Scientists Growing Food Plants Containing mRNA and other Medicine to Replace Injections

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Researchers at the University of California-Riverside are working on a way to grow edible plants that carry the same medication as an mRNA vaccine. A professor participating in the project said that ideally, a single plant would produce enough mRNA to vaccinate a single person. He said that they are currently tinkering with lettuce and spinach. The researchers say that chloroplasts, small organs inside plant cells that help convert sunlight into energy, are capable of expressing genes that are not a natural part of that plant. Their idea is to repurpose naturally occurring nanoparticles, namely plant viruses, for gene delivery to plants.

Vaccinations can be a controversial subject for many people, especially when it comes to injections. So what if you could replace your next shot with a salad instead? Researchers at the University of California-Riverside are working on a way to grow edible plants that carry the same medication as an mRNA vaccine.

The COVID-19 vaccine is one of the many inoculations which use messenger RNA (mRNA) technology to defeat viruses. They work by teaching cells from the immune system to recognize and attack a certain infectious disease. Unfortunately, mRNA vaccines have to stay in cold storage until use or they lose stability. The UC-Riverside team says if they're successful, the public could eat plant-based mRNA vaccines – which could also survive at room temperature.

Thanks to a $500,000 grant from the National Science Foundation, researchers are now looking accomplish three goals. First, the team will try to successfully deliver DNA containing mRNA vaccines into plant cells, where they can replicate. Next, the study authors want to show that plants can actually produce enough mRNA to replace a traditional injection. Finally, the team will need to determine the right dosage people

will need to eat to properly replace vaccinations.

“Ideally, a single plant would produce enough mRNA to vaccinate a single person,” says Juan Pablo Giraldo, an associate professor in UCR’s Department of Botany and Plant Sciences, in a university release.

“We are testing this approach with spinach and lettuce and have long-term goals of people growing it in their own gardens,” Giraldo adds. “Farmers could also eventually grow entire fields of it.”

Plants are capable of growing more vaccines

Giraldo and a team of scientists from UC-San Diego and Carnegie Mellon University say the key to making edible vaccines are chloroplasts. These are small organs inside plant cells which help convert sunlight into energy.

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