Package ‘meshr’

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Title Tools for conducting enrichment analysis of MeSH

Description A set of annotation maps describing the entire MeSH assembled using data from MeSH.

Version 2.8.0

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License Artistic-2.0

biocViews AnnotationData, FunctionalAnnotation, Bioinformatics, Statistics, Annotation, MultipleComparisons, MeSHDb

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**Description**

meshr package conducts a MeSH enrichment analysis employing gene-MeSH annotation data. A hypergeometric test accounting for a multiple testing correction is used to find significantly enriched MeSH terms.

**Details**

- **Package:** meshr
- **Version:** 1.2.6
- **Date:** 3-20-2015
- **biocViews:** AnnotationData, FunctionalAnnotation, Bioinformatics, Statistics, Annotation, MultipleComparisons
- **Depends:** R (>= 3.0.1), cummeRbund, org.Hs.eg.db, fdrtool, Category, BiocGenerics, methods, MeSH.db, MeSH.AOR.db, MeSH.Aca.eg.db, MeSH.Atu.K84.eg.db, MeSH.Bsu.168.eg.db, MeSH.Syn.eg.db
- **Imports:**
- **Suggests:**
- **License:** Artistic-2.0

Index:

meshHyperGTest performs a hypergeometric statistical test.

Further information is available in the vignettes.

**Author(s)**

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**See Also**

MeSHHyperGParams-class, MeSHHyperGResult-class, meshHyperGTest

**Examples**

```r
ls("package:meshr")
```
category

A function to return the name of MeSH category

Description

This function returns the name of MeSH category.

Usage

category(r)
category(r) <- value

Arguments

r An object containing annotation information.
value The annotation information to set on object.

Author(s)

Koki Tsuyuzaki

Examples

showMethods("category")

database

A function to return the name of MeSH database

Description

This function returns the name of MeSH database.

Usage

database(r)
database(r) <- value

Arguments

r An object containing annotation information.
value The annotation information to set on object.

Author(s)

Koki Tsuyuzaki
Examples

showMethods("database")

MeSHHyperGParams-class

Class "MeSHHyperGParams"

Description


Objects from the Class

Objects can be created by calls of the form new("MeSHHyperGParams", ...).

Slots

geneIds: Object of class "ANY": A vector of gene identifiers. Numeric and character vectors are probably the only things that make sense. These are the gene ids for the selected gene set.

universeGeneIds: Object of class "ANY": A vector of gene ids in the same format as geneIds defining a subset of the gene ids on the chip that will be used as the universe for the hypergeometric calculation.

annotation: A string giving the name of the gene-MeSH annotation package like MeSH.XXX.eg.db.

meshdb: A string giving the name of the MeSH database like MeSH.db.

category: A string giving the name of the MeSH category like A, B, C, D,...and so on.

database: A string giving the name of the MeSH database like gendoo, gene2pubmed,...and so on.

pvalueCutoff: A numeric values between zero and one used as a p-value or FDR cutoff for hypergeometric test depending on pAdjust. The default is set to 0.05.

pAdjust: A string which can be one of the Benjamini-Hochberg procedure (a.k.a. q-value) ("BH"), Q-value ("QV"), empirical Bayes method ("lFDR"), and unadjusted p-value ("none") for multiple testing correction.

Methods

geneIds(p), geneIds(p) <- value Accessor methods for the geneIds.

universeGeneIds(p), universeGeneIds(p) <- value Accessor methods for the geneIds.

annotation(p), annotation(p) <- value Accessor methods for the gene-MeSH annotation data.

pAdjust(p) An accessor method for the choice of a method for multiple testing correction.

pvalueCutoff(p) An accessor method for the choice of a threshold when conducting enrichment analysis.
Description

This class represents the results of a test for overrepresentation of MeSH terms among genes in a selected gene set based upon the Hypergeometric distribution.

For details on extracting information from this object, please read the documentation in the MeSHHyperGParams-class.

Objects from the Class

Objects can be created by calls of the form new("MeSHHyperGResult", ...).

Slots

meshCategory: Object of class "character" representing the category of MeSH terms tested.
meshAnnotation: Object of class "character". The name of the annotation data used in the analysis.
meshDatabase: Object of class "character". The name of the database used in the analysis.
ORA: Object of class "data.frame". MeSH IDs, MeSH Terms, P-value, and other statistics is returned.

Methods

meshCategory signature(r = "MeSHHyperGResult"): Returns the MeSH category used in the analysis.
meshAnnotation signature(r = "MeSHHyperGResult"): Returns the name of the annotation data used in the analysis.
meshDatabase signature(r = "MeSHHyperGResult"): Returns the name of the database used in the analysis.
meshIds signature(r = "MeSHHyperGResult"): Returns the character vector of the MeSH IDs identified as significant in the analysis.
meshTerms signature(r = "MeSHHyperGResult"): Returns the character vector of the MeSH terms identified as significant in the analysis.
meshHyperGTest

**pvalues** signature(r = "MeSHHyperGResult"): Returns the associated p-values of significantly enriched MeSH terms.

**summary** signature(r = "MeSHHyperGResult"): Returns a data.frame summarizing the test result. Optional arguments pvalue and categorySize allow specification of maximum p-value and minimum categorySize, respectively. Optional argument htmlLinks is a logical value indicating whether to add HTML links (useful in conjunction with xtables print method with type set to "html").

**show** signature(object = "MeSHHyperGResult"): Return a short description of the result.

**Author(s)**

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**See Also**

meshr-package, MeSHHyperGParams-class, meshHyperGTest

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**meshHyperGTest**

Hypergeometric Tests for MeSH term association

**Description**

Given a MeSHHyperGParams object containing a set of selected and background gene IDs, and gene-MeSH annotation data of interest, meshHyperGTest performs Hypergeometric test for over-representation of each MeSH term accounting for the multiple testing correction.

**Arguments**

- **p** A MeSHHyperGParams object

**Details**

For details on creating MeSHHyperGParams object, please read the documentation in the MeSHHyperGParams-class.

**Value**

A MeSHHyperGResult object.

**Author(s)**

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**See Also**

meshr-package, MeSHHyperGParams-class, MeSHHyperGResult-class
Examples

```plaintext
showMethods("meshHyperGTest")
```
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