

# Package ‘ReactomePA’

January 3, 2025

**Type** Package

**Title** Reactome Pathway Analysis

**Version** 1.50.0

**Maintainer** Guangchuang Yu <guangchuangyu@gmail.com>

**Description** This package provides functions for pathway analysis based on REACTOME pathway database. It implements enrichment analysis, gene set enrichment analysis and several functions for visualization.  
This package is not affiliated with the Reactome team.

**Depends** R (>= 3.4.0)

**Imports** AnnotationDbi, DOSE (>= 3.5.1), enrichplot, ggplot2 (>= 3.3.5), ggraph, reactome.db, igraph, graphite, gson, yulab.utils (>= 0.1.5)

**Suggests** BiocStyle, clusterProfiler, knitr, rmarkdown, org.Hs.eg.db, prettydoc, testthat

**VignetteBuilder** knitr

**ByteCompile** true

**License** GPL-2

**URL** <https://yulab-smu.top/contribution-knowledge-mining/>

**BugReports** <https://github.com/GuangchuangYu/ReactomePA/issues>

**biocViews** Pathways, Visualization, Annotation, MultipleComparison, GeneSetEnrichment, Reactome

**RoxygenNote** 7.3.2

**Encoding** UTF-8

**git\_url** <https://git.bioconductor.org/packages/ReactomePA>

**git\_branch** RELEASE\_3\_20

**git\_last\_commit** 5651432

**git\_last\_commit\_date** 2024-10-29

**Repository** Bioconductor 3.20

**Date/Publication** 2025-01-02

**Author** Guangchuang Yu [aut, cre],  
Vladislav Petyuk [ctb]

## Contents

ReactomePA-package . . . . .	2
DataSet . . . . .	2
enrichPathway . . . . .	3
getALLEG . . . . .	4
getDb . . . . .	4
gsePathway . . . . .	5
gson_Reactome . . . . .	6
reexports . . . . .	6
viewPathway . . . . .	7
<b>Index</b>	<b>8</b>

---

ReactomePA-package	<i>ReactomePA: Reactome Pathway Analysis</i>
--------------------	--

---

## Description

This package provides functions for pathway analysis based on REACTOME pathway database. It implements enrichment analysis, gene set enrichment analysis and several functions for visualization. This package is not affiliated with the Reactome team.

## Author(s)

**Maintainer:** Guangchuang Yu <guangchuangyu@gmail.com>

Other contributors:

- Vladislav Petyuk <petyuk@gmail.com> [contributor]

## See Also

Useful links:

- <https://yulab-smu.top/biomedical-knowledge-mining-book/>
- Report bugs at <https://github.com/GuangchuangYu/ReactomePA/issues>

---

DataSet	<i>Datasets sample contains a sample of gene IDs.</i>
---------	---

---

## Description

Datasets sample contains a sample of gene IDs.

---

enrichPathway	<i>Pathway Enrichment Analysis of a gene set. Given a vector of genes, this function will return the enriched pathways with FDR control.</i>
---------------	--

---

### Description

Pathway Enrichment Analysis of a gene set. Given a vector of genes, this function will return the enriched pathways with FDR control.

### Usage

```
enrichPathway(  
  gene,  
  organism = "human",  
  pvalueCutoff = 0.05,  
  pAdjustMethod = "BH",  
  qvalueCutoff = 0.2,  
  universe,  
  minGSSize = 10,  
  maxGSSize = 500,  
  readable = FALSE  
)
```

### Arguments

gene	a vector of entrez gene id.
organism	one of "human", "rat", "mouse", "celegans", "yeast", "zebrafish", "fly".
pvalueCutoff	Cutoff value of pvalue.
pAdjustMethod	one of "holm", "hochberg", "hommel", "bonferroni", "BH", "BY", "fdr", "none"
qvalueCutoff	Cutoff value of qvalue
universe	background genes
minGSSize	minimal size of genes annotated by Ontology term for testing.
maxGSSize	maximal size of each geneSet for analyzing
readable	whether mapping gene ID to gene Name

### Value

A enrichResult instance.

### Author(s)

Guangchuang Yu <http://ygc.name>

### See Also

[enrichResult-class](#)

**Examples**

```
gene <- c("11171", "8243", "112464", "2194",
          "9318", "79026", "1654", "65003",
          "6240", "3476", "6238", "3836",
          "4176", "1017", "249")
yy = enrichPathway(gene, pvalueCutoff=0.05)
head(summary(yy))
#plot(yy)
```

---

 getALLEG

*getALLEG*


---

**Description**

get all entrezgene ID of a specific organism

**Usage**

```
getALLEG(organism)
```

**Arguments**

organism      species

**Value**

entrez gene ID vector

**Author(s)**

Yu Guangchuang

---

 getDb

*getDb*


---

**Description**

mapping organism name to annotationDb package name

**Usage**

```
getDb(organism)
```

**Arguments**

organism      one of supported organism

**Value**

annotationDb name

**Author(s)**

Yu Guangchuang

gsePathway

*gsePathway***Description**

Gene Set Enrichment Analysis of Reactome Pathway

**Usage**

```

gsePathway(
  geneList,
  organism = "human",
  exponent = 1,
  minGSSize = 10,
  maxGSSize = 500,
  eps = 1e-10,
  pvalueCutoff = 0.05,
  pAdjustMethod = "BH",
  verbose = TRUE,
  seed = FALSE,
  by = "fgsea",
  ...
)

```

**Arguments**

geneList	order ranked geneList
organism	organism
exponent	weight of each step
minGSSize	minimal size of each geneSet for analyzing
maxGSSize	maximal size of each geneSet for analyzing
eps	This parameter sets the boundary for calculating the p value.
pvalueCutoff	pvalue Cutoff
pAdjustMethod	pvalue adjustment method
verbose	print message or not
seed	logical
by	one of 'fgsea' or 'DOSE'
...	other parameter

**Value**

gseaResult object

**Author(s)**

Yu Guangchuang

gson\_Reactome            *gson\_Reactome*

---

### Description

download the latest version of Reactome and stored in a 'GSON' object

### Usage

```
gson_Reactome(organism = "human")
```

### Arguments

organism            one of "human", "rat", "mouse", "celegans", "yeast", "zebrafish", "fly".

### Value

a 'GSON' object

### Examples

```
## Not run:  
rec_gson <- gson_Reactome("human")  
  
## End(Not run)
```

---

reexports            *Objects exported from other packages*

---

### Description

These objects are imported from other packages. Follow the links below to see their documentation.

**DOSE** [geneID](#), [geneInCategory](#)

**enrichplot** [cnetplot](#), [dotplot](#), [emapplot](#), [gseaplot](#), [heatplot](#), [ridgeplot](#)

---

viewPathway	<i>viewPathway</i>
-------------	--------------------

---

**Description**

view reactome pathway

**Usage**

```
viewPathway(  
  pathName,  
  organism = "human",  
  readable = TRUE,  
  foldChange = NULL,  
  keyType = "ENTREZID",  
  layout = "kk"  
)
```

**Arguments**

pathName	pathway Name
organism	supported organism
readable	logical
foldChange	fold change
keyType	keyType of gene ID (i.e. names of foldChange, if available)
layout	graph layout

**Details**

plotting reactome pathway

**Value**

plot

**Author(s)**

Yu Guangchuang

# Index

## \* **datasets**

DataSet, 2

## \* **internal**

ReactomePA-package, 2

reexports, 6

## \* **manip**

enrichPathway, 3

cnetplot, 6

cnetplot (reexports), 6

DataSet, 2

dotplot, 6

dotplot (reexports), 6

emapplot, 6

emapplot (reexports), 6

enrichPathway, 3

geneID, 6

geneID (reexports), 6

geneInCategory, 6

geneInCategory (reexports), 6

getALLEG, 4

getDb, 4

gseaplot, 6

gseaplot (reexports), 6

gsePathway, 5

gson\_Reactome, 6

heatplot, 6

heatplot (reexports), 6

ReactomePA (ReactomePA-package), 2

ReactomePA-package, 2

reexports, 6

ridgeplot, 6

ridgeplot (reexports), 6

viewPathway, 7