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# SARS-COV-2 NEUTRALIZING ANTIBODIES WITH DISTINCT EPITOPES EFFECTIVE AGAINST MULTIPLE VARIANTS

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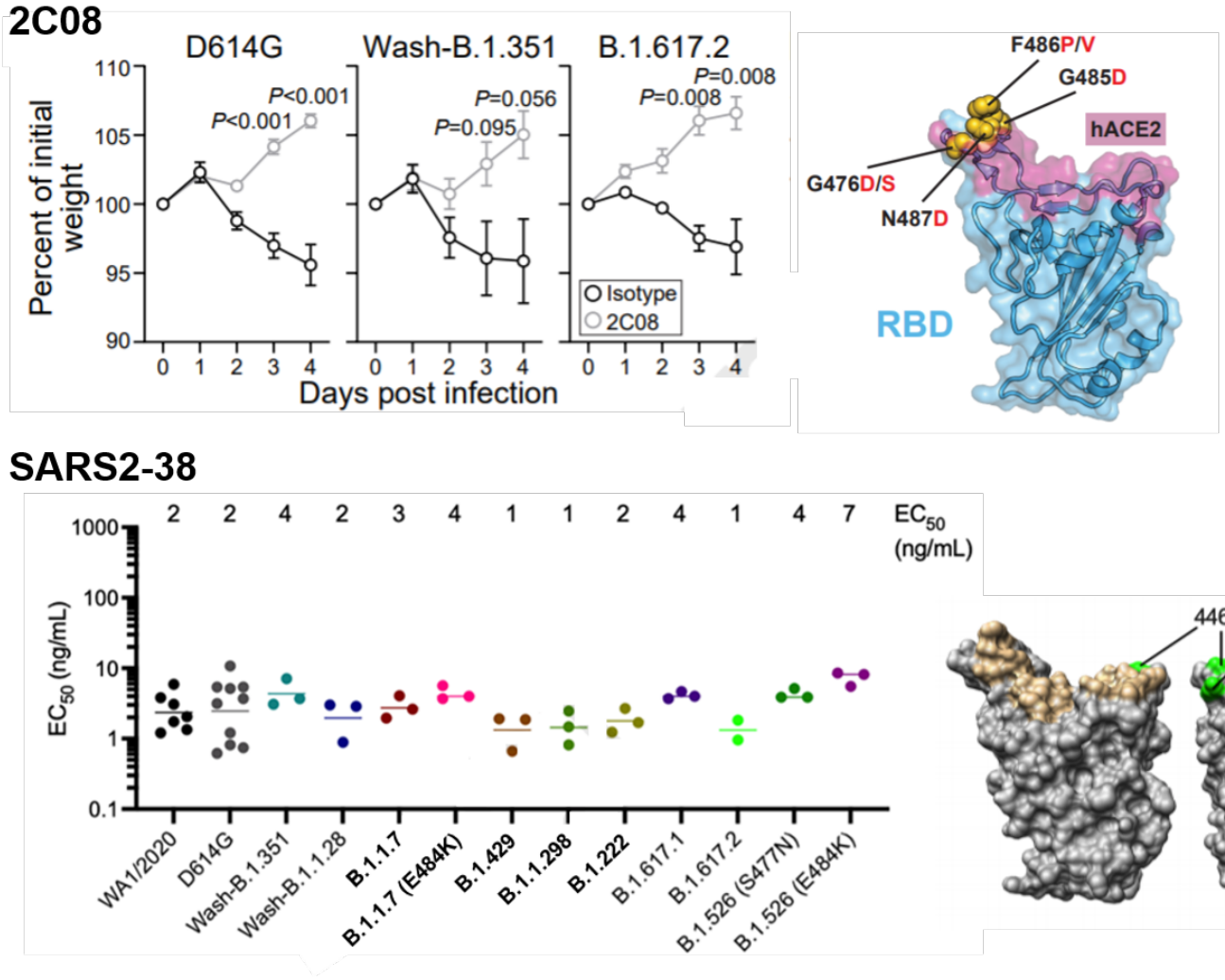
**Disease indication** - SARS-CoV-2 infection (COVID-19)

**Drug format**

- SARS2-38: chimeric monoclonal antibody
- 2C08: human monoclonal antibody

**Drug class** – Best-in-class

**Research stage and Preliminary data** – The inventors have developed and characterized these antibodies, creating a chimeric version with a human IgG backbone for SARS2-38. The antibodies have been extensively tested in hamster (2C08) and hACE2 transgenic mouse (SARS2-38) models. The researchers have also performed initial proof of concept experiments against common SARS-CoV-2 variants (including the alpha, beta, delta, epsilon, iota and kappa variants) *in vitro* to show similar levels of efficacy.




*(Top Left) Results of in vivo treatment in hamsters with 2C08 against multiple circulating variants. (Bottom Left) Results of in vitro focus-reduction neutralization tests with SARS2-38 against multiple circulating variants showing minimal change in $EC_{50}$ values across variants. (Right) Models depicting the antibody binding sites on the SARS-CoV-2 spike protein RBD.*

**Target** – Both antibodies target the SARS-CoV-2 spike protein receptor binding domain. 2C08 and SARS2-38 target distinct, non-overlapping epitopes in the region interacting with hACE2.

**Background –** The emergence of new variants of SARS-CoV-2 remains a concern, particularly when the new variants show decreased susceptibility to vaccine-generated immune response due to mutations in the spike protein. Therapeutics targeted at conserved regions of the spike protein are ideally suited for use in all variants. Additionally, the combination of multiple therapeutics with distinct epitopes prevents the emergence of resistant variants.

**Mode of action** – These antibodies bind the viral spike protein at highly-conserved epitopes, neutralizing the virus by blocking entry at attachment and post-attachment steps.

**Competitive edge** – While other neutralizing antibodies for SARS-CoV-2 have been developed, many show reduced efficacy on some variants due to mutation of the spike protein. These antibodies bind epitopes that are highly conserved across common variants of SARS-CoV-2, providing effective treatment for all variants. Additionally, the epitopes do not overlap, so the two antibodies could be used in combination to ensure effective neutralization.

**Publications**


- VanBlargan LA, Adams LJ, Liu Z, Chen RE, Gilchuk P, … Diamond MS. (2021). A potently neutralizing anti-SARS-CoV-2

antibody inhibits variants of concern by utilizing unique binding residues in a highly conserved epitope. *Immunity,* S1074-7613(21)00348-4.

- Schmitz AJ, Turner JS, Liu Z, Zhou JQ, Aziati ID, … Ellebedy AH. (2021). A vaccine-induced public antibody protects against SARS-CoV-2 and emerging variants. *Immunity*, S1074-7613(21)00345-9.
- Bhandari T. (2021). Antibody protects against broad range of COVID-19 virus variants. *Washington University School of Medicine*, August 20, 2021.

**Patent status –** Pending

**Web Links –** Diamond Profile & Lab; Fremont Profile & Lab**;** Ellebedy Profile **&** Lab