722042

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?

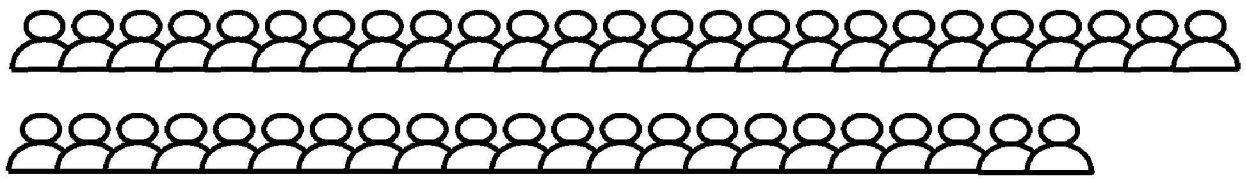
Longevity?

Cross-reactivity with other (corona) viruses

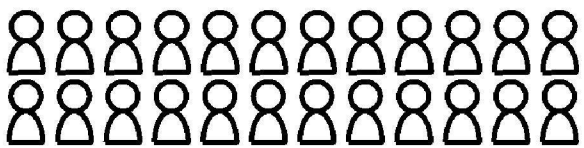
FFX cohort

FFX cohort

47
adults

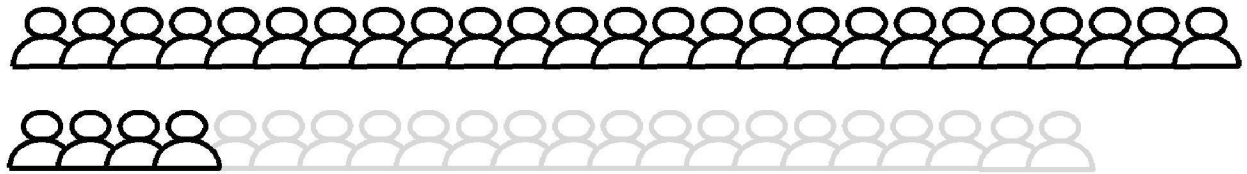


24
children

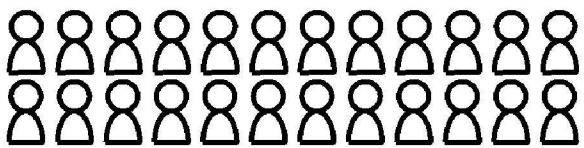


FFX cohort – T cell assays

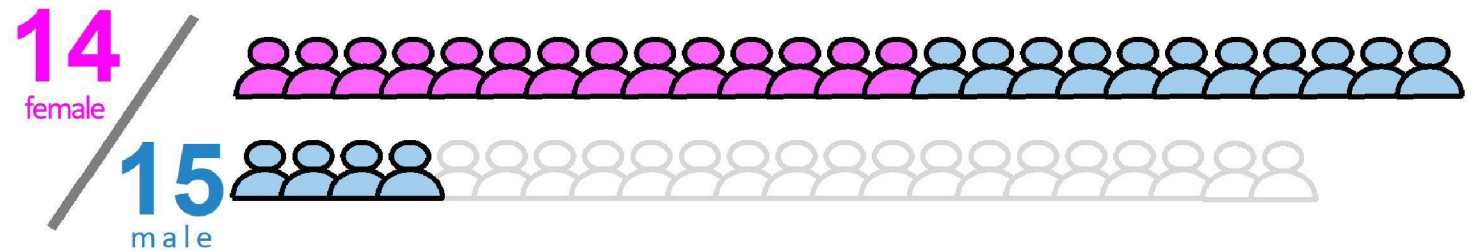
29
adults

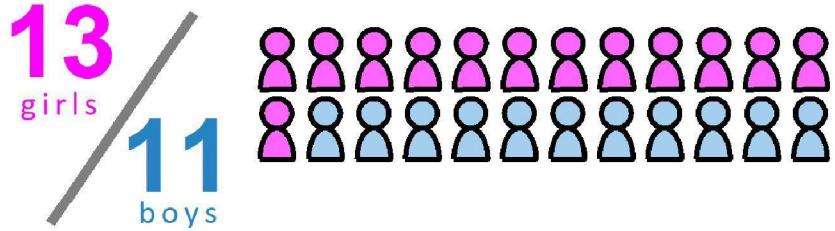


24
children

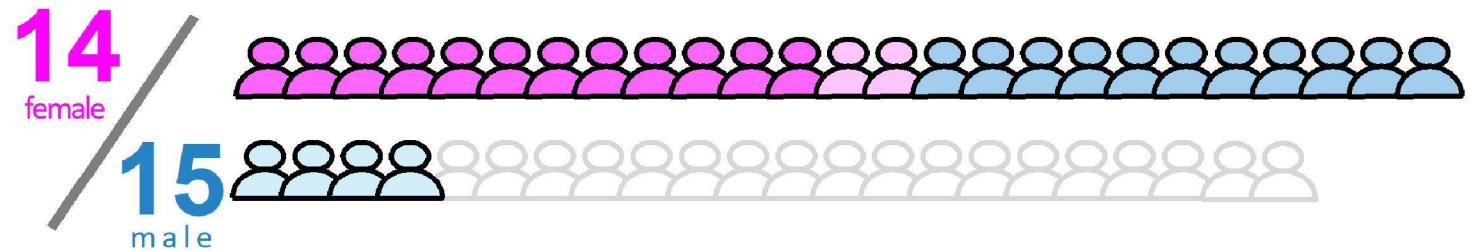


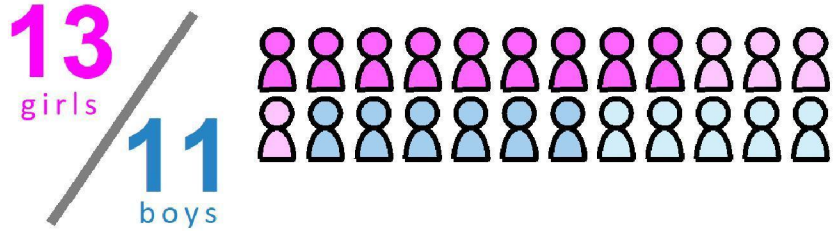
FFX cohort – T cell assays





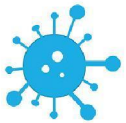
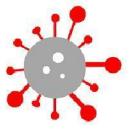
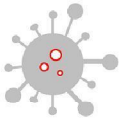
FFX cohort – T cell assays





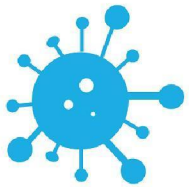
T-cell assay

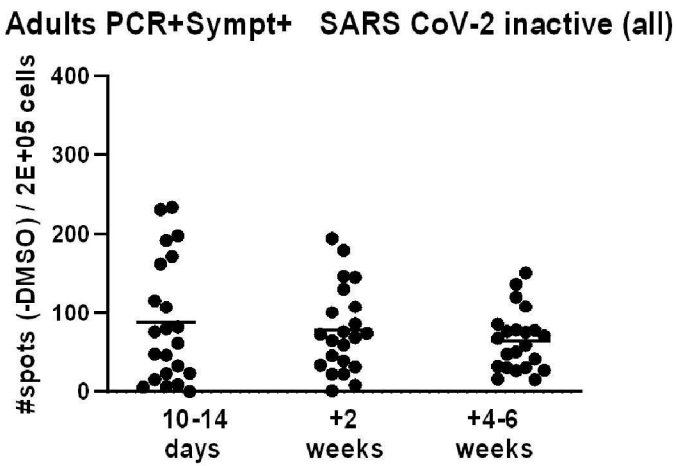
IFN-γ ELIspot

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

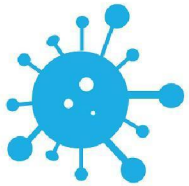
Flow cytometry

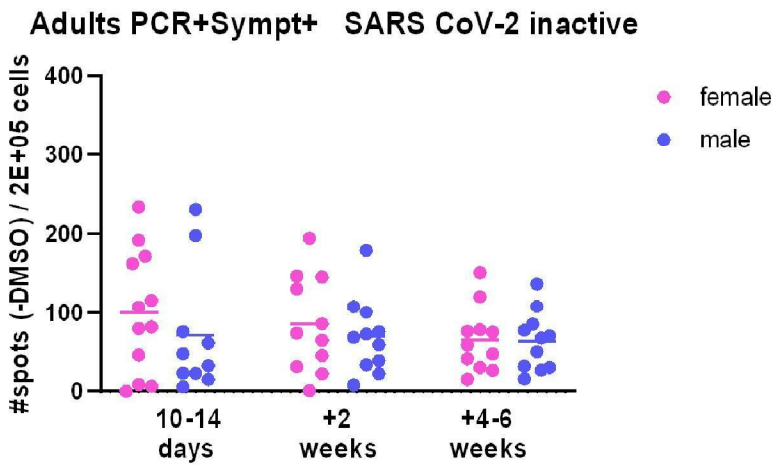
Heat-inactivated SARS-CoV-2



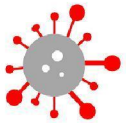


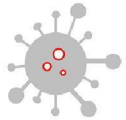
Heat-inactivated SARS-CoV-2

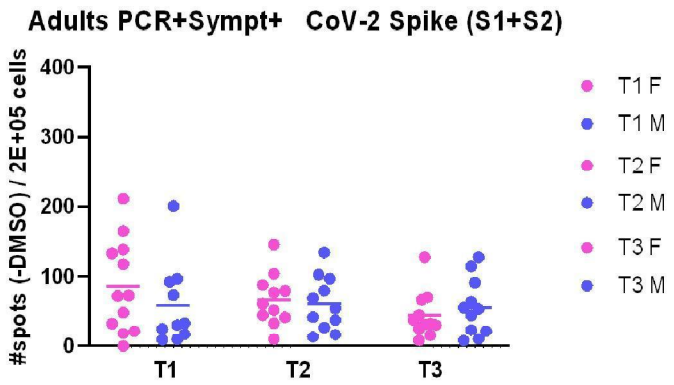


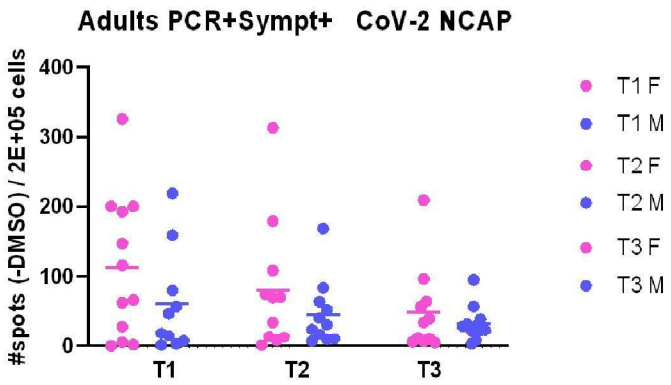


Peptide pools

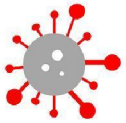


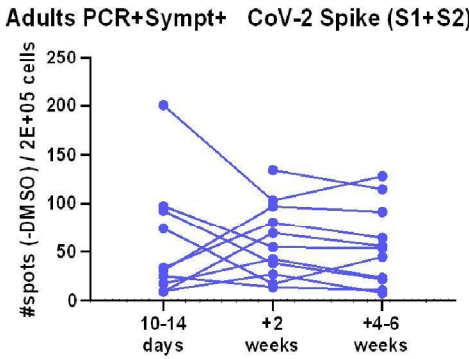


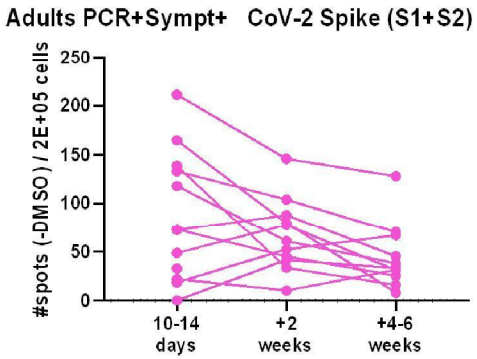




Kinetics




Adults PCR+Sympt+ CoV-2 Spike (S1+S2) Male
#spots (-DMSO) / 2E+05 cells
250
200
150
100
50
0
10-14 days
+2 weeks
+4-6 weeks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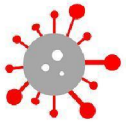
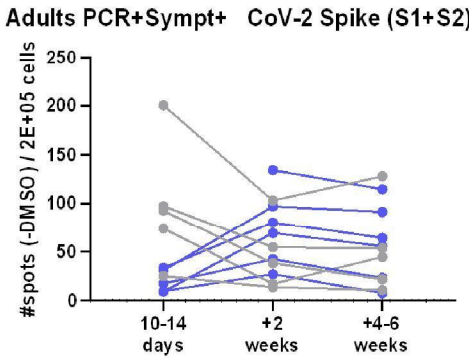
Kinetics

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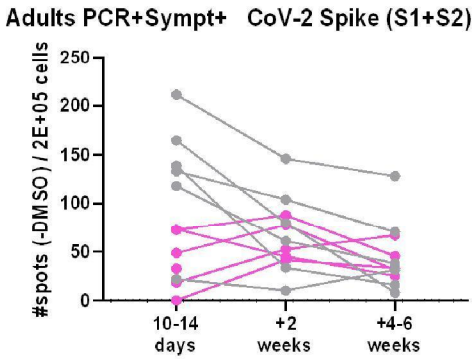
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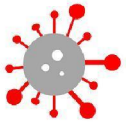

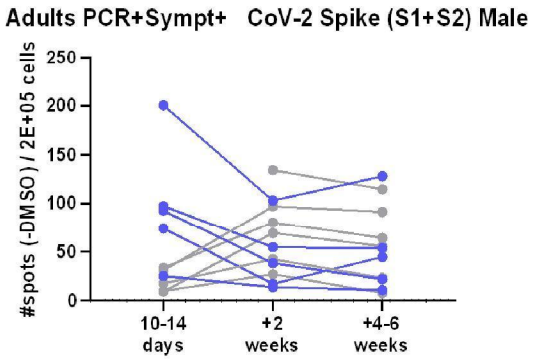
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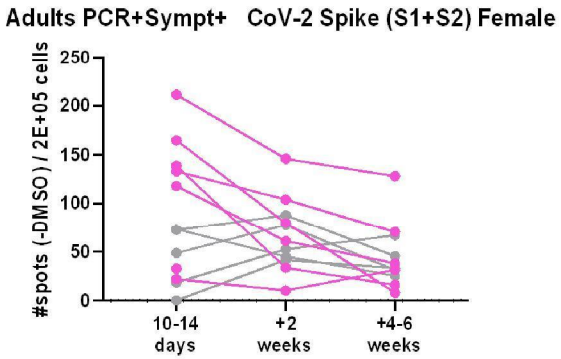
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#spots (-DMSO) / 2E+05 cells
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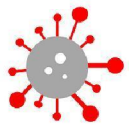
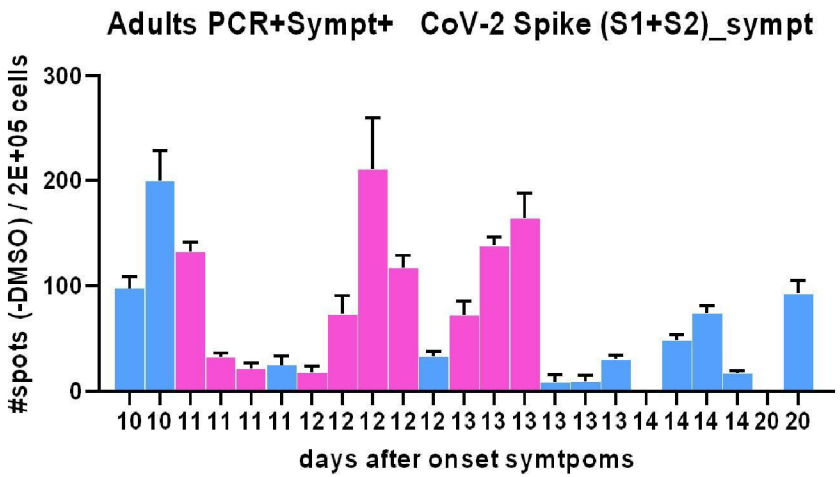
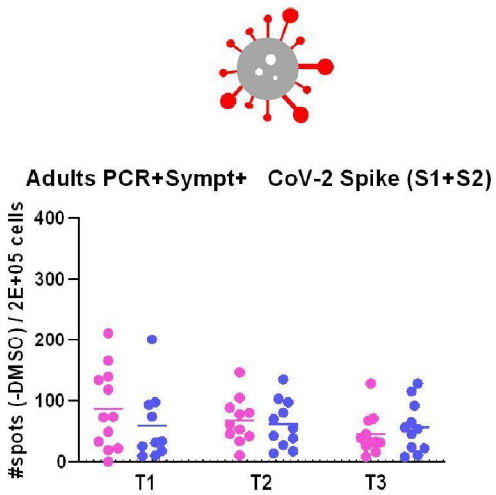
200
150
100
50
0
10-14 days
+2 weeks
+4-6 weeks

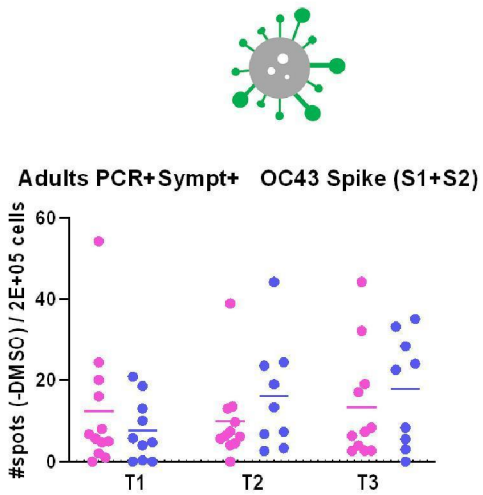
Days after onset symptoms



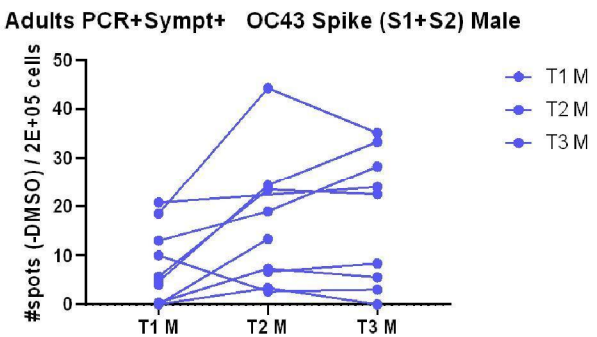


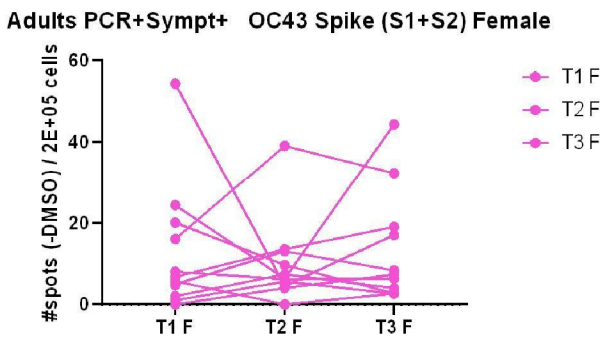
Response to OC43



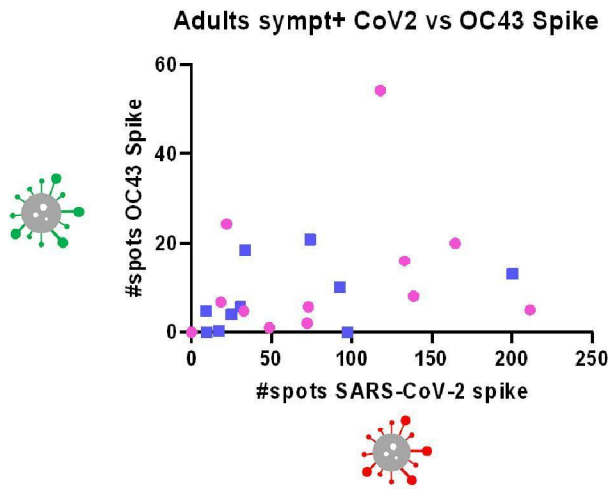


Boost of OC43 response?

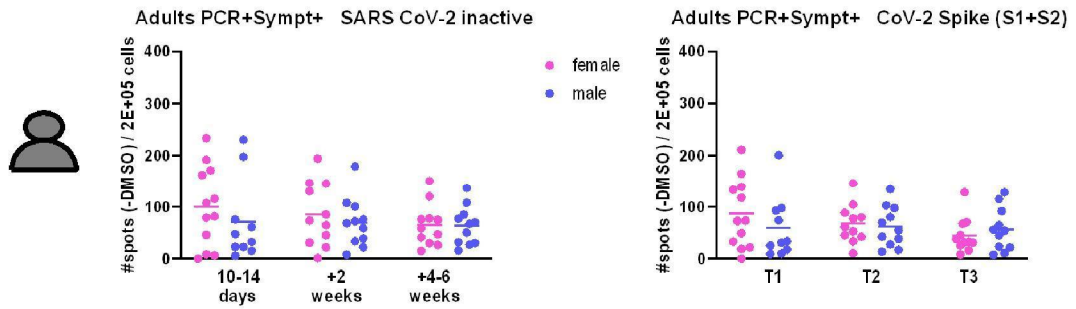




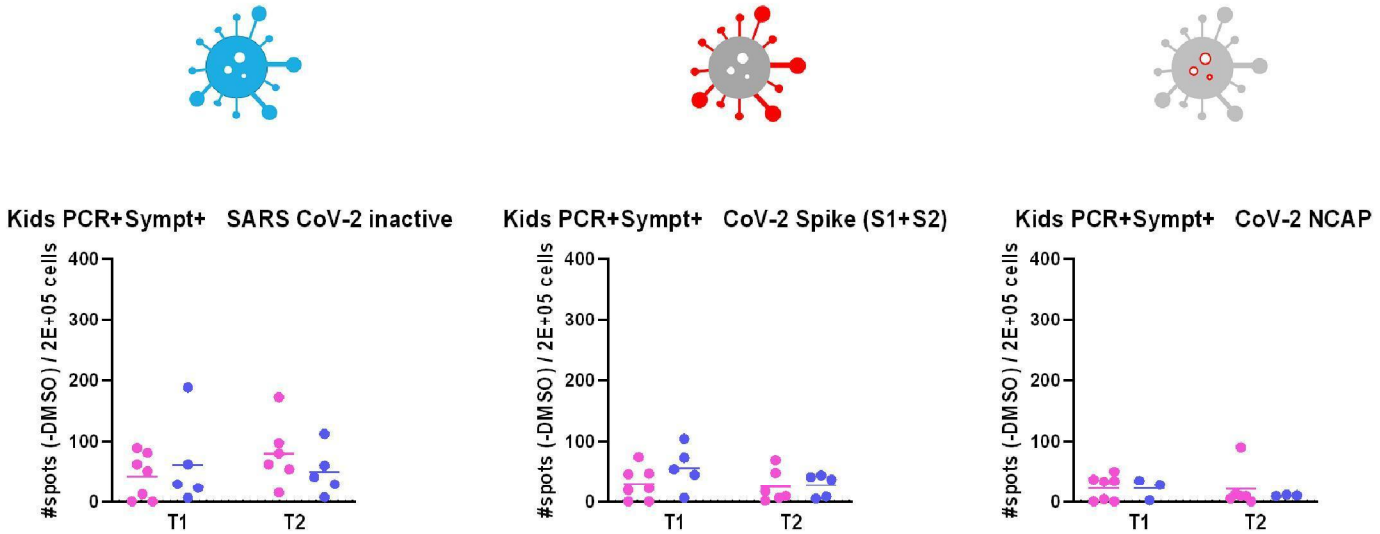
No correlation SARS-CoV-2 vs OC43



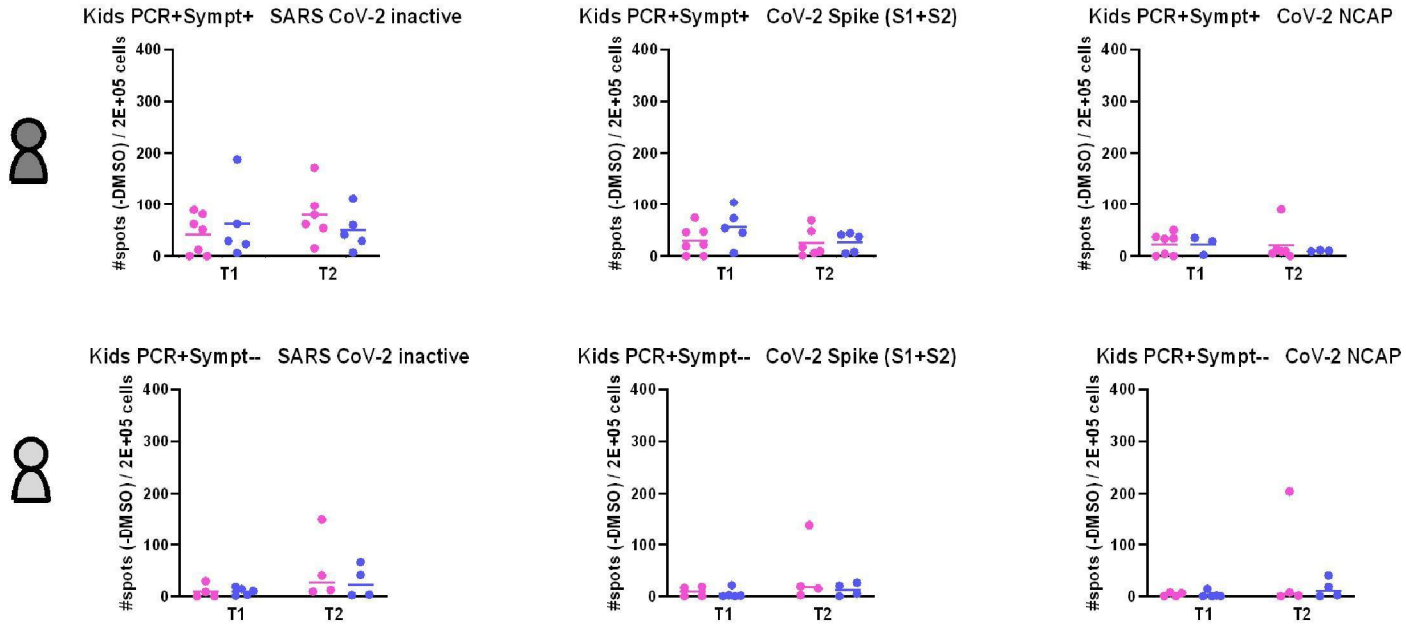
Asymptomatic patients



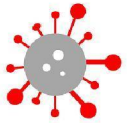
Responses in children

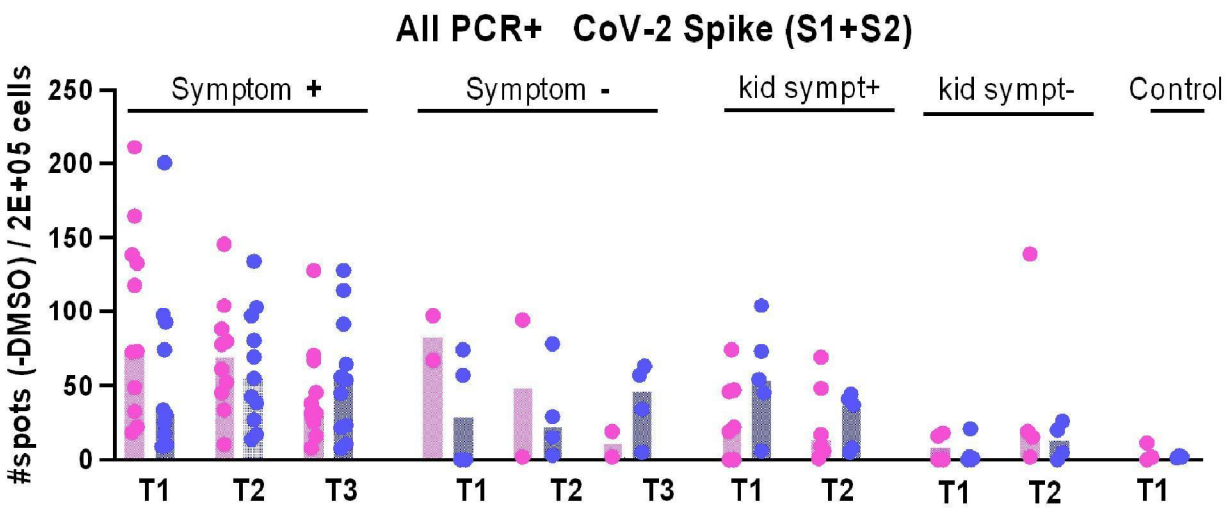


Responses in children

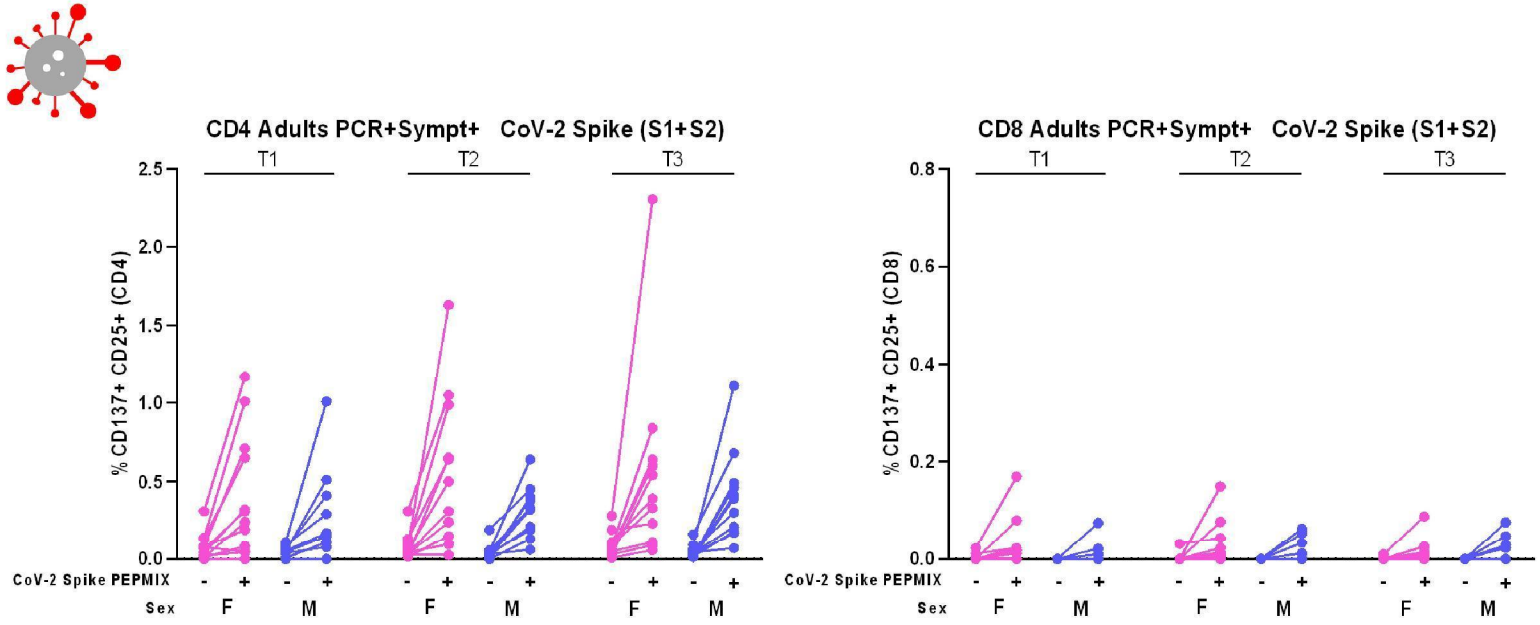


All responses





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

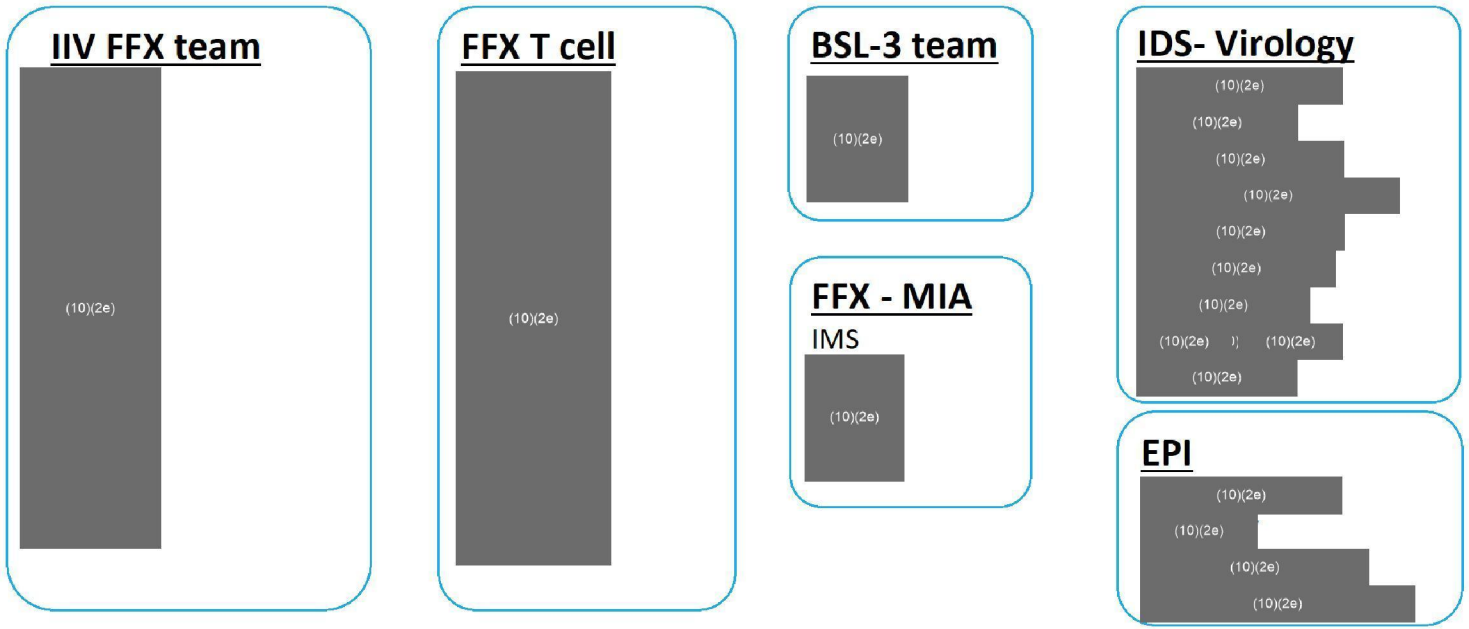
Future

Long-term follow up

In depth characterizations

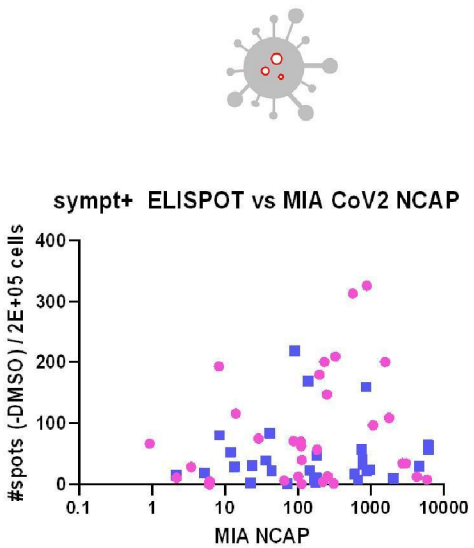
Cross-reactivity

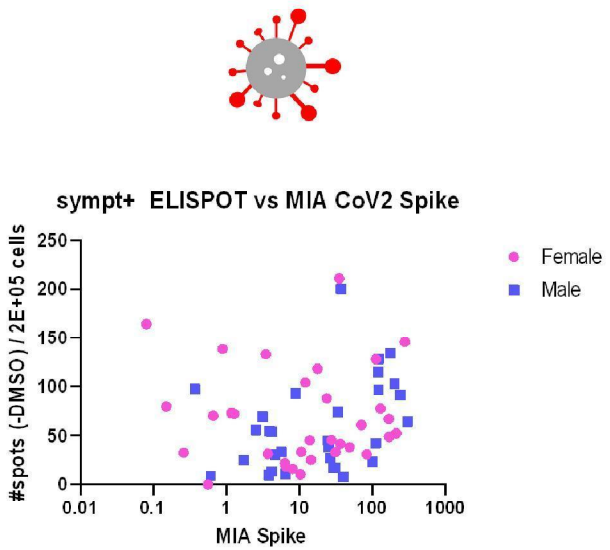
Acknowledgements



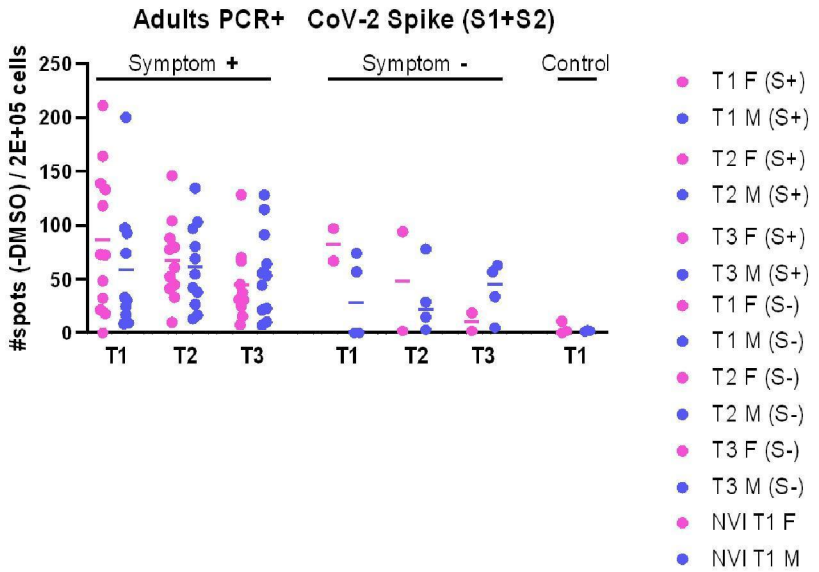
Marjan B
Marjan K

Association with antibody-levels





All results


Adults PCR+ CoV-2 Spike (S1+S2)
#spots (-DMSO) / 2E+05 cells
250
200
150
100
50
0
Symptom +
Symptom -
Control
T1
T2
T3
T1
T2
T3
T1
T1 F (S+)
T1 M (S+)
T2 F (S+)
T2 M (S+)
T3 F (S+)
T3 M (S+)
T1 F (S-)
T1 M (S-)
T2 F (S-)
T2 M (S-)
T3 F (S-)
T3 M (S-)
NVI T1 F
NVI T1 M