

Publications of the Week
Arthritis Flares Mediated by Tissue-Resident Memory T Cells in the Joint

 First Author: Margaret Chang and Anais Levescot | Senior Author: Peter Nigrovic *(pictured)*
 Cell Reports | Boston Children's Hospital and Brigham and Women's Hospital


Rheumatoid arthritis is a systemic autoimmune disease, but disease flares typically affect only a subset of joints, distributed in a distinctive pattern for each patient. Pursuing this intriguing pattern, the authors show that arthritis recurrence is mediated by long-lived synovial resident memory T cells (T_{RM}). In three murine models, CD8⁺ cells bearing T_{RM} markers remain in previously inflamed joints during remission. [Abstract](#)

Protective Efficacy of Gastrointestinal SARS-CoV-2 Delivery Against Intranasal and Intratracheal SARS-CoV-2 Challenge in Rhesus Macaques

 First Author: Jingyou Yu | Senior Author: Dan Barouch *(pictured)*
 Journal of Virology | Beth Israel Deaconess Medical Center, Harvard Medical School, and the Ragon Institute


Live oral vaccines have been explored for their protective efficacy against respiratory viruses, particularly for adenovirus serotypes 4 and 7. The potential of a live oral vaccine against SARS-CoV-2, however, remains unclear. The authors assessed the immunogenicity of live SARS-CoV-2 delivered to the gastrointestinal tract in rhesus macaques and its protective efficacy against intranasal and intratracheal SARS-CoV-2 challenge. [Abstract](#)

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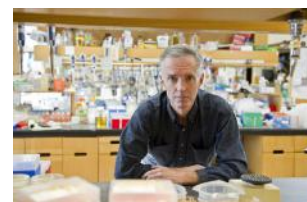
Harvard Medical School



No two human beings are the same, a biologic singularity encoded in the unique arrangement of the molecules that make up our individual DNA. Variation is a cardinal feature of biology, the driver of diversity, and the engine of evolution, but it has a dark side. Alterations in DNA sequences and the resulting proteins that build our cells can sometimes lead to profound disruptions in physiologic function and cause disease. [Read More](#)

Creating a New Toehold for RNA Therapeutics, Cell Therapies, and Diagnostics

Wyss Institute



Delivering a synthetic RNA molecule into a cell essentially instructs it to produce a desired protein. A key challenge for researchers has been to only allow cells causing or affected by a specific disease to express the protein and not others. Now, a team led by Dr. James Collins *(pictured)* has developed eToeholds — small versatile devices built into RNA that enable expression of a linked protein-encoding sequence only when a cell-specific or viral RNA is present. [Read More](#)

How Your Gut Is Controlling Your Immune System

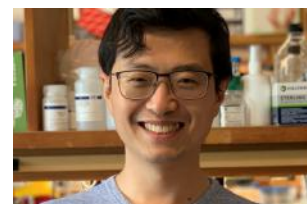
Center for Microbiome Informatics & Therapeutics



As we grow and age in ways obvious to the naked eye, our immune system is changing too, developing and adjusting a delicate equilibrium to leave us with a discerning defense system. If this process goes well, our immune system is ready to wage war against dangerous invaders while standing down when confronted with the cells and tissue of our own body. [Read More](#)

Fibroblasts Could Serve as New Key to Enhancing Personalized Treatment for Lung Cancer Patients

Massachusetts General Hospital



Cancer-associated fibroblasts (CAFs) derived from non-small-cell lung cancer patients are functionally heterogeneous, and could serve as an avenue for designing more personalized treatments. "I am optimistic that one day a fully personalized lung cancer treatment plan can be developed by taking into account the specific feature of each cell in a patient's tumor," says Dr. Haichuan Hu *(pictured)*. [Read More](#)

Preventing and Rescuing Hearing Loss

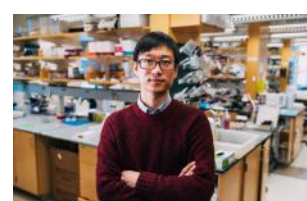
Harvard Medical School



A team of Harvard Medical School scientists at Massachusetts Eye and Ear, led by Drs. Albert Edge and Yushi Hayashi, has identified the mechanism that can lead to deafness in the rare syndrome Norrie disease. The researchers found that the Norrie disease protein, lacking in patients with the disease, is essential for the maintenance and survival of hair cells in the cochlea, the cells responsible for hearing. [Read More](#)

Solid, Liquid, or Gas? Technique Quickly Identifies Physical State of Tissues and Tumors

MIT News



As an organism grows, the feel of it changes too. In the initial stages, an embryo takes on an almost fluid-like state that allows its cells to divide and expand. As it matures, its tissues and organs firm up into their final form. In certain species, this physical state can be an indicator of developmental stage. Researchers at MIT led by Dr. Ming Guo *(pictured)* have found that the way in which a tissue's cells are arranged can serve as a fingerprint for the tissue's "phase." [Read More](#)

This Is Your Body on Carbs, in Real Time

Harvard Medical School



To study how cells break down carbohydrates in real time, researchers from Harvard-affiliated Brigham and Women's Hospital and Boston Medical Center studied healthy normal weight and healthy overweight participants as they consumed excess carbohydrates. Their findings revealed that excess carbohydrates can contribute to metabolic dysfunction by blocking the synthesis of important antioxidants. [Read More](#)

Finding New Targets for Acute Myeloid Leukemia in Children

Boston Children's Hospital



Acute myeloid leukemia (AML) is the second most common leukemia diagnosed in children. It is hard to treat and can be fatal in some cases. While there have been some recent successes with genetically targeted therapies for adults, AML has different genetic features in children, and care has been slow to advance. "The state of care for children with AML is very similar to what it's been over the last many decades," says Dr. Kimberly Stegmaier *(pictured)*. [Read More](#)

DNA Nanoswitch Calipers Created as Possibly World's Tiniest Ruler for Fingerprinting Proteins

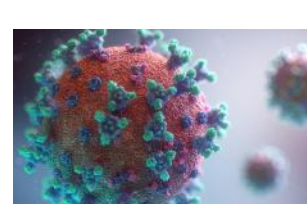
Genetic Engineering & Biotechnology News



Decoding the identity of biomolecules from trace samples is a longstanding goal in the field of biotechnology, and while next-generation sequencing technologies have made it possible to identify individual DNA and RNA molecules, the same capability isn't yet available for proteins. But scientists working at the Wyss Institute, the Blavatnik Institute, and Boston Children's Hospital have now used DNA to create what they say may be the world's tiniest ruler for measuring proteins. [Read More](#)

Carbon Nanotube-Based Sensor Can Detect SARS-CoV-2 Proteins

MIT News



Using specialized carbon nanotubes, MIT engineers have designed a novel sensor that can detect SARS-CoV-2 without any antibodies, giving a result within minutes. Their new sensor is based on technology that can quickly generate rapid and accurate diagnostics, not just for COVID-19 but for future pandemics, the researchers say. [Read More](#)

Faster, Safer Treatment

Harvard Medical School



Can the first new tuberculosis drugs in five decades make treatment faster and less dangerous for the hundreds of thousands of people living with drug-resistant strains of the world's deadliest infectious disease? A cross-border, cross-sectoral clinical trial has passed a major milestone on the road to answering that question. [Read More](#)

CRISPR-Based Approach Reveals Achilles' Heels of a Common Herpesvirus

Whitehead Institute



Many people — around half of the adult population — are infected with a type of herpesvirus called human cytomegalovirus, or HCMV. Though mostly asymptomatic, the virus can be dangerous for immunocompromised people and unborn babies. Because HCMV is so widespread, the chance of a baby becoming infected *in utero* is around one in 200, and that infection can lead to problems with the baby's brain, lungs and growth. [Read More](#)

New CRISPR-Based Screening Method Improves Gene Editors

Whitehead Institute



Gene editing methods often involve breaking a strand of DNA in order to make specific changes to the sequence. They then rely on the cell's DNA repair pathways to mend the break. These cellular repair pathways, however, are not completely understood. A collaborative team of researchers in Dr. Jonathan Weissman's *(pictured)* lab present a new experimental method that could help bridge this gap in our understanding. [Read More](#)

Vertex Announces Positive Day 90 Data for the First Patient in the Phase 1/2 Clinical Trial Dosed With VX-880, a Novel Investigational Stem Cell-Derived Therapy for the Treatment of Type 1 Diabetes

Vertex Pharmaceuticals



Vertex Pharmaceuticals has announced positive Day 90 data for the first patient from the Phase 1/2 clinical trial of VX-880, an investigational stem cell-derived, fully differentiated pancreatic islet cell replacement therapy for people with type 1 diabetes (T1D). This is the first demonstration of a patient with T1D achieving robust restoration of islet cell function from such a cell therapy. [Read More](#)

How Diet Affects Tumors

MIT News



A new study from MIT, which analyzed two different diets in mice, reveals how those diets affect cancer cells, and offers an explanation for why restricting calories may slow tumor growth. "There's a lot of evidence that diet can affect how fast your cancer progresses, but this is not a cure," says Dr. Matthew Vander Heiden *(pictured)*. "While the findings are provocative, further study is needed, and individual patients should talk to their doctor." [Read More](#)

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November 10 1:30 PM	Microbiome in Oncology Symposium Koch Institute
November 10 4:00 PM	STEMCELL Cambridge Career Open House Online

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