

Antigenic cartography using variant-specific hamster sera reveals substantial antigenic variation among Omicron sub-variants

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SARS-CoV-2 has developed substantial antigenic variability. As the majority of the population now has pre-existing immunity due to infection or vaccination, the use of experimentally immunized animal sera can be valuable for measuring antigenic differences between virus variants. Here we immunized Syrian golden hamsters by two subsequent infections with one of eight SARS-CoV-2 variants. Sera were titrated against 14 SARS-CoV-2 variants and the resulting antigenic distances visualized using antigenic cartography. The antigenic map shows a condensed cluster containing all pre-Omicron variants (D614G, Alpha, Delta, Beta, Mu, and an engineered B.1+E484K variant), and a more distinct positioning of a selected panel of Omicron sub-variants (BA.1, BA.2, BA.4/5; the BA.5 descendants BF.7 and BQ.1.18; the BA.2.75 descendant BN.1.3.1; and the BA.2-derived recombinant XBB.2). Some Omicron sub-variants were as antigenically distinct from each other as the wildtype is from Omicron BA.1. The results highlight the potential of using mono-specifically infected hamster sera for the continued antigenic characterisation of SARS-CoV-2.

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SARS-CoV-2, Antigenic Variation, Omicron

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