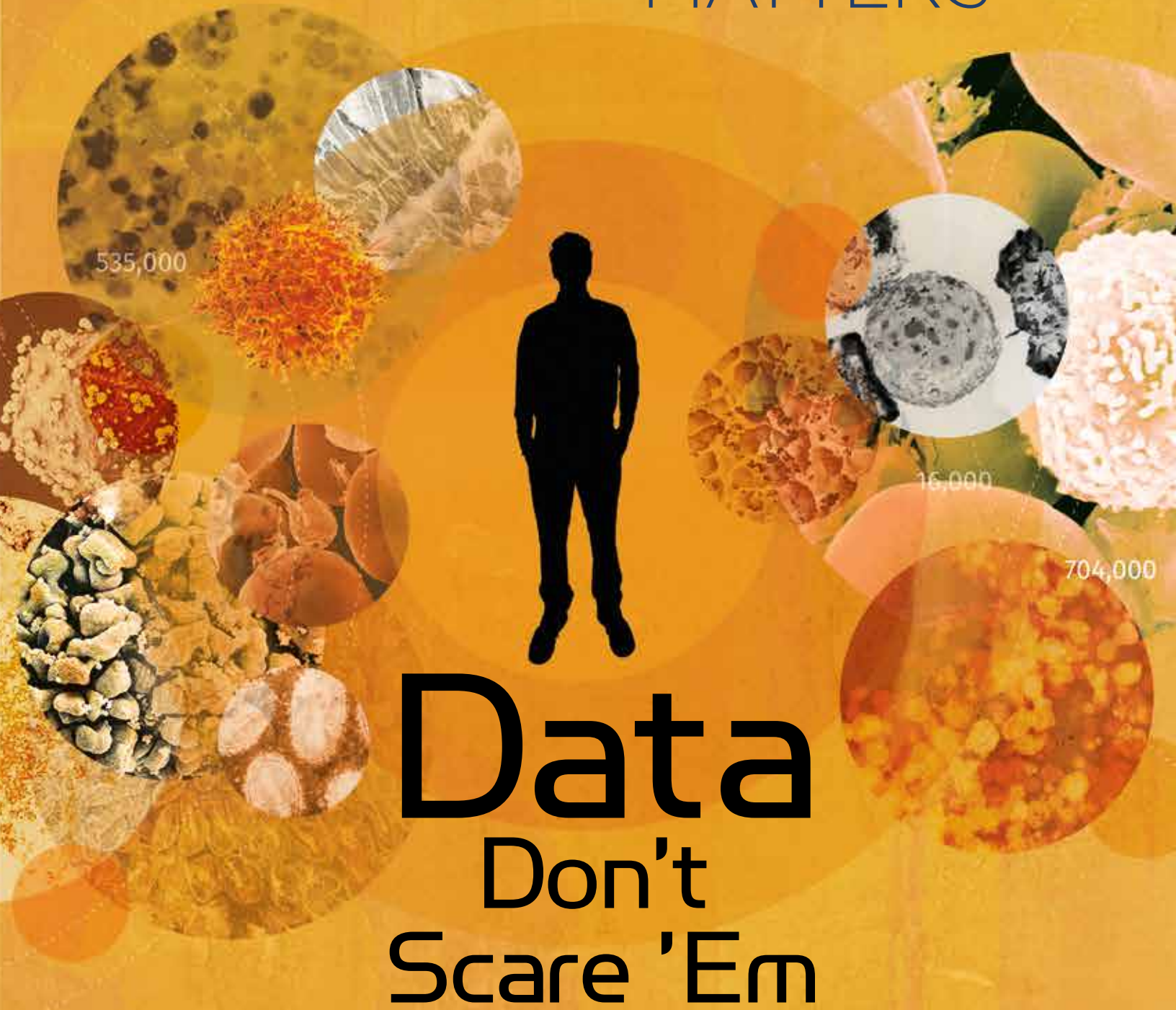


LA JOLLA INSTITUTE FOR IMMUNOLOGY

Immune

MATTERS

SPRING 2019



Data Don't Scare 'Em

Q&A with
Sujan Shresta

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Without Disease

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Immune MATTERS

SPRING 2019



LIFE WITHOUT DISEASE



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STAY UPDATED! If you would like to receive email updates from La Jolla Institute, please email us at: communications@lji.org or 858.752.6645.

LETTER FROM THE PRESIDENT

As La Jolla Institute for Immunology celebrates its 30th anniversary, it is a great time to reflect on what this organization has achieved in its relatively short history and why its future is even more exciting as our research rapidly progresses against some of the world's most challenging diseases.

The Institute has become one of the leading immunology research organizations globally thanks to a wide range of potentially life-saving discoveries that have demonstrated the immune system's critical role in battling and, in some cases, causing disease.

Among our many pioneering discoveries, we've unraveled how a family of molecules called TNF proteins function, and that's leading to the development of biologic drugs currently in clinical trials to treat asthma, psoriasis, and inflammatory bowel disease; we've developed an improved method of identifying cancer neoantigens that has produced a personalized cancer vaccine; our researchers are making major strides against infectious diseases such as dengue, Zika, and HIV/AIDS, and their pioneering work on the inflammatory nature of atherosclerosis is laying the groundwork for testing the first-ever heart vaccine.

As much as the Institute has accomplished, the exponential expansion of our knowledge of the immune system leads us to believe our greatest scientific achievements lie ahead. We recently completed a five-year strategic planning process that is leading to many changes. A relatively easy change has been dropping the word "Allergy" from our name. It is good thing to simplify our name, and while we remain very committed to allergy research, allergic diseases are not a separate discipline from studies of immune system function and diseases related to the immune system. A more complex and ambitious result of the planning is our intent to create three major disease research centers in the next few years, to leverage our strengths in studying cancer, infectious disease, and autoimmune disorders.

Playing a crucial role in that future will be another of the Institute's major successes—the development of huge databases that catalog the human immune response to infectious organisms, allergy-causing substances, and other triggers of the immune system. Our cover story looks at one of these, the Immune Epitope Database (IEDB), a free, searchable site that gives scientists around the world access to more than 1.5 million immunology experiments. We also have built and recently released to the public a genomics database that analyzes how normal human genetic variation affects gene expression in different immune cell types.



These public resources are part of our mission to advance science around the world, an effort in which all of our principal investigators are engaged. There's no better example than the subject of our Q&A in this issue, Sujana Shrestha, Ph.D., whose trailblazing work in understanding dengue and Zika virus infections extends to building scientific capacity in her native Nepal. Training the next generation of biomedical researchers is also an Institute goal, and in our "Up and Coming" profile, you'll read about a Hugo Sepúlveda, Ph.D., a brilliant young postdoctoral fellow from Chile who is eager to use the expertise he's gained in cancer research at the Institute to expand scientific capabilities in Latin America.

Fully imagining where La Jolla Institute for Immunology will be in the next 30 years is impossible, but I can assure you that some of the most remarkable advances—and quite likely cures for a number of diseases—are fast approaching. As always, joining us in that effort will be all of our wonderful Institute partners—including individual donors, foundations, and federal funding sources—who play such a crucial role in supporting research we believe will one day soon help us move towards our mission of *Life Without Disease*®.

Sincerely,

Mitchell Kronenberg, Ph.D.
President & Chief Scientific Officer
La Jolla Institute for Immunology



Sinu Paul,
Ph.D.

Nicole
Weise

Stephen
Wilson,
Ph.D.

Sandeep
Dhanda,
Ph.D.

Haeuk Kim

Data

Don't Scare 'Em

THE UNTOLD STORIES OF THE LJl TEAM BRINGING
IMMUNOLOGICAL DATA INTO THE LIGHT



Lindy Edwards

Nima
Salimi,
M.Sc.Naomi
KellyBjoern
Peters,
Ph.D.Alessandro Sette,
Dr. Biol. Sci.

The contents of the Immune Epitope Database (IEDB) are shocking. The free, searchable site is home to data from more than 1.6 million immunology experiments, making it a one-stop shop for understanding and predicting the body's response to viruses, bacteria, cancer, allergens, and more.

The IEDB was established in 2003 by LJI professors Alessandro Sette, Dr. Biol. Sci., and Bjoern Peters, Ph.D. Fifteen years later, the user base is booming. In fact, LJI was recently awarded a \$22 million contract renewal from the National Institute of Allergy and Infectious Diseases to continue hosting and expanding the IEDB for the next seven years. This support shows how vital the IEDB is for making sense of immunological data.

But the IEDB is so much more than a database. Behind the scenes is a hard-working team dedicated to guiding life-saving research.

The data hunters

Randi Vita, M.D., is the kind of person who really likes puzzles. An immunologist by training, Dr. Vita joined LJI in 2005 to work as a "biocurator" for the IEDB.

"The rise of public databases was relatively new back then, and they needed people to manually curate data,"

says Dr. Vita, who today serves as scientific curator and quality assurance manager for the IEDB. "It turns out I love data."

Good thing too, as the popularity of techniques like genome sequencing has led to what scientists call the age of "big data." While studies a few decades ago focused on only a couple of data points, studies today routinely contain supplemental tables with 10,000 data points or more. The challenge for Dr. Vita and her colleagues is to gather the reams of epitope data in one place.

In just the first eight years the IEDB operated, the curation team sorted through a staggering number of studies. Between 2004 and 2012, the team manually curated almost 16,000 published manuscripts, which included data from more than 704,000 experiments. They read papers, highlighted terms, and determined how to organize and label epitopes. As a result, more



Michael
Talbott

Jason
Greenbaum,
Ph.D.

What is an epitope?

Epitopes are molecular structures found on pathogens or infected cells. Immune cells recognize these epitopes and alert the body that danger is near. Scientists need to understand epitopes in order to fight disease. For example, a scientist studying peanut allergies needs to know which epitopes on peanut molecules are the ones triggering deadly immune responses.

Data in the IEDB includes information like epitope location, letting scientists map out which epitopes might be the best ones to attack with new drug therapies or vaccines.

than 120,000 epitopes were entered into the IEDB. Since then, the curators have worked to keep the database up to date. “It’s an extremely manual process,” says Dr. Vita. “We do a lot of interpreting and entering of data.” As of January 2019, the IEDB housed more than 535,000 epitopes. It also expanded in recent years to include data on T and B immune cells themselves, which lets scientists better understand how the body recognizes danger.

These efforts mean that important data won’t be forgotten in the tables of scientific papers. Scientists curious about tuberculosis, for example, can search the IEDB and find epitope data gathered from studies published decades apart in journals around the world.

Biocurator Nima Salimi, M.Sc., is another self-confessed data fan, and he likes working behind the scenes on the IEDB.

“I feel like Marie Kondo,” Salimi says. “We read these papers, and we have to extract and organize just the relevant data we need.”

Salimi says people regularly ask about an IEDB subscription fee. “It’s unbelievable that it’s free. It’s such an amazing resource to have at your disposal,” he says. “I’m always

proud to say that I’m part of a project like this. By supporting this kind of science, you’re not only promoting the discovery of information but also leveraging of that information to cure disease.”

The tool makers

“The IEDB does pretty much everything,” says John Sidney, M.Sc., an associate scientist at LJL. Sidney worked with Drs. Sette and Peters to establish the IEDB, and he still helps advise the curation team. He’s also happy to call himself a “guinea pig” as he tests out new IEDB tools.

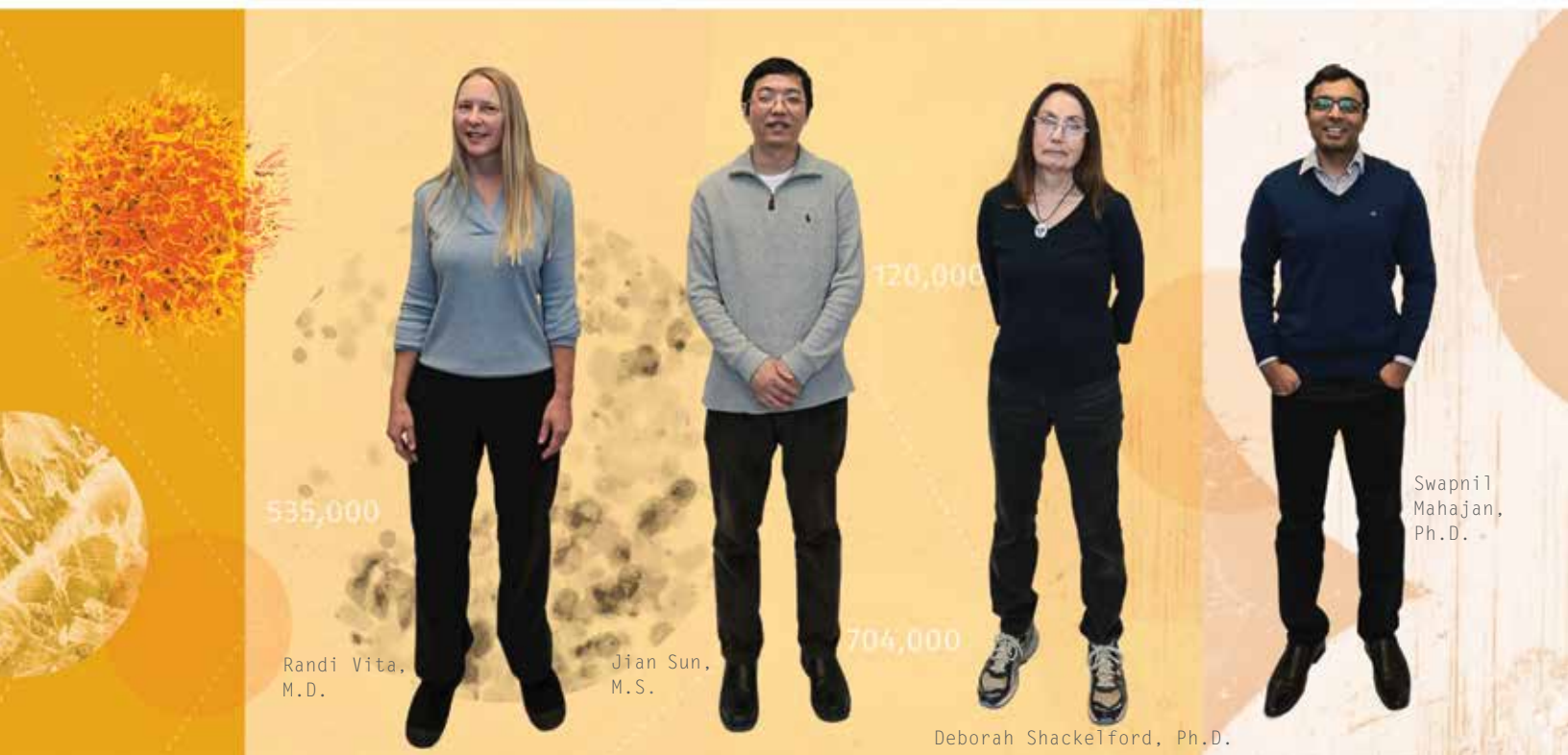
These tools can dramatically speed up research. For example, Sidney’s lab studies the immune system molecules that mark pathogens for destruction. This research requires an understanding of molecules called peptides. The problem is that large organisms can make tens of thousands of peptides.

“It would cost millions of dollars to even make the peptides to start a study,” says Sidney.

With the IEDB’s prediction tools, Sidney can narrow the candidate peptides down to just 1 or 2 percent of the

As of January 2019, the IEDB housed more than 535,000 epitopes.

It also expanded in recent years to include data on T and B immune cells.



total, saving vast amounts of money and time. “The IEDB’s bioinformatics tools are really invaluable,” Sidney says.

So far, Sidney has used the IEDB to study dengue, tuberculosis, HPV, hepatitis, Marburg virus, malaria, cancer, and even whooping cough.

Jason Greenbaum, Ph.D., director of the Bioinformatics Core Facility at LJI, has been involved in tool development for the IEDB since 2006, and he’s seen the tool user base triple in the last 10 years. With the renewed NIAID contract, Dr. Greenbaum’s mission is to expand the tools available to scientists.

One of his dedicated developers is Sinu Paul, Ph.D., a bioinformatics scientist. Before Dr. Paul had even earned his Ph.D., he knew he wanted to work at LJI. “I wanted to be part of the IEDB team,” says Dr. Paul. “I wanted to explore what we could do with new technology in the field of biology.”

The IEDB team has also found a way to address diseases we haven’t even heard of yet. When a disease emerges, global immunologists can use the IEDB’s prediction tools and learn about a new pathogen by studying its relatives. “We can use these tools to quickly predict epitopes,” says Dr. Paul.

“If tomorrow there is a new biohazard or concern, you can come to the IEDB, plug in the protein sequence of a new strain of the flu, for example, and find the peptides that would be relevant to studying the immune response,” Sidney explains.

In fact, researchers turned to the IEDB when Zika first emerged as a global pandemic. They knew Zika was related to dengue, so they analyzed dengue epitopes and extrapolated from the IEDB to jump-start new Zika studies.

“This work gives people a foundation to build on,” says Dr. Paul.

“ The IEDB has been really at the forefront of making sure this communication without frontiers is maintained in science as the data becomes bigger and bigger.”

ALESSANDRO SETTE, DR. BIOL. SCI.



Gabriele
Foos,
Ph.D.

Sheridan
Martini

Zhen
Yan
M.S.

A global team

Even scientists who have never used the IEDB have benefitted from the team's work.

As the team built the database, they established a system for how to label and organize data in immunology. Tackling the questions of how to categorize things is part of a field called ontology, and it has become a passion for Dr. Peters and many others with the IEDB. (Salimi says he finds himself mentally categorizing and subcategorizing things outside work.) This consistent language allows scientists anywhere to share their results and start new collaborations.

"Science is one of the things that has no frontiers," says Dr. Sette. "There's a common language in science. You can visit a local university on the other side of the world and talk about the same things. That's not to be taken for granted. The IEDB has been really at the forefront of making sure this communication without frontiers is maintained in science as the data becomes bigger and bigger."

Drs. Sette and Peters reflect on how the IEDB has evolved since its founding. "It's like watching a child grow up," Dr. Sette says.

"I would consider the IEDB my biggest achievement," adds Dr. Peters. "In my mind, this project has moved immunology into the twenty-second century."

The co-founders have also poured their own data into the IEDB and helped researchers worldwide with direct data submissions. The IEDB is turning the world's immunologists into a collaborative community, and LJI is at the epitope epicenter. ●

Training the next generation

With the renewed contract from NIAID, the team behind the IEDB is excited to expand their outreach efforts to site users and even immunology students.

The IEDB has always encouraged user feedback. The staff holds a user workshop every year, and they regularly set up booths at scientific conferences. Dr. Bjoern Peters says the team pays close attention to what users like and don't like. "That's rather uncommon in the scientific world," Dr. Peters says. For example, the team did a major redesign of the search interface in 2014 to better help users find the data they need.

The researchers now plan to further develop the IEDB as a teaching tool. "One of our goals with the renewal is to integrate the IEDB into courses," says Sheridan Martini, project manager for the IEDB. "Students can learn about the database development side of it, or about the bioinformatics tools available."

The team is also working on creating new material for academics, such as tools to better guide vaccine development.

Sujan
Shrestha

Q&A

Sujan Shresta, Ph.D.

As one of the world's foremost infectious disease researchers, La Jolla Institute Principal Investigator Sujan Shresta, Ph.D., believes she is on a path to developing a vaccine that will protect against both dengue and Zika virus.

Thanks to climate change, very little now stands in the way of dengue and Zika virus continuing to spread outside their traditional subtropical and tropical homes, with parts of the U.S. now threatened. Fortunately, for the future of the world's health, La Jolla Institute's (LJI) Sujan Shresta, Ph.D., represents a powerful front in the battle against these mosquito-borne viruses. Born in Nepal to university professors who moved the family to the U.S. so their children could receive a high quality education,

Dr. Shresta received her B.A. in Biological Sciences at Smith College and her Ph.D. in Immunology at Washington University in St. Louis. After her postdoc at UC Berkeley, Dr. Shresta was hired as an assistant professor in the Vaccine Discovery Division at LJI, where she pursues her three major passions in life: scientific research, mentoring the next generation of scientists across the globe, and spending time with her husband, a French-born scientist, her 13-year-old son, and 8-year-old daughter.

How does a young girl raised in a small Himalayan country end up as a groundbreaking scientist at a world-class immunology institute?

It really does seem like a miracle. It started with parents who believed in the value of education and continued with a series of wonderful mentors. When I went to Smith I knew nothing about science, but I had an immunology professor who inspired me during my freshman year. I actually did a research thesis with her on vitiligo in chickens that got published in a scientific journal. I also had a Ph.D. advisor who said he believed I could do anything I set my mind to. That gave me a tremendous feeling of confidence. This is why I believe that exposing young people to science today and helping them along the way is so critical to the future of research.

Why did you pick infectious disease as the focus of your research?

My interest started with Nepal because it is affected by many infectious diseases, but it is relevant for all of us. That's why I decided to pursue an area of immunology that has an immediate impact on global health. I became fascinated first with dengue and more recently with Zika as I realized my native country and many others will soon be severely challenged by them as the viruses continue their rapid spread across the globe.

Why are dengue fever and Zika such a threat?

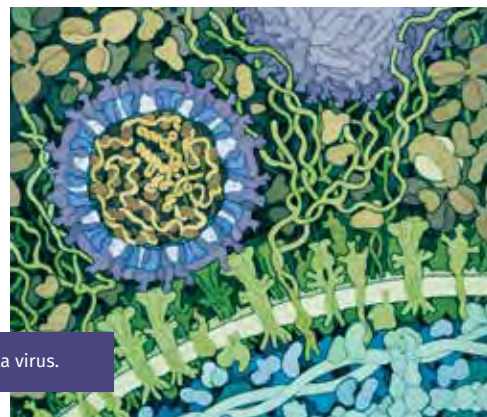
There are 390 million dengue infections each year and half the world's population—nearly four billion people—is at risk of infection. The mild form of dengue causes high fever, severe headaches, muscle and joint pain, and rashes.

The most severe form, dengue hemorrhagic fever, can cause severe bleeding, a sudden drop in blood pressure, and sometimes death. Zika, which has been deemed a international health emergency, is now found in nearly 90 countries. It produces similar symptoms, but can cause serious birth defects, and is also being investigated for associations with other neurological conditions, including Guillain-Barré Syndrome and meningoencephalitis. What's rarely mentioned is that health care costs, in addition to the economic loss for families and workforces of those afflicted, is devastating in countries that can ill afford it.

What progress have you made in addressing these viruses?

We're really encouraged by the success of our research, as we're beginning to understand the immune response to

We're really encouraged by the success of our research, as we're beginning to understand the immune response to these viruses.



Cross-section of Zika virus.

Illustration by David Goodsell

these viruses. Specifically, by using mouse models, we're learning a lot about how the immune system sometimes is a double-edged sword—it can protect the body or turn on it. One of our major studies discovered that some people can be infected with dengue and develop no disease or mild disease, and then later on with within a year or so, they can come down with the much more severe dengue hemorrhagic fever that is actually triggered by the pre-existing immunity to dengue.

You say that dengue and Zika are similar enough that a vaccine might be developed that would work against both simultaneously?

Yes, this is one of the most exciting areas of our research right now. We've discovered that there is a cross-reactivity between the immune response induced by these two viruses. This cross-reactivity should enable us to someday develop a vaccine—similar to a universal flu vaccine—that protects against both viruses. Right now we have to overcome the steep challenge that vaccinating against Zika may make dengue symptoms worse if a patient with pre-existing Zika immunity is infected with dengue, and vice versa.

Isn't that a big hurdle to overcome?

Yes, but one of the reasons we're so optimistic about all our research is that we're doing something no one else is doing, and that's leveraging both arms of the immune system in developing potential vaccines. We're starting to learn whether the immune system's traditional antibody response

or the T cell response—or a combination of both—offer the most effective way to attack or prevent the disease. We've also already proven that one antiviral treatment can completely wipe out the dengue virus in mice. This treatment is now being investigated in human trials.

You're also very interested in scientific capacity building in your native country.

I think it's critical that countries like Nepal that currently have minimal scientific infrastructure develop the capability to do their own world-class research, especially on diseases that prominently afflict their citizens. We're collaborating closely with Professor Krishna Manandhar, Ph.D., who trained in our lab as a Fulbright Scholar and who is now developing research facilities with our help at Tribhuvan University in Kathmandu. We're also training students from Nepal, Thailand, and Brazil to go back and join the research effort in their home countries. I'm thrilled about this because I can envision how, in a few years from now, scientists from resource-poor countries will be generating novel research that not only benefits their country but the rest of the world.

What do you do when you're not in the lab?

I love conducting research here at this wonderful Institute and I find great joy in my life as a scientist, but my family is even more important. The only thing that could make me prouder than my lab's impact on human health, is to watch my children growing up into good people who make a difference. So, I spend as

much time with them as I can, whether it's taking them to exotic destinations around the world, going on long hikes locally, or skiing in the mountains. Our children are truly international kids. My husband only speaks French to them, so they're completely bilingual. They're also very talented musicians. They're really bright and they can sometimes be conniving (laughs). We were playing the Sleeping Queen card game the other night and they somehow tricked me into playing an hour past their bedtime. I think they turned the clocks back! •

Life WITHOUT DISEASE

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FEATURING
Sujan Shresta, Ph.D.



Pew Latin America Fellow's Passion for Knowledge Spurs Promising Career as Epigenetics Researcher

If you had to isolate the one characteristic that has propelled Hugo Sepúlveda, Ph.D., to rise from humble beginnings in a small Chilean village to one of Latin America's most promising young scientists, it would be curiosity.

"In one way the story of my life is part of a social miracle," says Dr. Sepúlveda, a postdoctoral fellow at the La Jolla Institute for Immunology (LJI). "Our family had few resources in Chile and no one in our family had ever gone past high school. Despite this, they always supported my insatiable curiosity about how things work. When I discovered science, I knew I had found something that could fulfill my passion for knowledge."

Dr. Sepúlveda's innovative scientific talents were recognized last summer when the Pew Charitable Trust named him one of 10 Pew Latin American Fellows in Biomedical Sciences for 2018. The prestigious fellowship, which provides support for young scientists from Latin America to receive postdoctoral training in the U.S., is providing Dr. Sepúlveda with two years of funding to study with LJI Professor Anjana Rao, Ph.D.

Dr. Sepúlveda, who received his Ph.D., from Andrés Bello University in Santiago, Chile, is studying how regulatory proteins called TETs establish crosstalks with their partners in the cell's nucleus and how dysregulation of their activity can disrupt the formation of specialized cell types or promote cancer.

"I'm really thrilled about this fellowship because it allows me to pursue my fundamental interest in understanding how epigenetics act to control gene expression," says Dr. Sepúlveda. "The potential is truly exciting, because as we more fully understand how TET proteins communicate with their partners



to control cell proliferation and cell fate, we believe we'll discover new targets for the treatment of cancer and help advance stem cell therapies."

When his fellowship ends, Dr. Sepúlveda says he will miss taking his wife and three-year-old daughter to the beach in San Diego. It's a frequent activity that brought back a flood of memories of playing on the sand with his family in the small town of Penco, Chile, near the city of Concepción, where he and his two siblings attended college.

Thanks to the fellowship, however, Dr. Sepúlveda's return to Chile will be the beginning of an even more promising future as a researcher.

"The Pew fellowship is truly remarkable because it will provide me with additional funding and support to return to Chile and launch my own lab to contribute to the understanding of the principles that guide many fundamental biological processes," Dr. Sepúlveda says. "The opportunity to take the knowledge I've gained here at La Jolla Institute and share it with my scientific colleagues in Chile is beyond inspiring. I'm so honored to have a chance to build scientific expertise in Latin America and then use that research to advance human health around the world." ●

Imagine Life Without Disease.

What would you do?

Every day, all of us here at LJl work toward Life Without Disease. The challenges we face are neither small nor trivial—but not impossible to overcome. What keeps us going is the promise of empowering people to live the life they want.

That's why we went out and asked the simple question: What does Life Without Disease mean to you?

The answers were profound and thought-provoking, so we decided to share them.

▶ Watch the mini-docus at stories.lji.org and tell us what YOU would do.

Page + Larry

Page and Larry have been exploring the world together since their days as high school sweethearts. Page's family felt the impact of disease when her dad suffered from dementia before he died. Then her mom started to show signs of Alzheimer's disease. Worried that the same fate might be in store for her, Page took it as a moment of reckoning.

"I think that just really pushed me into saying, okay, we don't need that much money to go, we can just go now and think about it later."

For Larry and Page, life without disease means they can keep going wherever adventure leads them.



Melanie

Dr. Melanie McCauley is working closely with a team at Tribhuvan University in Kathmandu to increase Nepal's cadre of dengue experts by helping them acquire the necessary skills needed to study and halt the spread of dengue in Nepal.

"There's a lot of merit in bringing medicines to people who can't reach them themselves, but it's sort of putting a band aid on the situation and I realized that only through scientific discovery will we really make huge changes that impact large populations of people."

For Melanie, life without disease means building local research capacity in resource-poor areas around the globe.



Bill

In his 46 years operating the Balboa Park Carousel, Bill Brown has only missed two weeks of work. Just like Bill has become part of the community's fabric, the carousel has become a dependable constant in his own life. It helped him through difficult periods when he was caring for his sick parents.

"It was good to have this constant during a time of change."

For Bill, life without disease means that he never has to miss another day.



MATTHIAS VON HERRATH NAMED WORLD'S LEADING TYPE 1 DIABETES EXPERT

Professor Matthias von Herrath, M.D., founder of LJI's Type 1 Diabetes Center, has been identified as the world's top expert in type 1 diabetes. The ranking was announced by Expertscape, an organization that provides tools to quickly and easily find the best clinicians or pioneering scientists specializing in a wide range of medical conditions or biomedical topics.



Matthias von Herrath, M.D.

After witnessing first hand how patients with type 1 diabetes struggle with the disease, Dr. von Herrath made it his life's mission to gain a solid mechanistic understanding of type 1 diabetes and develop immune-based interventions. He splits his time between his lab at LJI and Novo Nordisk, a global pharmaceutical company best known for its diabetes products, where he recently assumed the position of Vice President and Senior Medical Officer. Dr. von Herrath's position allows him to realize his dream of playing a key role in clinical trials on potential type 1 diabetes treatments, while continuing to lead his word-renowned research program at LJI.

LJI SCIENTISTS AMONG "THE WORLD'S MOST INFLUENTIAL MINDS"

Among the flood of research papers published by scientists and scholars in academic journals year in and year out—by some estimates their numbers now exceed 2,500,000 papers annually—the research contributions of scientists at La Jolla Institute for Immunology stand out for their global impact.

For the third year in a row, Dr. Shane Crotty's pioneering studies on vaccine-related immunology have earned him a spot on the list of "The World's Most Influential Minds," an annual list that celebrates scientists whose work has outsized influence in their field of study. This year, he is joined by Dr. Alessandro Sette, whose sustained efforts to systematically dissect the immune response to a wide range of microbes and allergens has a tremendous impact on the field of immunology (see page 4).



Alessandro Sette, Dr. Biol.Sci.



Shane Crotty, Ph.D.

But LJI scientists are proving their outsized influence in more ways than one. Four LJI professors are listed in the 2018 Webometrics Highly Cited Researchers ranking chart, which uses the so-called H-Index to gauge their productivity and influence spanning their whole career. LJI professors currently on the list are Dr. Mitchell Kronenberg (103), Dr. Klaus Ley (129), Dr. Sette (144) and Dr. Anjana Rao (119).

NOBEL LAUREATE BRUCE BEUTLER NAMED INAUGURAL LA JOLLA INSTITUTE SCHOLAR

Nobel Laureate Bruce Beutler, M.D., has joined the Institute as a non-resident scholar. The newly established scholars program invites world-renowned scientists to spend time at the Institute each year to exchange ideas, foster innovation, and spark new discoveries through active collaborations. Nominated by the president, LJI Scholars serve for renewable two-year terms.

Dr. Beutler was awarded the Nobel Prize in Physiology or Medicine in 2011 for his groundbreaking work that provided novel insights into the activation and regulation of the innate immune system. His discoveries have led to therapies for crippling and life-shortening diseases that affect millions of people. He currently holds the position Regental Professor

and Director of the Center for Genetics of Host Defense at the University of Texas Southwestern Medical Center.



Bruce Beutler, M.D.

“We are thrilled to name someone with Bruce Beutler’s stature and unparalleled track record of innovation and discovery to the rank of LJI Scholar,” said Mitchell Kronenberg, Ph.D., president and chief scientific officer. “Adding the perspective and insight of one of the nation’s leading immunologists will undoubtedly enrich the Institute’s intellectual environment and accelerate breakthroughs.”



LA JOLLA COUNTRY DAY SCHOOL PARTNERSHIP

Each year, students in La Jolla Country Day School’s Design & Innovation program are tasked with finding a design solution to a real-world problem. This year, they partnered with scientists at La Jolla Institute to create test-tube holders that can accommodate tubes of different sizes without obscuring their content, use as little material as possible and are pleasing to the eye. Beta testers in LJI’s microscopy facility are currently testing different designs and providing feedback.

LJI DONORS TURN HEALTH CRISIS INTO MISSION TO CHAMPION INSTITUTE'S NEW CANCER VACCINE

Sometimes it takes a personal health crisis to galvanize people to pursue a life-changing path they could have never envisioned. Rebecca and Sandy Shapery embody that transformation, and they hope their inspirational journey will soon help save the lives of cancer patients around the world.

It's only been two years since Rebecca was diagnosed with a cancerous tumor in her right kidney. Fortunately, the kidney was removed and she has a clean bill of health. The story might have ended there if the couple had not subsequently attended an event hosted by the La Jolla Institute for Immunology.

"We were fascinated to learn LJI was researching the same kind of cancer Rebecca had, and has actually developed a personalized vaccine that uses the body's own immune system to attack and kill malignant cells," Sandy says. "The thought of a cure was so thrilling we knew we had to become involved."

Sandy, a highly successful business leader who developed San Diego's Emerald Plaza, joined the Institute board and the couple made a major donation to the lab of Principal Investigator Stephen Schoenberger, Ph.D. An immunotherapy pioneer, Dr. Schoenberger combines genomic sequencing and bioinformatics analysis to create personalized vaccines that marshal massive numbers of the body's own T cells to find and kill cancer cells.

A significant portion of the Shapery's gift is being used to reduce the time and huge data costs involved in identifying which T cells will be effective killers.

"That process was initially costing several hundred thousand dollars and we're extremely proud that our contribution has helped significantly reduce



Sandy and Rebecca Shapery

that expense," Sandy says. "But we're just at the beginning, and that's why we're asking for others to join us so this life-saving vaccine can someday soon reach everyone who needs it."

Toward that end, the Shaperys have eagerly signed on as Institute ambassadors, including appearing in a video to make more people aware of LJI's groundbreaking science.

"We're championing La Jolla Institute because it's at the leading edge of the most important immunology research in the world," Sandy says. "The idea Rebecca and I can play a role in advancing an actual cure for cancer is the most exciting and rewarding thing we've ever been involved in." ●

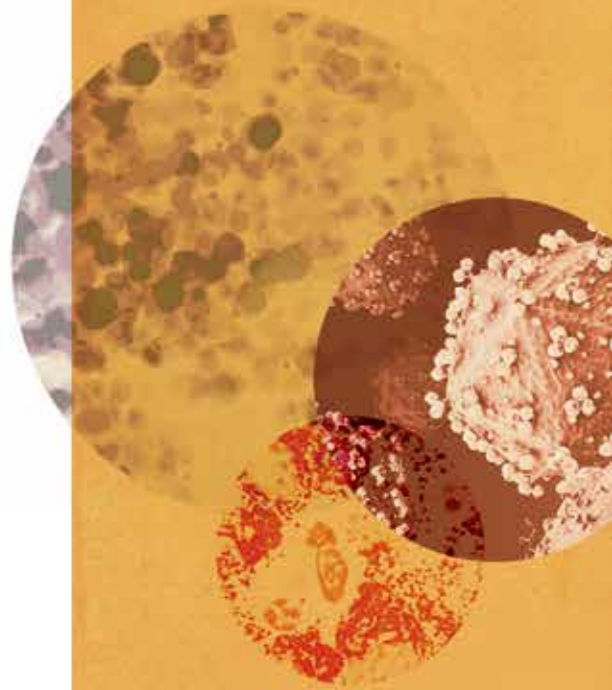


LJI CELEBRATES 30 YEARS OF WORKING TOWARD LIFE WITHOUT DISEASE WITH A NEW NAME

Since its inception 30 years ago, La Jolla Institute for Immunology has solely dedicated itself to understanding the far-reaching power of the immune system because we have always believed that no other biomedical discipline has greater implications for improving human health. Today, the Institute is widely recognized as one of world's most influential centers for immunology research and proudly celebrates 30 years of groundbreaking research with a new name.

Formerly known as "La Jolla Institute for Allergy and Immunology", the Institute has changed its name to La Jolla Institute for Immunology to reflect its singular focus: to understand and harness the power of the immune system. Allergies remain an important problem and are still researched at the Institute, but they are only a part of the broad impact that results from research on the immune system and immune-related diseases.

"There has never been a more exciting time to be an immunologist," says President and Chief Scientific Officer Mitchell Kronenberg, Ph.D., who has been leading the Institute since 2003. "Every day, we learn more about how the immune system intersects in often unexpected ways with other systems in the body, opening up new opportunities to prevent and treat disease. La Jolla Institute for Immunology brings a profound understanding of the immune system to the table and undoubtedly will contribute in important ways to the unfolding revolution in how we prevent and treat disease." •



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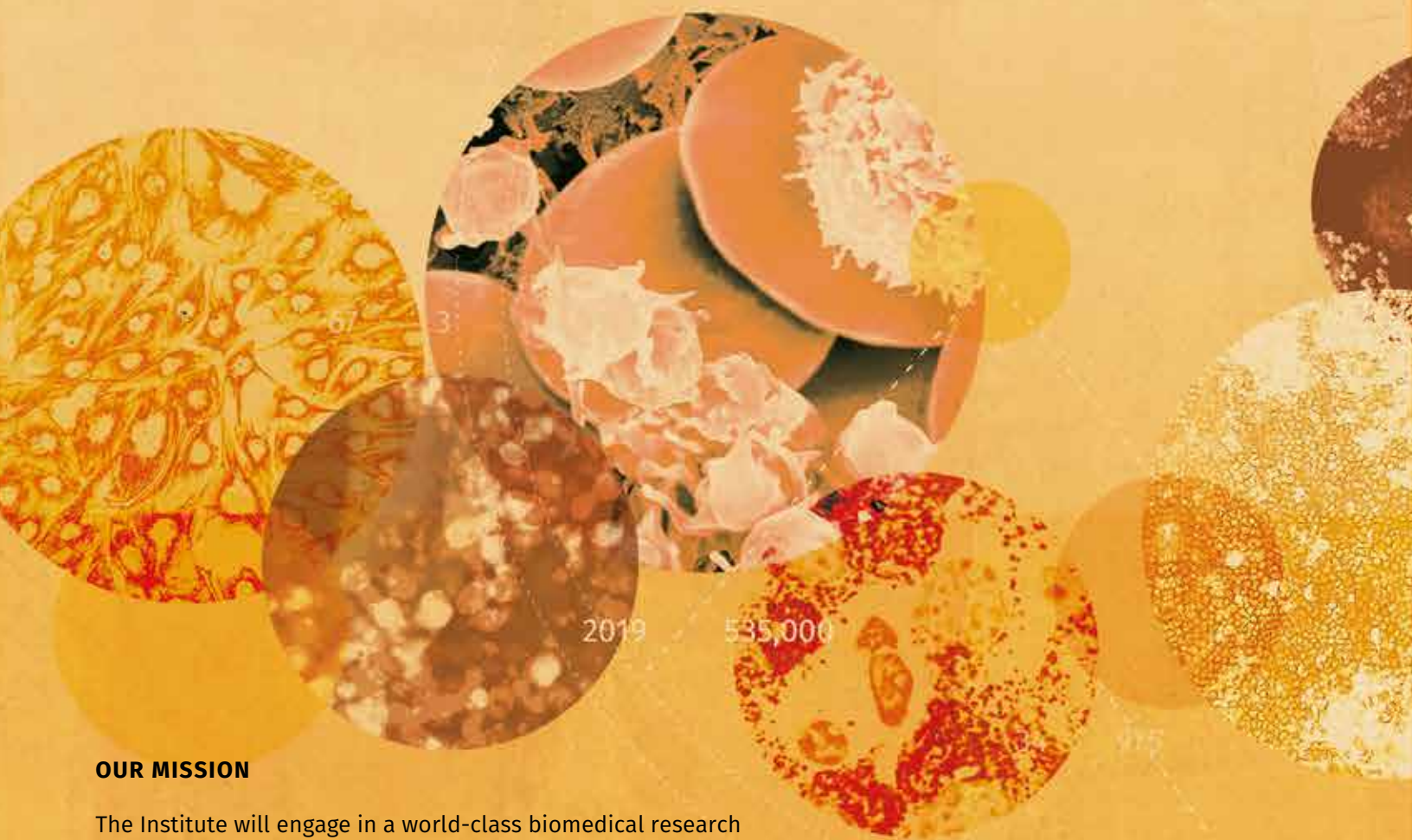
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OUR MISSION

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.



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