

### Publications of the Week

#### PI3K Drives the De Novo Synthesis of Coenzyme A from Vitamin B5

First Authors: Christian Dobbie (pictured, back row, third from left) and Samuel Barritt (back row, far right) | Senior Author: Alex Toker (back row, far left) | Nature | Beth Israel Deaconess Medical Center and Harvard Medical School



In response to hormones and growth factors, the class I phosphoinositide-3-kinase (PI3K) signaling network functions as a major regulator of metabolism and growth, governing cellular nutrient uptake, energy generation, reducing cofactor production, and macromolecule biosynthesis. Using mass-spectrometry-based metabolomics and isotope tracing, the authors show that PI3K signalling stimulates the *de novo* synthesis of one of the most pivotal metabolic cofactors: coenzyme A. [Profile](#) | [Abstract](#) | [Press Release](#)

#### Pyramidal Neuron Subtype Diversity Governs Microglia States in the Neocortex

First Authors: Jeffrey Stogsdill and Kwanho Kim | Senior Author: Paola Arlotta (pictured) | Nature | Harvard University and the Broad Institute



Microglia are specialized macrophages in the brain parenchyma that exist in multiple transcriptional states and reside within a wide range of neuronal environments. Using the mouse somatosensory cortex, the authors demonstrate that microglia density and molecular state acquisition are determined by the local composition of pyramidal neuron classes. [Abstract](#) | [Press Release](#)

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### Awards

#### BU Researcher Receives \$4M NIH Grant to Study the Impact of Cumulative Racism on Brain Health

BU School of Medicine



Through a five-year, \$4 million R01 grant from the National Institutes of Health (NIH), Dr. Karin Schon (pictured), Assistant Professor of Anatomy & Neurobiology at BU, plans to examine how cardiorespiratory fitness and chronic psychosocial stress interact to affect the medial temporal hippocampal system of the brain in Black emerging adults who are exposed to daily social stress, examined through the lens of racism-rated chronic stress. [Read More](#)

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### Local News

#### Humsa Venkatesh Probes Cancer's Grip on the Brain

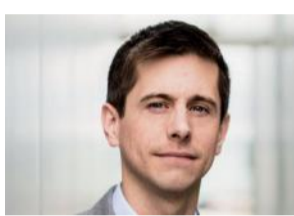
The Scientist



After her uncle was diagnosed with a type of kidney cancer called renal cell carcinoma around 2003, Dr. Humsa Venkatesh (pictured), then in high school, watched a team of oncologists struggle to battle the disease. She came to think of medicine as exploring what is known, and research as exploring what is not. "I was much more interested in the unknown, and advancing that somehow to get more new therapies," Dr. Venkatesh says. [Read More](#)

#### What Do At-Home Microbiome Tests Tell Us About Microbes Living in Our Guts?

TuftsNow



As a microbiologist who studies the microbiomes of plants, animals and people, Dr. Benjamin Wolfe (pictured) has watched public interest in gut microbes grow alongside research on their possible dramatic influence on human health. In the past several years, microbiome testing techniques used by researchers like him are now available to consumers at home. [Read More](#)

#### Forsyth Researchers Use Resolvins for the Treatment of Lung Cancer

Forsyth Institute



What if there was a way to stop an aggressive cancerous tumor from growing, reduce its size, keep it from spreading through the body, and mitigate the toxicity of chemotherapeutic drugs used to treat cancer? It would be a game changer in cancer treatment. A group of researchers at the Forsyth Institute have discovered that Resolvin E1, a lipid derivative of Omega-3 fatty acids, may be the way to do just that. [Read More](#)

#### Scientists Uncover Role of Alzheimer's-Linked APOE Gene in Glaucoma Protection and Identify Promising Treatment Strategy to Prevent Vision Loss

Brigham and Women's Hospital



New research led by scientists at Mass Eye and Ear and Brigham and Women's Hospital, member hospitals of Mass General Brigham, reveals the role that a genetic variant associated with Alzheimer's disease, APOE4, plays in protecting against glaucoma. In the new study, researchers including Drs. Milica Margeta (pictured, left) and Oleg Butovsky (right) also used a pharmacologic treatment to successfully prevent the destruction of neurons in the eyes of mice with glaucoma by targeting the APOE signaling pathway. [Read More](#)

#### Multiple Shots of the Bacillus Calmette-Guerin Vaccine Protect Patients with Type 1 Diabetes from COVID-19

Massachusetts General Hospital



Researchers at Massachusetts General Hospital published a new paper in *Cell Reports Medicine* demonstrating the protective potential of multiple doses of the Bacillus Calmette-Guerin (BCG) vaccine against COVID-19 and other infectious diseases. In a double-blind, placebo-controlled study of patients with type 1 diabetes conducted at the start of the pandemic, the researchers found that 12.5% of placebo-treated individuals and 1% of BCG-treated individuals met criteria for confirmed COVID-19. [Read More](#)

#### Scientists Identify a Plant Molecule That Sops up Iron-Rich Heme

MIT News



To establish symbiosis with bacteria, some legume plants produce hundreds of peptides that help bacteria live within structures known as nodules within their roots. A new study from MIT reveals that one of these peptides has an unexpected function: It sops up all available heme, an iron-containing molecule. "This is the first of the 700 peptides in this system for which a really detailed molecular mechanism has been worked out," says Dr. Graham Walker (pictured). [Read More](#)

#### Researchers Identify a Key Enzyme That Controls White-to-Brown Fat Conversion

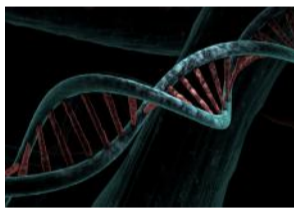
Beth Israel Deaconess Medical Center



A growing body of evidence suggests that brown and beige adipose tissues are protective against metabolic disease, such as insulin resistance and diabetes. Researchers in Dr. Shingo Kajimura's (pictured) group at Beth Israel Deaconess Medical Center have developed a transformative approach to make more of this kind of cell. [Read More](#)

#### New Online Resource Helps Connect Rare Genetic Variants to Human Health and Disease

Broad Institute



In 2006, researchers discovered that people with certain variants of the gene PCSK9 had dramatically lower cholesterol levels than the general population. Individuals with two broken copies of the gene — one from each parent — were up to 88 percent less likely to have coronary heart disease than people with functioning PCSK9. Now, researchers at the Broad Institute have created a resource that could help reveal potential therapeutic target genes like PCSK9. [Read More](#)

#### Study Provides First In-Depth Look at Major Mix-Ups in the Genomic Terrain of Pediatric High-Grade Glioma

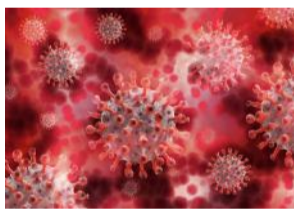
Dana-Farber Cancer Institute



A new study provides the first large-scale accounting of the "structural variants" — the most extensive type of genomic alterations — in pediatric high-grade glioma. The findings will be critical to understanding how the disease develops and whether some treatments work better in certain patients. "Although there has been some progress in treating the disease, it currently is not curable," says the study's co-senior author, Dr. Pratti Bandopadhyay (pictured). [Read More](#)

#### Powerful New Antibody Neutralizes All Known Coronavirus Variants

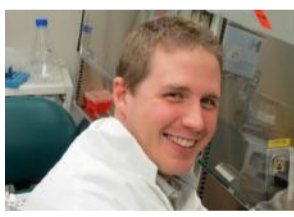
Boston Children's Hospital



As the COVID-19 pandemic wears on, newer variants of the SARS-CoV-2 coronavirus have been evolving ways to evade the antibodies we make in response to vaccines or prior infections. Scientists have been searching for an antibody that would be broadly neutralizing — able to fight off any virus variant that might emerge. An antibody developed by researchers at Boston Children's Hospital now seems to fit the bill. [Read More](#)

#### A Single Genetic Variant Affects Immune Response to an Experimental Flu Vaccine

Ragon Institute



A single genetic variant on human B cell receptors is responsible for differences in immune response to an experimental universal flu vaccine that targets the influenza viral spike protein. Findings from Dr. Daniel Lingwood's (pictured) lab suggest some people may not have broadly neutralizing antibody responses to universal flu vaccines, but there is the potential to rescue immune response. [Read More](#)

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### Upcoming Events in Boston

September 15–16  
8:00 AM  
**Forsyth Dentech 2022**  
Forsyth Institute & Online

September 20  
10:00 AM  
**Precision Medicine 2022: The New "Normal"?**  
Joseph B. Martin Conference Center & Online

September 20  
5:30 PM  
**Using Chemical and Biomedical Engineering to Advance Biomedicine**  
Whitehead Institute

September 23–24  
12:45 PM  
**15<sup>th</sup> Annual Inflammatory Bowel Disease: The Art and Science in the Diagnosis and Treatment 2022**  
Boston Park Plaza Hotel & Online

September 26  
8:00 AM  
**The Economics of Job Acquisition or "What's Going On with This Job Market?!"**  
MassBioHub & Online

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### Science Jobs in Boston

**Field Application Scientist, Primary and Cultured Cells**  
STEMCELL Technologies

**Lab Technician, Assay Development**  
Invalio Sciences

**Senior Principal Scientist, Preclinical Pharmacology**  
Lilly

**Computational Biologist**  
Broad Institute

**Postdoctoral Scientist I, Process Development**  
UMass Chan Medical School

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