

LA JOLLA INSTITUTE FOR ALLERGY AND IMMUNOLOGY

# Immune

Fall 2017

MATTERS



## Attacking Asthma

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Parkinson's Disease

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2017 Donor Honor Roll

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# Immune MATTERS

FALL 2017



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La Jolla Institute's battle against the inflammatory lung disease on three different research fronts offers the potential for developing treatments that will ease the suffering of asthmatics around the world.

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### IMMUNE MATTERS CONTRIBUTORS

Nick Abadilla	Jessica Roi
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### ON THE COVER

Mouse lung architecture. Courtesy of Dr. Catie Crosby, La Jolla Institute

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## Letter from the President

Funding from the National Institutes of Health is the lifeblood of independent research organizations like La Jolla Institute and for nearly three decades we've enjoyed an outstanding rate of success in attracting NIH grants.

Unfortunately, three proposed changes in NIH funding policies for the 2018 budget threaten severe cutbacks that would devastate our ability to conduct groundbreaking immunology research.

First, a proposed change would limit the number of grants any one researcher could receive. The NIH promoted this based on a study claiming the productivity per grant of well-funded labs decreased with each additional grant they receive.

Fortunately, this change has been put on hold, thanks in no small part to our own Shane Crotty, Ph.D., Professor in the Division of Vaccine Discovery. Dr. Crotty, who you'll read about in the Q&A section of this issue, invested countless hours in conducting his own inquiry into the NIH data, and he discovered they were highly flawed. Shane's communications with top NIH officials and blog on the subject helped persuade NIH Director Francis Collins to drop this limit, for now.

A second threat is a massive and unprecedented 21 percent decrease in the 2018 NIH budget proposed by the Executive Branch. To assuage fears this would delay critical progress, they also proposed the third threat, a slash of the indirect costs allowed as part of every grant to a flat 10 percent, way below the current rate for every university or research institute. Critical "indirect" costs are not what is typically considered overhead, but they include items required for research, such as core facilities that have specialized, technical capabilities. Together the second and third threats jeopardize the existence of independent research organizations across the nation, they threaten America's global leadership in biomedical research, and they cast a pall over our progress in developing lifesaving treatments. Thankfully, the bills going through Congress with bipartisan support do not contain such drastic budget cuts, but the final appropriations have not yet been approved and we are carefully monitoring the situation.



There's no better example of what NIH funding means to the Institute than our exciting research on asthma, a complex disease with growing prevalence and no cure. In our cover story, you'll see how three of our principal investigators are studying asthma from completely different immune system perspectives, using innovative approaches that are rapidly expanding our knowledge of this debilitating lung disease.

In this issue, you'll also read about the fascinating work of Professor Alessandro Sette, Dr. Biol. Sci., Head of the Division of Vaccine Discovery, who has discovered the first direct evidence that autoimmunity—in which the immune system attacks the body's own tissues—plays a role in Parkinson's disease.

Finally, I think you'll enjoy reading about the two newest members of our Board of Directors, Vanessa V. Wertheim, Ph.D., R.N., and David Steffy, MPA. Both have had successful careers in health care and both have family members who have suffered from immune system-related diseases.

As always, La Jolla Institute is appreciative of all of our wonderful partners—including individual donors, foundations, and federal funding sources—who play such a crucial role in supporting research we believe is leading us closer to achieving our mission of *Life Without Disease*®.

Sincerely,

A handwritten signature in dark ink that reads "Mitchell Kronenberg". The signature is written in a cursive, flowing style.

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

# Attacking Asthma . . .

La Jolla Institute's battle against the inflammatory lung disease on three different research fronts offers the potential for developing treatments that will ease the suffering of asthmatics around the world.



**U**nless you have experienced an asthma attack first-hand or know someone who has, you may believe asthma is simply a disease that makes it hard to breathe. Nothing could be further from the truth. Asthma is a terrifying and debilitating ailment that has no cure, afflicts 300 million people around the world, and kills 400,000 each year.

Asthma is caused by an inappropriate and overly vigorous immune or inflammatory response to harmless environmental agents. La Jolla Institute has taken asthma seriously as a global health problem for two decades, and as a result, made significant progress in understanding how cells and proteins of the immune system drive this chronic inflammatory lung disease.



It recently, the groundbreaking work of three pioneering Institute principal investigators—each with his own passionate dedication for attacking asthma—has made the Institute one of the leading research centers in the world for studying the disease. A series of significant discoveries could soon lead to important new treatments.

It makes the work Toshiaki Kawakami, M.D., Ph.D., Durangan Vijayanand, M.D., Ph.D., and Michael Croft, Ph.D., particularly interesting and potentially even more effective as the scientists are investigating the disease from three completely different scientific perspectives. As immunologists, what they have in common is they are trying to understand what causes the immune system to produce antibodies and

other proteins that set off an unwanted inflammatory reaction that attacks normal body tissues within the lungs.

Whether that inflammatory response is caused by environmental exposure to an allergen like pollen, tobacco smoke, air pollution or dust, or a genetic pre-disposition, the result is the same: bronchial tubes narrow and swell, producing extra mucus which makes breathing difficult and triggers coughing, wheezing, and shortness of breath. Mild to moderate forms of the disease can be managed with steroid inhalers and bronchodilators, but severe forms of the disease resist most therapies and have the potential to result in life-threatening asthma attacks.



“We’re excited we may have found the basis for a treatment that could potentially deliver extremely effective asthma treatment to many more patients at a much more affordable cost.”

### Toshiaki Kawakami, M.D., Ph.D.

As a professor in the Division of Cellular Biology, Dr. Kawakami’s ambition is to have an impact on two issues making asthma an increasingly serious disease: the fact that its incidence is actually growing worldwide and that the cost some of the latest and most effective treatments are so expensive some patients can’t afford them.

Dr. Kawakami, who has made novel discoveries into the causes of food allergies, has discovered that some of the same mechanisms are involved in triggering the inflammatory response underpinning asthma. A few years ago, he and his team discovered that a pro-inflammatory protein called histamine-releasing factor (HRF) activated a receptor expressed on mast cells—a type of white blood immune system cell—and that this plays a key role in unleashing the symptoms of asthma.

Armed with that information, Dr. Kawakami then identified two peptides that blocked HRF activity and decreased airway inflammation in mouse models of asthma. Dr. Kawakami said the discovery is particularly important because the peptides are inexpensive to produce and would cost a fraction of so called monoclonal antibody therapies that are in use today to treat moderate-to-severe asthmatic patients.

“As always, we have to wait to see if we can produce the same results in human patients, but we’re excited we may have found the basis for a treatment that could potentially deliver extremely effective asthma treatment to many more patients at a much more affordable cost,” Dr. Kawakami says. “As both a researcher and a physician, seeing our research translated to the clinic to reduce the suffering of asthma patients would be one of the highlights of work in our lab.”

To understand the motivation of Dr. Vijayanand, Associate Professor in the Division of Vaccine Discovery and a practicing pulmonologist, you only need to go back a few years to an experience he had when a young woman arrived at the hospital in throes of one of the most severe and heart-wrenching asthma attacks the physician had ever witnessed.

“She arrived in critical condition because her lungs had shut down and she literally couldn’t breathe,” recalls Dr. Vijayanand. “We tried everything possible to open up and clear her airways, but the attack had progressed too far and we sadly could not save her.”

**Pandurangan Vijayanand, M.D., Ph.D.**



For the physician side of Dr. Vijayanand, experiences like that are deeply emotional. Even as his research career as an immunologist has taken off, he still travels to England four times a year to work in a clinic treating patients with lung ailments, including those with all types of asthma. His frustration in not being able to offer any real help or hope to moderate-to-severe asthmatics drives his intense desire to use his research skills at La Jolla Institute to solve the mysteries of the disease and develop significantly improved therapies, if not vaccines, and hopefully someday even a cure.

A major step in that direction came in 2014 when Dr. Vijayanand and his colleagues published a pioneering study in the journal *Nature Immunology* demonstrating how the use of powerful new genomic tools could identify specific genes that could be targeted to treat asthma.

Dr. Vijayanand’s discovery was a key factor in his receiving two large five-year asthma research grants from the National Institutes of Health, including one to study the causes of the disease in children.

“The advances in computational biology and the emerging field of epigenetics—which attempts to determine how genes are turned on and off—are truly thrilling because they are allowing us real insight into what genetics is doing to the immune system and why it’s actually predisposing people to develop the disease,” Dr. Vijayanand says. “It’s also why I invest most of my time in the lab. As much as I enjoy my clinical work, I know that over my career the number of patients I will treat is in the thousands. As an immunologist, if our research leads to just one effective drug to treat asthma, I have the potential of helping hundreds of thousands if not several million people.

“As an immunologist, if our research leads to just one effective drug to treat asthma, I have the potential of helping hundreds of thousands if not several million people.”



### Michael Croft, Ph.D.

For Dr. Croft, Professor and Head of the Division of Immune Regulation, motivation for advances in his asthma research comes from the knowledge that he is closer to the end of his scientific career than the beginning, and as much as he enjoys unraveling the basic mechanisms of the immune system, today he's even more interested in seeing his research translated into actual patient treatment.

There's a good chance he will see that happen. As one of the world's foremost T-cell biologists, Dr. Croft and his team are making significant progress in understanding why the same immune cells that protect us can also trigger inflammatory diseases like asthma. One of Dr. Croft's earlier achievements—the discovery of a novel molecular mechanism driving lung inflammation—is the basis for a potential asthma treatment now in human clinical trials.

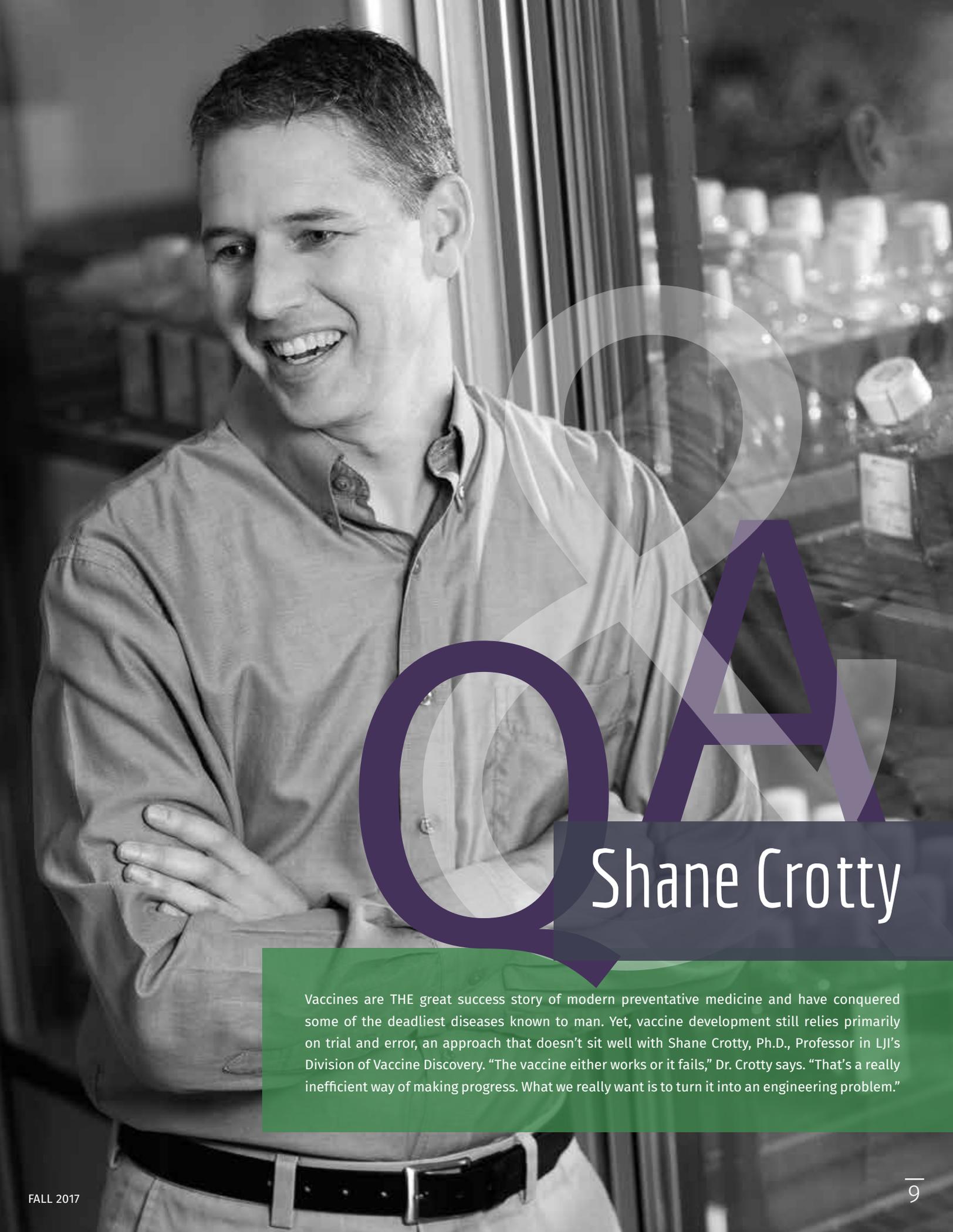


Allergen-induced asthma in a mouse lung.

In a recent and equally groundbreaking discovery, Dr. Croft has found a way to counteract airway wall thickening and tissue scarring, known as fibrosis, seen in many of the most severe asthmatic patients. In a study published in the journal *Nature Medicine*, Dr. Croft found that activity of a pro-inflammatory protein called LIGHT, which is made by T cells, increases airway wall thickness and fibrosis. These changes are thought to be the primary causes of the decline in lung function in severe asthmatics.

More importantly, Dr. Croft's lab has since discovered that when mice that display symptoms of severe asthma were treated with drugs that block LIGHT, they showed significantly less airway wall thickening and fibrosis. Dr. Croft believes LIGHT inhibitors may be effective in reversing the tissue destructive effects of fibrosis, not only in asthmatic lungs, but in other diseases that affect the lung and/or the skin, like chronic obstructive pulmonary disease, idiopathic pulmonary fibrosis, scleroderma, and eczema. Drugs targeting LIGHT are now in safety trials and could be used in the future in patients with fibrosis.

"I believe our work has massive potential beyond treating asthma," Dr. Croft says. "The ability to understand and manipulate extremely strong inflammatory responses could well translate to other autoimmune diseases. For me personally, this may be the most exciting time in my career because I can finally see that all the hard work on basic research that we've invested all these years may soon pay off with the most important result of all, and that's providing effective treatments that truly change the lives of patients who every day have to battle asthma and other serious diseases." •



# Q&A

Shane Crotty

Vaccines are THE great success story of modern preventative medicine and have conquered some of the deadliest diseases known to man. Yet, vaccine development still relies primarily on trial and error, an approach that doesn't sit well with Shane Crotty, Ph.D., Professor in LJI's Division of Vaccine Discovery. "The vaccine either works or it fails," Dr. Crotty says. "That's a really inefficient way of making progress. What we really want is to turn it into an engineering problem."

## QUESTIONS & ANSWERS

# Shane Crotty

## Vaccine immunologist

With that goal in mind, Dr. Crotty dedicated himself to studying vaccine-related immunology to understand the fundamentals of what makes a good immune response. He drew national attention when he discovered a pivotal piece of the body's mechanism for switching on the production of antibodies, a key ingredient of a strong immune response and the essential feature of the immune response to nearly all licensed vaccines. The process hinges on so called follicular helper T (Tfh) cells, which instruct B cells to start churning out antibodies that effectively neutralize or prevent infection. Most importantly, Dr. Crotty demonstrated that Tfh cells are crucial to triggering broadly neutralizing antibodies against HIV, the virus that causes AIDS. This seminal finding led to Dr. Crotty's international recognition as an expert in vaccine design, and to his inclusion as a T cell expert in one of the nation's top AIDS vaccine consortiums.

Last year, Dr. Crotty officially rose to the rank of Highly Cited Researcher, a select group of pioneering scientists whose work wields outsized influence in their respective fields of study. He is also the author of *Ahead of the Curve*, an acclaimed biography of Nobel laureate scientist David Baltimore.

### What sparked your interest in science?

Sharks.

### Can you explain?

During my junior year in high school, I was accepted into the National Science Foundation's Young Scholars program. It was a phenomenal program. It took high school students from across the Los Angeles area and paired them with a research professor at a nearby university. But I grew up in Antelope Valley, in the high desert at the outer edge of Los Angeles and the nearest university was an hour and a half away. The solution, somewhat counterintuitively, was to send me to the UCLA/USC joint marine biology lab on Catalina Island, which is the furthest possible distance in L.A. County from where I lived. So, once a month, I spent the weekend on Catalina Island.

### Is that where you encountered the sharks?

Yes, I was part of a project that asked whether horned sharks had color vision. Mostly, it was a very general introduction to experimental science but based on that experience I wanted to go to a college where I could actually do experiments.

### Where did your interest in writing originate?

Science relies heavily on writing and I wanted to be able to do it well. Publications, and even more so grant applications, need to cover a lot of complicated matters in very little space and that's really hard to do well. I also wanted to be able to communicate science to non-scientists. The public is constantly making decisions about science and policy such as recombinant DNA, cloning organisms, or genetically modified food, often without a basic understanding of the underlying science.



“Cutting-edge research is about being at the edge of the known versus the unknown and trying to figure out new things starting with very limited information.”



### How did you pick David Baltimore as your subject?

For one of my writing classes I had to write a 25-page biography. I had three tenets: It was going to be a biologist but it needed to be somebody alive because I wanted to interview that person. And there had to be conflict. Without conflict, books are boring and books about science doubly so. All I knew about Baltimore was that he was controversial and that he had won a Nobel Prize. He really evoked some powerful emotions in people.

### Isn't a class assignment still a far cry from publishing a full-length biography?

Eventually, I expanded that paper into a full thesis project because by that point it was also clear to me that David Baltimore was a great prism for talking about different areas of science since he had had such a great impact on so many different fields. It was actually my thesis advisor who suggested that I publish the biography. After a few false starts, I took a month off during my Ph.D. to finish it up. In the end, it was seven years from the beginning to the end of the project.

### What piqued your interest in viruses?

During my Ph.D. at UCSF I took a virology course in part because some people had recommended it. In fact, it was phenomenal. Viruses do all kinds of seemingly impossible tricks to take over a cell. They were these really cool little puzzles.

### How did you get from viruses to vaccine immunology?

One of the projects in the lab at time was a vaccine-related study. From a vaccine perspective, the immunization experiments would either work or they would fail. There was some immunological data collected but it didn't inform the next experiment in a predictive way. I couldn't believe that we could have the most successful medicines of the 20th century but didn't know how to improve them or make new ones in a scientific way. I didn't know much about immunology but it was clear to me that we should be able to do better.

### Of all the viruses for which we don't have vaccines, why did you choose HIV?

HIV is still one of the top three killers in the world. In the U.S., HIV is basically invisible and very few people die of AIDS but there are more people infected in our country now than ever before. And the number of cases continues to go up. In places like South Africa it's still a truly horrible epidemic and the number of deaths is staggering.

### Will there ever be an HIV vaccine?

Over the last five years we have made extraordinary progress with our colleagues and right now there's more excitement about the possibility of an HIV vaccine than ever before. The strategies we are pursuing look really promising, whereas five years ago most everybody said it's not worth working on an HIV vaccine because it's just not possible.

### What keeps you going in the face of seemingly insurmountable scientific challenges?

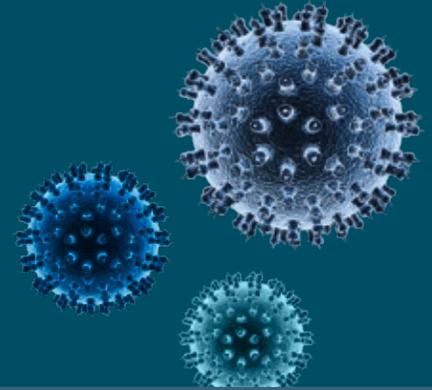
Working on vaccines is just incredibly motivating. They are extraordinary in terms of the number of lives they save and more broadly in terms of their socioeconomic impact. When you can interrupt the cycle of epidemics and keep lots of people from becoming sick, missing work, or dying, you create social stability and economic advances. For me, those are really powerful motivators.

### What advice do you give to budding scientists?

Research is about delayed gratification. People are used to doing things where they get some reward at the end of the day, the end of the week, maybe at the end of the month. Science doesn't work like that. Cutting-edge research is about being at the edge of the known versus the unknown and trying to figure out new things starting with very limited information. When you are going after the big questions you can easily go a year or more while there is essentially no evidence you're making progress. And you have to be ready to fail—a lot. If you are not failing at an experiment in science, you are not doing anything interesting. ●



# Somayeh Sabouri



There are many misconceptions about women in Iran—that they are seen but not heard, second-class citizens with limited educational opportunities. Nothing could be further from the truth. Seventy percent of Iran’s science and engineering students are women and they are a force to be reckoned with. Somayeh Sabouri, Ph.D., a postdoctoral researcher in Professor Matthias von Herrath’s lab, is one of them.

Beneath an outwardly quiet demeanor, Dr. Sabouri hides a fearless and adventurous spirit that led her halfway around the world. Born in Iran’s northeast corner, Dr. Sabouri grew up speaking Turkish and Farsi. From junior high to her master’s studies, she concentrated on her education with a laser-sharp focus to improve her odds of being accepted into an international Ph.D. program. “I felt that job opportunities for scientists in general, not just female scientists, were limited,” she explains.

Instead of taking the literal “easy way out,” Dr. Sabouri went to Japan and joined the lab of an eminent immunologist, Professor Tasuku Honjo, M.D., Ph.D., at Kyoto University. “It was the most challenging thing I’ve ever done,” she says.

“Japanese culture is lovely but it is just so different. If you can survive in Japan, especially completing your Ph.D., you can survive anywhere else,” she adds with a laugh. By the time she received her doctoral degree from Kyoto

University, she spoke Japanese and had learned how to read and write most commonly used Japanese characters.

But all along, Dr. Sabouri’s plan was to eventually move to the U.S. She specifically searched for places where she could continue her immunology research and ended up with a list of around 30 institutes and universities. “I quickly decided that La Jolla Institute was the best place for me,” she says. “The fact that it had been voted ‘Best place to work in academia’ certainly helped.”

Dr. Sabouri joined the lab of Dr. von Herrath, whom she had first met when she attended summer school at Riken Institute in Yokohama as a graduate student. She is interested how viral infections, particularly herpesvirus 6, contribute to the pathogenesis of type 1 diabetes, an autoimmune disease that destroys insulin-producing beta cells in the pancreas. “It is thought that both genetic and environmental factors, such as viral infections, may trigger the disease. However, little is known about the involvement of herpesviruses,” she explains.

When she is not hunting for viral footprints in pancreatic tissues, Dr. Sabouri challenges herself to learn how to play setar, a traditional Persian string instrument, explore San Diego, travel to the other states in the U.S., and add new languages to her ever-growing repertoire—most recently Swedish. ●

# Parkinson's Disease and Autoimmunity:

## What is the connection?

**T**he idea that a malfunctioning immune system contributes to Parkinson's disease, a neurodegenerative condition, dates back almost 100 years, but until now no one has been able to show a formal connection in the lab.

La Jolla Institute researchers, together with their collaborators at Columbia University in New York City, found the first direct evidence that Parkinson's disease may be an autoimmune disorder, in which the immune system mistakenly attacks part of the body. Their findings raised the tantalizing possibility that the death of neurons in Parkinson's could be prevented by therapies that dampen this unwanted immune response.

Parkinson's begins with the accumulation of misfolded alpha-synuclein protein in the brain. Neighboring dopamine-producing neurons then die, causing the hallmark tremors and difficulty moving. The prevailing wisdom has been that these neurons die from a toxic reaction to alpha-synuclein deposits.

However, Parkinson's has been linked to some gene variants that affect how the immune system works, leading to an alternative theory that alpha-synuclein causes Parkinson's by triggering the immune system to attack the brain.

A strong argument against this theory had been the belief by many scientists that brain cells are

safe from immune system attack, because most neurons lack the surface molecules that display antigens—the markers immune cells use to recognize a target.

In an earlier report, study co-leader David Sulzer, Ph.D., Professor of Neurobiology at Columbia, discovered that dopamine-producing neurons can in fact display antigens. As a result, he concluded that T cells had the potential to be tricked into thinking dopamine neurons are foreign and therefore targets of attack by the buildup of damaged alpha-synuclein proteins.

In the current study, Professor Alessandro Sette, Dr. Biol. Sci., Head of the Division of Vaccine Discovery, and his team were able to show that in people with Parkinson's two fragments of alpha-synuclein can activate T cells potentially involved in autoimmune attacks. In particular, the immune response was associated with a common form of a gene that helps to direct the immune response, which may explain why many people with Parkinson's disease carry this gene variant.

Although it isn't clear yet whether the immune response directly causes neurons to die or whether it is merely a side effect of the disease, these findings could provide a much-needed diagnostic test for Parkinson's disease, and could help clinicians identify individuals at risk or in the early stages of the disease.

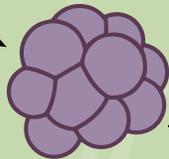
ABOUT 1.5 MILLION AMERICANS HAVE PARKINSON'S DISEASE AND 60,000 MORE ARE DIAGNOSED WITH IT EACH YEAR. MOST PEOPLE WHO GET THE DISEASE ARE OLDER THAN 60, BUT ABOUT 15 PERCENT ARE DIAGNOSED BEFORE AGE 50.

Parkinson's slowly destroys dopamine-producing cells in the brain. Dopamine—an important signaling molecule in the brain—plays an important role in controlling movement, cognition, learning, and mood, explaining the dementia and difficulty with motor control exhibited by patients with Parkinson's disease.

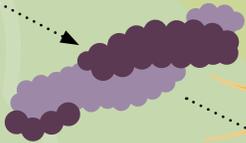
misfolded alpha-synuclein



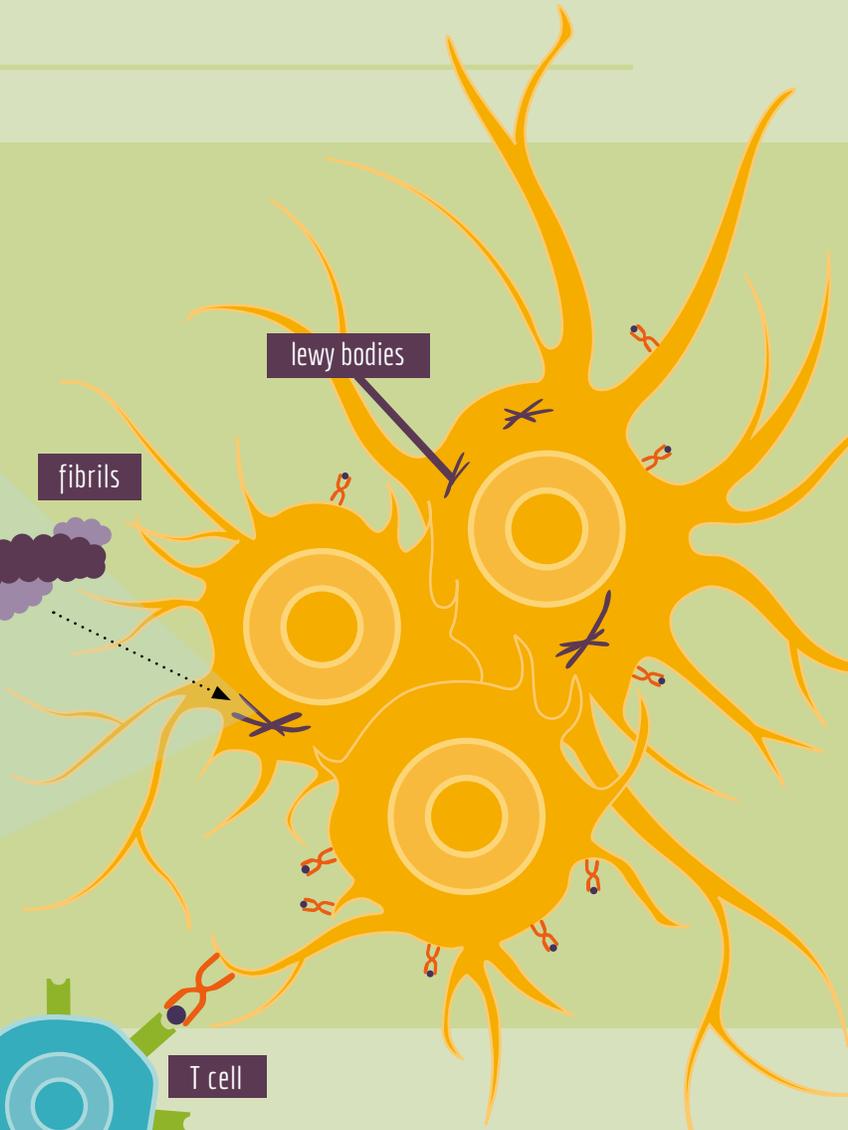
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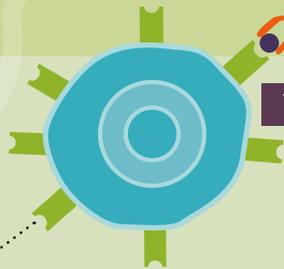


lewy bodies



The alpha-synuclein gene was one of the first genes to be implicated in Parkinson's disease. It produces a protein that can, under certain circumstances, accumulate inside neurons. The resulting protein clumps, known as Lewy bodies, disrupt normal cell function and are a hallmark of the disease.

T cell



activated T cells



Alpha-synuclein fragments can trigger the immune system, causing it to tag them as foreign invaders. In a blood test, immune cells called T cells became activated when exposed to the protein in about 40 percent of Parkinson's patients in a new study. This autoimmune response may contribute to the progression of the disease.

# BOARD OF DIRECTORS welcomes two new members

La Jolla Institute has appointed two new members to its Board of Directors, drawing talent from health care and biotech entrepreneurs dedicated to advancing scientific research.

The new board members are Vanessa V. Wertheim, Ph.D., R.N., a health care executive and entrepreneur, and David L. Steffy, one of the nation's leading hospital industry executives and more recently a biotech entrepreneur and philanthropist.

## Vanessa Wertheim, Ph.D., R.N.

Dr. Wertheim has one of the most varied professional backgrounds among Institute board members, having enjoyed success as a health care researcher, an entrepreneur who has created several companies, a neonatal intensive care unit nurse at Rady Children's Hospital-San Diego, and an executive at Rady Children's Institute for Genomic Medicine. Currently, Dr. Wertheim is a consultant specializing in health care engagement solutions.

Dr. Wertheim says she is looking forward to serving on the Institute board. "There are many reasons I wanted to become involved with La Jolla Institute: as a mom with a son and a daughter who both face incurable autoimmune diseases, and as a researcher, I'm particularly attuned to the need for research in this area," Dr. Wertheim says. "I'm honored to be given this opportunity to be involved in a remarkable research institute that I believe is on the path to developing cures for some of our most serious immune-based diseases."

Dr. Wertheim's career path was shaped in part by the medical challenges she faced as a 29-week preemie born at just two pounds, 10 ounces. She was also

inspired by the lifelong support of her two remarkable parents Nicole and Herbert A. Wertheim, O.D., D.Sc., M.D. (h.c.). Her father, who Dr. Wertheim is succeeding on the Institute board, is a noted scientist, clinician, entrepreneur, philanthropist, and founder and CEO of Brain Power, Inc., the world's largest manufacturer of ophthalmic instruments and chemicals.

Born and raised in the Miami, Fla., area, Dr. Wertheim started her research career at the University of California San Diego School of Medicine where she collected patient safety data in the operating room. Recognizing the importance of high-functioning teams, she earned an MBA from the University of Miami with a specialization in leadership in teams, and subsequently received a master's certificate in health care leadership from Cornell University.

After a number of years building and managing startups, Dr. Wertheim turned her sights on the clinical arena as a night-shift nurse in Rady Children's neonatal intensive care unit. She later returned to school at the University of San Diego, where she received her Ph.D. in nursing with a focus on health care engagement.



In 2015, Dr. Wertheim was asked to become an advisor to the hospital and to help create the new Rady Children's Institute for Genomic Medicine as its first employee and Director of Engagement and Education.

Earlier this year, Dr. Wertheim started PRISM Engagement LLC, a health care solutions consulting firm specializing in bridging the gaps in knowledge for health care facilities, medical practitioners, and the general public. Dr. Wertheim currently serves as a Director of the Dr. Herbert and Nicole Wertheim Family Foundation and is a member of the Board of Advisors for UC San Diego Health Sciences. ●

“This is an exciting time for immune system research and La Jolla Institute. I am confident that the breadth and depth of the new board members’ talents will help us drive our research to the next level where it will directly benefit people’s lives.”

– Mitchell Kronenberg, Ph.D., La Jolla Institute President and Chief Scientific Officer

## David Steffy, MPA

Mr. Steffy has enjoyed an outstanding career in running and owning hospitals for more than four decades. More recently, he has endowed a research fund at UCLA and created a biotech company to study interstitial pulmonary fibrosis (IPF), a disease that has affected several members of his family.

“I’m proud that a significant portion of my career has been devoted to service to others, whether it’s helping the medically underserved in small communities or supporting research to discover novel treatments for serious diseases,” Steffy said. “I’m particularly pleased to become involved with La Jolla Institute. They have the scientific talent, world-class facilities, and commitment that are vital to understanding and treating the types of diseases that took the lives of my relatives and so many other families.”

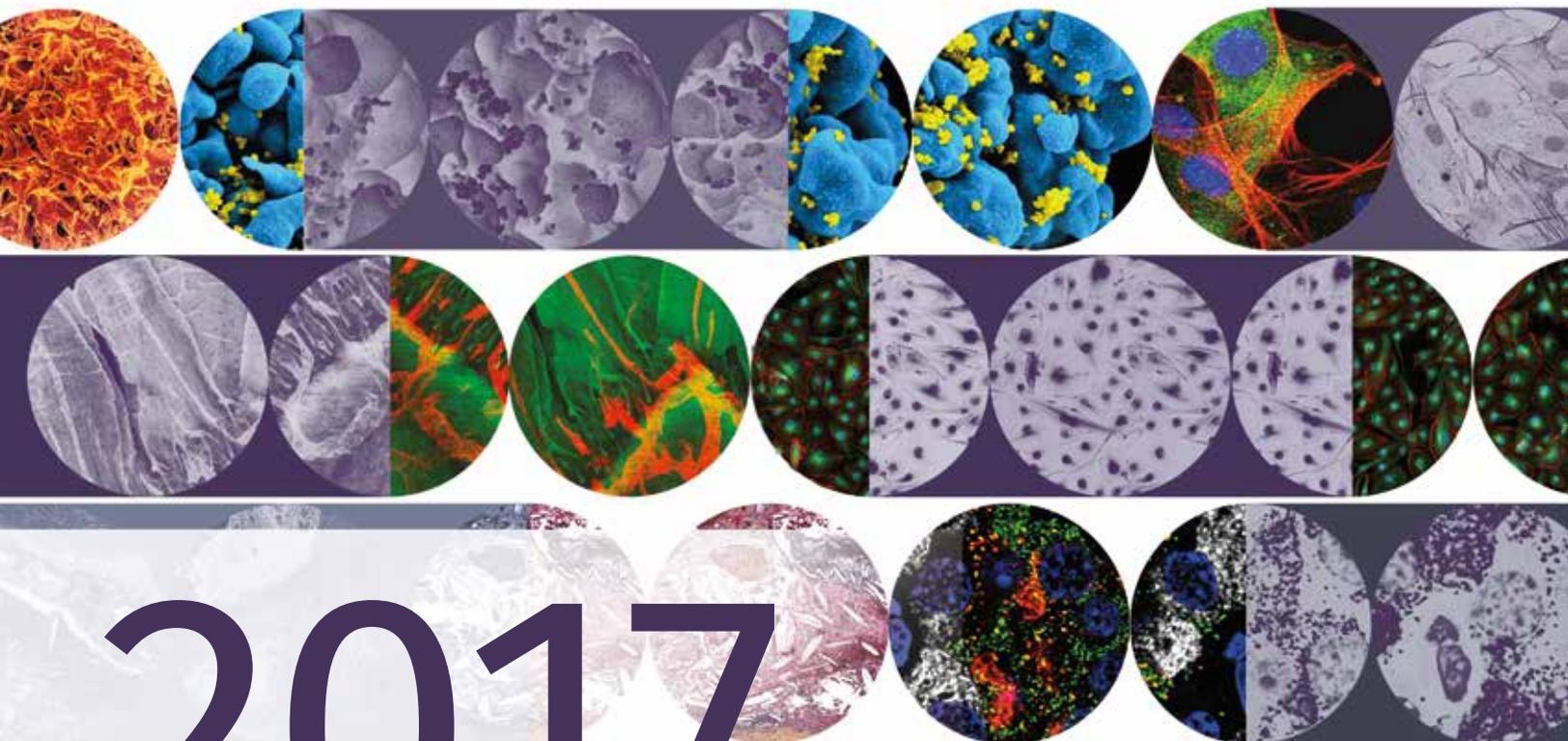
Raised in Columbus, Ohio, Steffy earned a BS in Business Administration at The Ohio State University. He received his first glimpse of the world of medicine when he served in the Medical Corps in the Army. His first hospital job was

at The Ohio State Medical Center where he served as Assistant Business Manager. Steffy moved to Los Angeles to attend the University of Southern California where he obtained a master’s in public administration while working at UCLA’s School of Public Health. Steffy was hired out of USC as Assistant Administrator at the University of Cincinnati Medical Center and then moved back to his alma mater at Ohio State, where over a six-year period he rose from Associate Administrator of outpatient services to Director of Hospital Administration, the medical center’s top executive position.

Steffy moved to Hospital Affiliates, marking a shift in his career to managing the operation of multiple hospitals at a corporate level and then founding and operating his own hospital management companies, including Republic Health in Dallas and Community Health Systems, which specialized in operating small community hospitals. Steffy later launched a national chain of 125 hospices and created a company that operated psychiatric hospitals.



By 2014, having sold or divested most of his corporate holdings, Steffy turned his attention to supporting research into IPF, the disease that had such a devastating impact on his family. He established The Steffy Research Fund at the Broad Stem Cell Center at UCLA and co-founded InSpira LLC, a biotech firm targeting fibrotic disease. Steffy is also a director and treasurer of the Pulmonary Fibrosis Foundation and a member of the Board of Overseers of The Hoover Institution. ●



# 2017

## Donor Honor Roll

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## Katie & Mark Bowles

Over the years, Katie and Mark Bowles have felt two emotions as they've watched their love ones struggle with or lose their lives to serious disease: deep sadness and a sense of helplessness because they could do nothing to prevent it.

The sadness never really goes away, but the La Jolla couple no longer feels helpless. They believe they can have a major impact on preventing and curing disease by donating to the La Jolla Institute and through Mark's service on the Institute Board of Directors.

Mark's mother died of breast cancer at 49, his sister survived the disease, and a number of other family members have succumbed to heart attacks and other illnesses. Katie's relatives have faced similar challenges, including her mother and brother-in-law who suffer from Crohn's disease.

"We're like everyone else whose families have been touched by illness, but fortunately the Institute and their incredible scientists have empowered us into believing we can help save lives by assisting their groundbreaking research," says Mark, a longtime business leader in technology, venture capital, and health care.

Katie adds, "When you see people you love endure a horrible disease like Crohn's, it's really exciting and satisfying to know you're involved with an organization that has already made significant process in researching and treating that disease and may well discover a cure in the near future. We have no doubt the Institute's unique understanding of the immune system is going to save many lives in the future."

Mark believes the Institute's scientists are critically important pioneers.

"When you think about frontiers you think about space and the ocean, but the immune system and its role in health is a vast frontier of its own and I would argue it's the one that is most fascinating and crucial to humans," he says. "Katie and I aren't scientists but we feel our involvement with the Institute is allowing us play an important role in this vital research and exploration."

“When you see people you love endure a horrible disease like Crohn's, it's really exciting and satisfying to know you're involved with an organization that has already made significant process in researching and treating that disease.”



## Lori & Paul Thiel

When Lori and Paul Thiel first heard about the La Jolla Institute four years ago, they thought the organization's stated mission of "Life Without Disease" was extremely ambitious if not audacious.

Today, now that the La Jolla couple is intimately familiar with the talented scientists and the pioneering research at the Institute, they believe that goal is completely within the realm of possibility. In fact, it has motivated the Thiels to become involved with the Institute, not just through their financial gifts but by volunteering their time through Paul's co-chairing the Institute's Planned Giving Advisory Council and Lori's serving as an ambassador. The Thiels also sponsor and run the BNY Mellon non-profit Financial Advisor of the Year Award, a not-for-profit educational organization that hosts an annual awards event which raises funds for the Institute.

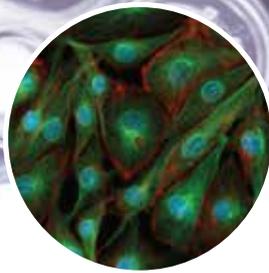
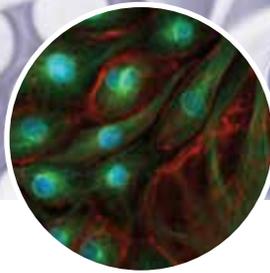
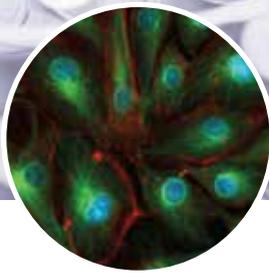
"'Life Without Disease' sounds really bold until you learn the immune system they're studying is both the foundation for good health and often the cause of disease,"

says Lori, a top communications executive who has worked with Honeywell, Porsche, and other major companies. "The Institute has known for years that immunology is the key to human health and that's why their brilliant scientists are ahead of almost everyone else in the world in finding ways to prevent and some day cure an array of life-threatening illnesses."

For Paul, a former award-winning journalist who today is Managing Director for BNY Mellon Wealth Management, the Institute offers one of the best investments in science.

"Because Lori and I have both had so many family members who have battled disease, our philosophy is that we want our philanthropic dollars to have impact and make a real difference scientifically," Paul says. "At the Institute we know our contributions go directly into the laboratories to support research that is actually paying off in major discoveries. The opportunity for us to play a role in furthering a mission that could one day lead to 'Life Without Disease' is one of the most exciting and satisfying things we've ever done."

“'Life without Disease' sounds really bold until you learn the immune system they're studying is both the foundation for good health and often the cause of disease.”



### \$10,000 - \$24,999

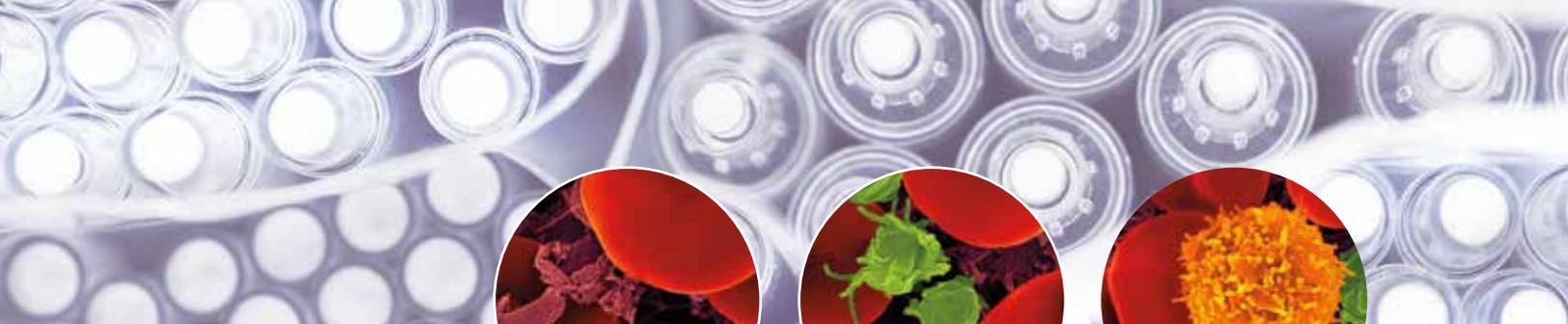
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The information listed above represents lifetime contributions as of September 2017.

\*Deceased



## Rachel & Bob Perlmutter

The idea of basic research may not excite the uninitiated, but to La Jolla Institute donors Rachel and Bob Perlmutter, the exploration Institute scientists conduct into the mechanisms of the immune system is some of the most thrilling science in the world.

“When you look at the remarkable breakthroughs coming out of the Institute, you can see how basic research is the foundation of all discovery,” says Rachel. “It’s even more exciting when it takes them down completely unexpected paths that lead to major advances in treating other diseases.”

To understand the La Jolla couple’s passion for the Institute’s work, you should know that Rachel, a retired school teacher, grew up around academic science as the daughter of a noted cell biologist, and Bob is a Stanford-trained Ph.D. in electrical engineering who was involved in the early development of MRI machines.

On a more emotional level, the Perlmutter family also support the Institute financially because their extended family has been afflicted by a number of autoimmune diseases, including multiple sclerosis, Parkinson’s and one that has hit devastatingly close to home.

“When our son was in college he developed type 1 diabetes and to this day has to inject himself six times a day,” says Bob. “It’s a terrible disease, so you can imagine how thrilled we were when we learned a principal investigator at the Institute, Matthias von Herrath, was named the number one diabetes researcher in the world. His innovative work gives us real hope that our son will be cured in our lifetime.”

Toward that end, Rachel believes her family’s gifts and those of other donors represent a vital investment in accelerating the impact of basic research

“We love the Institute’s slogan of ‘Life Without Disease’ because it is both aspirational and inspirational,” she says. “Bob and I are gratified to play a role in advancing science we believe will soon dramatically reduce suffering for millions around the world.”

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### Our Mission

La Jolla Institute for Allergy and Immunology is dedicated to understanding the intricacies and power of the immune system so that we may apply that knowledge to promote human health and prevent a wide range of diseases. Since its founding in 1988 as an independent, nonprofit research organization, the Institute has made numerous advances leading toward its goal:

*Life Without Disease®.*



[www.lji.org](http://www.lji.org)

Support us on **#GIVINGTUESDAY** November 28, 2017