

Package ‘NCIgraph’

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Title Pathways from the NCI Pathways Database

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Description Provides various methods to load the pathways from the NCI Pathways Database in R graph objects and to re-format them.

License GPL-3

LazyLoad yes

Imports graph, KEGGgraph, methods, RBGL, RCy3, R.oo

Depends R (>= 4.0.0)

Suggests Rgraphviz

Enhances DEGraph

biocViews Pathways, GraphAndNetwork

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directedBFS *Uses a breadth first search on a directed graph to identify which genes are regulated by a particular node in the graph*

Description

Uses a breadth first search on a directed graph to identify which genes are regulated by a particular node in the graph.

Usage

```
directedBFS(g, node)
```

Arguments

g A [graph](#) object.
node A node of g.

Value

A structured [list](#) containing the regulated genes and the type of interaction between node and each gene.

Author(s)

Laurent Jacob

See Also

[propagateRegulation\(\)](#)

edgesToMerge *Identifies edges that should be merged to parse a NCI network*

Description

Identifies edges that should be merged to parse a NCI network.

Usage

```
edgesToMerge(g)
```

Arguments

g A [graph](#) object.

Value

A [list](#) of edges to be merged

Author(s)

Laurent Jacob

See Also[parseNCInetwork\(\)](#)

`getNCIPathways`*Loads networks from Cytoscape and parses them*

Description

Loads networks from Cytoscape and parses them.

Usage`getNCIPathways(cyList=NULL, parseNetworks=TRUE, entrezOnly=TRUE, verbose=FALSE)`**Arguments**

| | |
|----------------------------|--|
| <code>cyList</code> | a list providing the networks loaded from Cytoscape. If <code>NULL</code> , the function will try to build the list from Cytoscape. |
| <code>verbose</code> | If <code>TRUE</code> , extra information is output. |
| <code>parseNetworks</code> | A logical . If <code>FALSE</code> , the raw NCI networks are returned as graphNEL objects. If <code>TRUE</code> , some additional parsing is performed by the <code>parseNCInetwork</code> function. |
| <code>entrezOnly</code> | A logical . If <code>TRUE</code> , only keep nodes with an entrezID property. |

ValueA [list](#) of two elements: `pList`, a [list](#) of graphNEL objects, and `failedW` a [list](#) containing the names of the networks that R failed to read from cytoscape.**Author(s)**

Laurent Jacob

See Also[parseNCInetwork\(\)](#)**Examples**

```
##-----  
## Load NCIGraph  
##-----  
  
library(NCIGraph)  
  
##-----  
## Example 1: with Cytoscape  
##-----
```

```

## Must have Cytoscape running with some networks open and CyREST plugin started.

## In this case, getNCIPathways will both read the raw networks from Cytoscape and parse them.

## Not run:
grList <- getNCIPathways(cyList=NULL, parseNetworks=TRUE, entrezOnly=TRUE, verbose=TRUE)$pList

## End(Not run)

##-----
## Example 2: without Cytoscape
##-----

## Get some raw networks

data("NCIgraphVignette", package="NCIgraph")

## When passed a non null cyList argument (a list of networks),
## getNCIPathways will simply parse the list of networks

grList <- getNCIPathways(cyList=NCI.demo.cyList, parseNetworks=TRUE, entrezOnly=TRUE, verbose=TRUE)$pList

```

getSubtype.NCIgraph *Returns a list of @KEGGEdgeSubType objects describing each edge of the NCI network*

Description

Returns a list of @KEGGEdgeSubType objects describing each edge of the NCI network.

Usage

```
getSubtype.NCIgraph(object)
```

Arguments

object An [NCIgraph](#) object.

Value

A [list](#) of KEGGEdgeSubType objects.

Author(s)

Laurent Jacob

Examples

```

##-----
## Load NCIgraph
##-----

library(NCIgraph)

```

```
##-----  
## Get some raw networks  
##-----  
  
data("NCIgraphVignette", package="NCIgraph")  
  
##-----  
## Parse them  
##-----  
  
grList <- getNCIPathways(cyList=NCI.demo.cyList, parseNetworks=TRUE, entrezOnly=TRUE, verbose=TRUE)$pList  
  
##-----  
##  
## Get the subtype of the second network. Some activation and some  
## inhibition edges.  
##  
##-----  
  
getSubtype.NCIgraph(grList[[2]])
```

is.NCIgraph

Assess whether a graph is a NCI graph

Description

Assess whether a graph is a NCI graph.

Usage

```
is.NCIgraph(gr)
```

Arguments

`gr` A [graph](#) object.

Value

A [logical](#), [TRUE](#) if the graph is a NCI graph, [FALSE](#) otherwise.

Author(s)

Laurent Jacob

See Also

[parseNCInetwork\(\)](#)

| | |
|------------|--|
| mergeNodes | <i>Merges a given list of nodes in a graph</i> |
|------------|--|

Description

Merges a given list of nodes in a graph.

Usage

```
mergeNodes(g, mEdges, separateEntrez=TRUE, entrezOnly=TRUE)
```

Arguments

`g` A [graph](#) object.
`mEdges` A [list](#) of nodes to be merged.
`separateEntrez` A [logical](#). If `TRUE`, don't merge two nodes with entrezID.
`entrezOnly` A [logical](#). If `TRUE`, only keep nodes with an entrezID property.

Value

The updated [graph](#) object

Author(s)

Laurent Jacob

See Also

[parseNCInetwork\(\)](#)

| | |
|-----------------|--|
| NCI.demo.cyList | <i>10 raw NCI networks from Nature curated pathways and BioCarta imported as graphNEL objects, for demonstration purpose</i> |
|-----------------|--|

Description

These are the ten first elements of the full list of raw networks that can be downloaded using the `downloadCyLists.R` script.

Usage

```
NCI.demo.cyList
```

Format

A list of 10 graphNEL objects.

Author(s)

Laurent Jacob

Examples

```
data("NCIgraphVignette")
length(NCI.demo.cyList)

library(Rgraphviz)
plot(NCI.demo.cyList[[1]])
```

NCIgraph

*Class NCIgraph***Description**

Package: NCIgraph
Class NCIgraph

public static class **NCIgraph**
 extends graphNELObject

Class extending graphNEL fro graphs build from NCI gene networks.

Author(s)

Laurent Jacob

parseNCInetwork

Takes a NCI network and transforms it into a simpler graph only representing inhibition/activation relationships between genes

Description

Takes a NCI network and transforms it into a simpler graph only representing inhibition/activation relationships between genes.

Usage

```
parseNCInetwork(g, propagateReg=TRUE, separateEntrez=TRUE, mergeEntrezCopies=TRUE, entrezOnly=TRUE)
```

Arguments

g A [graph](#) object.

propagateReg A [logical](#). If [TRUE](#), use propagateRegulation to transform the network before parsing it.

separateEntrez A [logical](#). If [TRUE](#), don't merge two nodes with entrezID.

mergeEntrezCopies A [logical](#). If [TRUE](#), merge resulting nodes that have the same entrezID.

entrezOnly A [logical](#). If [TRUE](#), only keep nodes with an entrezID property.

Value

The new [graph](#) object.

Author(s)

Laurent Jacob

Examples

```
## Load NCIGraph
library(NCIGraph)

## Get some raw networks
data("NCIGraphVignette", package="NCIGraph")

## Parse the first of them

parsedNetwork <- parseNCInetwork(NCI.demo.cyList[[1]],propagateReg=TRUE,separateEntrez=TRUE,mergeEntrezCopi
```

| | |
|---------------------|---|
| propagateRegulation | <i>Transforms the network in a way that each Biochemical Reaction node pointing to a Complex points to what is regulated by the complex and updates the interaction types accordingly</i> |
|---------------------|---|

Description

Transforms the network in a way that each Biochemical Reaction node pointing to a Complex points to what is regulated by the complex and updates the interaction types accordingly.

Usage

```
propagateRegulation(g)
```

Arguments

`g` A [graph](#) object.

Value

The updated [graph](#) object

Author(s)

Laurent Jacob

See Also

[parseNCInetwork\(\)](#)

translateNCI2GeneID *Gives the entrezID corresponding to the nodes of a graph*

Description

Gives the entrezID corresponding to the nodes of a graph.

Usage

```
translateNCI2GeneID(g)
```

Arguments

`g` A [graph](#) object.

Value

A vector of [character](#) giving the entrez ID of the nodes of `g`.

Author(s)

Laurent Jacob

See Also

[parseNCInetwork\(\)](#)

Examples

```
##-----  
## Load NCIgraph  
##-----  
  
library(NCIgraph)  
  
## Get some raw networks  
  
data("NCIgraphVignette", package="NCIgraph")  
  
## Parse them  
  
grList <- getNCIPathways(cyList=NCI.demo.cyList, parseNetworks=TRUE, entrezOnly=TRUE, verbose=TRUE)$pList  
  
## Get the gene ids for the first of them  
  
gids <- translateNCI2GeneID(grList[[1]])
```

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