

Alexandra Magold

Good morning, Science. My name is Alexander Magold. It is a great pleasure to talk to Chitavi Maulloo today. She's an inverse vaccine engineer. While, she has not defended her PhD, yet she's already part of a phenomenal group that is about to launch a brand new startup. The idea is to prevent and to treat severe food allergies even before they become a problem. Chitavi, how did this all start out for you? I understand this is fresh off of the bench, is it?

Chitavi Maulloo

It started out working on, like, you know, something something else and optimizing conditions for another project. And then the Aha Eureka moment came about a year ago when I just started my 5th, so PhD students watching this keep moving. It will come the Aha!-Moment will come, do not give up. And we have this really cool finding. And so we published this back to a systemic intravenous administration of this antigen conjugate. It leads to really impressive antigen specific tolerance.

Chitavi Maulloo

So if you think of it as probably you probably know all what a vaccine is, I'm guessing that by this point where a lot about vaccines is in print.

Alexandra Magold

Yeah, everybody is an immunologist by now.

Chitavi Maulloo

So with a vaccine, you want to stimulate and want to activate the immune system to that protein, to that insult the pathogen. But in our case, we are engineering inverse vaccines. So instead of activating the immune system, you want to suppress the immune system to that particular insult, that particular protein. So that's that. And that can be really valuable to treat patients with autoimmune disorders or in the case of allergies, just like allergies to like, you know, anything to cats or to house dust mites and food allergies. Right?

Chitavi Maulloo

And your immune system normally is functioning absolutely normally and correctly should not recognize these foods at any point and should be innocuous signals. But your body recognizes those those food antigens as being dangerous and a point and starts not immune response. And that's what gives rise to food allergies. The incidence of food allergies is really like, you know, hit like record high. In the last decade in the US, it's about one in 13 children suffer from food allergy.

Chitavi Maulloo

That's about two in every classroom. And that's that's a really alarming number. And but in food allergies to treat food allergies in the clinic, these these days really be the only sort of options available to patients of sort of very, very limited. Many of them are just like broad immunosuppressive drugs, which really come with so many complications like the side effects and not just not effective in the long run, especially for such a chronic condition. And and this year has been a particularly good one, actually, I should say, for food allergy therapies.

Chitavi Maulloo

The first peanut oral immunotherapy, the first prescription oral immunotherapy has been approved this year.

Alexandra Magold

Sure. Yet these desensitization approaches often have side effects, don't they?

Chitavi Maulloo

It's like heart breaking. You read the comments of parents putting their children right now for the oral immunotherapy. And they are like: "My child can't stop vomiting" and like having all these strange issues like it's just like we just need better therapy. So this is pretty much where my work comes in with this technology. We are inducing tolerance for these peripheral routes. Where, you don't go with a systemic intravenous injection, but really go for some peripheral route.

Chitavi Maulloo

We're really leveraging the lymphatics as as a drainage and sort of targeting system as well to be able to really treat the allergies, prevent and treat the allergies of those patients in a very safe way. So efficient and safe are really what what we're going for. Preventing food allergies has only come to light in the last five to six years, like food allergy prevention was not a thing back then before people thought that to prevent food allergies, you just need to avoid the food, right?

Chitavi Maulloo

Like in babies, like you just need to. Oh, yeah. Do not expose your child, like to peanut or to milk. Otherwise you will develop a food allergy. But guess what? That's why it doesn't work that way. We are really going after not just treatment, but also prevention. So we want to really develop a vaccine against food allergy. Food allergies is such an impairment, it's included under the Americans with Disabilities Act. You can qualify if you have a food allergy as if you have a disability. It's that severe.

Alexandra Magold

I mean, there are literally cases where a touch or any of like somebody who has something of a peanut, it's unbelievable. The sensitivity level is just beyond anything even I could have imagined before I ever heard about it, as this is like it's radioactive. It's really crazy.

Chitavi Maulloo

We want to really want to prevent it even before it has a chance, even before it becomes a problem.

Chitavi Maulloo

Thank you so much for your time.