

Stanford
MEDICINE

Sean N. Parker Center
for Allergy & Asthma Research



Tackling Tough Challenges

2022 ALLERGY + ASTHMA UPDATE



Top: Center staff and other stakeholders get a behind-the-scenes tour of the clinic while it's still under construction. Bottom left: Sharon Chinthrajah (right), clinical translational research director, and Catherine Feight, clinical program manager, review the site renderings. Bottom right: The architect team leads Center staff on a tour.



Coming Soon: the David and Julia Koch Clinic at the Sean N. Parker Center for Allergy & Asthma Research at Stanford University



A transformative gift from Julia and David Koch will allow the Center to open the new Koch Clinic on the Stanford campus this fall, expanding our ability to provide world-class care. The 4,000-square-foot facility will have 14 exam bays, enabling us to see 20 to 30 patients a day.

The clinic is just a 10-minute walk from the Center's wet and dry laboratory space in the Biomedical Innovations Building. We will be able to draw blood from a patient at the Koch Clinic and have it at the lab for further testing within an hour.

Julia Koch said, "Through this gift, we hope to advance innovative research and allow more individuals and families to enjoy fuller lives."

Many thanks to the Kochs, whose vision and generosity will have an impact on allergy and asthma care for many years to come!



Learn more

Scan the QR code for photos of the ribbon-cutting and finished space.



Facing Global Climate Change



The interconnections between human-caused climate change and public health threats have become increasingly clear. The Center is responding to these inseparable challenges by illuminating the impacts climate change has on disease,

especially in relation to immune dysfunction. In this way, we are at the forefront of research on how the health of the planet affects human health.

Over the last year, our physician-scientists have published 10 articles in leading peer-reviewed journals on key aspects of the emerging public health emergencies brought on by

a changing climate. Our research on this complex topic helped lead to the development of international and national strategies in support of community action. Some of our recently published papers call on policymakers in the federal government, United Nations, and World Health Organization to address climate change in equitable and sustainable ways. These papers outline new global air quality recommendations and highlight the need for more investments in research on the direct and indirect effects of adverse environmental conditions. One paper proposes integrating planetary health measures into clinical guidelines for managing severe health conditions linked to climate change—including allergies, asthma, and cardiovascular disease.



Wildfires and the Immune System

Under the direction of **Mary Prunicki, MD, PhD**, and with the support of a \$10.5 million grant from the National Institutes of Health’s National Heart, Lung, and Blood Institute, we are getting a better idea of how wildfire smoke and related pollutants affect health at a molecular level.

For example, an ongoing study of active-duty and retired firefighters is using microsamples of blood to detect the acute and chronic or delayed health consequences that come from being exposed to toxic pollutants and chemicals when facing fire. Because only such small samples are needed, our firefighter participants were able to collect samples themselves, which allowed us to continue this research during COVID-19 restrictions.

Preliminary data from another study of people exposed to smoke during the 2020 Bay Area wildfires found that even healthy people working primarily indoors had biomarkers associated with several elevated inflammatory pathways, which could have serious consequences for the heart, brain, and lungs.



Our Work on Air Pollution

An article published in the June 2022 issue of the *New England Journal of Medicine* co-authored by **Kari Nadeau, MD, PhD, FAACAP**, director of the Sean N. Parker Center for Allergy & Asthma Research at Stanford University, describes how air pollution may hurt children’s health more than adults’. Children metabolize toxins differently than adults, and also need more air on a per-pound basis, putting them at a higher risk of negative long-term outcomes from air pollution. In other research, we have found that childhood exposure to dirty air can affect learning and increase the risk of serious illnesses developing in adulthood.

In another study, conducted in Fresno (a heavily polluted city in central California), Center researchers found that constant exposure to air pollution during pregnancy may negatively impact the immune function in pregnant women and their babies after birth.

It is funding from donors like you that gives us the opportunity to study this vital topic, and to push for real change at the highest levels.



Learn more

For more information on this important work, scan this QR code.



Focus on Food Allergy



Research from our scientists has radically altered the way we approach allergy treatments today compared to 20 years ago, when parents were encouraged to delay the introduction of common food allergens like milk, peanuts,

and shrimp to their babies. While studies have established the importance of introducing single allergens to infants early on to prevent food allergies, it is still unclear what the exact dose, frequency, and number of introduced allergens should be.

A pilot study from our Center provided preliminary data to help answer these questions. It found that giving infants between 4 and 6 months of age a mixture combining many allergenic foods could be safe and effective for preventing food allergy. We are excited by the prospect of further studies to corroborate these findings. In another study, this one on children ages 1 to 3 with a peanut allergy, we found that introducing peanuts desensitized most participants and led to remission of the peanut allergy in 21 percent of them.



Sharon Chinthrajah, MD, our Center’s clinical translational research director, has already shown that measuring certain antibodies along with white blood cells called basophils can predict how well and for how long oral immunotherapy (OIT) will work for people with peanut allergies. Center researchers are now gathering more samples from patients with multiple food allergies and analyzing changes over time in a variety of immune cells. Eventually, they will use data collected from thousands of patients worldwide to create an algorithm for a prognostic device that can run many molecular tests at once and produce an accurate assessment of OIT response, including the risk of serious side effects for each patient.

Many people are diagnosed with allergies in childhood, but some learn of their allergy later in life. However, little is known about the pervasiveness and characteristics of peanut allergy in the adult population. The Center made progress in this area by conducting a survey that found that adults with childhood-onset peanut allergy were significantly more likely to have a current epinephrine prescription and also more likely to have been diagnosed by a physician than were those diagnosed in adulthood. This indicates that further attention needs to be paid to why these differences in emergency care exist.

New Faces, New Roles

Over the last year, we welcomed some new staff to the Center and have many accomplishments to celebrate. Below are a few of the noteworthy updates that we want to share with you—our supporters and friends.



Anjali Garg, MS

Ms. Garg came to the Center as the new executive director in March, bringing more than 15 years of experience in health care consulting, operations, and finance. She is most excited about creating new processes for Center scientists to be able to continue advancing allergy and asthma research.



Tyolhi Tirumalasetty, MD

Dr. Tirumalasetty is a clinical assistant professor at Stanford University who joined the Center in May. She has more than 15 years of experience as a clinician and clinician educator. She has worked with a diverse group of patients and is interested in long-term outcomes in food allergy, biologics in food allergy, atopic dermatitis, and anaphylaxis.



Suzanne Barshow, MD

Dr. Barshow joined the Center in July after completing her allergy and immunology and advanced research fellowships at Duke University. She is passionate about improving the lives of children and adults with food allergies. Dr. Barshow is particularly interested in understanding early life exposures and mechanisms behind the development of allergic disease in addition to novel interventions to prevent and treat food allergy.



Tina B. Sindher, MD

This year, Dr. Sindher has taken on new leadership roles and received prestigious recognition for her work. She is now the director of the Oral Immunotherapy Clinic in Pediatric Allergy at Lucile Packard Children’s Hospital Stanford, and co-chair of the clinician educator grant review committee of Stanford’s Maternal & Child Health Research Institute. She also received the Inspiration Award for Women in Medicine from the American Academy of Allergy, Asthma & Immunology.



Fischer

Oral Immunotherapy: Improving the Lives of the Whole Family

At 6 months of age, Fischer was rushed to the hospital with anaphylactic shock after eating a wheat teething biscuit. Another time he went into shock just from walking into a pizza shop where flour was in the air.

Now, he's 10 and a recent graduate of the COMBINE food trial. **"Because of the trial, I feel like a totally different person,"** he says. He can now eat small portions of the multiple foods he was allergic to. No more canceled play dates because the other parents were too nervous to host Fischer. No more missed opportunities to

vacation in remote locations because he would be too far from a hospital. No more constant anxiety around food. **"This trial improved the lives of everyone in our family,"** says Fischer's mom, Nan.

She said at first she was scared to have Fischer eat small amounts of the foods she had worked so hard to keep from him, but she was quickly reassured. "What makes the program so special is not only the wealth of knowledge from the staff but the breadth of resources available. These include fully equipped

hospital rooms, a psychologist, and innovative technologies such as a food challenge virtual reality headset. All of these greatly enhance the patient experience and increase the chance of success in the program."

Now, Fisher is looking forward to eating an English muffin and going fishing for crabs and shrimp—foods he couldn't even touch before. To the Center staff he says, **"Thank you so much. You changed my life. Now I'm not isolated. I'm not anxious. Just thank you."**



Jared

Gaining Confidence After a Clinical Trial

Jared graduated from the MTAX trial six years ago and has been on a maintenance dose for his nut allergies since then. This summer, he swam from Alcatraz to San Francisco to raise money for the Center. His mother, Sylvia, credits the Center for his ability to accomplish so much. **"Your groundbreaking work has transformed Jared from an anxiety-laden kid to someone who is free to take on challenges. Thank you for all you do,"** she says.



A Look at Some of Our Food Allergy Trials



Below are brief descriptions of just some of the clinical trials we are working on in relation to food allergy. Please get in touch if you'd like to participate in an open trial or learn more about the trials already underway.

COMBINE. This first-of-its-kind clinical study looks at combining two biological therapies to improve outcomes of oral immunotherapy (OIT) in patients with multiple food allergies. We are close to completing enrollment for the 110 patients ages 4 to 55 years needed for this phase-2 trial. As of July 2022, 41 people had completed the trial, 80 were enrolled, and another 103 had consented to enroll.

OUTMATCH. This study examines the effectiveness of omalizumab by itself and in combination with multi-allergen OIT in patients with multiple food allergies. Enrollment for the trial is open to patients between 1 and 55 years old who are allergic to both peanuts and at least two other eligible foods, including milk, eggs, wheat, cashews, hazelnuts, or walnuts.

EPITOPE. This phase-3 clinical trial assessed the safety and effectiveness of using a peanut patch in 362 children ages 1 to 3 years for peanut allergy desensitization. After one year, 67 percent of participants who received the Viaskin peanut skin patch were able to tolerate larger doses of peanut protein, compared with 34 percent of those who received a placebo. The patch caused very few serious adverse effects, with only four people experiencing an anaphylactic reaction to it.

EPOPEX. This phase-3 follow-up study to EPITOPE tests the long-term benefits of the peanut patch. The trial is currently enrolling patients who finished the EPITOPE study.

MOTIF. This phase-2 trial investigates OIT for patients between 7 and 55 years of age with allergies to shrimp and cashews. This study should be completed next year.

MAGIC. This trial studies the use of dupilumab and milk OIT for the treatment of cow's milk allergy. This pioneering study aims to enhance the safety and efficacy of this treatment in milk allergy patients between 4 and 50 years of age. Enrollment for this study is ongoing.

STRING. In this study within the MAGIC and COMBINE trials, participants swallow a small capsule attached to a string that the clinician can gently retrieve to collect an esophageal tissue sample, replacing the need for a more intrusive biopsy. Patients ages 5 to 55 years with the ability to swallow the esophageal sampler can enroll in this ongoing study.

SEAL. This trial aims to break the link between infant eczema and food allergies later in life by using moisturizers to restore the function of a baby's skin barrier against airborne food particles. This trial is now enrolling participants and welcomes the parent(s) of any child up to 12 weeks of age to schedule a pre-screening visit.

SELA. This long-term follow-up study investigates the effects of aging on the immune system. This study focuses on twins, using "omics" platforms and functional assessments to deepen our understanding of how genetic and environmental factors affect immunity with age. Enrollment for this study has begun.

SUNBEAM. Enrollment has begun for this trial examining the relationships of clinical, environmental, biological, and genetic prenatal and early-life factors in the development of food allergies and eczema.

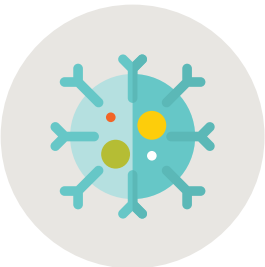


Learn more

To learn about other trials and how to participate, scan this QR code.



Examining Immune Responses to COVID-19



The Center’s immediate and ongoing response to the COVID-19 pandemic is greatly informing treatment decisions and clinical management, while also evaluating the considerable impact the pandemic has had on public health issues.

Understanding the immune mechanisms involved in COVID-19 infection will help us define biomarkers that identify people at greater risk for severe illness and long-term COVID-19, which could guide treatment decisions and clinical management. As part of that endeavor, we conducted one of the first-ever analyses to characterize the cellular and molecular networks that drive two types of immunity—“innate,” meaning the immunity a person is born with, and “acquired,” meaning the immunity a person acquires throughout life in response to infections.

People who received two doses of the Pfizer vaccine had a low innate immune response after the first dose but a notably enhanced one following the second dose. Our findings shed light on the nature of the immune responses induced by mRNA vaccination. They also demonstrate the capacity of a vaccine to prime the innate immune system for a more potent response after immunization with a booster.

Another study, this one conducted by **Scott Boyd, MD, PhD**, an endowed faculty scholar at our Center, compared the immune response elicited by mRNA vaccines with that elicited by infection with COVID-19. He found that the mRNA vaccine seemed to give a broader immune response that would be more protective against a wider range of viral variants. The study also found that the vaccine was less effective against the beta and omicron variants, which suggests that adding different antigens to existing SARS-CoV-2 vaccines might be a key strategy for preventing future waves of infection from any emerging variants.

In another area of COVID-19 research, we evaluated the varying immune responses elicited by different vaccines (Pfizer/BioNTech, AstraZeneca, Sputnik V, and Sinopharm). While studying the immune responses of previously vaccinated individuals, we found that the Pfizer/BioNTech vaccine led to a more potent immune response compared to other vaccines. These findings suggest public health measures like vaccine boosting with the more potent mRNA vaccines could help prevent or mitigate COVID-19 outbreaks.

Our hope is that as we continue to gain insight about the molecular mechanisms behind this challenging condition, we will be able to personalize COVID-19 treatments to provide safer and more effective therapies. We are thankful that you, our donors, make this work possible.

By the Numbers: What We’ve Accomplished This Past Year, Thanks to You!

30
clinical trials



2
new clinicians



58
staff members



2,000+
patients served



82,000
blood, saliva, and tissue samples in our biobank



80+
peer-reviewed research articles



Thank You!

You make possible our pivotal research on allergies and asthma, and allow us to provide state-of-the-art care to patients from across the country. Your generosity also touches countless families around the world. We could not do all that we do without the support of our philanthropic community!



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With your help, we are treating more patients with best-in-class care and conducting more groundbreaking research on food allergy, climate change, and COVID-19. To learn more, visit supportlpch.org/SNP or call (650) 721-9320.



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