

Efficacy of COVID-19 vaccines against omicron studied

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There is virtually no protection against infection with the currently circulating omicron variant of the SARS-CoV-2 virus for dual-vaccinated and recovered individuals who were infected with the

previous SARS-CoV-2 variants. Only individuals who have been immunized against COVID-19 with a third vaccination form antibodies that can partially block omicron. This is the result of a study conducted by MedUni Vienna, the results of which were recently published in the journal *Allergy*.

In a study led by Rudolf Valenta of the Medical University of Vienna, Institute of Pathophysiology and Allergy Research, an Austrian subpopulation of vaccinated and recovered [individuals](#) was examined for their antibody status and protection against the virus that originated in Wuhan as well as the delta and omicron variants, the latter being currently prevalent in Austria. For this purpose, a test developed for the previous variants, which investigates whether the virus can bind to the receptor on human cells via its receptor binding domain (RBD), was rapidly adapted for omicron, which, if needed, can also be done for any newly emerging [variant](#) swiftly. Accordingly, vaccinees of all vaccines and [vaccine](#) combinations currently licensed in Austria were examined.

The results showed that both COVID-19 convalescent individuals and individuals who had been vaccinated twice had developed antibody protection against delta. However, the antibodies were not able to block receptor binding against omicron.

Third vaccination offers best protection, but far from being optimal

Blockade of omicron was better in those individuals who had received a third vaccination. "The third vaccination developed protective [antibodies](#) in many individuals," explains Rudolf Valenta, "however, there is also a significant proportion (20%) in whom no protection was established."

The receptor binding domain (RBD) which is used by SARS-CoV-2 to enter [human cells](#) via the ACE2 receptor differed only slightly in all

previously known SARS-CoV-2 variants, so that infections with these and the currently available vaccines provided protection against the previous coronavirus variants. Omicron is the first variant that differs greatly from the previous variants in RBD, consequently infections with the previous variants and currently available vaccines provide little or no protection against omicron.

For the immunologist, the best protection under such circumstances would be to develop a broadly effective combination vaccine that protects against both the previous variants and [omicron](#). "Until we have such a vaccine, only repeated vaccinations with the existing vaccines will provide some protection. The protective effect achieved by vaccination can be evaluated with special tests that can be rapidly adapted to new virus variants."

More information: Pia Gattinger et al, Omicron: A SARS-CoV-2 variant of real concern, *Allergy* (2022). [DOI: 10.1111/all.15264](https://doi.org/10.1111/all.15264)

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