Volume 6.39: September 30, 2024

Publications of the Week

Commensal Consortia Decolonize Enterobacteriaceae via Ecological Control

First Authors: Munehiro Furuichi, Takaaki Kawaguchi, Marie-Madlen Pust, and Keiko Yasuma-Mitobe | Senior Authors: Ramnik Xavier *(pictured)* and Kenya Honda
Nature | Broad Institute, Massachusetts General Hospital, and Harvard Medical School

Gram-negative Enterobacteriaceae gut pathobionts are particularly recalcitrant to conventional antibiotic treatment although an emerging body of evidence suggests that manipulation of the commensal microbiota may be a practical alternative therapeutic strategy. Here, researchers isolated and down-selected commensal bacterial consortia from stool samples from healthy humans that could strongly and specifically suppress intestinal Enterobacteriaceae. **Abstract | Press Release**

Carbohydrate-Lectin Interactions Reprogram Dendritic Cells to Promote Type 1 Anti-Tumor Immunity

First Author: Valerie Lensch | Senior Author: Laura Kiessling *(pictured)*
ACS Nano | Koch Institute, Ragon Institute, Broad Institute, and MIT

The immune system monitors cells for signs of a foreign entity, but potent activation occurs when a second signal is present to activate toll-like receptors signaling. To exploit dual signaling, researchers engineered a glycan-costumed virus-like particle vaccine that displays a dendritic cell-SIGN-selective aryl mannose ligand and encapsulates TLR7 agonists. **Abstract | Press Release**

Nanoparticle Delivery of Innate Immune Agonists Combined with Senescence-Inducing Agents Promotes T Cell Control of Pancreatic Cancer

First Authors: Loretah Chibaya and Kelly DeMarco | Senior Author: Prabhani Atukorale *(pictured, right)* and Marcus Ruscetti *(left)*
Science Translational Medicine | UMass Chan Medical School

Unlike other tumor types, existing immunotherapies have not proven very successful for pancreatic ductal adenocarcinoma, necessitating the development of additional approaches. Here, researchers developed a combination therapy approach that included nanoparticle delivery of STING and TLR4 agonists, which stimulate the immune response. **Abstract | Press Release**

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Awards

Large-Scale Study Will Seek to Unearth Causes of Persistent Symptoms of Lyme Disease

Tufts Now

Tufts University researchers have received a $20.7 million grant from the National Institutes of Health (NIH) to try to answer some of the most vexing questions around chronic Lyme disease. The collaborative team led by Dr. Linden Hu *(pictured)*, the Paul and Elaine Chervinsky Professor in Immunology, will head the largest NIH-funded prospective study to date. **Read More**

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Local News

Curbing Blood Cancers by Teaching Immune Cells to Kill Mutant Stem Cells

Boston Children's Hospital

Blood stem cells, which give rise to all of our blood cell types, undergo a quality assurance process after they're born. As the lab of Dr. Leonard Zon has documented, immune cells known as macrophages interact with each newly born cell. Now, studying zebrafish, researchers in the Zon Lab show that the "eat-me" signal for macrophages can be induced on blood stem cells in several ways. **Read More**

Wyss Institute Team Selected by DARPA-SHIELD Program to Develop First-of-Its-Kind Biologically Engineered Broad-Spectrum Antimicrobial Therapeutic

Wyss Institute

Researchers at the Wyss Institute received a contract for up to $12M from the Defense Advanced Research Projects Agency (DARPA)'s new Synthetic Hemo-technologies to Locate and Disinfect (SHIELD) program. The SHIELD program aims to develop a prophylactic treatment that can be broadly administered to rapidly clear multiple bloodborne bacterial and fungal pathogens. **Read More**

A New Type of RNA Could Revolutionize Vaccines and Cancer Treatments

The Brink

An accidental discovery turned into an unexpected success, when a team of interdisciplinary researchers created a new and improved COVID vaccine. The group of researchers includes Drs. Wilson Wong, Jack Kirsch, Florian Douam, Joshua McGee, and Mark Grinstaff *(pictured, clockwise from back left)*. They worked together to investigate the promising technology of self-amplifying RNA as a way to deliver lifesaving drugs and create more effective vaccines. **Read More**

Protein Engineering Is Coming of Age with New Tools

Dana-Farber Cancer Institute

In 2016, the key to naturally deconstructing plastic seemed to have been found with plastic-eating bacteria. Since then, protein engineers have been trying to give a protein frmo that bacteria superpowers not needed in nature, but essential for industrial recycling. That effort has been slow, but a new tool from the lab of Dr. Nicholas Gauthier *(pictured)* could help pick up the pace. **Read More**

A Two-Dose Schedule Could Make HIV Vaccines More Effective

MIT News

One major reason why it has been difficult to develop an effective HIV vaccine is that the virus mutates very rapidly, allowing it to evade the antibody response generated by vaccines. In a new study, researchers found that with just two doses, given one week apart, part of that challenge can be overcome by generating larger quantities of neutralizing antibodies. **Read More**

New Research from the Ragon and Broad Unveils the Protective Role of CD4$^+$ T Cells in Tuberculosis Reinfection

Ragon Institute

Researchers from the Shalek Lab at the Ragon Institute have uncovered key insights into how prior *Mycobacterium tuberculosis* (Mtb) infection primes the immune system for enhanced protection against reinfection. The study's first author, Josh Bromley *(pictured)*, used a non-human primate model to demonstrate that previous Mtb infection leads to a durable, protective immune response that is dependent on CD4$^+$ T cells. **Read More**

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Upcoming Events in Boston

September 30 5:30 PM	**Connect the DOTs** Dillon's
October 7 - 9 7:00 AM	**Digital Health & AI Innovation Summit** Boston Marriott Cambridge
October 8 - 10 8:00 AM	**Executive Decision Making for Pharma & Biotech 2024** Royal Sonesta Boston
October 9 - 10 8:00 AM	**Wilson Sonsini's Biotech Summit 2024** The Newbury Boston
October 10 9:00 AM	**The State of AI in Precision Health** Northeastern University

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