

THE JACKSON LABORATORY OPEN HOUSE

The Jackson Laboratory Virtual Open House 2020

Event Quick Guide

Our week-long event will feature a variety of live and pre-recorded content, as well as links to activities and lessons. **LIVE!** events are denoted with red text and specify the start time; all other sessions will be released the morning of to watch on your own time.

Advanced registration required to access events:

<https://www.jax.org/education-and-learning/high-school-students-and-undergraduates/virtual-open-house>

Sessions are divided into 4 science topics:



Bioinformatics & Data Science showcases the intersection of biological and computational fields in modern genetics and genomics research.



COVID-19 features genetic perspectives on the virus of the 2020 pandemic.



Mighty Mice in Space highlights the out-of-this-world research project that sent mice to the International Space Station.



Mouse Models reveals how mice are critical research tools to research human health and disease.

Each science topic includes 4 session types:

- **Career Exploration** sessions put you in the shoes of real scientists. Learn about their jobs and career path through live panel discussions, video interviews, and spotlight articles.
- **Learn & Discover** sessions offer more information about the topics presented at the Open House, allowing for self-paced learning.
- **Real Research** sessions highlight the work of JAX scientists.
- **Skill Building** sessions let you practice what you learned at the Open House. These are also great resources for teachers.

Event Schedule

Day 1 – Monday, October 19



Opening Ceremonies: Welcome Presentation

Hosts Emaly Piecuch, Ph.D. & Christina Vallianatos, Ph.D.

Event Co-organizers and hosts Emaly and Christina welcome you to the first Virtual Open House event. They will discuss tips and resources to help you learn how to get the most out of this week-long event.



Learn & Discover: Conversation with Dr. Cat Lutz

LIVE! 1:30-2:00pm EST | 12:30pm CST | 11:30am MST | 10:30am PST

Learn about the K18 mouse model and its application to therapeutic development for COVID-19.



Skill Building: Science After High School, interactive discussion

LIVE! 4:00-5:00pm EST | 3pm CST | 2pm MST | 1pm PST

What are science classes like in college? How can you get research experience? What jobs fit your skills and interests? Presented by the JAX Women in Science & Engineering group.

- *Lerato Hlaka, Ph.D. (Postdoctoral Researcher, Palucka lab)*
- *Rachel Goldfeder, Ph.D. (Computational Scientist, Genome Technologies)*
- *Yu-Hui Rogers, M.S. (Senior Director, Research Strategy, Asia)*
- *Laura Urbanski, M.S. (Predoctoral Researcher, Anczukow lab)*
- *Isha Walawalkar, B.A. (Research Assistant, Beck lab)*



Learn & Discover: DNA 101

Take a minute to learn about DNA, the building block of life.



Learn & Discover: What are genes?

Take a minute to learn about what genes are and how they shape every one of us.



Learn & Discover: What is the difference between genetics and genomics?

Take a minute to learn about differences between genetics and genomics.



Learn & Discover: JAX Coronavirus Learning Portal

JAX is committed to helping address the coronavirus pandemic as rapidly as possible. This page is dedicated to providing you with up-to-date information about how JAX is applying our expertise in human genomics and mammalian genetics to help support the quickly evolving public health crisis.



Career Exploration: Frontline perspectives from Dr. Rachel Goldfeder

Rachel Goldfeder, Ph.D. is a computational scientist in the JAX Genome Technologies division. She served as Project Manager for the JAX COVID-19 diagnostic testing team during the height of the 2020 pandemic, and shares her experience working on the frontlines.

Day 2 – Tuesday, October 20



Career Exploration: Career panel on bioinformatics and data science

LIVE! 4:00-5:00pm EST | 3pm CST | 2pm MST | 1pm PST

- Christina Vallianatos, Ph.D. (Genomics Educator, host)
- Bri Angello, B.S. (Research Project Manager, Computational Sciences)
- Chris Baker, Ph.D. (Assistant Professor)
- Ali Foroughipour, Ph.D. (Postdoctoral Researcher, Chuang lab)
- Martine Seignon, B.S. (Research Data Analyst, Single Cell Technologies)
- Victor Wang, B.S. (Predoctoral Researcher, Chuang lab)
- Ann Wells, Ph.D. (Postdoctoral Researcher, Carter lab)



Real Research: Dan Cortes lab tour and mouse cell culture discussion

Take a walk in the shoes of Dr. Cortes as he guides us through the space where he does his research as a postdoctoral fellow and see for yourself what it looks like to work in a mouse cell culture lab.



Real Research: Bioinformatics research

Postdoctoral fellow Ali Foroughipour, Ph.D. presents his research project in the Chuan lab.



Career Exploration: Career Chat with Sarah Holbrook

Sarah Holbrook is a University of Maine PhD student researching mouse strains modeling childhood neuromuscular degenerative diseases in the Cox lab at JAX.



Skill Building: Intro to Bioinformatics, and Wiki vs. OMIM Bioinformatics Exercise

The Wiki vs. OMIM Bioinformatics exercise allows students to "jump into bioinformatics" by exploring two databases in search of specific genetic information: Wikipedia, an online encyclopedia they are likely familiar with navigating; and OMIM, an online catalog of human genetics and genetic diseases. The exercise outlines

student tasks and thinking questions. You will learn that bioinformatics is a key component of genetics and genomics and that analyses can be performed anywhere there is a computer and an internet connection.



Skill Building: The Curious Case of James Lupski, Case Study Exercise

This case study guides students through publicly available bioinformatics databases to solve a medical mystery. The case relates the real-life story of Dr. James Lupski, a renowned geneticist, who has a rare form of Charcot-Marie-Tooth Disease (CMT), a degenerative peripheral neuropathy. Students assume the role of a family physician who meets Dr. Lupski prior to his diagnosis. Students then investigate his symptoms to provide a medical diagnosis and, alongside Dr. Lupski, investigate his published genomic data and the causative gene, SH3TC2. Since there is no cure for the disease, students explore model databases to determine if there is an animal model of CMT and if it is being actively researched.

Day 3 – Wednesday, October 21



Learn & Discover: Kristin Cough presents mouse models followed by Q&A

LIVE! 2:00-3:00pm EST | 1pm CST | 12pm MST | 11am PST

Learn about the important mouse models maintained at The Jackson Laboratory to study disease in humans.



Learn & Discover: Challenger Center for Space Science Education

LIVE! 4:00-5:00pm EST | 3pm CST | 2pm MST | 1pm PST

Life Aboard the International Space Station: living and working in space



Real Research: Sending Mighty Mice to Space

JAX Professor Se-Jin Lee, M.D., Ph.D. presents the out-of-this-world story of how his discovery of the myostatin gene, a critical component of muscle growth, lead to genetically engineered “mighty mice” spending time on the International Space Station.



Skill Building: JAX Mighty Mice in Space High School Lessons

These lessons take real data from Dr. Lee’s Mice in Space experiments and allow students to immerse themselves in the research process and learn scientific skills including prediction, experimental design, data interpretation, and graphing analysis.



Learn & Discover: What is a mouse model?

Take a minute to learn about why mice are used in biomedical research.



Learn & Discover: Human diversity in mice

Take a minute to learn how mice can help model human genetic diversity.

Day 4 – Thursday, October 22



Real Research: Elli Hartig presents the biology of hearing, followed by Q&A

LIVE! 4:00-5:00pm EST | 3pm CST | 2pm MST | 1pm PST

At the forefront of the hearing process, specialized sensory cells in the cochlear half of the inner ear transform sound into cellular signals. Tune to learn about graduate student Elli Hartig's investigations of the molecular mechanisms shaping hair cell architecture in the inner ear and ask her questions about her work!



Real Research: Dr. Muneer Hasham presents the biology and research of cancer

In this talk Muneer Hasham, Ph.D. introduces the field of cancer research and highlights the importance of mouse modeling.



Career Exploration: Career Chat with Zoe Brown

Zoe Brown is a research assistant at the Center for Biometrics Analysis at JAX within the neurobehavioral phenotyping division. In this interview, Zoe shares how her work helps advance human disease research through mouse studies.



Career Exploration: Career Chat with Dr. Dave Mellert

Dave Mellert, Ph.D. is a scientist and manager of information technology applications in the IT department at JAX, working to enable scientific research through technology.



Skill Building: The Power of a Test: How COVID-19 Is Diagnosed and Who Does It, Case Study Exercise

In this directed case study, students follow the story of "Marcus," a recent college graduate who is working as a technician in a clinical laboratory to gain experience before applying to medical school. Marcus' work duties suddenly shift when the COVID-19 pandemic hits his region to testing patient samples for the virus. Students investigate the process of COVID-19 diagnostic testing, from sample collection and processing to data analysis and the reporting of results. They then explore the molecular biology of nucleic acid purification, amplification of a target nucleic acid sequence, sequence detection and analysis, and ultimately, diagnosis.

Day 5 – Friday, October 23



Learn & Discover: A conversation with Mighty Mice in Space researchers Dr. Se-Jin Lee and Dr. Emily Germain-Lee

LIVE! 4:00-5:00pm EST | 3pm CST | 2pm MST | 1pm PST

They sent Mighty Mice to space, now hear from the researchers about how this out-of-this-world experiment can help humans with muscle and bone disease. Tune in live to ask your own questions!



Closing Ceremonies: Open House 2020 in review LIVE

LIVE! 5:00-6:00pm EST | 4pm CST | 3pm MST | 2pm PST

Hosts Emaly Piecuch, Ph.D. & Christina Vallianatos, Ph.D.

Event Co-organizers and hosts Emaly and Christina close out the Virtual Open House week-long event by reviewing the highlights of the week and answering questions from the audience. Special guest appearances by several of the Open House speakers, so don't miss this event!



Career Exploration: Spotlight on Dr. Johnnie Moore Dotson

Johnnie Moore Dotson, Ph.D. is a senior project manager at the JAX Mice, Clinical & Research Services division. Learn about the steps she took in her career journey, and how her current job helps researchers with their mouse models for various human diseases.



Career Exploration: Spotlight on Jasmina Uvalic

Jasmina Uvalic is a clinical genomic technologist in the JAX Mice and Clinical & Research Services division, working on testing human patient samples including COVID testing and tumor sequencing.