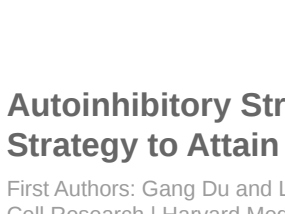


Publications of the Week

Bifunctional Cancer Cell–Based Vaccine Concomitantly Drives Direct Tumor Killing and Antitumor Immunity

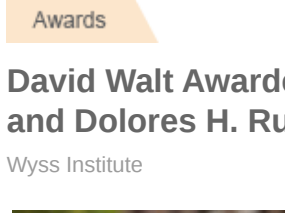
First Author: Kok-Siong Chen | Senior Author: Khalid Shah (pictured)  
Science Translational Medicine | Brigham and Women’s Hospital and Harvard Medical School



The administration of inactivated tumor cells is known to induce a potent antitumor immune response; however, the efficacy of such an approach is limited by its inability to kill tumor cells before inducing the immune responses. Unlike inactivated tumor cells, living tumor cells have the ability to track and target tumors. The authors developed a bifunctional whole cancer cell–based therapeutic with direct tumor killing and immunostimulatory roles. [Abstract](#) | [Press Release](#)

Autoinhibitory Structure of Preligand Association State Implicates a New Strategy to Attain Effective DR5 Receptor Activation

First Authors: Gang Du and Linlin Zhao | Senior Author: James Jiweun Chou (pictured)  
Cell Research | Harvard Medical School, Boston Children’s Hospital, and Sanofi



Members of the tumor necrosis factor receptor superfamily (TNFRSF) are important therapeutic targets that can be activated to induce death of cancer cells or stimulate proliferation of immune cells. The authors find that the ectodomain of death receptor 5 (DR5), a representative member of TNFRSF, can specifically self-associate when anchored to lipid bilayer, and they report this self-association structure determined by nuclear magnetic resonance. [Abstract](#)

[View All Publications](#)

Awards

David Walt Awarded with National Academy of Engineering’s 2023 Fritz J. and Dolores H. Russ Prize

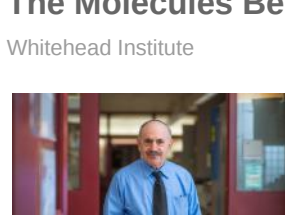
Wyss Institute



The National Academy of Engineering has announced Dr. David Walt (pictured) as the recipient of its 2023 Fritz J. and Dolores H. Russ Prize. Dr. Walt is honored for the development of microwell arrays that greatly advanced the fields of genomics and proteomics. Awarded biennially, the Russ Prize recognizes an outstanding bioengineering achievement in widespread use that improves the human condition. Dr. Walt receives a \$500,000 cash award and a commemorative medallion. [Read More](#)

Dan Barouch Awarded King Faisal Prize

Ragon Institute



Congratulations to Dr. Dan Barouch (pictured), one of this year’s recipients of the King Faisal Prize! Dr. Barouch, a founding member and steering committee member of the Ragon Institute, was jointly awarded the 2023 King Faisal Prize for Medicine with vaccinologist Dr. Sarah Gilbert of the University of Oxford. Drs. Barouch and Gilbert were chosen for their work on COVID-19 viral vector vaccines. [Read More](#)

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Local News

The Molecules Behind Metastasis

Whitehead Institute



Past research from Dr. Robert Weinberg (pictured) and others suggests that cancer cells are best able to form metastatic tumors when the cells are in a particular state called the quasi-mesenchymal (qM) state. New research from Dr. Weinberg and his former postdoc Dr. Arthur Lambert has identified two gene-regulating molecules as important for keeping cancer cells in the qM state. [Read More](#)

Brandon Ogbunu Is a Radical Collaborator

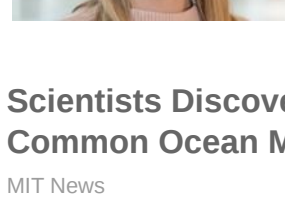
MIT News



Learning has always come naturally to Dr. Brandon Ogbunu (pictured). When he was a child growing up in Manhattan, his mother, a teacher, instilled in him an appreciation for school, the sciences, and curiosity. At work, she taught mathematics, social studies, and special education. At home, she taught her son to embrace art, literature, and sports in addition to science, laying the groundwork for a well-rounded approach to learning that would inform the rest of his career. [Read More](#)

Enhanced Cancer Immunotherapies Through Cytokine-Labeled T Cells

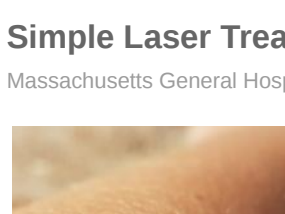
Wyss Institute



CAR T cell therapies have advanced into clinical practice to treat tumors of the immune system, such as leukemias and lymphomas, and more recently multiple myeloma. Pairing T cell transfer therapy with cytokine therapy can help T cells target solid tumors, but leads to side effects. Dr. Yutong Liu and a team in Dr. David Mooney’s (pictured) lab anchored cytokines to T cells to avoid systemic side effects. [Read More](#)

PhD Student Aims to Develop Novel Immunotherapies to Conquer ALS

UMass Chan Medical School



Ashley Harkins (pictured), a PhD student in the neuroscience program at the Morningside Graduate School of Biomedical Sciences, has always felt compelled to help others. Harkins, who grew up in Bridgewater, set out to become a physician but fell in love with bench science at Drexel University, where she majored in biology and minored in neuroscience. [Read More](#)

Scientists Discover a New Way of Sharing Genetic Information in a Common Ocean Microbe

MIT News



From the tropics to the poles, from the sea surface to hundreds of feet below, the world’s oceans are teeming with one of the tiniest of organisms: a type of bacteria called *Prochlorococcus*. New research from Dr. Penny Chisholm’s (pictured) group reveals that these tiny bacteria exchange genetic information with one another, even when widely separated, by a previously undocumented mechanism. [Read More](#)

Simple Laser Treatments May Help Prevent Nonmelanoma Skin Cancer

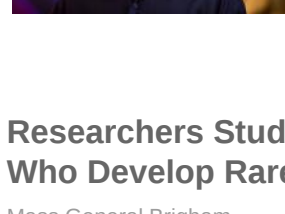
Massachusetts General Hospital



In a study of patients with a history of facial keratinocyte carcinoma, 20.9% of those treated with nonablative fractional lasers (NAFL) experienced a subsequent keratinocyte carcinoma, compared with 40.4% of patients who did not receive laser treatment. Among patients who developed a facial keratinocyte carcinoma, the time to development was longer in patients treated with NAFL compared with untreated patients. [Read More](#)

Abnormal RNA Gums Up the Works in Brain Cells

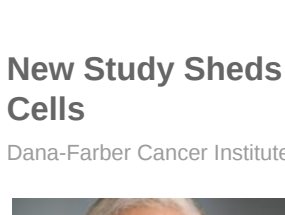
Whitehead Institute



Whitehead Institute Member Dr. Ankur Jain (pictured) and Michael Das, a graduate student in his lab, have found that, in cells grown in the lab, repeat-containing RNAs and the proteins made from them combine to form solid, gel-like clumps in the cytoplasm — and these clumps cause serious damage to cells. The researchers show that the clumps can push on and deform the nucleus, affect how molecules travel in and out of the nucleus, trap other molecules so they cannot do their jobs, and ultimately kill the cell. [Read More](#)

Researchers Identify Blood Panel to Predict Placenta Accreta

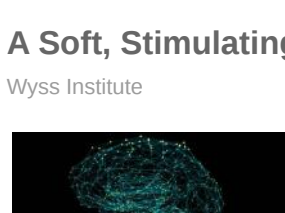
Brigham and Women’s Hospital



Of the nearly 4 million births each year in the United States, roughly 50,000 are marked by life-threatening complications, and up to 900 result in maternal death during delivery. One major, often life-threatening complication is placenta accreta spectrum (PAS), which poses a threat to both the mother and the baby. Investigators from Brigham and Women’s Hospital embarked on a study to create a targeted test for predicting PAS during pregnancy, thus better preparing patients and practitioners for the delivery day. [Read More](#)

Enzyme “Atlas” Helps Researchers Decipher Cellular Pathways

MIT News



One of the most important classes of human enzymes are protein kinases — signaling molecules that regulate nearly all cellular activities, including growth, cell division, and metabolism. Dr. Michael Yaffe (pictured) and other researchers have now created a comprehensive atlas of more than 300 of the protein kinases found in human cells, and identified which proteins they likely target and control. [Read More](#)

Researchers Study Immune Response, Proteins in Blood of Young Adults Who Develop Rare Complication After COVID Vaccination

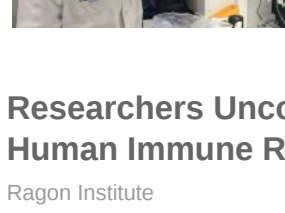
Mass General Brigham



In a new study by researchers from Brigham and Women’s Hospital and Massachusetts General Hospital, a team extensively investigated the immune response of 16 adolescents and young adults who developed myocarditis after receipt of the COVID mRNA vaccine. “The risk of developing severe disease from acute infection significantly outweighs this rare risk,” said co-corresponding author Dr. Lael Yonker (pictured). [Read More](#)

New Study Sheds New Light on the Formative Years of Immune System T Cells

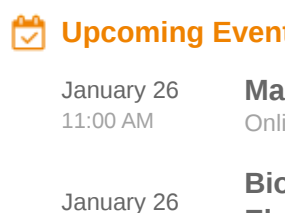
Dana-Farber Cancer Institute



Over the past half dozen years, Dana-Farber scientists led by Dr. Ellis Reinherz (pictured) have published a series of studies suggesting that the selection of thymocytes for survival occurs considerably earlier, when thymocytes carry a kind of T cell receptor-in-training known as a pre-T cell receptor, or pre-TCR. In the new paper, the researchers show that the absence of interaction between normal pre-TCR and pMHC in the thymus has significant and potentially disastrous consequences for the health of a mammal. [Read More](#)

A Soft, Stimulating Scaffold Supports Brain Cell Development Ex Vivo

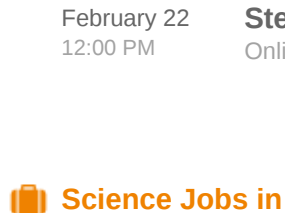
Wyss Institute



A major hurdle for the development of brain-computer interfaces is the electrodes that connect humans’ brains to machines. A new type of electrically conductive hydrogel scaffold developed at the Wyss Institute mimics the soft, porous conditions of brain tissue and supported the growth and differentiation of human neural progenitor cells into multiple different brain cell types for up to 12 weeks. [Read More](#)

Researchers Shed Light on How Exercise Preserves Physical Fitness During Aging

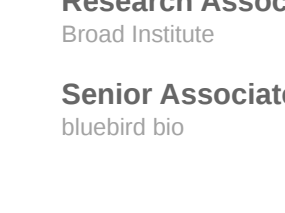
Joslin Diabetes



Researchers at Joslin Diabetes Center investigated the role of one cellular mechanism in improving physical fitness by exercise training and identified one anti-aging intervention that delayed the declines that occur with aging in the model organism. “Our data identify an essential mediator of exercise responsiveness and an entry point for interventions to maintain muscle function during aging,” said Dr. T. Keith Blackwell (pictured). [Read More](#)

Tufts Researchers Investigate How Sepsis Can Result in Cell Death

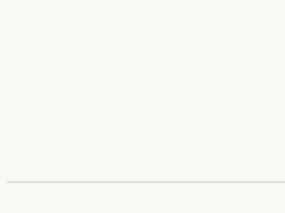
TuftsNow



Despite dramatic improvements in understanding the immunological mechanisms behind sepsis, it accounted for 11 million deaths worldwide in 2017, and is the most expensive medical condition in the US. In newly published research, Drs. Alexander (Sasha) Poltorak (pictured) and Hayley Muendlein discovered the cells and molecules that potentially trigger death from sepsis. [Read More](#)

Researchers Uncover How HIV Reservoir Cells Resist Elimination by Human Immune Responses

Ragon Institute



Soon after infection, HIV-1 establishes a life-long infection by forming viral reservoirs in the body. “High-throughput, single-cell sequencing now allows us to take a precise look at the antiretroviral therapy, and small numbers of infected cells that persist lifelong despite antiretroviral therapy, and can fuel rebound viremia when treatment is stopped,” says Dr. Matthias Lichterfeld (pictured). [Read More](#)

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- January 26 4:30 PM **Biomedical Informatics Entrepreneurs Salon: Iris Grossman, ElevenTx** Harvard Medical School & Online
- 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

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