SCIENCE in BOSTON

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Volume 3.19: May 24

Publications of the Week

Extended-Representation Bisulfite Sequencing of Gene Regulatory Elements in Multiplexed Samples and Single Cells

First Author: Sarah Shareef | Senior Authors: Volker Hovestadt and Bradley Bernstein *(pictured)*
Nature Biotechnology | Massachusetts General Hospital, Harvard Medical School, Broad Institute, Brigham and Women's Hospital, and Dana-Farber Cancer Institute

The biological roles of DNA methylation have been elucidated by profiling methods based on whole-genome or reduced-representation bisulfite sequencing, but these approaches do not efficiently survey the vast numbers of non-coding regulatory elements in mammalian genomes. The authors present an extended-representation bisulfite sequencing method for targeted profiling of DNA methylation. **Abstract**

Therapeutically Reprogrammed Nutrient Signaling Enhances Nanoparticulate Albumin Bound Drug Uptake and Efficacy in KRAS-Mutant Cancer

First Author: Ran Li | Senior Authors: Ralph Weissleder and Miles Miller *(pictured)*
Nature Nanotechnology | Massachusetts General Hospital, Harvard Medical School, MIT, and Brigham and Women's Hospital

Nanoparticulate albumin bound paclitaxel (nab-PTX) is among the most widely prescribed nanomedicines in clinical use, yet it remains unclear how nanoformulation affects nab-PTX behavior in the tumor microenvironment. The authors quantified the biodistribution of the albumin carrier and its chemotherapeutic payload in optically cleared tumors of genetically engineered mouse models. **Abstract**

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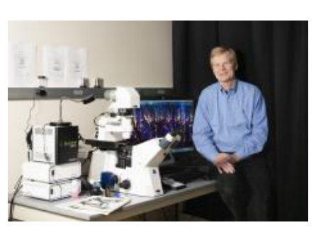
Awards

Leaders in Neuroscience and Genetics Recognized

Harvard Medical School



Dr. Christopher Walsh *(pictured)*, the Bullard Professor of Pediatrics and Neurology at Harvard Medical School and Boston Children's Hospital, will share the 2021 Gruber Neuroscience Prize with Dr. Christine Petit of the Institut Pasteur and Collège de France for their groundbreaking work in revealing the genetic and molecular mechanisms behind inherited neurodevelopmental disorders. **Read More**

Awards & Recognitions: May 2021

Harvard Medical School

Dr. Clare Tempany-Afdhal *(pictured)*, Harvard Medical School Professor of Radiology and Vice-Chair of Radiology Research at Brigham Health, received the International Society for Magnetic Resonance in Medicine's Gold Medal Award, which recognizes a major research contribution to the field of magnetic resonance within the scope of the society. **Read More**

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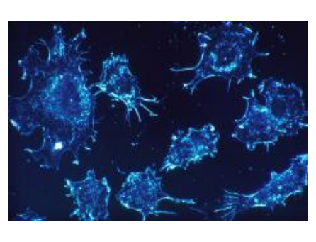
Local News

Scientists Attack 'Undruggable' Cancer Protein with Targeted Nanoparticles

Dana-Farber Cancer Institute



There are many proteins and genes that make up scientists' list of most wanted cancer culprits. Some are more elusive than others. A new approach using nanoparticles may shed light on one previously undruggable protein, making it a potential target for a proven cancer drug. If successful, it may open the door for a new treatment for triple-negative breast cancer. **Read More**

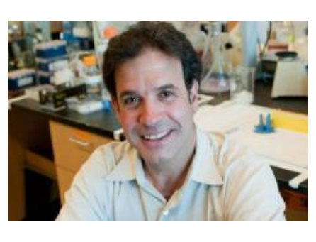
Childhood Hobbies Jump-Start a Research Career

MIT Biology

In seventh grade, Eduardo Canto *(pictured)* wanted a dog. His mom said no, though. She didn't want to spend her days vacuuming fur. They reached a compromise: Canto was allowed to have a pet fish. Soon Canto's disappointment with his new pets turned to curiosity. While he couldn't train the fish to sit or roll over, he decided that breeding the fish could be a fun pastime. **Read More**

Study Solves Mystery of How Amyloid Beta, a Key Player in Alzheimer's, Forms in Brain Nerve Cells

Massachusetts General Hospital



In a major breakthrough, researchers at Massachusetts General Hospital led by Dr. Rudolph Tanzi *(pictured)*, have discovered how amyloid beta — the neurotoxin believed to be at the root of Alzheimer's disease — forms in axons and related structures that connect neurons in the brain, where it causes the most damage. Their findings could serve as a guidepost for developing new therapies to prevent the onset of this devastating neurological disease. **Read More**

Nahid Bhadelia to Head New Boston University Center for Emerging Infectious Diseases

Boston University

With an audience of one, and from behind her blue mask, Dr. Nahid Bhadelia *(pictured)* slips on one hat after another, pivoting seamlessly from healthcare policy work to infectious diseases physician to Associate Professor to expert researcher in highly communicable diseases. It's easy to see why Dr. Bhadelia is such a sought-after expert voice on the coronavirus pandemic — no question, no subject, is out of her comfort zone. **Read More**

Creating a Niche

The Harvard Gazette

Every week during her first year at Harvard Medical School, Ryoko Hamaguchi *(pictured)* sat in the front row of her preclinical classes sketching a portrait of a guest patient on her iPad. "I would incorporate elements of their story as they were telling them," said Hamaguchi, who is graduating this year and will train in the Harvard Plastic Surgery Residency program. **Read More**

A Gut Feeling

The Harvard Gazette

By analyzing the genetic makeup of bacteria in the human gut, a team at Harvard Medical School and Joslin Diabetes Center has successfully linked groups of bacterial genes, or "genetic signatures," to multiple diseases. "Our study underscores the value of data science to tease out complex interplay between microbes and humans," said study senior author Dr. Chirag Patel *(pictured)*. **Read More**

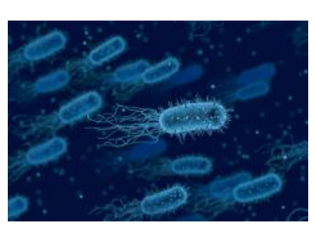
How Moths Find Their Flame – Genetics of Mate Attraction Discovered

Tufts University

The mysteries of sexual attraction just became a little less mysterious – at least for moths. A team of six American and European research groups including Tufts University has discovered which gene expressed in the brain of the male European corn borer moth controls his preference for the sex pheromone produced by females. **Read More**

Bacteria-Killing Viruses to Help Developing Countries Fight Cholera

MIT Alumni



"As a scientist, I always thought that if I develop something innovative, it will affect a whole community," says Dr. Minmin "Mimi" Yen, who was awarded a Howard Hughes Medical Institute fellowship as a grad student and who worked on translating bench science to clinical applications. But when she flew to Haiti in 2014 to study the cholera epidemic, she realized the path to impact wasn't so simple. **Read More**

Not So Black and White

The Harvard Gazette

In a new study published in the journal *Science*, Harvard University researchers have identified a mechanism that controls the emergence of early precursors for red blood cells by regulating a metabolic program. By studying how red blood cells develop in zebrafish, the researchers found that a specific DNA-binding protein controls metabolism in the mitochondria. The pathway can potentially be targeted in diseases such as anemia to restore red blood cell production. **Read More**

Painful Endometriosis Could Hold Clues to Tissue Regeneration, Scientist Says

NPR

It's estimated that one in ten women experience endometriosis during their reproductive years, a condition where cells that line the uterus go rogue by moving to other organs, taking root and spreading there, leading to terrible pain. Many women who have the disorder struggle to be properly diagnosed. It was years before Dr. Linda Griffith *(pictured)*, a top biological engineer at MIT, knew why she was experiencing exceptionally heavy periods and debilitating pain. **Read More**

Study Reveals Promising Combination Therapy for T Cell Prolymphocytic Leukemia

Dana-Farber Cancer Institute

"T cell prolymphocytic leukemia (T-PLL) is an especially challenging cancer to treat. The current treatments, such as chemotherapy and the antibody drug alemtuzumab, aren't very effective and lead to considerable toxicities," says Dana-Farber's Dr. Matthew Davids *(pictured)*. "We urgently need to identify the molecular vulnerabilities of T-PLL cells so we can design clinical trials of drugs that target those weaknesses. Our study is one of the first to do that." **Read More**

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Upcoming Events in Boston

May 26 3:00 PM	**MassBio Virtual Career Fair** Online
May 27 7:00 PM	**When Miniaturization Meets Medicine: A Conversation with Sangeeta Bhatia** Online
June 4 1:00 PM	**Renal Grand Rounds, Co-Hosted by the Fibrosis ARC** Online
June 9 7:00 PM	**Biotechnology and the Future of Medicine** Online
June 9 7:00 PM	**Nobel Laureate Dr. Shinya Yamanaka Presents "Recent Progress in iPS Cell Research and Application"** Online

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