Volume 4.11: March 28, 2022

## Publications of the Week

### Time-Series Transcriptomics and Proteomics Reveal Alternative Modes to Decode p53 Oscillations

First Authors: Alba Jiménez and Dan Lu | Senior Author: Galit Lahav *(pictured)*
Molecular Systems Biology | Blavatnik Institute, Dana-Farber Cancer Institute, and Harvard Medical School

The cell stress-responsive transcription factor p53 influences the expression of its target genes and subsequent cellular responses based in part on its dynamics. The mechanisms decoding p53 dynamics into subsequent target mRNA and protein dynamics remain unclear. The authors systematically quantified p53 target mRNA and protein expression over time under two p53 dynamical regimes, oscillatory and rising, using RNA-sequencing and tandem mass tag mass spectrometry. **Abstract**

### Human Organs-on-Chips for Disease Modeling, Drug Development, and Personalized Medicine

Author: Donald Ingber *(pictured)*
Nature Reviews Genetics | Wyss Institute, Boston Children's Hospital, Harvard Medical School, and Harvard John A. Paulson School of Engineering and Applied Sciences

Organ-on-a-chip microfluidic devices lined with living cells cultured under fluid flow can recapitulate organ-level physiology and pathophysiology with high fidelity. The author reviews how single and multiple human organ chip systems have been used to model complex diseases and rare genetic disorders, to study host–microbiome interactions, to recapitulate whole-body inter-organ physiology, and to reproduce human clinical responses to drugs, radiation, toxins, and infectious pathogens. **Abstract**

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## Awards

### Postdocs Kevin Dalton, Xiaotang Lu, and Sara Pintos dos Santos Matias Receive Research Fellowships

Harvard University Molecular and Cellular Biology (MCB)

Three postdocs from MCB labs have been awarded fellowships that will support ambitious research projects. Dr. Kevin Dalton *(pictured, left)* of the Hekstra lab has received a Career Award at the Scientific Interface from the Burroughs Wellcome Fund, Dr. Xiaotang Lu *(right)* of the Lichtman lab has received a K99/R00 Pathway to Independence Award from the National Institutes of Health, and Sara Pinto dos Santos Matias *(center)* of the Uchida lab has received a Young Investigator Grant from the Brain & Behavior Research Foundation. **Read More**

### Graduate Students Awarded Warren-McLeod Fellowships

BU Biology

Congratulations to the 2022 winners of the Warren-McLeod Graduate Fellowships! The Warren-McLeod Graduate Fellowship in Marine Science was established by Patricia Warren (the granddaughter of BU's first President, William Fairfield Warren) in 1990 to support graduate students in the BU Marine Program. James Fifer *(pictured)* received a full year fellowship for his project on predicting coral resilience on the reefs of the Marianas. **Read More**

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## Local News

### Pioneering a Deeper Understanding of Metabolism

Whitehead Institute

Whitehead Institute Member Dr. Siniša Hrvatin *(pictured)* was inspired to pursue his current research by science-fiction tales about suspended animation for long-term space travel. And during graduate school, he realized that the ability of some mammals to enter a state of greatly reduced metabolism — such as occurs in hibernation — was a mild but real-world form of suspended animation. **Read More**

### #WhyIScience Q&A: An Aspiring Physician-Scientist Investigates Health Through the Eye

Broad Institute

During an undergraduate summer research program in Switzerland, Maryam Zekavat *(pictured)* became fascinated with a crucial, yet often overlooked part of the body — the eye. After researching eye diseases and observing ophthalmology in the clinic, she knew she wanted to learn more about the eye's connections to the brain, the vasculature, and the rest of the body. **Read More**

### Fundamental Cancer Metabolism Dogma Revisited

Massachusetts General Hospital

A new paper in *Nature Communications* reveals new insights into adaptations made by cancer cells to rewire their metabolism to achieve growth and survive. Among the discoveries include a challenge to a well-known feature in cancer metabolism, raising the call for tools to study cancer cell metabolism on a nearly single-cell level. **Read More**

### Cancer Cells That Spread to Different Sites in the Body Express Varying Levels of Targetable Proteins

Massachusetts General Hospital

Cancer cells initially confined to a single location in the body can eventually spread, or metastasize, to distant sites such as the bone, lung, liver, and brain, where they take on new characteristics depending on the particular tissue environment. A team led by investigators at Massachusetts General Hospital including Dr. Shyamala Maheswaran *(pictured)* used single cell protein analysis to reveal insights into these alterations that may help explain why certain therapies work against some metastasized cancers but not others. **Read More**

### Ragon Institute Women Make a Difference: Amy Barczak

Ragon Institute

Dr. Amy Barczak *(pictured)* has been a physician-scientist at the Ragon Institute since 2015, where she is both a Faculty Member and the Director of the Biosafety Level 3 Laboratory for Special Pathogens. Dr. Barczak's lab investigates, at the cellular level, the fundamental interactions between tuberculosis pathogens and the human immune system that could lead to breakthroughs in preventing and treating tuberculosis. **Read More**

### Opioids and the Brain: New Insights Through Epigenetics

Whitehead Institute

Drug overdose, mostly from opioid use, is the leading cause of accidental death in the United States. Prior studies of twins have revealed that genetics play a key role in opioid use disorder. Dr. Olivia Corradin's *(pictured)* lab studies genetic variants — regions of DNA that differ from person to person — and how they are associated with human disease. **Read More**

### New Technique Improves Detection of Cancer DNA in Blood

Broad Institute

A team led by researchers at the Broad Institute, Dana-Farber Cancer Institute, and Harvard Medical School has developed a new method to identify thousands of DNA mutations accurately and efficiently in a patient's blood sample with minimal sequencing. The approach could one day enable the detection of residual cancer in patients who have undergone treatment, alerting doctors to disease recurrence earlier and more cheaply than current techniques allow. **Read More**

### Conjugate Therapy Produces Remissions in One-Third of Patients with Drug-Resistant Ovarian Cancer, Study Results Show

Dana-Farber Cancer Institute

In a clinical trial involving patients with ovarian cancer previously treated with platinum-based chemotherapy, a novel "conjugate" therapy produced a substantially better response than standard treatments. "These data have the potential to be transformative for ovarian cancer patients and their physicians," said Dr. Ursula Matulonis *(pictured)*. **Read More**

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## Upcoming Events in Boston

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| March 29<br>5:30 PM | **SCIENCE with/in/sight: How Are Cancer Researchers Fighting COVID-19?**<br>Koch Institute |
| March 30<br>11:00 AM | **Careers in Academia for Biomedical Students: Panel**<br>Online |
| March 31<br>10:00 AM | **13th Annual Prostate Cancer Awareness Day**<br>Online |
| April 5<br>5:30 PM | **Astellas Pharma Day**<br>MassBioHub |
| April 8<br>12:00 PM | **2022 MIT Biotech Group Career Fair**<br>Online |

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## Science Jobs in Boston

**Senior Scientist/Associate Principal Scientist, Biochemistry & Biophysics**
LifeMine Therapeutics

**Scientist/Engineer III, Cell Therapy Downstream Purification**
Rubius Therapeutics

**Senior Associate Scientist, Research Histology**
Biogen

**Associate Scientist II, Lab Management**
bluebird bio

**Research Assistant II, Neurodegenerative Disease Biomarkers**
Harvard Medical School

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