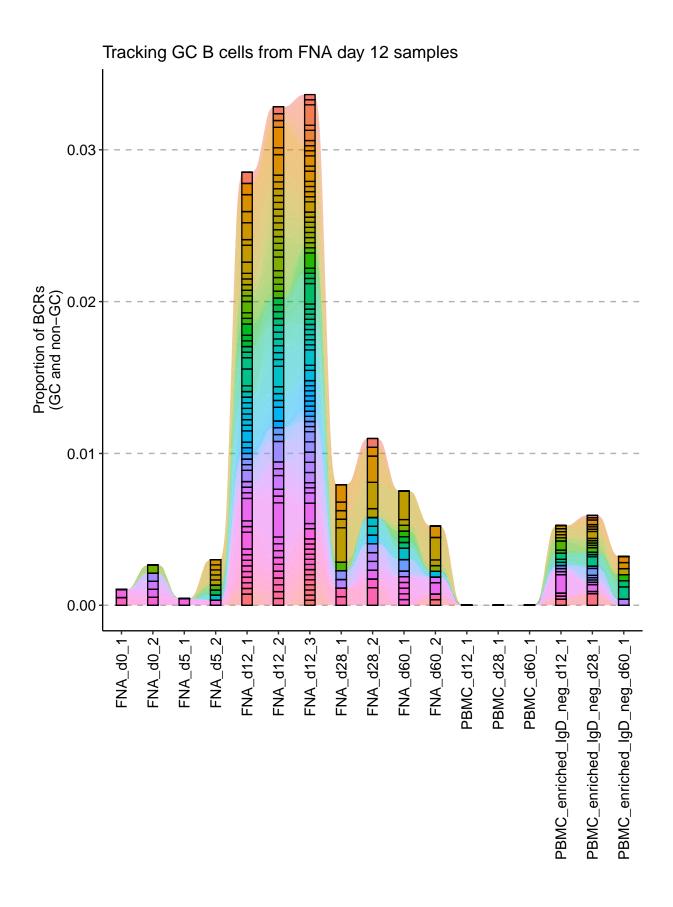```
[,1] [,2]
SRR11233622_filtered_contig_annotations 2957 2957
SRR11233623_filtered_contig_annotations 2928 2928
SRR11233624_filtered_contig_annotations 1943 1943
SRR11233625_filtered_contig_annotations 1926 1926
SRR11233626_filtered_contig_annotations 2911 2911
SRR11233627_filtered_contig_annotations 2478 2478
SRR11233628_filtered_contig_annotations 3320 3320
SRR11233629_filtered_contig_annotations 2611 2611
SRR11233631_filtered_contig_annotations 3338 3338
SRR11233632_filtered_contig_annotations 2132 2132
SRR11233633_filtered_contig_annotations 2094 2094
SRR11233634_filtered_contig_annotations 2687 2687
SRR11233635_filtered_contig_annotations 7481 7481
SRR11233636_filtered_contig_annotations 5517 5517
SRR11233637_filtered_contig_annotations 2893 2893
SRR11233638_filtered_contig_annotations 3355 3355
SRR11233639_filtered_contig_annotations 291 291
SRR11233640_filtered_contig_annotations 420 420
SRR11233642_filtered_contig_annotations 419 419
SRR11233643_filtered_contig_annotations 943 943
SRR11233644_filtered_contig_annotations 769 769
```

```
## [1] TRUE
```

```
##      time_source_order
## [1,]               10
## [2,]               11
## [3,]                8
## [4,]                9
## [5,]                5
## [6,]                6
```

```
##  [7,]               7
##  [8,]               3
##  [9,]               4
## [10,]               1
## [11,]               2
## [12,]              21
## [13,]              20
## [14,]              19
## [15,]              18
## [16,]              17
## [17,]              16
## [18,]              15
## [19,]              14
## [20,]              13
## [21,]              12

##  [1] 10 11  8  9  5  6  7  3  4  1  2 19 18 17 14 13 12
```

Tracking GC B cells from FNA day 12 samples

Proportion of BCRs (GC and non-GC)

0.03

0.02

0.01

0.00

FNA_d0_1
FNA_d0_2
FNA_d5_1
FNA_d5_2
FNA_d12_1
FNA_d12_2
FNA_d12_3
FNA_d28_1
FNA_d28_2
FNA_d60_1
FNA_d60_2
PBMC_d12_1
PBMC_d28_1
PBMC_d60_1
PBMC_enriched_IgD_neg_d12_1
PBMC_enriched_IgD_neg_d28_1
PBMC_enriched_IgD_neg_d60_1

```
## [1] 24 25
## [1] 36 28
## [1]  7 25
## [1]  8 28
```

SessionInfo

```
## R version 3.6.1 (2019-07-05)
## Platform: x86_64-pc-linux-gnu (64-bit)
## Running under: CentOS Linux 7 (Core)
##
## Matrix products: default
## BLAS:   /bi/apps/R/3.6.1/lib64/R/lib/libRblas.so
## LAPACK: /bi/apps/R/3.6.1/lib64/R/lib/libRlapack.so
##
## locale:
##  [1] LC_CTYPE=en_US.UTF-8 LC_NUMERIC=C         LC_TIME=C
##  [4] LC_COLLATE=C         LC_MONETARY=C        LC_MESSAGES=C
##  [7] LC_PAPER=C           LC_NAME=C            LC_ADDRESS=C
## [10] LC_TELEPHONE=C       LC_MEASUREMENT=C     LC_IDENTIFICATION=C
##
## attached base packages:
## [1] stats     graphics  grDevices utils     datasets  methods   base
##
## other attached packages:
## [1] immunarch_0.6.6   patchwork_1.0.0   data.table_1.12.8 dtplyr_1.0.1
## [5] dplyr_1.0.2       ggplot2_3.3.2
##
## loaded via a namespace (and not attached):
##  [1] tidyr_1.0.0         shiny_1.4.0         stats4_3.6.1
##  [4] cellranger_1.1.0    yaml_2.2.0          robustbase_0.93-5
##  [7] ggrepel_0.8.1       factoextra_1.0.6    pillar_1.4.7
## [10] lattice_0.20-38     glue_1.4.2          digest_0.6.23
## [13] RColorBrewer_1.1-2  promises_1.1.0      ggsignif_0.6.0
## [16] colorspace_1.4-1    htmltools_0.4.0     httpuv_1.5.2
## [19] plyr_1.8.5          pkgconfig_2.0.3     pheatmap_1.0.12
## [22] ggseqlogo_0.1       purrr_0.3.3         xtable_1.8-4
## [25] scales_1.1.0        ggalluvial_0.12.3   later_1.0.0
## [28] tibble_3.0.4        generics_0.0.2      farver_2.0.1
## [31] ellipsis_0.3.0      ggpubr_0.2.4        UpSetR_1.4.0
## [34] withr_2.1.2         nnet_7.3-12         magrittr_1.5
## [37] crayon_1.3.4        readxl_1.3.1        mime_0.7
## [40] mclust_5.4.5        evaluate_0.14       MASS_7.3-51.4
## [43] class_7.3-15        tools_3.6.1         hms_0.5.2
## [46] GlobalOptions_0.1.2 lifecycle_0.2.0     stringr_1.4.0
## [49] kernlab_0.9-29      munsell_0.5.0       cluster_2.1.0
## [52] fpc_2.2-3           compiler_3.6.1      rlang_0.4.10
## [55] grid_3.6.1          circlize_0.4.11     labeling_0.3
## [58] rmarkdown_2.0       gtable_0.3.0        flexmix_2.3-15
## [61] reshape2_1.4.3      R6_2.4.1            gridExtra_2.3
## [64] knitr_1.26          prabclus_2.3-1      fastmap_1.0.1
```

```
## [67] shinythemes_1.1.2   shape_1.4.5      readr_1.3.1
## [70] modeltools_0.2-22   stringi_1.4.3    parallel_3.6.1
## [73] Rcpp_1.0.3          vctrs_0.3.6      DEoptimR_1.0-8
## [76] tidyselect_1.1.0    xfun_0.11        diptest_0.75-7
```