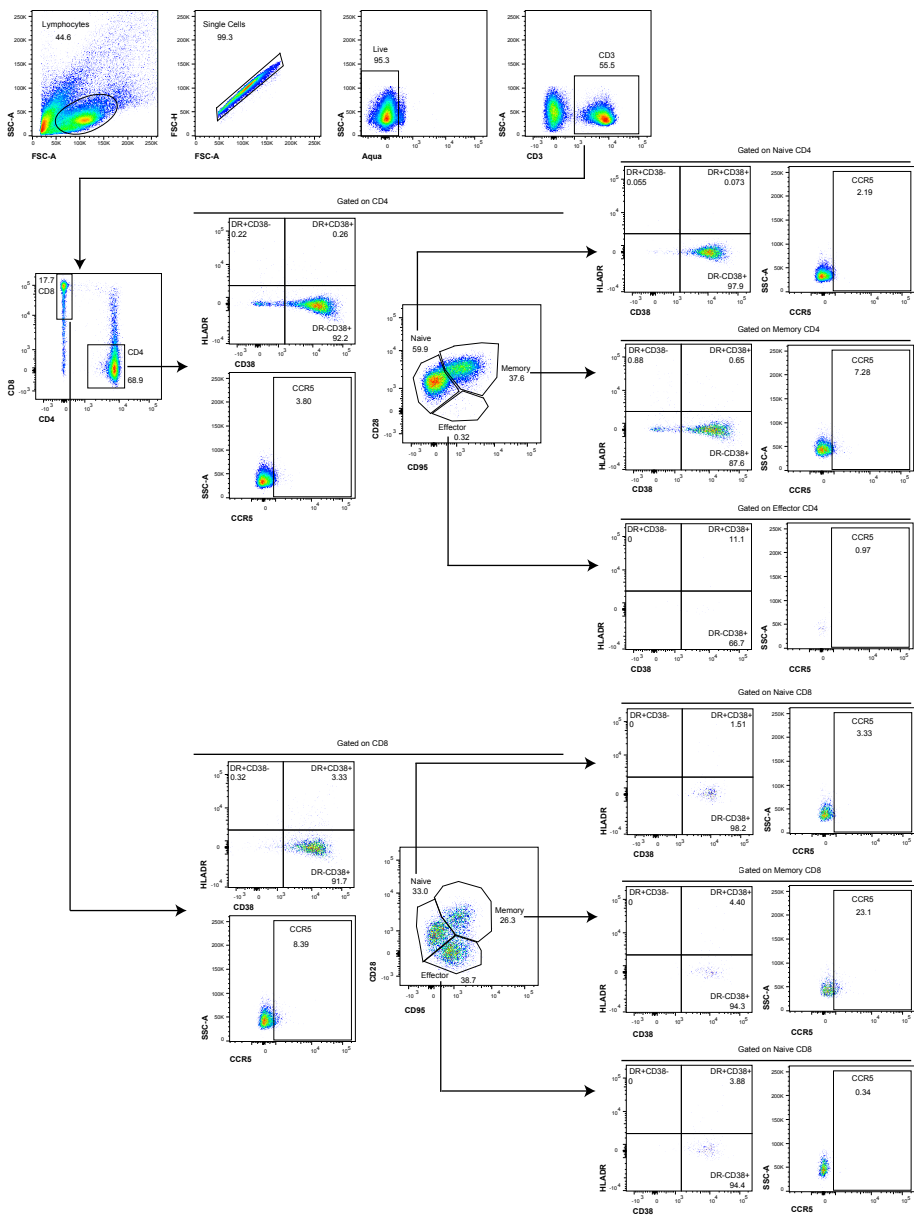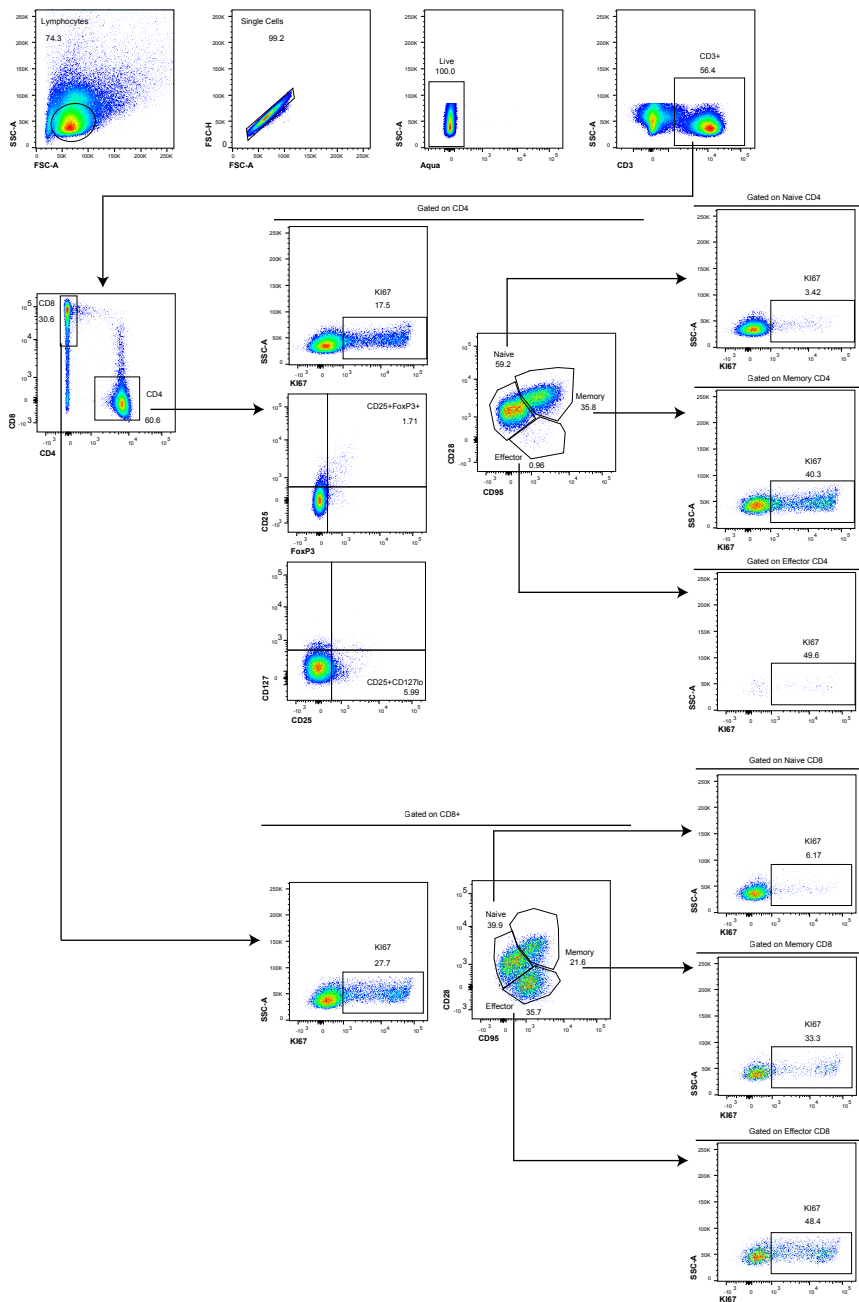**Supplemental Figure 1. Gating strategy for T cell activation flow cytometry analysis.**
Lymphocytes were gated based on FSC and SSC, followed by single cells gated based on FSC-A and FCS-H. Live cells were subsequently selected by Aqua- expression. Then, T cells were selected by CD3+ expression and CD8+ and CD4+ T cells were identified using CD8 and CD4. Naive (CD28+CD95-), memory (CD28+CD95+) and effectors (CD28-CD95+) were identified using CD28 and CD95. Activation markers HLADR and CD38, and CCR5 expression gated on CD4 or CD8 T cells and gated on naive, memory and effectors CD4 or CD8 T cells are shown in the remaining plots.
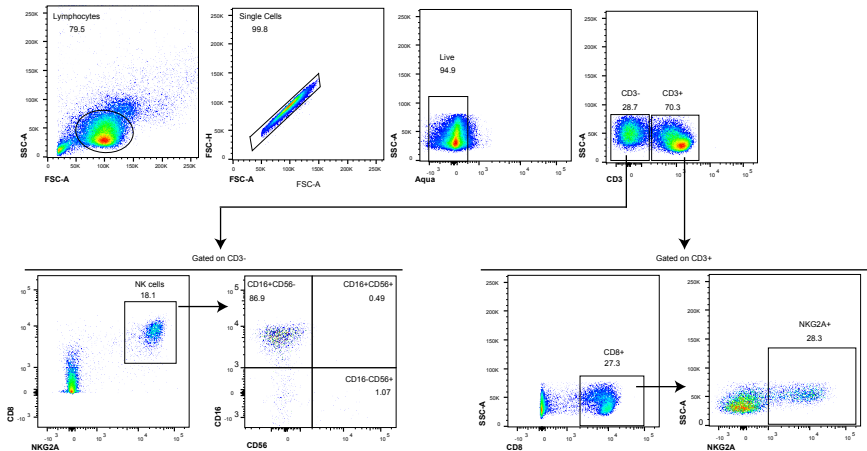
Supplemental Figure 2. Gating strategy for T-reg phenotype and proliferation flow cytometry analysis.
Lymphocytes were gated based on FSC and SSC, followed by single cells gated based on FSC-A and FCS-H. Live cells were subsequently selected by Aqua- expression. Then, T cells were selected by CD3+ expression and CD8+ and CD4+ T cells were identified were identified using CD8 and CD4. Naive (CD28+CD95-), memory (CD28+CD95+) and effectors (CD28-CD95+) were identified using CD28 and CD95. T-regs (CD25+FOXP3+) and (CD25+CD127lo) were identified using CD25 and FOXP3 or CD25 and CD127, both gated on CD4+ T cells. Expression of Ki67 gated on CD4 or CD8 T cells and gated on naive, memory and effectors CD4 or CD8 T cells are shown in the remaining plots.
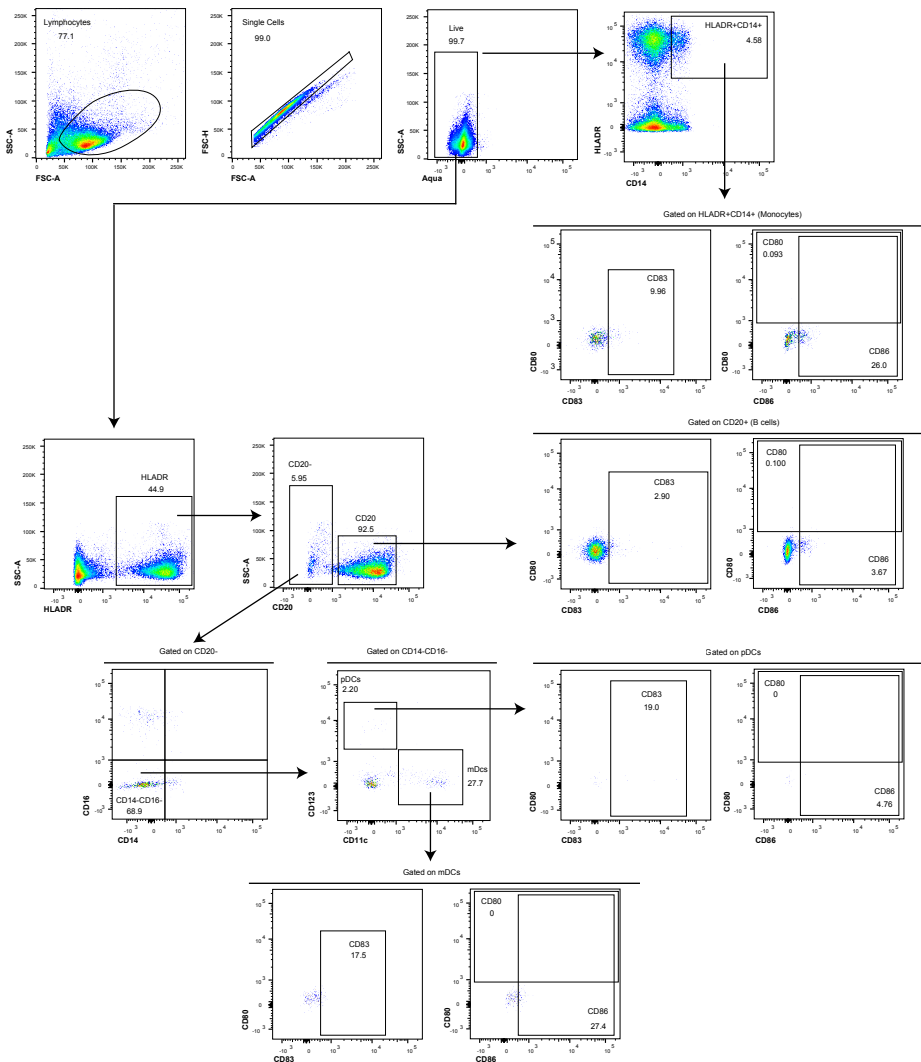
Supplemental Figure 3. Gating strategy for NK cell flow cytometry analysis.
Lymphocytes were gated based on FSC and SSC, followed by single cells gated based on FSC-A and FCS-H. Live cells were subsequently selected by Aqua- expression. T cells were selected by CD3+ expression and CD8 T cells by CD8+ expression, then NKG2A/C+CD8+ T cells were identified by NKG2A+ expression. NK cells were gated from CD3- cells and identified by CD8+ and NKG2A+ expression using CD8 and NKG2A, the expression of CD16+ and/or CD56+ NK cells was identified using CD16 and CD56.
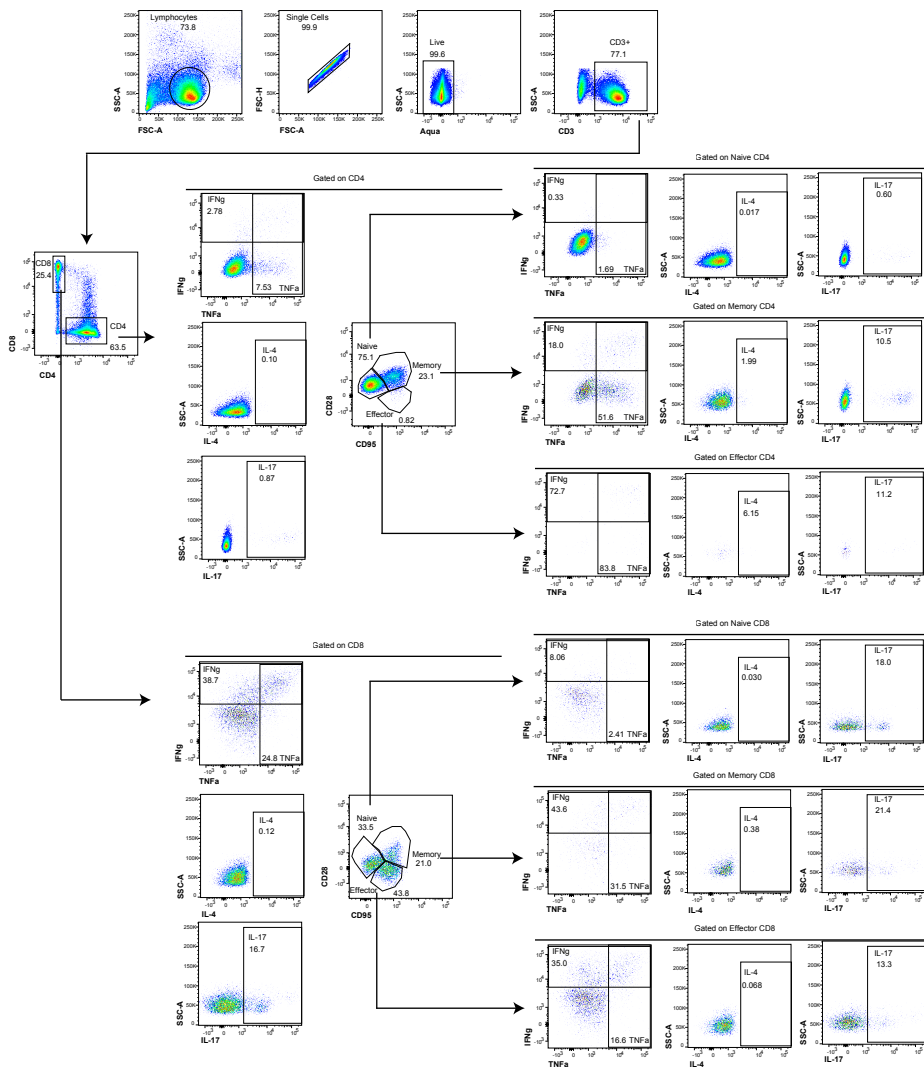
Supplemental Figure 4. Gating strategy for APC flow cytometry analysis.
APC were gated based on FSC and SSC including both lymphocytes and monocytes, followed by single cells gated based on FSC-A and FCS-H. Live cells were subsequently selected by Aqua- expression. Monocytes were identified by HLADR+ and CD14+ expression and the expression of maturation markers was identified using CD80, CD83 and CD86. B cells were gated from HLADR+ cells and identified by CD20+ expression, and the expression of maturation markers was identified using CD80, CD83 and CD86. Dendritics cells (DCs) were gated from CD20-, CD14-, CD16- cells, myeloid DCs (CD11c+CD123-) and plasmacytoid DCs (CD11c-CD123+) were identified using CD11c and CD123, and the expression of maturation markers from myeloid DCs and plasmacytoid DCs was identified using CD80, CD83 and CD86

Supplemental Figure 5. Gating strategy for intracellular cytokines flow cytometry analysis.
Lymphocytes were gated based on FSC and SSC, followed by single cells gated based on FSC-A and FCS-H. Live cells were subsequently selected by Aqua- expression. Then, T cells were selected by CD3+ expression and CD8+ and CD4+ T cells were identified were identified using CD8 and CD4. Naive (CD28+CD95-), memory (CD28+CD95+) and effectors (CD28-CD95+) were identified using CD28 and CD95. Expression of IFNg, TNFa, IL-4 and IL-17 gated on CD4 or CD8 T cells and gated on naive, memory and effectors CD4 or CD8 T cells are shown in the remaining plots.

Supplemental Figure 6. Transcriptome sorting strategy and post-sort purity flow cytometry analysis.
(**A**) Lymphocytes were gated based on FSC and SSC, followed by single cells gated based on FSC-A and FCS-H. T cells were selected by CD3+ and CD20- expression followed by CD8 T cells gated based on CD8+ and CD4- expression, then NKG2A/C+CD8+ and NKG2A-CD8+T cells were identified using NKG2A. NK cells were gated from CD3- and CD20- cells and identified by CD8+ and NKG2A+ expression using CD8 and NKG2A. APC were gated from CD3-, CD20-, CD8-, NKG2A- cells, and identified by HLADR+ and CD11c+ expression using HLADR and CD11c. (**B**) Left, before sort expression of CD3 vs NKG2A. Right, after sort purity of NKG2A-CD8+ T cells, NKG2A+CD8+ T cells and NK cells. (**C**) Left, before sort expression of HLADR vs CD11c. Right, after sort purity of APC cells.
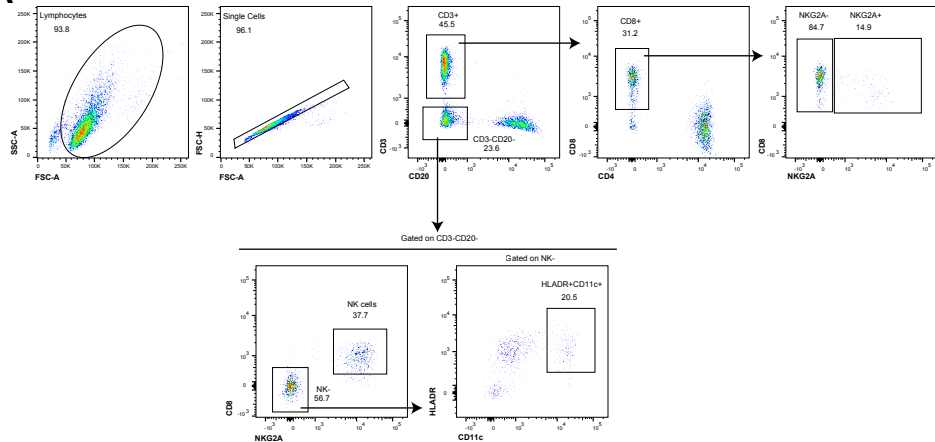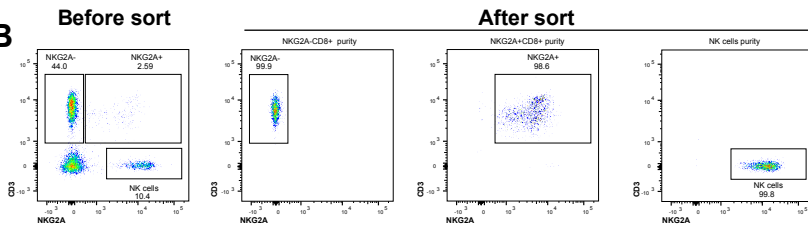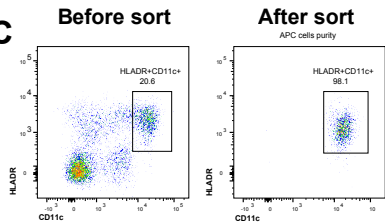
Supplemental Figure 7. Functional responsiveness sorting strategy and post-sort purity flow cytometry analysis.
(**A**) Lymphocytes were gated based on FSC and SSC, followed by single cells gated based on FSC-A and FCS-H. T cells were selected by CD3+ and CD4- expression, then NKG2A/C+CD8+ and NKG2A-CD8+T cells were identified using CD8 and NKG2A. NK cells were gated from CD3- and CD4- cells and identified by CD8+ and NKG2A+ expression using CD8 and NKG2A. (**B**) Left, before sort expression of CD3 vs NKG2A. Right, after sort purity of NKG2A-CD8+ T cells, NKG2A+CD8+ T cells and NK cells.
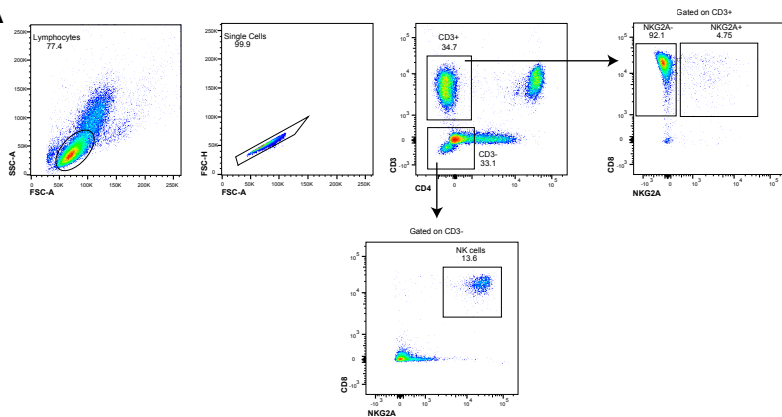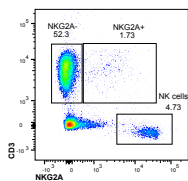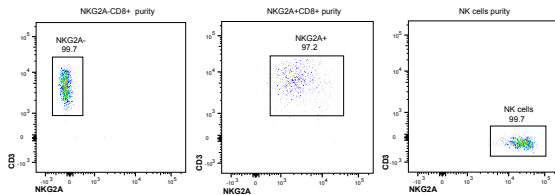
Table 1: Detailed information on animals included in the peripheral blood immunophenotyping

ID	Sex	Weight (kg)	Age at study (years)	Age at CMV seropositivity (years)	CMV	SFV	RRV	HERB
44747	M	1.8	0.53	0.50	+	+	-	-
44680	M	1.74	0.64	0.61	+	-	-	-
44592	M	1.52	0.69	0.66	+	-	+	-
44511	M	1.94	0.72	0.68	+	-	-	+
44494	F	1.78	0.72	0.69	+	+	+	-
44490	M	1.66	0.72	0.69	+	-	-	-
44454	F	2.21	0.73	0.70	+	+	+	-
44452	F	2.12	0.73	0.70	+	+	-	-
44435	M	1.8	0.74	0.71	+	-	+	-
44425	M	1.8	0.74	0.71	+	+	-	-
44405	M	1.84	0.75	0.72	+	-	-	-
44175	F	1.49	0.81	0.78	+	+	-	-
44352	M	1.94	0.77	0.74	+	-	-	-
44627	M	1.65	0.67	0.64	+	+	+	-
44673	F	1.39	0.64	0.61	+	+	-	-
44092	M	1.94	0.85	0.82	+	-	-	-
44001	F	2.04	0.93	0.90	+	+	+	-
44507	M	1.62	0.72	0.69	+	-	-	-
44296	M	1.79	0.78	0.75	+	+	-	-
44422	F	1.7	0.75	0.72	+	-	-	-
44324	F	1.58	0.78	0.75	+	+	-	-
44345	F	2.05	0.77	0.74	+	-	-	-
44298	F	1.91	0.78	0.75	+	-	-	-
44468	M	1.64	0.73	0.70	+	-	-	-
44257	M	1.96	0.79	0.76	+	-	-	-
44512	M	1.47	0.72	0.68	+	-	-	-
44157	F	1.64	0.82	0.79	+	+	-	+
44434	M	1.65	0.74	0.71	+	-	-	-
44011	M	2.24	0.91	0.88	+	+	-	-
44728	F	1.78	0.56	NA	-	+	-	-
44336	M	1.86	0.77	NA	-	-	-	-
44022	M	2.37	0.90	NA	-	-	-	-
44242	M	1.87	0.80	NA	-	-	-	-
44337	M	1.81	0.77	NA	-	-	-	-

ID	Sex	Weight (kg)	Age at study (years)	Age at CMV seropositivity (years)	CMV	SFV	RRV	HERB
44245	M	2.17	0.80	NA	-	-	-	-
44258	M	1.9	0.79	NA	-	-	-	-
44277	F	1.89	0.79	NA	-	+	-	-
44381	F	1.53	0.76	NA	-	+	-	-
44428	M	2.35	0.75	NA	-	+	-	-
44591	M	1.82	0.69	NA	-	+	-	-
43998	F	1.89	0.93	NA	-	-	-	-
44496	M	1.59	0.72	NA	-	+	-	-
44375	F	1.44	0.76	NA	-	-	-	-
44380	F	1.65	0.76	NA	-	+	-	-
44244	M	1.87	0.80	NA	-	-	-	-
44042	M	1.88	0.87	NA	-	-	-	-
44243	F	1.86	0.80	NA	-	+	-	-
44043	M	2.14	0.87	NA	-	-	-	-
44051	M	2.34	0.87	NA	-	-	-	-
44045	F	1.79	0.87	NA	-	-	-	-
44769	F	1.32	0.49	NA	-	-	-	-
44503	F	1.59	0.72	NA	-	-	-	-
44429	F	1.79	0.74	NA	-	-	-	-
44418	M	2.02	0.75	NA	-	+	-	-
44417	M	1.94	0.75	NA	-	+	-	-
44600	F	1.6	0.69	NA	-	+	-	-
44439	F	1.84	0.74	NA	-	-	-	-
44602	M	1.58	0.69	NA	-	-	-	-
44526	M	2.2	0.72	NA	-	-	-	-
44683	F	1.44	0.64	NA	-	-	-	-
44727	F	1.42	0.57	NA	-	-	-	-
44737	M	1.46	0.55	NA	-	-	-	-
44624	M	1.44	0.68	NA	-	-	-	-
44687	M	2.18	0.63	NA	-	-	-	-
44664	M	1.98	0.65	NA	-	-	-	-
44646	M	1.84	0.66	NA	-	-	-	-
44339	M	2.36	0.77	NA	-	-	-	-
44736	M	1.68	0.56	NA	-	+	-	-
44640	M	1.62	0.67	NA	-	-	-	-
44663	F	2.14	0.65	NA	-	-	-	-
44478	F	1.72	0.73	NA	-	+	-	-

Sex (M: Male, F: Female); CMV (Rhesus Cytomegalovirus); SFV (Simian Foamy Virus); RRV (Rhesus Rhadinovirus); HERB (Macacine alphaherpesvirus 1)