

Publications of the Week

High-Performance Multiplex Drug-Gated CAR Circuits

First Authors: Hui-Shan Li and Nicole Wong | Senior Author: Wilson Wong *(pictured)*
 Cancer Cell | Boston University, the Wyss Institute, and Harvard University

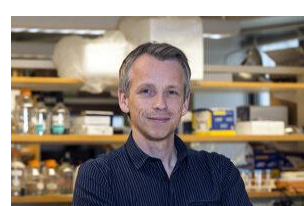


Chimeric antigen receptor (CAR) T cells can revolutionize cancer medicine. However, overactivation, lack of tumor-specific surface markers, and antigen escape have hampered CAR T cell development. A multi-antigen targeting CAR system regulated by clinically approved pharmaceutical agents is needed. The authors present VIPER CARs (versatile protease regulatable CARs), a collection of inducible on and off switch CAR circuits engineered with a viral protease domain.

[Abstract](#)

A Bacterial Pan-Genome Makes Gene Essentiality Strain-Dependent and Evolvable

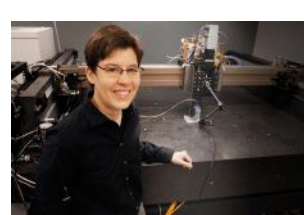
First Author: Federico Rosconi | Senior Author: Tim van Opijnen *(pictured)*
 Nature Microbiology | Boston College and the Broad Institute



Many bacterial species are represented by a pan-genome, whose genetic repertoire far outstrips that of any single bacterial genome. The authors investigate how a bacterial pan-genome might influence gene essentiality and whether essential genes that are initially critical for the survival of an organism can evolve to become non-essential. [Abstract](#)

Organoid-on-a-Chip Model of Human ARPKD Reveals Mechanosensing Pathomechanisms for Drug Discovery

First Authors: Ken Hiratsuka and Tomoya Miyoshi | Senior Authors: Jennifer Lewis *(pictured)* and Ryuji Morizane
 Science Advances | Massachusetts General Hospital, Harvard University, Brigham and Women's Hospital, and the Wyss Institute



Organoids serve as a novel tool for disease modeling in three-dimensional multicellular contexts. The authors unite organoids with organ-on-a-chip technology to unravel disease pathology and develop therapies for autosomal recessive polycystic kidney disease (ARPKD). *PKHD1*-mutant organoids-on-a-chip are subjected to flow that induces clinically relevant phenotypes of distal nephron dilatation. [Abstract](#) | [Press Release](#)

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Awards

Alt Named to Receive Paul Ehrlich and Ludwig Darmstaedter Prize

Harvard Medical School (HMS)



Dr. Frederick Alt *(pictured)*, the HMS Charles A. Janeway Professor of Pediatrics at Boston Children's Hospital, will be awarded the 2023 Paul Ehrlich and Ludwig Darmstaedter Prize, Germany's highest medical award. Dr. Alt and co-winner Dr. David Schatz of Yale Medical School will be recognized for their discovery of molecules and mechanisms that enable the immune system to recognize billions of different antigens. [Read More](#)

Deborah Anderson Receives NIH Award to Advance Research on Products that Control Sexual Transmission of Viruses, Provide Contraception

BU School of Medicine



Dr. Deborah Anderson *(pictured)*, Professor of Medicine, has received a four-year, \$7.2 million grant from the National Institutes of Health's (NIH) National Institute of Child Health and Human Development, renewing support for a Contraceptive Research Center to further her research to develop innovative monoclonal antibody-based contraceptive and multipurpose prevention technology products. [Read More](#)

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Local News

Genomic Sequencing Analysis Gets Boost through Nvidia, Broad Partnership

Genetic Engineering & Biotechnology News



The Broad Institute and Nvidia, a Silicon Valley micro-processing giant that invented the graphics processing unit in 1999, are teaming up. The two have announced a partnership that will provide the Terra cloud platform (Broad's widely used genomic analysis platform) with Nvidia's artificial intelligence and acceleration tools. The result, they say, will be faster analysis of more data. [Read More](#)

A New View of Heart Health: Mutations Accumulate in the Heart Starting in Childhood

Boston Children's Hospital



Why do so many people get heart disease when they get older? We know that factors like high blood pressure or high cholesterol contribute to heart disease risk, but they don't explain all cases. A first-of-its-kind study from Boston Children's Hospital offers a new lens on heart health. It shows that the cells of our heart muscle accumulate new genetic mutations starting in childhood — and lose the ability to repair them. [Read More](#)

Exercise Hormone Reduces Parkinson's Disease-Associated Brain Degeneration and Symptoms in Animal Model

Dana-Farber Cancer Institute



Dopaminergic neurons in the brain, which are key to control of body movement, die in patients with Parkinson's disease. Irisin hormone, secreted by muscles with endurance exercise, is believed to cause some of the health benefits of exercise, including improved cognitive function. In an animal study, researchers led by Dr. Bruce Spiegelman *(pictured)* showed that irisin prevented the loss of dopaminergic neurons in the brain and halted some symptoms of Parkinson's. [Read More](#)

New BU Center for Brain Recovery Aims to Advance Treatments for Stroke, Alzheimer's, and Parkinson's

BU



At the new BU Center for Brain Recovery, computing and data experts are joining with neurobiologists, biomedical engineers, speech therapists, and other researchers to improve our understanding of how the brain works — including why it sometimes malfunctions. Founded this summer, the center's mission is to bring together multidisciplinary teams to look for new ways to prevent, treat, and cure brain disorders like stroke, Alzheimer's disease, and Parkinson's disease. [Read More](#)

Tufts Scientists Use Artificial Intelligence to Improve Tuberculosis Treatments

Tufts Now



To treat tuberculosis (TB) effectively, patients will need a combination of three or four drugs because TB bacteria behave differently in different environments — and in some cases, evolve to become drug-resistant. In a recent study, published in the September issue of *Cell Reports Medicine*, Dr. Bree Aldridge *(pictured)* and her team from Tufts University used machine learning to design a data-driven solution to this challenge that will allow researchers to consider novel drug combinations at a new scale. [Read More](#)

Germ Cells Move like Tiny Bulldozers

Whitehead Institute



During fruit fly embryo formation, primordial germ cells — the stem cells that will later form eggs and sperm — must travel from the far end of the embryo to their final location in the gonads. In a new paper published in *Science Advances*, Dr. Ruth Lehmann *(pictured)* and researchers at the Whitehead Institute and the Skirball Institute at New York University School of Medicine show that germ cells in growing fly embryos are using a method of movement which depends on a process called cortical flow, similar to the way bulldozers move on rotating treads. [Read More](#)

David Avigan Named Director of the BIDMC Cancer Center and Senior Vice President of Cancer Services at Beth Israel Lahey Health

Beth Israel Lahey Health



Dr. David Avigan *(pictured)* has been named Director of the Beth Israel Deaconess Medical Center (BIDMC) Cancer Center and Senior Vice President of Cancer Services at Beth Israel Lahey Health (BILH). In his new role, Dr. Avigan will be responsible for setting the vision and strategic direction for cancer care, research and education for the BIDMC Cancer Center and the BILH network. [Read More](#)

How a Patient Partnership Is Propelling Cancer Research

Broad Institute



Accelerating biomedical advances that could one day lead to new treatments is one of the key goals of *Count Me In*, a research initiative that cancer researcher Dr. Corrie Painter *(pictured)* helped build. *Count Me In* is a partnership between the Broad Institute, the Dana-Farber Cancer Institute, and the Emerson Collective. It enables cancer patients across the US and Canada to share their medical information, DNA samples, and their voices with cancer researchers. [Read More](#)

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Upcoming Events in Boston

September 28 4:30 PM	MetroWest Life Sciences Network – 3rd Annual Fall Mixer ABI-LAB 2
October 5 – 6 1:00 PM	Glial and Neuronal Biology of the Aging Brain Symposium Online
October 6 2:30 PM	Bristol Myers Squibb Pharma Day 2022 MassBioHub
October 7 – 8 8:00 AM	Forsyth Orthodontic Symposium: In Honor of Dr. Moorrees Forsyth Institute and Online
October 21 9:00 AM	BIDMC Cancer Symposium 2022 Online

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Science Jobs in Boston

- Scientific Inside Sales Representative, Cell Culture**
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Broad Institute
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