
Monitoring and assessing SARS-CoV-2 Variants of Concern.

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Ladner et al. 2020. mBio
SARS-CoV-2 Variants of Concern

• Some lineages of the virus have accumulated mutations that enhance binding to human cells and/or allow the virus to avoid antibodies – think velcro

• Predicted or demonstrated to have higher transmissibility, higher mortality, evasion of vaccine- and COVID-acquired immunity, diagnostic failures

• Variants of Interest (e.g. B.1.526, NYC)

• Variants of Concern (e.g. B.1.1.7, UK; B.1.351, S Africa P.1, Brazil)

• Variants of High Consequence (none yet, fortunately)

The University of Arizona’s planned activities

- Genomic sequencing of all SARS-CoV-positive samples
- Isolation and characterization of variants of concern
- Monitoring and detecting variants using wastewater
- Viral genomic analyses from individual to globe
- ‘Long COVID’
Clinical Populations to Focus on:

- Individuals infected with COVID-19 variants of concerns
- Reinfection cases
- COVID-infected individuals despite vaccine (breakthrough)
- Post Acute COVID Symptoms (long haulers)
- Immunocompromised COVID-19 patients
ASU Biodesign Clinical Testing Lab

- Internationally and nationally recognized
- ¾ Million PCR tests performed for Arizonans
- Total number agreed to be contacted for research: 86,805
- Total number of unique positive tests: 24,277
- Number of test positive participants agreed to participate in research: 9,700
Tracking the immune response

- Detect prior COVID19 infection
- Distinguish infection vs. Vaccination responses
- Do SARS-CoV-2 variants induce different immune responses?
- What other viruses have individuals been infected with?
- How do other coronaviruses and respiratory pathogens affect infection outcomes?
- Do some patients make antibodies against their own proteins (autoimmunity)? Could this cause post-acute COVID syndrome?
Slide 7 – NAU’s role in the project (Keim)

Advanced Serology

In vitro testing

SARS-CoV-2

Genomes

AC³

Wastewater

In vivo testing

Northern Arizona University
Arizona Collaborative COVID Consortium

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