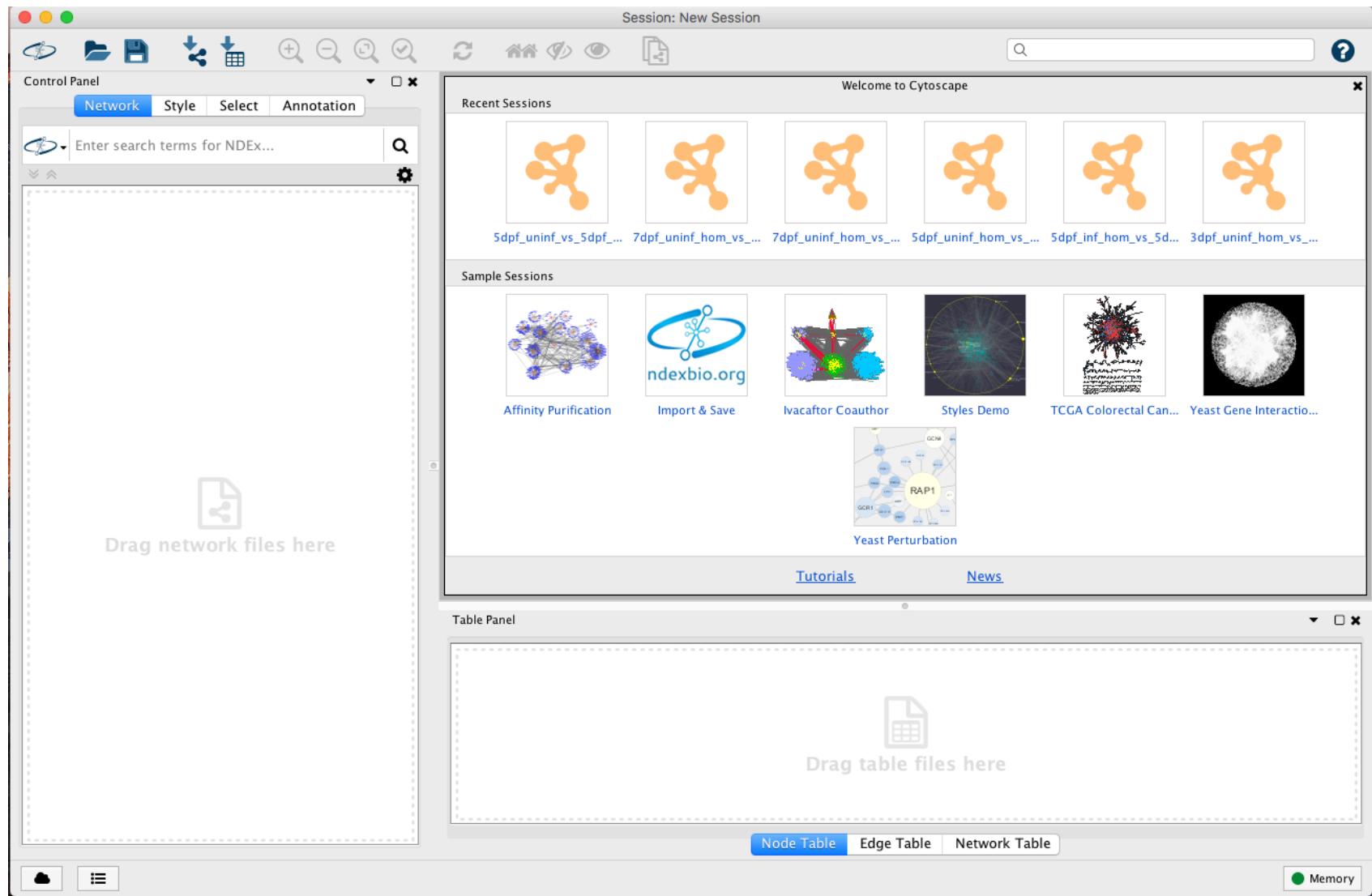
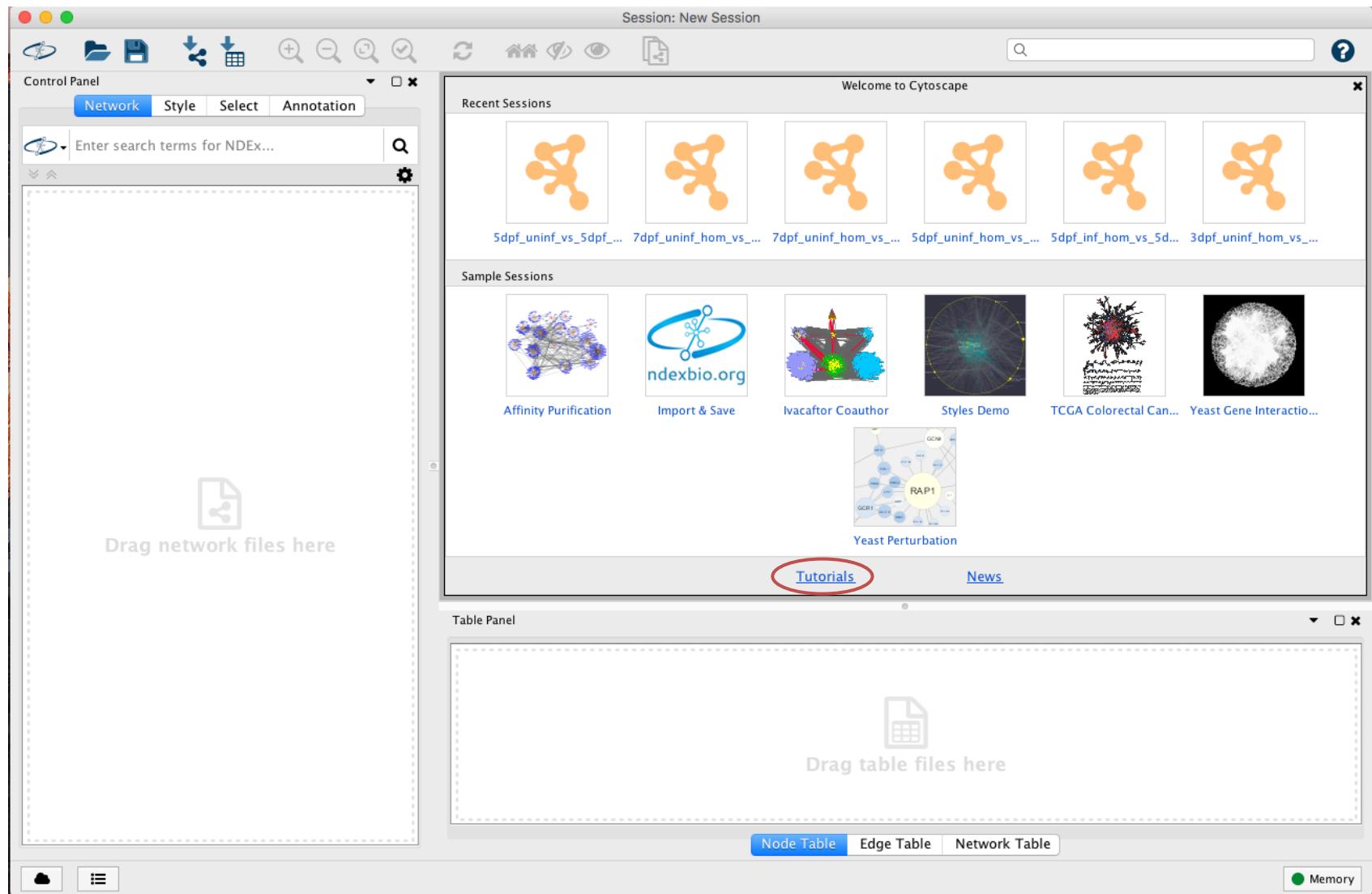


# Cytoscape for Visualisation

# Cytoscape

- Analysing and visualising networks
  - Protein-Protein interactions
  - Gene coexpression
  - Functional Enrichments
- <https://github.com/cytoscape/cytoscape-tutorials/wiki>





[tutorials.cytoscape.org](http://tutorials.cytoscape.org)

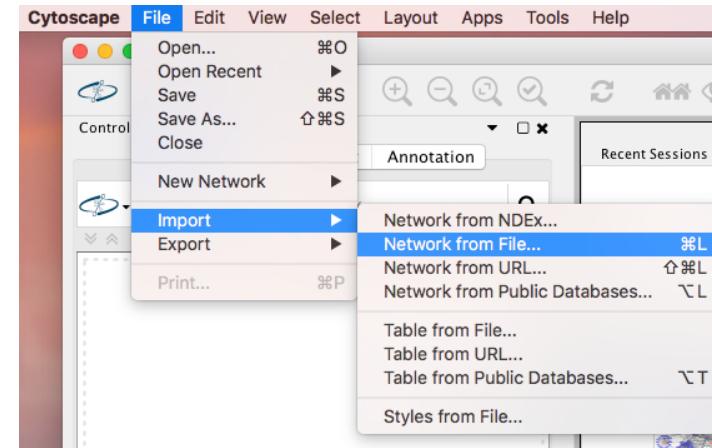
# Loading Networks

- Simplest format is Simple interaction file (.sif)
- columns are:
  - Source Node
  - relationship type
  - Target Node

ENSDARG00000099966	geneExprCor	ENSDARG00000095904
ENSDARG00000099966	geneExprCor	ENSDARG00000086425
ENSDARG00000099966	geneExprCor	ENSDARG00000104899
ENSDARG00000070656	geneExprCor	ENSDARG00000038066
ENSDARG00000070656	geneExprCor	ENSDARG00000019339
ENSDARG00000070656	geneExprCor	ENSDARG00000095743

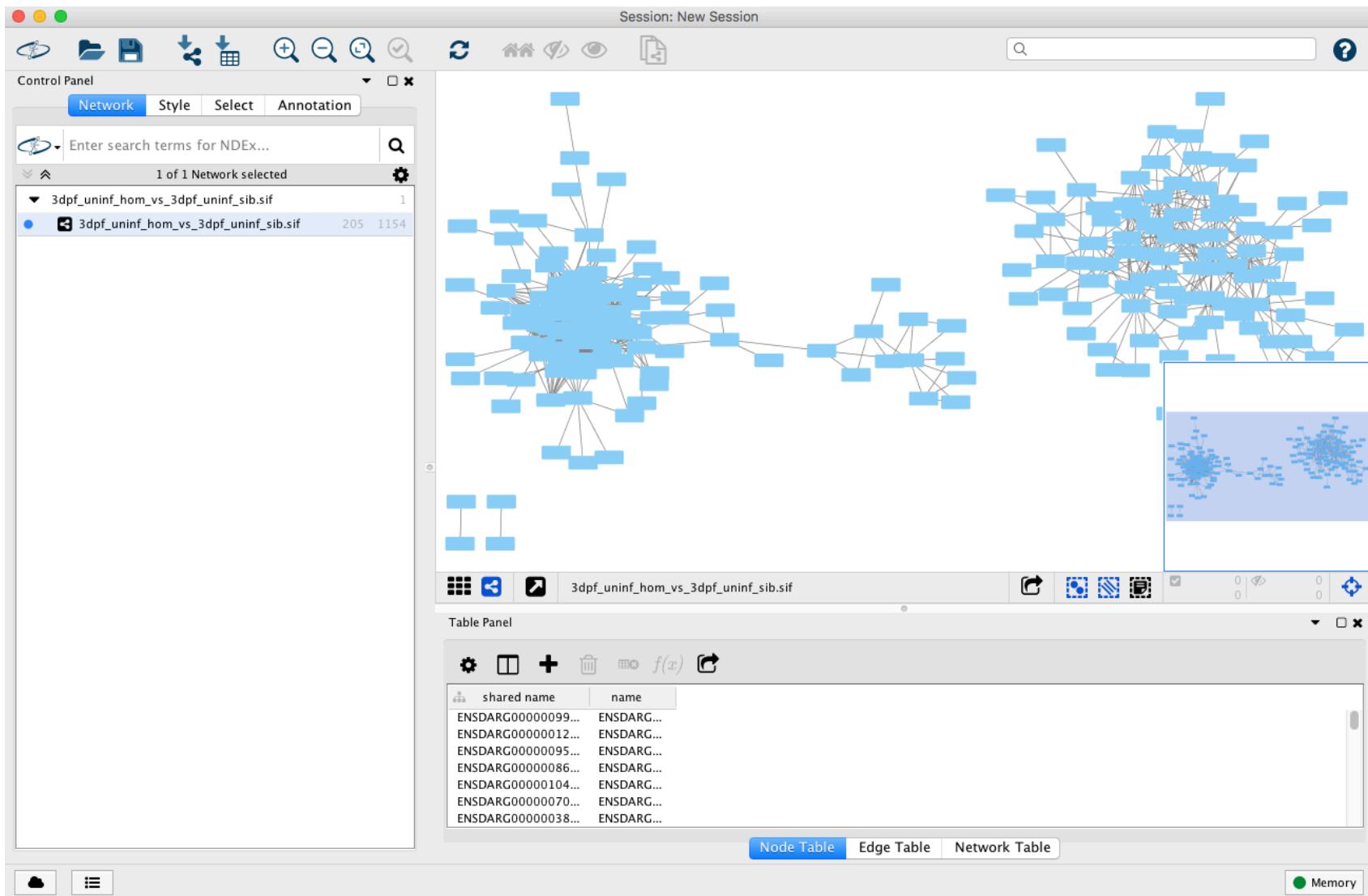
# Loading Networks

- Simplest format is Simple interaction file (.sif)
- columns are:
  - Source Node
  - relationship type
  - Target Node

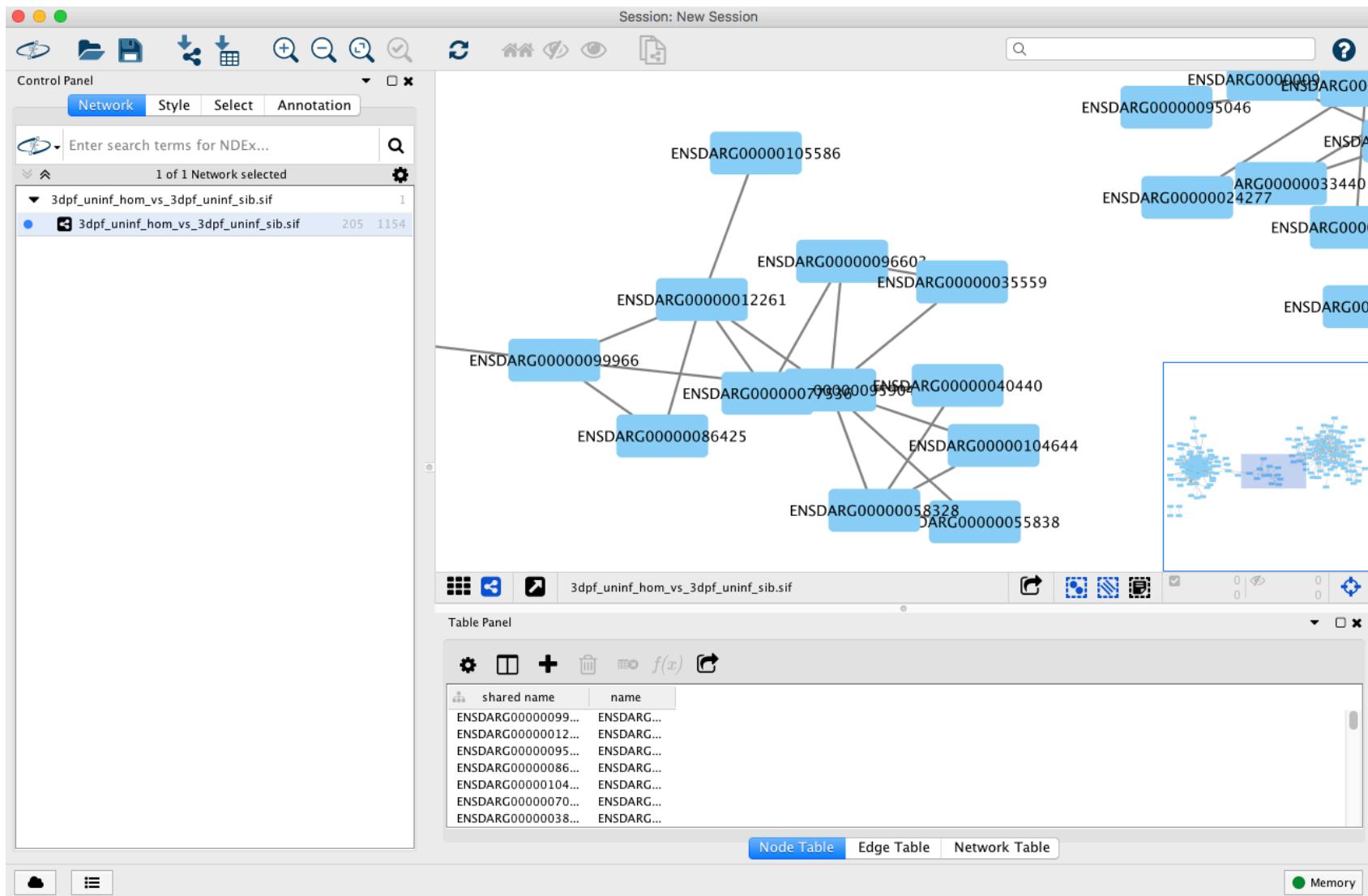


ENSDARG00000099966	geneExprCor	ENSDARG00000095904
ENSDARG00000099966	geneExprCor	ENSDARG00000086425
ENSDARG00000099966	geneExprCor	ENSDARG00000104899
ENSDARG00000070656	geneExprCor	ENSDARG00000038066
ENSDARG00000070656	geneExprCor	ENSDARG00000019339
ENSDARG00000070656	geneExprCor	ENSDARG00000095743

# Loading Networks



# Loading Networks



# Add extra node/edge information

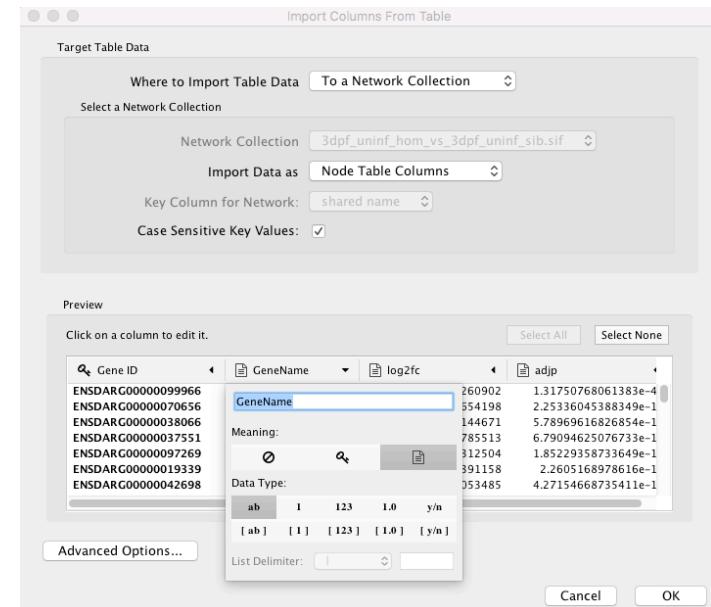
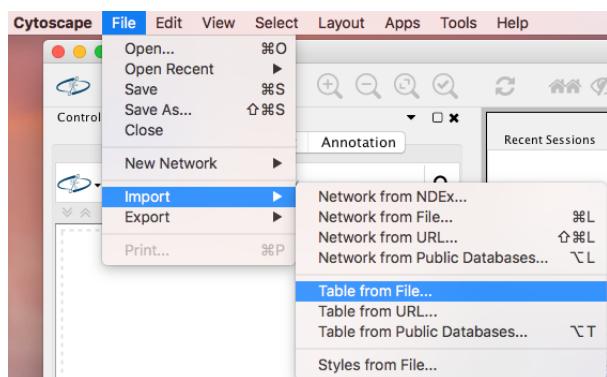
- Extra node information can be imported from a file containing a column that matches the node names

Gene ID	GeneName	log2fc	adjp
ENSDARG00000099966	polr2a	0.773509255	1.32E-49
ENSDARG00000070656	si:ch211-69g19.2	-0.583759051	2.25E-15
ENSDARG00000038066	kpna2	-0.520683514	5.79E-14
ENSDARG00000037551	pm20d1.1	2.334699018	6.79E-11

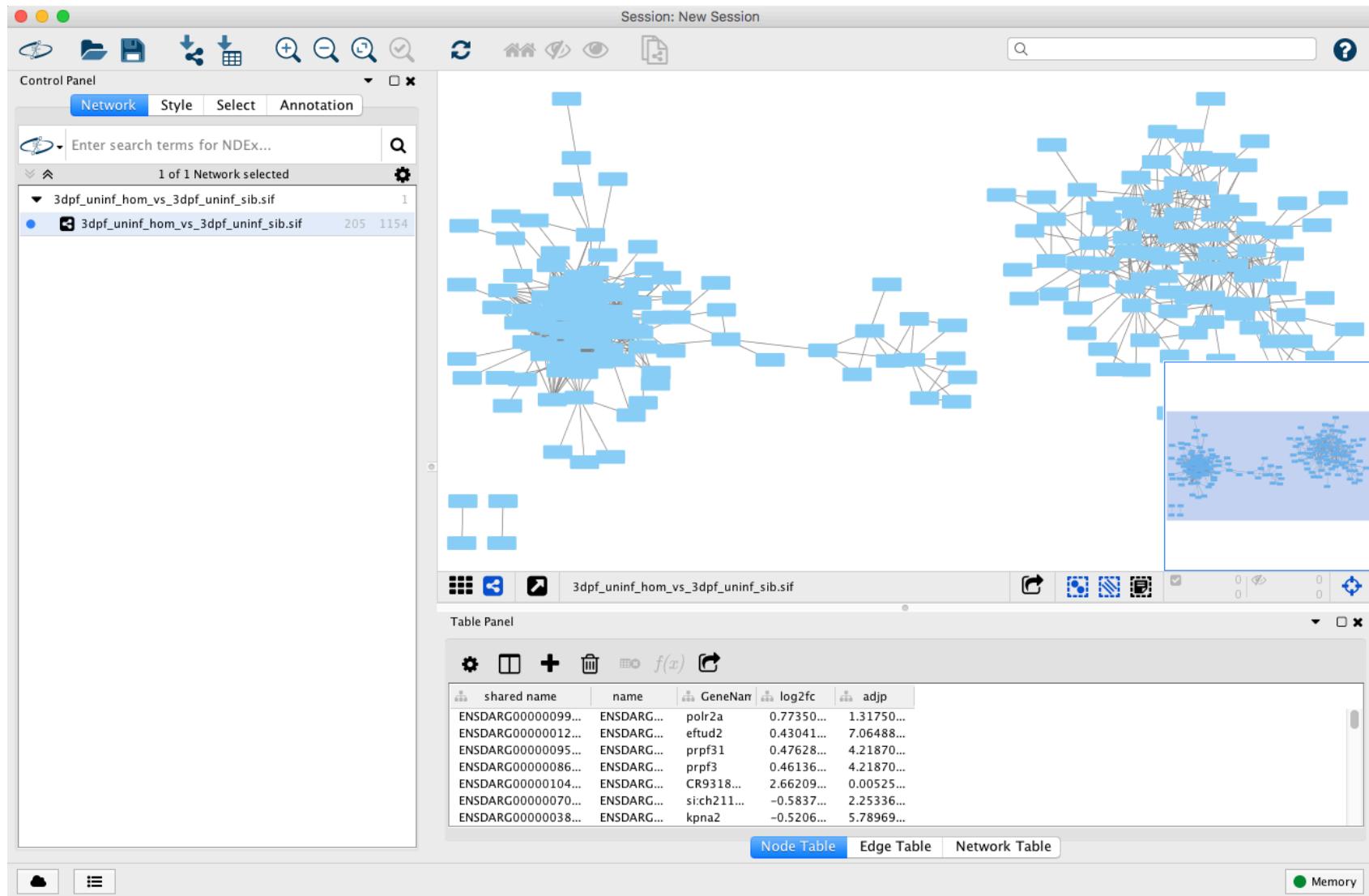
# Add extra node/edge information

- Extra node information can be imported from a file containing a column that matches the node names

Gene ID	GeneName	log2fc	adjp
ENSDARG00000099966	polr2a	0.773509255	1.32E-49
ENSDARG00000070656	si:ch211-69g19.2	-0.583759051	2.25E-15
ENSDARG00000038066	kpna2	-0.520683514	5.79E-14
ENSDARG00000037551	pm20d1.1	2.334699018	6.79E-11

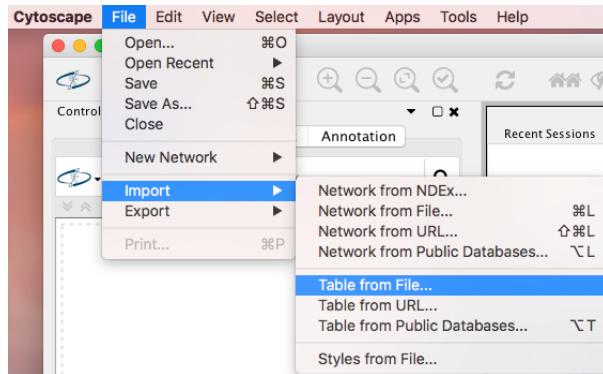


# Add extra node/edge information

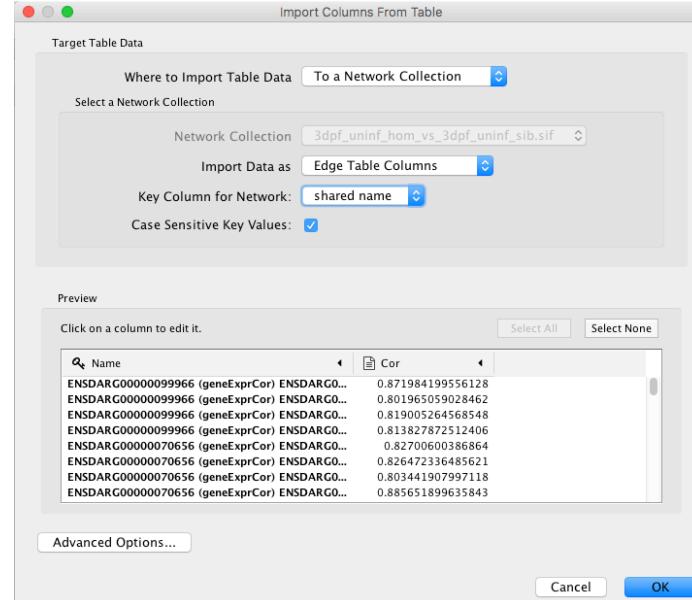


# Add extra node/edge information

- Extra edge information can be imported in the same way



The screenshot shows the Cytoscape interface with the 'Import' option highlighted in the 'File' menu.



The dialog box is titled 'Import Columns From Table' and contains settings for importing data:

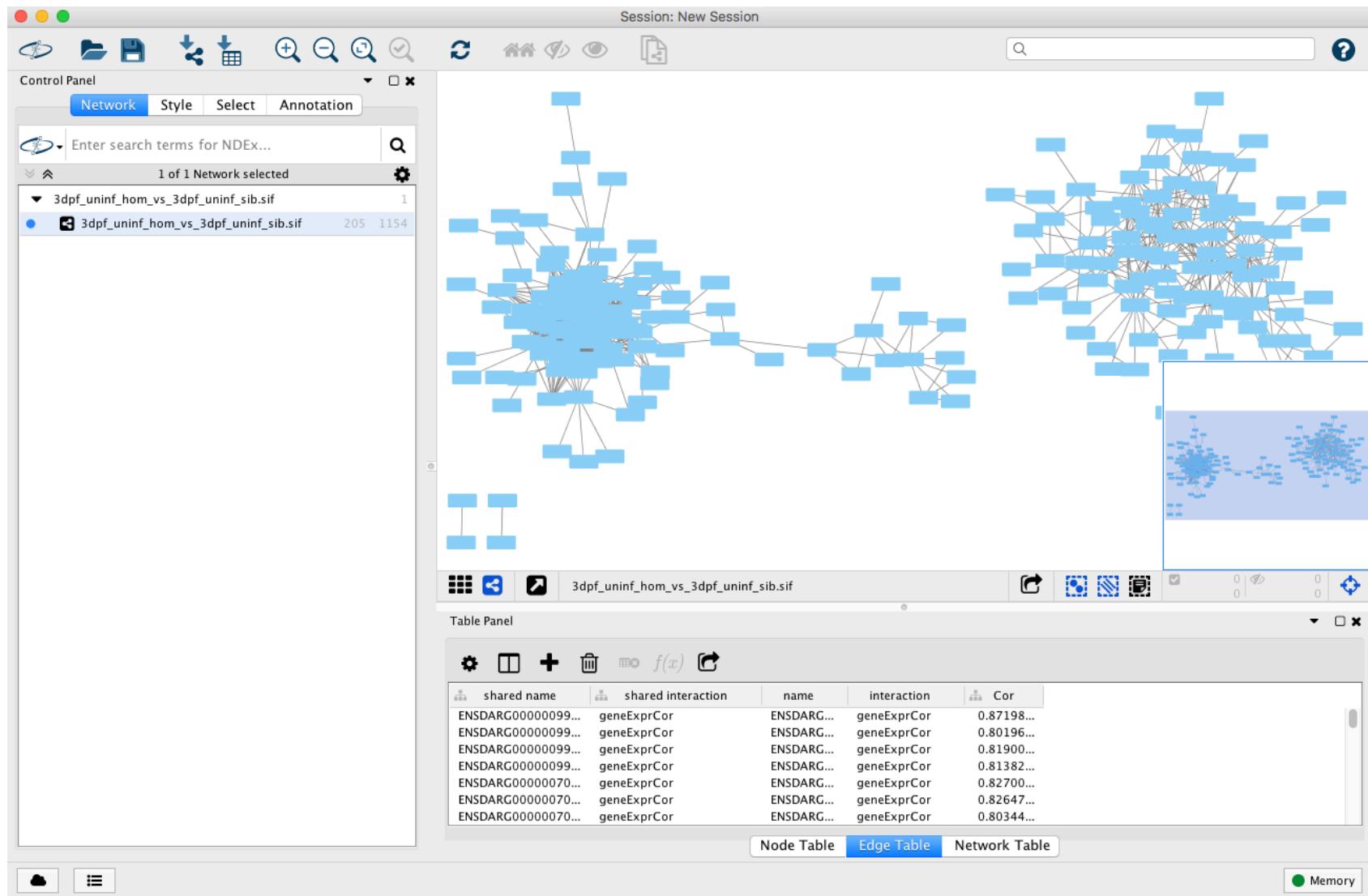
- Target Table Data: 'Where to Import Table Data' is set to 'To a Network Collection'.
- Select a Network Collection: 'Network Collection' is set to '3dpf\_uninf\_hom\_vs\_3dpf\_uninf\_sib.sif'.
- Import Data as: 'Edge Table Columns'.
- Key Column for Network: 'shared name'.
- Case Sensitive Key Values: checked.

Below the dialog is a preview table showing the data being imported:

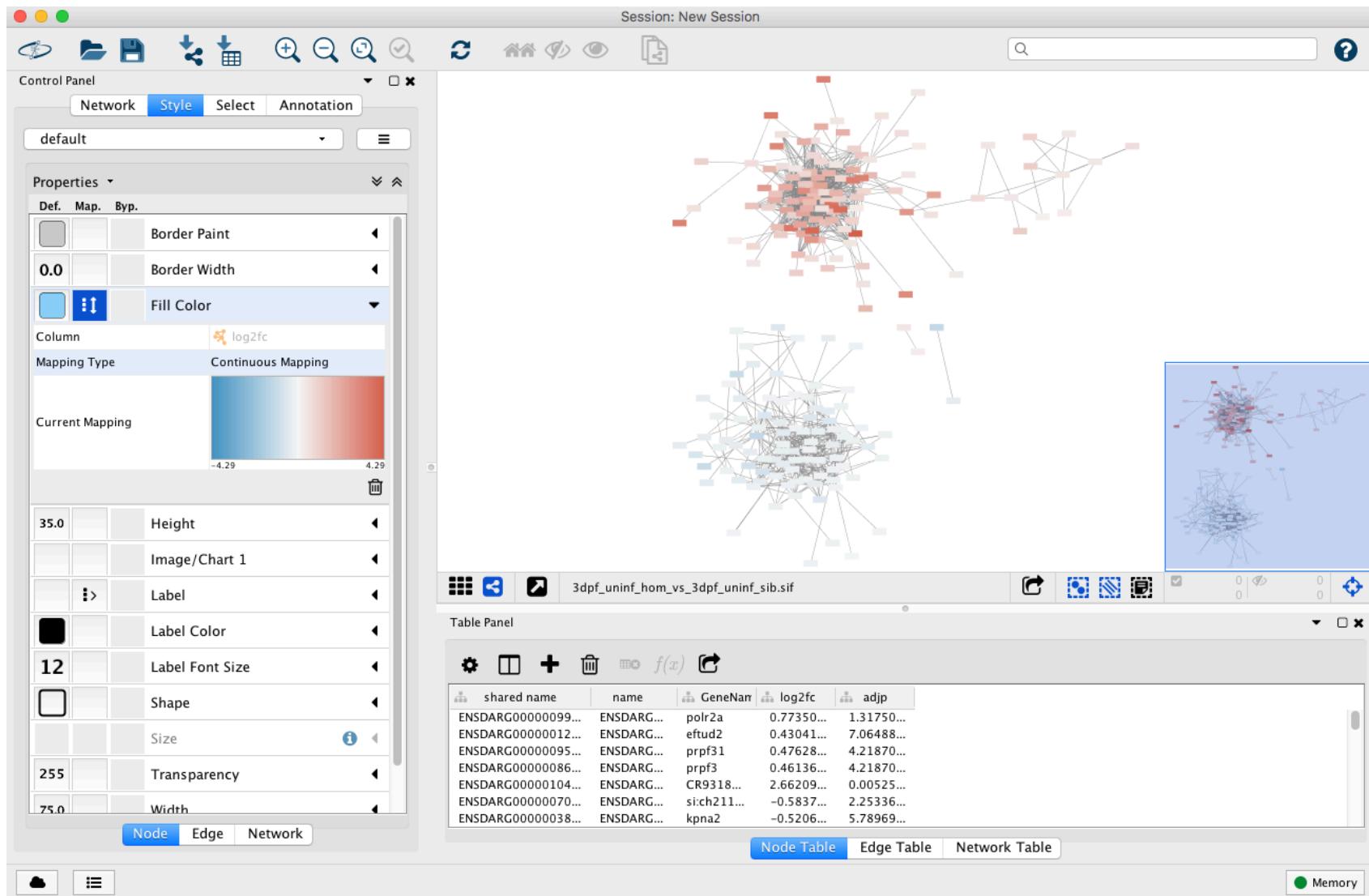
Name	Cor
ENSDARG00000099966 (geneExprCor) ENSDARG00000012261	0.8719842
ENSDARG00000099966 (geneExprCor) ENSDARG00000095904	0.801965059
ENSDARG00000099966 (geneExprCor) ENSDARG00000086425	0.819005265
ENSDARG00000099966 (geneExprCor) ENSDARG00000104899	0.813827873

At the bottom right of the dialog are 'Cancel' and 'OK' buttons.

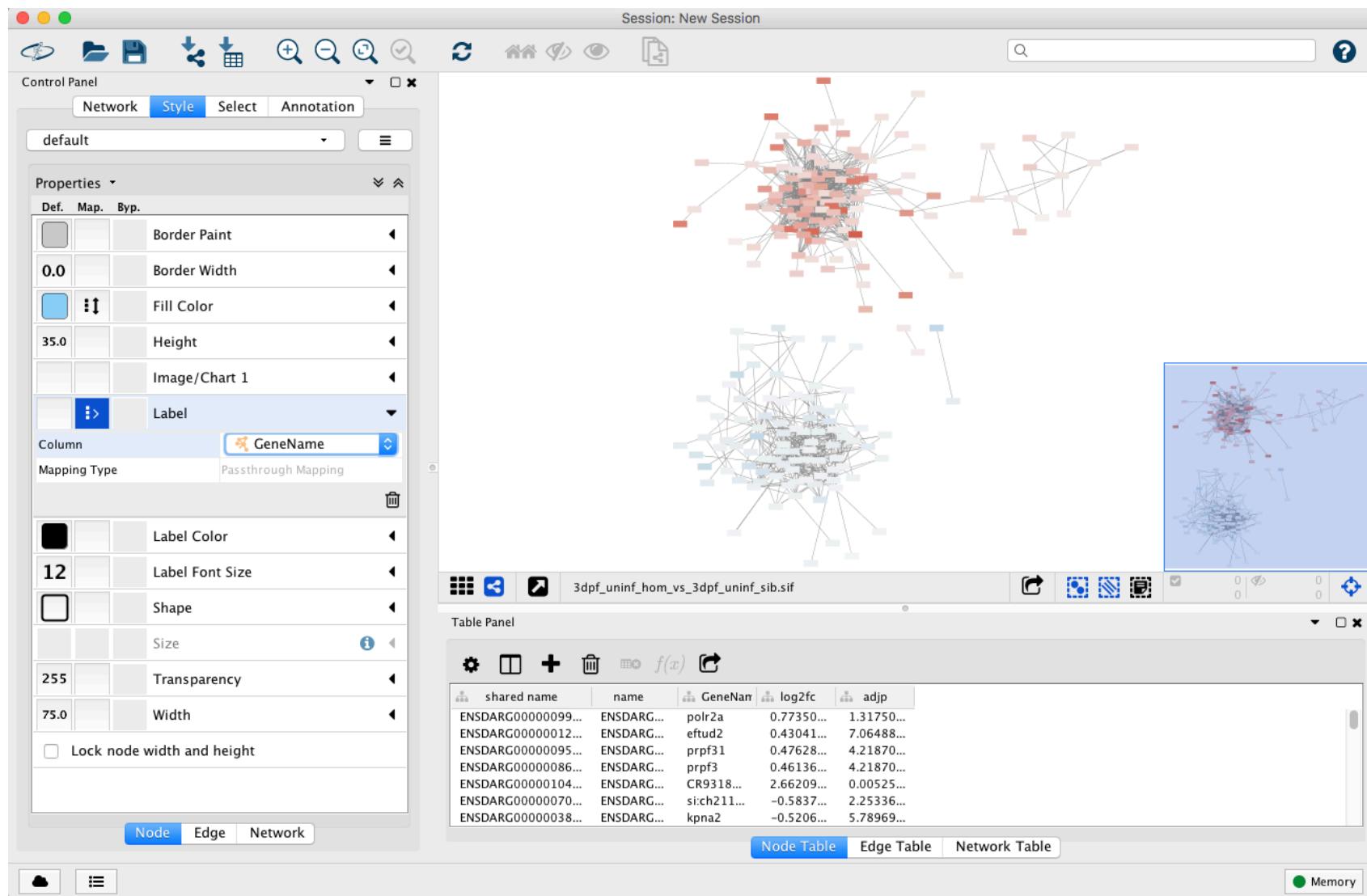
# Add extra node/edge information



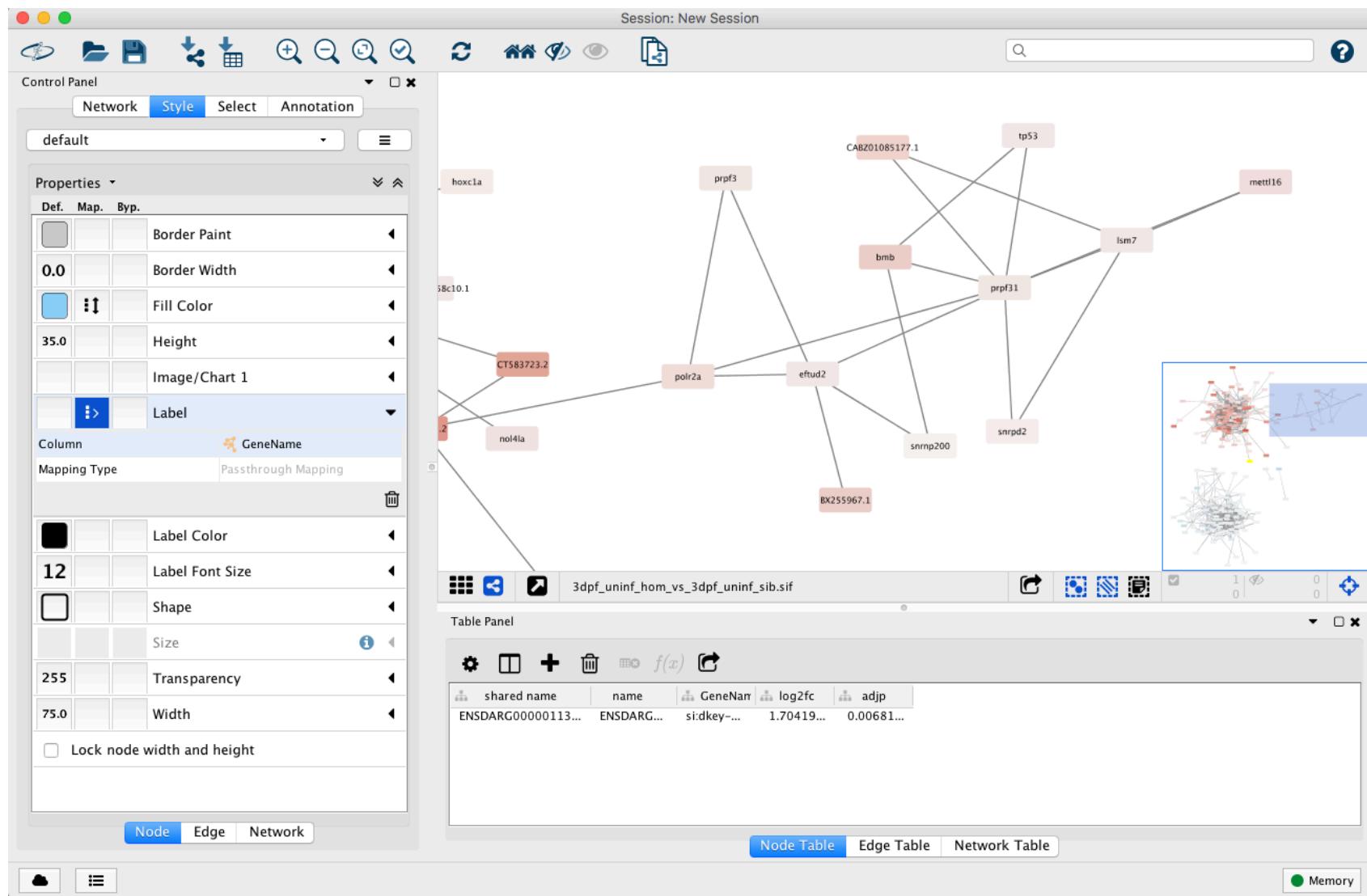
# Add styles to nodes



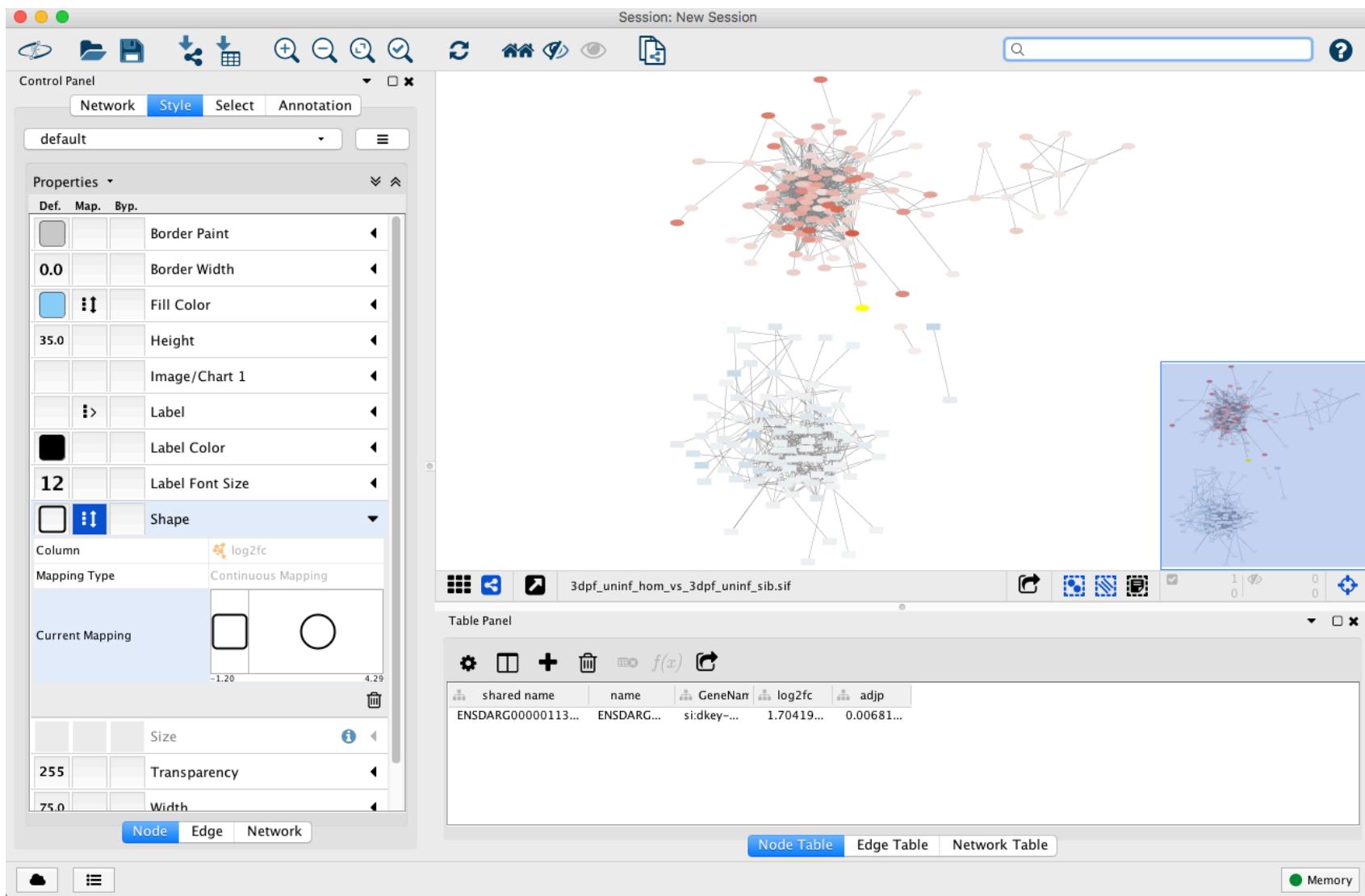
# Add styles to nodes



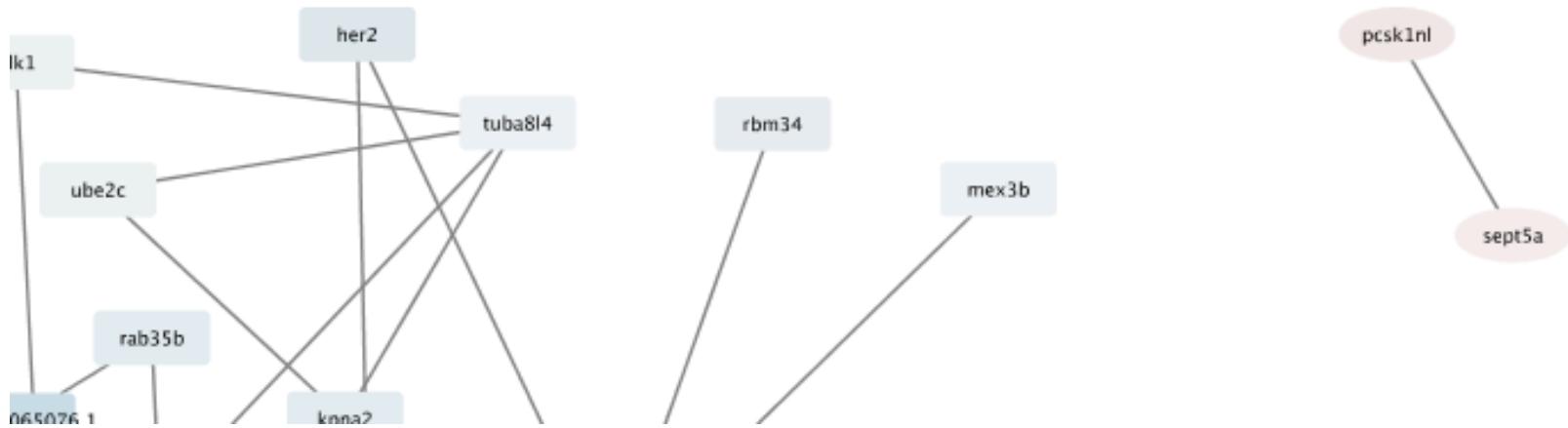
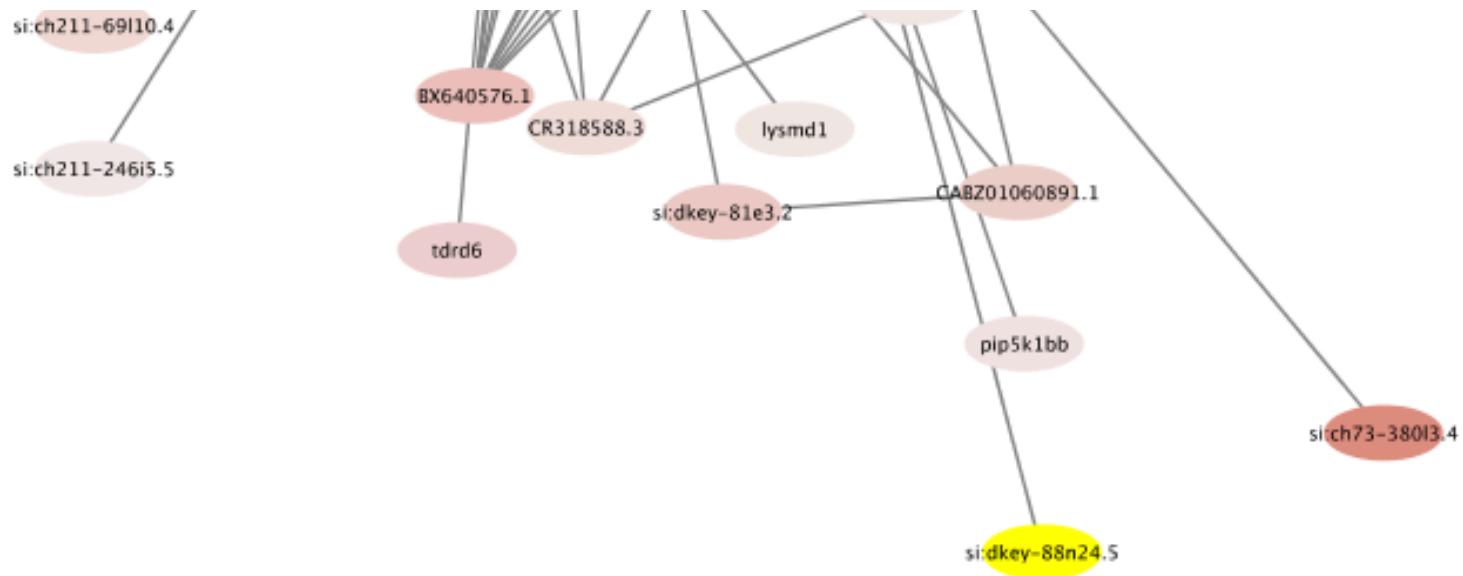
# Add styles to nodes



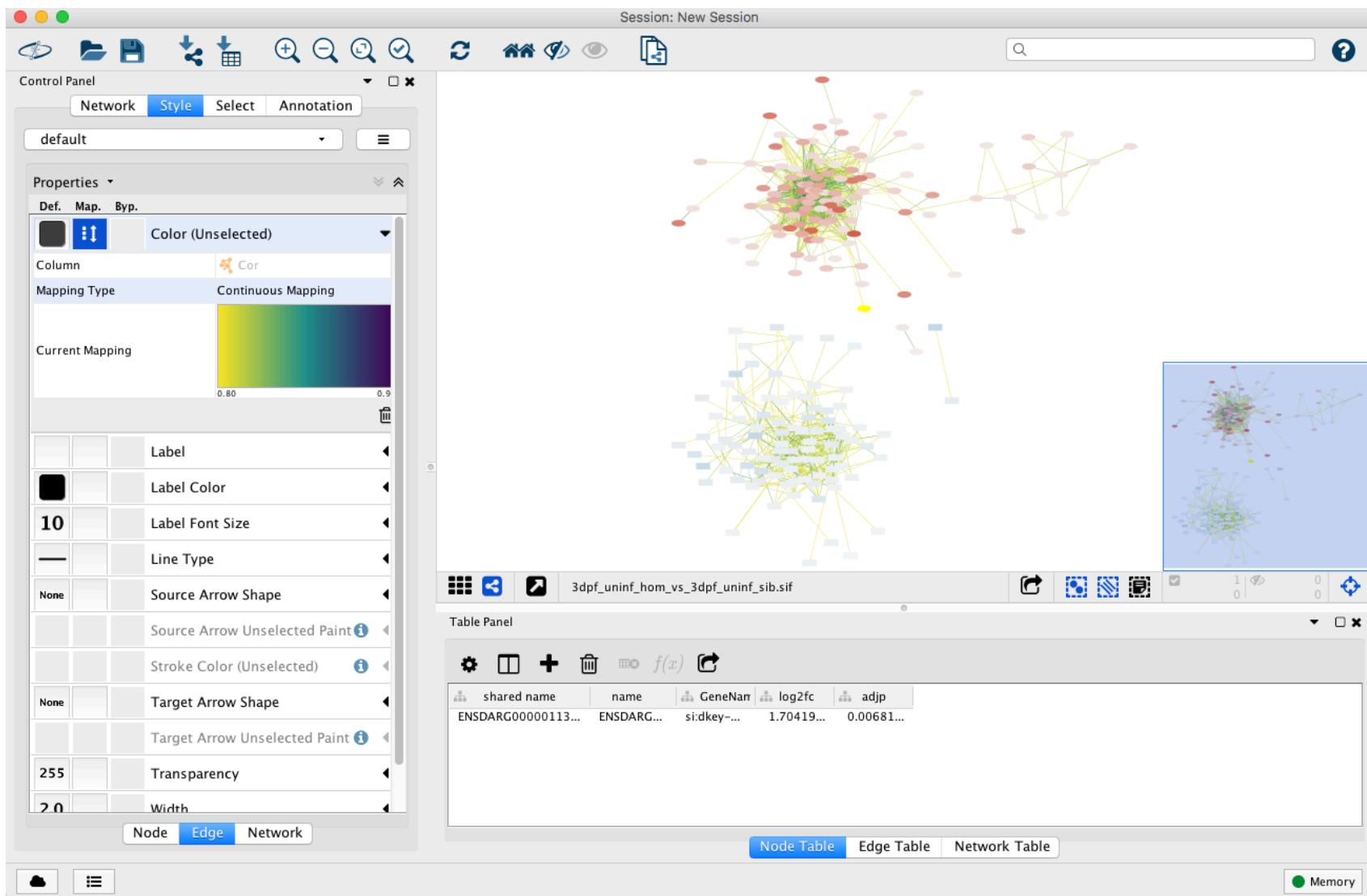
# Add styles to nodes



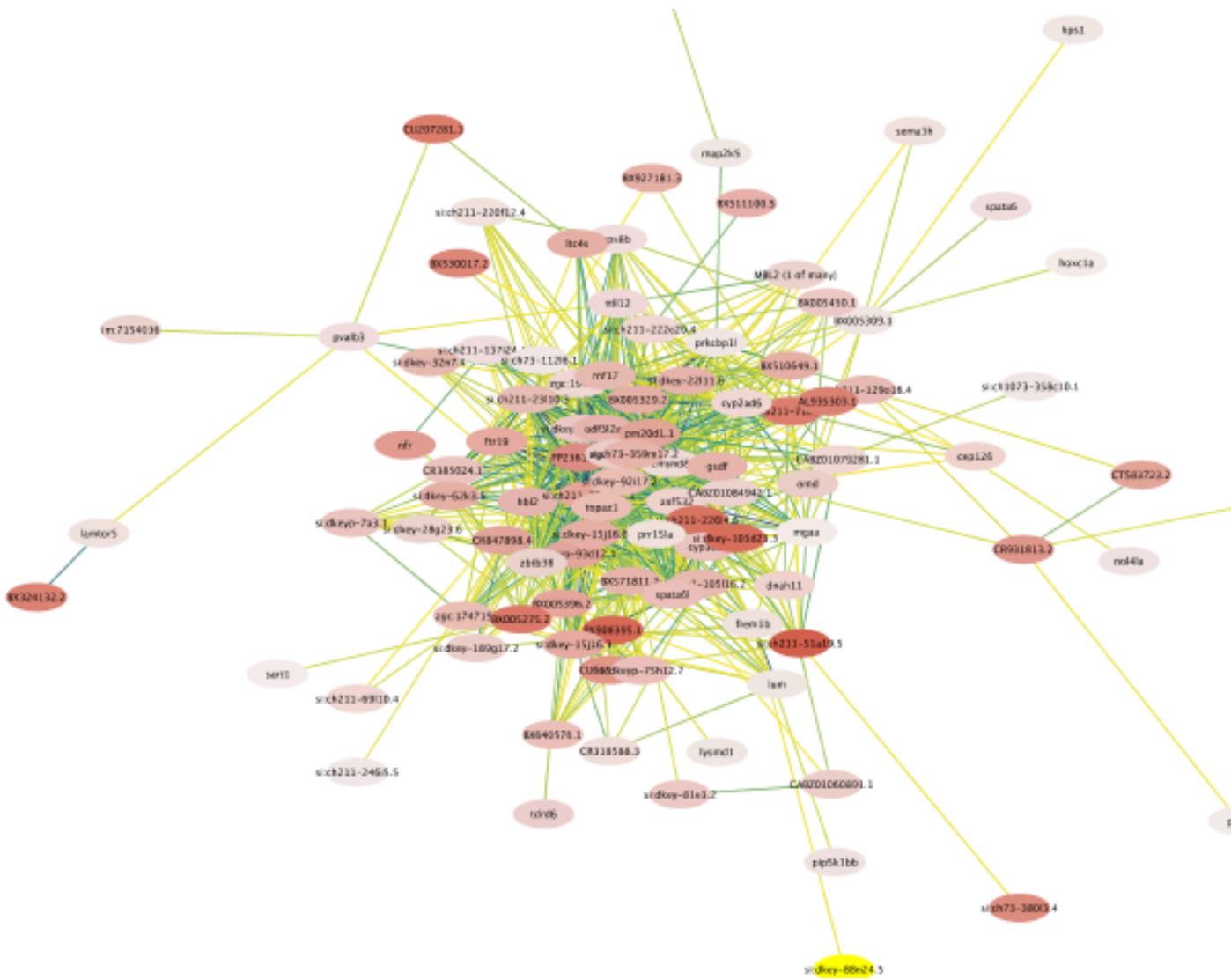
# Add styles to nodes



# Add styles to edges

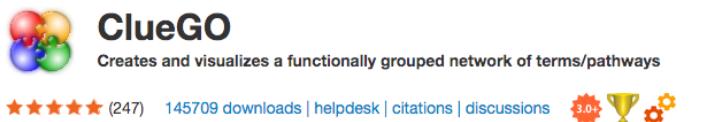


# Add styles to edges

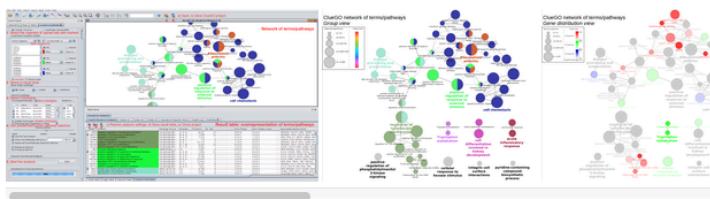


# ClueGO

- Cytoscape App for visualising functional enrichments
  - GO/KEGG/Reactome etc.
  - <http://www.ici.upmc.fr/cluego/cluegoDocumentation.shtml>
- Groups terms to identify non-redundant terms



Categories: automation, data visualization, enrichment analysis, functional module detection, GO annotation, heat map visualization, ontology analysis



Bindea et al. 2009

# ClueGO

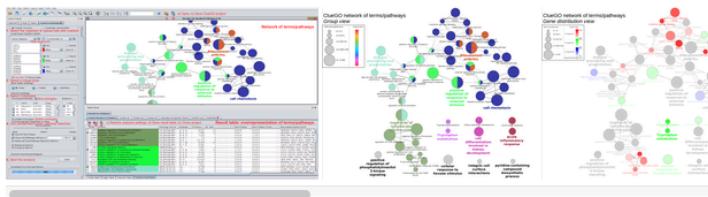
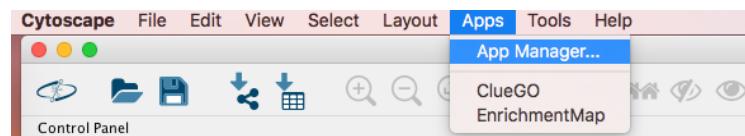
- Cytoscape App for visualising functional enrichments
  - GO/KEGG/Reactome etc.
  - <http://www.ici.upmc.fr/cluego/cluegoDocumentation.shtml>
- Groups terms to identify non-redundant terms

**ClueGO**  
Creates and visualizes a functionally grouped network of terms/pathways

★★★★★ (247) 145709 downloads | helpdesk | citations | discussions 3.0 🏆 ⚙️

Details Release History

Categories: automation, data visualization, enrichment analysis, functional module detection, GO annotation, heat map visualization, ontology analysis

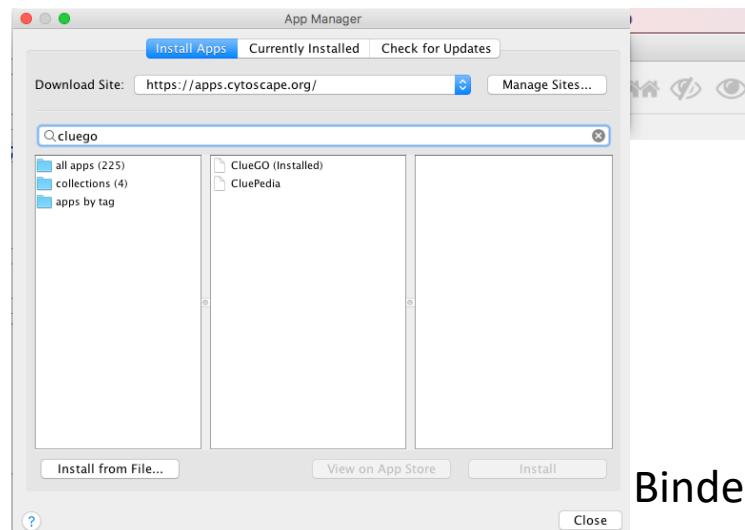


Bindea et al. 2009

# ClueGO

- Cytoscape App for visualising functional enrichments
  - GO/KEGG/Reactome etc.
  - <http://www.ici.upmc.fr/cluego/cluegoDocumentation.shtml>
- Groups terms to identify non-redundant terms

The screenshot shows the ClueGO project page on a website. It features a logo of three overlapping colored circles (blue, green, yellow). Below the logo, the text "Creates and visualizes a functionally grouped network of terms/pathways". A star rating of 4.5 stars from 247 reviews, 145709 downloads, and links to helpdesk, citations, and discussions. A "Release History" tab is selected. Categories listed include automation, data visualization, enrichment analysis, functional module detection, GO annotation, heat map visualization, and ontology analysis. At the bottom, there are three small screenshots of the Cytoscape interface showing network visualizations.



Bindea et al. 2009

# ClueGO

Cytoscape File Edit View Select Layout Apps Tools Help

App Manager... ClueGO EnrichmentMap

Control Panel Network Style Select Annotation ClueGO

Analysis Mode ClueGO v2.5.5  
ClueGO: Functional Analysis Cluepedia: Genes/miRNAs  
Preselected Functions

Check out Cluepedia as well!  
To visualize Genes along with Pathways -> App Store

Load Marker List(s)  
Homo Sapiens [9606] # Automatic # File Network

Visual Style Groups Significance

ClueGO Settings  
Ontologies/Pathways Evidence  
Name # Date Shape  
C... Huma... 5... 04.09...  
C... CORU... 3... 04.09...  
C... Chrom... 2... 27.02...  
GO Biolog... 1... 27.02...  
GO Cellul... 2... 27.02...  
GO Immu... 1... 27.02...  
Code  
All  
All\_Experimental\_(EXP, IDA,...  
All\_without\_IDA  
EXP (Inferred from Experim...  
IBA (Inferred from Biologic...  
IBD (Inferred from Biologic...  
Update Ontologies  
Download New Organisms or Data  
Network Specificity  
Global Medium Detailed  
Use GO Term Fusion  
Show only Pathways with pV ≤ 0.05000

Session: New Session

Welcome to Cytoscape

Recent Sessions Styles Demo.cys inf\_5dpf\_hom\_vs\_sib... 3dpf\_uninf\_hom\_vs\_... 5dpf\_inf\_hom\_vs\_5dpf... 5dpf\_uninf\_vs\_5dpf...

Sample Sessions Affinity Purification Import & Save Ivacafactor Coauthor Styles Demo TCGA Colorectal Can...

Yeast Gene Interaction Yeast Perturbation

Tutorials News

Table Panel Drag table files here

Node Table Edge Table Network Table

Memory

# ClueGO

Cytoscape File Edit View Select Layout Apps Tools Help

Session: New Session

Control Panel

Network Style Select Annotation ClueGO

Analysis Mode  
ClueGO:  Functional Analysis  Preselected Functions  
CluePedia:  Genes/miRNAs

Check out CluePedia as well!  
To visualize Genes along with Pathways → App Store

Load Marker List(s)  
Homo Sapiens [9606] # Automatic # File Network

Visual Style  
 Groups  Significance

ClueGO Settings

Ontologies/Pathways Evidence

Name # Date Shape  
C... Huma... 5... 04.09....  
C... CORU... 3... 04.09....  
C... Chrom... 2... 27.02....  
 GO Biolog... 1... 27.02....  
GO Cellul... 2... 27.02....  
GO Immu... 1... 27.02....

Code  
 All  
 All\_Experimental\_(EXP, IDA,...  
 All\_without\_IDA  
 EXP (Inferred from Experim...  
 IBA (Inferred from Biologic...  
 IBD (Inferred from Biologic...)

Update Ontologies  
Download New Organisms or Data

Network Specificity  
Global Medium Detailed

Use GO Term Fusion  
Show only Pathways with pV ≤ 0.05000

Recent Sessions

Welcome to Cytoscape

Styles Demo.cys inf\_5dpf\_hom\_vs\_sib... 3dpf\_uninf\_hom\_vs\_... 5dpf\_inf\_hom\_vs\_5dpf... 5dpf\_uninf\_vs\_5dpf...

Affinity Purification Import & Save Ivacaftor Coauthor Styles Demo TCGA Colorectal Can...

Yeast Gene Interaction Yeast Perturbation

Tutorials News

Table Panel

Drag table files here

Node Table Edge Table Network Table

Memory

# ClueGO

Cytoscape File Edit View Select Layout Apps Tools Help

Session: New Session

Control Panel

Network Style Select Annotation ClueGO

Analysis Mode  
ClueGO:  Functional Analysis  Preselected Functions  
CluePedia:  Genes/miRNAs

Check out CluePedia as well!  
To visualize Genes along with Pathways -> App Store

Load Marker List(s)  
Homo Sapiens [9606] # Automatic # File Network

Visual Style  
Groups Significance

ClueGO Settings

Ontologies/Pathways Evidence

Name	#	Date	Shape
C... Huma...	5...	04.09....	...
C... CORU...	3...	04.09....	...
C... Chrom...	2...	27.02....	...
<input checked="" type="checkbox"/> GO_Biolog...	1...	27.02....	...
GO_Cellul...	2...	27.02....	...
GO_Immuno...	1...	27.02....	...

Code  
 All  
 All\_Experimental\_(EXP, IDA,...  
 All\_without\_IDA  
 EXP (Inferred from Experim...  
 IBA (Inferred from Biologic...  
 IBD (Inferred from Biologic...  
  
Update Ontologies  
Download New Organisms or Data

Network Specificity  
Global Medium Detailed

Use GO Term Fusion  
 Show only Pathways with pV ≤ 0.05000

Recent Sessions

Welcome to Cytoscape

Styles Demo.cys inf\_5dpf\_hom\_vs\_sib... 3dpf\_uninf\_hom\_vs\_... 5dpf\_inf\_hom\_vs\_5dpf... 5dpf\_uninf\_vs\_5dpf...

Affinity Purification Import & Save Ivacaftor Coauthor Styles Demo TCGA Colorectal Can...

Yeast Gene Interaction Yeast Perturbation

Tutorials News

Table Panel

Drag table files here

Node Table Edge Table Network Table

Memory

# ClueGO

Cytoscape File Edit View Select Layout Apps Tools Help

Session: New Session

Control Panel

Network Style Select Annotation ClueGO

Analysis Mode  
ClueGO:  Functional Analysis  Preselected Functions

CluePedia:  Genes/miRNAs

To visualize Genes along with Pathways -> App Store

Load Marker List(s)  
Danio rerio [7955] # Automatic #

File Network

Visual Style  
Groups Significance

ClueGO Settings

Ontologies/Pathways Evidence

T...	Name	#	Date	Shape
<input type="checkbox"/>	Chr... Chromosom...	2...	27.03.2019	<input type="radio"/>
<input checked="" type="checkbox"/>	GO_BiologicalPr...	1...	27.03.2019	<input type="radio"/>
<input checked="" type="checkbox"/>	GO_CellularCo...	1...	27.03.2019	<input type="radio"/>
<input type="checkbox"/>	GO_ImmuneSyst...	5...	27.03.2019	<input type="radio"/>
<input checked="" type="checkbox"/>	GO_MolecularF...	3...	27.03.2019	<input type="radio"/>
<input checked="" type="checkbox"/>	KEGG/KEGG	1...	27.03.2019	<input type="radio"/>

Code  
 All  
 All\_Experimental\_(EXP,IDA,IPI,IMP,IGI,IEP)  
 All\_without\_IEA  
 EXP (Inferred from Experiment)  
 IBA (Inferred from Biological Aspect of Ancestor)  
 IBD (Inferred from Biological Aspect of Descendant)

Update Ontologies  
Download New Organisms or Data

Network Specificity  
Global Medium Detailed

Use GO Term Fusion  
Show only Pathways with pV ≤ 0.05000

Recent Sessions

Welcome to Cytoscape

Styles Demo.cys inf\_5dpf\_hom\_vs\_sib... 3dpf\_uninf\_hom\_vs\_... 5dpf\_inf\_hom\_vs\_5d...

Affinity Purification Import & Save Ivacaftor Coauthor Styles Demo

Tutorials News

Table Panel

Drag table files here

Node Table Edge Table Network Table

Memory

# ClueGO

Cytoscape File Edit View Select Layout Apps Tools Help

Session: New Session

Control Panel

Network Style Select Annotation ClueGO

Analysis Mode  
ClueGO:  Functional Analysis  Preselected Functions

CluePedia:  Genes/miRNAs

Check out CluePedia as well!  
To visualize Genes along with Pathways -> App Store

Load Marker List(s)  
Danio rerio [7955] # Automatic #

ENSDARG00000117609  
ENSDARG00000117610  
ENSDARG00000117812

File Network

Visual Style  
Groups Significance

ClueGO Settings

Ontologies/Pathways Evidence

T...	Name	#	Date	Shape
<input type="checkbox"/>	Chromosome...2...	27.03.2019	El...	<input type="button"/>
<input checked="" type="checkbox"/>	GO_BiologicalPr...1...	27.03.2019	El...	<input type="button"/>
<input checked="" type="checkbox"/>	GO_CellularCo...1...	27.03.2019	El...	<input type="button"/>
<input type="checkbox"/>	GO_ImmuneSyst...5...	27.03.2019	El...	<input type="button"/>
<input checked="" type="checkbox"/>	GO_MolecularF...3...	27.03.2019	El...	<input type="button"/>
<input checked="" type="checkbox"/>	KEGGKEGG	1...	27.03.2019	<input type="button"/>

Code  
 All  
 All\_Experimental\_(EXP,IDA,IPI,IMP,IGI,IEP)  
 All\_without\_JEA  
 EXP (Inferred from Experiment)  
 IBA (Inferred from Biological Aspect of Ancestor)  
 IBD (Inferred from Biological Aspect of Descende...)

Update Ontologies  
Download New Organisms or Data

Network Specificity  
Global Medium Detailed

Use GO Term Fusion  
Show only Pathways with pV ≤ 0.05000

Recent Sessions

Welcome to Cytoscape

Styles Demo.cys inf\_5dpf\_hom\_vs\_sib... 3dpf\_uninf\_hom\_vs\_5dpf\_inf\_hom\_vs\_5dpf...

Affinity Purification Import & Save Ivacaftor Coauthor Styles Demo

Tutorials News

Table Panel

Drag table files here

Node Table Edge Table Network Table

Memory

# ClueGO

Cytoscape File Edit View Select Layout Apps Tools Help

Session: New Session

Control Panel

Network Style Select Annotation ClueGO

Global Medium Detailed

Use GO Term Fusion [?](#)

Show only Pathways with pV ≤

Advanced Term/Pathway Selection Options

GO Tree Interval: 3 Min Level: 8 Max Level: [?](#)

GO Term/Pathway Selection (#/% Genes): Cluster #1: 3 Min #Genes: 4.000 %Genes: [?](#)

GO Term/Pathway Network Connectivity (Kappa Score): Low Medium High Score: 0.4 [?](#)

Statistical Options

Advanced Statistical Options: Enrichment (Right-sided hypergeometric test) Bonferroni step down  pV Correction  mid-P-values  Doubling [?](#)

Reference Set Options:  Selected Ontologies Reference Set  Predefined IDs Reference Set  Custom Reference Set [?](#)

Grouping Options

Preferred Layout: Prefuse Force Directed Layout

ClueGO Functional Analysis

Recent Sessions

Welcome to Cytoscape

Styles Demo.cys inf\_5dpf\_hom\_vs\_sib... 3dpf\_uninf\_hom\_vs\_... 5dpf\_inf\_hom\_vs\_5d...

Affinity Purification Import & Save Ivacafactor Coauthor Styles Demo

Tutorials News

Table Panel

Drag table files here

Node Table Edge Table Network Table

Memory

The screenshot shows the ClueGO application running within the Cytoscape environment. The main window has a 'Control Panel' on the left containing sections for Global settings, Pathway selection, Statistical Options, Reference Set Options, Preferred Layout, and ClueGO Functional Analysis. On the right, there's a 'Recent Sessions' section showing thumbnails of previous sessions like 'Styles Demo.cys', and a 'Welcome to Cytoscape' section with links to 'Affinity Purification', 'Import & Save', 'Ivacafactor Coauthor', and 'Styles Demo'. At the bottom, a 'Table Panel' is visible with a message 'Drag table files here' and tabs for 'Node Table', 'Edge Table', and 'Network Table'. The status bar at the bottom right indicates 'Memory'.

# ClueGO

Cytoscape File Edit View Select Layout Apps Tools Help

Session: New Session

Control Panel

Network Style Select Annotation ClueGO

Recent Sessions

Welcome to Cytoscape

Sample Sessions

Table Panel

Drag table files here

Node Table Edge Table Network Table

Memory

The screenshot shows the Cytoscape interface with the ClueGO application open. The main window displays various configuration panels for ClueGO, including settings for GO Term Fusion, Pathway selection, Statistical Options (with Bonferroni step down selected), Reference Set Options (Selected Ontologies Reference Set), Grouping Options, Preferred Layout (Prefuse Force Directed Layout), and ClueGO Functional Analysis. To the right, there is a 'Recent Sessions' panel showing network diagrams for different sessions like 'Styles Demo.cys', 'inf\_5dpf\_hom\_vs\_sib...', '3dpf\_uninf\_hom\_vs...', and '5dpf\_inf\_hom\_vs\_5d...'. Below it is a 'Sample Sessions' panel featuring network diagrams for 'Affinity Purification', 'Import & Save', 'Ivacafator Coauthor', and 'Styles Demo'. At the bottom is a 'Table Panel' with a placeholder message 'Drag table files here' and tabs for 'Node Table', 'Edge Table', and 'Network Table'.

# ClueGO

Cytoscape File Edit View Select Layout Apps Tools Help

Session: New Session

Control Panel

Network Style Select Annotation ClueGO

Recent Sessions

Welcome to Cytoscape

Sample Sessions

Table Panel

Drag table files here

Node Table Edge Table Network Table

Memory

Global Medium Detailed

Use GO Term Fusion [?](#)

Show only Pathways with pV ≤

Advanced Term/Pathway Selection Options

GO Tree Interval: 3 Min Level: 8 Max Level: [?](#)

GO Term/Pathway Selection (#/% Genes): Cluster #1

Min #Genes: 3 %Genes: 4.000

GO Term/Pathway Network Connectivity (Kappa Score)

Low Medium High Score: 0.4

Statistical Options

Advanced Statistical Options

Enrichment (Right-sided binomial exact test)

Bonferroni  Bonferroni step down [?](#)

Benjamini-Hochberg [?](#)

None [?](#)

pV Correction: [?](#)

Reference Set Options

Selected Ontologies Reference Set [?](#)

Predefined IDs Reference Set [?](#)

Custom Reference Set [?](#)

Grouping Options

Preferred Layout

Select Layout: Prefuse Force Directed Layout [?](#) Apply

ClueGO Functional Analysis Start

Affinity Purification Import & Save Ivacafactor Coauthor Styles Demo

Tutorials News

GCN RAP1

# ClueGO

Cytoscape File Edit View Select Layout Apps Tools Help

Session: New Session

Control Panel Network Style Select Annotation ClueGO

Analysis Mode ClueGO: Functional Analysis CluePedia: Genes/m Preselected Functions

Check out CluePedia as well! To visualize Genes along with Pathways -> App Store

Load Marker List(s) Danio rerio [7955] # Automatic #

ENSDARG00000117609  
ENSDARG00000117610  
ENSDARG00000117812

Visual Style Groups Significance

ClueGO Settings

Ontologies/Pathways Evidence

Name	#	Date	Shape
Ch...Chromosomal... 27.03.2...			
GO_Biological... 1... 27.03.2...			
GO_Cellular... 1... 27.03.2...			
GO_Immuni... 5... 27.03.2...			
GO_Molecul... 3... 27.03.2...			
KE...KEGG 1... 27.03.2...			

Code All All\_Experimental\_ All\_without\_IEA EXP (Inferred from IBA (Inferred from IBD (Inferred from

Update Ontologies Download New Organisms or Data

Network Specificity Global Medium Detailed

Use GO Term Fusion

Results for Analysis0

Table Panel

Results for Analysis0

ClueGO Results (Cluster #1) Cluster #1 ClueGO Log

Node Table Edge Table Network Table ClueGO

Memory

# ClueGO

Cytoscape File Edit View Select Layout Apps Tools Help

Session: New Session

microtubule cytoskeleton

Cell cycle

Spliceosome

ribosomal protein import into nucleus

negative regulation of neurogenesis

protein sumoylation

definitive hemopoiesis

eye development

Results for Analysis0

Table Panel

Results for Analysis0

ClueGO Results (Cluster #1) Cluster #1 ClueGO Log

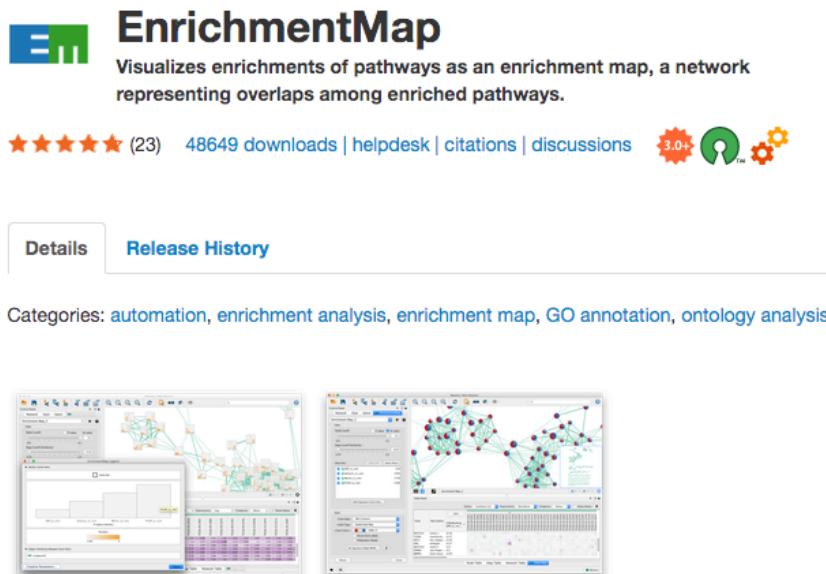
GOID	GOTerm	Ontology Source	Term PValue	Term PValue Corrected with FDR	Group PValue	l	Selection
<input checked="" type="checkbox"/> KEGG:0...	cell cycle	KEGG_27.03.2019	1.3 E-7	1.3 E-5	1.6 E-9		
<input type="checkbox"/> KEGG:0...	Progesterone-mediated oocyte maturation	KEGG_27.03.2019	7.1 E-4	4.2 E-2	1.6 E-9		
<input type="checkbox"/> GO:002...	cell cycle process	GO_BiologicalProcess-EBI-U...	3.7 E-9	4.0 E-7	1.6 E-9		
<input type="checkbox"/> GO:005...	meiotic cell cycle	GO_BiologicalProcess-EBI-U...	7.8 E-4	4.3 E-2	1.6 E-9		
<input type="checkbox"/> GO:000...	mitotic cell cycle	GO_BiologicalProcess-EBI-U...	4.6 E-10	5.1 E-8	1.6 E-9		
<input type="checkbox"/> GO:190...	meiotic cell cycle process	GO_BiologicalProcess-EBI-U...	1.3 E-4	9.8 E-3	1.6 E-9		
<input type="checkbox"/> GO:009...	nuclear chromosome segregation	GO_BiologicalProcess-EBI-U...	5.1 E-6	4.7 E-4	1.6 E-9		
<input type="checkbox"/> GO:190...	mitotic cell cycle process	GO_BiologicalProcess-EBI-U...	3.3 F-9	3.6 F-7	1.6 F-9		

Node Table Edge Table Network Table ClueGO

Cloud View Memory

# Enrichment Map

- <https://enrichmentmap.readthedocs.io/en/latest>
- Inputs:
  - GSEA
  - DAVID/BINGO/Great
  - Generic



Merico et al. 2010

# Generic Input Files

## Enrichments

GeneSetID	Description	p.Val	FDR	Phenotype
GO:0000070	mitotic sister chromatid segregation	6.83E-04	0.04165	1.38041
GO:0000278	mitotic cell cycle	4.64E-10	5.10E-08	7.29235
GO:0000280	nuclear division	3.62E-07	3.65E-05	4.43731

## GeneSets

GeneSetID	Description	Genes					
GO:0000070	mitotic sister chromatid segregation	bub1	incenp	nusap1	pds5a	ran	
GO:0000278	mitotic cell cycle	aspm	atoh7	bmb	bub1	ccna2	...
GO:0000280	nuclear division	bub1	ccna2	ccnd1	ccne2	incenp	...

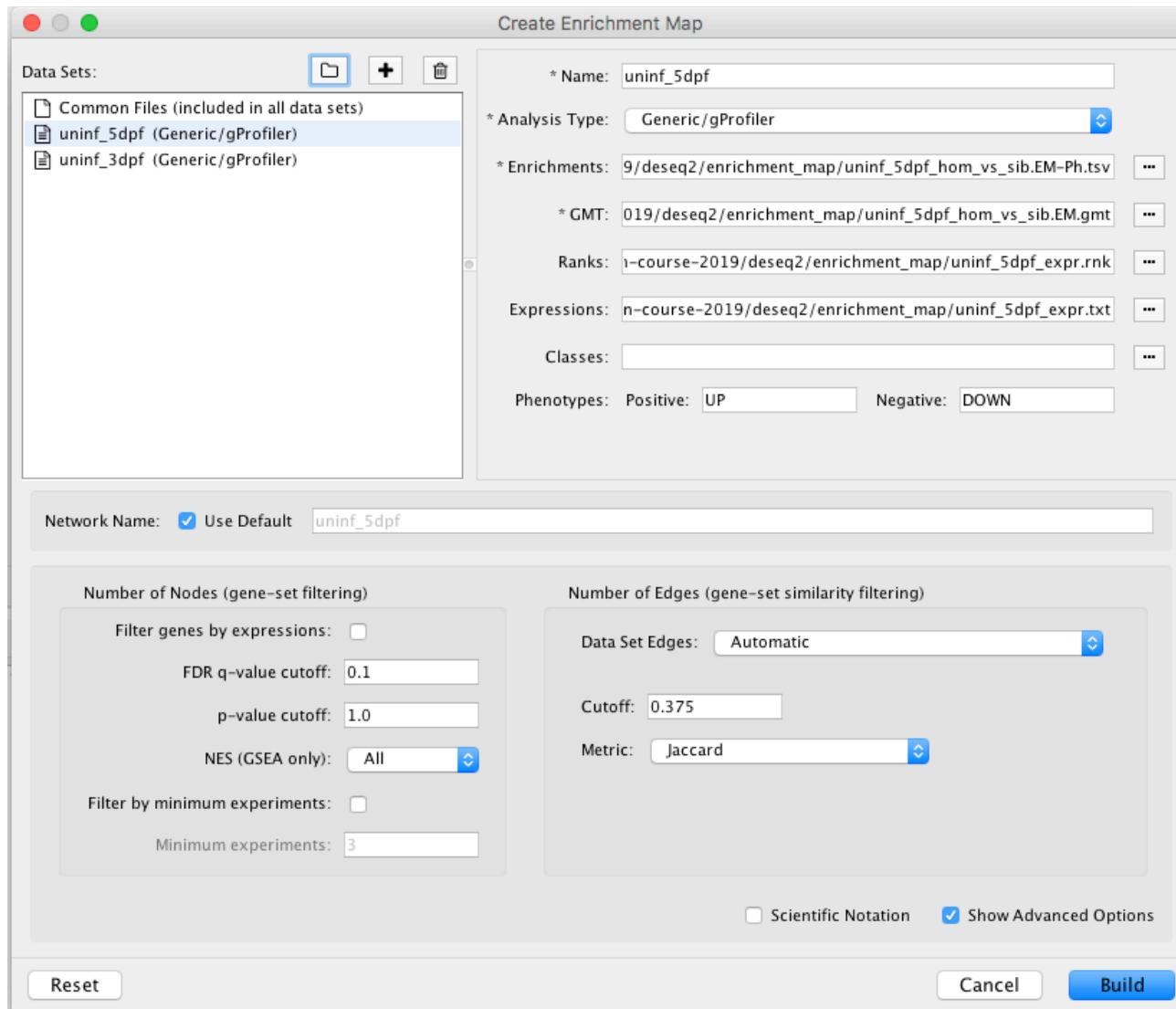
## Expression

name	description	uninf_3dpf_wt_rep1	uninf_3dpf_wt_rep2
slc35a5	ENSDARG000000000001	36.28229146	33.4323
ccdc80	ENSDARG000000000002	75.50639034	113.155
nrf1	ENSDARG000000000018	305.9479712	281.174

## Ranks

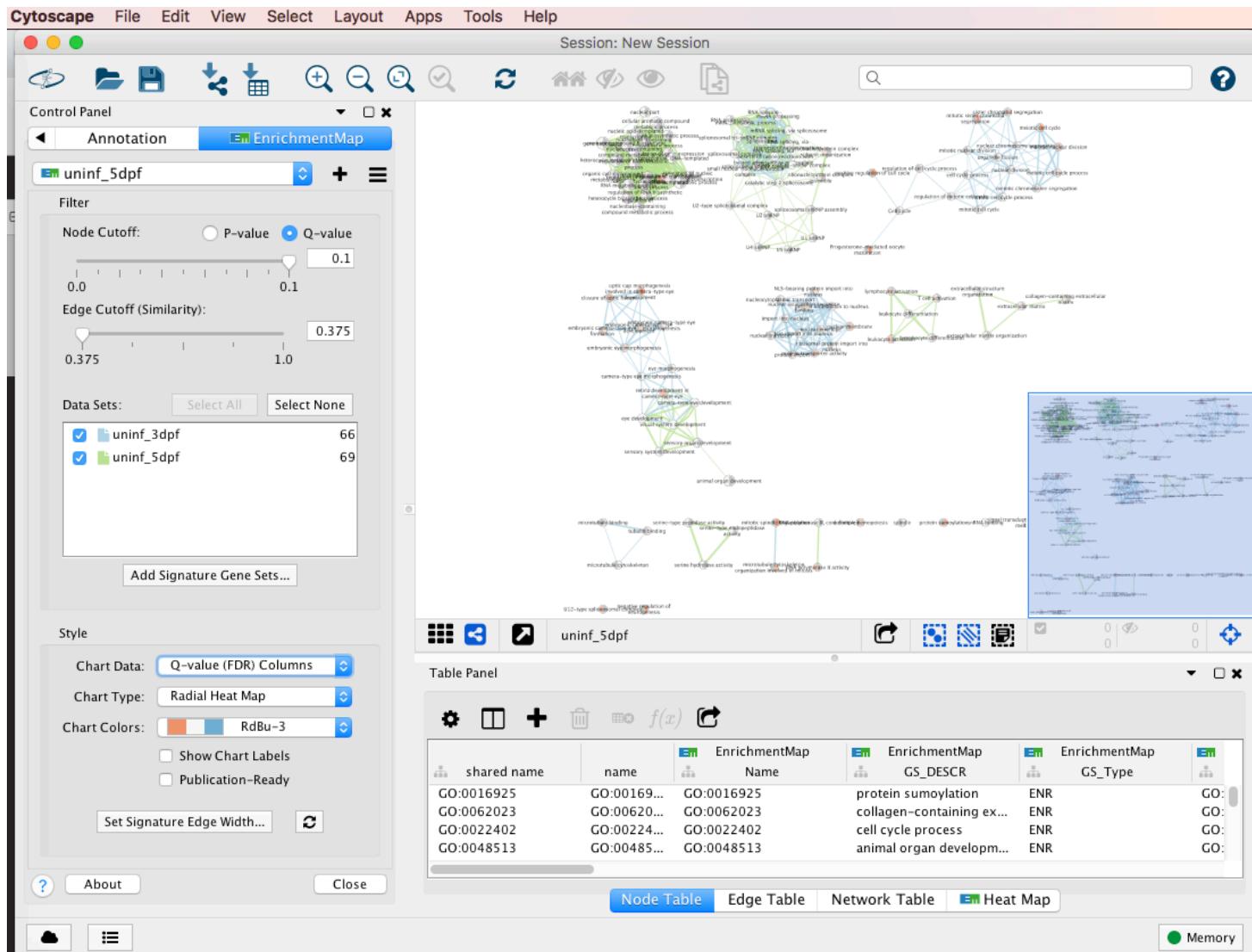
name	rank
slc35a5	0.946000588
ccdc80	0.987509859
nrf1	0.646467578

# Enrichment Map

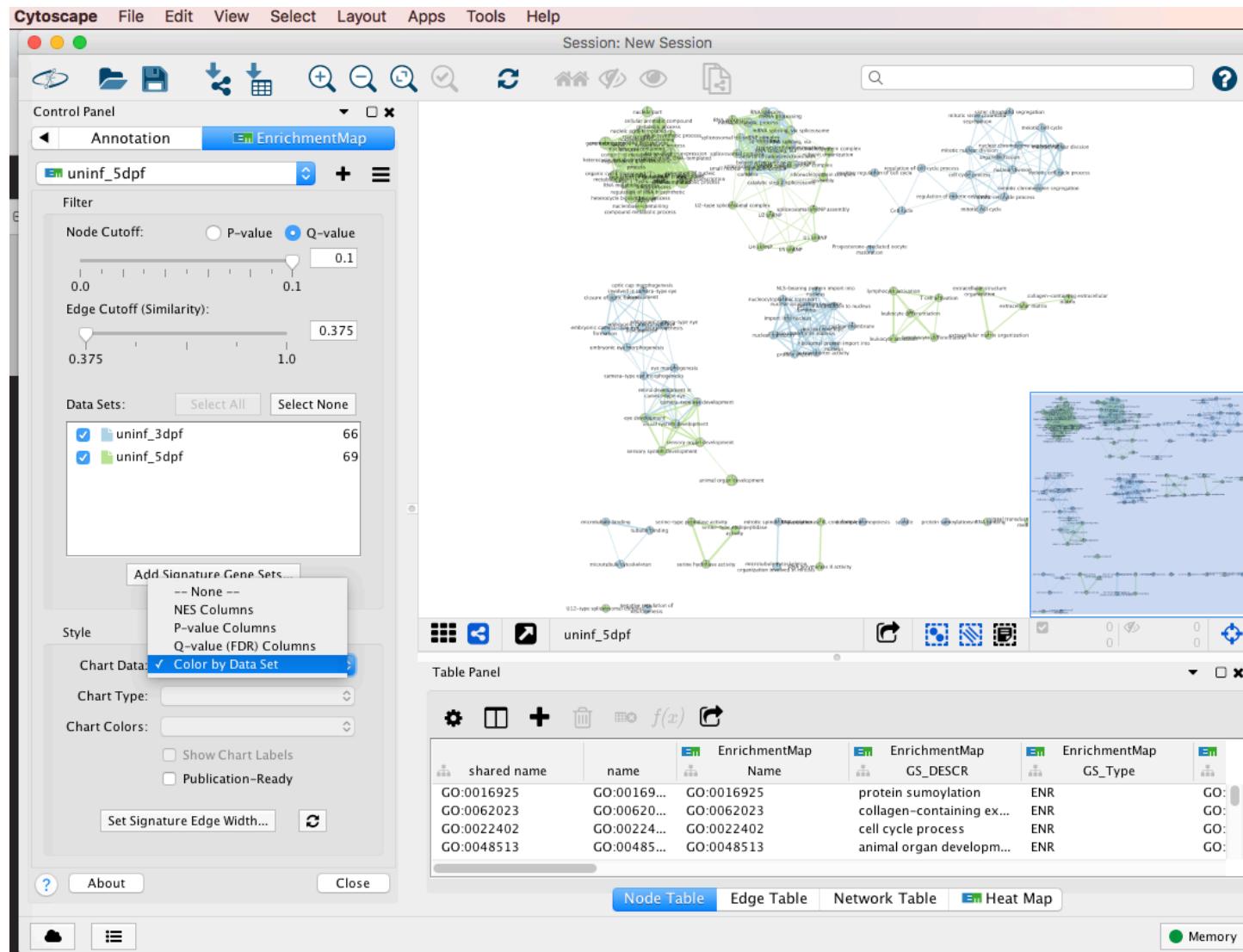


<https://enrichmentmap.readthedocs.io/en/latest/Parameters.html>

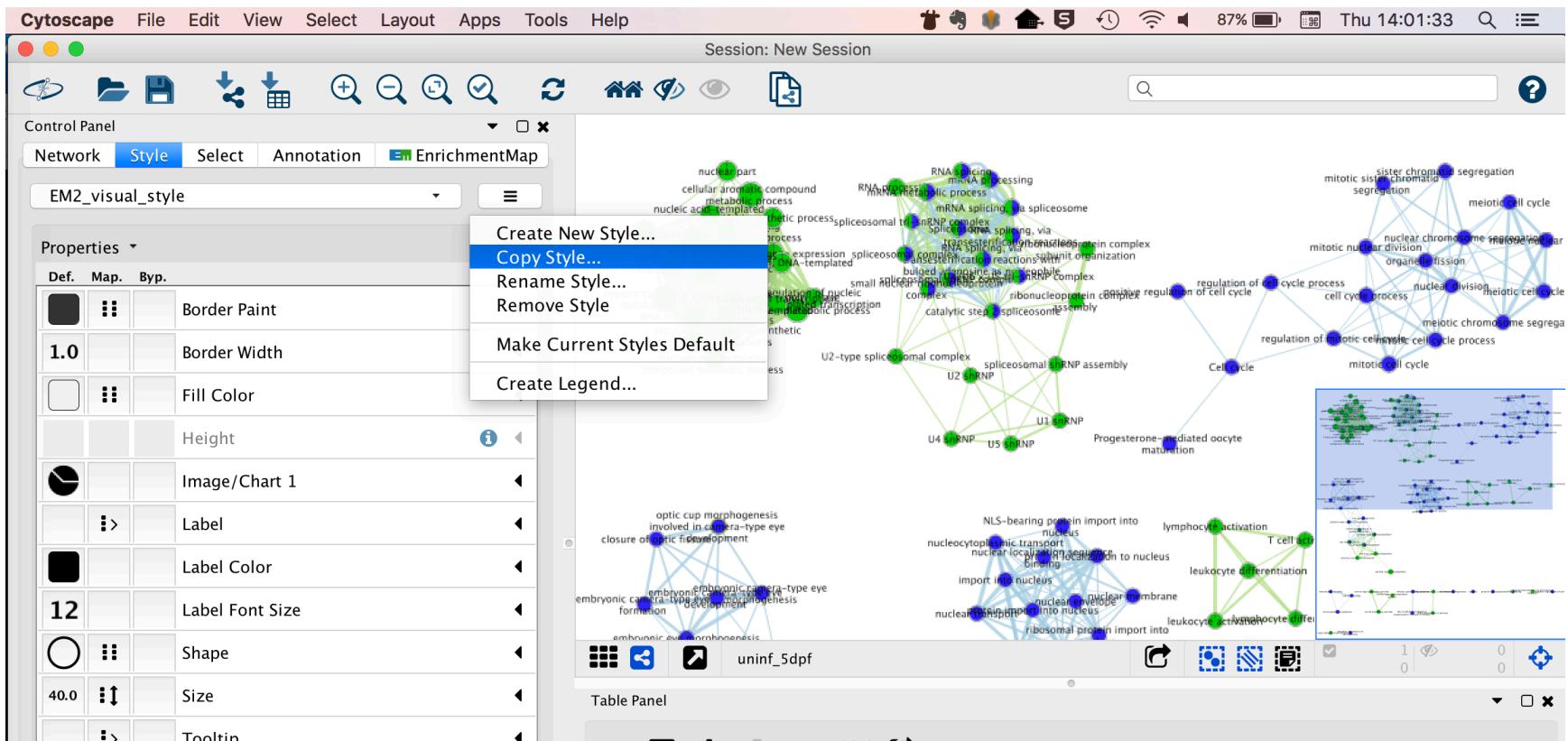
# Enrichment Map



# Enrichment Map



# Enrichment Map



# Learning Cytoscape

- CytoScape training
  - <https://www.ebi.ac.uk/training/events/2020/advanced-network-analysis-and-visualisation-cytoscape>

The screenshot shows a web page for a training event. At the top, there's a navigation bar with links: Overview, Train at EMBL-EBI, Train outside EMBL-EBI, Train online, Webinars, About, 10 Years, and Contact. The main title is "Advanced Network Analysis and Visualisation in Cytoscape". Below the title, there's a section with event details: Date (Thursday 23 - Friday 24 April 2020), Venue (European Bioinformatics Institute (EMBL-EBI) - Wellcome Genome Campus, Hinxton, Cambridge, CB10 1SD, United Kingdom), Application opens (Monday 14 October 2019), Application deadline (Friday 03 January 2020), Participation (Open application with selection), Contact (Rebecca Nicholl), and Registration fee (£130). A yellow "Apply now >" button is located at the bottom right of this section. To the right of the text, there's a map of the area around St Mary and All Saints Church, Hinxton Village Hall, and the European Bioinformatics Institute (EMBL-EBI) campus. The map includes icons for a church, a hall, and a building, along with street names like A1301 and Junt Ln.

Training

Overview | Train at EMBL-EBI | Train outside EMBL-EBI | Train online | Webinars | About | 10 Years | Contact

## Advanced Network Analysis and Visualisation in Cytoscape

**Date:** Thursday 23 - Friday 24 April 2020

**Venue:** European Bioinformatics Institute (EMBL-EBI) - Wellcome Genome Campus, Hinxton, Cambridge, CB10 1SD, United Kingdom

**Application opens:** Monday 14 October 2019

**Application deadline:** Friday 03 January 2020

**Participation:** Open application with selection

**Contact:** Rebecca Nicholl

**Registration fee:** £130

[Apply now >](#)

European Bioinformatics Institute (EMBL-EBI)