers now hope to use this approach to develop a cheaper and faster alternative to existing diagnostics. **Read More**

Different Anesthetics, Same Result: Unconsciousness by Shifting Brainwave Phase

The Picower Institute

At the level of molecules and cells, ketamine and dexmedetomidine work very differently, but in the operating room they do the same exact thing: anesthetize the patient. By demonstrating how these distinct drugs achieve the same result, a new study in animals identifies a potential signature of unconsciousness that is readily measurable to improve anesthesiology care. **Read More**

Biologists Identify Targets for New Pancreatic Cancer Treatments

MIT News

Researchers from MIT and Dana-Farber Cancer Institute, led by Dr. Tyler Jacks *(pictured)*, have discovered that a class of peptides expressed in pancreatic cancer cells could be a promising target for T-cell therapies and other approaches that attack pancreatic tumors. Known as cryptic peptides, these molecules are produced from sequences in the genome that were not thought to encode proteins. **Read More**

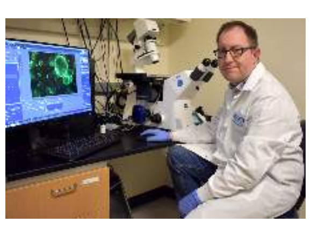
A Systems Biologist Uses AI to Understand How the Genome Controls Cell Fate

Broad Institute

Growing up in the Sichuan province in China, Dr. Bo Xia *(pictured)* was curious about the nature he saw around him. In school, he loved imagining how molecules made up materials and whole organisms. Today, Xia runs a lab at the Broad dedicated to untangling how the structure of the genome regulates gene expression and determines cell fates in health and disease. **Read More**

What is Immunopeptidomics?

Dana-Farber Cancer Institute



A burgeoning type of “omics” called immunopeptidomics is being used to take an inventory of every flag on the surface of a cancer cell and determine what it is, if it is specific to the cancer, and if it can stimulate an immune response. Dr. William Freed-Pastor *(pictured)* and his team have used this method to help build a short-list of pancreatic-cancer-specific immune targets that could become the targets for new cancer therapies. **Read More**

In Down Syndrome Mice, 40Hz Light and Sound Improve Cognition, Neurogenesis, Connectivity

MIT News

Studies by a growing number of labs have identified neurological health benefits from exposing human volunteers or animal models to light, sound, and/or tactile stimulation at the brain’s “gamma” frequency rhythm of 40Hz. In the latest such research, scientists found that 40Hz sensory stimulation improved cognition and circuit connectivity and encouraged the growth of new neurons in mice genetically engineered to model Down syndrome. **Read More**

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Upcoming Events in Boston

May 21 10:00 AM	**Cancer Biology Annual Spring Symposium** Harvard Medical School
May 22 4:00 PM	**2025 Phillip A. Sharp Lecture in Neural Circuits with Mala Murthy** Building 46
May 28 - 29 8:00 AM	**3rd Gene Therapy Potency Assay Summit** Revere Hotel Boston Common
June 9 - 10 8:00 AM	**Precision in Drug Discovery & Preclinical Summit Boston** Revere Hotel Boston Common
June 13 4:00 PM	**Symposium Series on Emerging Model Organisms with Tessa Montague** Building 46

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Science Jobs in Boston

Global Head, Oncology Translational Research
Novartis

Biostatistics Leader, Immunology
Roche

Research Associate, PRISM Lab
Broad Institute

Senior Scientist, *In Vivo* Pharmacology, Oncology Discovery Biology
Bristol Myers Squibb

Postdoctoral Fellow
Beth Israel Deaconess Medical Center

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