

Scientists identify antibodies to develop pan-COVID vaccine

US: Scientists have discovered human antibodies that can neutralise several different coronaviruses and pave the way for a pan-coronavirus vaccine.

These antibodies have been detected in some people who have recovered from COVID-19, said the team at University of Washington.

The study, appearing in the journal *Science*, describes research on five such human monoclonal antibodies that can cross-react with a number of beta-coronaviruses.

The team examined certain memory B cells from COVID-19 convalescent donors. Memory B cells are white blood cells that recognise and respond to pathogens that have tried

to attack the body during a previous encounter.

Out of five promising antibodies that they isolated, the scientists decided to concentrate on one designated S2P6. Molecular structure analysis and functional studies showed that this human monoclonal antibody had impressive breadth: it was able to neutralize three different subgenera of beta-coronaviruses. The scientists observed that it did so by inhibiting the virus' ability to fuse with cell membranes.

These antibodies target a structure, called stem helix, in the spike protein of these viruses. The spike protein is critical to the virus' ability to overtake host cells. The stem helix in the

spike protein has remained conserved during the evolution of certain coronaviruses. That means it is much less prone to genetic changes and is similar in various coronaviruses, explained lead author Dora Pinto, from varsity's School of Medicine in Seattle.

These include those originating in bats that have become dangerous pathogens in people, and another subgenus that causes a serious human lung disease transmitted by dromedary camels, as well as a few other subgenera that cause simple common cold symptoms.

The team went on to test if the S2P6 stem helix antibody could protect against SARS-CoV-2 by administering it to hamsters 24 hours before exposure.

They found that this antibody reduced the viral load of SARS-CoV-2 by inhibiting entry of the virus and by enhancing additional anti-viral and virus-clearing cellular immune responses.

Studies of the plasma from pre-pandemic human samples, as well as from Covid-vaccinated and Covid-recovered individuals were also analysed to see how frequently the stem-helix targeting antibodies appeared.

The highest frequencies occurred in people who had recovered from COVID-19, then were later vaccinated. Overall, however, the data from this study shows that, while it does occur, it is relatively rare for SARS-CoV-2 to elicit plasma stem-helix antibody responses. - IANS