

Publications of the Week

Engineering, Delivery, and Biological Validation of Artificial microRNA Clusters for Gene Therapy Applications

First Author: Vivek Bhaskaran | Senior Author: Pierpaolo Peruzzi (pictured, third from left) Nature Protocols | Harvard Medical School and Brigham and Women's Hospital



MicroRNAs are tiny RNAs belonging to the larger family of non coding RNAs (i.e. genes that are transcribed but do not become proteins) and have a crucial role in keeping cells healthy and in check. Unsurprisingly, in cancer, many of them are dysregulated simultaneously, and each one partially contributes to the malignancy of the disease. The authors provide the research community with a "recipe" to build up artificial genes encoding multiple microRNAs of choice. [Profile](#) | [Abstract](#)

Activity-by-Contact Model of Enhancer–Promoter Regulation from Thousands of CRISPR Perturbations

First Author: Charles Fulco | Senior Author: Eric Lander (pictured) Nature Genetics | The Broad Institute, Harvard Medical School and Massachusetts Institute of Technology



Enhancer elements in the human genome control how genes are expressed in specific cell types and harbor thousands of genetic variants that influence risk for common diseases. The authors developed an experimental approach, CRISPRi-FlowFISH, to perturb enhancers in the genome, and applied it to test >3,500 potential enhancer–gene connections for 30 genes. They then applied a simple activity-by-contact model to predict the complex connections in their CRISPR dataset. [Abstract](#)

Single Cell Census of Human Kidney Organoids Shows Reproducibility and Diminished Off-Target Cells after Transplantation

First Author: Aishwarya Subramanian | Senior Author: Anna Greka (pictured) Nature Communications | The Broad Institute, Harvard Medical School and Brigham and Women's Hospital



Human iPSC-derived kidney organoids have the potential to revolutionize discovery, but assessing their consistency and reproducibility across iPSC lines, and reducing the generation of off-target cells remain an open challenge. The authors profiled four human iPSC lines for a total of 450,118 single cells to show how organoid composition and development are comparable to human fetal and adult kidneys. [Abstract](#)

Somatic and Dendritic Encoding of Spatial Variables in Retrosplenial Cortex Differs during 2D Navigation

First Author: Jakob Voigts | Senior Author: Mark Härmelt (pictured) Neuron | The McGovern Institute for Brain Research and Massachusetts Institute of Technology



Active amplification of organized synaptic inputs in dendrites can endow individual neurons with the ability to perform complex computations. Head-restrained imaging has yielded important insights into cellular and circuit function, but this approach limits behavior and the underlying computations. The authors describe a method for full-featured 2-photon imaging in awake mice during free locomotion with volitional head rotation. [Abstract](#)

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Awards

Jennifer Tseng, MD, Receives 2020 Pinnacle Award from Greater Boston Chamber of Commerce

Boston University News



Boston University School of Medicine's James Utley Professor and Chair of Surgery Dr. Jennifer Tseng (pictured), has been selected as a 2020 Pinnacle Award winner in the "Achievements in the Professions" category by the Greater Boston Chamber of Commerce Women's Network. Dr. Tseng also is Boston Medical Center's Surgeon-in-Chief. [Read More](#)

BIDMC Neurologist Louis R. Caplan, MD, Receives American Heart Association Mentorship Award

Beth Israel Deaconess Medical Center



Beth Israel Deaconess Medical Center (BIDMC) senior neurologist Dr. Louis R. Caplan (pictured), has received the American Heart Association's Eugene Braunwald Academic Mentorship Award. The award recognizes individuals whose academic careers have included a long-term record of successful mentoring of promising young academicians. [Read More](#)

Matcheri Keshavan, MD, Receives 2019 National Alliance on Mental Illness Research Award

Beth Israel Deaconess Medical Center



Dr. Matcheri Keshavan (pictured), psychiatrist and Academic Chair of Psychiatry at Beth Israel Deaconess Medical Center, received the 2019 Scientific Research Award from the National Alliance on Mental Illness. The award is given in recognition of individuals whose research advances the understanding and treatment of mental illnesses. [Read More](#)

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Local News

Flagship Invests \$50M in Startup Seeking to Tackle 'All Diseases'

Boston Business Journal



A new startup, Cellarity, has launched out of Cambridge-based venture capital firm Flagship Pioneering with what it hopes could be an industry-changing formula: mix cells and artificial intelligence to create treatments for any and all diseases. Flagship has invested \$50 million in the company to date, and will continue to finance Cellarity as needed until it is ready to raise a Series B round, according to a company spokesperson. [Read More](#)

Lantheus Enters into Strategic Collaboration with CarThera for Use of Microbubbles in Combination with SonoCloud® System for Treatment of Glioblastoma

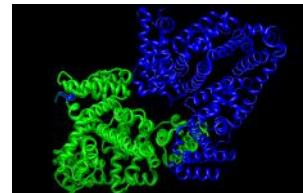
BioSpace



Lantheus Holdings, parent company of Lantheus Medical Imaging, a global leader in the development, manufacturing and commercialization of innovative diagnostic imaging agents and products, has announced that it has entered into a strategic commercial supply agreement with CarThera® for the use of Lantheus' microbubbles in combination with SonoCloud®, a proprietary implantable device in development for the treatment of recurrent glioblastoma. [Read More](#)

New Technique to Determine Protein Structures May Solve Biomedical Puzzles

Dana-Farber Cancer Institute



For decades, molecular biologists have known that a protein's ability to function in a cell relies on its proper shape, which is dictated by the order of its constituent amino acids. Scientists at Dana-Farber have developed a technique that helps determine the 3D structure of cancer-related proteins. It also helps understand how oncogenes evolve in cancer, and pinpoint which mutations in those genes contribute to disease progression. [Read More](#)

Use of Venetoclax in Reduced-Intensity Transplant Conditioning Regimen in Patients with High-Risk Myeloid Cancers Shows Promise in Early Trial

Dana-Farber Cancer Institute



For patients with high-risk myeloid cancers undergoing a donor stem cell transplant, adding the targeted drug venetoclax to a reduced-intensity drug regimen prior to transplant is safe and does not impair the ability of the donor cells to take root in recipients' bodies, a study led by Dana-Farber Cancer Institute researchers suggests. [Read More](#)

Treatment with PD-1 Inhibitor Prior to Stem Cell Transplant Is Safe, Effective for Patients with Classic Hodgkin Lymphoma, Study Finds

Dana-Farber Cancer Institute



A new analysis shows that a donor stem cell transplant following treatment with an immune checkpoint inhibitor is generally safe and produces good outcomes for patients with Hodgkin lymphoma. The study focused on the safety of donor stem cell transplantation in patients with classic Hodgkin lymphoma who were previously treated with a PD-1 inhibitor, a drug that unleashes an immune system attack on tumor cells. [Read More](#)

Probiotic Yeast May Offer an Effective Treatment for Drug-Resistant Fungal Infections

EurekaAlert



A study by Dr. Reeta Rao (pictured) has shown that probiotic yeasts derived from food are able to reduce the virulence of, and even prevent infections by, several types of fungi that are responsible for life-threatening infections in hospitalized and immune-compromised individuals, including the multi-drug resistant *Candida auris*, which was recently listed as an urgent threat by the U.S. Centers for Disease Control in its 2019 Antibiotic Resistance Threats report. [Read More](#)

A Harvard Geneticist's Goal: To Protect Humans from Viruses, Genetic Diseases, and Aging

CBS News



Our lives have been transformed by the information age. But what's coming next is likely to be more profound, call it the genetic information age. We have mapped the human genome and in just the last few years we have learned to read and write DNA like software. And we're about to see a few breakthroughs-in-waiting that would transform human health. For a preview of this revolution in evolution, CBS News met Dr. George Church, a world leading geneticist. [Read More](#)

Living Hydrogel Can Help Heal Intestinal Wounds

The Harvard Gazette



About 1.6 million people in the U.S. have an incurable inflammatory bowel disease such as Crohn's or ulcerative colitis, and 70,000 new cases are diagnosed each year. Scientists led by Dr. Neel Joshi (pictured) at the Wyss Institute have developed a bioactive material that uses a strain of genetically engineered gut bacteria as a locally acting probiotic to produce a network of nanofibers that directly bind to mucus to fill inflamed areas like a patch. [Read More](#)

Protecting against HIV by Tricking the Immune System

Boston Children's Hospital



In making an HIV vaccine, a major goal is to stimulate production of broadly neutralizing antibodies that can fight multiple strains of the frequently changing virus. To date, experimental HIV vaccines haven't been able to induce these kinds of antibodies. Researchers at Boston Children's Hospital, including Dr. Frederick All (pictured), have developed a new immunization method that stimulates the production of broadly neutralizing antibodies that can fight multiple strains of HIV. [Read More](#)

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The EPA's Proposed 'Transparency Rule' Will Harm Health, Safety, and the Environment

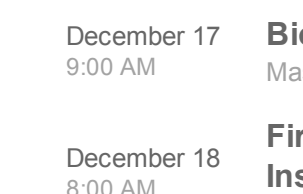
STAT News



A proposed rule by the Environmental Protection Agency (EPA) that allegedly aims to strengthen transparency in regulatory science suggests that science is broken. It isn't. We know it works because we can see the life-saving transplant technologies, hurricane forecasts, new medications, pest-resistant crops, and countless other breakthroughs that exist because of science. This discipline isn't perfect, but it is the best tool available to safeguard the planet and its people. [Read More](#)

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Upcoming Events in Boston



- December 17 9:00 AM **Biotech 101: The Science & Business of Biotech** MassBio
- December 18 8:00 AM **Fireside Chat with Stiris Research's Experts on Health Authority Inspection** MassBio
- December 22 6:00 PM **Going Beyond the Gut: The Future of Microbiome Therapeutics** Broad Institute of MIT and Harvard
- January 7 8:30 AM **Harvard Medical School Master's Degree Info Session** Online
- January 8 5:00 PM **Post-Seed Venture Capital: What Is It? Is it Right for Me?** MZD2

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