THE JACKSON LABORATORY FOR GENOMIC MEDICINE

CELEBRATING FIVE YEARS OF DISCOVERY

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The Jackson Laboratory

I remember the day we officially opened the doors on our new genomic medicine facility in Farmington, Connecticut. The excitement in the air was palpable.

The Jackson Laboratory's expansion into Connecticut, led by President and CEO Edison T. Liu, M.D., Chuck Hewett, Ph.D., who served as chief operating officer at the time, and Mike Hyde, then-vice president for external affairs and strategic partnerships, was incredibly meaningful. There were high expectations that The Jackson Laboratory for Genomic Medicine (JAX Genomic Medicine) would make an impact on science and human health for decades to come. We would draw on the Laboratory's 90 years of research experience in mammalian genetics, while adding to JAX's analytical abilities, acquiring and developing cutting-edge genomic technologies, and providing clinical expertise to discover the precise genomic causes of human disease, and ultimately to develop individualized diagnostics, treatments and cures.

Today, with five years of incredible research under our belts, we're even more excited about the promise of our work than we were that very first day. We've now grown to over 450 scientists and staff who are all working toward our mission.

In the following pages, you'll meet just a few of the people who have been at JAX Genomic Medicine from the very beginning and learn about how they have created this wonderful organization. I hope you enjoy reading about their first memories and what they find special about this community.

I'm so proud of what we have achieved together over the past five years and I can't wait to see what the next five years will bring.

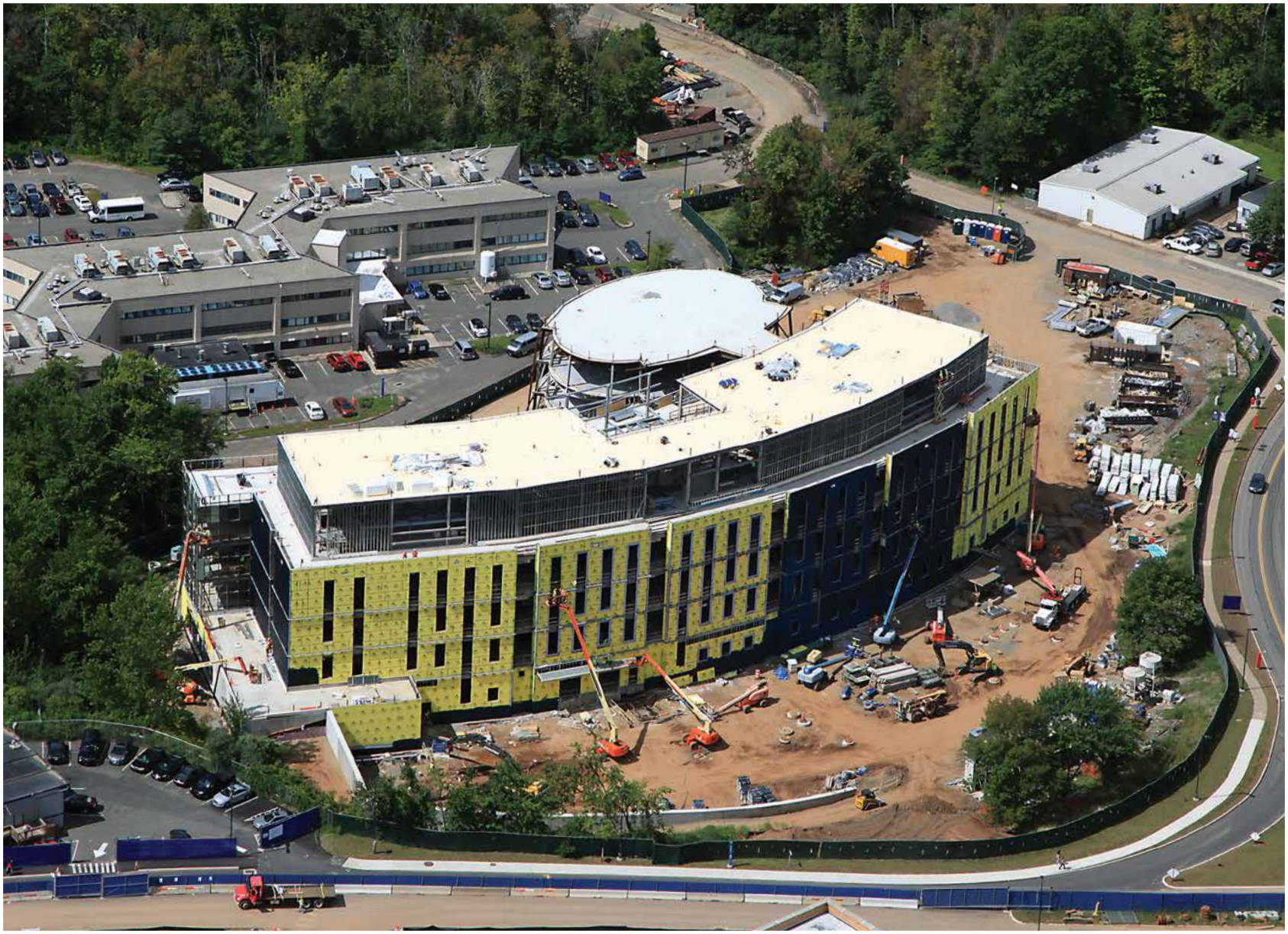
Charles Lee, Ph.D., FACMG
Scientific Director and Professor
The Jackson Laboratory for Genomic Medicine

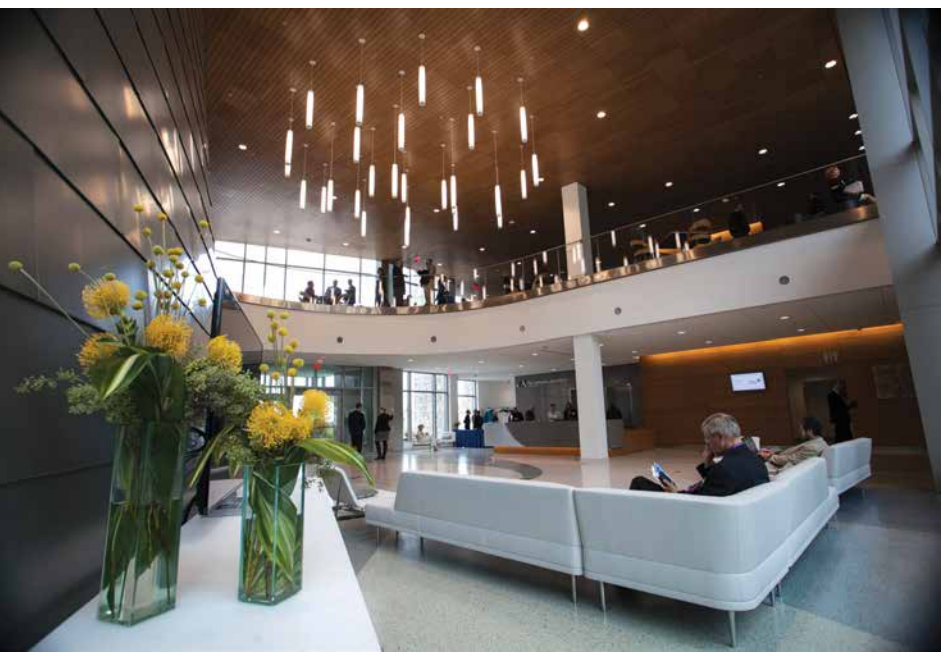
THE FARMINGTON CAMPUS

JAX Genomic Medicine's 183,500-square-foot facility sits atop a 17-acre parcel of land on the UConn Health Center campus in Farmington, Connecticut. Its proximity to the health center is not by accident. With the prospect for joint faculty appointments, research and clinical collaborations and engagement between academic programs, the physical proximity makes sense.

Surrounded by wetlands, the facility boasts rainwater capture systems, active daylight controls, ventilation heat recovery, demand-based ventilation controls and an energy efficient building envelope. It is one of only a few laboratory facilities nationwide to achieve LEED Gold® certification by the U.S. Green Building Council.

The landscaping, designed to treat storm water onsite before releasing to the surrounding areas, incorporates plants selected to thrive in moist environments as well as to act as natural filters for the water entering the bioswale.

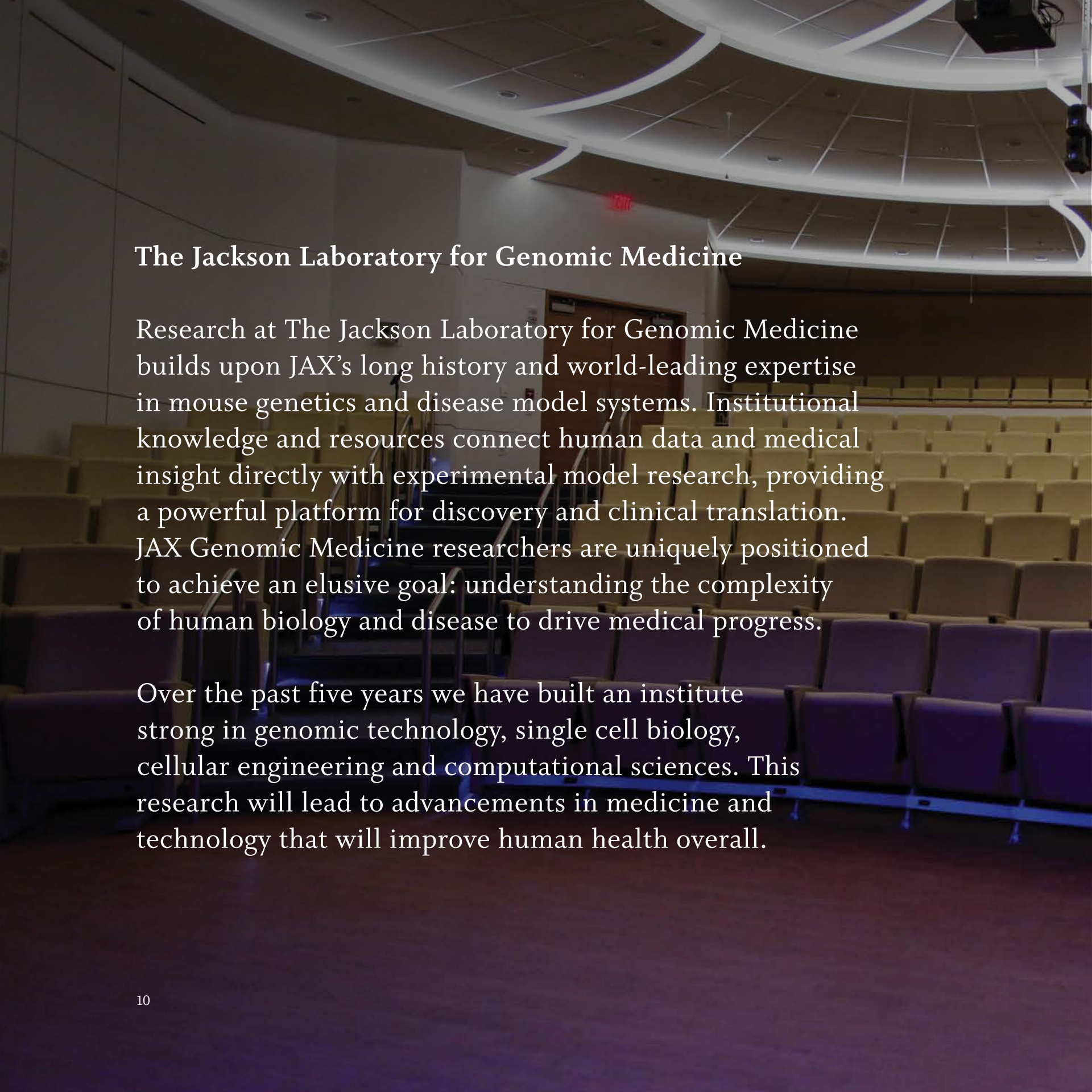




GROUNDBREAKING & GRAND OPENING

In January 2013, JAX Genomic Medicine broke ground on its state-of-the-art research facility. As staff and faculty were hired, they began to take up temporary residence in nearby buildings on the UConn Health Center's campus.

Finally, on October 7, 2014, the ribbon-cutting and grand-opening celebration took place. Many of the same people who had gathered 22 months before, wielding shovels, returned to snip the ribbon proclaiming the Farmington campus officially open. Charles Lee gave the keynote address and was joined by many distinguished guests, including Edison T. Liu, president and CEO of The Jackson Laboratory, Leo Holt, chair of the JAX Board of Trustees, Connecticut Governor Dannel P. Malloy, and Susan Herbst, president of the University of Connecticut.



The Jackson Laboratory for Genomic Medicine

Research at The Jackson Laboratory for Genomic Medicine builds upon JAX's long history and world-leading expertise in mouse genetics and disease model systems. Institutional knowledge and resources connect human data and medical insight directly with experimental model research, providing a powerful platform for discovery and clinical translation. JAX Genomic Medicine researchers are uniquely positioned to achieve an elusive goal: understanding the complexity of human biology and disease to drive medical progress.

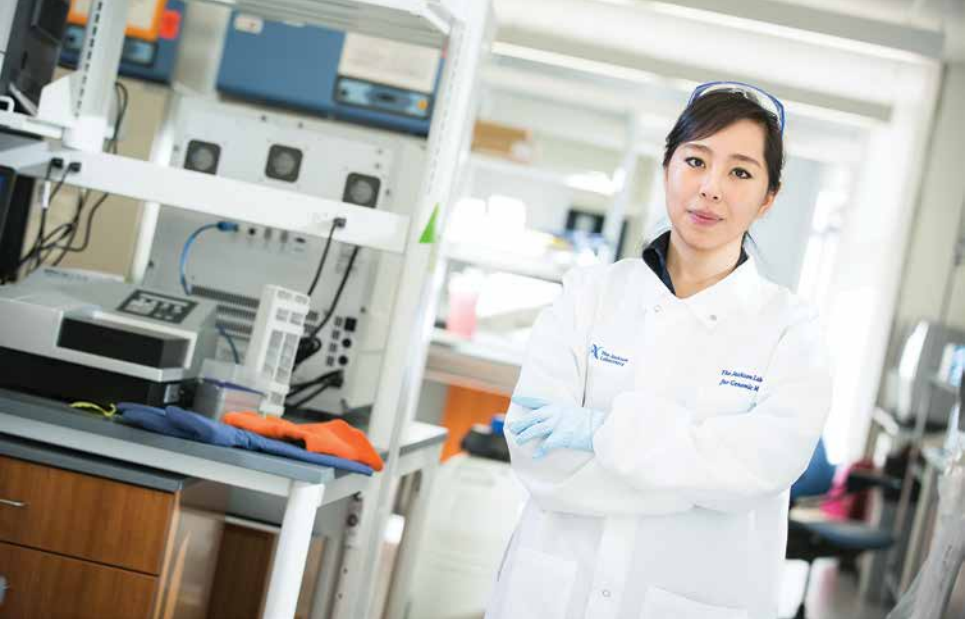
Over the past five years we have built an institute strong in genomic technology, single cell biology, cellular engineering and computational sciences. This research will lead to advancements in medicine and technology that will improve human health overall.


EXIT

OUR RESEARCH

JAX Genomic Medicine houses 26 laboratories, configured in large open suites to encourage collaboration and allow for easy reconfiguration to meet changing needs. Researchers investigate many aspects of human genomics and disease, including immune response, cancer genomics, the microbiome, genome structure, computational modeling/analyses and more. Seven faculty members have M.D. degrees, and several combine clinical practice with their research programs.

In its brief history, JAX Genomic Medicine's research effort has grown rapidly. Research funding has increased to more than $39 million annually, and several NIH-funded research centers have been established, including one led by Yijun Ruan, Ph.D., to explore three-dimensional genomics; one by Derya Unutmaz, M.D., that expands research into the immune and microbiome components of myalgic encephalomyelitis (chronic fatigue syndrome or ME/CFS); one by Karolina Palucka, M.D., focusing on the immune response to viruses in the lung; and another by Jacques Banchereau, Ph.D., to develop new ways to boost vaccine effectiveness in the elderly and immunosuppressed patients. Significant collaborative research programs have also been established for single-cell biology, cellular engineering and systems genomics. The CLIA-certified Clinical Genomics laboratory provides clinical-grade DNA sequencing and analysis, and in addition to wet lab research, the Farmington facility is home to a dynamic team of computational scientists who analyze and integrate vast amounts of scientific data.




The Jackson Laboratory


2013


2014


2015


2016


2017

2018

CLASS PHOTOS

Farmington's faculty members research the complex genetic causes of disease and develop genomic solutions tailored to each person's unique genetic makeup. In partnership with the expertise at Connecticut's universities and hospitals, these 26 faculty members strive to impact the way we diagnose, treat and cure genetic disease.

Here you see the annual "class photos" taken of the scientific faculty year after year. This dedicated group of researchers has grown from its inaugural member in February 2012 to 26 faculty members in 2019.

Current Farmington faculty members (with the year they joined JAX):

Charles Lee, Ph.D., FACMG (2013)
Mark Adams, Ph.D. (2016)
Olga Anczuków-Camarda, Ph.D. (2016)
Jacques Banchereau, Ph.D. (2013)
Christine Beck, Ph.D. (2017)
Albert Cheng, Ph.D. (2015)
Jeff Chuang, Ph.D. (2012)
J. Travis Hinson, M.D. (2016)
Ching Lau, M.D., Ph.D. (2016)
Se-Jin Lee, M.D., Ph.D. (2017)
Sheng Li, Ph.D. (2016)
Shuzhao Li, Ph.D. (2019)
Edison Liu, M.D. (2012)
Julia Oh, Ph.D. (2015)
Karolina Palucka, M.D., Ph.D. (2014)
Peter Robinson, M.D., M.Sc. (2016)
Paul Robson, Ph.D. (2014)
Yijun Ruan, Ph.D. (2012)
William Skarnes, Ph.D. (2016)
Michael Stitzel, Ph.D. (2013)
Duygu Ucar, Ph.D. (2013)
Derya Unutmaz, M.D. (2014)
Roel Verhaak, Ph.D. (2016)
Chia-Lin Wei, Ph.D. (2016)
George Weinstock, Ph.D. (2013)
Adam Williams, Ph.D. (2014)

YU-HUI ROGERS, M.S., M.B.A.
Senior Director, Research Strategy in Asia
Site Director (2013–2017)

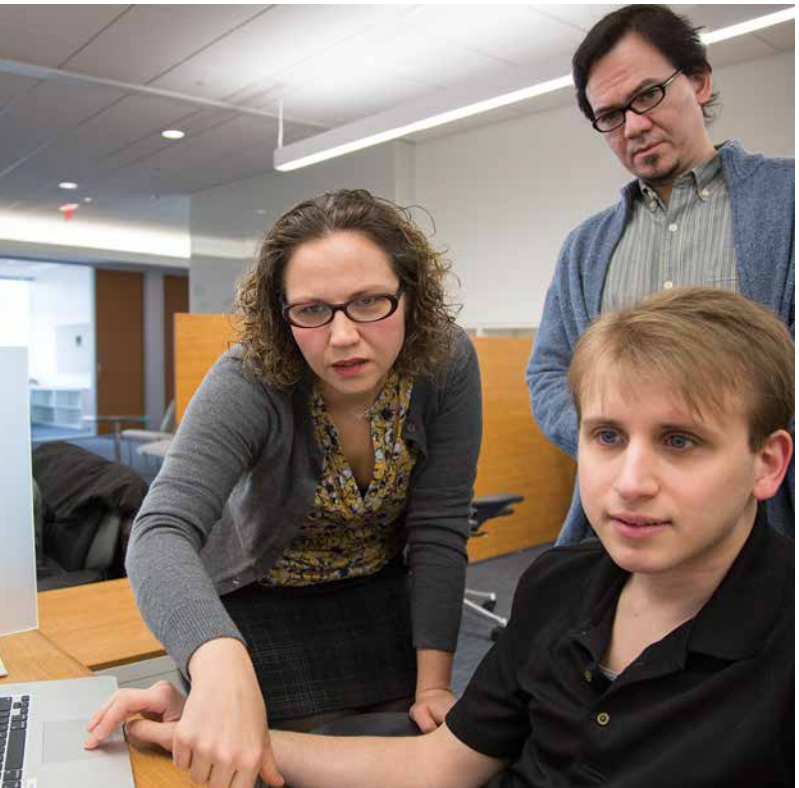
I came to JAX for the opportunity to help build a genomic medicine institute from the ground up, after having worked on the Human Genome Project (HGP). The HGP's goal was to advance our understanding of biology and disease and to improve human health — a goal that is still largely unfinished business. JAX is home to a passionate and diligent group of scientists who have devoted their lives to the advancement of genomic science and improvement of human health.

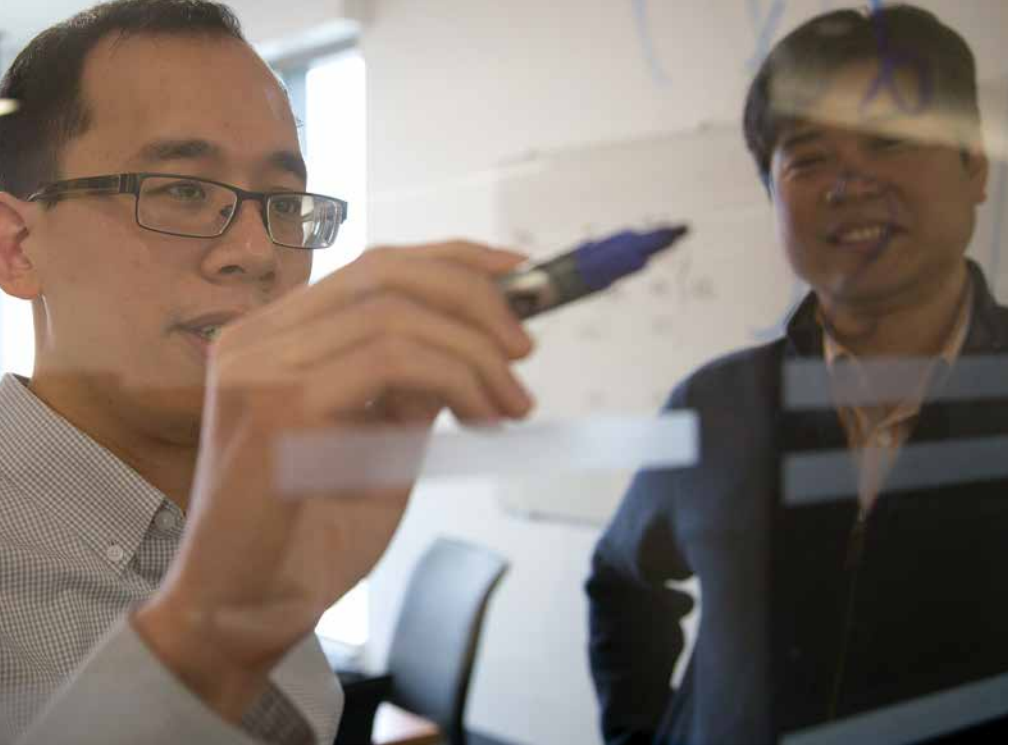
DERYA UNUTMAZ, M.D.
Professor

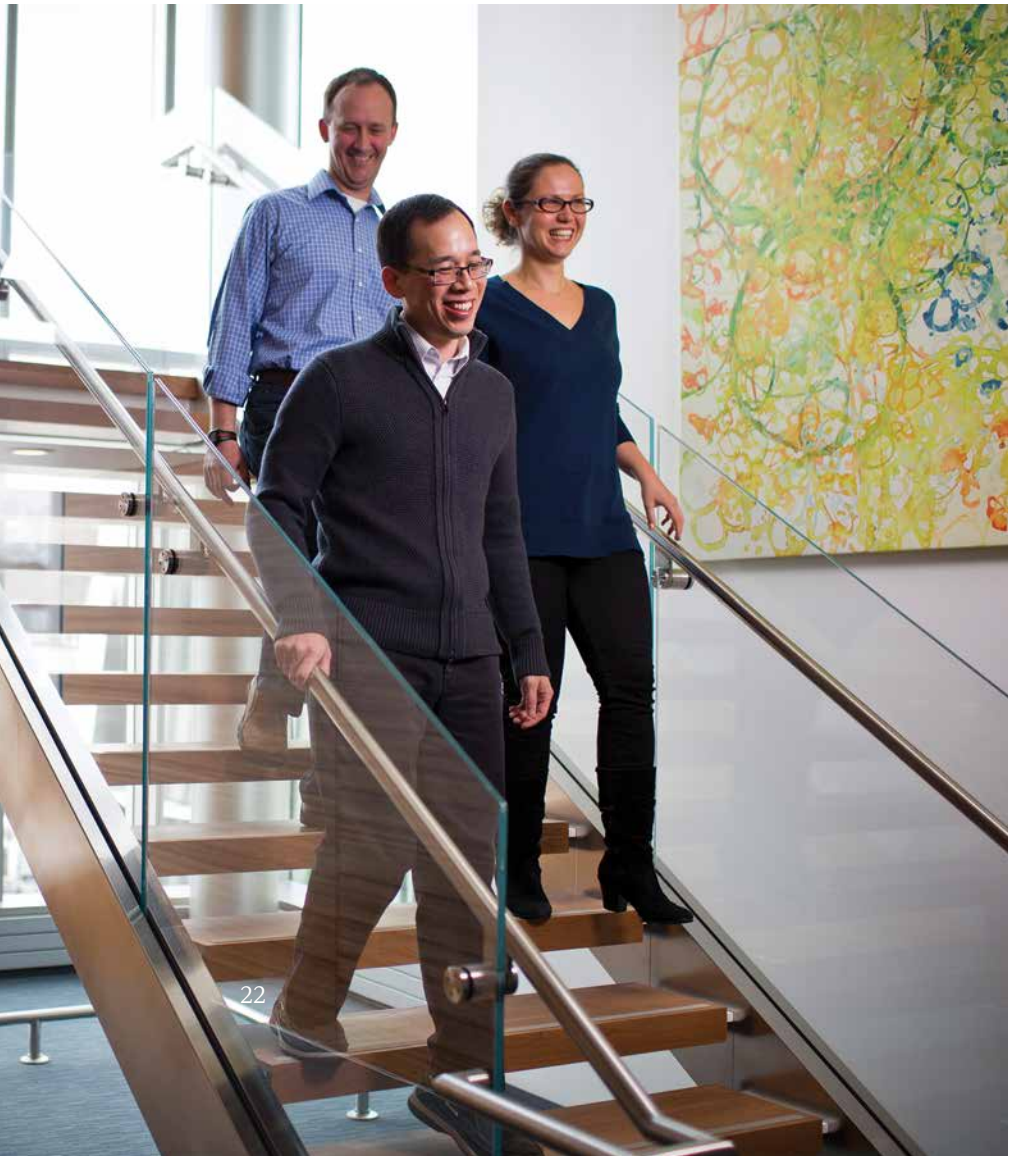
Understanding major medical or biological problems such as cancer, aging or chronic illnesses, all of which my lab studies from the immunological perspective, requires multidisciplinary approaches. One of the great aspects of working at JAX has been the ease to start such systems biology collaborations with my colleagues here who all have unique and outstanding expertise in their respective fields.

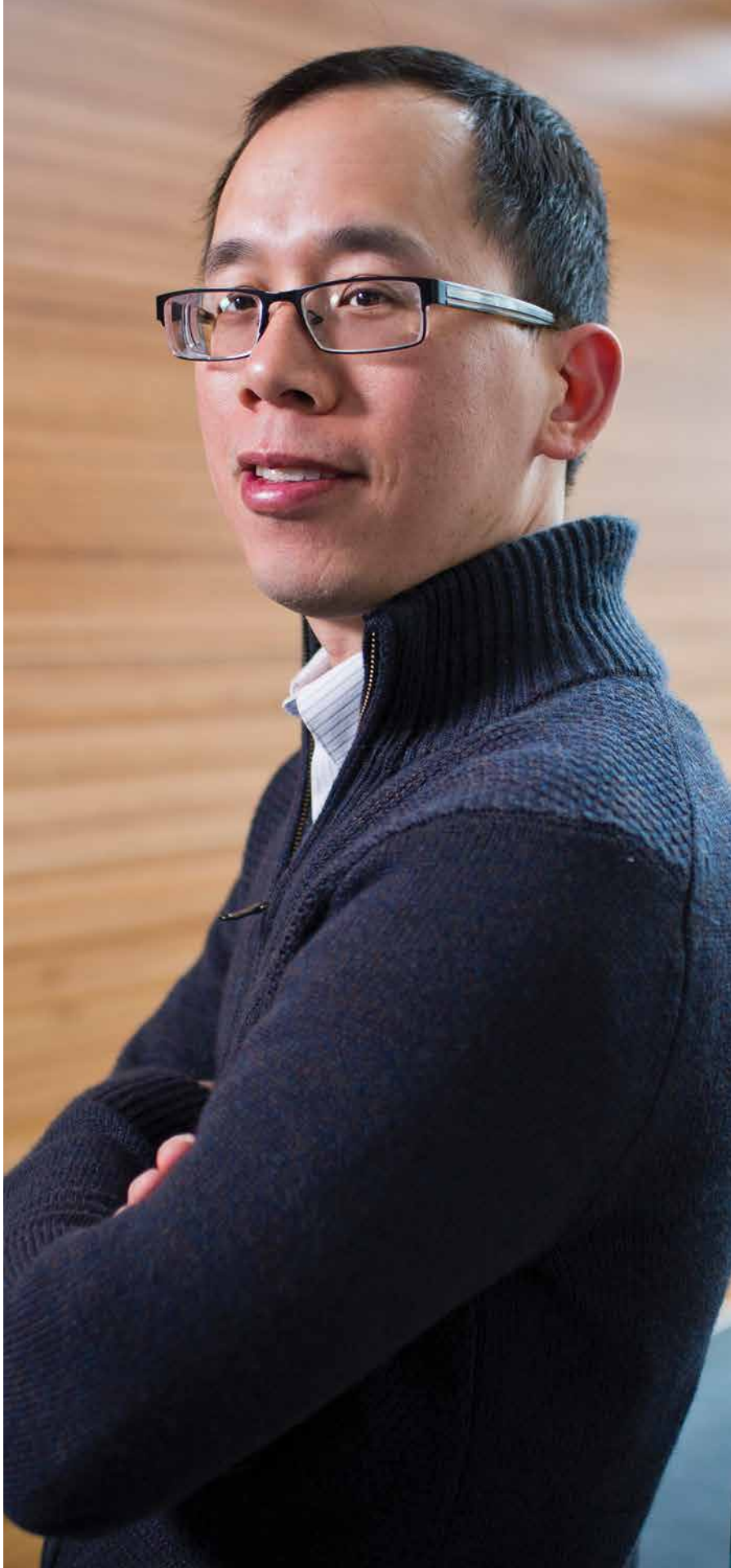
DUYGU UCAR, PH.D.
Associate Professor

JAX has been a wonderful home for my interdisciplinary team, who are experts in integrating advanced genomic technologies and informatics to uncover how epigenomes of human cells change over time and in age-related diseases.









JEFF CHUANG, PH.D.
Associate Professor

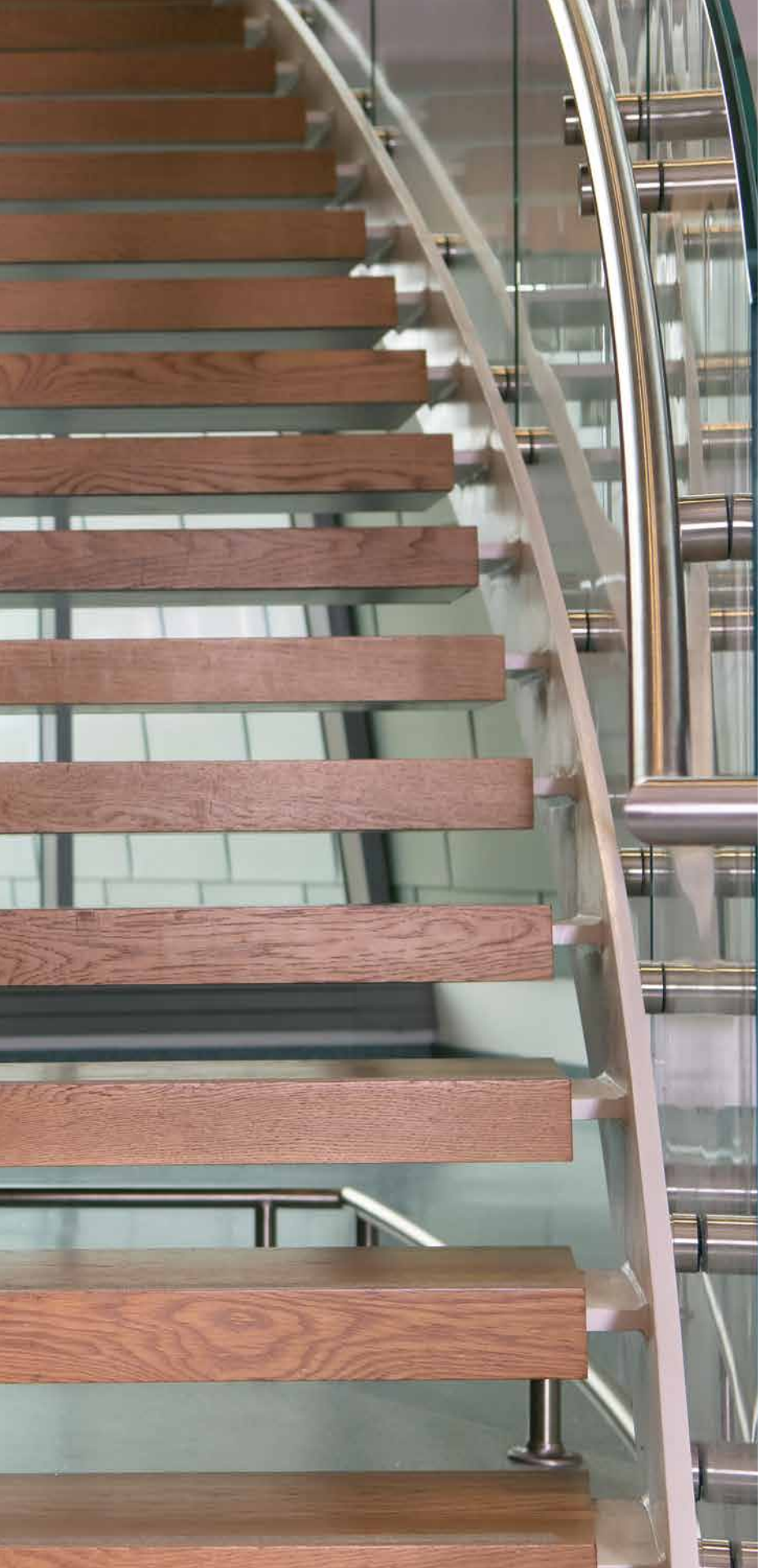
I could not pass up the chance to help build the Farmington campus. I knew the science would be excellent, but it was exciting to build! There was an electricity to it. I spent a lot of time at the Bar Harbor, Maine campus, trying to learn how my new colleagues had made things work there, and people were so welcoming.

Just six years ago, we were a tiny group that was trying to figure out what to do when a visitor rang the doorbell. Now, we have scientists leading consortia around the world.

FRANCESCA MENGHI, PH.D.
Research Scientist

I joined as JAX Genomic Medicine employee number 39. I could not help but be excited. It really took very little time to make new close friends, whom to this day I consider my family abroad.

Our research administrative assistant used to keep a world map on the wall. Every time a new hire joined, she would add a pin on the map indicating where that person came from. Not long after, the map was so filled with pins on so many world regions that she had no space to continue this tradition. To me, this speaks of the great diversity of backgrounds that has been a feature of JAX Genomic Medicine, which is such an important feature for any scientific environment because out of these many diversified experiences come the greatest collaborative efforts!



LORI LAVERDIERE
Supervisor, Security Services

I chose to work at JAX because it presented me the opportunity to be more impactful in a smaller environment. The groups I work and interact with — from people in facilities, to administrators, to scientists — are all dynamic and I am glad that I have been able to provide a service and have some laughs along the way. Even five years in, I think we continue to evolve, offering new programs to employees and opportunities to become involved in the science — even for those of us who are in support and operational positions.

KRISHNA KARUTURI, PH.D.
Senior Director, Computational Sciences

The Jackson Laboratory's deep collaborative culture, coupled with a fully integrated ecosystem of datascience, provides fertile ground for my research and that of other computational scientists here at JAX Genomic Medicine.

JOSHY GEORGE, PH.D.
Associate Director, Computational Sciences

Investigations in the labs here generate vast quantities of data. As a computational scientist, I have had the opportunity to design experiments, implement computational strategies and develop statistical methods to test the hypothesis. The last six years have been the most productive in my career and the future looks even more promising.

LUIS SORDO VIEIRA, PH.D.
Postdoctoral Associate

The passion JAX has for education was perhaps the most important point for me. Furthermore, the co-location with UConn Health opens up an even richer scientific environment and opportunities for developing new collaborations that would not be possible otherwise. I have interacted with most labs here, with respect to various aspects of my project. Working at JAX Genomic Medicine gives me access to a rich network of experts that, together with the incredible scientific services that JAX has, synergize for a unique environment for a trainee to thrive.

MICHELLE SPOTO
Predoctoral Associate

When I was looking for a lab to do my thesis work, I had a couple of things in mind. First, I wanted to join a lab that was doing exciting work in my field of interest, bacterial genetics. Second, I wanted a supportive mentor that would allow me to work more independently as I progressed through my thesis project. I found both of those things in Dr. Julia Oh's lab. From the start, everyone was great about making me feel welcome and I knew that this was a place that would be really supportive during my graduate school education. Almost three years later, I still feel the same way. It's been a great place to work and I've learned so much from my colleagues.

SARAH WOJISKI, PH.D.
Director, Education & External Programs

Working at JAX seemed like the perfect opportunity to continue to pursue my passion for science education while being surrounded by scientists who are making breakthroughs that will directly impact those suffering from disease. I find JAX Genomic Medicine to be a highly collaborative environment. People work together to accomplish great things. What impressed me about JAX is that it is an institution doing cutting-edge genetics and genomics research that also places a very high value on, and devotes considerable resources to, educating the next generation of scientists.

JACOB DAYTON
Summer Student Program, Class of 2018

My first impressions of JAX can be summed up in two words: genomics and community. It is truly unique in the way that it brings together a diverse group of researchers, from various fields and backgrounds, whose scientific approach is grounded in a genomics-based perspective. As a summer student, JAX provided an incredible community to learn and challenge yourself through contributing to your PI's research, participating in journal clubs and laboratory meetings, and attending guest lectures and workshops.


TRAINING &
EDUCATION

DAVE MELLERT, PH.D., P.M.P.
Manager, IT Applications,
Information Technology

Since I have been at JAX, it has grown and matured from a handful of labs to a diverse and complementary team that is a real force for discovery. If you are motivated and excited about something that has value to the JAX community, leadership is very supportive — I mentioned how cool it would be to do a podcast, and a few weeks later it was happening.

ANNA LISA LUCIDO, PH.D., P.M.P.
Director of Research Program Development

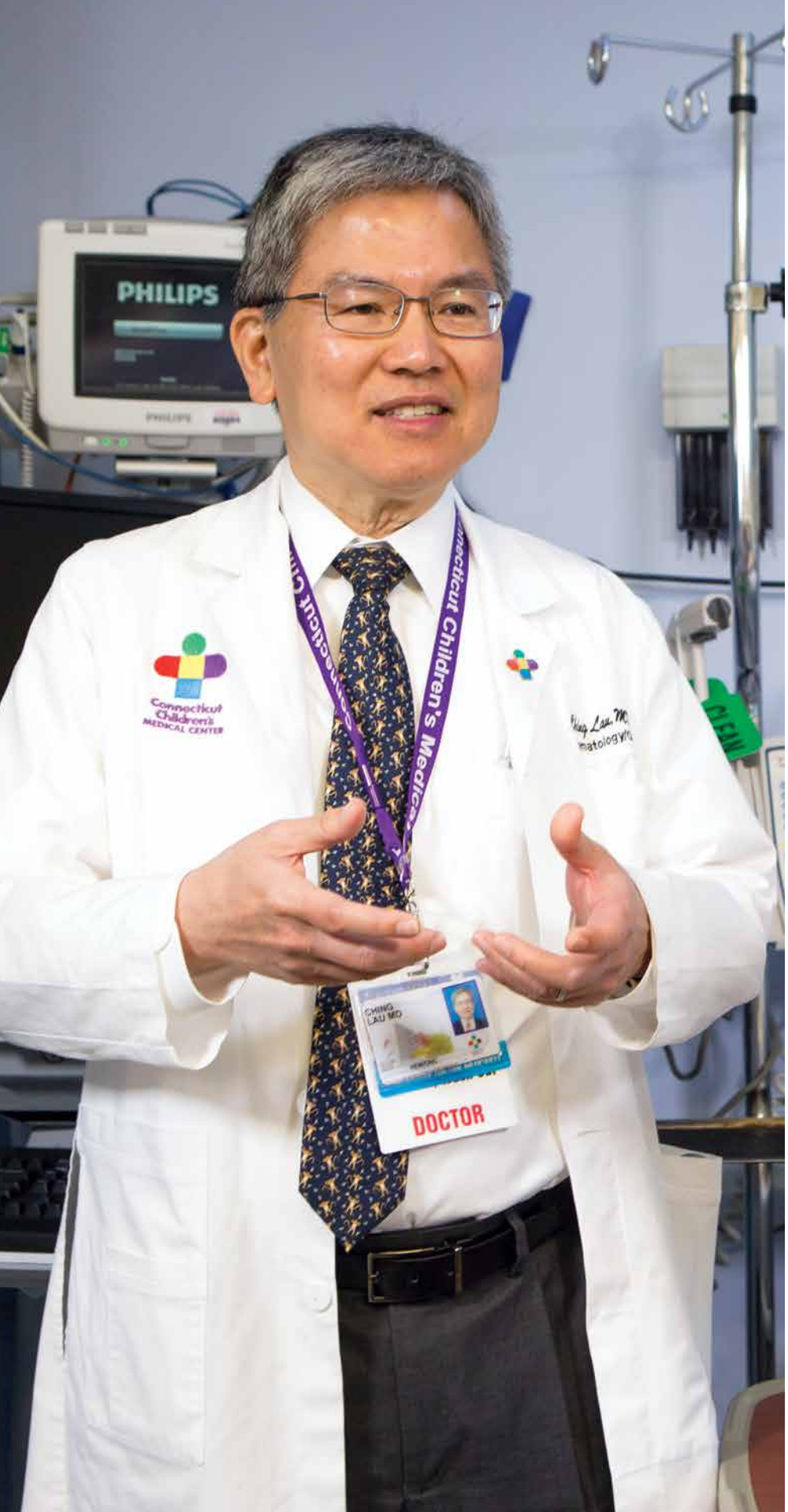
I can think of no other organization that combines research with the range of educational offerings and experimental and informatics resources that JAX does. The scientific community knows who we are now, and it has been incredibly gratifying to watch that evolution, knowing I was a part of it.

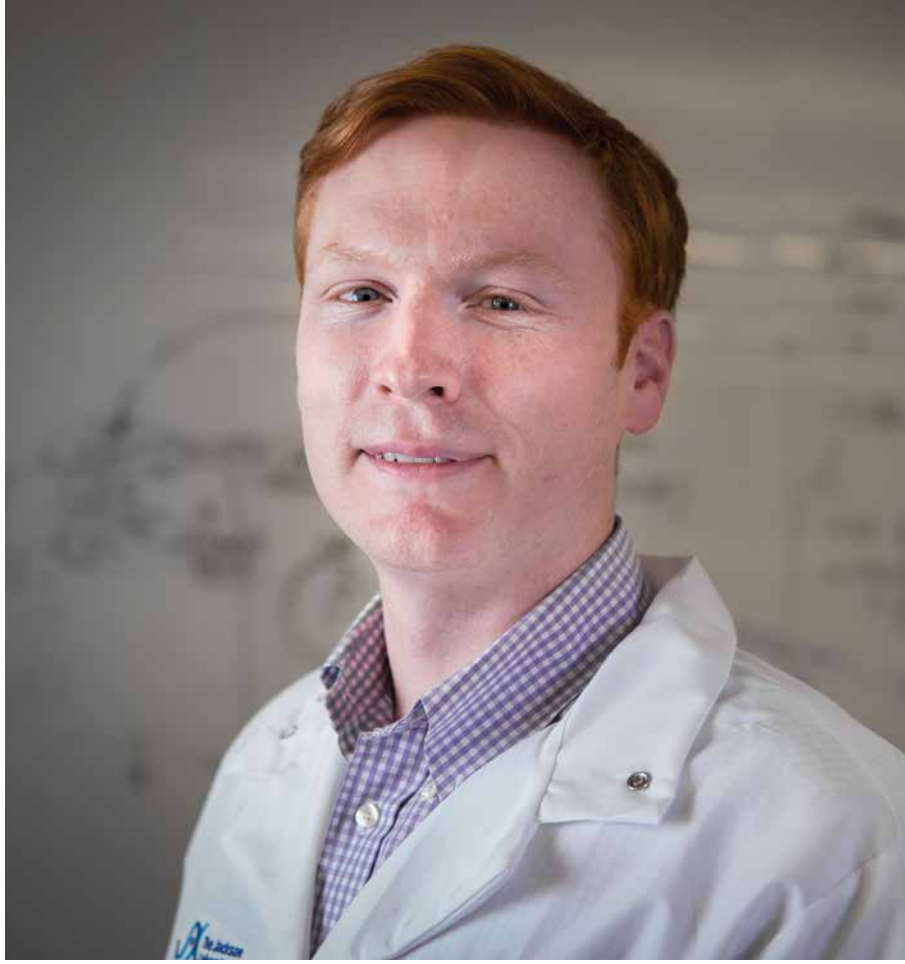
CLINICIAN SCIENTISTS

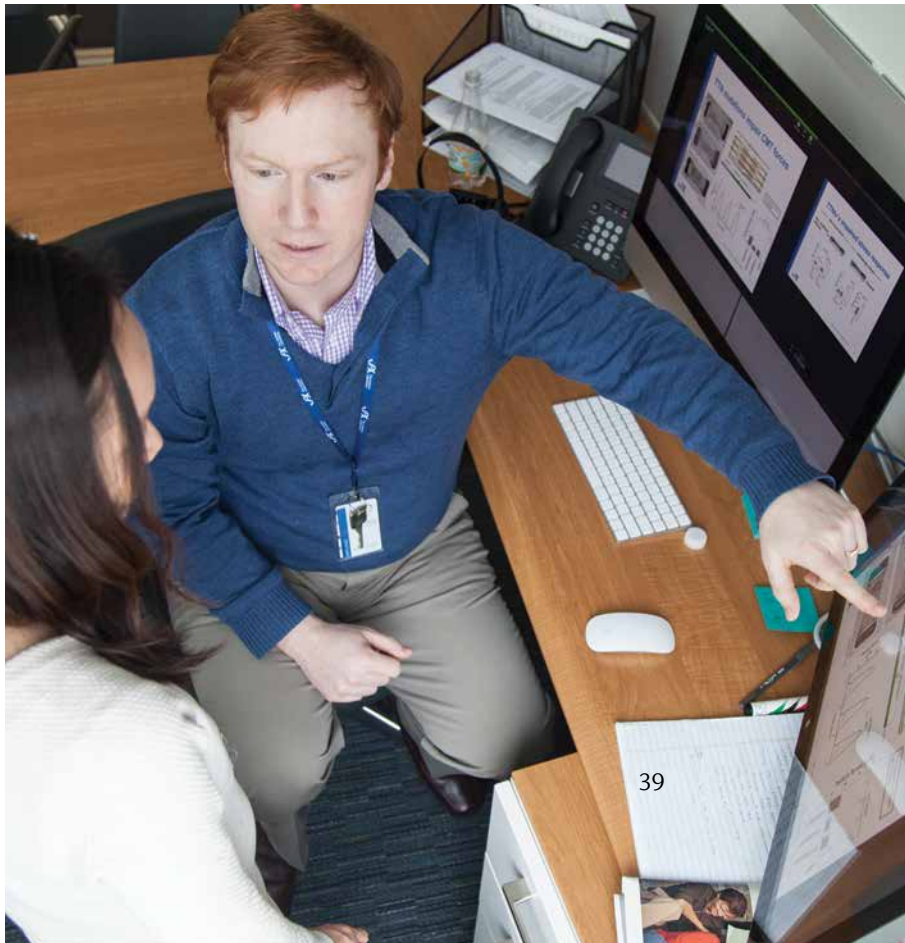
Clinician scientists help bridge the gap between research and medical intervention and allow JAX Genomic Medicine to bring true translation to its work, targeting diagnostics and actionable therapeutics to better human health and reduce disease.

Our pioneering clinician scientists include Dr. Ching Lau, professor at JAX and the medical director of Hematology-Oncology at Connecticut Children's Medical Center, who studies brain and bone tumors in children. Using genomic technologies and mouse modeling, including patient-derived xenografts, the Lau Lab is discovering and validating novel biomarkers and therapeutic targets for pediatric cancers.

Dr. Travis Hinson is an assistant professor at JAX, as well as an assistant professor in cardiology and genetics at the Pat and Jim Calhoun Cardiology Center of UConn Health. He utilizes genomic approaches, like CRISPR/Cas, to interrogate mechanisms of inherited cardiovascular disorders that lead to heart failure.


PHILIPS
Connecticut Children's Medical Center
DOCTOR





JAX provides opportunities and resources to conduct and participate in impactful research.

There are world-class experts in the wet labs and dry labs as well as clinicians that you can brainstorm and collaborate on research projects with.

– Javad Noorbakhsh, Ph.D.

JAX ENVIRONMENT

Watching JAX Genomic Medicine grow, quite literally, from the ground up, has been tremendously exciting and rewarding. As one of the first employees in Farmington, I've been able to watch, and be an integral part of, JAX Genomic Medicine's growth. I often tell friends and family how lucky I am to work for an organization that celebrates diversity, and transcends politics, cultures, language and lifestyles to accomplish the common goal of finding cures and saving lives. In the years that I've worked at JAX, I've seen a lot of change, and am proud to be able to say that I was there when it started.

– Julie Francis, Research Administrative Assistant


JAX Healthcare Forum
WELCOME


TOGETHER
WE CAN END
ALZHEIMER'S
alzheimer's association
The Jackson Laboratory
hope

GROWING OUR COMMUNITY

Since opening, The Jackson Laboratory for Genomic Medicine has hosted numerous events, welcoming hundreds of learners of all ages through its doors. From open houses targeted at high school students, to public tours, to the JAX Healthcare Forum, JAX has proudly served as a nucleus for scientific learning in the greater Hartford, Connecticut area.

The bright and welcoming lobby, futuristic auditorium and Helix Cafe make up the central hub of the building, allowing visitors to network, collaborate and learn in inspiring surroundings.

PHILANTHROPIC IMPACT

Philanthropy has helped JAX launch new creative research projects, support outstanding scientists and further its impact in Connecticut and beyond. A 2016 gift from the Petit Family Foundation of Plainville, Connecticut provided a new initiative for promising young women pursuing careers in STEM education through JAX Genomic Education programs. The following year, a $500,000 gift by an anonymous Connecticut donor launched JAX's Tallwood Cancer Canine Research Initiative, focused on finding new cures through studying canine cancers.


PETIT Family
June 20, 2016
PAY TO THE ORDER OF
The Jackson Laboratory
$248,000
Two hundred and forty-eight thousand
DOLLARS
MEMO
The Petit Family Foundation Women in Genomics Initiative
The Jackson Laboratory

ENDOWED CHAIRS

Roux Family Center for Genomics and Computational Biology

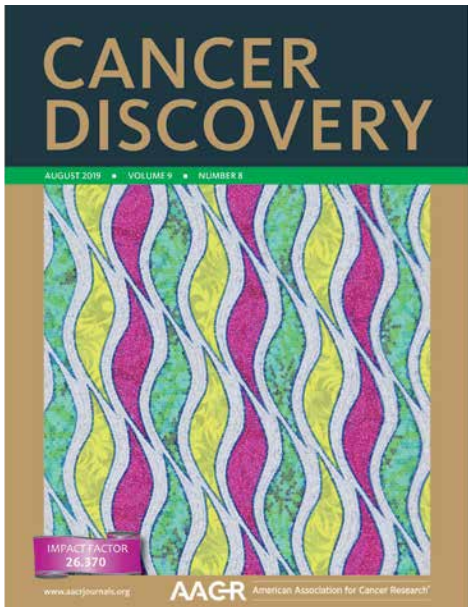
In addition to providing an important source of permanent funding for research, named and endowed faculty positions enable JAX to recruit, retain and support the best scientists in the world. Just weeks after the grand opening of the Farmington facility, technology investor (and current chairman of the Laboratory's Board of Trustees) David Roux and his wife Barbara gave $5 million to JAX for genomic medicine research. Their donation triggered a matching gift in their honor by JAX for a total gift of $10 million, and endowed three faculty chairs at the Laboratory. Two of those endowed chairs are held by JAX Genomic Medicine faculty. Professor Peter Robinson, M.D., MSc., holds the Donald A. Roux Chair of Genomics and Computational Biology, while Professor and Director of Genome Sciences Yijun Ruan, Ph.D., holds the Florine Deschenes Roux Chair.

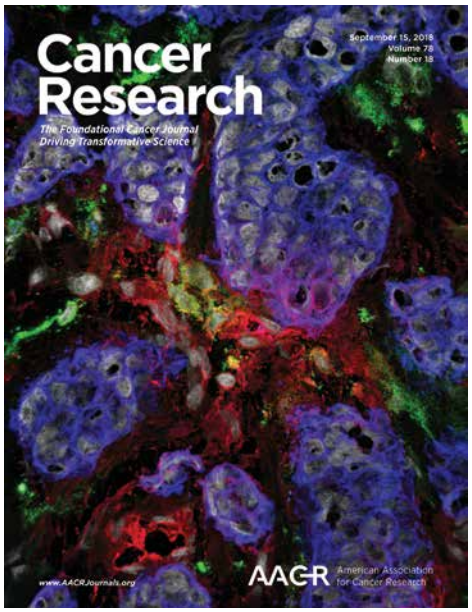
The Evnin Family Chairs

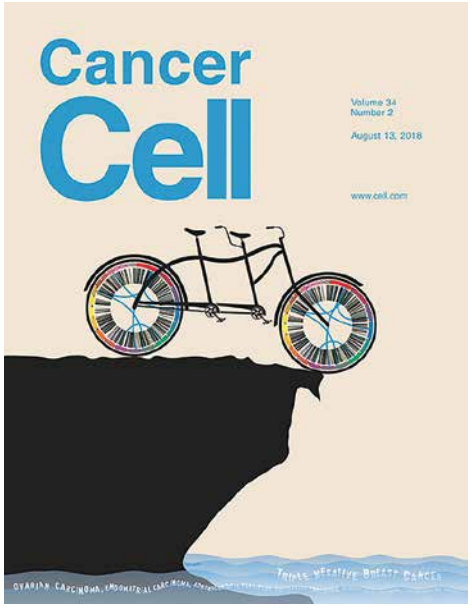
Gifts made in 2015 and 2017 by Judith and Anthony Evnin, Ph.D., established the Evnin Family Chairs, one of which is held by Professor George Weinstock, Ph.D., one of the world's leading experts in the microbiome — a new area of research for the Laboratory at the time.

"The Jackson Laboratory for Genomic Medicine was a once-in-a-lifetime opportunity to build research programs from scratch with excellent resources and the legendary JAX environment. It has been an exciting period to use world-class mouse models to study the role of the microbiota in aging and conditions such as Parkinson's disease, metabolic diseases, addiction, cancer, autoimmune disease and many more."

– George Weinstock, Ph.D., Professor and Director of Microbial Genomics







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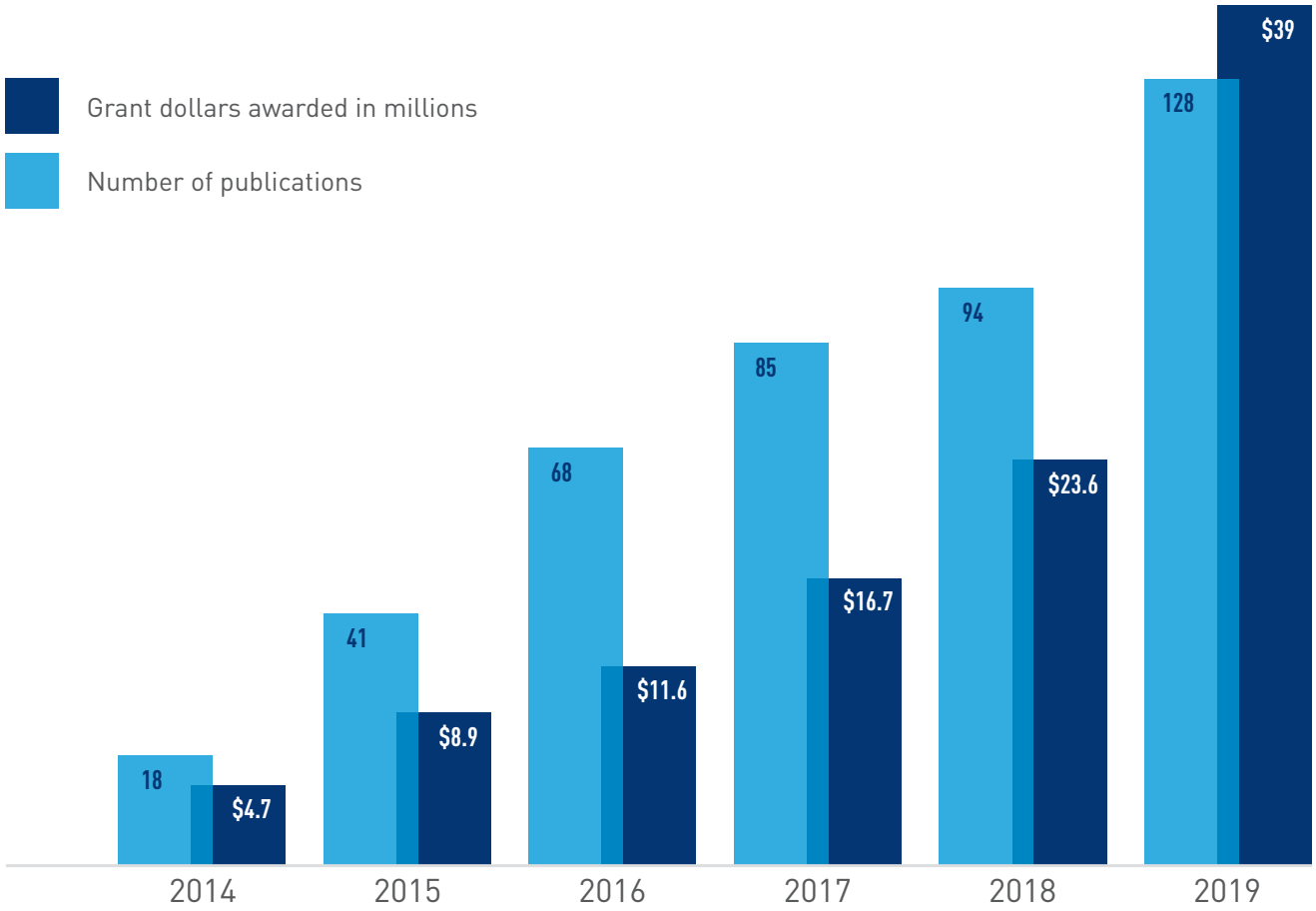
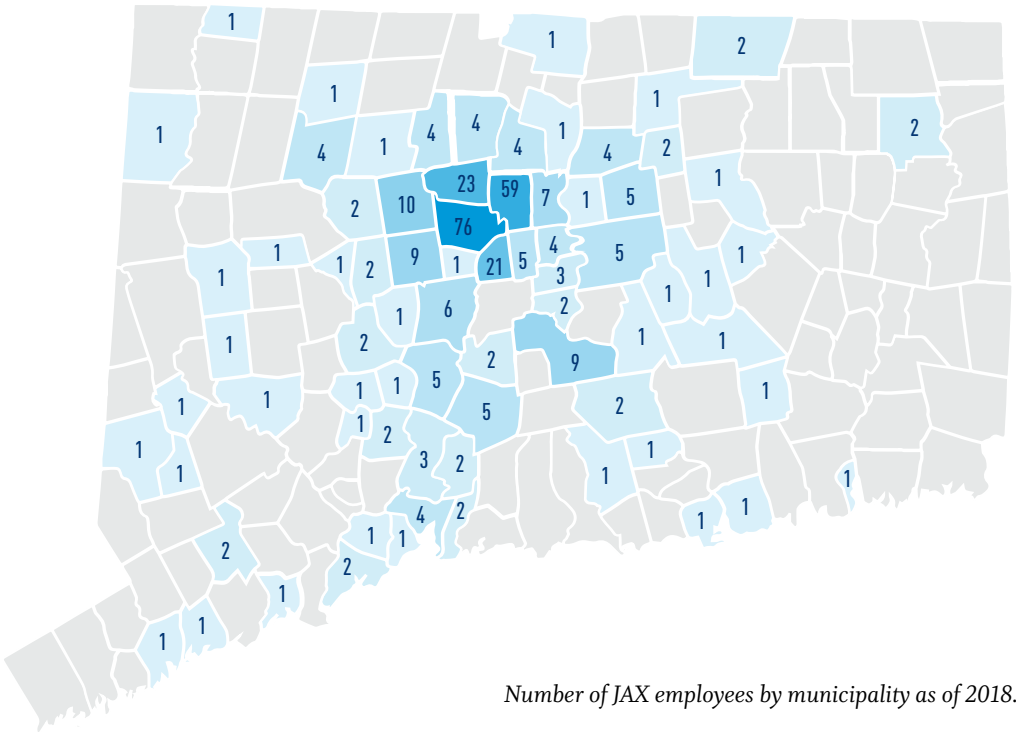


RESEARCH IMPACT

In a short amount of time, the research portfolio and impact on the scientific community has grown exponentially. Researchers from The Jackson Laboratory for Genomic Medicine continue to strive for high-impact publications and have already been featured in many top scientific journals. Papers have been featured on the cover of prominent journals from (clockwise from top left, previous page) the Robson Lab, the Palucka and Banchereau Labs, the Liu Lab and the Weinstock Lab. JAX scientists have also created a network of collaborations focused on transforming human health through genomics.



Number of JAX employees by municipality as of 2018.

JAX ECONOMIC AND COMMUNITY IMPACT

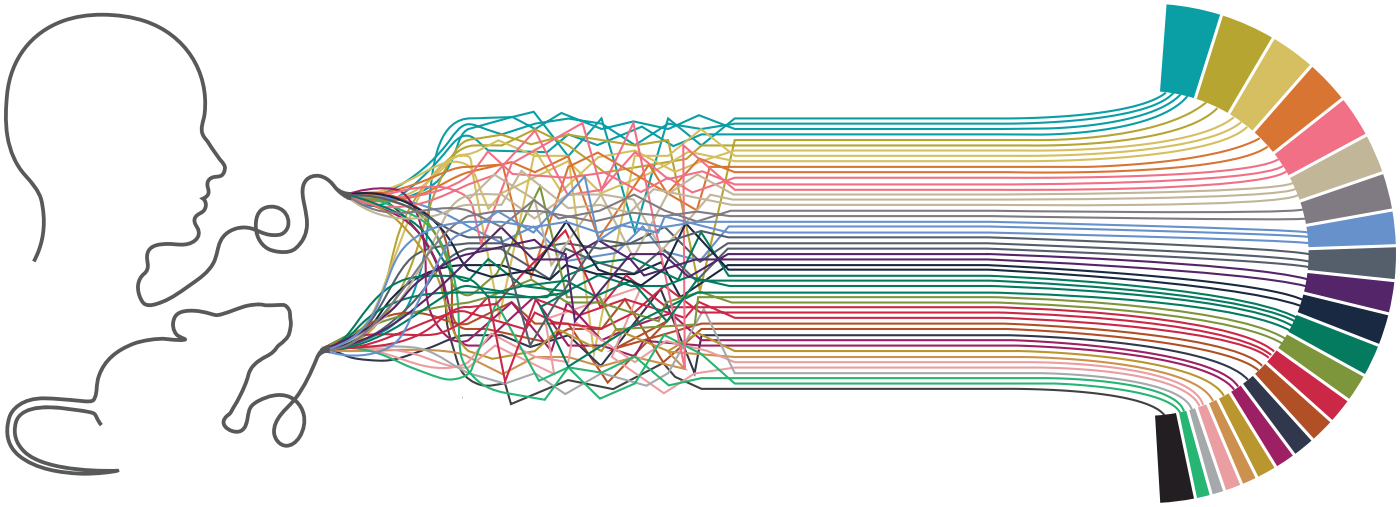
As a complex and rapidly growing enterprise, The Jackson Laboratory has far-reaching economic, fiscal and community impacts across the state of Connecticut. Since its inception, JAX Genomic Medicine has provided support to Connecticut in the form of research collaborations, community outreach, education programs, jobs and economic development.

In 2018, JAX contributed an estimated $187 million to the state's economy — a 31% increase over the 2014 estimated contribution of $143 million. JAX employees now reside in 75 different communities, and JAX has established relationships with 565 businesses located in 124 municipalities across the state. Through educational and volunteer activities, JAX employees engage with students, teachers, fellow academics, and business and community leaders. JAX is a critical player in the state's bioscience sector and is a nexus for innovation and entrepreneurial activity. In addition to spearheading collaborations with UConn Health, Hartford Hospital and Connecticut Children's Medical Center, JAX instituted and hosts the annual JAX Healthcare Forum, where high-level executives, researchers and industry leaders hear from and engage with nationally recognized healthcare and biotech innovators.


JAXTAPOSITION


Classroom Codes:
Chemistry: rtzwd90 yrnycl9
Biology: 8lolat ou1229
@hartfordschools.org
GOOGLE CLA
Chemistry
Biology
Objectives:
Biology:
Chemistry:
Homework


Laboratory



THE FUTURE

It is an exciting time in biomedical research, but there is still so much to learn.

JAX research as a whole is embracing and studying the complexities of humankind's most serious diseases — those that remain difficult or impossible to prevent or cure. Using human data to work more specifically and effectively with mouse and cellular models — and bringing those findings back to humans — represents a break from the traditional "bench-to-bedside" way of thinking. Instead, it's a loop of increasing knowledge about our genomics, our biology and our diseases.

The implications are profound. Imagine if we could fine-tune cancer vaccines based on our immune systems to effectively prevent many cancers, find a biomarker for ME/CFS that leads to accurate diagnoses and effective therapies, or discover the genetic mechanisms of susceptibility to diabetes, allowing doctors to prevent their high-risk patients from progressing to disease.

The goals are ambitious, but at The Jackson Laboratory for Genomic Medicine we have an unprecedented opportunity to achieve them. It is our mission for now and for the years to come.


The Jackson
The Jackson Laboratory

ACKOWLEDGEMENTS

We would like to thank the current growing JAX Genomic Medicine community in addition to those who helped in the creation of this book:

Mark Adams
LuAnn Ballesteros
Ali Borgert
Amy Carlough
Shelley Chappell
Henry Chung
Mike Hyde
Caitlin Iorillo
Carol Lamb
Yu-Hui Rogers

JAX Strategic Communications

This book is printed on 100# Creator Silk Cover (FSC) and 100# Creator Silk Text (FSC Mixed) by J.S. McCarthy Printers in Augusta, Maine.


The Jackson Laboratory
Leading the search for tomorrow's cures