

Package ‘HTGM’

April 5, 2025

Version 1.1

Date 2025-04-04

Title High Throughput 'GoMiner'

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Depends R (>= 4.2.0)

Imports minimalistGODB, GoMiner, grDevices, stats, gplots

LazyData true

LazyDataCompression xz

Description Two papers published in the early 2000's (Zeeberg, B.R., Feng, W., Wang, G. et al. (2003) <[doi:10.1186/gb-2003-4-4-r28](https://doi.org/10.1186/gb-2003-4-4-r28)>) and (Zeeberg, B.R., Qin, H., Narashimhan, S., et al. (2005) <[doi:10.1186/1471-2105-6-168](https://doi.org/10.1186/1471-2105-6-168)>) implement 'GoMiner' and 'High Throughput GoMiner' ('HTGM') to map lists of genes to the Gene Ontology (GO) <<https://geneontology.org>>. Until recently, these were hosted on a server at The National Cancer Institute (NCI). In order to continue providing these services to the bio-medical community, I have developed stand-alone versions. The current package 'HTGM' builds upon my recent package 'GoMiner'. The output of 'GoMiner' is a heatmap showing the relationship of a single list of genes and the significant categories into which they map. 'High Throughput GoMiner' ('HTGM') integrates the results of the individual 'GoMiner' analyses. The output of 'HTGM' is a heatmap showing the relationship of the significant categories derived from each gene list. The heatmap has only 2 axes, so the identity of the genes are unfortunately ``integrated out of the equation." Because the graphic for the heatmap is implemented in Scalable Vector Graphics (SVG) technology, it is relatively easy to hyperlink each picture element to the relevant list of genes. By clicking on the desired picture element, the user can recover the ``lost" genes.

License GPL (>= 2)

Encoding UTF-8

VignetteBuilder knitr

Suggests knitr, rmarkdown, testthat (>= 3.0.0)

RoxygenNote 7.3.2

Config/testthat/edition 3

NeedsCompilation no

Repository CRAN

Date/Publication 2025-04-05 11:20:27 UTC

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Housekeeping_Genes *HTGM data set*

Description

HTGM data set

Usage

`data(Housekeeping_Genes)`

HTGM

HTGM

Description

driver to invoke GoMiner for multiple studies, and integrate the results in a categories versus study hyperlinked heatmap

Usage

```
HTGM(  
  title = NULL,  
  dir = tempdir(),  
  sampleLists,  
  GOGOA3,  
  ONT,  
  enrichThresh = 2,  
  countThresh = 5,  
  fdrThresh = 0.1,  
  nrand = 100,  
  verbose = TRUE  
)
```

Arguments

title	character string descriptive title
dir	character string full pathname to the directory acting as result repository
sampleLists	list of character vector of user-supplied genes of interest
GOGOA3	return value of subsetGOGOA()
ONT	c("molecular_function","cellular_component","biological_process")
enrichThresh	numerical acceptance threshold for enrichment passed to GoMiner
countThresh	numerical acceptance threshold for gene count passed to GoMiner
fdrThresh	numerical acceptance threshold for fdr passed to GoMiner
nrand	integer number of randomizations passed to GoMiner
verbose	Boolean if TRUE, GoMiner will message some helpful diagnostics

Value

returns the matrix of significant categories versus study

Examples

```
## Not run:
# this example takes too long to run, and
# GOGO3.RData is too large to include in the R package
# so I need to load it from a file that is not in the package.
# Since this is in a file in my own file system, I could not
# include this as a regular example in the package.
# This example is given in full detail in the package vignette.
# You can generate GOGO3.RData using the package 'minimalistGODB'
# or you can retrieve it from https://github.com/barryzee/GO

# load("data/Housekeeping_Genes.RData")
# load("~/GODB_RDATA/GOGO3.RData")
sampleList<-unique(as.matrix(Housekeeping_Genes[, "Gene.name"]))
n<-nrow(sampleList)
sampleLists<-list()
# test the effect of random sampling of the entire gene set
# this can give an idea of the quality of the GoMiner results
# when the complete gene set is yet to be determined
sampleLists[["1"]]<-sampleList[sample(n,n/2)]
sampleLists[["2"]]<-sampleList[sample(n,n/2)]
sampleLists[["3"]]<-sampleList[sample(n,n/2)]
sampleLists[["4"]]<-sampleList[sample(n,n/2)]
sampleLists[["5"]]<-sampleList[sample(n,n/2)]
sampleLists[["ALL"]]<-sampleList
m<-HTGM(title=NULL,dir=tempdir(),sampleLists,GOGO3,ONT="biological_process",
  enrichThresh=2,countThresh=5,fdrThresh=0.10,nrand=100,verbose=TRUE)

## End(Not run)
```

htgmM

htgmM

Description

generate FDR matrix of id versus cat

Usage

```
htgmM(l, fdrThresh)
```

Arguments

l	list of return values of GoMiner()
fdrThresh	numerical acceptance threshold for fdr

Value

returns numeric matrix m containing FDR values

Examples

```
# load("data/x_1.RData")
m<-htgmM(x_1,.1)
```

hyperGenes

hyperGenes

Description

populate subdirectory of hyperlinked gene lists

Usage

```
hyperGenes(l, dir)
```

Arguments

l return value of GoMiner()
dir character string containing path name of results directory

Value

returns no value but has side effect of populating subdirectory of hyperlinked gene lists

Examples

```
# x_1<-load("data/x_1.RData")
dir<-tempdir()
print(dir)
hyperGenes(x_1,dir)
```

hyperlinks

hyperlinks

Description

driver to add gene list hyperlinks to the HTGM heatmap

Usage

```
hyperlinks(s, rownames, colnames)
```

Arguments

`s` character path name of the file containing the HTGM svg
`rownames` character vector of row names
`colnames` character vector of column names

Value

returns the path name of the file containing the hyperlinked HTGM svg

Examples

```
#load("data/x_rn.RData")
#load("data/x_cn.RData")
#load("data/x_svg.RData")
s<-system.file("extdata","x_htgm.svg",package="HTGM")
# need to avoid writing to "extdata"
dir<-tempdir()
file.copy(from=s, to=dir)
hyperlinkedFileName<-hyperlinks(sprintf("%s/%s",dir,"x_htgm.svg"),x_rn,x_cn)
print("hyperlinkedFileName")
print(hyperlinkedFileName)
```

pasteHyperlinks *pasteHyperlinks*

Description

add gene list hyperlinks to the HTGM heatmap

Usage

```
pasteHyperlinks(str, c1, c2)
```

Arguments

`str` character a line from the svg that is to have a hyperlink inserted
`c1` character list of row names
`c2` character list of column names

Value

returns a line of code to insert into svg

Examples

```
#load("data/x_svgr.RData")
#load("data/x_rnr.RData")
#load("data/x_cnc.RData")
hl<-pasteHyperlinks(x_svgr,x_rnr,x_cnc)
```

x_cn	<i>HTGM data set</i>
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Description

HTGM data set

Usage

```
data(x_cn)
```

x_cnc	<i>HTGM data set</i>
-------	----------------------

Description

HTGM data set

Usage

```
data(x_cnc)
```

x_l	<i>HTGM data set</i>
-----	----------------------

Description

HTGM data set

Usage

```
data(x_l)
```

x_m	<i>HTGM data set</i>
-----	----------------------

Description

HTGM data set

Usage

data(x_m)

x_rn	<i>HTGM data set</i>
------	----------------------

Description

HTGM data set

Usage

data(x_rn)

x_rnr	<i>HTGM data set</i>
-------	----------------------

Description

HTGM data set

Usage

data(x_rnr)

x_svg	<i>HTGM data set</i>
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Description

HTGM data set

Usage

data(x_svg)

x_svgr

HTGM data set

Description

HTGM data set

Usage

data(x_svgr)

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