UMAP_Fig8b.R

t

2024-11-18

```
# HEADER ####
#
# Version: 2024-11-14
#
# Figure 8B: UMAP color by AC-subtypes
#
#
#
#
# SETUP ####

Sys.setenv(lang = "en_US")
```

Install required packages if missing ————————————————–

```
# Package names from CRAN
packs <- c("ggplot2", "dplyr", "tibble", "ggnewscale", "umap")

# Install packages not yet installed
installed_packages <- packs %in% rownames(installed.packages())
if (any(installed_packages == FALSE)) {
  install.packages(packs[!installed_packages])
}
```

Load required packages ————————————————–

```
invisible(lapply(packs, library, character.only = TRUE))
```

```
##
## Attaching package: 'dplyr'
```

```
## The following objects are masked from 'package:stats':
##
##     filter, lag
```

```
## The following objects are masked from 'package:base':
##
##     intersect, setdiff, setequal, union
```

```
## Warning: package 'ggnewscale' was built under R version 4.4.2
```

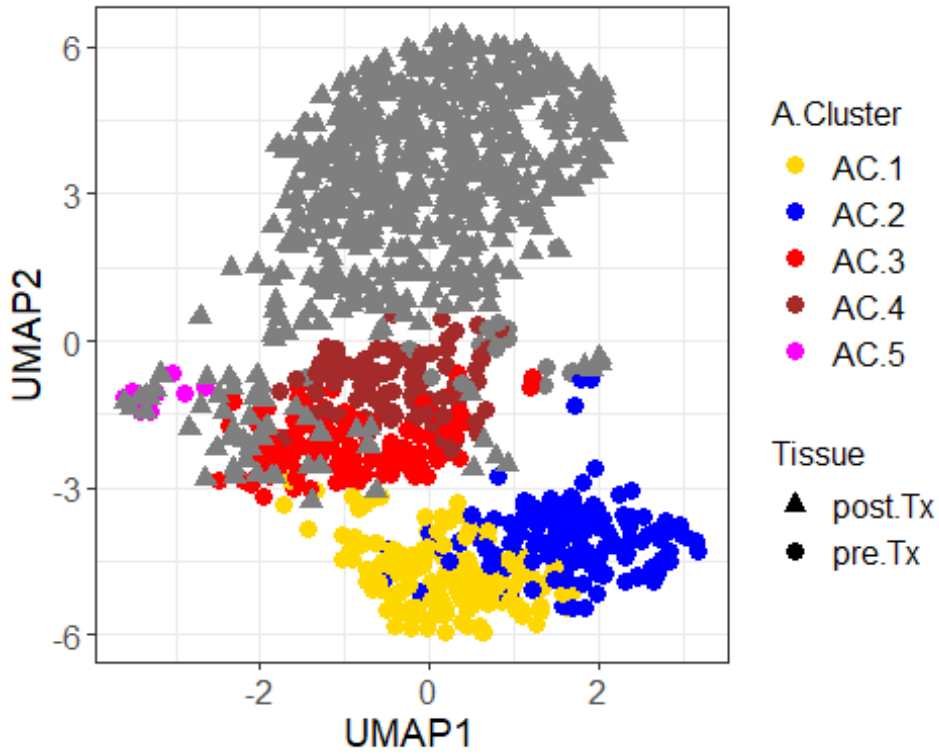
```
## Warning: package 'umap' was built under R version 4.4.2
```

```r
# IMPORT ####

heatmap_br <- read.delim("UMAP335_Biop_Res.txt", stringsAsFactors = FALSE)
sampleinfo <- read.delim("UMAP_sample_info.txt", stringsAsFactors = TRUE)

heatmap_br$id <- NULL

# Analysis / Plots ####

filtered_expression_df <- t(heatmap_br)

set.seed(123)

umap_results <- umap(filtered_expression_df, n_neighbors = 15, min_dist = 0.3, metric =
"euclidean")

kmeans_result <- kmeans(umap_results$layout, centers = 3)

umap_plot_df <- data.frame(umap_results$layout) %>%
  tibble::rownames_to_column("SampleName") %>%
  dplyr::inner_join(sampleinfo, by = "SampleName")%>%
  dplyr::mutate(Cluster = as.factor(kmeans_result$cluster) )



df_Bclusters <- data.frame(
  UMAP1 = umap_plot_df$X1,
  UMAP2 = umap_plot_df$X2,
  A.Cluster = umap_plot_df$AC1_5.clusters,
  pre.AIMS = umap_plot_df$pre.AIMS,
  AIMS = umap_plot_df$AIMS,
  Tissue=umap_plot_df$tissue,
  cls=umap_plot_df$Cluster
)

AC.colors <- c('AC.1' = "gold", 'AC.2' = "blue", 'AC.3' = 'red', 'AC.4' = "brown", 'AC.5'
= "magenta")

# Create the plot
AC_ggplot <- ggplot(
  df_Bclusters,
  aes(
    x = UMAP1,
    y = UMAP2)
  ) +
  geom_point(aes(color = A.Cluster, shape = Tissue), size=3) +
  scale_color_manual(name = "A.Cluster", values = AC.colors) +
  new_scale_color() +
  scale_shape_manual(name = "Tissue", values = c(17,19)) +
  labs(color = "Legend") +
  theme_bw() +
  theme(
    axis.text = element_text(size = 12),
    axis.title = element_text(size = 14),
```

```
    legend.text = element_text(size = 12, family = "Arial"),
    legend.title = element_text(size = 12, family = "Arial")
  )

AC_ggplot
```

```
## Warning in grid.Call(C_stringMetric, as.graphicsAnnot(x$label)): font family
## not found in Windows font database
```

```
## Warning in grid.Call.graphics(C_text, as.graphicsAnnot(x$label), x$x, x$y, :
## font family not found in Windows font database
```




```
ggsave("UMAP_AC_clusters_Fig8B.svg", plot = AC_ggplot, device = "svg", width = 10, height
= 8)

# SESSION INFO ####
sessionInfo()
```

```
## R version 4.4.1 (2024-06-14 ucrt)
## Platform: x86_64-w64-mingw32/x64
## Running under: Windows 11 x64 (build 22631)
##
## Matrix products: default
##
##
## locale:
## [1] LC_COLLATE=German_Germany.utf8  LC_CTYPE=German_Germany.utf8
## [3] LC_MONETARY=German_Germany.utf8 LC_NUMERIC=C
## [5] LC_TIME=German_Germany.utf8
##
## time zone: Europe/Berlin
## tzcode source: internal
##
```

```
## attached base packages:
## [1] stats     graphics  grDevices utils     datasets  methods   base
##
## other attached packages:
## [1] umap_0.2.10.0    ggnewscale_0.5.0 tibble_3.2.1     dplyr_1.1.4
## [5] ggplot2_3.5.1
##
## loaded via a namespace (and not attached):
##  [1] Matrix_1.7-0      gtable_0.3.5      jsonlite_1.8.8    compiler_4.4.1
##  [5] tidyselect_1.2.1  Rcpp_1.0.13       textshaping_0.4.0 systemfonts_1.1.0
##  [9] png_0.1-8         scales_1.3.0      yaml_2.3.10       fastmap_1.2.0
## [13] reticulate_1.39.0 lattice_0.22-6    R6_2.5.1          labeling_0.4.3
## [17] generics_0.1.3    knitr_1.48        munsell_0.5.1     openssl_2.2.1
## [21] svglite_2.1.3     pillar_1.9.0      rlang_1.1.4       utf8_1.2.4
## [25] xfun_0.47         cli_3.6.3         withr_3.0.1       magrittr_2.0.3
## [29] digest_0.6.37     grid_4.4.1        rstudioapi_0.16.0 askpass_1.2.0
## [33] lifecycle_1.0.4   vctrs_0.6.5       RSpectra_0.16-2   evaluate_1.0.0
## [37] glue_1.7.0        farver_2.1.2      ragg_1.3.2        fansi_1.0.6
## [41] colorspace_2.1-1  rmarkdown_2.28    tools_4.4.1       pkgconfig_2.0.3
## [45] htmltools_0.5.8.1
```