Volume 4.13: April 11, 2022

Publications of the Week

Stitchr: Stitching Coding TCR Nucleotide Sequences from V/J/CDR3 Information

First Author: James Heather | Senior Author: Aaron Hata *(pictured)*
Nucleic Acids Research | Massachusetts General Hospital Cancer Center and Harvard Medical School

Produced by V(D)J recombination, T cell receptors (TCRs) are often only recorded in the literature and data repositories as a combination of their V and J gene symbols, plus their hypervariable complementarity-determining region 3 (CDR3) amino acid sequence. However, numerous applications require full-length coding nucleotide sequences. The authors present Stitchr, a software tool developed to specifically address this limitation. Abstract

Types and Functions of Heterogeneity in Mycobacteria

First Author: Eun Seon Chung | Senior Author: Bree Aldridge *(pictured)*
Nature Reviews Microbiology | Tufts University

The remarkable ability of *Mycobacterium tuberculosis* to survive attacks from the host immune response and drug treatment is due to the resilience of a few bacilli rather than a result of survival of the entire population. Mycobacterial populations develop a wide range of phenotypes through an innate asymmetric growth pattern and adaptation to fluctuating microenvironments during infection that point to heterogeneity being a vital survival strategy. Abstract

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Awards

2022 Canada Gairdner Award Given to Stuart H. Orkin, MD, Researcher at Dana-Farber/Boston Children's Cancer and Blood Disorders Center

Dana-Farber Cancer Institute

The Gairdner Foundation has announced that Dr. Stuart Orkin *(pictured)* is one of the 2022 Canada Gairdner Award laureates for seminal discoveries and contributions to biomedical science. Dr. Orkin was recognized for the discovery of the molecular mechanism responsible for the switch from fetal to adult hemoglobin gene expression during human development and translating that knowledge into a novel treatment for sickle cell disease and beta-thalassemia. Read More

Junior Dana-Farber Analyst Named to Forbes Healthcare's 30 Under 30

Dana-Farber Cancer Institute

At 28 years old, Dana-Farber bioinformatics analyst Dr. Carino Gurjao *(pictured)* is already making a splash in the field of colorectal cancer research. He is coming off the back of a big year: the Paris-born researcher was named to Forbes Healthcare's 2022 30 Under 30 list for his role in the Giannakis lab at Dana-Farber, which identified a mutational link between red meat and colorectal cancer. Read More

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Local News

Researchers Find First Strong Genetic Risk Factor for Bipolar Disorder

Broad Institute

The main treatment for bipolar disorder, lithium, was approved a half-century ago, but doesn't help all patients and has significant side effects. Little progress has been made in finding better therapies, in part because scientists don't fully understand how the condition arises or exactly how lithium improves symptoms when it does work. A genetic study involving thousands of people with bipolar disorder has revealed new insight into the condition's molecular underpinnings. Read More

Two Large Studies Reveal Genes and Genome Regions That Influence Schizophrenia Risk

Broad Institute

In a landmark genetic study of more than 121,000 people, an international consortium led by researchers at the Broad Institute of MIT and Harvard has identified extremely rare protein-disrupting mutations in ten genes that strongly increase an individual's risk of developing schizophrenia — in one instance, by more than 20-fold. Read More

Clinical Trials Bring First CRISPR-Based Therapies to Patients

McGovern Institute

Nearly ten years ago, Dr. Feng Zhang *(pictured)* and other pioneering scientists developed CRISPR, a revolutionary technology that quickly became biologists' preferred method of editing DNA. Biologists, computer scientists, and engineers in Dr. Zhang's lab are continuing to explore natural CRISPR systems and expand researchers' gene-editing toolkit. But for their long-term goal of using those tools to improve health, clinical collaboration is essential. Read More

Douglas Melton, Noted Stem Cell Researcher, Leaves Harvard for Vertex to Create Diabetes Treatments

STAT News

Dr. Douglas Melton *(pictured)*, one of the leading stem cell researchers in the world, is leaving Harvard University to join Vertex Pharmaceuticals, where he says he will pursue his deeply personal, decades-long quest to create therapies for type 1 diabetes. Both of his adult children have the disease, which affects the regulation of blood sugar and afflicts 1.9 million Americans. Read More

Neurons Are Fickle. Electric Fields Are More Reliable for Information.

MIT News

Based on electrode measurements of electrical activity in individual brain cells, researchers mathematically estimated the amplitude of a neural electric field at each electrode over an 800 millisecond time frame. They found the fields represented information held in working memory more reliably and stably than the direct measures of neural activity did. Read More

UMass Chan Biomedical Sciences Student Studies a Gene That Causes ALS

UMass Chan Medical School

Megan Fowler-Magaw has always been interested in neuroscience. Now she's putting that passion into studying amyotrophic lateral sclerosis (ALS), a progressive, neurodegenerative disorder that involves the loss of motor neurons that control voluntary muscles. A PhD student in the Morningside Graduate School of Biomedical Sciences, she studies a specific gene that is found in 97 percent of ALS cases, transactive response DNA-binding protein. Read More

HIV Drug Stabilizes Disease Progression in Metastatic Colorectal Cancer

Massachusetts General Hospital

New clinical research shows that lamivudine, a reverse transcriptase inhibitor widely used in HIV therapy, stopped disease progression in 25% of patients with fourth-line metastatic colorectal cancer. Findings from the trial, published in *Cancer Discovery*, raise the possibility of an unexpected promising direction in cancer treatment, not just colorectal cancer. Read More

Molecules Produced by Cells in Response to Stress May Be Indicators of Various Diseases

Massachusetts General Hospital

The body's ability to respond to various types of stress is essential for maintaining health, and failure of such adaptive stress responses can trigger or worsen numerous diseases. New research led by investigators at Massachusetts General Hospital and published in *Advanced Science* reveals that cells often release tRNA-derived small noncoding RNAs (tDRs) in response to stressors, and that different tDRs may serve as markers of cellular stress in different diseases. Read More

Study Shows That RNA Can Be Targeted by Small Molecule Drugs, Creating New Possibilities for Disease Treatment

Massachusetts General Hospital

RNA plays many roles in human health, and now a study in the journal *Nature* offers powerful evidence that RNA could also be a viable target for drug development. This work, led by Dr. Jeannie Lee's *(pictured)* team at Massachusetts General Hospital, suggests that a new class of biological factors numbering in the thousands can be targeted and thereby heralds a new era in drug development. Read More

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April 13
12:30 PM
A Macro View of Microdosing
Online

April 27
8:00 AM
Turning Great Ideas into Dollars: The Life-Cycle of a Start-Up – Part One
MassBioHub

April 27
4:30 PM
Tufts@Kendall: Advances in Immunology and Inflammation
MassBio

April 29
10:00 AM
Annual MIT Microbiome Symposium 2022
MIT Media Lab

May 5
8:00 AM
2022 State of Possible Conference
Royal Sonesta Boston

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