


# MSU undergraduate research students discover new way to detect celiac disease

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## Health

The test that students developed would be much less invasive to patients and cut down on the time it takes to get results.

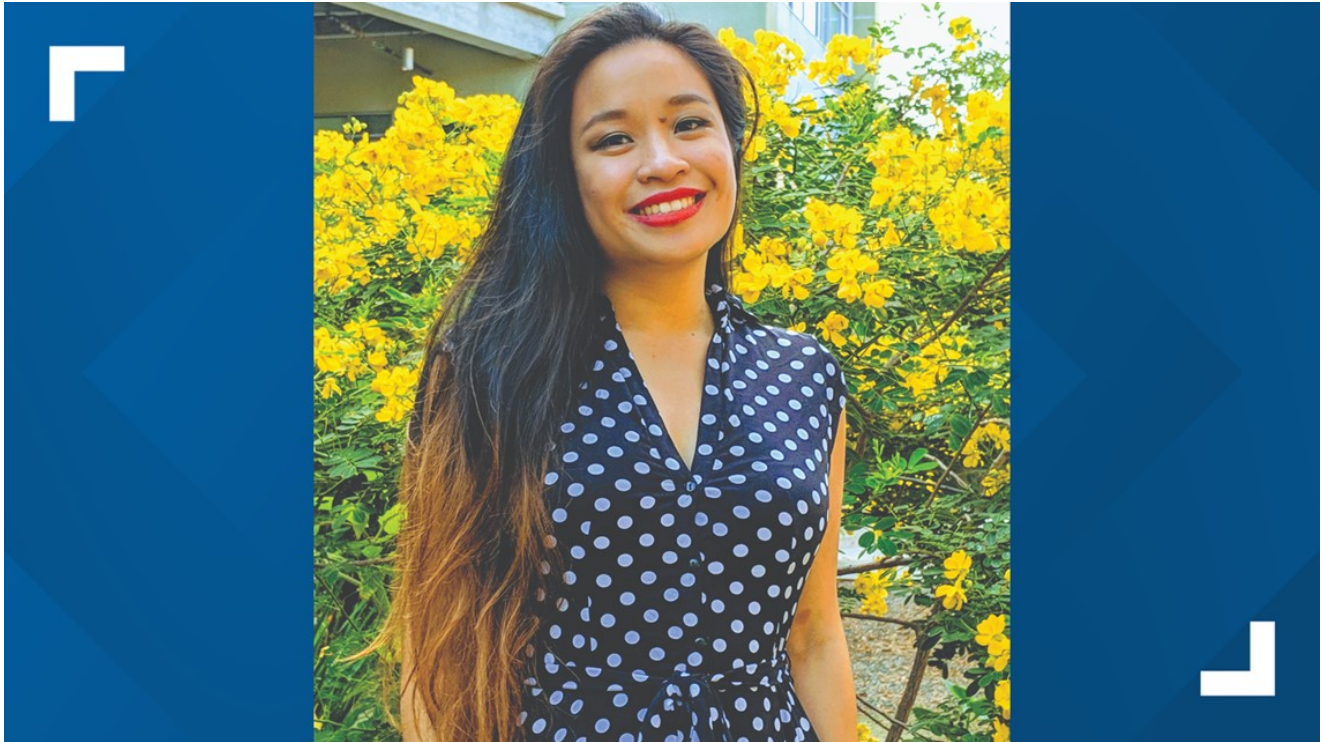
DENVER — Undergraduate researchers at Metropolitan State University of Denver discovered a new way to detect celiac disease that significantly cuts down the time and difficulty of the current method of diagnosing the disease.

Anna Nguyen, a biochemistry student from Westminster who spearheaded the research project in 2016 and graduated from MSU in 2018, said the project was inspired because she was initially a nutrition student when she began studying at MSU.

“I was really passionate about learning nutrition and diet, but eventually I got to the point where I was more interested in the science behind nutrition,” Nguyen said. “And it led me down this biochemistry route and wanting to get my Ph.D., which requires you to do undergrad research.”

From there, Nguyen decided to focus her research on a new and easier way to detect celiac disease. Currently, she said, the process to detect celiac disease is invasive and time-consuming.

“If you are suspected to have celiac disease, one of the things that you have to do is go through a week-long heavy diet of gluten, and if you have celiac disease, unfortunately, that's going to make you feel really sick for about a week,” Nguyen said. “And what they then do is a blood test and maybe like a week or two later you're going to get results. So that's one week of undergoing diet that probably doesn't make you feel good, and one to two weeks of waiting for a results.”



Credit: Andrew Bonham

Anna Nguyen

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She said if they can't make a conclusive diagnosis of Celiac's after the blood test, patients would then have to get a biopsy.

The test that Nguyen and other undergraduate researchers discovered would take much less time and effort. It would be as simple as one quick finger prick.

“What we wanted to do was just do make a quick blood test that, maybe just after a day of eating gluten, you could be able to go to your doctor, get a pinprick blood test, and it would just tell you immediately.”

This test uses an electrochemical biosensor. Nguyen said this technology is currently only used out of labs, including her celiac test, but they are hoping to one day have it engineered into a compact and convenient test to be widely used by doctors and patients.

Chemistry and Biochemistry Department Chair Andrew Bonham Ph.D., guided Nguyen throughout this research.

He said that while electrochemical biosensors for many researchers are still considered in the early stage proof of concept of implementation, some scientists are working towards taking the next steps with the technology.

“There's an equally large community that is taking these kind of medical diagnostic designs and really working with companies to bring them to patients and to the world,” Bonham said.

Bonham said that a big driver for this research project was the constant flow of ideas and discussions between the research students like Nguyen.

“A big part of the scientific process is those kinds of free-ranging discussions, and thought, and trying stuff and to be free, throwing stuff at the wall and seeing what sticks,” Bonham said. “Definitely I always keep five or six students in my lab at a time, so that they can build that camaraderie and have that team to talk through their crazy ideas and work things out.”

Bonham said that regardless if the research project goes will one day be developed into a widely used device to help patients, this project has given students a springboard to launch their journeys.

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