

Publications of the Week

A Tissue-Bioengineering Strategy for Modeling Rare Human Kidney Diseases *In Vivo*

First Authors: J. Hernandez & X. Wang | Senior Author: Dario Lemos (pictured, third from left)
Nature Communications | Brigham and Women's Hospital, Harvard Medical School, Boston Children's Hospital, and Harvard Stem Cell Institute



The lack of animal models for some human diseases precludes scientists' understanding of disease mechanisms and their ability to test prospective therapies *in vivo*. Generation of kidney organoids from tuberous sclerosis complex patient-derived human induced pluripotent stem cells allows researchers to recapitulate a rare kidney tumor called angiomyolipoma. [Profile](#) | [Abstract](#)

Reprogramming Natural Killer Cells and Macrophages via Combined Antibody and Cytokine Therapy Primes Tumors for Elimination by Checkpoint Blockade

First Author: Chensu Wang | Senior Author: Darrell Irvine (pictured)
Cell Reports | Koch Institute, Broad Institute, Massachusetts General Hospital, Ragon Institute, Harvard Medical School, MIT



Treatments aiming to augment immune checkpoint blockade (ICB) in cancer often focus on T cell immunity, but innate immune cells may have important roles to play. The authors demonstrate a single-dose combination treatment using a pan-tumor-targeting antibody surrogate, half-life-extended interleukin-2, and anti-programmed cell death 1, which primes tumors to respond to subsequent ICB and promotes rejection of large established tumors in mice. [Abstract](#)

[View All Publications](#)

Awards

Flotte Lab Receives Grant to Develop Gene Therapy Models for Genetic Lung Disease

UMass Chan Medical School



Researchers from UMass Chan Medical School have received a five-year, \$13.6 million program project grant from the National Heart, Lung and Blood Institute to develop new gene therapy models for alpha-1 antitrypsin (AAT) deficiency, a chronic, debilitating genetic lung disease that shortens the lifespan. Dr. Terence Flotte (pictured) said that while this program project grant targets AAT deficiency, the findings could apply to other genetic diseases. [Read More](#)

This Year's Kilachand Fund Awards Will Support Pioneering Research across Engineering and Life Sciences

The Brink



In 2018, BU trustee Rajen Kilachand made a historic gift of \$115 million, \$100 million of which established the Rajen Kilachand Fund for Integrated Life Sciences and Engineering, supporting interdisciplinary research and solutions to some of today's biggest challenges in the life sciences. Funded teams include Drs. Anna Devor (pictured) and Laura Lewis, who plan to develop a technique for measuring blood vessel behavior during sleep. [Read More](#)

UMass Cancer Center Funds Five UMass Chan Research Projects

UMass Chan Medical School



Five new cancer-focused research studies are being funded by one-year grants from the UMass Cancer Center Pilot Project Program. The UMass Cancer Center, the Department of Population and Quantitative Health Sciences, and the National Cancer Institute provided funding for the pilot projects. Dr. John Harris (pictured) will investigate if intratumoral injection of AIM2 small interfering RNA enhances the response of immune checkpoint inhibitor for melanoma. [Read More](#)

Wyss Faculty Members Named Top Translational and Highly Cited Researchers of the Year

Wyss Institute



Every year, the journal *Nature Biotechnology* releases a list of the top 20 translational researchers recognizing scientists for making their research available to the world via patents in addition to publications. Its 2020 list, released earlier this month, includes three Wyss Institute Core Faculty members: Drs. George Church (pictured), Don Ingber, and David Weitz. [Read More](#)

[View All Awards](#)

Local News

BioGenesis Podcast: Jade Varineau of the Calo Lab on the Fundamental Biology behind Craniofacial Disorders

Whitehead Institute



BioGenesis is the podcast where we get to know a biologist, where they came from, and where they're going next. Co-hosts Raleigh McElvey, Communications Specialist at MIT Biology, and Eva Frederick, Science Communications Officer at the Whitehead Institute, introduce Jade Varineau (pictured), who is investigating what goes wrong when errors in the genetic code confuse the cells that form facial structures. [Read More](#)

A Stealthy Way to Combat Tumors

MIT News



Under the right circumstances, the body's T cells can detect and destroy cancer cells. However, in most cancer patients, T cells become disarmed once they enter the environment surrounding a tumor. In a new study, researchers led by Dr. Stefani Spranger (pictured) identified a specific subset of dendritic cells that have a unique way of activating T cells. [Read More](#)

Investigating Pathogens and Their Life Cycles, for the Benefit of Society

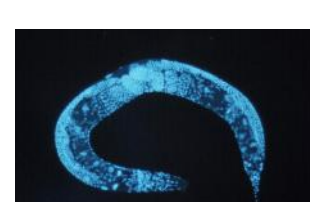
MIT News



The Lamason lab researches the life cycle of two different pathogens, trying to understand how the bacteria move between cells. Desmond Edwards (pictured) has focused on *Rickettsia parkeri*, a tick-borne pathogen that's responsible for causing spotted fever. This type of *Rickettsia* is what biologists call an obligate intracellular pathogen, meaning that it resides within cells and can only survive when it's in a host. "I like to call it a glorified virus," Edwards jokes. [Read More](#)

Feast or Forage: Study Finds Circuit That Helps a Brain Decide

The Picower Institute



MIT neuroscientists have discovered the elegant architecture of a fundamental decision-making brain circuit that allows a *C. elegans* worm to either forage for food or stop to feast when it finds a source. Capable of integrating multiple streams of sensory information, the circuit employs just a few key neurons to sustain long-lasting behaviors, and yet flexibly switch between them as environmental conditions warrant. [Read More](#)

New Details behind How the *Shigella* Pathogen Delivers Bacterial Proteins into Our Cells

Massachusetts General Hospital



Shigella, a bacterial pathogen that causes dysentery and is the leading cause of childhood diarrheal diseases, inserts a pore called a translocon into an infected person's intestinal cells and then injects bacterial proteins into the cells. "*Shigella* infects our gut by manipulating our intestinal cells and tricking them into letting the *Shigella* inside. In fact, there are many bacterial pathogens that use this same, or similar, mechanism to infect us," says Dr. Poyin Chen (pictured). [Read More](#)

B Cells Do More than Just Help Fight Infection: A New Study Shows That They Can Support Tissue Repair and Regeneration after Injury

Massachusetts General Hospital



Until recently, B cells — present in the blood stream — were mainly thought to produce antibodies and present antigens to help with the immune response to pathogens. A research team at the Vaccine and Immunotherapy Center at Massachusetts General Hospital led by Drs. Ruxandra Silibulescu and Mark Poznansky (pictured) is exploring the novel protective roles that B cells may play in the context of injury. [Read More](#)

Optimized Second-Generation mRNA Vaccine Demonstrated Improved Protection against COVID-19 in Preclinical Testing

Beth Israel Deaconess Medical Center



In a recent phase 2b/3 clinical trial, a third mRNA vaccine against COVID-19 — known as CVnCoV and developed by CureVac — reported approximately 48 percent efficacy against symptomatic disease. In a head-to-head test of a revised version of the vaccine, CV2CoV, researchers at Beth Israel Deaconess Medical Center assessed the vaccines' ability to provoke an immune response as well as their protective efficacy against COVID-19 in non-human primates. [Read More](#)

A Spatially Resolved Cell Atlas of the Brain Region that Controls Movement

Harvard Brain Science Initiative



A cell atlas of the brain, an extremely complex machine, catalogs the brain's fundamental units — the cells, with their properties and locations — and also illustrates how they are connected to form functional circuits. Recent advances in technology have shed light on the road towards a comprehensive brain atlas: Single-cell sequencing methods systematically identify cell types and quantify the heterogeneity of tissues. [Read More](#)

Discovery May Lead to Expanded Donor Pool for Stem Cell Transplants for Patients with Cancer

Dana-Farber Cancer Institute



Cancer physicians have long disagreed about whether stem cell transplants from donors with an asymptomatic blood condition called clonal hematopoiesis (CH) put recipients at risk for subsequent health problems. Such concerns have even prompted some transplant centers to exclude these individuals as donors. In a new study, researchers led by Dr. Coleman Lindsley (pictured) at Dana-Farber Cancer Institute show that in most cases, such transplants are safe and effective. [Read More](#)

Cystic Fibrosis Faithfully Modeled in a Human Lung Airway Chip

Wyss Institute



The inherited progressive disorder cystic fibrosis (CF) causes severe damage to the lungs, and other tissues in the body by affecting the cells that produce mucus, sweat, and digestive juices. A multidisciplinary research team at Harvard's Wyss Institute for Biologically Inspired Engineering, supported by a grant from the Cystic Fibrosis Foundation, have developed a microfluidic organ chip that recapitulates key pathological hallmarks from CF patients more accurately than other *in vitro* systems. [Read More](#)

Astrocyte Pharmaceuticals Announces Publication in the Journal *Stroke* of Results Supporting Advancement of AST-004 into the Clinic

Astrocyte Pharmaceuticals



Astrocyte Pharmaceuticals, a drug discovery and development company advancing novel neuroprotective therapeutics for the treatment of brain injuries, has announced the publication of a manuscript in the peer reviewed journal *Stroke* entitled: Adenosine A1 and A3 Receptor Agonist AST-004 Reduces Brain Infarction in a Nonhuman Primate Model of Stroke. [Read More](#)

[View All Articles](#) | [Submit an Article](#)

Upcoming Events in Boston

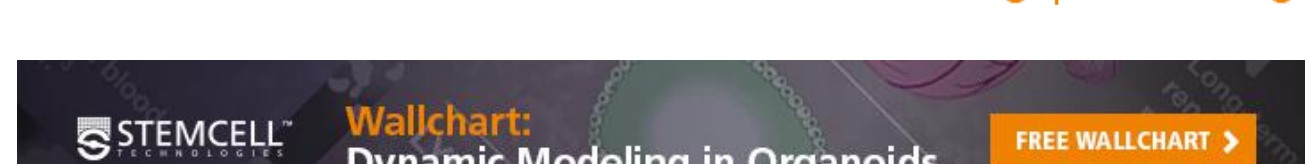
November 30 12:00 PM	Regulatory Science Forum: New Funding and Business Models for Accelerating Biomedical Innovation Online
November 30 4:00 PM	How Cancer Spreads Online
November 30 4:00 PM	Biology Colloquium Series: Dr. Omer Yilmaz Online
December 6 3:00 PM	MIT.nano Seminar: Lipid Nanoparticles for RNA Delivery: SARS-CoV-2 Vaccines, Chemistry, and Beyond Online
December 7 1:00 PM	Aligning Financial Management Systems to the Biotech Lifecycle: From Pre-Commercial to High Growth Online

[View All Events](#) | [Submit an Event](#)

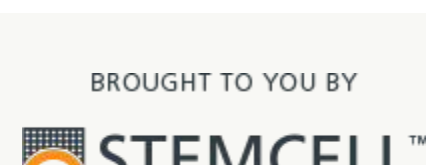
Science Jobs in Boston

- Research Associate II, Stem Cell Models**
Broad Institute
- Postdoctoral Research Fellow, Biology**
Wave Life Sciences
- Cell Banking Principal Research Associate or Scientist, Analytical Development**
CRISPR Therapeutics
- Senior Scientist/Principal Scientist, Cell Biology**
LifeMine Therapeutics
- Research Scientist**
Massachusetts General Hospital

[View 53 Other Science Jobs](#) | [Submit a Job](#)



Submit your articles and events by reaching out to us at info@scienceinboston.com.



- STEMCELL Technologies**
Products | Services
- STEMCELL Science News**
Free Weekly Updates on Your Field
- The Stem Cell Podcast**
Interviews and Updates on Stem Cell Science