

In Conversation: Lloyd B. Minor, M.D.



Stanford School of Medicine's Dean Minor discusses food allergies and immunology with noted author Melanie Thernstrom

Dr. Kari Nadeau has recently shown that oral immunotherapy causes epigenetic changes in the functioning of the genes of people with food allergies.

Dean Minor: As we learn the impact of these epigenetic influences we are really starting to see the richness and diversity of the interplay between our genetic makeup and our environment and the other things that impact the way our genes are expressed—and that's fascinating scientifically and it's incredibly important clinically.

It's amazing to think that we can influence our genes! If you think of the way human nature was understood throughout history, it has fluctuated between an emphasis on the idea of fate and the idea of free will and choice.

The scientific idea that we are preprogrammed genetically seemed to be aligned with the idea of fate. But now we are seeing the truth of both elements—that our genes program us, but we and the world we live in can reprogram them, so to speak. And that reprogramming can be passed on to our children in the case of food allergies.

Dean Minor: Yes, I think the latter part is what is so mind-boggling—that reprogrammed genes can be passed on to your children and even in some cases your grandchildren. That is really quite profound.

Tell me about your vision of building the Allergy Center. This is a big move for Stanford.



Dean Minor: One reason I'm excited about the center is that, with Kari's leadership, the center is establishing and leveraging interactions with departments around the entire university in truly innovative ways. That's important because I think one of the most distinctive features of Stanford University is our interdisciplinary character and it's been a tremendous benefit to Stanford Medicine. We already have extensive interactions with every school and division of the university and even more to come. And Kari, in building this center, has really sought out those interactions.

It is oftentimes said, and it's true, that Stanford nurtures innovation like no other place does. But when we really look at what makes innovation possible, it comes down to combination and collaboration. Sometimes we think of innovation as being that aha moment—that fleeting moment in time when someone gets this incredibly

visionary idea that changes the way we view the world. And, while there are at times elements of that in innovation, that's not really the heart and core of innovation. Innovation is fundamentally about combining ideas and approaches in new and creative ways; it's about imagining solutions and imagining approaches in ways others might have thought not to be feasible. It's also about collaboration — about bringing people with different areas of expertise together and giving them the opportunity to work together.

Kari has really leveraged these opportunities for combination and collaboration in building a truly innovative program that's going to be a truly innovative center.

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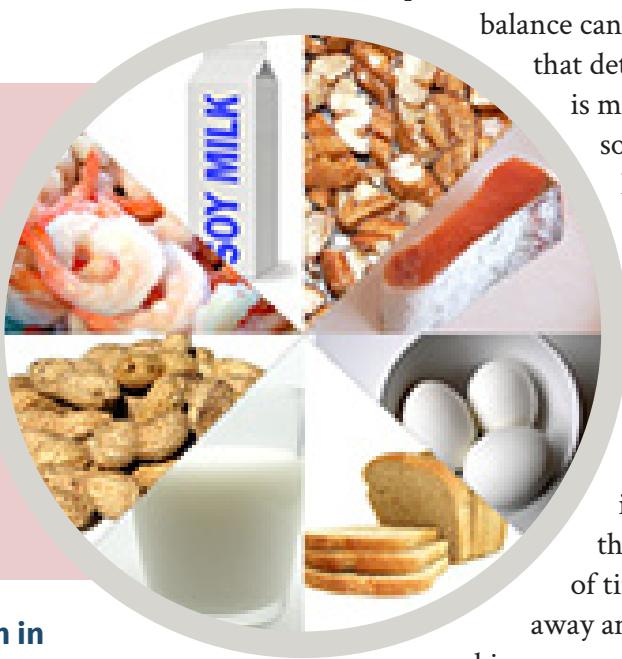
I think that is very true about innovation in science. That model of individual innovation is really based in the arts, which is much less collaborative.

Dean Minor: Another reason I'm excited about the center is there is such an enormous clinical need. This profound increase in the incidence of serious food allergy that has occurred in a relatively short space of time is fascinating and deeply concerning at the same time. And this is where, as you were mentioning before, the impact of epigenetics and environmental factors could be coming into play. I think that the approach that Kari is taking in founding this center and bringing together so much expertise will give us our best shot at discerning why this is the case. We need to understand why because that's how we will ultimately, hopefully, be able to prevent food allergies and their growing prevalence.

The center will also treat food intolerances and sensitivities, which is another strange epidemic. I know that while many physicians believe there has been a dramatic rise in celiac disease, they think that a lot of the gluten intolerance is just made up.

Dean Minor: My position is that we need the approach that Kari has taken to find out the truth and to really understand these trends.

My field is otolaryngology and ear diseases. I'm probably best known for describing a clinical syndrome in which a group of patients have bone missing from the top balance canal. (We have these three



balance canals in the inner ear that detect how our head is moving in space.) In some people — perhaps as many as 2% of the population — there is a developmental anomaly where that bone covering the top balance canal fails to form and is microscopically thin. Over the course of time it can break away and people get these bizarre symptoms, such as getting dizzy when they hear loud noises or hearing the sound of their own eyes moving.

The very first patient I saw with this syndrome back in 1995 was referred to me by a psychiatrist. The psychiatrist said: his mental health seems fine to me, but there is something going on. There was something going on in his head, but just not in the way he had been told.

When we don't have adequate medical knowledge — and there are so many areas of medicine where we don't — we, as physicians and as biomedical researchers, have to maintain a sense of humility about the very fragile nature of our biomedical knowledge in so many areas. There are so many examples where "this can't possibly be" pronouncements have proven to be wrong later on.

Can you tell me a bit about the state of the research regarding food intolerance and sensitivities? I don't think there are any other centers that treat both.

Dean Minor: I think it's reasonable, as Kari has done, to hypothesize that serious food allergies and intolerances are related and — if not part of a spectrum — at least share some common elements of pathophysiology. Therefore it makes sense to study both and see if the knowledge and epigenetics of one could illuminate the knowledge of the other. Furthermore, the approach to dealing with food allergies and the approach to dealing with food intolerances have many similarities, mostly involving working with families on diet and dietary planning. So it would be beneficial to patients to have the expertise of a care delivery team that has honed its skills in serious food allergies, but also has that expertise available for working with people with food intolerances and sensitivities.

A lot of patients believe they have allergies because they don't know the difference between intolerances and allergies. So to tell those patients, "Oh you don't have allergies, so bye now" might mean you are telling half of your patients to go someplace else when there really aren't good places to go. Such patients often bounce around being rejected by medical doctors and falling prey to expensive holistic alternative treatments that have no evidence behind them.

Dean Minor: Yes...I think Stanford is the ideal place to do this work because of our collaborative and interdisciplinary nature, and I think Kari Nadeau is doing a marvelous job of bringing together a premier group of scientists and physicians to tackle these very difficult problems. I think the center will not only benefit the patients who receive care here, but will also benefit hundreds of thousands of other people because of the research that emanates from here.

Do you personally have a hypothesis about what causes food allergies?

Dean Minor: No. I think in a number of different areas of medicine we are seeing how much we have to learn about our immune system. For example, in cancer, we have a notion that the immune system could be better at fighting cancer and why isn't it? A lot more work needs to be done in immunology before we have a better hypothesis about the causes of many disorders, from cancer to food allergies.

Do you think immunology is one of those fields that has finally reached a point where scientific knowledge will translate into helping patients?

Dean Minor: I do...This is going to be a very exciting decade coming up in immunology because we are beginning to see the fruits of all the basic immunology that has been done in the past 25 years coming to benefit patients in really transformative ways. Just as the work the center is going to do will clarify our understanding of the immunological processes behind food allergies, we are going to see this dramatic expansion of knowledge across the board of the immune system.

We just have so much data at our fingertips that we didn't have before, both with sequencing and with clinical data. We can approach more complicated problems today in ways you couldn't a decade ago.



Noted author Melanie Thernstrom is best known in the allergy community for her *New York Times Magazine* article, "The Allergy Buster." She is a contributing writer to *The New York Times Magazine* and the author of three books including, most recently, *The New York Times* bestseller *The Pain Chronicles: Cures, Myths, Mysteries, Prayers, Diaries, Brain Scans, and the Science of Suffering*.

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