

Publications of the Week

Paraxial Mesoderm Organoids Model Development of Human Somites

First Author: Christoph Budjan | Senior Author: Sahand Hormoz (*pictured*)
eLife | Dana-Farber Cancer Institute and Harvard Medical School



During the development of the vertebrate embryo, segmented structures called somites are periodically formed from the presomitic mesoderm, and give rise to the vertebral column. The authors describe the generation of human paraxial mesoderm organoids from human pluripotent stem cells, which recapitulate the molecular, morphological, and functional features of paraxial mesoderm development. [Profile](#) | [Abstract](#)

Nonenzymatic Assembly of Active Chimeric Ribozymes from Aminoacylated RNA Oligonucleotides

First Author: Aleksandar Radakovic | Senior Author: Jack Szostak (*pictured*)
PNAS | Massachusetts General Hospital and Harvard Medical School



The emergence of a primordial ribosome from the RNA world would have required access to aminoacylated RNA substrates. The spontaneous generation of such substrates without enzymes is inefficient, and it remains unclear how they could be selected for in a prebiotic milieu. The authors identify a possible role for aminoacylated RNA in ribozyme assembly, a longstanding problem in the origin-of-life research. [Abstract](#)

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Awards

UMass Center for Clinical and Translational Science Awards Seven New Pilot Grants

UMass Chan Medical School



The UMass Center for Clinical and Translational Science has awarded seven pilot grants to faculty and research collaborators to accelerate the translation of basic discoveries into practical, cost-effective solutions that improve human health. Drs. Katherine Fitzgerald (*pictured*) and Fiachra Emanuel Humphries will help advance research of a novel small molecule agonist of the stimulator of interferon genes against SARS-CoV-2 infection. [Read More](#)

Ambitious Effort to Develop Lab-Grown Lungs Wins Paul G. Allen Frontiers Group Funding

The Brink



A bold early-stage project aiming to develop lab-grown lungs — which could bring fresh hope to people with pulmonary diseases such as asthma and lung cancer — has been awarded \$1.5 million over three years from the Paul G. Allen Frontiers Group. The effort will be led by Drs. Wilson Wong (*pictured*), Darrell Kotton, and Christopher Chen. [Read More](#)

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Local News

A New “Atlas” of Cells That Carry Blood to the Brain

The Picower Institute



While neurons and glial cells are by far the most numerous cells in the brain, many other types of cells play important roles. Among those are cerebrovascular cells, which form the blood vessels that deliver oxygen and other nutrients to the brain. Researchers from MIT have now performed an extensive analysis of these difficult-to-find cells in human brain tissue, creating a comprehensive atlas of cerebrovascular cell types and their functions. [Read More](#)

Researchers Identify Novel PARP-Like Enzyme in Mitochondria

BU School of Medicine



BU School of Medicine researchers have identified an ADP-ribosyltransferase enzyme that is active in the mitochondria and characterized its activity. ADP-ribosyltransferases are enzymes that play a role in the modification of other proteins. The activity of this new mitochondrial enzyme is similar to that of poly(ADP-ribose) polymerase 1 (PARP1), an enzyme with a critical role in DNA damage repair and gene expression regulation. [Read More](#)

Biohybrid Fish Made from Human Cardiac Cells Swims Like the Heart Beats

Harvard John A. Paulson School of Engineering and Applied Sciences



Harvard University researchers, in collaboration with colleagues from Emory University, have developed the first fully autonomous biohybrid fish from human stem-cell derived cardiac muscle cells. The artificial fish swims by recreating the muscle contractions of a pumping heart. “Our ultimate goal is to build an artificial heart to replace a malformed heart in a child,” said Dr. Kit Parker (*pictured*). [Read More](#)

Leah Williams Published in *Communications Biology*

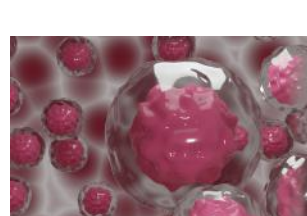
BU Biology



Dr. Leah Williams (*pictured*) was lead author on a paper published in December 2021 in *Communications Biology*. The study presents the first functional characterization of nuclear factor kappa B in single-celled organisms. The results provide a basis for understanding the evolutionary origins of this key protein and have implications for the origins of regulated immunity in higher animals, including humans. [Read More](#)

Researchers Devise Sex Cell Precursors with Staying Power

Massachusetts General Hospital (MGH)



Human primordial germ cell-like cells (PGCLCs) are stem-cell-derived models of early germ cell precursors that are widely used in medical research, but PGCLCs are usually short-lived, difficult to maintain, and quickly lose their germ cell-like features. MGH researchers and colleagues have developed a method for preserving human PGCLCs and allowing them to replicate without apparent limit while still maintaining their germ-cell-like properties. [Read More](#)

Dendrites May Help Neurons Perform Complicated Calculations

MIT News



Within the human brain, neurons perform complex calculations on information they receive. Researchers at MIT have now demonstrated how dendrites help to perform those computations. “Our hypothesis is that these neurons have the ability to pick out specific features and landmarks in the visual environment, and combine them with information about running speed, where I’m going, and when I’m going to start, to move toward a goal position,” says Dr. Mark Harnett (*pictured*). [Read More](#)

Heart Health Month: How Cardiac Imaging Can Give Us a Better Understanding of Heart Failure

Bench Press



Dr. Christopher Nguyen (*pictured*) is an Investigator at Mass General’s Cardiovascular Research Center and an Assistant Professor of Medicine at Harvard Medical School. The Nguyen lab is using advanced imaging techniques to learn more about the underlying mechanisms of the heart, with the hope of identifying new strategies to treat and prevent heart failure, and make cardiovascular imaging faster and easier. [Read More](#)

How Broad Scientists Are Bridging the Gap Between Biological Insights and New Therapies

Broad Institute



Throughout his 30-year career, Dr. Alex Burgin (*pictured*) has jumped multiple times over the divide between academia and industry, working at a biotech company, a university, and another company before realizing one September morning, nearly a decade ago, that he could land squarely between the two. In 2012, just after a cross-country move to Boston, Dr. Burgin visited the Broad Institute of MIT and Harvard to meet collaborators. [Read More](#)

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Interesting Articles

NIH Issues a Seismic Mandate: Share Data Publicly

Nature News



In January 2023, the US National Institutes of Health (NIH) will begin requiring most of the 300,000 researchers and 2,500 institutions it funds annually to include a data-management plan in their grant applications — and to eventually make their data publicly available. Researchers who spoke to *Nature* largely applaud the open-science principles underlying the policy — and the global example it sets. [Read More](#)

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Upcoming Events in Boston

February 28 10:00 AM	2022 Rare Disease Day Online
March 2 4:00 PM	SeXX and Immunity MIT
March 8 12:00 PM	PhD Career Prototype Series – Careers in the Pharmaceutical Industry Online
March 10 5:30 PM	2022 Koch Institute Image Awards Online
March 14 7:00 PM	The Code Breaker: A Conversation with Jennifer Doudna Online

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