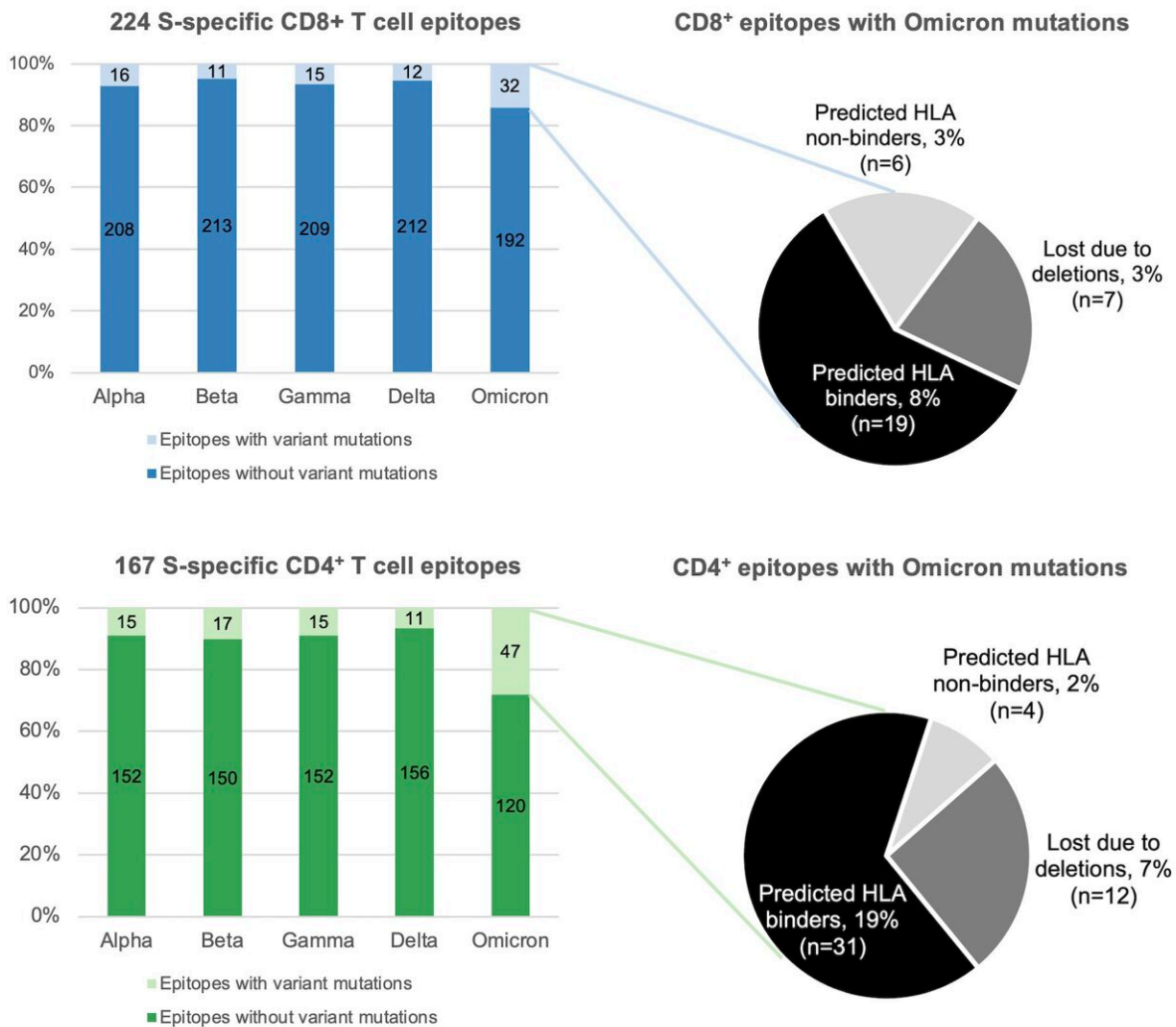


T cells fit to tackle Omicron, suggests new study

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The research team found that despite the number of epitopes encompassing Omicron mutations are nonetheless notably higher than other virus variants, Omicron, like other variants, is still unlikely to escape human's T cell responses.

Credit: HKUST, University of Melbourne

Research from the Hong Kong University of Science and Technology (HKUST) and the University of Melbourne has revealed that T cells, one of the body's key defenses against COVID-19, are expected to be effective in mounting an immune response against Omicron despite its significantly higher mutations compared to previous variants of concern.

T cells, generated both by vaccinations and COVID-19 infections, have been shown to be critical in limiting progression to [severe disease](#) by eliminating [virus](#)-infected cells and helping with other immune system functions. Preliminary studies have reported that Omicron (fast becoming the most dominant circulating strain globally) can escape antibodies produced by vaccination or natural COVID-19 infection, raising concerns about the increased possibility of reinfection and breakthrough cases.

Published yesterday in *Viruses*, the team analyzed over 1,500 fragments of SARS-CoV-2's [viral proteins](#), called epitopes, that have been found to be recognized by T cells in recovered COVID-19 patients or after vaccination. The team's findings suggest Omicron is unlikely to be able to evade T cells, adding to a growing body of evidence from research groups around the world who are also investigating T cell responses to COVID-19.

"Despite being a preliminary study, we believe this is positive news. Even if Omicron, or some other variant for that matter, can potentially escape antibodies, a robust T cell response can still be expected to offer protection and help to prevent significant illness," said Prof. Matthew McKay from the University of Melbourne, who co-led the research.

The most concerning aspect of Omicron is the abundance of [mutations](#) in its [spike protein](#), which is the primary target of COVID-19 vaccines.

The spike enables the virus to attach and enter cells in humans. Current vaccines induce neutralizing antibodies aimed at blocking this process, however these antibodies have been reported to be less effective against Omicron compared with previous variants, like Delta.

In analyzing virus epitopes from the spike protein that are targeted by T cells in vaccinated or previously infected individuals, the study found that only 20 per cent showed mutations associated with Omicron. Even then, these mutations do not necessarily mean the virus will be able to evade the body's T cells.

"Among these T cell epitopes that have Omicron mutations, our further analysis revealed that more than half are predicted to still be visible to T cells. This further diminishes the chance that Omicron may escape T cells' defenses," said study co-lead Prof. Ahmed Abdul Quadeer, Research Assistant Professor at HKUST's Department of Electronic and Computer Engineering.

While the study focused on the spike protein of the virus, when the team broadened their analysis to other virus proteins, they found an overwhelming majority (more than 97 per cent) of non-spike T cell epitopes do not encompass mutations associated with Omicron.

"These results overall, would suggest that broad escape from T [cells](#) is very unlikely," Prof. McKay said. "Based on our data, we anticipate that T cell responses elicited by vaccines and boosters, for example, will continue to help protect against Omicron, as observed for other variants.

More information: Syed Faraz Ahmed et al, SARS-CoV-2 T Cell Responses Elicited by COVID-19 Vaccines or Infection Are Expected to

Remain Robust against Omicron, *Viruses* (2022).

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