

# Researchers develop exciting new vaccine adjuvant

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Associate Professors Bridget Stocker and Mattie Timmer from the School of Chemical and Physical Sciences worked with scientists from Japan to develop an adjuvant which can kick-start a powerful immune response and trigger a specific type of T-cell response. Adjuvants are substances that improve the body's immune response to an antigen.

Current vaccines tend to stimulate antibody-only responses, while this [adjuvant](#) targets a specific receptor, which means the immune [response](#) is consistent and defined and may also lead to fewer side-effects. It will also assist in the development of vaccines against pathogens for which there are no current vaccines.

"There's been a shift in recent years in looking at whether more precise vaccines can be developed. Rather than packing everything into a [vaccine](#), including the parts of a pathogen that don't stimulate the desired immune response, you're just adding the specific ingredients that do the job," says Associate Professor Stocker.

The adjuvant could play a role in developing vaccines for HIV, Group A Streptococcus, Tuberculosis, and Meningitis, as well as improving current vaccines, and may also reduce the need for booster shots.

"One reason why there's no vaccine for many pathogens is that you can't get the right immune response with the current technology. This new additive will allow vaccines to be tailored to each immune response, and it could also increase the length of time immunity lasts after

vaccination."

The findings are part of a wider project to target immune cells and develop novel cancer therapies. The new adjuvant can be used in preventative vaccines, but it could also be used to switch off dysfunctional [immune cells](#) in an effort to combat cancer.

Vaccine development is an area that Associate Professor Stocker and her team have been interested in since 2011. They had been researching different molecules to add to vaccines and were able to combine that research with the discovery of a new cell receptor to work towards their new adjuvant.

The new receptor was discovered by Professor Sho Yamasaki from Japan, one of the world's foremost experts in immunology. Professor Yamasaki flew to New Zealand to work with the Victoria research team, and Associate Professor Stocker's Ph.D. student Amy Foster spent three months in Japan to complete further testing in Professor Yamasaki's lab.

"This was an amazing opportunity for Amy to experience the whole process, from our focus on chemistry and cell-based immunology, to Professor Yamasaki's more advanced immunological expertise. Amy had turned down a Fulbright scholarship to stay and do further study with us at Victoria, in part due to the ability to offer opportunities like this. We also had an undergraduate student, Amy Lynch, who helped in the early stages of the project and is now completing her Masters with us. It just shows that good projects attract good students, no matter where you are in the world."

The next step for Associate Professor Stocker and her team is to work with other partners to test the adjuvant in specific disease settings. They will also look at it in context with different antigens.

"In our current research we used a generic antigen—something that induces an [immune response](#) in the body—to test the effect of the adjuvant. The next step will be to test specific antigens in different diseases, and to refine the adjuvant we have. We have a patent on this compound, but any research group can only take an idea so far until you need a partnership to take it to the next level. We have a lot of people interested in what this adjuvant can do, and that is very exciting."

Provided by Victoria University

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