

# Allergy-free protein shows hope for a risk-free peanut

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For nearly 3 million Americans, the most dangerous aspect to air travel is the complimentary in-flight snack. Every year, about 150 people are killed by a common ingredient of a first-grader's brown bag lunch.

Peanut allergies are the most common and often the most severe of all food allergies, but now researchers from the University of Florida's Institute of Food and Agricultural Sciences may have taken an important first step toward creating a non-allergenic peanut.

The researchers have found that one of the allergenic proteins in peanuts is sometimes produced with a portion missing—resulting in a form that apparently doesn't trigger a bad reaction by human immune systems.

“If we can somehow breed or create a peanut where all the allergenic proteins are in forms that are as benign as this one, that would be a big step for making life much easier for the millions of people who are sensitive—sometimes deathly so—to a substance that the rest of us like to eat so much that it's virtually everywhere,” said Maria Gallo, a plant molecular biologist who conducted the research with her graduate student, Il-Ho Kang. Their work has been published online by the journal *Plant Science* and will appear in an upcoming issue of the publication.

Peanuts are known for being loaded with protein, but over the years scientists have reported about 20 types of protein molecules that seem to trigger an overblown immune response in those with peanut sensitivities.

The three that cause the most problems are dubbed Ara h 1, Ara h 2 and Ara h 3.

The latter, however, sometimes shows up in a form that's slightly different than that found in most peanuts. This altered protein has been named Ara h 3-im. The UF researchers extracted peanut proteins and exposed them to blood drawn from two people who are allergic to peanuts and one who isn't.

The normal form of the protein set off a severe reaction in the samples from the allergenic patients, but Ara h 3-im produced none—showing that the patients' immune defenses didn't recognize this altered protein.

As promising as this sounds, the future of an allergen-free peanut is far from certain.

“This seems great, but we need to go through and try this out with samples from a lot more than just three people to see that this lack of response is true for everyone,” Gallo said. “Some might just have less of a response, and—who knows—there is a possibility that sometimes this might just get the same response as the normal allergen.”

The next step would then be trying to find or create other stand-ins for the usual suspects of peanut allergens. If that were accomplished, then they would all have to be put together to produce a peanut plant that would replace those used by peanut farmers today.

“Don't look for this to be something that you'll see in the next twenty years or so,” said Peggy Ozias-Akins, a peanut genome researcher at the University of Georgia. “There's a lot of genetics groundwork that we still have to lay before we even know if something like this can be done.

“However, it opens up an opportunity. And, more importantly, it tells us

a lot about food allergies,” she said. And that knowledge is not limited to peanuts. “Similar structures could be found in soybeans—which would be the most likely plant—but also in tree nuts and a lot of other foods.”

In the end, building a better peanut might not need to be the ultimate goal. Understanding why the human immune system doesn’t overreact to this particular form of protein could play a vital role in other efforts to protect those with peanut sensitivities, such as efforts to create a peanut allergy vaccine.

“There are many dedicated scientists out there working on this, and technology is making our jobs easier and easier,” Gallo said. “We’ll figure out how to produce an even healthier peanut.”

Source: University of Florida

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