SCIENCE in BOSTON

STEMCELL™ TECHNOLOGIES

Volume 4.46: November 28, 2022

Publications of the Week

RBPMS2 Is a Myocardial-Enriched Splicing Regulator Required for Cardiac Function

First Author: Alexander Akerberg | Senior Author: Geoffrey Burns *(pictured)*
Circulation Research | Boston Children's Hospital, MIT, Massachusetts General Hospital, Harvard University, and Brigham and Women's Hospital

Geoff Burns

Numerous RNA-binding proteins (RBPs) have been implicated in cardiac development or physiology based on gene knockout studies and the identification of pathogenic RBP gene mutations in monogenic heart disorders. The authors performed a differential expression screen in zebrafish embryos to identify genes enriched in *nkx2.5*-positive cardiomyocytes or cardiopharyngeal progenitors compared to *nkx2.5*-negative cells from the same embryos. **Abstract**

Identification of TFPI as a Receptor Reveals Recombination-Driven Receptor Switching in *Clostridioides difficile* Toxin B Variants

First Author: Songhai Tian | Senior Author: Min Dong *(pictured)*
Nature Communications | Boston Children's Hospital, Harvard University, and Wyss Institute

Toxin B (TcdB) is a major exotoxin responsible for diseases associated with *Clostridioides difficile* infection. The authors investigate receptor-binding specificity of major TcdB subtypes. They find that representative members of subtypes 2, 4, 7, 10, 11, and 12 do not recognize the established host receptor, frizzled proteins. Using a genome-wide CRISPR-Cas9-mediated screen, they identify tissue factor pathway inhibitor as a host receptor for TcdB4. **Abstract**

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Awards

Fourteen Wyss Faculty Named Highly Cited Researchers in 2022

Wyss Institute

Clarivate has announced its Highly Cited Researchers™ 2022 list, which uses both quantitative and qualitative analysis to identify individuals from across the globe who have demonstrated significant and broad influence in their chosen field(s) of research. Fourteen Wyss faculty members, including Drs. George Church *(pictured)*, Jim Collins, Donald Ingber, and Peng Yin are honored in this year's list. **Read More**

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Local News

How Touch Dampens the Brain's Response to Painful Stimuli

McGovern Institute

When we press our temples to soothe an aching head or rub an elbow after an unexpected blow, it often brings some relief. It is believed that pain-responsive cells in the brain quiet down when these neurons also receive touch inputs, say scientists in Dr. Fan Wang's *(pictured)* lab at MIT's McGovern Institute, who, for the first time have watched this phenomenon play out in the brains of mice. **Read More**

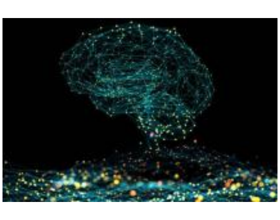
Fidelity, Arch Back Precision Medicine Startup's $178M Round

Boston Business Journal

Precision medicine startup FogPharma has raised $178 million as it prepares to launch its first human trial within the next year. With the help of the Series C, FogPharma plans to launch a Phase I clinical trial of its lead drug in mid-2023. The drug is a protein therapeutic — specifically, a stabilized polypeptide made of alpha-helix structures — that could be applicable in "a broad range of intractable cancers," according to a statement. **Read More**

Pair of Studies Uncover Surprising New Roles for Spinal Cord and Brainstem in Touch

Harvard Medical School



A pair of papers by scientists at Harvard Medical School reveal critical new insights into how the spinal cord and brainstem contribute to the sense of touch. Specifically, the research shows that the spinal cord and the brainstem, previously thought to be mere relay centers for touch information, are actively involved in processing touch signals as they travel to higher-order brain regions. **Read More**

How Big Brains Are Made

The Harvard Gazette

In a new study, researchers from the Faculty of Arts and Sciences Center for Systems Biology at Harvard describe how they used a new live-imaging technique to watch neurons being created in squid embryos almost in real-time. They were then able to track those cells through the development of the nervous system in the retina. They were surprised to discover that these neural stem cells behaved very much like those in vertebrates during nervous-system development. **Read More**

Alzheimer's Risk Gene Undermines Insulation of Brain's "Wiring"

MIT News

It's well-known that carrying one copy of the *APOE4* gene variant increases one's risk for Alzheimer's disease threefold and two copies about tenfold, but the fundamental reasons why, and what can be done to help patients, remain largely unknown. A study published in *Nature* by Dr. Li-Huei Tsai's *(pictured)* group provides some new answers as part of a broader line of research that has demonstrated *APOE4*'s consequences, cell-type-by-cell-type, in the brain. **Read More**

Obesity Is Increasing People's Risk of Cancer. Why?

Boston Children's Hospital

Marsha Moses

Obesity is now a global epidemic, and it is increasing people's risk for cancer. The National Cancer Institute lists more than a dozen cancers that are associated with overweight and obesity. But how obesity increases cancer risk hasn't been clear. The lab of Dr. Marsha Moses *(pictured)* at Boston Children's Hospital now draws a direct link — one with possible implications for cancer screening and treatment. **Read More**

Eric and Wendy Schmidt Center Announces Data Science Challenge to Harness Machine Learning for Cancer Immunotherapy

Broad Institute

Nir Hacochen

Scientists at the Broad Institute and beyond have been looking for ways to genetically modify T cells to improve their cancer-fighting ability. Now the Eric and Wendy Schmidt Center is joining this effort by holding a data science challenge this winter that will call on machine learning enthusiasts to develop algorithms that identify effective genetic modifications in T cells. Members of a cancer immunology lab led by Dr. Nir Hacohen *(pictured)* will make the top-ranked genetic modifications in T cells in the lab and assess the cells' cancer-fighting abilities. **Read More**

Gene-Delivering Viruses Reach the Brain in a Step Toward Gene Therapy for Neurological Diseases

Broad Institute

Gene therapies can treat, even potentially cure, certain genetic diseases, but it is challenging to deliver the treatments to the parts of the body where they are needed. Researchers have engineered viruses called adeno-associated viruses (AAVs) to deliver cargo to specific cells and organs, but they don't always get to their desired destination. Dr. Pardis Sabeti's *(pictured)* group at the Broad Institute have now developed a family of AAVs that is able to reach a particularly challenging target tissue — the brain. **Read More**

MassBio and Beacon Capital Partners Are Launching a Life Sciences Workforce Training Center to Meet Growing Demand

MassBio

MassBio and Beacon Capital Partners have announced a partnership to launch a nearly 4,000 square foot workforce training center at Southline Boston, the redevelopment project of the former Boston Globe building in Dorchester. Expected to open in 2023, the MassBio Training Center will launch with three distinct fast-track certificate training programs that are purpose-built to meet both the needs of the life sciences industry and the unique needs of prospective learners. **Read More**

The Best Advice for Life Sciences Entrepreneurs

Wyss Institute

The Lumineers are members of the Wyss Institute's community who have left academia and entered industry to translate their technologies into products that can transform healthcare and sustainability. Dr. Nicole Black *(pictured)* advises entrepreneurs to "build an interdisciplinary team, as having diverse viewpoints at the table will help craft the vision of the company and solve early problems effectively." **Read More**

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Upcoming Events in Boston

November 29 12:00 PM	**A Conversation with Special Guest, Dr. France Córdova, President of Science Philanthropy Alliance** Harvard Medical School & Online
November 30 4:00 PM	**SCSB Colloquium Series: Maternal Gut Bacteria Dictate Offspring's Neurodevelopmental and Immune-Primed Phenotypes** MIT & Online
December 5 6:00 PM	**Science on Stage** MIT Museum
December 6 4:00 PM	**BioAgilytix Presents: Science After Hours at MassBioHub** MassBioHub
December 7 4:00 PM	**Why Sex Matters in Health and Disease** Online

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