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Publications of the Week

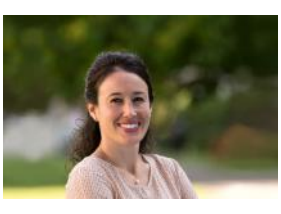
Graded BMP Signaling Within Intestinal Crypt Architecture Directs Self-Organization of the Wnt-Secreting Stem Cell Niche

First Author: Judith Kraiczy | Senior Author: Ramesh Shivdasani *(pictured)*
Cell Stem Cell | Dana-Farber Cancer Institute and Brigham and Women's Hospital

Signals from the surrounding niche drive proliferation and suppress differentiation of intestinal stem cells (ISCs) at the bottom of intestinal crypts. Among sub-epithelial support cells, deep sub-cryptal CD81^{+} PDGFRA^{lo} trophocytes capably sustain ISC functions *ex vivo*. The authors show that mRNA and chromatin profiles of abundant CD81^{-} PDGFRA^{lo} mouse stromal cells resemble those of trophocytes and that both populations provide crucial canonical Wnt ligands. **Abstract**

Structural and Functional Properties of mSWI/SNF Chromatin Remodeling Complexes Revealed Through Single-Cell Perturbation Screens

First Authors: Jordan Otto and Oana Ursu | Senior Author: Cigall Kadoch *(pictured)*
Molecular Cell | Dana-Farber Cancer Institute, Harvard University, Broad Institute, and MIT



The authors performed Perturb-seq-based CRISPR-Cas9 knockout screens targeting mSWI/SNF subunits individually and in select combinations, followed by single-cell RNA-seq and SHARE-seq. They uncovered complex-, module-, and subunit-specific contributions to distinct regulatory networks and defined paralog subunit relationships and shifted subcomplex functions upon perturbations. **Abstract**

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Local News

Speeding Up Drug Discovery with Diffusion Generative Models

MIT News

A team of researchers in Dr. Tommi Jaakkola's *(pictured)* lab at MIT's Abdul Latif Jameel Clinic for Machine Learning in Health developed a new molecular docking model, called DiffDock. The model's unique approach to computational drug design is a paradigm shift from current state-of-the-art tools that most pharmaceutical companies use, presenting a major opportunity for an overhaul of the traditional drug development pipeline. **Read More**

A Shot in the Arm

MIT News

In a recent paper published in *Advanced Healthcare Materials*, researchers describe a hydrogel platform for delivering monoclonal antibodies through subcutaneous injection. “This is an important milestone,” says Dr. Patrick Doyle *(pictured)*. “We are on the route to transforming the next generation of treatment with monoclonal antibodies and other kinds of therapeutics.” **Read More**

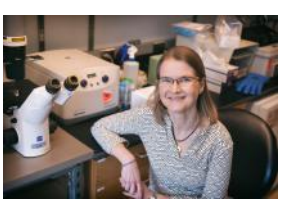
Skin Biopsy Distinguishes Between Parkinson’s and “Look-Alike” Disorder with High Degree of Accuracy, Study Shows

Beth Israel Deaconess Medical Center (BIDMC)

The overlapping features between multiple system atrophy (MSA) and Parkinson's disease create an unmet need for an accurate diagnostic biomarker. Now, physician-scientists at BIDMC have demonstrated that a skin test that measures the deposition and distribution of the protein linked with neurodegeneration in the two diseases can differentiate patients with MSA from those with Parkinson’s disease with a high degree of accuracy. **Read More**

Could Gene Therapy Relieve Post-Hemorrhagic Hydrocephalus?

Boston Children's Hospital



Premature infants, especially very low birthweight babies, are at risk for intraventricular hemorrhage. A frequent complication of these brain bleeds is hydrocephalus, an accumulation of cerebrospinal fluid (CSF) in the brain ventricles that can gravely disrupt brain development. In a groundbreaking study in *Neuron*, led by Dr. Maria Lehtinen *(pictured)* at Boston Children’s Hospital, targeting the choroid plexus with gene therapy accelerated clearance of the CSF in a mouse model of post-hemorrhagic hydrocephalus. **Read More**

Discovering How to Think About the Brain and Its Associated Diseases and Disorders

Whitehead Institute

In order to prevent and treat disorders and diseases of the brain, researchers first need to understand its underlying biology. This is not a simple task, because researchers cannot get a good look at cells inside a living brain. Additionally, many health issues that affect the brain are complex, with contributing factors that are not well understood. **Read More**

Reimagining Infertility – An Interview with Christian Kramme

Wyss Institute

Dr. Christian Kramme *(pictured)* is a former Wyss Institute researcher who is now the Vice President of Cell Engineering at a women’s health startup called Gameto. "If I could reimagine the world, I think about true reproductive autonomy. I think about a world in which when a person wants to have a child, that’s possible, and it’s on their time frame," says Dr. Kramme. **Read More**

Base Editing Treats Spinal Muscular Atrophy in Mice

Broad Institute

Researchers in Dr. David Liu's *(pictured)* lab have used a gene-editing technique called base editing to restore motor function to near-normal levels in a mouse model of spinal muscular atrophy (SMA) — a disease that leads to paralysis and, in its most severe form, death before the age of two in humans. SMA occurs when cells in the spinal cord that control muscle movement, called motor neurons, die. **Read More**

Engineered *E. coli* Delivers Therapeutic Nanobodies to the Gut

Massachusetts General Hospital

Researchers in Dr. Cammie Lesser's *(pictured)* group have succeeded in developing an *E. coli*-based “smart microbe” that secretes therapeutic payloads, including antibodies, into the gut. In mouse models, the smart microbe was as efficacious as a systemically delivered conventional monoclonal antibody in limiting colitis in inflammatory bowel disease. **Read More**

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April 19
12:00 PM
Cell and Gene Therapy Catapult Boston Showcase
MassBio

April 20
5:00 PM
Biomedical Informatics Entrepreneurs Salon: Linda Avey
Online

April 25
8:30 AM
2023 State of Possible Conference
Royal Sonesta Boston

April 26
12:00 PM
Is It Possible to Bioprint Human Hearts?
Online

April 29
9:00 AM
Microbial Sciences 20th Annual Symposium
Northwest Labs

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