

Publications of the Week

Engineering Designer Beta Cells with a CRISPR-Cas9 Conjugation Platform

First Author: Donghyun Lim | Senior Author: Amit Choudhary (pictured)
 Nature Communications | The Broad Institute, Harvard Medical School and Brigham and Women's Hospital



Genetically fusing protein domains to Cas9 has yielded several transformative technologies; however, the genetic modifications are limited to natural polypeptide chains at the Cas9 termini, which excludes a diverse array of molecules useful for gene editing. The authors report chemical modifications that allow site-specific and multiple-site conjugation of a wide assortment of molecules on both the termini and internal sites of Cas9, creating a platform for endowing Cas9 with diverse functions. [Profile](#) | [Abstract](#)

Novel Antimicrobials from Uncultured Bacteria Acting against Mycobacterium tuberculosis

First Author: Jeffrey Quigley | Senior Author: Kim Lewis (pictured, bottom right)
 mBio | Northeastern University and Novartis Pharmaceuticals



The authors screened extracts from previously uncultured soil microbes for specific activity against *Mycobacterium tuberculosis*, identifying three novel compounds. They further define the mechanism of action of one compound, amycobactin, and demonstrate that it inhibits protein secretion through the Sec translocation machinery. [Profile](#) | [Abstract](#)

Engineered PLGA Microparticles for Long-Term, Pulsatile Release of STING Agonist for Cancer Immunotherapy

First Author: Xueguang Lu | Senior Author: Ana Jaklenec (pictured)
 Science Translational Medicine | Koch Institute at MIT



Stimulator of interferon gene (STING) agonists have shown promising results against tumors in mice and people, but they require multiple intratumoral injections, which are impractical for many tumors. The authors designed box-shaped microparticles filled with STING agonist and optimized them to release the agonist at appropriate time intervals after being injected into a tumor just once, showing promising results in multiple mouse models of cancer. [Profile](#) | [Abstract](#)

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Awards

Massachusetts Life Sciences Center Capital Funding to Support Three Programs at Medical School

UMass Medical School
 Three projects at UMass Medical School are receiving funding from the Massachusetts Life Sciences Center to support the life sciences ecosystem. Drs. Dorothy Schafer (pictured) and Christina Baer are working with their industry partner, Tiaki, to lead the project *Spatial Transcriptomic Approaches to Map Neuroinflammation in Neurodegenerative Disease*. [Read More](#)

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Local News

Aging Cells Reorganize Their Genome Structure to Defend against Cancer

Broad Institute
 Scientists at the Broad Institute and Massachusetts General Hospital have revealed previously unknown changes that occur in aging cells. The entire three-dimensional structure of the genetic material in these cells is reorganized over time as they divide, the researchers showed. Surprisingly, they found that these changes help prevent the development of cancer. [Read More](#)

Unique HIV Reservoirs in Elite Controllers

Massachusetts General Hospital
 Researchers at the Ragon Institute have found rare sequences of HIV DNA by analyzing billions of cells from 64 elite controllers (people living with HIV who suppress the virus naturally without the need for medication), and 41 individuals on antiretroviral drugs (ART). Unlike ART-treated individuals, elite controllers' viral reservoirs appear to be incapable of being reactivated. [Read More](#)

Mass General Researchers Create Bioluminescent Tag to Detect DNA Break Repair

Massachusetts General Hospital
 A new bioluminescent reporter that tracks DNA double stranded break repair in cells has been developed by researchers from Massachusetts General Hospital and the Academia Sinica in Taiwan. The international team's novel bioluminescent repair reporter-based system can be used to monitor DNA repair pathways directly in animals as well as cell lines. [Read More](#)

Hodgkin Lymphoma Treatment Has Been Transformed by Immunotherapy. New Study Helps Explain Why

Dana-Farber
 In a new study, Dr. Margaret Shipp (pictured) and investigators at Dana-Farber have unraveled some key aspects of the immune system's response to checkpoint inhibitors in the treatment of classical Hodgkin lymphoma. The findings may provide a springboard to improving immunotherapies in Hodgkin lymphoma and other cancers as well. [Read More](#)

On Cancer's Case: How Family Tragedy Gave Rise to a World-Leading Cancer Biologist

Harvard Medical School
 In this episode of *Harvard Medical Labcast*, Dr. Joan Brugge (pictured), the Louise Foote Pfeiffer Professor of Cell Biology in the Blavatnik Institute at Harvard Medical School, tells the story of her path into cancer biology and discusses her latest endeavors. She also shares her thoughts on the challenges and opportunities facing the field today and the skills she believes will best serve the next generation of cancer researchers. [Read More](#)

A Not-So-Silent Threat: Genomic Analysis Suggests Silent Carriers Play a Role in C. Diff Infection

Harvard Medical School
 Treating *Clostridioides difficile* infection is hard, and preventing its recurrence can be challenging. A small new study using a genomic surveillance tool developed by Harvard Medical School researchers at Brigham and Women's Hospital has shown that silent carriers — people who carry the toxin-producing strains of the bacterium but have no symptoms — may be one important source of infection. [Read More](#)

Natural Killer Cells: Protect the Placenta Cell but Kill the Infection

Boston Children's Hospital
 Infections that reach the placenta can lead to spontaneous abortions, intrauterine growth restriction, congenital abnormalities, and premature births. New research from the laboratory of Dr. Judy Lieberman (pictured) at Harvard University has shown that a group of cells near the site where the placenta attaches to the uterine wall plays an essential role in preventing these infections. [Read More](#)

Cells in Your Airway Talk to Each Other. For Some, What They Say Can Trigger an Asthma Attack.

News@Northeastern
 New findings from Dr. Harkrishnan Parameswaran (pictured), an Assistant Professor of Bioengineering at Northeastern, show how even healthy human airway cells in contact with each other can respond to a stimulus in a similar way as the unhealthy cells from an asthmatic person — that is, if they are also in contact with an unhealthy extracellular matrix. [Read More](#)

Worcester Polytechnic Institute Receives \$877K to Support Cell Engineering Program

Worcester Business Journal
 Worcester Polytechnic Institute has received an \$877,314 grant from a capital funding initiative led by the Governor Charlie Baker Administration and the Massachusetts Life Sciences Center (MLSC). Funded through MLSC's Open Capital program, the grant program provides funding for state-of-the-art equipment and infrastructure to support the life sciences ecosystem in Massachusetts. [Read More](#)

Inside the Broad Lab that Sequenced the COVID-19 Virus from the Boston Outbreak

Broad Institute
 This spring, the research associates in the lab of Dr. Pardis Sabeti at the Broad Institute were able to experience first-hand how quickly and efficiently the group could harness its expertise in metagenomic sequencing and viral evolution in an effort to better understand the introduction and continued spread of SARS-CoV-2 throughout Boston and its surrounding communities. [Read More](#)

MassBiologics Discovers Antibodies that May Protect against COVID-19

UMass Medical School
 A new study by researchers at MassBiologics of UMass Medical School suggests that COVID specific IgA monoclonal antibodies may provide effective immunity in the respiratory system against the novel coronavirus — a potentially critical feature of an effective vaccine. The origins of this rapid and important discovery go back 16 years, when MassBiologics developed an IgG monoclonal antibody that was effective against a similar virus, SARS. [Read More](#)

Massachusetts Life Sciences Center Announces \$15 Million in Capital Funding to Support Innovation Infrastructure, Data Repositories, and Scientific Training

Massachusetts Life Sciences Center
 The Baker-Polito Administration and the Massachusetts Life Sciences Center have announced more than \$15 million in capital funding to support life sciences innovation infrastructure, the development of key data repositories, and training for scientists across the Commonwealth. In total, 17 projects are receiving funding to support the life sciences ecosystem. [Read More](#)

Harvard's Wyss Institute Launches Torus Biosystems to Pioneer Its Comprehensive Infectious Disease Diagnostics Platform at the Patient Point-of-Care

Wyss Institute
 The Wyss Institute has announced that Cambridge-based Torus Biosystems™ will develop and commercialize DNA nanotechnology developed at the Wyss Institute by Drs. Peng Yin (pictured) and David Zhang. The technology has the potential to disrupt current infectious disease diagnostics by delivering quantitative DNA and RNA results at the patient point-of-care in under 30 minutes. [Read More](#)

UMass Medical School Granted Five-Year, \$30 Million Clinical and Translational Sciences Award

UMass Medical School
 UMass Medical School will bring the UMass Center for Clinical and Translational Science to its next level of innovation and collaboration with the five-year, \$30 million renewal of its Clinical and Translational Sciences Award from the National Institutes of Health. Dr. Katherine Luzuriaga (pictured) is the Principal Investigator for the grant, and the Director of the UMass Center for Clinical and Translational Science. [Read More](#)

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Upcoming Events in Boston

- September 1 12:00 PM **DF/HCC Connect Science Seminar Series: Monitoring with Data during the COVID-19 Pandemic** Online
- September 2 4:00 PM **Seminar: The Road to Sterilizing Immunity against Tuberculosis** Online
- September 3 12:00 PM **Dana-Farber Targeted Protein Degradation Seminar Series: Carolyn Bertozzi** Online
- September 4 8:00 AM **Networking in a Virtual World** Online
- September 10 11:00 AM **MassBio Virtual Mixer** Online

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Science Jobs in Boston

- Assistant/Associate Professor Department of Molecular Metabolism**
Harvard T.H. Chan School of Public Health
- Scientist II/Scientific Technical Leader, Cellular Analytical Development**
Eli Lilly Medicine
- Scientist, Virology**
Moderna
- Senior Research Associate, RNA Technology & Manufacturing**
Verve Therapeutics
- Flow Cytometry Core Manager**
Harvard Medical School

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