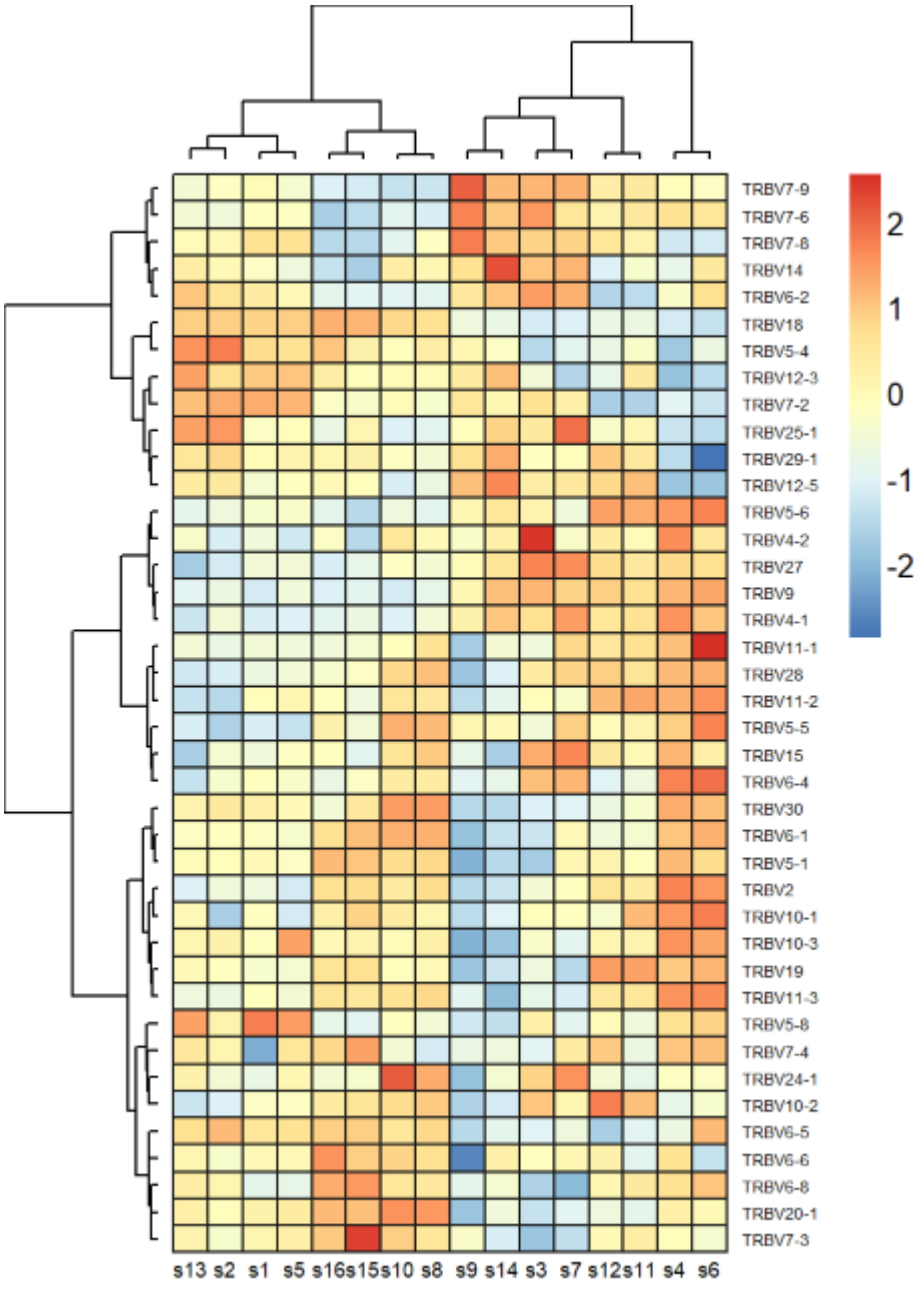
Project 8 Immunoinformatics

Tags

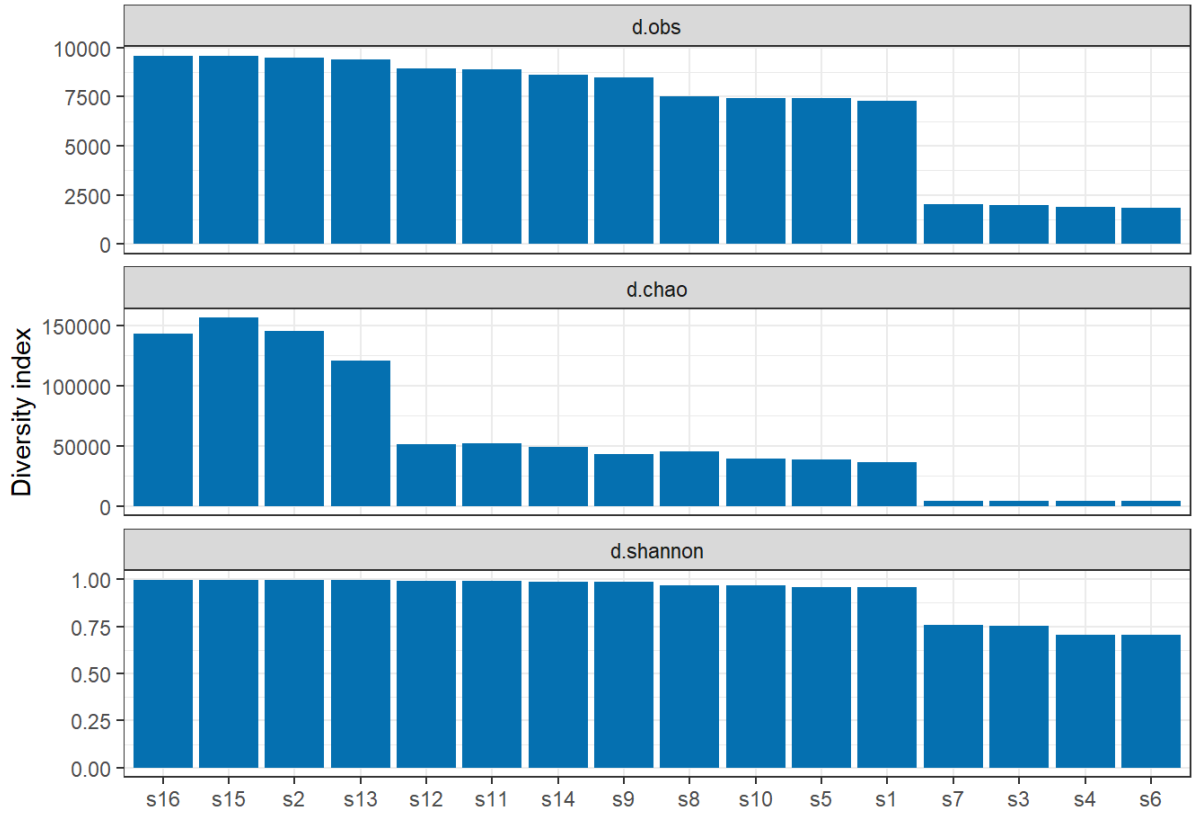
Made by Maria Uzun and Alisa Fedorenko.

Initially, we detected pairs (replicas). For this, we used heatmap with samples and TRBVs.



pairs
13 - 2
1 - 5
16 - 15
10 - 8
9 - 14
3 - 7
12 - 11
4 - 6

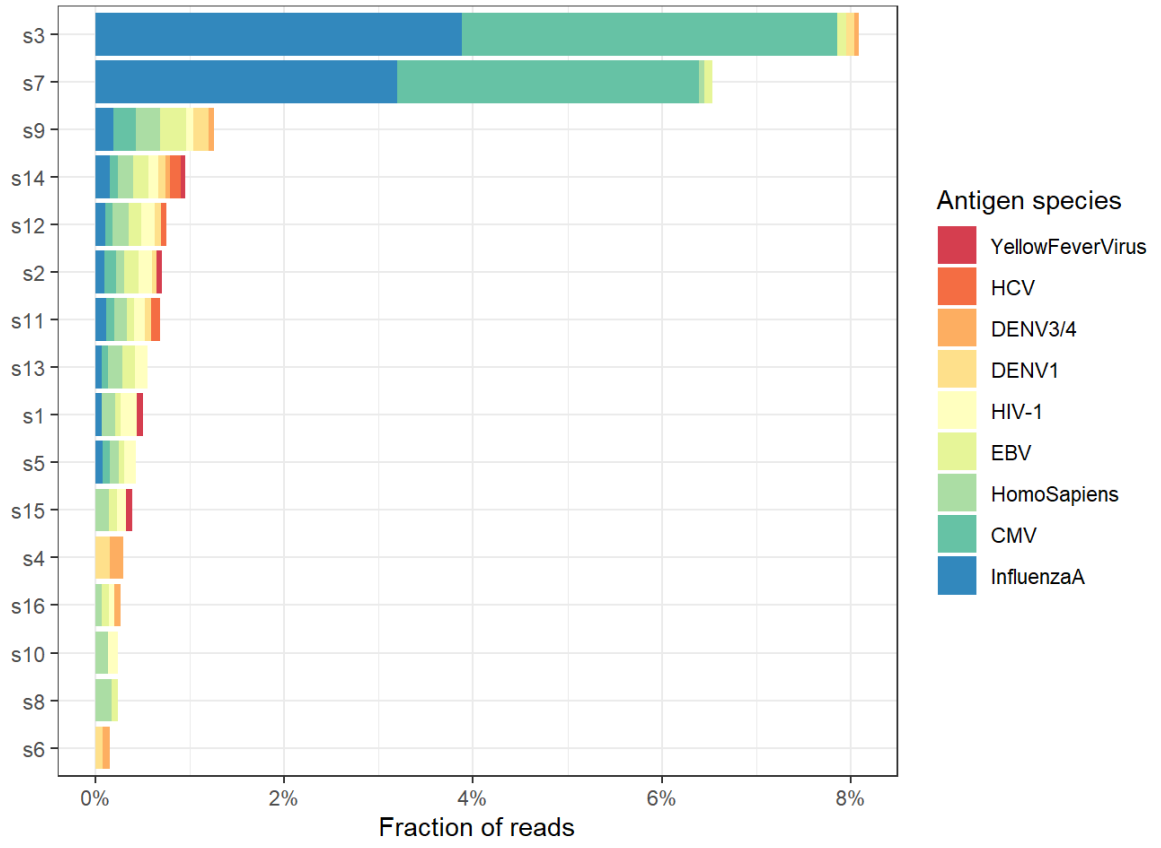
After that, we detected memory and naive phenotypes using diversity plots. The right part with the lower diversity belongs to ‘memory” phenotype. The left part - to the “naive phenotype”.



pairs	
13 - 2	naive
1 - 5	memory

16 - 15	naive
10 - 8	memory
9 - 14	naive
3 - 7	memory
12 - 11	naive
4 - 6	memory

After that, we detected CD4 and CD8 subsets. For this, we used heatmap with samples and TRBVs and antigen species plot. We see in antigen species plot that s3 and s7 samples have a huge fractions of CMV and Infuenza A. This means they are related to CD8 subset. And this fact means, that the wright part of the heatmap with samples and TRBVs contains CD8 subsets. Thus, we have the next column of our table.



pairs	Phenotype	Subset
13 - 2	naive	CD4
1 - 5	memory	CD4
16 - 15	naive	CD4

10 - 8	memory	CD4
9 - 14	naive	CD8
3 - 7	memory	CD8
12 - 11	naive	CD8
4 - 6	memory	CD8

After that, we detected CMV status according to plot of antigen species, presented above. According to plot, we filled out the table

pairs	Phenotype	Subset	CMVstatus
13 - 2	naive	CD4	+
1 - 5	memory	CD4	+
16 - 15	naive	CD4	-
10 - 8	memory	CD4	-
9 - 14	naive	CD8	+
3 - 7	memory	CD8	+
12 - 11	naive	CD8	-
4 - 6	memory	CD8	-

Finally, according to CMVstatus, we detected donors, knowing that donor 1 has CMV+, and donor 2 has CMV-

pairs	Phenotype	Subset	CMVstatus	Donor
13 - 2	naive	CD4	+	D1
1 - 5	memory	CD4	+	D1
16 - 15	naive	CD4	-	D2
10 - 8	memory	CD4	-	D2
9 - 14	naive	CD8	+	D1
3 - 7	memory	CD8	+	D1
12 - 11	naive	CD8	-	D2
4 - 6	memory	CD8	-	D2

The final table:

Sample	Donor	Subset	Phenotype	CMVstatus
s1	D1	CD4	memory	+
s2	D1	CD4	naive	+
s3	D1	CD8	memory	+
s4	D2	CD8	memory	-
s5	D1	CD4	memory	+
s6	D2	CD8	memory	-
s7	D1	CD8	memory	+
s8	D2	CD4	memory	-
s9	D1	CD8	naive	+
s10	D2	CD4	memory	-
s11	D2	CD8	naive	-
s12	D2	CD8	naive	-
s13	D1	CD4	naive	+
s14	D1	CD8	naive	+
s15	D2	CD4	naive	-
s16	D2	CD4	naive	-