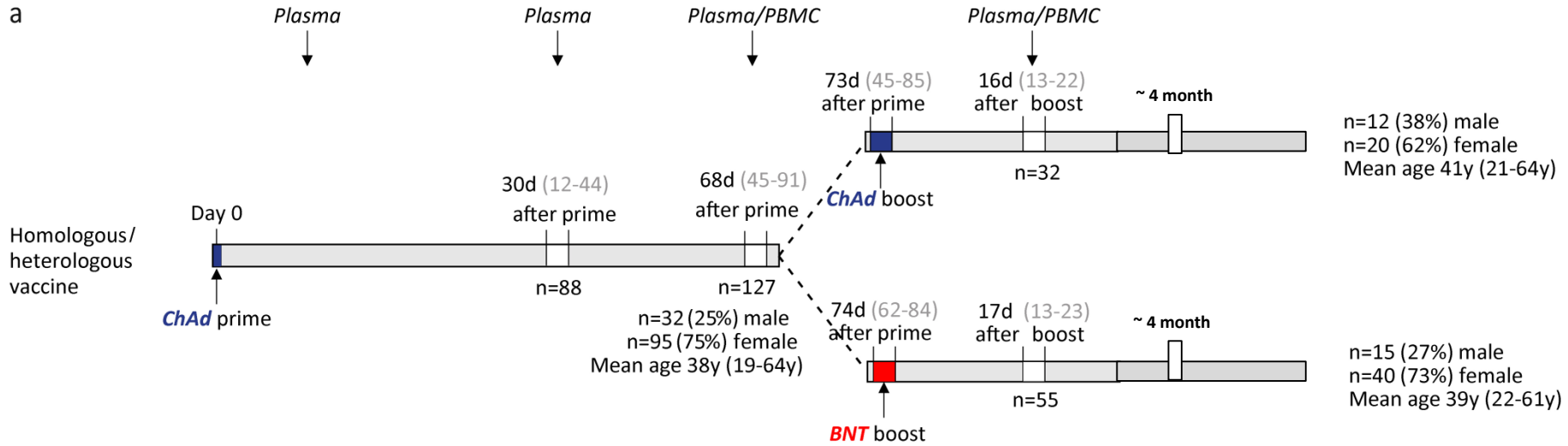


**Humoral and cellular immune response against  
SARS-CoV-2 variants following  
heterologous and homologous  
Vaccination**

**Reinhold Förster and Georg Behrens**  
for the Hannover CoCo-Study group

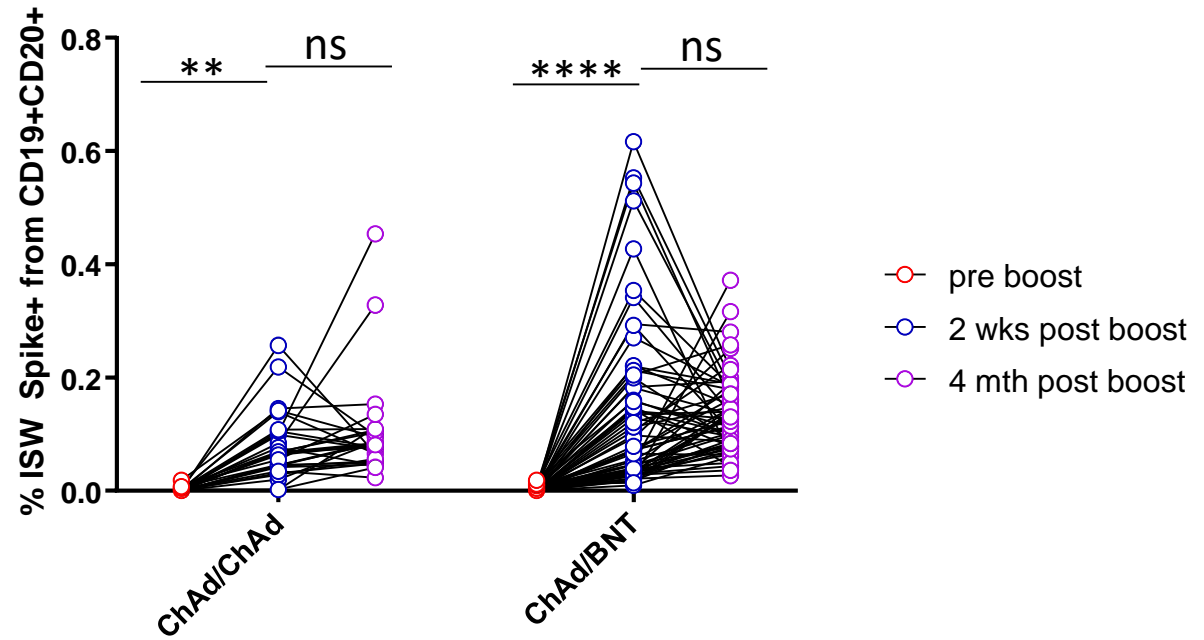
# Analysis scheme



## Parameters determined

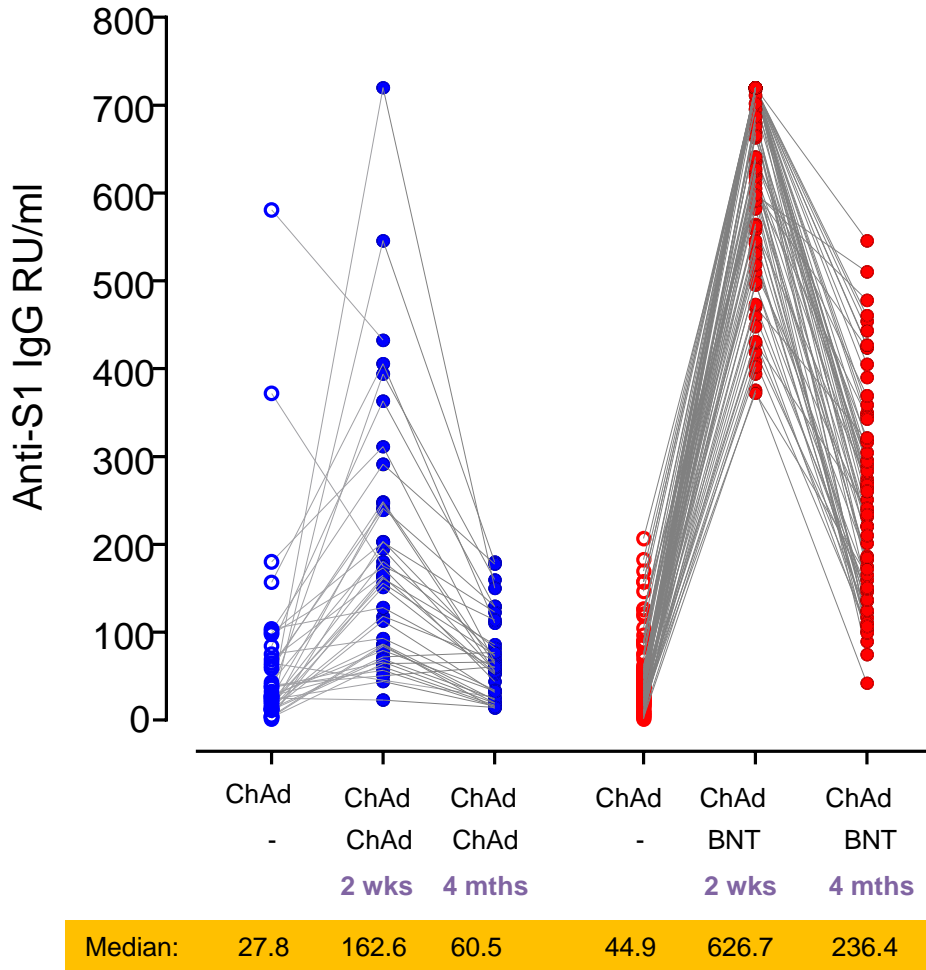
- Anti-S1 IgG (Euroimmune; QuantiVac)
- Anti-S- IgA
- Surrogate virus neutralization test (sVNT)
- S-specific B cells
  
- S-specific CD4 T cells
- S-specific CD8 T cells
- IGRA

# No drop in ISW S-specific B cells

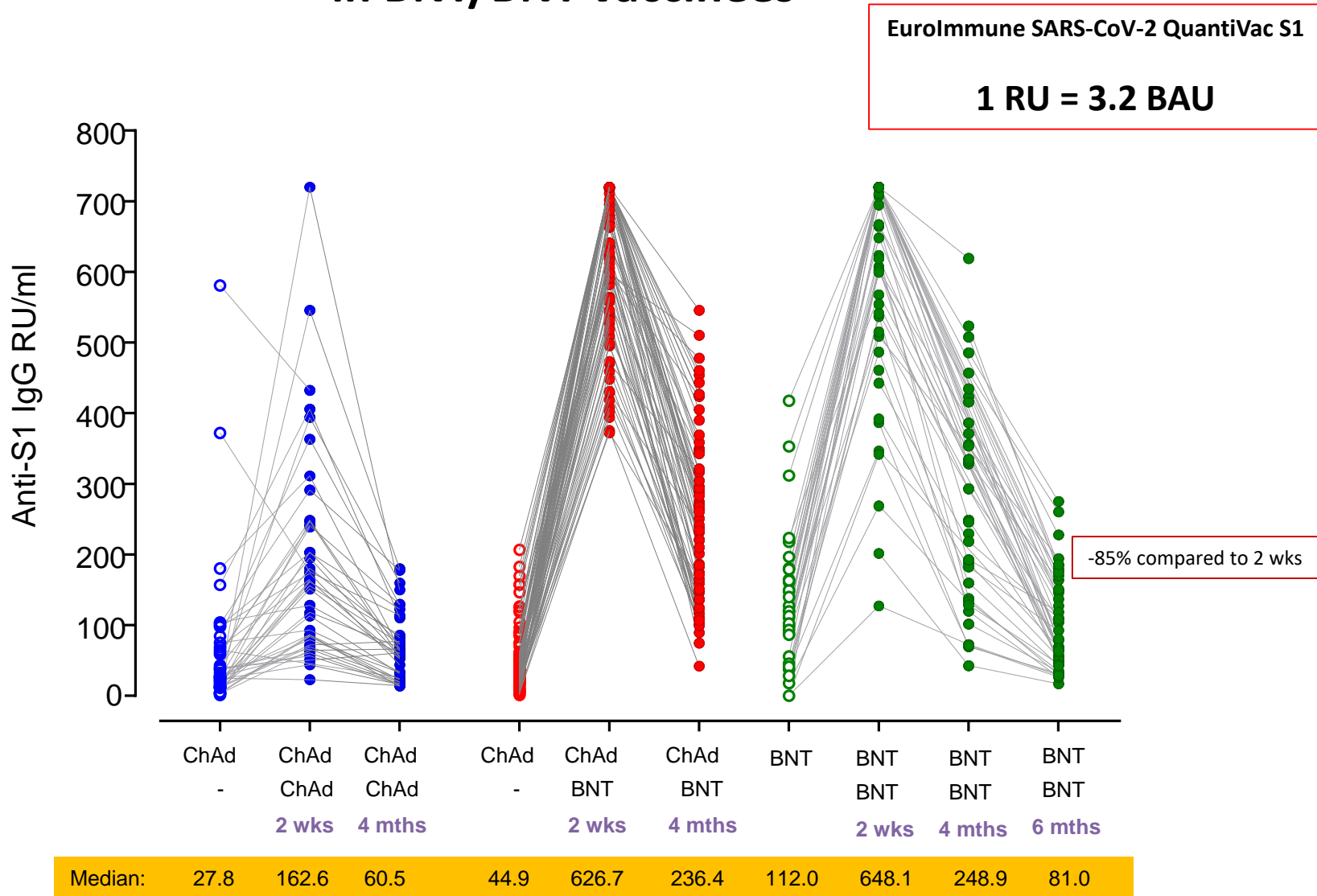


# Strong drop in S1 antibodies 6 month after boost in BNT/BNT vaccinees

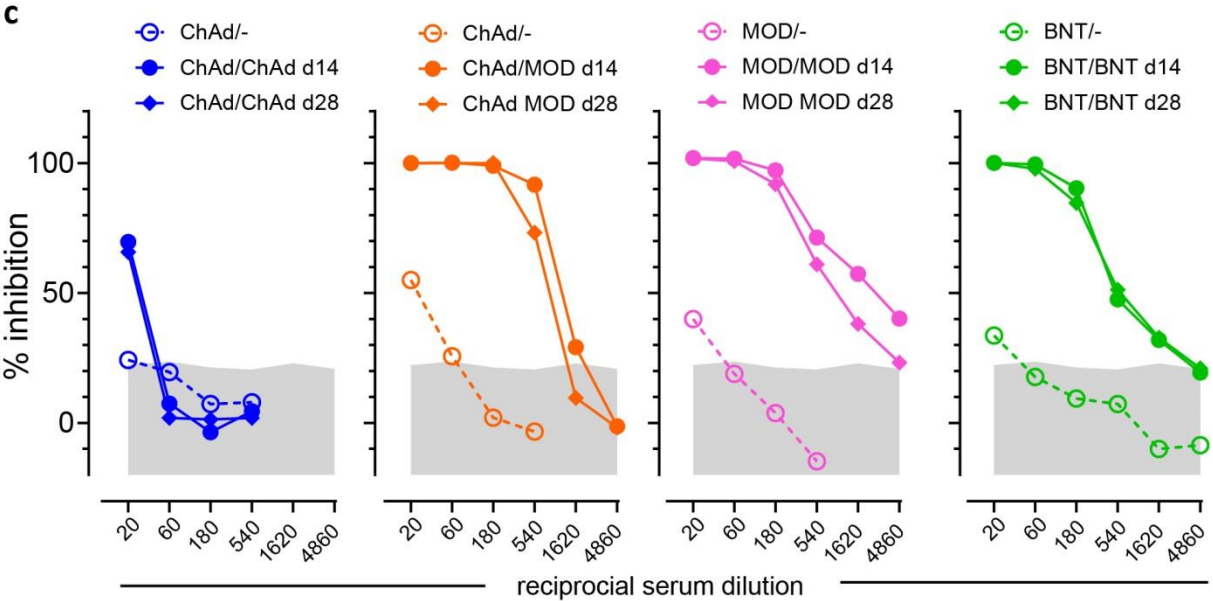
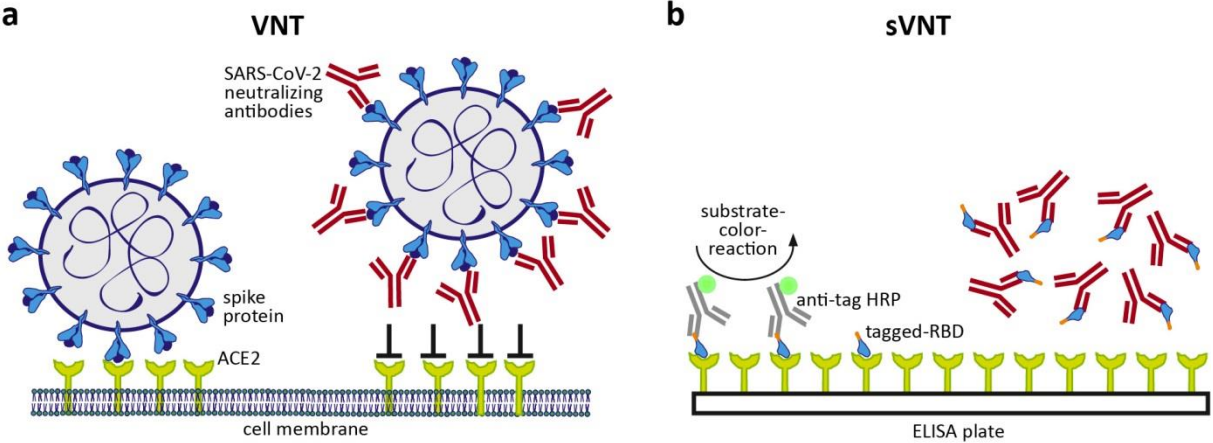
EuroImmune SARS-CoV-2 QuantiVac S1  
**1 RU = 3.2 BAU**



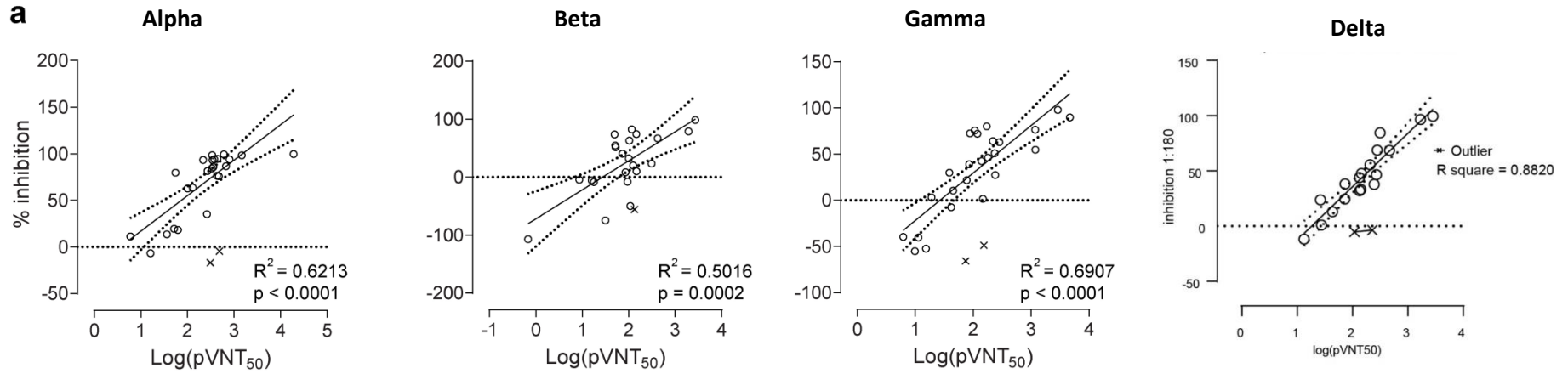
# Strong drop in S1 antibodies 6 month after boost in BNT/BNT vaccinees



# Surrogate virus neutralization test

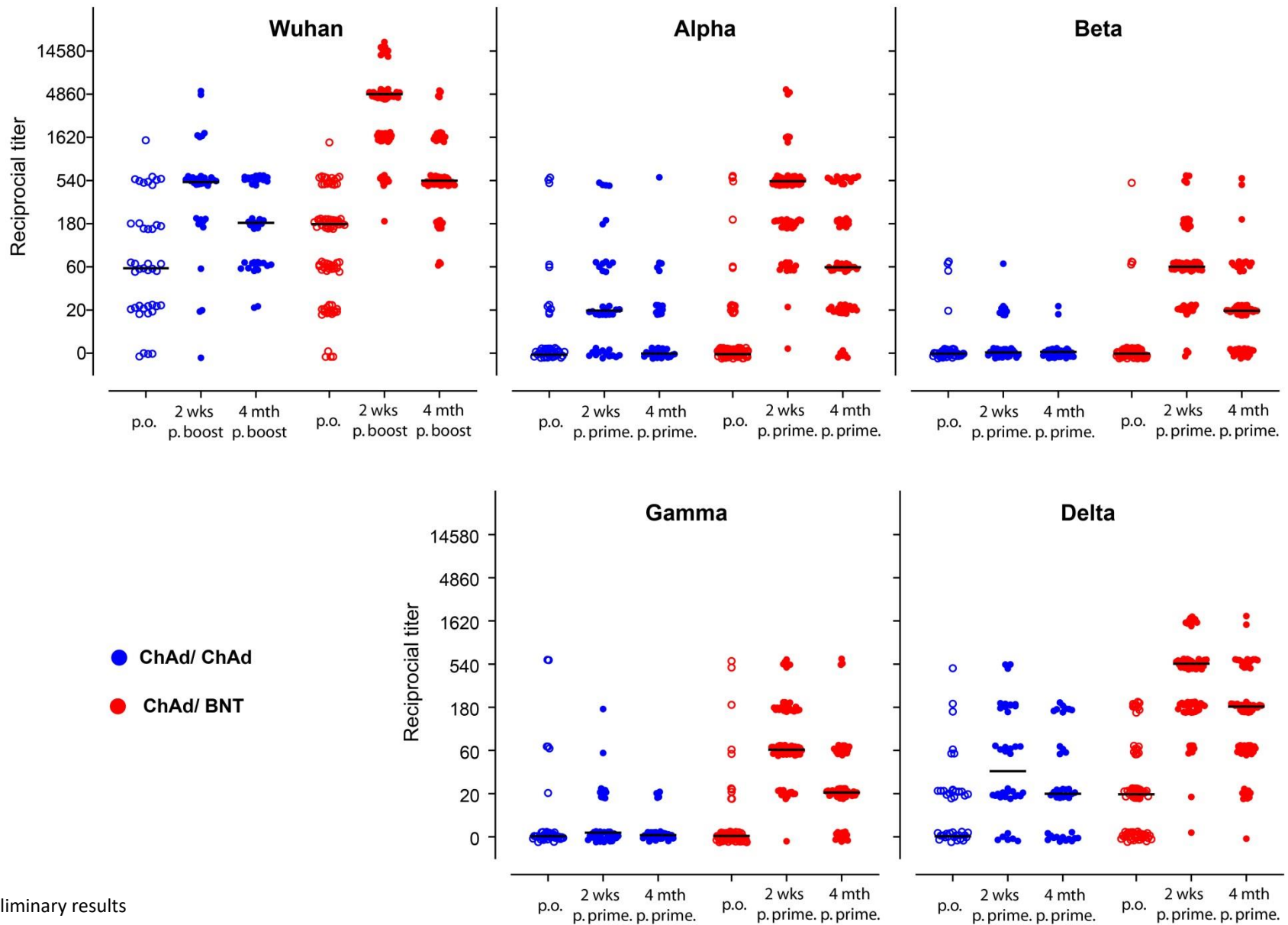


# Correlation of sVNT with pVNT

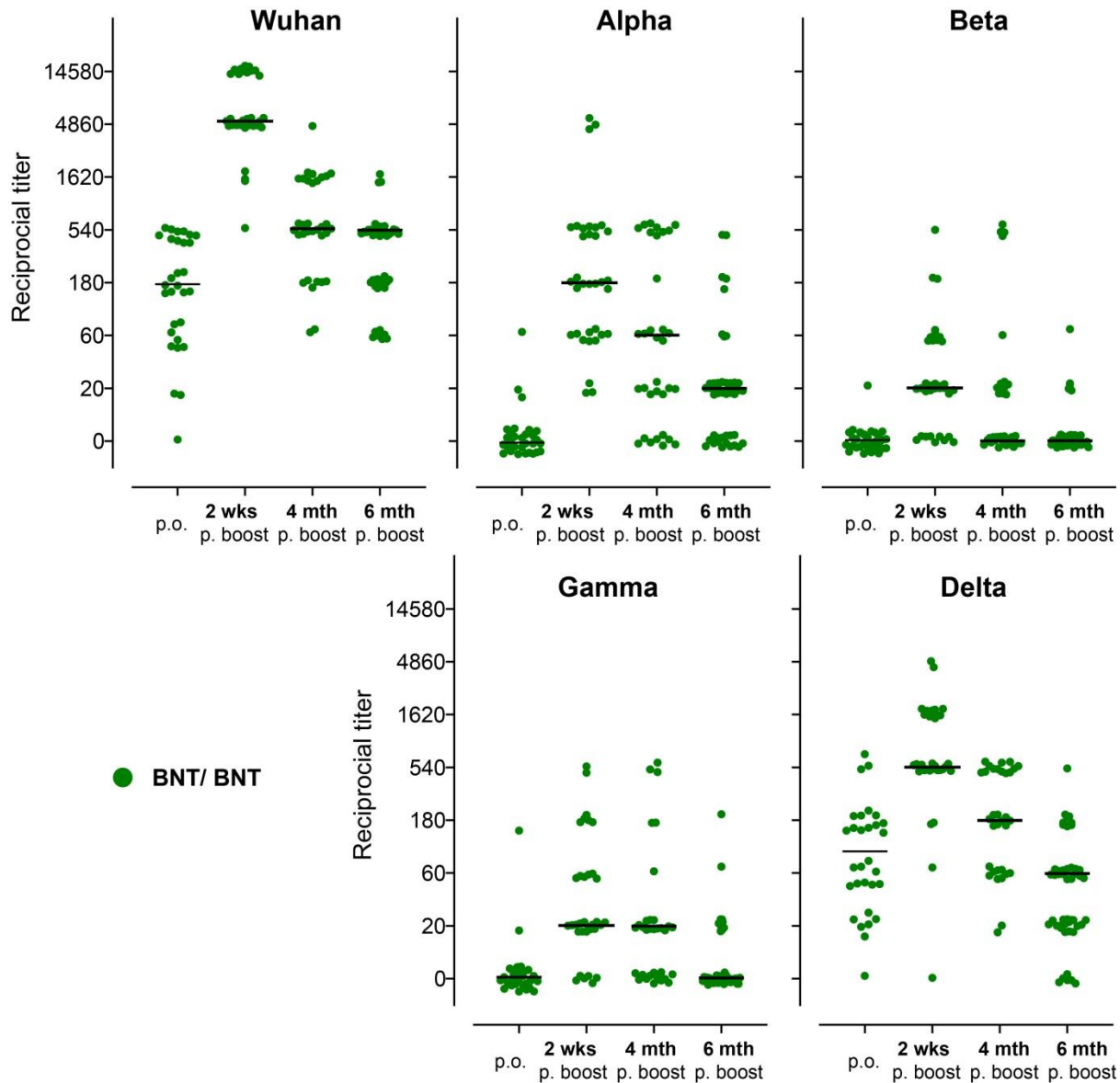




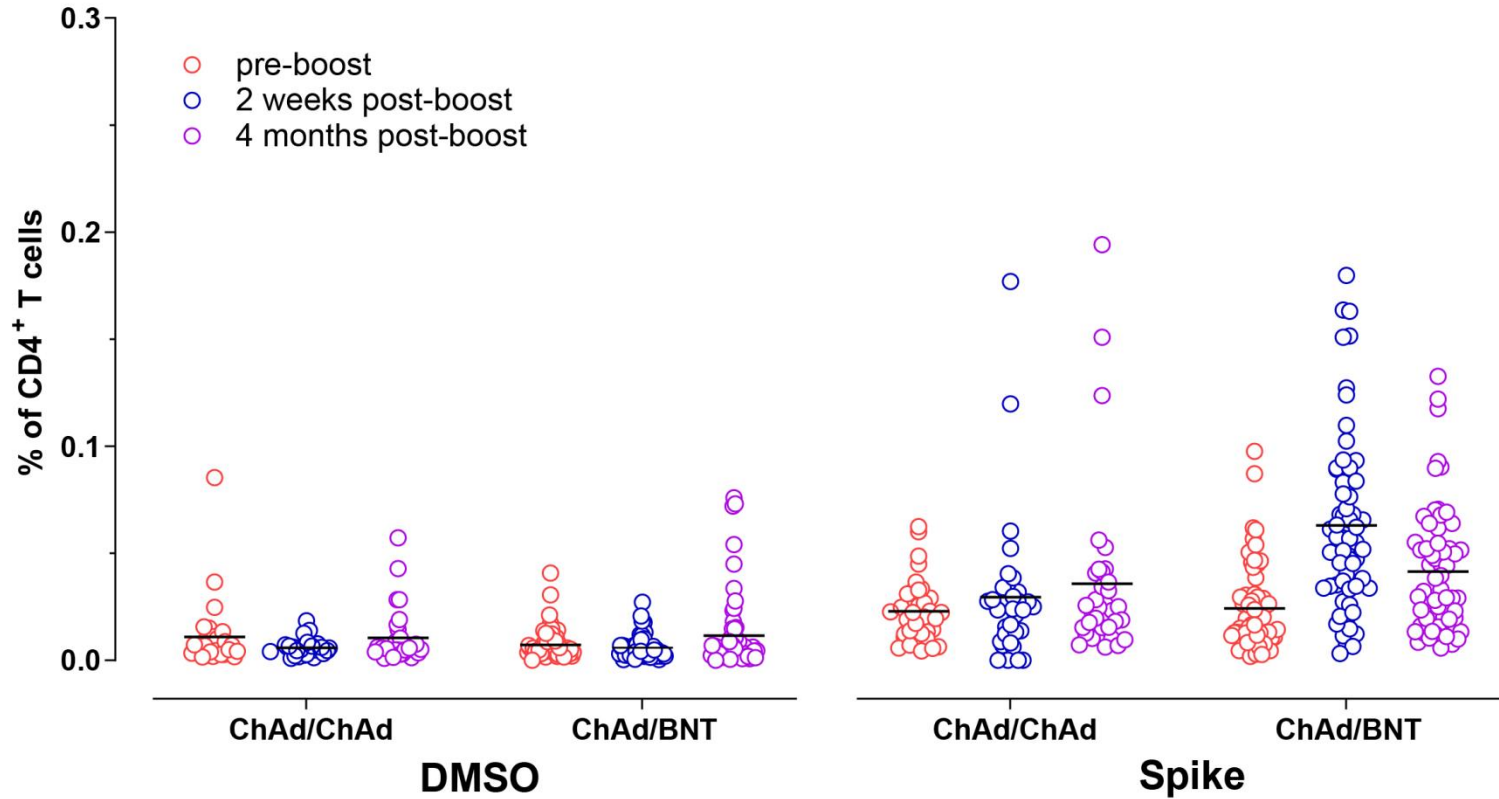
# Drop in neutralizing antibodies 4 month after boost



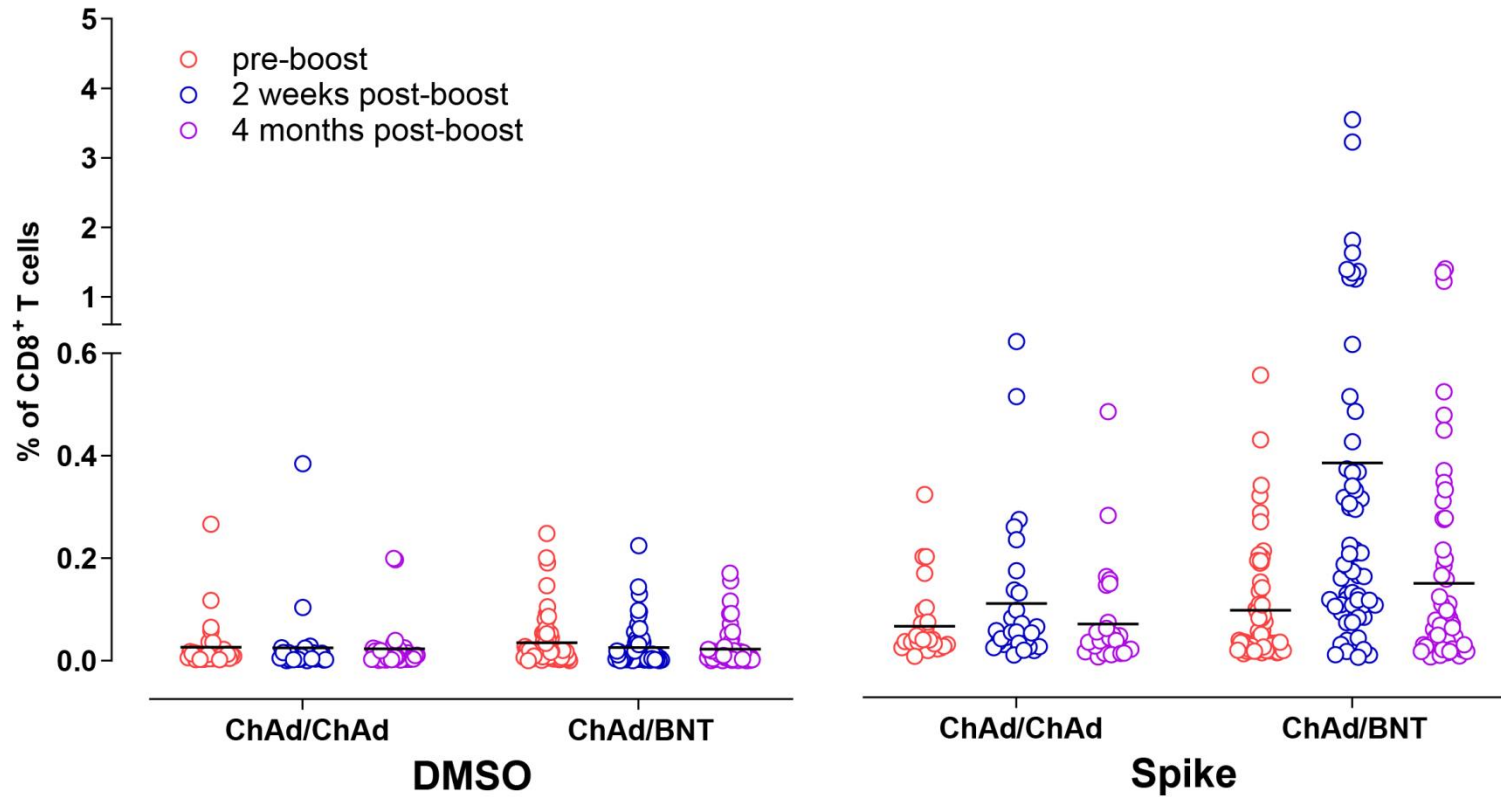
# Strong drop in neutralizing antibodies 6 month after boost in BNT/BNT vaccinees



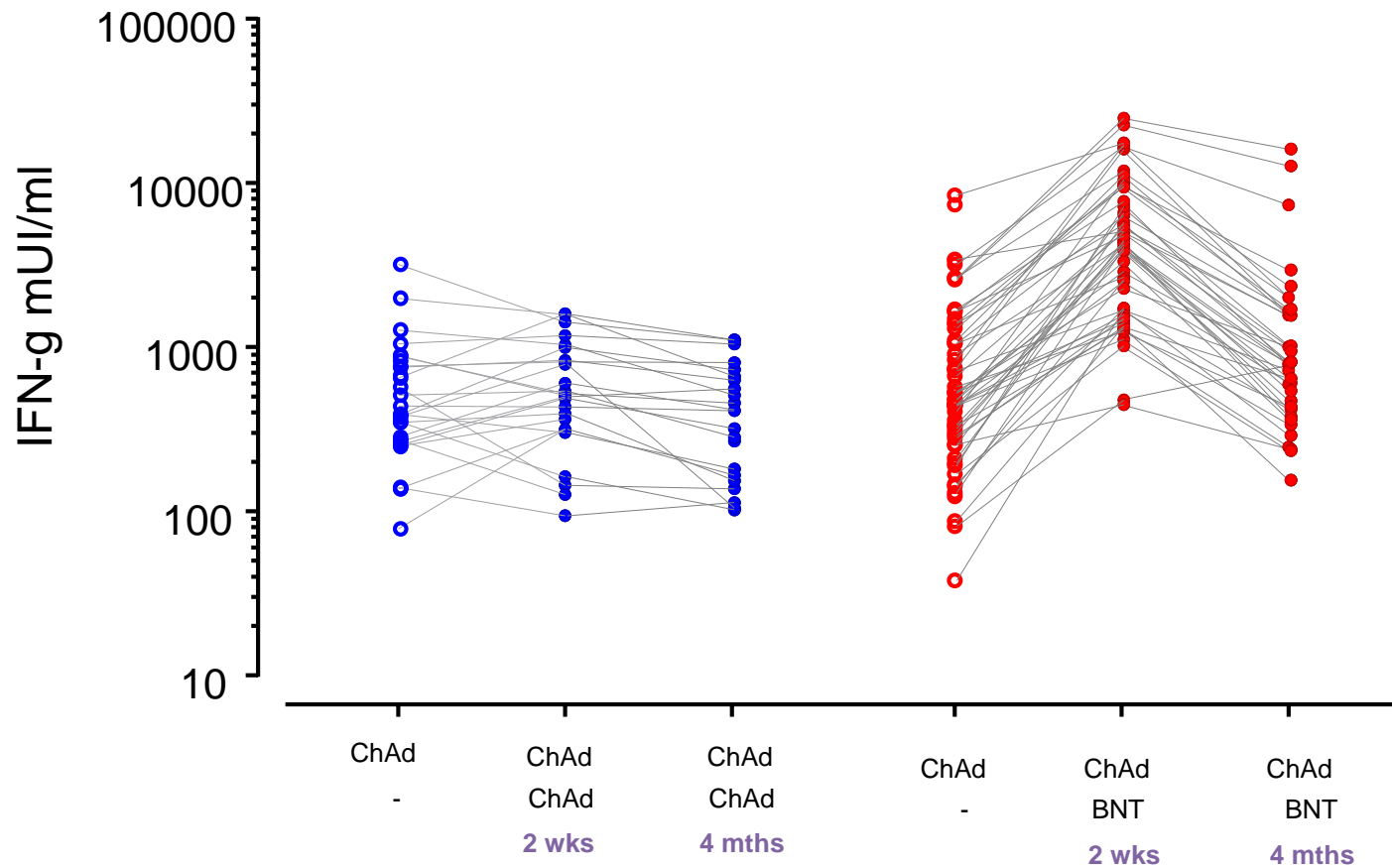
# Frequencies of Spike-specific CD4+ T cells



# Reduced frequencies of Spike-specific CD8+ T cells



# Interferon gamma release assay



## Summary

- Heterologous immunization with ChAd followed by BNT or MOD induces Spike –specific CD4 and CD8 T cell responses as well as high titers of neutralizing antibodies.
- 4 month after booster immunization a drop in T cell responses is observed with all immunization protocols.
- ChAd/ChAd vaccinees have lowest Spike-specific T cell counts as well as lowest titers of all vaccination protocols
- Mod/Mod induces highest titers of Delta neutralizing antibodies
- After six month Delta neutralizing antibodies dropped in BNT/BNT vaccinees by approx 85%

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