

DataS1: Demographic and disease information on human participants and details on cytometry experiments, related to STAR Methods.

Multi-omics analysis of mucosal and systemic immunity to SARS-CoV-2 after birth

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Infant Demographics Table – Blood samples

	Controls (n = 27)	Cases (n = 54) [including 27 longitudinal cases with pre-infection sample]
Female	11	24
Male	16	30
Hispanic	3	3
Not Hispanic	24	51
White	19	42
Black/African American	4	8
White, Black/African American	4	2
White, Other	0	1
American Indian/Native Alaskan	0	1
Pre-Omicron	NA	32
Omicron	NA	22
Age in Months (Mean)	14 (Age at specimen)	12 (Age at first positive swab)
Age in Months (Median)	12 (Age at specimen)	9 (Age at first positive swab)
Age in Months (Range)	5-39 (Age at specimen)	1-47 (Age at first positive swab)
Symptomatic Around First Positive Swab (Any Symptom)	NA	50
Asymptomatic Around First Positive Swab (Any Symptom)	NA	4
If Symptomatic – Was Cough/Fever Present?	NA	41 of 50

Infant Demographics Table – Nasal samples (A subset of blood sample cohort - 58 of 81)

	Controls (n = 20)	Cases (n = 38) [including 2 longitudinal cases with pre-infection sample]
Female	10	17
Male	10	21
Hispanic	3	2
Not Hispanic	17	36
White	15	28
Black/African American	3	6
White, Black/African American	2	2
White, Other	0	1
American Indian/Native Alaskan	0	1
Pre-Omicron	NA	20
Omicron	NA	18
Age in Months (Mean)	13 (Age at IFNa swab)	12 (Age at first positive swab)
Age in Months (Median)	10 (Age at IFNa swab)	9 (Age at first positive swab)
Age in Months (Range)	4 – 39 (Age at IFNa swab)	1 – 47 (Age at first positive swab)
Symptomatic Around First Positive Swab (Any Symptom)	NA	35
Asymptomatic Around First Positive Swab (Any Symptom)	NA	3
If Symptomatic – Was Cough/Fever Present?	NA	29 of 35

Adult Demographics Table

	Controls (n = 10)	Cases (n = 48)
Female	5	25
Male	5	23
Hispanic	1	1
Not Hispanic	7	35
No data available	2	12
White	8	14
Black/African American	0	25
Other	2	0
No data available	0	9
Pre-Omicron	NA	48
Omicron	NA	0
Age in Years (Mean)	52 (Age at first positive swab)	57 (Age at specimen)
Age in Years (Median)	53 (Age at first positive swab)	59 (Age at specimen)
Age in Years (Range)	25 – 90 (Age at first positive swab)	24 – 85 (Age at specimen)
Mild and moderate disease	NA	19
Severe disease	NA	20
ICU	NA	9

Mothers Demographics Table – Blood samples

	Controls (n = 3)	Cases (n = 41) [including 3 longitudinal cases with pre-infection]
Female	3	41
Male	0	0
Hispanic	0	1
Not Hispanic	3	40
White	3	31
Black/African American	0	8
White, Black/African American	0	1
Asian	0	1
Pre-Omicron	NA	21
Omicron	NA	20
Symptomatic Around First Positive Swab (Any Symptom)	NA	37
Asymptomatic Around First Positive Swab (Any Symptom)	NA	4
If Symptomatic – Was Cough/Fever Present?	NA	26
Sought medical attention at an Emergency Department or Hospital	NA	1
Age in Years (Mean)	38 (Age at plasma)	34 (Age at first positive swab)
Age in Years (Median)	38 (Age at plasma)	33 (Age at first positive swab)
Age in Years (Range)	37 – 39 (Age at plasma)	22 – 42 (Age at first positive swab)

Mothers Demographics Table – Nasal samples (All cases and one control are a subset of the maternal plasma sample cohort – 20 of 44)

	Controls (n = 19)	Cases (n = 19)
Female	19	19
Male	0	0
Hispanic	1	1
Not Hispanic	18	18
White	13	14
Black/African American	4	4
Asian	1	1
None	1	0
Pre-Omicron	NA	4
Omicron	NA	15
Symptomatic Around First Positive Swab (Any Symptom)	NA	15
Asymptomatic Around First Positive Swab (Any Symptom)	NA	4
If Symptomatic – Was Cough/Fever Present?	NA	12 of 15
Sought medical attention at an Emergency Department or Hospital	NA	0
Age in Years (Mean)	31 (Age at IFNa swab)	34 (Age at first positive swab)
Age in Years (Median)	32 (Age at IFNa swab)	33 (Age at first positive swab)
Age in Years (Range)	22 – 40 (Age at IFNa swab)	23 - 42 (Age at first positive swab)

Mothers Demographics Table – Healthy control serum autoantibody analysis

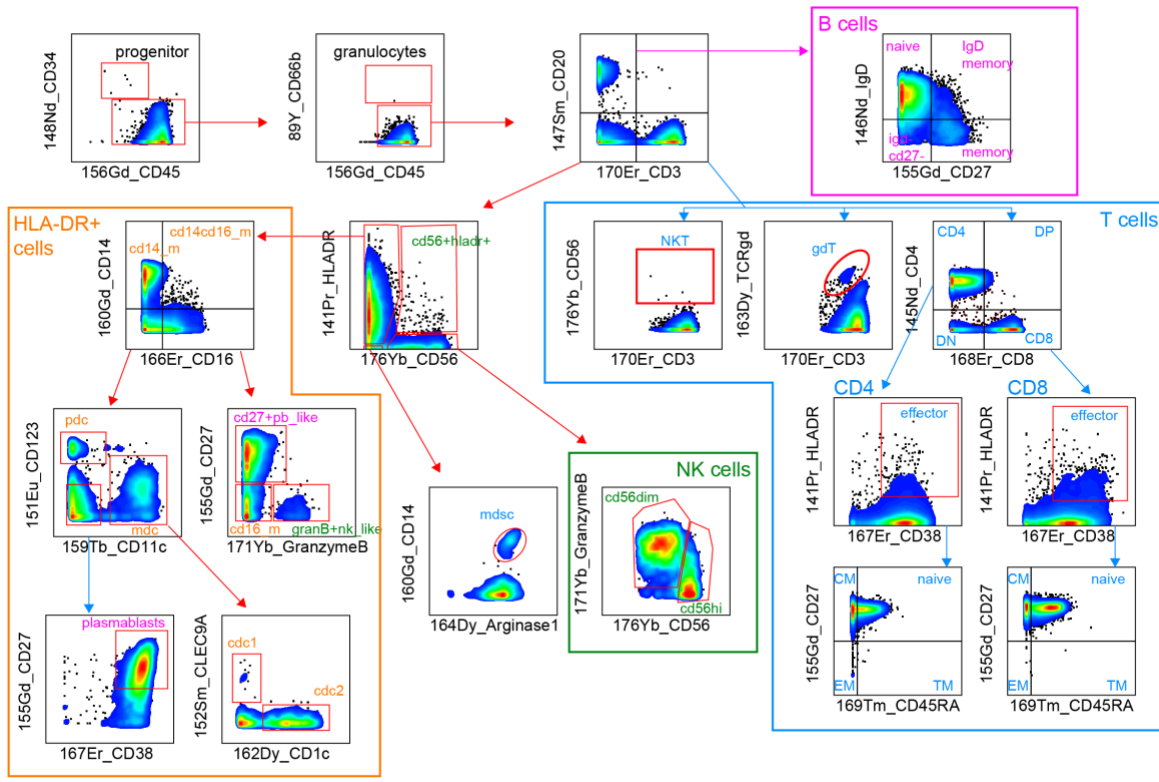
	Cases (n = 30)
Female	30
Male	0
Hispanic	0
Not Hispanic	30
White	28
Black/African American	2
Pre-Omicron (Variant Child Was Infected With)	15
Omicron (Variant Child Was Infected With)	15
Age in Years (Mean)	30 (Age at blood)
Age in Years (Median)	30 (Age at blood)
Age in Years (Range)	22 – 39 (Age at blood)

CyTOF antibodies

Metal label	Target	Source	Clone	Catalog#	Lot #
89Y	CD66b	BioLegend	G10F5	305102	B289360
102-110Pd	barcodes	Fluidigm		201060	
113In	CD57	BioLegend	HNK-1	359602	B256178
140Ce	Beads	Fluidigm		201078	2108040-25
141Pr	HLA-DR	BioLegend	L243	307651	B293412
142Nd	CD19	Fluidigm	HIB19	3142001B	2110583-20
143Nd	CD127	Fluidigm	A019D5	3143012B	2109346-24
144Nd	IL4	Fluidigm	MP4-25D2	3144010B	1641910
145Nd	CD4	Fluidigm	RPA-T4	3145001B	2109320-22
146Nd	IgD	Fluidigm	IA6-2	3146005B	2112420-15
147Sm	CD20	Fluidigm	2H7	3147001B	2108087-31
148Nd	CD34	Fluidigm	581	3148001B	3361909
149Sm	STAT6	Fluidigm	18/P-Stat6	3149004A	2631806
150Nd	pSTAT5	Fluidigm	47	3150005A	2103186-01
151Eu	CD123	Fluidigm	6H6	3151001B	2112140-01
152Sm	CLEC9A	BioLegend	8F9	353802	B285751
153Eu	pSTAT1	Fluidigm	4a	3153005A	0572002
154Sm	H3K27ac	ActiveMotif	MABI0309	MABI0309	17014
155Gd	CD27	Fluidigm	L128	3155001B	3331901
156Gd	CD45	Fluidigm	HI30	3156010B	0652006
157Gd	CD25	BioLegend	M-A251	356102	B332599
158Gd	pSTAT3	HIMC	4/P-Stat3	3158005A	0132015
159Tb	CD11c	Fluidigm	Bu15	3159001B	0622021
160Gd	CD14	Fluidigm	M5E2	3160001B	2102949-16
161Dy	Ki-67	Fluidigm	B56	3161007B	1262010
162Dy	CD1c	BioLegend	L161	331502	B341969
163Dy	TCRg/d	BioLegend	B1	331202	B336422
164Dy	Arginase-1	Fluidigm	658922	3164012B	2191531
165Ho	pCREB	Fluidigm	87G3	3165009A	1812007
166Er	CD16	BioLegend	B73.1	360702	B243320
167Er	CD38	Fluidigm	HIT2	3167001B	0902009
168Er	CD8	Fluidigm	SK1	3168002B	2103185-01
169Tm	CD45RA	Fluidigm	HI100	3169008B	2109314-21
170Er	CD3	Fluidigm	UCHT1	3170001B	1691904
171Yb	Granzyme B	Fluidigm	GB11	3171002B	2111006-23
172Yb	CD15	Fluidigm	W6D3	3172021B	2103359-16
173Yb	Perforin	abcam	B-D48	ab47225	GR3362878-9
174Yb	IFNg	BioLegend	4S.B3	502502	B259482
175Lu	pS6	Fluidigm	N7-548	3175009A	3451912
176Yb	CD56	Fluidigm	NCAM16.2	3176008B	2151801
191Ir	DNA1	Fluidigm		201192A	P19K2303
193Ir	DNA2	Fluidigm		201192A	P19K2303
209Bi	PD-L1	Fluidigm	MIH1	3209014B	2102823-01

Antibodies for T cell ICS assay

Fluorochrome	Antigen	Vendor	Catalog#	Clone	Reaction	Volume per reaction (μl)
FITC	IL-2	Biolegend	500304	MQ1-17H12	ICS	2
PerCP-eF710	CXCR5	Invitrogen	46-9185-42	MU5UBEE	Stimulation	2.5
PE	IL-4	BioLegend	500810	MP4-25D2	ICS	1
PE-CF594	CD45RA	BD Biosciences	565419	5H9	Surface	2
PE-Cy7	TNF- α	E-Bioscience	25-7349-82	Mab11	ICS	0.3
BV421	CD40L	Biolegend	310824	24-31	ICS	2
BV506	TCR-γδ	Biolegend	331220	B1.1	Surface	2.5
BV605	CD4	Biolegend	317438	OKT4	Surface	1.5
BV650	CD3	BD Biosciences	563916	SP34-2	Surface	2.5
BV711	CCR7	Biolegend	353228	G043H7	Surface	2
BV785	CD127	Biolegend	351330	A019D5	Surface	2.5
APC	IL-21	BioLegend	513008	3A3-N2	ICS	2.5
A700	IFN-γ	Biolegend	502520	4S.B3	ICS	1
APC-Cy7	CD25	Biolegend	302614	BC96	Surface	2
BUV395	CXCR3	BD Biosciences	565223	1C6/CXCR3	Stimulation	2.5
BUV563	CD8	BD Biosciences	612914	RPA-T8	Surface	2
BUV737	CCR6	BD Biosciences	612780	11A9	Surface	2
BUV805	CD69	BD Biosciences	748763	FN50	Surface	2



CytoF Gating Scheme