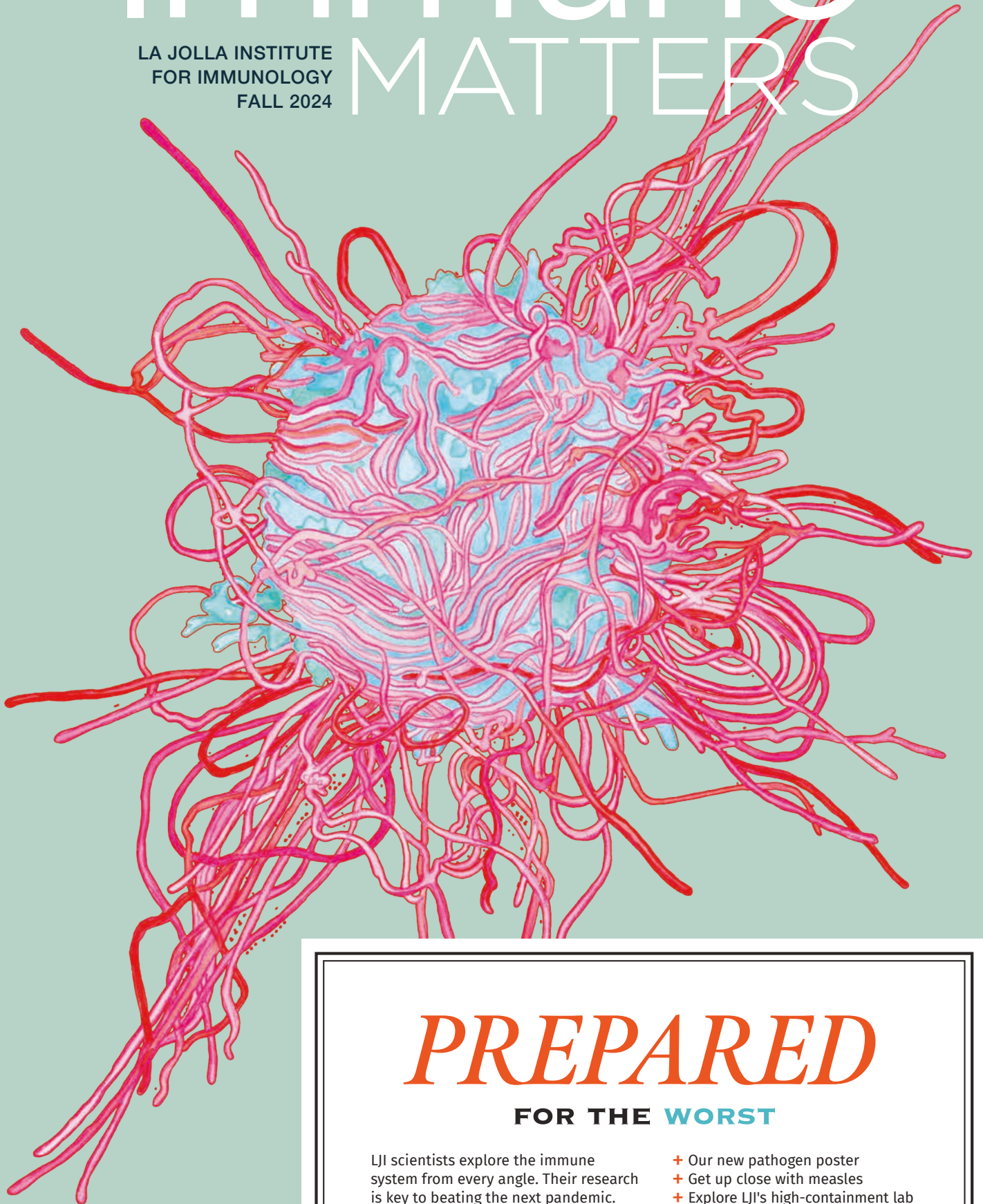


Immune MATTERS

LA JOLLA INSTITUTE
FOR IMMUNOLOGY
FALL 2024

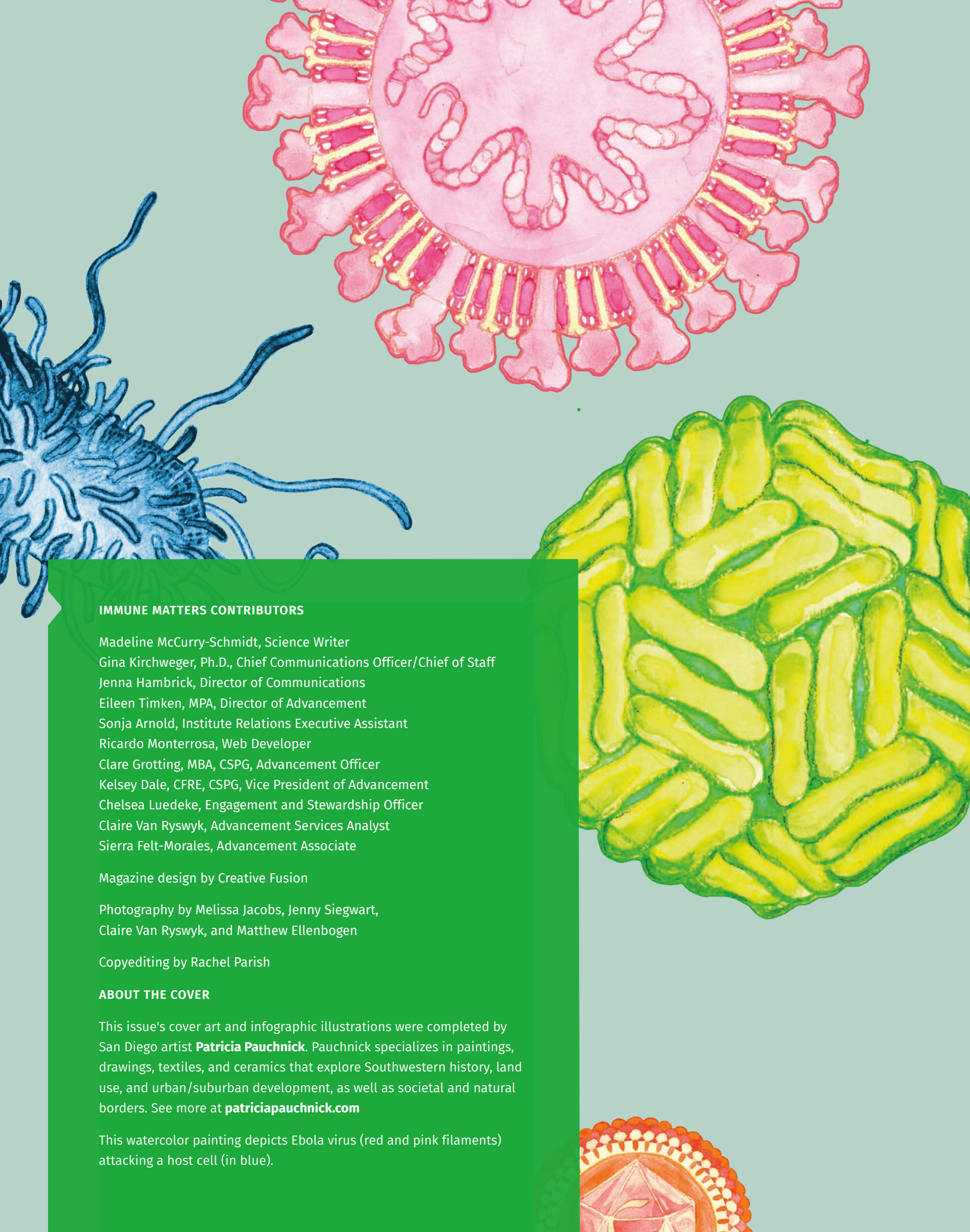


PREPARED

FOR THE WORST

LJI scientists explore the immune system from every angle. Their research is key to beating the next pandemic.

- + Our new pathogen poster
- + Get up close with measles
- + Explore LJI's high-containment lab



Immune MATTERS

LA JOLLA INSTITUTE FOR IMMUNOLOGY
FALL 2024

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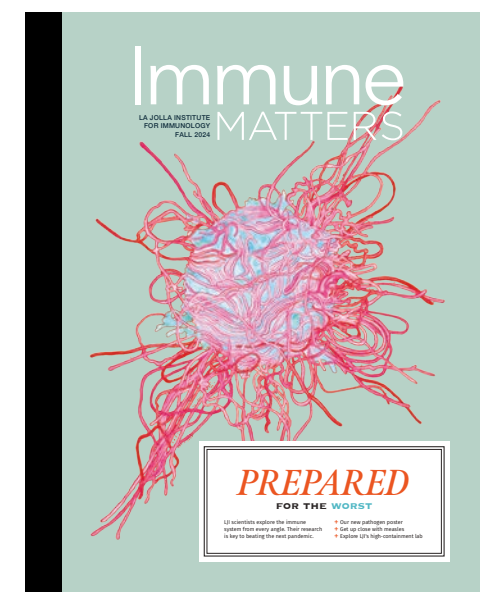
Copyediting by Rachel Parish

ABOUT THE COVER

This issue's cover art and infographic illustrations were completed by San Diego artist **Patricia Pauchnick**. Pauchnick specializes in paintings, drawings, textiles, and ceramics that explore Southwestern history, land use, and urban/suburban development, as well as societal and natural borders. See more at patriciapauchnick.com

This watercolor painting depicts Ebola virus (red and pink filaments) attacking a host cell (in blue).

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Our issue is all about pandemic preparedness. Explore our new pathogen poster to learn about fascinating microbes—and LJI's mission to advance global health

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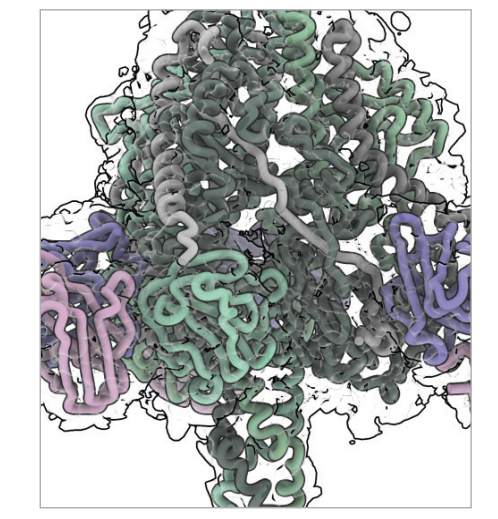
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OUR MISSION

The Institute will engage in a world-class biomedical research program with a focus on the immune system. It will conduct, share, and partner such that the results of its discovery program will make outsized contributions to the betterment of human health.

STAY UPDATED! If you would like to receive email updates from La Jolla Institute, please subscribe at lji.org/signup or contact us at communications@lji.org or (858) 752-6645.





LJI's Leadership

IN THE GLOBAL COMMUNITY

First and foremost, I am incredibly honored to take on the role of Chair of La Jolla Institute for Immunology (LJI)'s Board of Directors. I have big shoes to fill following the outstanding and impactful leadership of Gail K. Naughton, Ph.D., MBA. I am also excited to be working with such a dedicated and resourceful Board. During my career as a scientist and an entrepreneur, I've met many people who want to find solutions to the world's problems. But few have taken on bigger challenges than the LJI scientists. Under the exceptional leadership of LJI Professor, President & CEO Erica Ollmann Saphire, Ph.D., MBA, they are working relentlessly to bring us closer to *Life Without Disease*.

Since joining LJI's Board in 2017, I've found that this Institute punches way above its weight in so many areas. For example, after the COVID-19 pandemic hit, I was blown away by the Institute's ability to deploy immense scientific resources to forcefully address this global health crisis. It was all hands on deck at LJI to really understand how the virus attacks the body, and the Institute contributed enormously to the world's understanding of the interactions between the virus and the immune system. I found it fascinating that a small group of researchers could accomplish so much in such a short period of time. LJI's mission of having a global impact truly resonates with me.

This issue of *Immune Matters* perfectly illustrates this point as it focuses on the importance of better understanding the immune response to pathogens in a global effort to thwart the next pandemic. LJI scientists understand that the next pandemic is not an issue of "if"; it's an issue of "when." Climate change is forcing many people to migrate to new places and accelerating the movement of animals that carry disease, including mosquitoes. As a result, many mosquito-borne diseases, such as

dengue, are at historically high levels. Between 2000 and 2019, we saw a 10-fold increase in cases of dengue fever, with the World Health Organization reporting a leap from 500,000 to 5.2 million cases. At the same time, we're witnessing the thawing of the permafrost in the Arctic, which means we may soon find ourselves facing unfamiliar pathogens, such as fungi, novel bacteria, and other threats. Therefore, pandemic preparedness should remain top of mind globally. LJI scientists are well-positioned to help stop disease in our changing world. Indeed, their vast knowledge-base of the intricacies of how the immune system works should inform vaccine development brilliantly.

This Institute also tackles important issues beyond pandemic preparedness. One top initiative that I deeply care about is LJI's efforts to understand sex-based differences in immune responses. This work can help us understand why men and women show different symptoms of disease and respond differently to drug therapies. Studying these differences will allow scientists to develop more tailored vaccines and treatments for autoimmune diseases, infectious diseases, cancers, and more.

The science done at LJI has a huge impact, not only on global health but also on our society. LJI scientists are finding solutions and demonstrating how we can all live in a safer world. I am incredibly proud and excited to support LJI's mission.

Sincerely,

François Ferré, Ph.D.

Chair of The Board of Directors
La Jolla Institute for Immunology

Protecting

THE GLOBE

LJI Professor, President & CEO Erica Ollmann Saphire, Ph.D., MBA, discusses the Institute's leadership in pandemic preparedness research.

What scientific mysteries do we need to solve as we prepare for future pandemics?

Dr. Saphire: No one knows what virus will cause the next pandemic, but we do know that the human immune system will be called upon to respond.

Understanding how to draw out the most effective, long-lasting, and broad immune responses is the most important approach humanity can take.

In LJI's Center for Vaccine Innovation, our scientists have come together to reveal how immune "memory" is created, and how the different components of the immune system (innate and adaptive, B cells and T cells, etc.) amplify and shape each other. This research will help us understand how to keep immune responses balanced and protective, rather than overly inflammatory and pathogenic.

Where does LJI stand on pandemic preparedness right now?

A: LJI is leading the world community in revealing the vulnerabilities of the viruses themselves and in engineering the immune protection we need. Our own LJI Professor, Sujan Shresta, Ph.D., made the pioneering discovery that explained why sequential infection with the mosquito-borne dengue virus is more severe, and how dengue virus vaccines that are in development right now should be reshaped. Young scientists in my lab have illuminated key immune targets on the surface of rabies, measles, Ebola, Lassa, and other viruses for the first time. We're now crafting thermostable vaccine components that can be transported at room temperature to anywhere in the world.

Further, LJI is the best in the world at immune bioinformatics, and our top-notch computational experts, such as LJI Professor Bjoern Peters, Ph.D.; LJI Professor Alessandro Sette, Dr.Biol.Sci.; and LJI Bodman Family Assistant Professor Tal Einav, Ph.D., have constructed analysis tools that guide scientists around the world in vaccine development.

LJI Professor and Chief Scientific Officer Shane Crotty, Ph.D., the world's expert in how B cells are trained to battle with pathogens, is finding new ways to stimulate protective immune responses against viruses that have stubbornly evaded successful vaccine development for decades, and our newest LJI Assistant Professor, Daniela Weiskopf, Ph.D., was recently named by the journal *Nature* as one of the world's top four "rising stars" to watch.

What role does LJI play in the global health community?

A: Dr. Shresta's work with international partners serves as the perfect example of how to establish fair partnerships and train young researchers on both sides. Across the Institute, we aim to establish fair partnerships with researchers in low- and middle-income countries where there is a high burden of globally relevant infectious diseases. We have important connections with researchers in countries such as Sierra Leone, Nigeria, Nepal, Thailand, Vietnam, Indonesia, and Malaysia and have launched new collaborations with scientists in Mexico and across Latin America.

LJI's international partnerships are critical for pandemic preparedness. There is sharing of real-time information, samples, and know-how back and forth, and we have welcomed researchers from dozens of countries to complete their education and immunology training in our laboratories.

International collaboration also shines a light on how emerging diseases may spread in our own country. Dengue, which is not endemic to the United States, has now been reported in North Carolina, South Carolina, Georgia, and Florida, and other mosquito-borne viruses like Zika virus are also emerging.

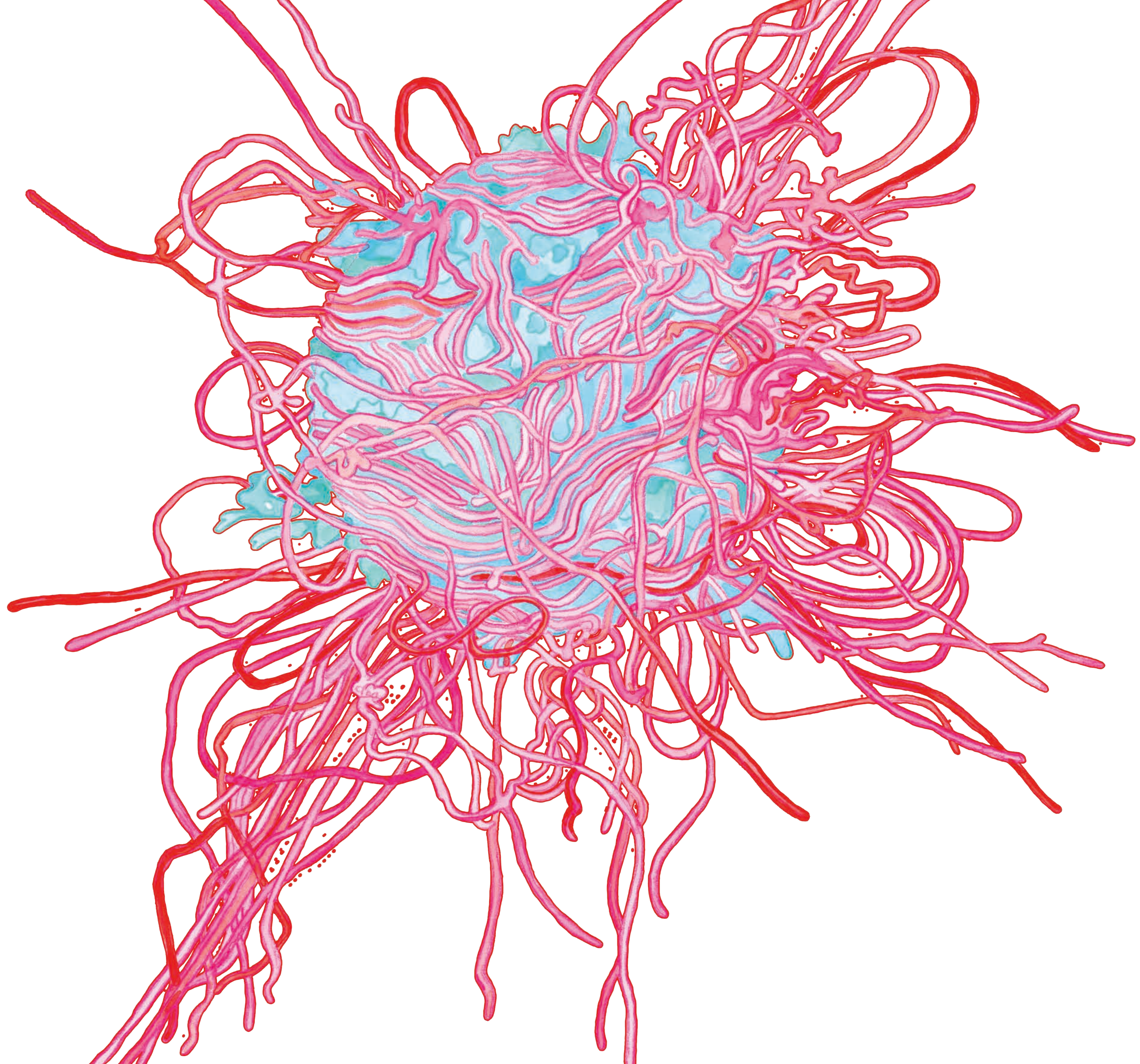
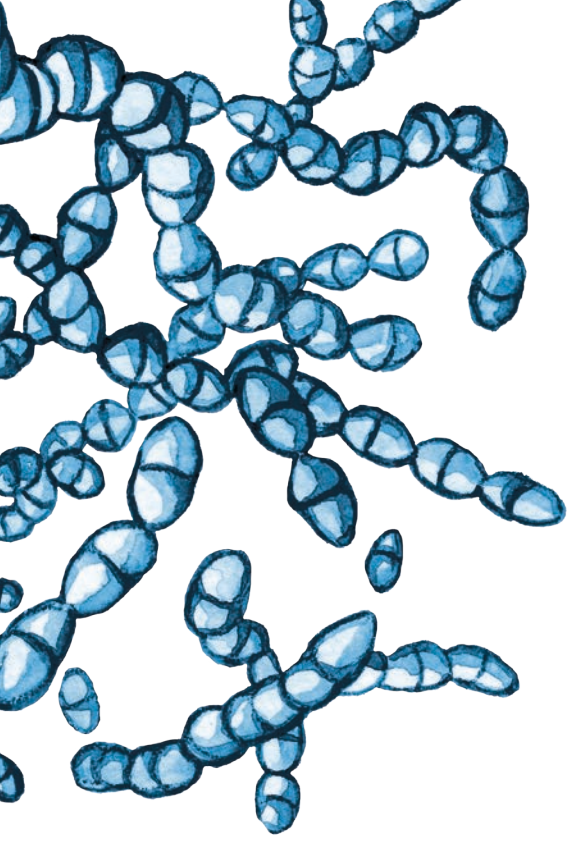
LJI laboratories are racing to stop the spread of these diseases in the United States and help save lives across the globe. For example, while others are developing single-virus vaccines, LJI is developing a dengue-Zika combination vaccine.

Is there an area of infectious disease research you find especially exciting right now?

A: I'm tremendously inspired by LJI's powerful armamentarium of core instrumentation that lets us see and understand so much more than was possible even three years ago. This is aimed at viruses that cause pandemics globally, as well as the multiple viruses that cause cancer right here at home.

We can now explain why people with underlying conditions suffer more severely, and how we can keep them safe. We can now explain why some viruses stubbornly evade vaccine attempts. We now have the ability to directly image things that used to be beyond any microscope and to combine that information with our other faculty expertise to steer immune responses. Using our human patient cohorts in San Diego and around the world, and these next-generation vaccine materials, we are achieving levels of protection never seen before, and a breadth of protection never attempted. ♦





GOING IN

The Infectious Disease Exploration and Abatement (IDEA) Facility at La Jolla Institute for Immunology (LJI) is where scientists come face-to-face with pathogens.

The IDEA Facility is one of the few places in San Diego with a “Biosafety Level 3” (BSL-3) distinction. This high-containment lab was specially designed to ensure safety for scientists while handling pathogens.

The IDEA Facility is also a piece of engineering genius. It was constructed at the height of the COVID-19 pandemic and is key to understanding how to stop emerging diseases.

What does it take to work in the IDEA Facility? Scan QR to watch a behind-the-scenes video.



HOW IT BEGAN

LJI Chief Operating Officer John Keegan works to make sure LJI scientists are ready for anything. He joined the Institute in 2005, just as construction was ramping up on the current LJI building. “The architects had originally planned for a BSL-3 facility in the building,” says Keegan. “It was there when we moved in, but it wasn’t used.”

Then in 2019, Keegan was approached by LJI scientists looking to conduct virology research that required a BSL-3. Keegan knew LJI had a potential space for a BSL-3 facility—he just needed to get it up and running. “It wasn’t going to be a simple process,” says Keegan.

Keegan’s team would need to remodel the space to install multiple layers of biosafety measures, and they would need to bring in experts to train and monitor the scientists working in the new BSL-3 facility.

No one at LJI had that kind of experience, so Keegan volunteered to become a BSL-3 facility expert himself. He enrolled in the UC Irvine School of Medicine National Biosafety Level 3 Training Program, an intensive in-person course that includes hands-on training in a model BSL-3 laboratory.

Then the COVID-19 pandemic hit. Keegan’s team was suddenly in a race against a global killer.

HOW IT WORKS

BSL-3 construction standards are incredibly strict. Not a single viral particle should ever leave the IDEA Facility.

At the core of the IDEA Facility are four isolated laboratory spaces. This is where scientists (decked out in astronaut-like PPE suits with respirators) work with pathogens. Scientists pass through four locked areas before they get to these high-security spaces.

SARS-CoV-2 is an airborne virus, so controlling air flow is key. The facility has “cascading” air flow systems that direct the air from the outside corridor toward the anteroom, and then farther, toward the secured laboratory spaces. Each laboratory space has a special experimental space, or “biosafety cabinet,” where researchers can safely work with infectious agents.

LJI’s Facilities, Operations, and Environmental Health and Safety teams worked around the clock to construct the safest facility possible. Despite the rapid timeline, Keegan took every opportunity to make sure LJI’s BSL-3 facility went beyond required safety measures.

Need two layers of self-closing doors? The IDEA Facility has three. Need an isolation valve to control air flow? The IDEA Facility has two types of valves for a lightning-fast, 100-percent seal.

These choices paid off when the time came for LJI to bring in a third-party group to test the IDEA Facility and “commission” it for use. The facility passed the tests with flying colors.

HOW LJI STAYS PREPARED

Since the IDEA Facility opened in 2021, LJI has built up a small team of BSL-3 experts. This team plays an important role in helping LJI lead the way in pandemic preparedness.

LJI Biosafety Officer Laurence Cagnon, Ph.D., is in charge of training researchers to use the facility and monitoring their safety. “I help scientists find ways to do their work in the BSL-3—and do it safely,” says Dr. Cagnon.

Thanks to Dr. Cagnon and her colleagues, LJI scientists can now stay safe while investigating a broad range of pathogens—such as SARS-CoV-2 and chikungunya virus. LJI scientists can use the IDEA Facility to study how immune cells fight these pathogens and even test experimental vaccine strategies in mouse models.

Keegan is proud of what this team has accomplished. “We have passed every single certification test the first day, every single time we’ve done it,” Keegan says. “I consider that the mark of unbelievable teamwork.”

The IDEA Facility was launched with the generous support of the Arvin Gottlieb Charitable Foundation, the GHR Foundation, The Mark and Katie Bowles Family Foundation, the London Stock Exchange Group Foundation, Harold Clark Nathan/The Harold Nathan Charitable Fund at Vanguard Charitable, and Neal Alison Roberts. ♦



LJI BIOSAFETY OFFICER LAURENCE CAGNON, PH.D., DEMONSTRATES HOW SCIENTISTS “SUIT UP” TO ENTER THE IDEA FACILITY



How Prebys Foundation helps LJI fight disease

Prebys Foundation knows La Jolla Institute for Immunology (LJI) has a part to play in pandemic preparedness. In just the last four years, Prebys Foundation has given nearly \$4 million to support LJI researchers and expand LJI's mentorship and training programs for young scientists.



PREBYS FOUNDATION CEO
GRANT OLIPHANT

“What really stands out at LJI is the caliber of the researchers there,” says Prebys Foundation CEO Grant Oliphant. “The Institute has extremely talented people who are doing seminal work in the field.”

Earlier this year, Prebys Foundation granted two-year, \$500,000 Prebys Research Heroes Awards to three LJI faculty members, all of whom belong to the LJI Center for Vaccine Innovation: LJI Professor, President & CEO Erica Ollmann Saphire, Ph.D., MBA; LJI Associate Professor Sonia Sharma, Ph.D.; and LJI Professor Sujan Shresta, Ph.D.

The Prebys Research Heroes program celebrates female scientists pursuing “high-risk, high-reward” research projects. The program is a partnership between Prebys Foundation and the Science Philanthropy Alliance.

As Oliphant explains, supporting scientists from underrepresented groups is an important part of pandemic preparedness—and research overall. “When you broaden the perspectives of the people in the lab, you get better science,” says Oliphant. “At its core, we believe the Research Heroes program will produce better science and better medicine for everyone.”

Building a more inclusive and diverse research workforce is also a priority for LJI leadership.

Dr. Saphire put part of her Prebys Research Heroes funding toward building an Inclusion and Mentorship Program, which includes the expansion of a paid summer internship that connects LJI scientists with high school and university students from underrepresented backgrounds.

Dr. Sharma is using the funds to advance new research into sex-based differences in how people respond to disease and to shed light on the workings of the innate immune system.



LEFT TO RIGHT: PREBYS FOUNDATION VICE PRESIDENT OF PROGRAMS CHRIS SICHEL; PREBYS FOUNDATION DIRECTOR OF COMMUNICATIONS CRYSTAL PAGE, MFA; LJI ASSOCIATE PROFESSOR SONIA SHARMA, PH.D.; LJI PROFESSOR, PRESIDENT & CEO ERICA OLLMANN SAPHIRE, PH.D., MBA; LJI PROFESSOR SUJAN SHRESTA, PH.D.; PREBYS FOUNDATION VICE PRESIDENT OF PROGRAMS EMILY YOUNG, PH.D.; AND PREBYS FOUNDATION COMMUNICATIONS COORDINATOR TESS KARESKY

Meanwhile, Dr. Shresta is using the Prebys Research Heroes funding to explore how neurotropic flaviviruses, such as Zika and Powassan, may trigger dementia.

All three scientists also lead research as members of LJI's Center for Sex-Based Differences in the Immune System, directed by Dr. Sharma.

Oliphant says it is essential for scientists to investigate how factors like sex affect disease outcomes. Prebys Foundation has given additional funding to help scientists accelerate this research, including a grant of more than \$1.16 million in 2022 toward the purchase of advanced equipment in LJI's Flow Cytometry Core.

“The Institute is doing extraordinary work in terms of sex-specific research challenges and the manifestations of disease and illness as it relates to sex—that work

could be hugely influential for the field globally,” says Oliphant.

More recently, Prebys Foundation awarded a \$300,000 Prebys Foundation Youth Workforce grant for LJI Assistant Professor Miguel Reina-Campos, Ph.D., to recruit undergraduate and graduate students to conduct independent research in the Reina Lab and receive important scientific training. This grant also fulfills another Prebys Foundation commitment: to support youth outreach and development in San Diego.

Outside of the research world, Prebys Foundation grants funding to youth programs, the arts, and public health efforts across San Diego County. “We think that, together, these initiatives make up the elements of a healthy, well community,” says Oliphant. “And we're really proud of what we see happening here.” ♦

ON THE

Front Line

Coronavirus expert Dr. Sydney Ramirez spent the peak of the pandemic visiting patients' bedsides. Her research breakthroughs may help us fight future outbreaks.

As a physician-scientist, Sydney Ramirez, M.D., Ph.D., has seen firsthand how COVID-19 patients have suffered. Today, she's working to better understand pathogen-host interactions and help guide future vaccine development.

Dr. Ramirez works as an infectious diseases clinician at UC San Diego Health. She's also an Instructor at La Jolla Institute for Immunology (LJI), where she leads COVID-19 studies in the laboratory of LJI Professor and Chief Scientific Officer Shane Crotty, Ph.D.

“I want to do research that will help improve medicine. Seeing patients is very rewarding, but science is what pushes medical care forward.”

LJI POSTDOCTORAL RESEARCHER SYDNEY RAMIREZ, M.D., PH.D.

Dr. Ramirez has a unique perspective on pandemic preparedness. She first studied coronaviruses as a graduate

student at the University of Texas Medical Branch. This was pre-pandemic work, and she looked at coronaviruses such as SARS and MERS.

In early 2020, Dr. Ramirez was considering accepting a position in LJI's Crotty Lab. She was eager to continue her virology and vaccine research, but she wasn't planning to stick with coronaviruses. Then the COVID-19 pandemic reached the United States, and Dr. Ramirez was one of the few San Diego scientists with extensive experience studying coronaviruses. She joined the Crotty Lab just days before the lockdown and immediately began making connections with other doctors and researchers at UC San Diego to enroll participants and collect samples for LJI's COVID-19 research.

“We were one of the first groups on the ground here in San Diego that was able to collect and study human samples,” says Dr. Ramirez. “It was amazing to be a part of that.”

Dr. Ramirez recalls visiting COVID-19 patients at the hospital to see if they were willing to donate blood samples for LJI

research. These patients were desperate for answers. “So little was known about the virus early in the pandemic,” says Dr. Ramirez. “Patients would ask me if they should be scared. It was heartbreaking.”

Fortunately, Dr. Ramirez had the expertise to advance critical COVID-19 research. Dr. Ramirez and her LJI colleagues went on to publish a series of studies on how long SARS-CoV-2 immunity lasts in the body—and how well the immune system responds to newer SARS-CoV-2 variants, such as omicron. Their findings proved incredibly important for scientists working in vaccine and therapeutic development.

Still, scientists had a problem: They couldn't get a clear look at immune cell activity in the upper airway. “It was time to look at immune responses from a different perspective,” says Dr. Ramirez.

Every breath you take gives pathogens a potential ride into your body. Luckily, our airway is lined with mucosal surfaces, where immune cells can stop pathogens in their tracks. Scientists are looking for strategies, such as new intranasal vaccines, that might boost this immune protection.

The first step is to understand exactly which immune cells are the main players in the upper airway. Unfortunately, the upper airway is a tough place to study. Researchers who try to collect and analyze cells from the airway often find the cells to be too few or too degraded for analysis, says Dr. Ramirez. “Some of the problems seem to come from freezing the samples or overprocessing them,” she says.

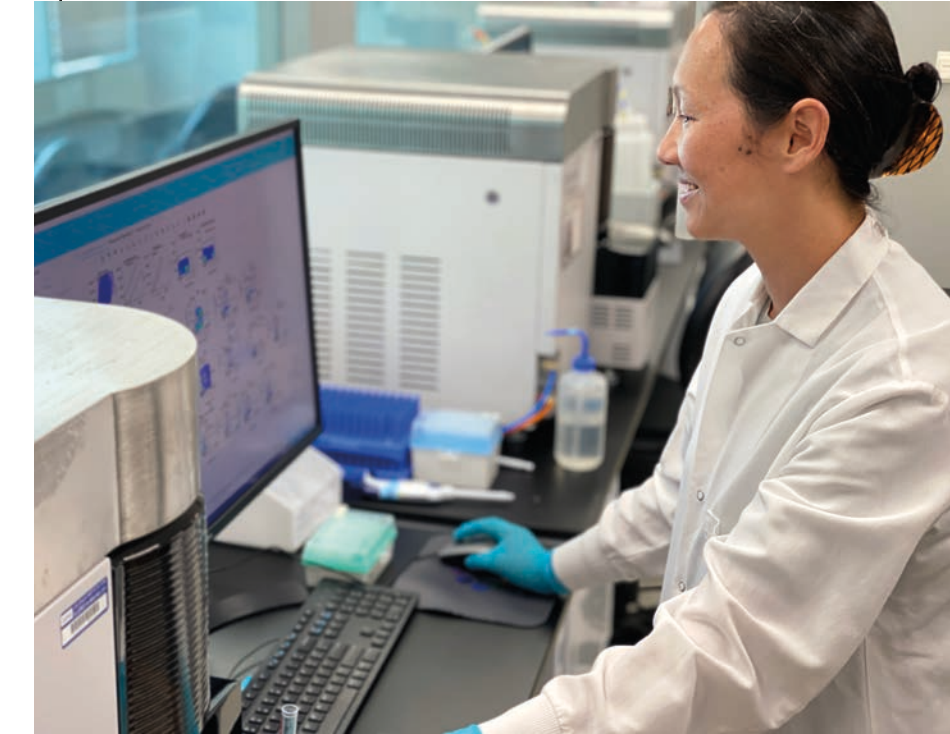
So Dr. Ramirez and her LJI colleagues devised a method that makes it possible to study these elusive immune cells.

Dr. Ramirez worked with experts in LJI's John and Susan Major Center for Clinical Investigation to perform deep-nasal-cavity swabs of study participants to sample immune cells in their upper airway. These swabs reached way back into the nasal passages—to the adenoids. Dr. Ramirez and her colleagues then performed same-day processing and analysis, which meant they didn't have to freeze the samples and risk degrading the cells.

The study was a success. As the study participants returned for regular swabbing, Dr. Ramirez and her colleagues finally got a close look at which kinds of immune cells stand ready to defend the mucosal tissues of the airway.

Among their many discoveries, the researchers found that immune cells such as T cells and B cells leap into action in response to SARS-CoV-2 vaccination or infection. They measured a large variety of T cells and B cells, including germinal center follicular helper T cells, which help B cells generate and improve antibody responses.

They also learned that populations of virus-specific memory immune cells—including tissue-resident memory T cells,



memory B cells, and antibody-producing plasma cells—can ramp up antibody production in response to infection. This means the body doesn't have to wait for immune cells to migrate from the bloodstream to the airway to fight the virus.

“We were finally able to take a closer look at the anatomy of infection—what happens when a virus first infects tissues of the upper airway,” says Dr. Ramirez.

Dr. Ramirez calls the discovery of these long-lived tissue-resident immune cells “really striking.” These specialized cells were adapted to survive in the upper airway, and they stayed in the airway for at least six months after the infection was over.

With these new findings, published recently in *Nature*, scientists and doctors can move forward with new intranasal vaccine strategies to boost immunity in the upper airway.

Dr. Ramirez's work may one day advance medical care, and the research world is taking note.

Dr. Ramirez recently received significant funding through the Burroughs Wellcome Fund Career Awards for Medical Scientists program.

“I didn't ever expect to receive such a prestigious award,” says Dr. Ramirez. “This support should allow me to wrap up the work that I started in the Crotty Lab and then move on to having my own laboratory—which has been a lifelong career goal.”

Dr. Ramirez hopes to lead new investigations into pathogen-host interactions, and she's already thinking of the next big mysteries to solve. “With these new mucosal studies, we can start asking questions we've never asked before,” she says. ♦



UP CLOSE WITH
Measles

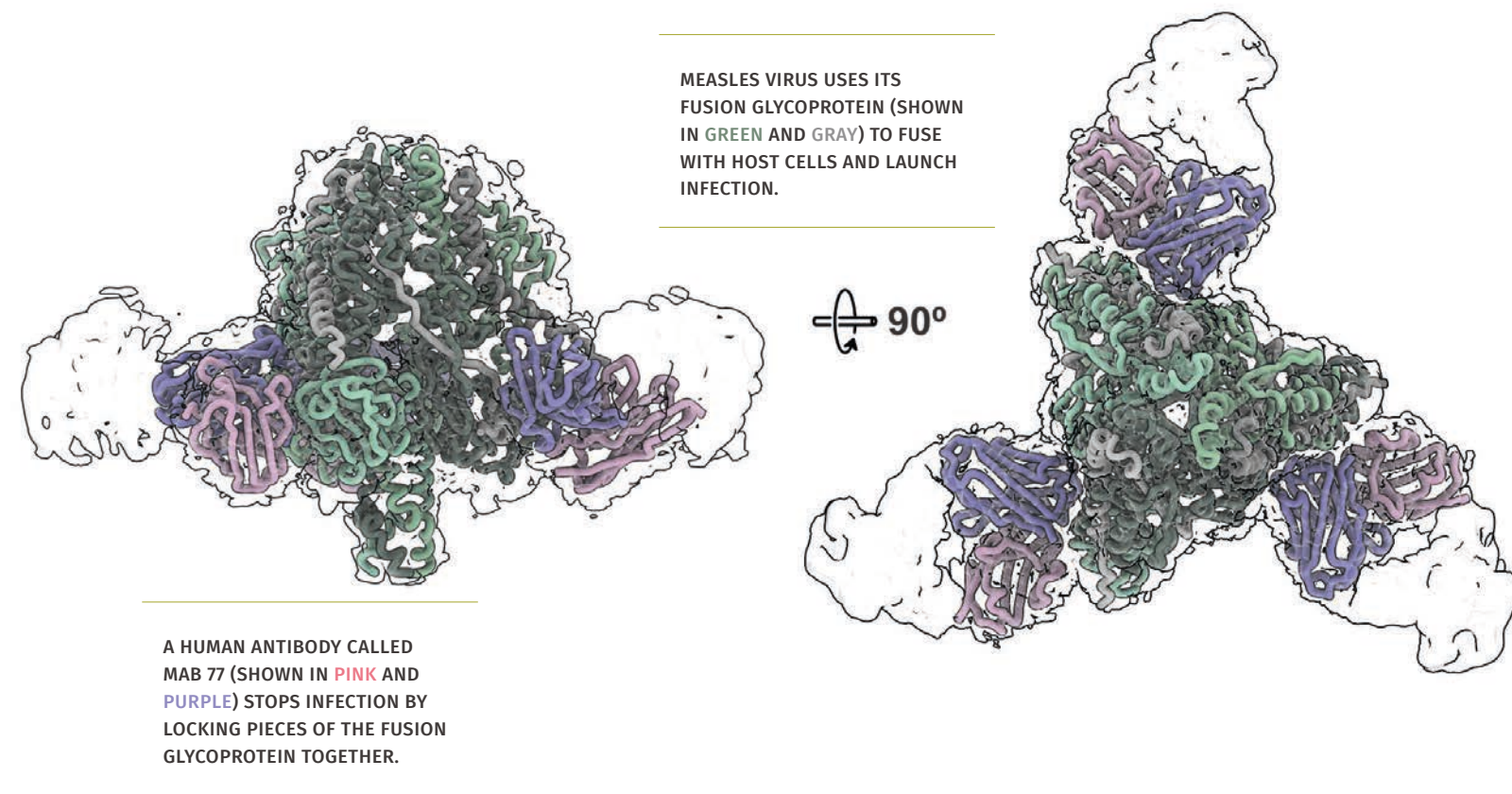
Many scientists at La Jolla Institute for Immunology (LJI) use a cutting-edge technique called cryo-electron microscopy to study how antibodies target pathogens.

Cryo-electron microscopes work by pelting samples with electrons. These electrons “excite” the electrons in the sample itself, which allows researchers to see structural features of antibodies and viral proteins.

In a recent *Science* study, LJI Postdoctoral Researcher Dawid Zyla, Ph.D., worked closely with LJI Professor, President & CEO Erica Ollmann Saphire, Ph.D., MBA, and LJI Cryo-Electron Microscopy Core Director Ruben Diaz Avalos, Ph.D., to capture the first-ever images of an important measles virus protein, called the fusion glycoprotein, under attack by a human antibody known as mAb 77.

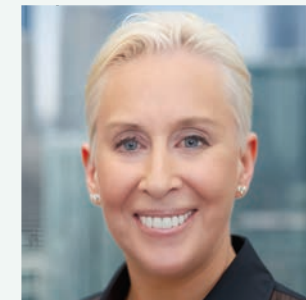
Dr. Zyla then processed the images to assemble a three-dimensional model. This model revealed exactly which parts of the fusion glycoprotein are vulnerable to antibody attack. The next step is to study whether future measles vaccines or treatments can target these weak spots.

LJI’s Cryo-Electron Microscopy Core has received generous support from LJI Board of Directors Member Anthony “Tony” R. Carr, the Buck Family Foundation, and several additional donors, including an anonymous donor. ♦



Institute

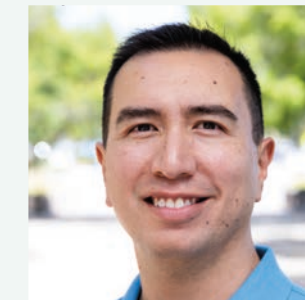
NEWS



CAROLEE LEE

La Jolla Institute for Immunology (LJI) Board Member and Women's Health Access Matters (WHAM) CEO &

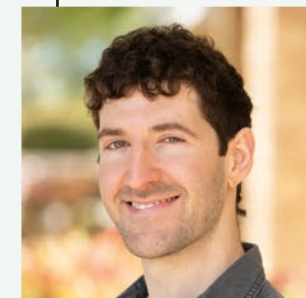
Founder, was named to the [TIME100 Health list](#) for her leadership as an advocate for increased research into women's health.



ISAAC LÓPEZ-MOYADO, PH.D.

an LJI Instructor in the Rao Lab, was awarded the [Fred Hutch Cancer Center 2024 Dr. Eddie Méndez Scholar Award](#)

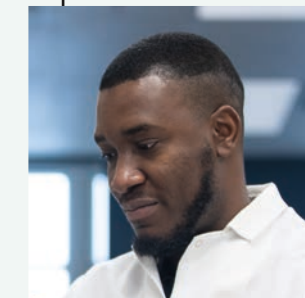
for his cancer research and his work toward making LJI more diverse and inclusive. Dr. López-Moyado is supported in part by The Tullie and Rickey Families SPARK Awards for Innovations in Immunology, with funding provided by LJI Board Member Tom Tullie and the Tullie Family Foundation.



TAL EINAV, PH.D.

LJI Bodman Family Assistant Professor, received funding through the UC San Diego

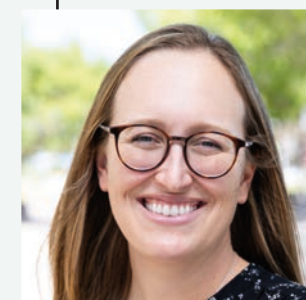
[Pandemic Response to Emerging Pathogens, Antimicrobial Resistance and Equity \(PREPARE\)](#) Institute to use machine learning to advance influenza vaccine research.



ONYEKA CHUKWUDOZIE

a member of the Saphire Lab and Merkin Graduate Fellow at

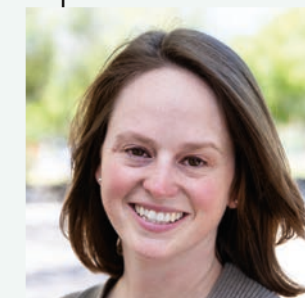
UC San Diego, won a [Curci Ph.D. Fellows Award](#) through the [Shurl and Kay Curci Foundation](#).



ALISON TARKE, PH.D.

LJI Postdoctoral Fellow in the Sette Lab, received the

[“Science, She Says!” Award](#) from the [Italian Ministry of Foreign Affairs and International Cooperation](#) in recognition of her efforts to strengthen ties between scientists in Italy and the United States. This award is given to one early-career female scientist every year.



RACHEL HELMS, PH.D.

LJI Postdoctoral Fellow in the Rao Lab, was awarded a prestigious [Irvington](#)

[Postdoctoral Fellowship](#) by the [Cancer Research Institute](#). She is using the funding to study potential ways to intervene during cancer development.

LJI scientists and staff participated in [Curebound's 2024 Padres Pedal the Cause](#) event. Their efforts helped raise more than \$3 million to fund pioneering cancer research in San Diego.



Labs team up for new pandemic preparedness effort

LJI Professor Alessandro Sette, Dr.Biol.Sci., and LJI Research Assistant Professor Alba Grifoni, Ph.D., were awarded funding through the Coalition for Epidemic Preparedness Innovations (CEPI) to collaborate with researchers across the country to study how to stop viruses from the Paramyxoviridae and Arenaviridae families.



LJI RESEARCH ASSISTANT PROFESSOR ALBA GRIFONI, PH.D.



LJI PROFESSOR ALESSANDRO SETTE, DR.BIOL.SCI.



Dr. Hilde Cheroutre named AAI Distinguished Fellow

LJI Professor Hilde Cheroutre, Ph.D., has been named a Distinguished Fellow by the American Association of Immunologists. This honor recognizes Dr. Cheroutre's pioneering investigations into how the immune system functions at mucosal surfaces, as well as her service to the immunology community. "I could never have done it if it weren't for the excellent scientists I've had the honor and luck to work with," says Dr. Cheroutre, who has also served on the faculty of the RIKEN Center for Integrative Medical Sciences (IMS) in Japan.

MEET THE NEWEST MEMBERS OF

LJI's Board of Directors



SANDRA BOEK WERNESS, JD

is the Executive Director of the Global Autoimmune Institute (GAI), a nonprofit focused on supporting solutions in the diagnosis and treatment of autoimmune disease through research, education, and awareness. Under her leadership, GAI has granted vital funding for patient education, physician outreach, and scientific efforts to shed light on many types of autoimmune diseases. The organization recently awarded funding to researchers in LJI's Center for Autoimmunity and Inflammation. GAI has also sponsored a range of LJI programming and publications to share autoimmune disease findings with the public.

BRAD GREENWALD, MBA

is the Managing Partner of Hilltop Venture Partners. Over the past 25 years, he has successfully launched and operated innovative startup and corporate businesses. Greenwald has also served on the boards of several nonprofits, including Colorado Public Radio, Oxfam America, Food Bank of the Rockies, the Jewish Community Foundation, and the nutrition-education program Operation Frontline. Greenwald founded the Denver Angels and is Co-Founder and Managing Director of the Evergreen National Education Prize. Greenwald is a Henry Crown Fellow at the Aspen Institute and has received the SOS National Community Leader Award.



RENETTA HAAS, MBA

is a financial and strategic risk management specialist with over 35 years of experience advising and mentoring hundreds of companies, executives, and boards. She has extensive experience helping healthcare organizations, including Health Care Services Corporation, Banner Health, and Community Health Choice, adapt to change and achieve and maintain financial success. Haas recently retired from the position of Principal at Deloitte, where she served some of Deloitte's largest national and global clients and played a critical role in Deloitte's Client Experience Program. Haas has also served on the boards of Sharp HealthCare, the Leukemia & Lymphoma Society, and the Westerly School.



LJI and Kyowa Kirin, Inc., celebrate 35-year collaboration

LJI and its long-term partner Kyowa Kirin, Inc. (KKNA), a global specialty pharmaceutical company, are celebrating 35 years of successful collaboration this fall. The ongoing partnership began in 1989 and is now one of the most enduring industry-academic collaborations in the world. Through the years, this unique and dynamic partnership between basic science and applied research has led to the advancement of several LJI discoveries into clinical development.





LJI welcomes cancer researcher Dr. Miguel Reina-Campos

Cancer researcher Miguel Reina-Campos, Ph.D., has joined the LJI faculty as an Assistant Professor to lead the Laboratory of Tissue Immune Networks. His laboratory aims to investigate the basis of CD8+ T cell tissue

immunity to improve life-saving cancer immunotherapies.

“I am delighted to welcome Miguel to the LJI faculty,” says LJI Professor, President & CEO Erica Ollmann Saphire, Ph.D., MBA. “Miguel amplifies our wealth of cancer immunology expertise, and his focus on understanding hormonal effects on disease dovetails with our new initiative in sex-based differences in the immune system.”

Dr. Reina-Campos, originally from Barcelona, Spain, is a biochemist specializing in cancer cell biology and immunology. Dr. Reina-Campos completed his Ph.D. in Oncology and Cancer Biology in the laboratory of Jorge Moscat, Ph.D., and Maria T. Diaz-Meco, Ph.D., at Sanford Burnham Prebys Medical Discovery Institute, followed by a postdoctoral fellowship in the laboratory of Ananda Goldrath, Ph.D., at UC San Diego.

Dr. Reina-Campos’s research is focused on specialized immune cells called tissue-resident T cells.

Unlike T cells circulating in the bloodstream, tissue-resident T cells live deep within our organs, such as the colon and the liver, where they provide fast and robust protection against future infections and tumors. “The goal is to illuminate the secret lives of tissue-resident immune cells,” says Dr. Reina-Campos.

Dr. Reina-Campos hopes a better understanding of these cells can help scientists develop new approaches to boosting immune responses to cancer. His research might also benefit treatment for T cell-driven autoimmune diseases, such as colitis.

“What’s amazing about LJI is the density of immune-focused labs and the availability of resources.”

LJI ASSISTANT PROFESSOR MIGUEL REINA-CAMPOS, PH.D.



T cell expert Dr. Daniela Weiskopf promoted to LJI Assistant Professor

LJI Research Assistant Professor Daniela Weiskopf, Ph.D., has been appointed to a tenure-track Assistant Professor position. Her laboratory is working to understand how the immune system’s T cells respond to viruses, and why T cell responses vary so widely between people.

“Daniela’s research is not only a testament to her deep expertise in human T cell immunology, but also to the

power of applying the full force of science combined with great agility to respond to a global health crisis,” says LJI Professor, President & CEO Erica Ollmann Saphire, Ph.D., MBA.

Dr. Weiskopf, a native of Austria, completed her Ph.D. in immunology at the Innsbruck Medical University in Austria before she joined the lab of LJI Professor Alessandro Sette, Dr.Biol.Sci., as a Postdoctoral Researcher to study how T cells respond to dengue virus infection and vaccination. She quickly broadened her research interests to include other neglected mosquito-borne infectious diseases, such as Zika fever and chikungunya. Dr. Weiskopf was the recipient of a Tullie and Rickey Families SPARK award, made possible through the generosity of LJI Board Chair François Ferré, Ph.D., and Magda Marquet, Ph.D.

When the COVID-19 pandemic hit, Dr. Weiskopf quickly changed gears and started drawing on her large body of work studying human T cell responses to publish several benchmark studies that helped guide COVID-19 vaccine efforts worldwide.

Today, Dr. Weiskopf has refocused her attention on flaviviruses, including dengue virus, and alphaviruses, such as chikungunya virus, both of which can elicit widely differing symptoms, ranging from completely asymptomatic to severe or chronic disease.

“I feel truly honored to be joining the ranks of tenure-track faculty, and my commitment to the Institute is just as strong as the commitment the Institute has shown by promoting me,” says Dr. Weiskopf.

“LJI has been my scientific home for many years and the place where my research could flourish.”

LJI ASSISTANT PROFESSOR DANIELA WEISKOPF, PH.D.

MAR 6, 2024

Life WITHOUT DISEASE

EVENT SERIES

La Jolla Institute for Immunology (LJI) Associate Professor Ferhat Ay, Ph.D., was the featured speaker at the spring program of the *Life Without Disease* event series. Dr. Ay discussed his groundbreaking work in computational biology. His research is transforming our understanding of disease mechanisms and immune responses.

Following his presentation, Dr. Ay was joined by LJI Professor, President & CEO Erica Ollmann Saphire, Ph.D., MBA, and LJI Vice President of Advancement Kelsey Dale, CFRE, CSPG, for a Q&A session. Afterward, attendees mingled with LJI scientists and leadership at an energetic reception in the LJI Atrium.



Left to right: Featured speaker LJI Associate Professor Ferhat Ay, Ph.D., with co-panelist LJI Professor, President & CEO Erica Ollmann Saphire, Ph.D., MBA, and moderator LJI Vice President of Advancement Kelsey Dale, CFRE, CSPG



Left to right: LJI Scientific Advisory Board Member Richard Ulevitch, Ph.D., with LJI Board Member Emily Holmes, JD, Ph.D., CHRC, and LJI President Emeritus and Professor Mitchell Kronenberg, Ph.D.

MAR 11, 2024

BIGHORN

At the gracious invitation of LJI Board Director Emeritus Larry S. Spitcaufsky, LJI Professor, President & CEO Erica Ollmann Saphire, Ph.D., MBA, presented at the prestigious BIGHORN community in Palm Desert, California. Dr. Saphire addressed a full house of members in The Hub, the BIGHORN Clubhouse's grandest venue, sharing insights into LJI's cutting-edge medical research.

MAR 24, 2024



LJI celebrated The Heights Golf Club in Rancho Bernardo for the organization's lifetime collective giving, which has totaled nearly \$200,000. Since 2018, The Heights has hosted seven fundraisers to benefit precision immunotherapy cancer research at LJI, with generous support coming from its members and stakeholders. In March 2024, The Heights Golf Club held the most recent Swing for a Cure fundraiser to support LJI's Schoenberger and Sharma Laboratories.



Left to right: The Heights Golf Club General Manager Paul Devine with fundraiser leader and donor Carol Rud; LJI Associate Professor Sonia Sharma, Ph.D.; LJI Professor, President & CEO Erica Ollmann Saphire, Ph.D., MBA; fundraiser leaders and donors Carole Tessicini and Julie Stone; and The Heights Golf Club Director of Member Experience Maria Furman

APR 10, 2024

WHAM

WOMEN'S HEALTH ACCESS MATTERS

Dr. Saphire was featured at the WHAM 3Not30 Forum in Washington, D.C., attended by high-ranking government officials and Congressional representatives such

as Senator Amy Klobuchar. Dr. Saphire highlighted LJI's transformative research and the Institute's leadership in advancing women's health and better health for all.



LJI Professor, President & CEO Erica Ollmann Saphire, Ph.D., MBA, addresses the WHAM 3Not30 Forum audience



Left to right: LJI Board Member and WHAM CEO & Founder Carolee Lee with Senator Amy Klobuchar; Chair of the White House Initiative on Women's Health Research Carolyn M. Mazure, Ph.D.; and WHAM President Lori Frank, Ph.D.

JUN 4, 2024

SPARK

THE TULLIE AND RICKEY FAMILIES SPARK AWARDS FOR INNOVATIONS IN IMMUNOLOGY

LJI hosted a "sparkling" reception celebrating seven years of the Tullie and Rickey Families SPARK Awards for Innovations in Immunology. Held on LJI's back patio, the event honored the brilliant winners of the 2024 SPARK Awards and recognized the donors and supporters of this impactful program. This year's event was particularly special as it honored the late Joani Nelson, a proud SPARK champion whose philanthropic generosity through her estate provided program underwriting.



Left to right: LJI Board Member and SPARK benefactor Tom Tullie, MBA, with SPARK benefactors Judy Tullie and Brenda Rickey and LJI Board Member and SPARK benefactor David M. Rickey



LJI Board Member and SPARK donor Barbara Donnell, MA, (left) with Joshua Nelson (right)



Left to right: 2024 SPARK winners Jingru Fang, Ph.D.; Chen Sun, Ph.D.; and Isaac López-Moyado, Ph.D., with LJI Professor, President & CEO Erica Ollmann Saphire, Ph.D., MBA, and 2024 SPARK winners Kazumasa Suzuki, M.D., Ph.D.; Thomas Riffelmacher, Ph.D.; and Rimjhim Agarwal

Empowering solutions in autoimmune research

The Global Autoimmune Institute (GAI) is bringing researchers and doctors together to help patients with autoimmune disease.



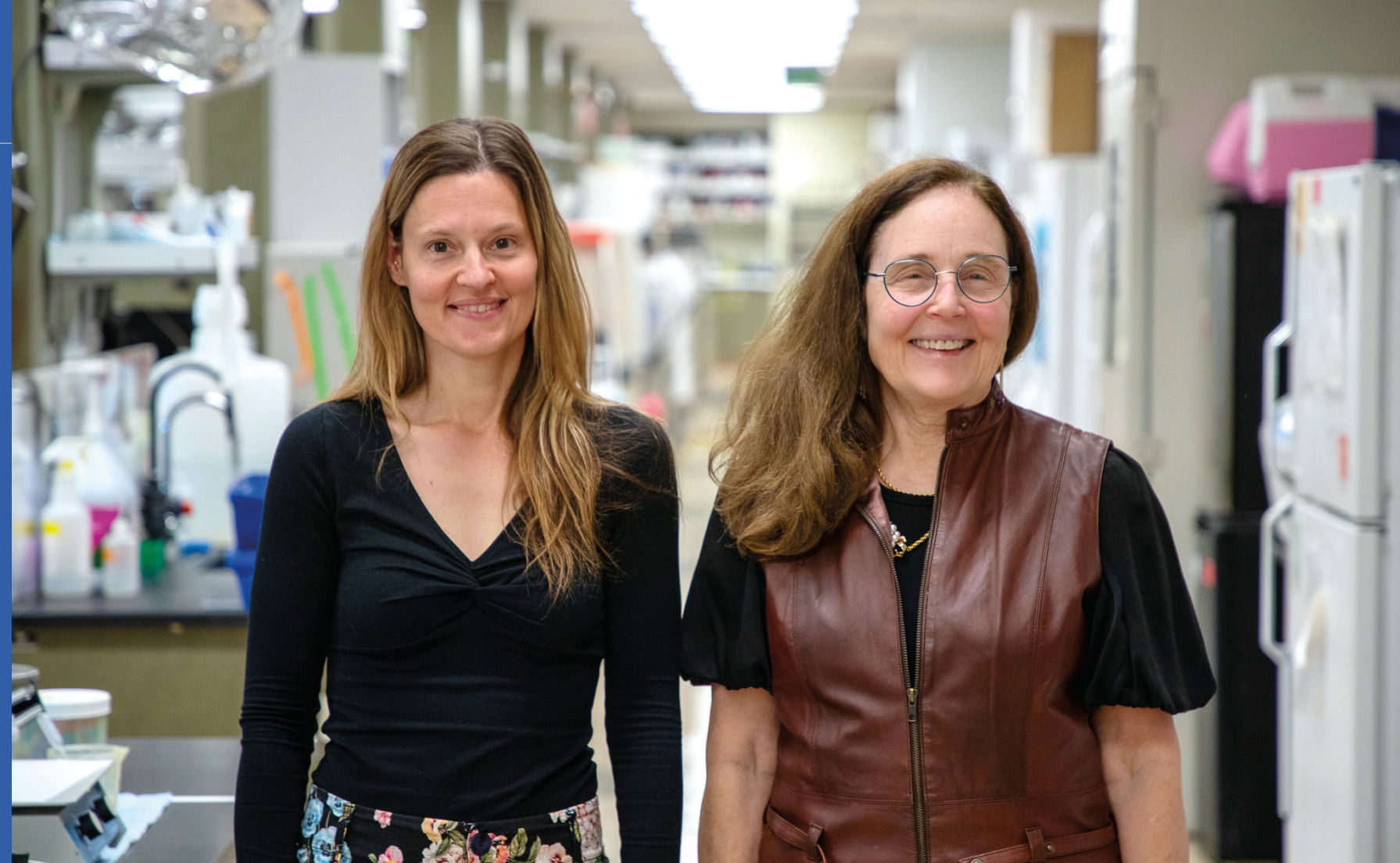
Boek Werness says GAI and LJI share a goal: to shed light on the fundamental drivers of autoimmune diseases.

LEFT TO RIGHT: LJI'S GLOBAL AUTOIMMUNE INSTITUTE ASSISTANT PROFESSOR SAM MYERS, PH.D., WITH LJI BOARD MEMBER AND GAI EXECUTIVE DIRECTOR SANDRA BOEK WERNESS, JD.

GAI is a nonprofit led by LJI Board Member Sandra Boek Werness, JD, a lawyer with a solid understanding of medical research. Boek Werness's parents were pioneers in public health research, and her own career includes serving as Vice President of Northern Virginia Pathology. In 2013, after years of advocating for a loved one with a devastating autoimmune disease, Boek Werness took the helm of an existing nonprofit to create GAI.

"There is a lack of understanding around autoimmune diseases—and a lack of successful diagnoses and treatments," says Boek Werness, who serves as GAI Executive Director.

Under Boek Werness's leadership, GAI has become a major contributor to autoimmune disease education, physician and patient outreach, and research. In 2024, GAI granted six-figure funding to support autoimmune disease research at La Jolla Institute for Immunology (LJI).



LEFT TO RIGHT: LJI POSTDOCTORAL FELLOW GREET VERSTICHEL, M.D., PH.D., OF THE CHEROUTRE LAB AND LJI BOARD MEMBER AND GAI EXECUTIVE DIRECTOR SANDRA BOEK WERNESS, JD.

"It's important to fund research into the initiation of autoimmune disease," says Boek Werness. "We need to understand what's happening before these diseases start to differentiate and cause damage in different organs."

GAI granted LJI Global Autoimmune Institute Assistant Professor Sam Myers, Ph.D., generous lab funding that supports his efforts to investigate how molecular modifications alter immune cell behavior. Dr. Myers was also granted his new title of Global Autoimmune Institute Assistant Professor. LJI Postdoctoral Fellow Greet Verstichel, M.D., Ph.D., of the Cheroutre Lab, received GAI funding to further examine how T cell development can lead to autoimmune diseases.

GAI support hasn't stopped there. The organization has also stepped up to provide underwriting for patient resources, including *Life Without Disease* and *Live from the Lab* programming. GAI has also underwritten

comprehensive programming at LJI for scientists and stakeholders in the autoimmune disease patient community.

Boek Werness recently visited LJI to meet with Drs. Myers and Verstichel. She says she was impressed by the work ethic of the scientists, as well as LJI's team atmosphere.

"LJI scientists are looking around the next corner and figuring out how to collaborate with each other—with the added benefit of having advanced technology to do their work."

LJI BOARD MEMBER AND GAI EXECUTIVE DIRECTOR SANDRA BOEK WERNESS, JD

"The GAI Board Members and I are really thrilled with the research LJI is doing," says Boek Werness. ♦



Global Autoimmune Institute

Empowering Solutions

Further bolstering their commitment to empowering solutions and providing comprehensive resources for those impacted by and interested in autoimmune and inflammatory diseases, the Global Autoimmune Institute (GAI) has generously provided underwriting for programming at LJI, including upcoming events in the *Life Without Disease* in-person lecture and reception series and the *Live from the Lab* virtual lecture series. Learn more about GAI by visiting: autoimmuneinstitute.org

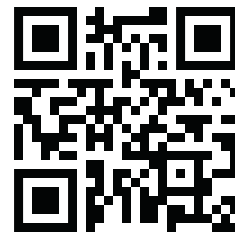


Life WITHOUT DISEASE
EVENT SERIES

A SOCIAL GATHERING
AMONGST SCIENTISTS, FRIENDS
AND INFLUENCERS

Please join us for the *Life Without Disease* event sponsored by GAI on **Thursday, November 7, 2024, from 4:30 to 6:30 p.m.** at LJI, which will feature LJI Global Autoimmune Institute Assistant Professor Sam Myers, Ph.D.

Learn more by scanning the QR code below or by visiting: lji.org/lwd



LIVE FROM THE LAB

Be the first to get all the details about the *Live from the Lab* webinar, sponsored by GAI, as well as other events. Sign up today at: lji.org/event-invite-signup

La Jolla Institute | VANGUARD GIVING SOCIETY

With your contribution of \$1,000 or more to La Jolla Institute for Immunology, you are joining our Vanguard and asserting your role at the forefront of the next breakthroughs in medical research. Our researchers are dedicated to harnessing the immune system to fight diseases ranging from asthma to Zika fever, so that one day we can all live free of the symptoms and hardships of the conditions that afflict us. Your support ensures our scientists have the resources they need to accelerate the pace of their discoveries and turn "someday" into today. As a member of LJI's Vanguard, you are taking an active role in leading the way to *Life Without Disease*®.

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If you have any questions about membership benefits, please reach out to Vice President of Advancement Kelsey Dale, CFRE, CSPG, at kdale@lji.org, 858.752.6542. More information can also be found at: lji.org/giving-society

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Continuing the Course

The enduring impact of the Miller family

Multigenerational philanthropy is one of the most fulfilling types of giving, especially at La Jolla Institute for Immunology (LJI), where donor investment can impact generations to come. Through the years, the support of the Miller family has made a particularly significant and enduring impact. The family's connection to LJI began with Ernest "Ernie" C. Miller, who invested nearly two decades of service as a member of LJI's Board of Directors and left an indelible mark on the Institute and its research. His commitment to exceptionalism, an ethos he shared with LJI, resonated throughout his distinguished life and career—from naval service aboard the USS San Diego to academic achievements and professional success in business consulting, publishing, and academia.

Miller's life path mirrors the foundational narrative of LJI—both were deeply rooted in Japanese cultural exchange. After being selected for a Japanese language-learning program in the Navy, Miller's military career took off, and he later parlayed his successful military tenure into a thriving civilian career. His marriage to Tung-Fen Lin in 1985 not only enriched his personal life but also merged his study of Asian culture with Tung-Fen's background and interests. Together, the couple traversed the globe, expanding their perspectives and strengthening their dedication to cultural understanding—a commitment that profoundly influenced Miller's personal and professional philosophies, evident in his leadership at LJI.

Miller's global perspective and dedication to service extends to his children—Reverend E. Charles, Laura Lee, and Marcy Rogers—who continue the family tradition of leadership through pursuits in business, theology, academia, the arts, and education.

Following Miller's passing in 2018, the Miller family chose to celebrate his life and legacy at LJI through philanthropy. Their support has notably underwritten



ERNEST C. MILLER AND TUNG-FEN LIN MILLER

the LJI Postdoctoral Association (LPA) lecture series for the 2024-2025 academic calendar and the 2025 annual LJI Scientific Retreat at Lake Arrowhead. These initiatives not only foster academic excellence and collaboration among researchers but also reflect Miller's enduring principles and belief in rigorous academic inquiry.

In celebrating Ernie C. Miller and the Miller family, LJI recognizes the transformative power of multigenerational philanthropy in advancing its mission. The lecture series and retreats made possible by the Miller family are milestones in an ongoing journey of discovery and innovation. The Miller family legacy is not simply remembered; it lives on daily through the researchers whose work is touched by the family's generosity.

As LJI charts its future, it does so with the steadfast support of the Miller family guiding it forward, just as Ernie once navigated the seas. ♦

\$1,000 - \$4,999 continued

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**In Memoriam*

La Jolla Institute for Immunology also wishes to express its gratitude for the support of the following organizations and governmental entities:

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Members of La Jolla Institute for Immunology's (LJI) Bonsai Legacy Society are among the Institute's most important benefactors. Gifts that qualify for LJI's Bonsai Legacy Society create a legacy that will shape the future of the Institute. LJI's Bonsai Legacy Society honors individuals who share a commitment to the betterment of human health through world-class biomedical research. By including LJI in your will, trust, or other estate plans, you are investing in the future of research and *Life Without Disease*®.

If you have made plans to include LJI in your estate, we encourage you to let us know so we can welcome you to **LJI's Bonsai Legacy Society**. Please reach out to:

Clare Grotting, MBA, CSPG
 Advancement Officer
 Manager of LJI's Bonsai Legacy Society
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More information about planned gifts can be found at: lji.org/plannedgiving



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**In Memoriam*



THE TULLIE AND RICKEY FAMILIES
SPARK AWARDS FOR
INNOVATIONS IN IMMUNOLOGY

Celebrating early-career excellence in immunology

The faces on the next page are those of the winners of The Tullie and Rickey Families SPARK Awards for Innovations in Immunology. These individuals, representing cohorts spanning 2017 to 2024, have achieved exceptional milestones—from publishing record volumes of highly cited papers, to securing millions in follow-on funding, to establishing their own laboratories.

The Tullie and Rickey Families SPARK Awards program bridges the gap between scientists' imaginative, high-risk, high-reward projects and generous donors like you who believe in their potential. This philanthropically funded program offers \$25,000 per award in seed funding to support projects of innovative nature—providing a unique funding model that has empowered early-career researchers to pursue bold ideas that promise groundbreaking advancements in immunology.

A program impact snapshot

Over the past seven years, **226 donor families nationwide** have fueled this vital program through their philanthropic support, contributing over **\$1.2 million** to fund **45 innovative projects**.

This support led to **promotions for 21 young scientists**, with 11 successfully establishing their own independent laboratories.

Tullie and Rickey Families SPARK Awards winners have collectively published **62 papers** and submitted **7 patent or intellectual property filings** based on the research they conducted for their SPARK projects.

Early-career scientists can develop viable proof-of-concept data through a Tullie and Rickey Families SPARK Awards project—and this has resulted in over **\$11.6 million in follow-on funding** to build on SPARK projects.



Support the next breakthrough in immunology

The next cohort of early-career researchers are competing to join the ranks of the winners depicted on this page. By making a gift during our Fall 2024 fundraising campaign, you have the power to ensure funding for this year's finalists. And in doing so, you will make a direct and deeply meaningful impact that SPARKs their research, potentially leading to life-saving breakthroughs in biomedical science.

For more information on how to support the next cohort of Tullie and Rickey Families SPARK Awards finalists, scan the QR code below or visit our website at: lji.org/spark



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