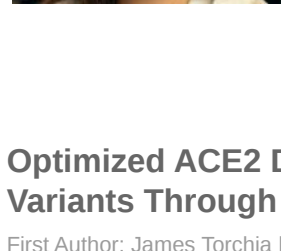


Publications of the Week

Breast Cancer Prevention by Short-Term Inhibition of TGFβ Signaling

First Authors: Maša Alečković, Simona Cristea, and Carlos Gil Del Alcazar | Senior Author: Kornelia Polyak (pictured) Nature Communications | Dana-Farber Cancer Institute, Brigham and Women's Hospital, Harvard University, and the Broad Institute



Cancer prevention has a profound impact on cancer-associated mortality and morbidity. The authors show that short-term TGFβ receptor inhibitor (TGFβRI) treatment of peripubertal ACI inbred and Sprague Dawley outbred rats induces lasting changes and prevents estrogen- and carcinogen-induced mammary tumors, respectively. They identify TGFβRI-responsive cell populations by single cell RNA-sequencing, including a unique epithelial subpopulation designated secretory basal cells with progenitor features. [Abstract](#)

Optimized ACE2 Decoys Neutralize Antibody-Resistant SARS-CoV-2 Variants Through Functional Receptor Mimicry and Treat Infection *In Vivo*

First Author: James Torchia | Senior Author: Gordon Freeman (pictured) Science Advances | Dana-Farber Cancer Institute, Harvard Medical School, Boston University, and Massachusetts General Hospital



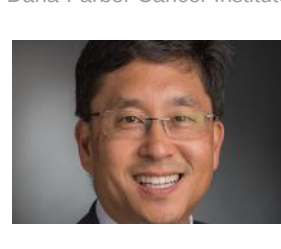
As severe acute respiratory syndrome coronavirus-2 (SARS-CoV-2) evolves to escape natural antibodies, it also loses sensitivity to therapeutic antibody drugs. The authors find that an ACE2 decoy neutralizes antibody-resistant variants, including Omicron, with no loss in potency. To identify design features necessary for *in vivo* activity, they compare several enzymatically inactive, Fc effector-silenced ACE2-Fc decoys. [Abstract](#) | [Press Release](#)

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Awards

UMass Chan Researcher Anastasia Khvorova Named 2022 National Academy of Inventors Fellow

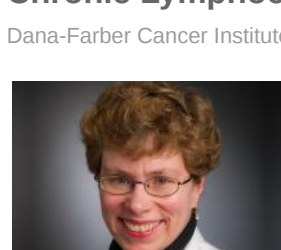
UMass Chan Medical School



Dr. Anastasia Khvorova (pictured) the Remondi Family Chair in Biomedical Research, Professor of RNA Therapeutics, and a leader in transformative discoveries in fundamental chemical biology, was named a 2022 Fellow of the National Academy of Inventors. She was selected for her "...highly prolific spirit of innovation in creating or facilitating outstanding inventions that have made a tangible impact on the quality of life, economic development, and welfare of society." [Read More](#)

William Hahn Named a 2022 National Academy of Inventors Fellow

Dana-Farber Cancer Institute



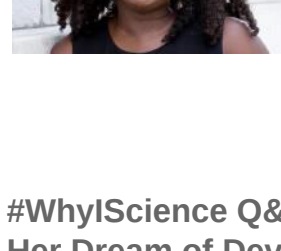
Dr. William Hahn (pictured), Executive Vice President and Chief Operating Officer at Dana-Farber Cancer Institute and William Rosenberg Professor of Medicine at Harvard Medical School, has been named a Fellow of the National Academy of Inventors (NAI). Election as a NAI Fellow is the highest professional distinction awarded to academic inventors. [Read More](#)

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Local News

Next-Generation Drug Improves Progression-Free Survival in Relapsed Chronic Lymphocytic Leukemia

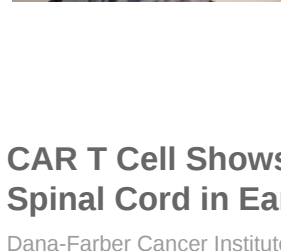
Dana-Farber Cancer Institute



A clinical trial in patients with relapsed or refractory chronic lymphocytic leukemia and small lymphocytic lymphoma has found that zanubrutinib, a next-generation BTK inhibitor, was more effective at preventing disease progression and better tolerated than ibrutinib, the first-generation BTK inhibitor that is the current standard treatment. The new results were presented by Dr. Jennifer Brown (pictured) of Dana-Farber Cancer Institute at the American Society of Hematology Annual Meeting. [Read More](#)

New Clinical Tool for Clonal Hematopoiesis Identifies Patients at High Risk for Blood Cancer

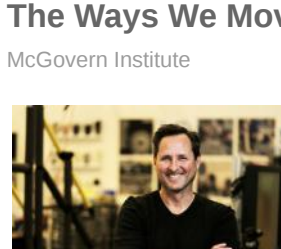
Dana-Farber Cancer Institute



A new clinical tool developed by a team of researchers led by the Dana-Farber Cancer Institute pinpoints which clonal hematopoiesis patients are at highest risk for cancer progression. "We've been able to detect clonal hematopoiesis in patients for years now," said Dana-Farber hematologist-oncologist and lead author Dr. Lachelle Weeks (pictured). "But this diagnosis often exposes patients to stress and anxiety because it's unclear who is at highest risk of developing blood cancer. Our tool can help change that." [Read More](#)

#WhyScience Q&A: A Cancer Researcher Has Traveled the World to Pursue Her Dream of Developing Better Treatments

Broad Institute



Farzaneh (Farzi) Kordbacheh (pictured) arrived in Boston in May 2020 and soon after began working at Dana-Farber, looking for biomarkers of immune evasion in patient tumors and plasma samples collected before and after immunotherapy. She now works at the Broad Institute in the Cancer Program, where she works under the direction of Institute Director Dr. Todd Golub, studying the genes and microenvironment factors that tumor cells rely on to spread throughout the body. [Read More](#)

CAR T Cell Shows Promise in Patients with Lymphoma of the Brain and Spinal Cord in Early Trial

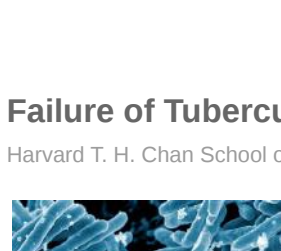
Dana-Farber Cancer Institute



A CAR T cell therapy known as axicabtagene ciloleucel is safe and shows encouraging signs of efficacy in a small pilot trial involving patients with lymphoma of the brain and/or spinal cord, Dana-Farber Cancer Institute investigators report at the 64th American Society of Hematology Annual Meeting. "Our early results suggest that expanding the applicability of CAR T cells to this indication could improve patient outcomes," said Dana-Farber's Dr. Caron Jacobson, who led the trial. [Read More](#)

The Ways We Move

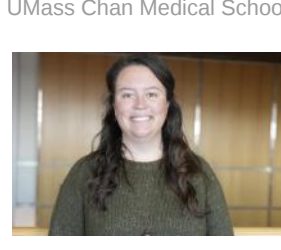
McGovern Institute



The McGovern Institute scientists who are working to understand human movement and restore it after it has been lost know that the way we move is an engineering marvel. Muscles, bones, brain, and nerves work together to navigate and interact with an ever-changing environment, making constant but often imperceptible adjustments to carry out our goals. It's an efficient and highly adaptable system, and the way it's put together is not at all intuitive, says Dr. Hugh Herr (pictured) a new Associate Investigator at the Institute. [Read More](#)

Microparticles Could Help Prevent Vitamin A Deficiency

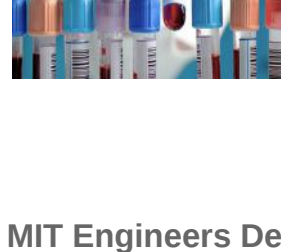
MIT News



Vitamin A deficiency is the world's leading cause of childhood blindness, and in severe cases, it can be fatal. About one-third of the global population of preschool-aged children suffer from this vitamin deficiency, which is most prevalent in sub-Saharan Africa and South Asia. Dr. Robert Langer's (pictured) team have now developed a new way to fortify foods with vitamin A, which they hope could help to improve the health of millions of people around the world. [Read More](#)

Looking to Retain Most Potent Regenerative Stem Cells

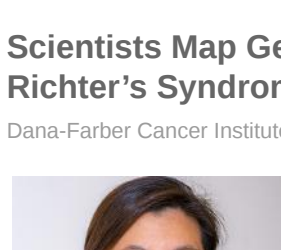
Massachusetts General Hospital



New research offers insights that someday may help scientists create the kind of stem cells capable of reversing all manner of human ill, the same powerful structures that generate all the different types of cells needed in our embryonic development. In a new paper published in *Cell*, Dr. Mansi Srivastava (pictured) describes the discovery of a specific pair of cells in an animal embryo that gives rise to pluripotent stem cells, and what genes are flipped on and off in their creation. [Read More](#)

Failure of Tuberculosis Treatment Linked to Bacterial Resilience

Harvard T. H. Chan School of Public Health



Researchers have discovered a new form of altered drug susceptibility — dubbed antibiotic resilience — that enables *Mycobacterium tuberculosis* to survive antibiotic treatment. The study, led by Harvard T.H. Chan School of Public Health, could help inform future therapeutics and reduce treatment failure in tuberculosis patients. The widespread use of antibiotics has led to an increase in drug-resistant tuberculosis, making treatment more difficult. [Read More](#)

PhD Candidate Seeks to Develop First Clinically Approved Antifungal Vaccine

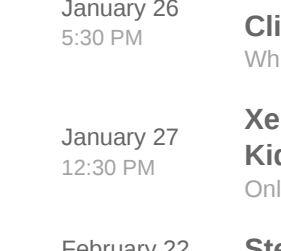
UMass Chan Medical School



Fungal diseases kill approximately 1.7 million people annually, but there are no licensed antifungal vaccines. Maureen Hester's (pictured) research explores fungal immunology, working with vaccines to target *Cryptococcus neoformans*, a fungal pathogen that can cause pneumonia and eventually progress to meningitis. "Cryptococcus is something most people breathe in regularly; it's only really a problem if you're immunocompromised," said Hester. [Read More](#)

New Technique Can Detect and Analyze Tumor Cells of Multiple Myeloma and Precursor Conditions from Blood Sample

Dana-Farber Cancer Institute



A new technique developed by researchers at Dana-Farber Cancer Institute makes it possible to detect tumor cells in people at heightened risk for multiple myeloma, assess risk of progression in patients with myeloma, and track genetic changes in tumor cells over time – all from a small blood sample. The approach, known as MinimuMM-seq, has the potential to replace a bone marrow biopsy as the standard method of screening people for conditions that often precede myeloma and of determining the extent of the disease. [Read More](#)

MIT Engineers Design a Soft, Implantable Ventilator

MIT News



A new proof-of-concept design by MIT engineers aims to one day boost the diaphragm's life-sustaining function and improve lung capacity for people with diaphragm dysfunction. Dr. Ellen Roche's (pictured) lab has developed a soft, robotic, and implantable ventilator that is designed to augment the diaphragm's natural contractions. At the heart of the system are two soft, balloon-like tubes that can be implanted to lie over the diaphragm. [Read More](#)

Scientists Map Genetic Evolution of Chronic Lymphocytic Leukemia to Richter's Syndrome

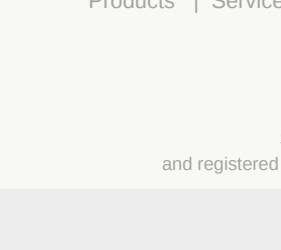
Dana-Farber Cancer Institute



Every year, up to 1% of patients with chronic lymphocytic leukemia (CLL), a slow-growing blood cancer, have their disease transform into a far more aggressive cancer known as Richter's Syndrome. In a new study, scientists in Dr. Catherine Wu's (pictured) lab at Dana-Farber and the Broad Institute trace these changes in unprecedented detail, revealing for the first time the genomic differences between CLL and Richter's, the molecular pathways by which Richter's emerges, and the existence of multiple subtypes of the disease. [Read More](#)

Molecules Found in Mucus Could Prevent Cholera Infection

MIT News



MIT researchers have identified molecules found in mucus that can block cholera infection by interfering with the genes that cause the microbe to switch into a harmful state. These protective molecules, known as glycans, are a major constituent of mucins, the gel-forming polymers that make up mucus. Dr. Katharina Ribbeck's (pictured) team identified a specific type of glycan that can prevent *Vibrio cholerae* from producing the toxin that usually leads to severe diarrhea. [Read More](#)

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January 26 5:30 PM	The Importance of Broad Science Literacy: Lessons from Covid, Climate Change, and More Whitehead Institute & Online
January 27 12:30 PM	Xenotransplantation: Transplanting Genetically-Modified Pig Kidneys into Patients Online
February 22 12:00 PM	Stem Cells in Space Online
February 28 10:00 AM	2023 Rare Disease Day Massachusetts State House

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