

## ***Summer of '21: The Delta Variant***

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**Professor of Medicine**

**Division of Infectious Diseases**

**Hospital Epidemiologist**

**Veterans Affairs Western New York Healthcare System**

**Kaleida Health**



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## **Disclosure**

- I have no actual or potential conflict(s) of interest in relation to this presentation.

## **Learning Objectives & References**

- **Objectives**
  - Learn how the Omicron Variant might affect the epidemiology of COVID-19
  - Understand the importance of vaccination to diminish variant infections
- **References**
  - <https://www.cdc.gov/coronavirus/2019-ncov/variants/omicron-variant.html>
  - <https://jamanetwork.com/journals/jama/fullarticle/2787065>
  - <https://www.washingtonpost.com/health/2021/12/04/omicron-variant-how-bad/>

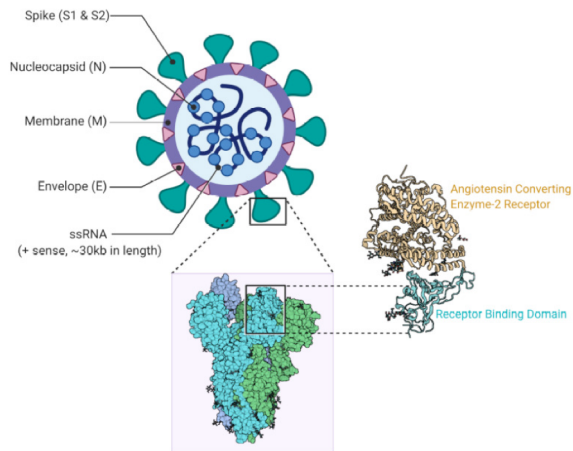


## The Parade of Variants

- Wuhan strain
  - D614G – our “baseline” strain *via* Europe
  - Alpha – B.1.1.7 (UK)
  - Beta – B.1.351 (South Africa)
  - Gamma – P.1 (Brazil)
  - Epsilon – B.1.427/B.1.429 (LA)
  - Eta/Iota – B.1.525/B.1.526 (NYC)
- **Delta – B.1.617.2 (India)**
- *Omicron – B.1.1.529 (South Africa)*

# SARS-CoV-2

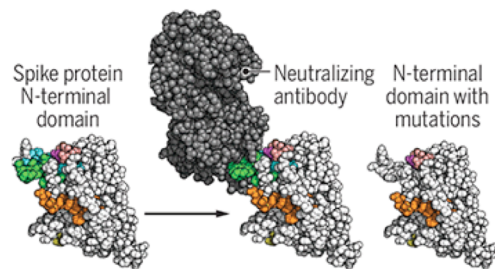
SARS-CoV 2 Structure



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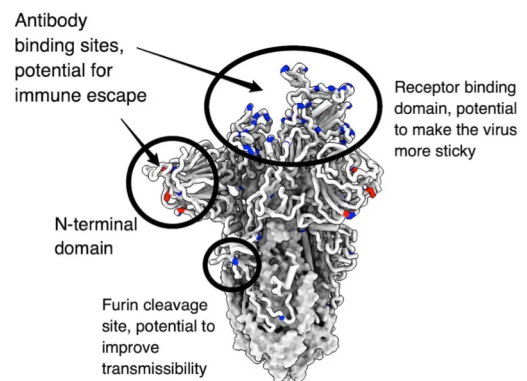
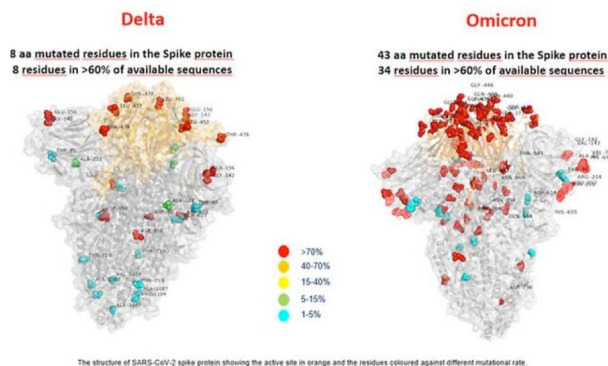
## Evasive maneuver

The spike protein's N-terminal domain (left) includes a "supersite" where powerful antibodies latch on to the virus (middle). Mutations there (right) can prevent them from binding.



Kupferschmidt, Science, 2021

# Delta & Omicron



## The Big Concerns

- Increased Transmissibility
- Increased Severity
- Immune escape
  - Vaccines
  - MAbs
- Rx failure
- Testing failure

## Caveat lector

**medRxiv**  
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medRxiv is receiving many new papers on coronavirus SARS-CoV-2. A reminder: these are preliminary reports that have not been peer-reviewed. They should not be regarded as conclusive, guide clinical practice/health-related behavior, or be reported in news media as established information.



### 1 Early evidence suggests omicron is better at re-infecting people

It looks like an earlier infection only offers half as much protection against omicron as it does against delta. ([Science](#))

+ But early data from South Africa indicates it causes less severe illness. ([STAT](#))

+ Part of the reason why it seems to be more transmissible may be because it shares genetic code with the common cold, researchers say. ([WP](#) \$)

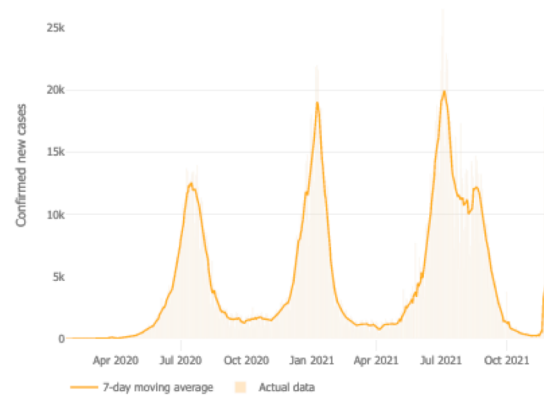
+ Notably, omicron is yet to cause a single death, according to the World Health Organization. ([Slate](#) \$)

+ Omicron is already spreading widely in Europe. ([NYT](#) \$)

+ It might feel hard to believe right now, but this pandemic WILL end. ([The Guardian](#))

## Transmissibility

- Sudden increase in cases in RSA
- BUT...low vaccination rate
  - 30%, 26% “fully”
  - Social activity?



## Severity

- Initial reports
  - Mild, young people, “breakthroughs”
  - BUT the  $n$  is small

South Africa sees rise in child COVID hospital admissions in Omicron epicentre but cases 'mild'

## Immune Escape

- South Africa *preprint* study
  - Restrospective, “big data”
  - Breakthrough infections more common than primary
  - Peaks @ 6 & 12 months after a prior infection
  - BUT no data on:
    - Immunization or underlying disease
    - Social activity correlates
    - Severity of initial infection
- No lab/clinical data on vaccine immunity

## Testing

- No evidence of molecular test failures
- Most tests do not target S gene; those that do use other targets as well
  - SGTF (S gene target failure) on ThermoFisher may suggest presence
- Not much data on rapid tests; should work
- WGS at UB still shows Delta dominance in WNY

## Immune Escape (2)



### **Regeneron says its antibody treatment 'may be' less effective against omicron**

BY PETER SULLIVAN - 11/30/21 09:38 AM EST

235 COMMENTS

## What to Watch for...

- Epidemiologic data on transmission
  - Outrun Delta??
- Clinical data on severity of illness
- Lab and clinical evidence of vaccine, MAb & Rx failures
  - Countries & companies actively setting up neutralization assays using serum from study & other known vaccinated/infected people
  - Data on breakthroughs in those vaccinated
- Need for modified vaccine and/or booster?



## What to Do for Now

- Vaccination and boosters!!
  - Delta is still rampant!
  - Unlikely omicron will completely escape
- Non-pharmacologic interventions
  - Masks
  - Distancing
  - Avoiding crowds

