

COVID-19 T cell immunity

OCT 26TH 2020 - IMM MAMoME

(10)(2e)



SARS-CoV-2 immune response


Antibody response

- Neutralizing
- Help in clearance of virus and infected cells

Innate

- Cytokine storm in severe cases
- Shaping adaptive response

Adaptive response

- B cells
 - T cells
- 

T cell immunity – Research questions

Is T cell immunity induced?

What type of response?

Longevity?

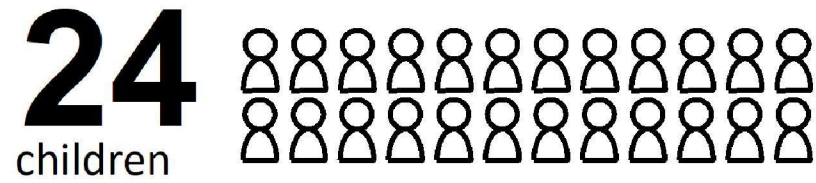
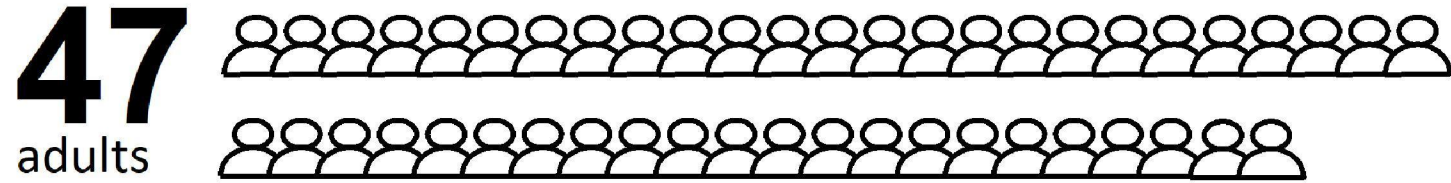
Cross-reactivity with other (corona) viruses



FFX cohort

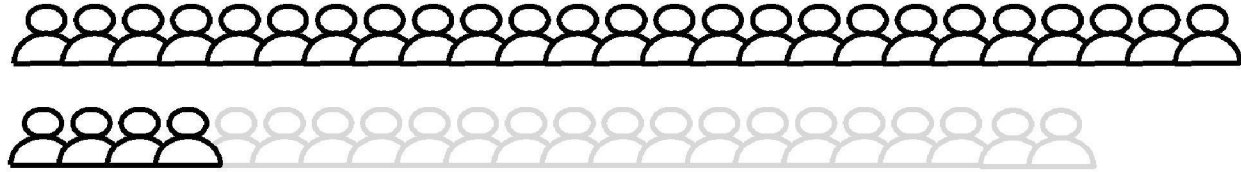


FFX cohort

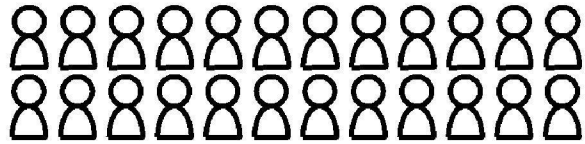


FFX cohort – T cell assays

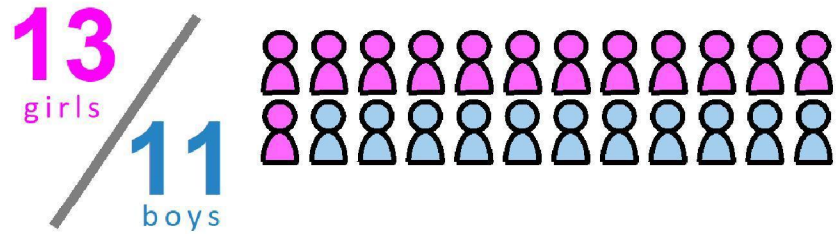
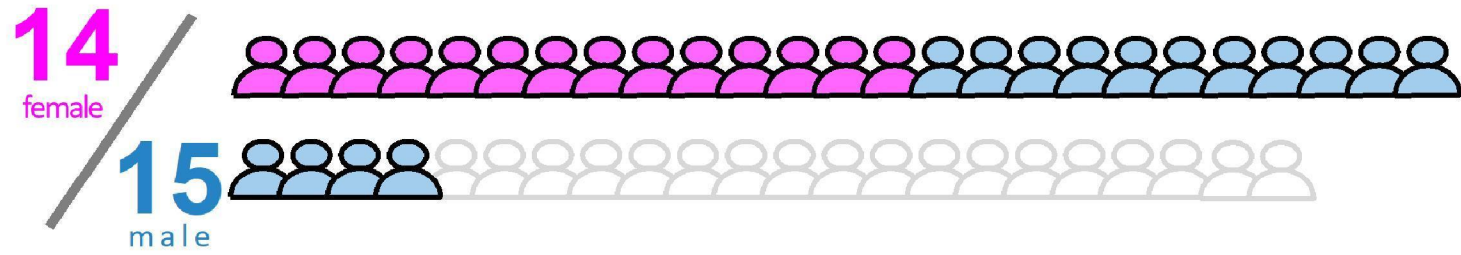
29
adults



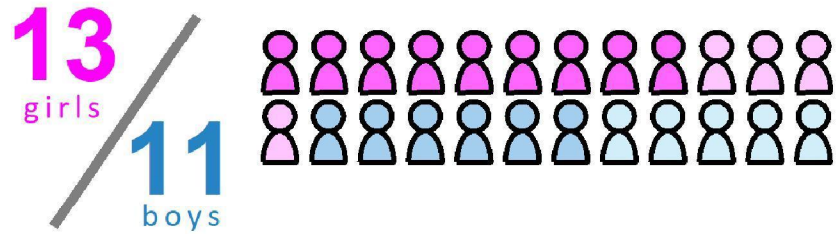
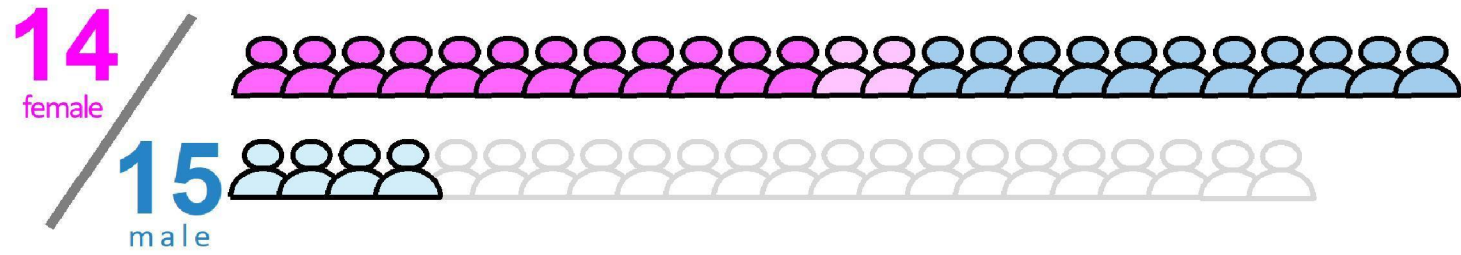
24
children



FFX cohort – T cell assays

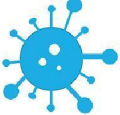
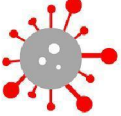
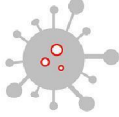



FFX cohort – T cell assays



T-cell assay

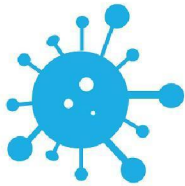
IFN- γ ELIspot

- Heat-inactivated SARS-CoV-2 
- Peptide pool SARS-CoV-2 spike 
- Peptide pool SARS-CoV-2 nucleocapsid 
- Peptide pool OC-43 spike 

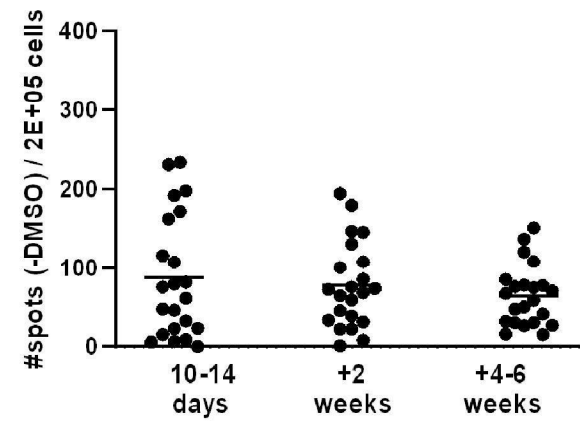
Flow cytometry



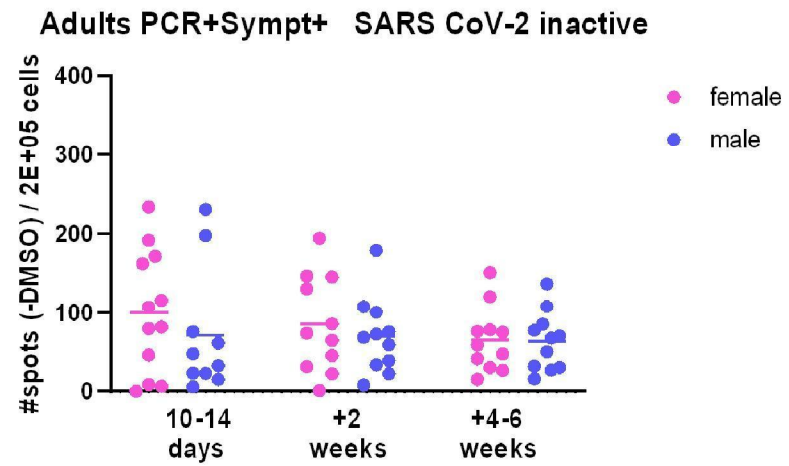
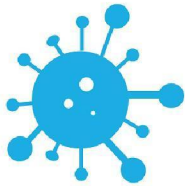
Heat-inactivated SARS-CoV-2



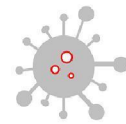
Adults PCR+Sympt+ SARS CoV-2 inactive (all)



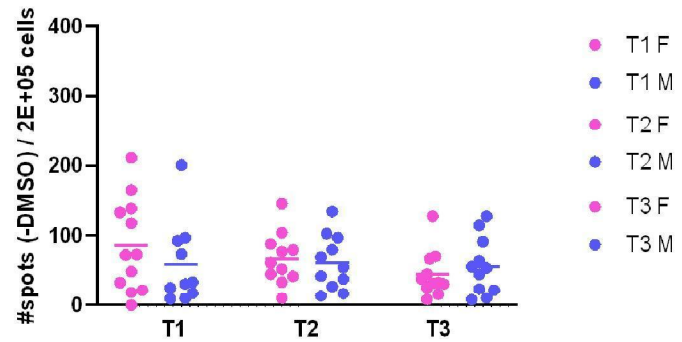
Heat-inactivated SARS-CoV-2



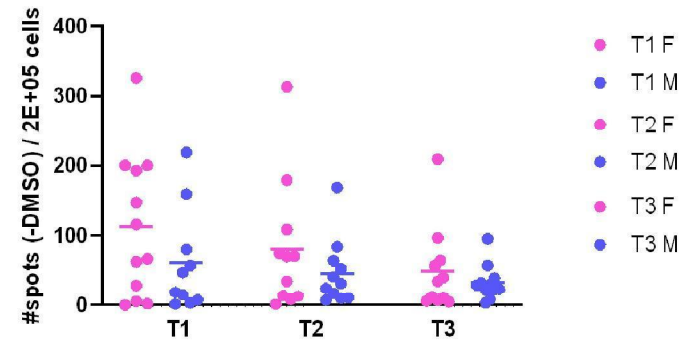
Peptide pools



Adults PCR+Sympt+ CoV-2 Spike (S1+S2)



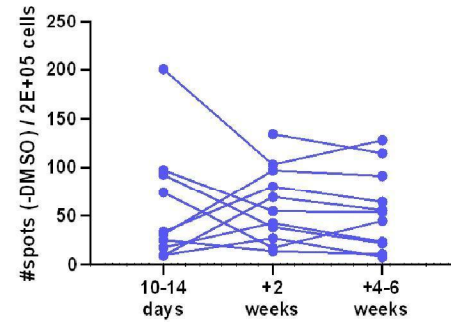
Adults PCR+Sympt+ CoV-2 NCAP



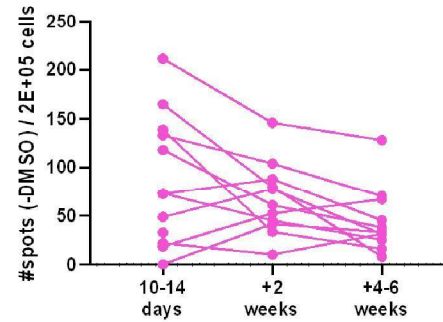
Kinetics



Adults PCR+Sympt+ CoV-2 Spike (S1+S2) Male



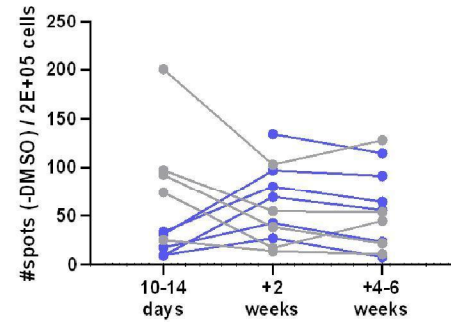
Adults PCR+Sympt+ CoV-2 Spike (S1+S2) Female



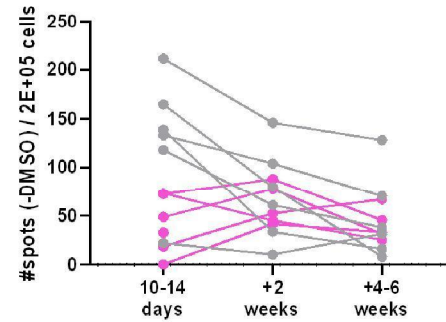
Kinetics



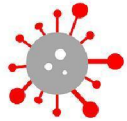
Adults PCR+Sympt+ CoV-2 Spike (S1+S2) Male



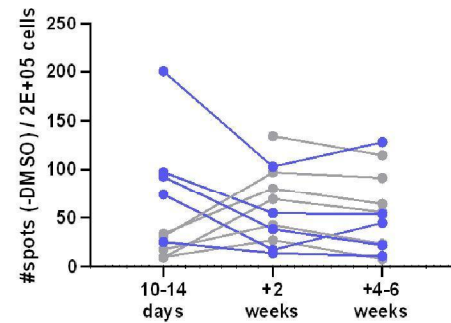
Adults PCR+Sympt+ CoV-2 Spike (S1+S2) Female



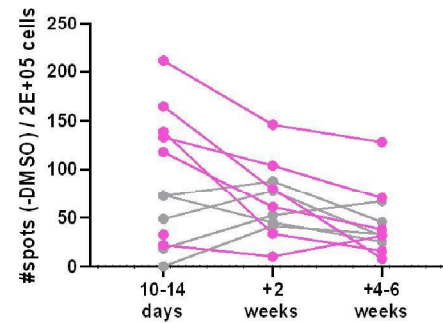
Kinetics



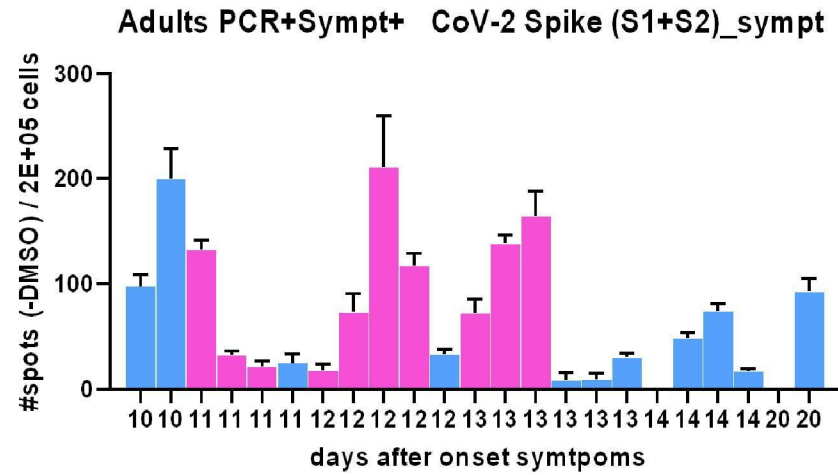
Adults PCR+Sympt+ CoV-2 Spike (S1+S2) Male



Adults PCR+Sympt+ CoV-2 Spike (S1+S2) Female



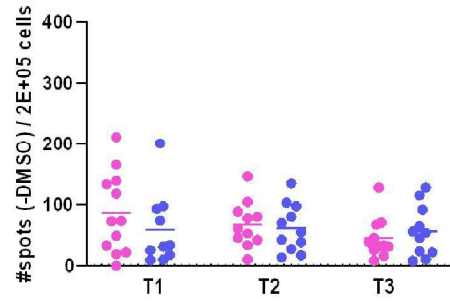
Days after onset symptoms



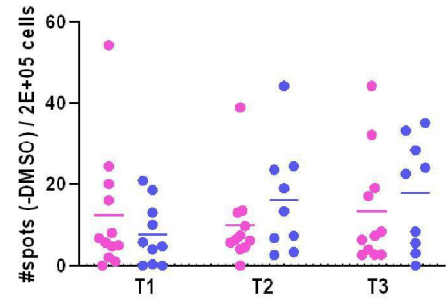
Response to OC43



Adults PCR+Sympt+ CoV-2 Spike (S1+S2)



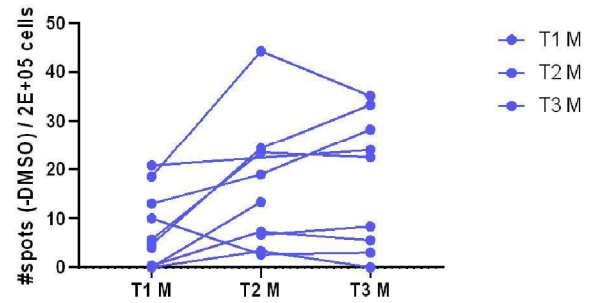
Adults PCR+Sympt+ OC43 Spike (S1+S2)



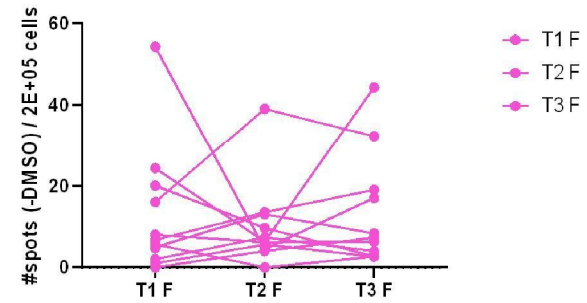
Boost of OC43 response?



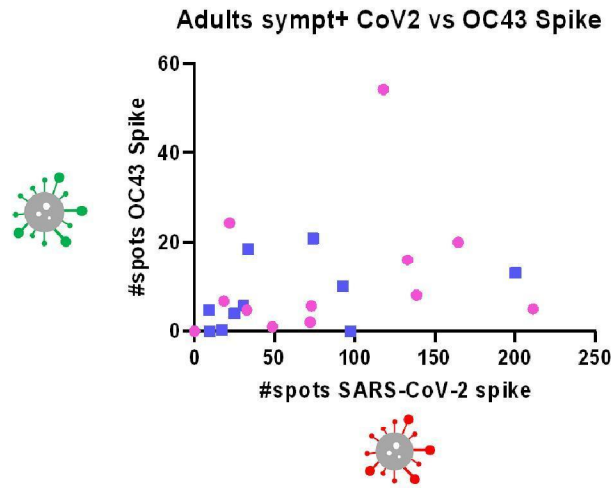
Adults PCR+Sympt+ OC43 Spike (S1+S2) Male



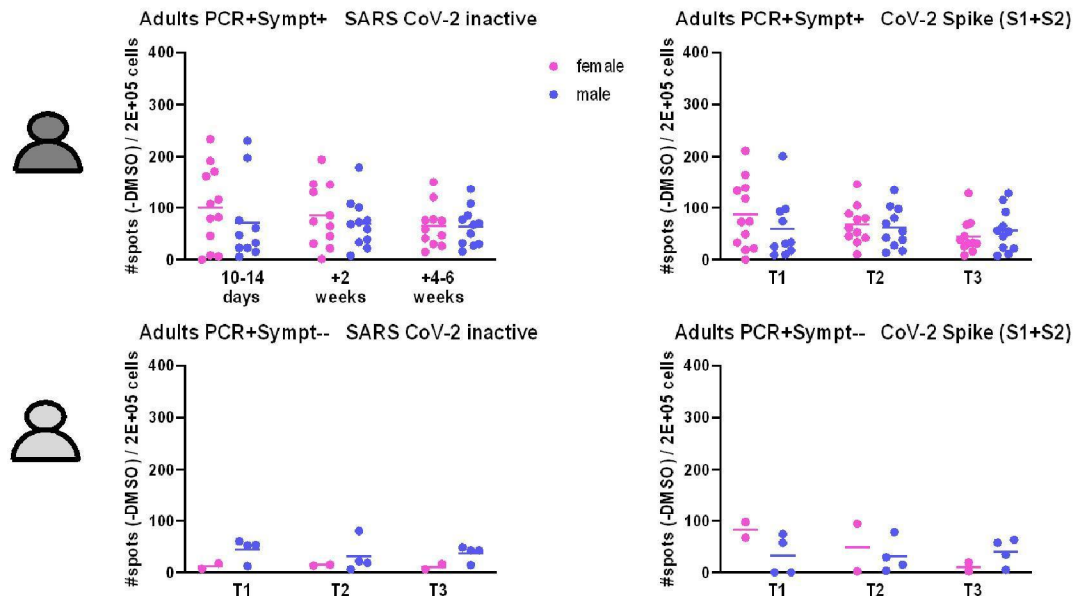
Adults PCR+Sympt+ OC43 Spike (S1+S2) Female



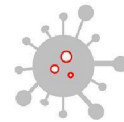
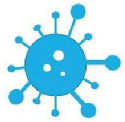
No correlation SARS-CoV-2 vs OC43



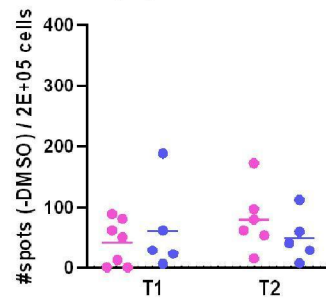
Asymptomatic patients



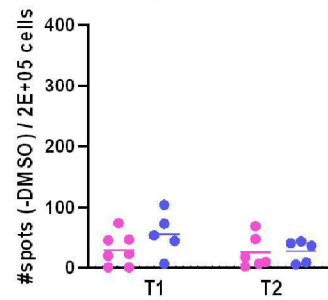
Responses in children



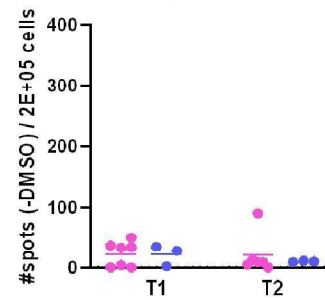
Kids PCR+Sympt+ SARS CoV-2 inactive



Kids PCR+Sympt+ CoV-2 Spike (S1+S2)



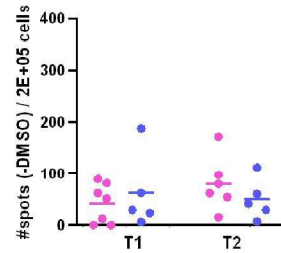
Kids PCR+Sympt+ CoV-2 NCAP



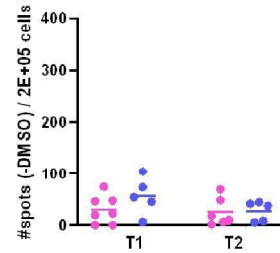
Responses in children



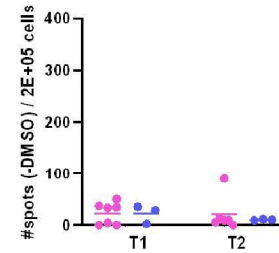
Kids PCR+Sympt+ SARS CoV-2 inactive



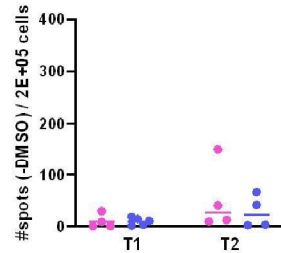
Kids PCR+Sympt+ CoV-2 Spike (S1+S2)



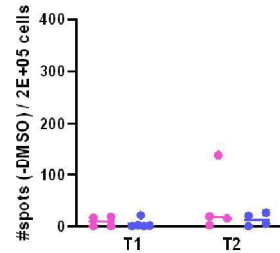
Kids PCR+Sympt+ CoV-2 NCAP



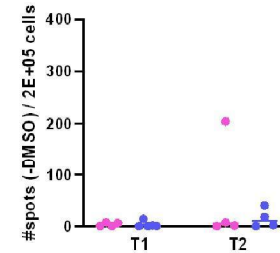
Kids PCR+Sympt- SARS CoV-2 inactive



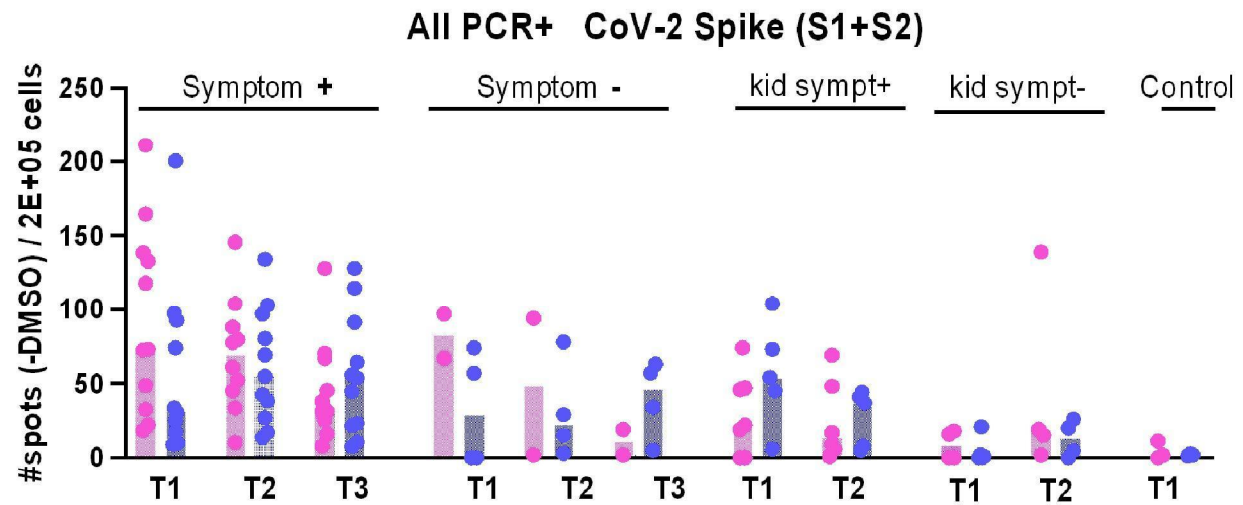
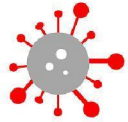
Kids PCR+Sympt- CoV-2 Spike (S1+S2)



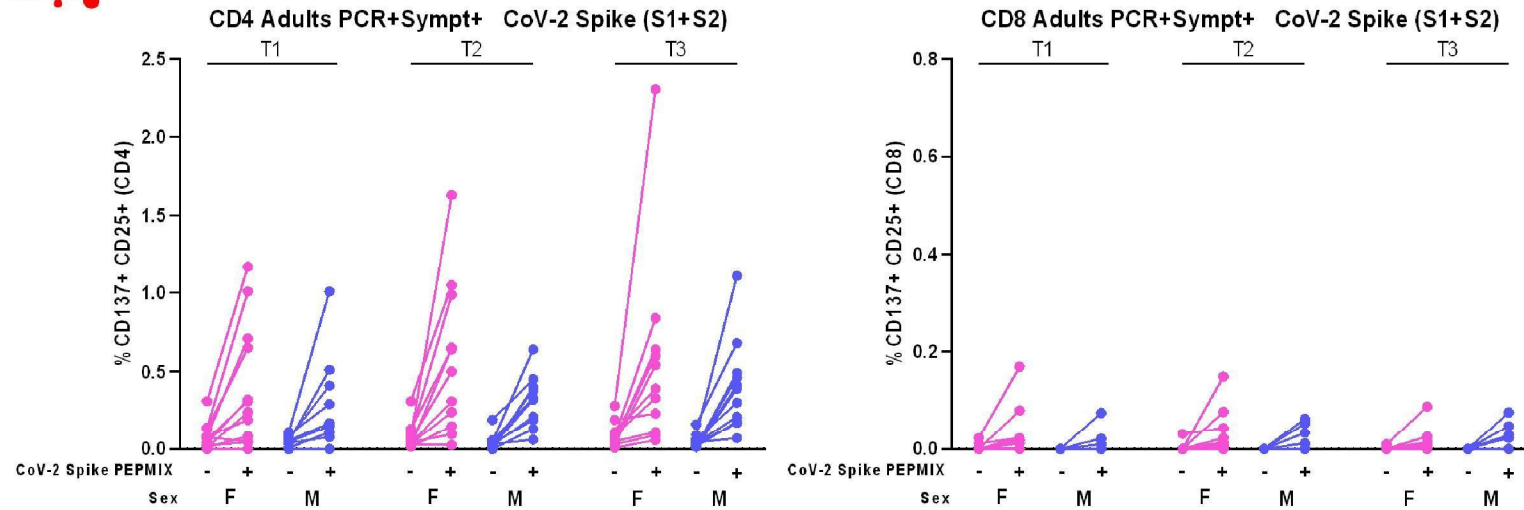
Kids PCR+Sympt- CoV-2 NCAP



All responses




Activated T cells



Next steps

- Analyse flow cytometry – CD4 or CD8 response
 - Other cytokines produced?

 - Link to onset of disease; symptoms; severity (also with UMCU)

 - Link to antibody/B cell responses
 - Link to deep phenotyping
- 

Future

Long-term follow up

In depth characterizations

Cross-reactivity



Acknowledgements

IIV FFX team

(10)(2e)

FFX T cell

(10)(2e)

BSL-3 team

(10)(2e)

FFX - MIA

IMS

(10)(2e)

IDS- Virology

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EPI

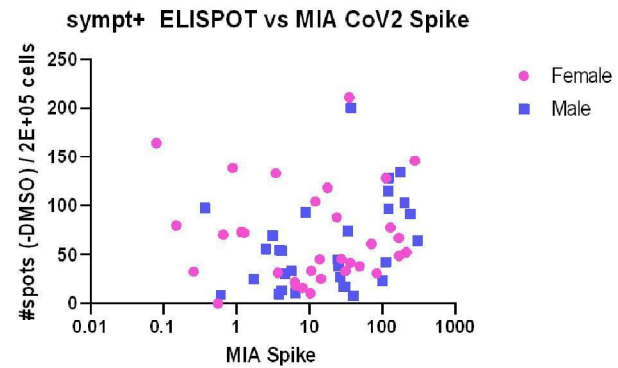
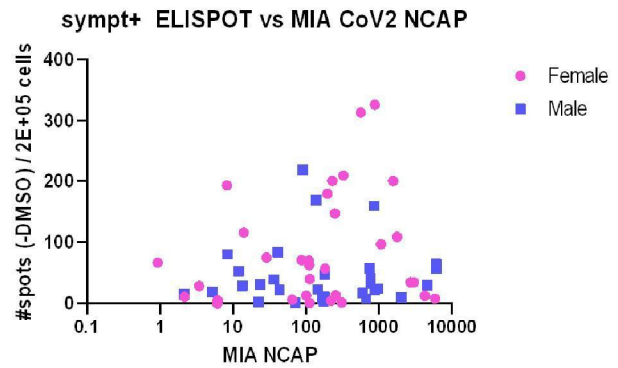
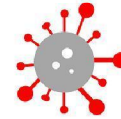
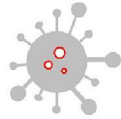
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Association with antibody-levels



All results

