

# MIGSA: Getting pbcmc datasets

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## Abstract

In this vignette we are going to show how we got the RData *pbcmcData.RData* which can be loaded via the **MIGSAdata** package using `data(pbcmcData)`.

*Keywords:* singular enrichment analysis, over representation analysis, gene set enrichment analysis, functional class scoring, big omics data.

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## 1. Getting the data

Following we give the used code to download this data and their PAM50 subtypes.

```
> library(limma);
> library(pbcmc);
> # datasets included in BioConductor repository
> libNames <- c("mainz", "nki", "transbig", "unt", "upp", "vdx");
> # let's load them!
> pbcmcData <- lapply(libNames, function(actLibName) {
+   print(actLibName);
+
+   # the pbcmc package provides an easy way to download and classify them
+   actLib <- loadBCDataset(Class=PAM50, libname=actLibName, verbose=FALSE);
+   actLibFilt <- filtrate(actLib, verbose=FALSE);
+   actLibFilt <- classify(actLibFilt, std="none", verbose=FALSE);
+   actSubtypes <- classification(actLibFilt)$subtype;
+
+   # get the expression matrix and the annotation
+   actExprs <- exprs(actLib);
+   actAnnot <- annotation(actLib);
+ }
```

```

+   # we recommend working allways with Entrez IDs, let's match them with
+   # expression matrix rownames (and modify them)
+   if (all(actAnnot$probe == rownames(actExprs))) {
+     actExprs <- actExprs[!is.na(actAnnot$EntrezGene.ID),];
+     actAnnot <- actAnnot[!is.na(actAnnot$EntrezGene.ID),];
+     rownames(actExprs) <- as.character(actAnnot$EntrezGene.ID);
+   } else {
+     matchedEntrez <- match(rownames(actExprs), actAnnot$probe);
+     # all(rownames(actExprs) %in% actAnnot$probe == !is.na(matchedEntrez));
+
+     stopifnot(all(
+       actAnnot$probe[!is.na(matchedEntrez)] ==
+       rownames(actExprs)[!is.na(matchedEntrez)]));
+
+     actExprs <- actExprs[!is.na(matchedEntrez),];
+     actAnnot <- actAnnot[!is.na(matchedEntrez),];
+     stopifnot(all(actAnnot$probe == rownames(actExprs)));
+     actExprs <- actExprs[!is.na(actAnnot$EntrezGene.ID),];
+     actAnnot <- actAnnot[!is.na(actAnnot$EntrezGene.ID),];
+     rownames(actExprs) <- as.character(actAnnot$EntrezGene.ID);
+   }
+
+   # average repeated genes expression
+   actExprs <- avereps(actExprs);
+
+   stopifnot(all(colnames(actExprs) == names(actSubtypes)));
+   # filtrate only these two conditions
+   actExprs <- actExprs[, actSubtypes %in% c("Basal", "LumA")];
+   actSubtypes <- as.character(
+     actSubtypes[actSubtypes %in% c("Basal", "LumA")]);
+
+   return(list(geneExpr=actExprs, subtypes=actSubtypes));
+ })
> names(pbcmcData) <- libNames;

```

And let's check it is the same data.

```

> # save the just created pbcmcData to newPbcmcData
> newPbcmcData <- pbcmcData;
> library(MIGSAdata);
> # and load the MIGSAdata one.
> data(pbcmcData);
> all.equal(newPbcmcData, pbcmcData);

```

## Session Info

```
> sessionInfo()
```

```
R version 4.1.1 (2021-08-10)
```

```
Platform: x86_64-pc-linux-gnu (64-bit)
```

```
Running under: Ubuntu 20.04.3 LTS
```

```
Matrix products: default
```

```
BLAS: /home/biocbuild/bbs-3.14-bioc/R/lib/libRblas.so
```

```
LAPACK: /home/biocbuild/bbs-3.14-bioc/R/lib/libRlapack.so
```

```
locale:
```

```
[1] LC_CTYPE=en_US.UTF-8      LC_NUMERIC=C
[3] LC_TIME=en_GB             LC_COLLATE=C
[5] LC_MONETARY=en_US.UTF-8   LC_MESSAGES=en_US.UTF-8
[7] LC_PAPER=en_US.UTF-8     LC_NAME=C
[9] LC_ADDRESS=C              LC_TELEPHONE=C
[11] LC_MEASUREMENT=en_US.UTF-8 LC_IDENTIFICATION=C
```

```
attached base packages:
```

```
[1] stats4      stats      graphics  grDevices  utils      datasets  methods
[8] base
```

```
other attached packages:
```

```
[1] edgeR_3.36.0      MIGSadata_1.17.0  MIGSA_1.18.0
[4] mGSZ_1.0          ismev_1.42        mgcv_1.8-38
[7] nlme_3.1-153     MASS_7.3-54       limma_3.50.0
[10] GSA_1.03.1       BiocParallel_1.28.0 GSEABase_1.56.0
[13] graph_1.72.0     annotate_1.72.0    XML_3.99-0.8
[16] AnnotationDbi_1.56.0 IRanges_2.28.0    S4Vectors_0.32.0
[19] Biobase_2.54.0   BiocGenerics_0.40.0
```

```
loaded via a namespace (and not attached):
```

```
[1] Category_2.60.0    bitops_1.0-7      matrixStats_0.61.0
[4] bit64_4.0.5       httr_1.4.2        GenomeInfoDb_1.30.0
[7] Rgraphviz_2.38.0  tools_4.1.1       utf8_1.2.2
[10] R6_2.5.1           vegan_2.5-7       DBI_1.1.1
[13] colorspace_2.0-2  permute_0.9-5     tidyselect_1.1.1
[16] bit_4.0.4          compiler_4.1.1    formatR_1.11
[19] gg dendro_0.1.22  labeling_0.4.2    scales_1.1.1
[22] genefilter_1.76.0 RBGL_1.70.0       digest_0.6.28
[25] stringr_1.4.0     AnnotationForge_1.36.0 XVector_0.34.0
[28] pkgconfig_2.0.3   fastmap_1.1.0     rlang_0.4.12
[31] rstudioapi_0.13   RSQLite_2.2.8     farver_2.1.0
[34] G0stats_2.60.0    generics_0.1.1    jsonlite_1.7.2
[37] dplyr_1.0.7       RCurl_1.98-1.5    magrittr_2.0.1
[40] G0.db_3.14.0     GenomeInfoDbData_1.2.7 futile.logger_1.4.3
[43] Matrix_1.3-4      Rcpp_1.0.7        munsell_0.5.0
```

[46]	fansi_0.5.0	lifecycle_1.0.1	stringi_1.7.5
[49]	zlibbioc_1.40.0	org.Hs.eg.db_3.14.0	plyr_1.8.6
[52]	grid_4.1.1	blob_1.2.2	parallel_4.1.1
[55]	crayon_1.4.1	lattice_0.20-45	Biostrings_2.62.0
[58]	splines_4.1.1	KEGGREST_1.34.0	locfit_1.5-9.4
[61]	pillar_1.6.4	reshape2_1.4.4	futile.options_1.0.1
[64]	glue_1.4.2	lambda.r_1.2.4	data.table_1.14.2
[67]	png_0.1-7	vctrs_0.3.8	gtable_0.3.0
[70]	purrr_0.3.4	assertthat_0.2.1	cachem_1.0.6
[73]	ggplot2_3.3.5	xtable_1.8-4	survival_3.2-13
[76]	tibble_3.1.5	memoise_2.0.0	cluster_2.1.2
[79]	ellipsis_0.3.2		

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