# Introduction to the *sampleClassifierData* Package

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## 1 Introduction

*sampleClassifierData* contains a collection of publicly available microarray and RNA-seq datasets that have been pre-processed for use with the *sampleClassifier* package. These pre-processed datasets can be used as reference matrices for gene expression profile classifcation using *sampleClassifier*. This introduction contains a brief overview of the datasets included in the package. For more examples on how to use *sampleClassifier* and *sampleClassifierData*, please refer to the *sampleClassifier* Vignette.

## 2 Data overview

First, we load the package *sampleClassifierData*:

```
> library(sampleClassifierData)
```

The *sampleClassifierData* package contains two microarray datasets and two RNA-seq datasets that have been pre-processed for use with *sampleClassifier*.

The datasets are stored as `SummarizedExperiment` objects. The numeric matrices to use with the *sampleClassifier* can be extracted using the `assay()` function from *SummarizedExperiment* package.
The object $se_rnaseq_refmat$ contains pre-processed RNA-seq data from the study E-MTAB-1733 [1]. The data are available from the ArrayExpress [2] (http://www.ebi.ac.uk/arrayexpress/) database. The provided dataset contains gene expression profiles from 24 tissue types. Each tissue is represented by 3 replicates, except ovary which is represented by 2 replicates.
To download and load this dataset, run the following code:

```
> data("se_rnaseq_refmat")
> rnaseq_refmat <- assay(se_rnaseq_refmat)
> dim(rnaseq_refmat)
```

```
[1] 43819    71
```

The object *se_micro_refmat* contains normalized microarray data from the study GSE3526 [3]. The dataset is available from GEO [4] (https://www.ncbi.nlm.nih.gov/geo/). The provided dataset contains gene expression profiles from 26 tissues. Each tissue is represented by 3 replicates. To download and load this dataset, run the following code:

```
> data("se_micro_refmat")
> micro_refmat <- assay(se_micro_refmat)
> dim(micro_refmat)

[1] 54675    78
```

The object *se_rnaseq_testmat* contains pre-processed RNA-seq data derived from the study E-MTAB-513 [5]. The data are available from the ArrayExpress (http://www.ebi.ac.uk/arrayexpress/) database. The provided dataset contains gene expression profiles from 12 tissues. To download and load this dataset, run the following code:

```
> data("se_rnaseq_testmat")
> rnaseq_testmat <- assay(se_rnaseq_testmat)
> dim(rnaseq_testmat)

[1] 43819    12
```

The object *se_micro_testmat* contains normalized microarray data derived from the study GSE2361 [6]. The dataset is available from GEO. The provided dataset contains gene expression profiles from 16 tissues. To download and load this dataset, run the following code:

```
> data("se_micro_testmat")
> micro_testmat <- assay(se_micro_testmat)
> dim(micro_refmat)

[1] 54675    78
```

# 3 Data pre-processing

The reads from the studies E-MTAB-1733 and E-MTAB-513 were mapped to the GRCh37 version of the human genome with Tophat v2.1.0 [7]. FPKM (fragments per kilobase of exon model per million mapped reads) values were calculated using cuffnorm v2.2.1 [8]. The used data from E-MTAB-1733 were extracted after processing of all samples and averaging across technical replicates.
The microarray data from the studies GSE3526 and GSE2361 were normalized using YuGene [9].

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