Activity of convalescent and vaccine serum against SARS-CoV-2 Omicron BA.1 and BA.1.1


WHO Global Consultation – What recent evidence do we have that omicron is evading immunity and what are the implications?

February 14th, 2022
• Serum samples (from PARIS study)
• Neutralization of B.1.1.529 isolate (R346)
• ELISA against wild type, B.1.351 and B.1.1.529 RBD, NTD and spike
Overall reduction in neutralizing activity

Overall neutralization

Overall neutralization fold change

Negative values set to 5 ID$_{50}$
Convalescent individuals

Convalescent neutralization

$\text{Fold-change in ID}_{50}$

Negative values set to 5 $\text{ID}_{50}$
2x Pfizer in previously naive individuals

Negative values set to 5 ID$_{50}$
3x Pfizer in previously naive individuals

Negative values set to 5 \( ID_{50} \)
2x Pfizer in previously infected individuals

Convalescent plus 2x BNT162b2 neutralization

\[ p = 0.0165 \]
\[ p = 0.0005 \]

Negative values set to 5 \( \text{ID}_{50} \)
Overall comparison of residual titers to BA.1

Comparison of B.1.1.529 neutralization titers

Negative values set to 5 ID$_{50}$
RBD binding

Overall RBD binding

Negative values set to 5 AUC
NTD binding

Negative values set to 5 AUC
Spike binding

Overall spike binding

AUC

WA1 (WT)   B.1.351   B.1.1.529

p<0.0001  p<0.0001  p<0.0001

Overall spike binding fold change

Fold-change in AUC

WA1 (WT)   B.1.351   B.1.1.529

2.7-fold    5.2-fold

Negative values set to 5 AUC
The impact of R346K (BA.1 vs BA.1.1)

Overall neutralization

Fold-change in ID$_{50}$

Overall neutralization fold change

1.3-fold

Negative values set to 5 AUC
Conclusions

• Neutralizing activity drops sharply
• Convalescent individuals are most affected, followed by double vaccinated individuals
• Triple vaccinated and convalescent vaccinated individuals have most residual neutralizing activity
• This aligns well with clinical observations and vaccine effectiveness data against symptomatic infection
• R346K can cause additional drops in neutralizing activity of polyclonal serum
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