Package 'easyDifferentialGeneCoexpression'

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Encoding UTF-8

Title Easily Performs Differential Coexpression Analysis

Version 1.4

Description A function that reads in the GEO code of a list of probesets or gene symbols, a gene expression dataset GEO accession code, the name of the dataset feature discriminating the two conditions for the differential coexpression, and the values of the two different conditions for the differential coexpression, and returns the significant pairs of genes/probesets with highest differential coexpression (p-value < 0.005). If the input gene list is made of gene symbols, this package associates the probesets to these gene symbols, if found. Platforms available: GPL80, GPL8300, GPL80, GPL96, GPL570, GPL571, GPL20115, GPL1293, GPL6102, GPL6104, GPL6883, GPL6 pression Omnibus. ID: identifier code. The GEO datasets are downloaded from the URL <https://ftp.ncbi.nlm.nih.gov/geo/series/>.

BugReports <https://github.com/davidechicco/easyDifferentialGeneCoexpression/issues>

Depends R (>= 4.0.0)

License GPL-3

URL <https://github.com/davidechicco/easyDifferentialGeneCoexpression>

Imports annotate, Biobase, diffcoexp, geneExpressionFromGEO, GEOquery, jetset, limma, magrittr, xml2

Suggests knitr, rmarkdown

VignetteBuilder knitr

RoxygenNote 7.1.2

NeedsCompilation no

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Repository CRAN

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R **topics documented:**

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easyDifferentialGeneCoexpression

> *Function that computes the differential coexpression of a list of probe-sets in a specific dataset and returns the most significant pairs*

Description

Function that computes the differential coexpression of a list of probesets in a specific dataset and returns the most significant pairs

Usage

```
easyDifferentialGeneCoexpression(
  list_of_probesets_to_select,
  GSE_code,
  featureNameToDiscriminateConditions,
  firstConditionName,
  secondConditionName,
  batchCorrection = TRUE,
  verbose = FALSE
)
```

Arguments

list_of_probesets_to_select

list of probesets for which the differential coexpression should be computed

GSE_code   GEO accession code of the dataset to analyze

featureNameToDiscriminateConditions

name of the feature of the dataset that contains the two conditions to investigate

firstConditionName

name of the first condition in the feature to discriminate (for example, "healthy")

secondConditionName

name of the second condition in the feature to discriminate (for example, "can-cer")

batchCorrection

says if the script should perform the batch correction with limma::removeBatchEffect() or not

verbose   prints all the intermediate message to standard output or not

Value

a dataframe containing the significantly differentially co-expressed pairs of genes

Examples

```
probesetList <- c("200738_s_at", "217356_s_at", "206686_at")
verboseFlag <- "TRUE"
batchCorrection <- "TRUE"
signDiffCoexpressGenePairs <- easyDifferentialGeneCoexpression(probesetList,
"GSE3268", "description", "Normal", "Tumor", verboseFlag)
```

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fromProbesetToGeneSymbol

Function that associates a gene symbol to a probeset for some Affymetrix platforms

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Description

Function that associates a gene symbol to a probeset for some Affymetrix platforms

Usage

```
fromProbesetToGeneSymbol(
  thisProbeset,
  thisPlatform,
  this_platform_ann_df,
  verbose = FALSE
)
```

Arguments

thisProbeset	probeset in input
thisPlatform	GEO platform accession code
this_platform_ann_df	
	annotation dataframe of the platform
verbose	prints all the intermediate message to standard output or not

Value

a gene symbol as string

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geoDataDownload   *Function that downloads gene expression data from GEO, after checking the connection*

Description

Function that downloads gene expression data from GEO, after checking the connection

Usage

```
geoDataDownload(GSE_code, verbose = FALSE)
```

Arguments

GSE_code   GEO code dataset

verbose   prints all the intermediate message to standard output or not

Value

a gene set gene expression AnnotationDataFrame

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geoPlatformAnnotationsDownload

Function that downloads the annotations of a GEO platform

Description

Function that downloads the annotations of a GEO platform

Usage

```
geoPlatformAnnotationsDownload(platformID, verbose = FALSE)
```

Arguments

platformID   GEO platform ID

verbose   prints all the intermediate message to standard output or not

Value

a dataframe containing the annotations of the GEO platform

| probesetRetrieval | *Function that reads a CSV file of probesets or gene symbols and, in the latter case, it retrieves the original probesets* |

Description

Function that reads a CSV file of probesets or gene symbols and, in the latter case, it retrieves the original probesets

Usage

```
probesetRetrieval(
  probesets_or_gene_symbols,
  csv_file_name,
  platformCode,
  verbose = FALSE
)
```

Arguments

probesets_or_gene_symbols

flag saying if we're reading probesets or gene symbols

csv_file_name complete name of CSV file containing the probesets or the gene symbols

platformCode code of the microarray platform for which the probeset-gene symbol mapping should be done

verbose prints all the intermediate message to standard output or not

Value

a vector of probesets

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