Pathogen and Human Genomics Studies

- A Novel Diagnostic Test to Screen SARS-CoV-2 Variants Containing E484K and N501Y Mutations. (/PHGKB/phgHome.action?action=forward&dbsource=covUpdate&id=1195)
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- Discovery of human ACE2 variants with altered recognition by the SARS-CoV-2 spike protein. (/PHGKB/phgHome.action?action=forward&dbsource=covUpdate&id=1196)
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transmission in many countries and increasing mobility led to the emergence and spread within the continent of many variants of concern and interest, such as B.1.351, B.1.525, A.23.1 and C.1.1

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  Lopez Bernal Jamie et al. BMJ (Clinical research ed.) 2021 5 n1088

  Vaccination with either one dose of BNT162b2 or ChAdOx1-S was associated with a significant reduction in symptomatic COVID-19 in older adults, and with further protection against severe disease. Both vaccines showed similar effects. Protection was maintained for the duration of follow-up (>6 weeks). A second dose of BNT162b2 was associated with further protection against symptomatic disease. A clear effect of the vaccines against the B.1.1.7 variant was found.

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- Neutralizing antibody levels are highly predictive of immune protection from symptomatic SARS-CoV-2 infection (/PHGKB/phgHome.action?action=forward&dbsource=covUpdate&id=1206)
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  Predictive models of immune protection from COVID-19 are urgently needed to identify correlates of protection to assist in the future deployment of vaccines. To address this, we analyzed the relationship between in vitro neutralization levels and the observed protection from SARS-CoV-2 infection using data from seven current vaccines and from convalescent cohorts. We show that neutralization level is highly predictive of immune protection, and provide an evidence-based model of SARS-CoV-2 immune protection that will assist in developing vaccine strategies to control the future trajectory of the pandemic.

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We recently identified several emerging SARS-CoV-2 variants of concerns, characterized by Membrane (M) protein mutations, including I82T and V70L. We now identify a sub-lineage of B.1.1.7 that emerged through sequential acquisitions of M:V70L in November 2020 followed by a novel S:D178H mutation first observed in early February 2021. The percentage of B.1.1.7 isolates in the U.S. that belong to this sub-lineage increased from 0.15% in February 2021 to 1.8% in April 2021. To date this sub-lineage appears to be U.S.-specific with reported cases in 31 states, including Hawaii. As of April 2021 it constituted 36.8% of all B.1.1.7 isolates in Washington.

Diverse Functional Autoantibodies in Patients with COVID-19 (/PHGKB/phgHome.action?action=forward&dbsource=covUpdate&id=1211)
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ACE2 polymorphism and susceptibility for SARS-CoV-2 infection and severity of COVID-19. (/PHGKB/phgHome.action?action=forward&dbsource=covUpdate&id=1219)
Möhlendick Birte et al. Pharmacogenetics and genomics 2021 5

We performed genotyping of SNPs in the genes ACE2 and ACE in 297 SARS-CoV-2-positive and 253 SARS-CoV-2-negative tested patients. We analyzed the association of the SNPs with susceptibility for SARS-CoV-2 infection and the severity of COVID-19. For ACE2 rs2285666, the GG genotype or G-allele was significantly associated with an almost two-fold increased SARS-CoV-2 infection risk and a three-fold increased risk to develop serious disease or COVID-19 fatality. In contrast, the ACE polymorphism was not related to infection risk or severity of disease.

Non-Genomics Precision Health Studies

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