CSIR-CCMB

Study demonstrates Delta variant of coronavirus could evade our immune system better.

Hyderabad, 12th September, 2022: In the last almost three years, there have been many SARS-CoV-2 variants spreading across the world. But their outcomes have varied greatly, with the Delta variant being the deadliest. Dr. Krishnan Harshan's group led this study in collaboration with Dr. Divya Tej Sowpati's group at CSIR-Centre for Cellular and Molecular Biology. They tried to understand if hosts, that is, the humans infected by the virus, react differently to the different SARS-CoV-2 variants.

They selected five different SARS-CoV-2 variants and studied how the human immune system responds to the variants. The studied variants included Alpha, Delta, and three other variants that emerged before the Alpha variant. Upon viral infection, the first line of attack by the host's immune system is by producing certain defense chemicals that break down the viruses. The researchers studied how their production responds to these five variants. "We infected the human cells in a cell culture system with these different variants of the virus and monitored the production of known immune defense molecules and the activation of signaling pathways associated with them," said Dixit Tandel, the first author of the study.

From left to right: Vishal Sah, Dixit Tandel, Divya Tej Soqpati, Krishnan H Harshan, and Nitesh Singh

“We navigated through the hundreds of immune pathways known to us using high throughput sequencing and analysis,” said Dr. Nitesh Kumar Singh, who worked on the project with Dr Sowpati.

In this study published in Microbiology Spectrum journal, the researchers found that the immune system could not produce the defense molecules against the Delta variant as effectively as the other variants. While infection due to the other four variants alerted the immune system quickly, the Delta variant could silently replicate in the host cells.

“We have identified that molecular mechanisms regulating the host immune response have not been as potent against the Delta variant of SARS-CoV-2. This also includes the production of interferons, immune molecules often used for antiviral therapies. The study hints at why the Delta variant could spread more easily," said Dr. Krishnan Harshan, the lead investigator in this work. He added that the study also helps us understand how viruses evolve with changing effects on human hosts.