

# 用Cytoscape绘制网络图

易生信

宏基因组

生信宝典

易生信



# Cytoscape完整视频 [链接](#)

## Cytoscape最新视频教程 - 一文学会Cytoscape

2396 2 2022-04-21 18:18:15 未经作者授权，禁止转载

分析结果导入Cytoscape绘制网络图

易生信

宏基因组

易生信

20

易生信，毕生缘；培训版权所有。LLD, SHW

2022/4/15

# What is Cytoscape?

**Cytoscape** is an open source software platform for *visualizing* molecular interaction networks and biological pathways and *integrating* these networks with annotations, gene expression profiles and other state data. Although Cytoscape was originally designed for biological research, now it is a general platform for complex network analysis and visualization. Cytoscape *core* distribution provides a basic set of features for data integration, analysis, and visualization. Additional features are available as **Apps** (formerly called *Plugins*). Apps are available for network and molecular profiling analyses, new layouts, additional file format support, scripting, and connection with databases. They may be developed by anyone using the Cytoscape open API based on **Java™** technology and App community development is encouraged. Most of the Apps are freely available from [Cytoscape App Store](#).

宏基因组

易生信

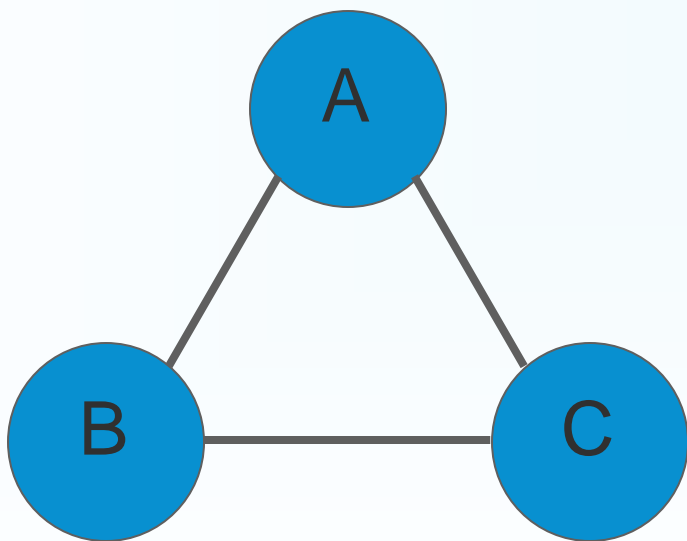


## ○ 节点 (Node)

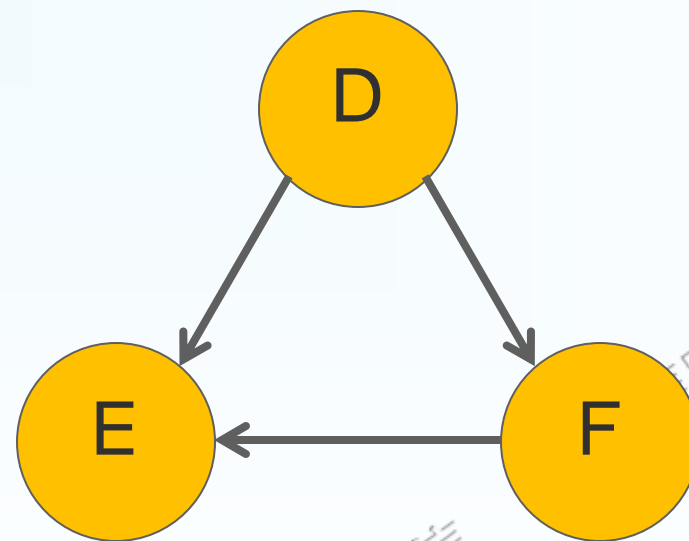
- 网络中的基本单元，基因、蛋白、药物分子等

## ○ 边 (Edge)

- 节点之间的相互作用



无向网络



有向网络

宏基因组

信

信

- Cytoscape安装
- 界面介绍
- 网络和本地数据的导入与作图
- App的安装和应用

宏基因组

生信宝典

易生信





# Cytoscape的下载与安装

- <http://cytoscape.org/>



宏基因组

信宝典

易生信

## Download Cytoscape 3.6.0

 for Windows (64 bit)

Please install **Java 8** first to use Cytoscape.

Java 9 is not yet supported

Java 6 & 7 are no longer supported

Problems? [Read this page first](#)

<https://www.java.com/en/download/windows-64bit.jsp>

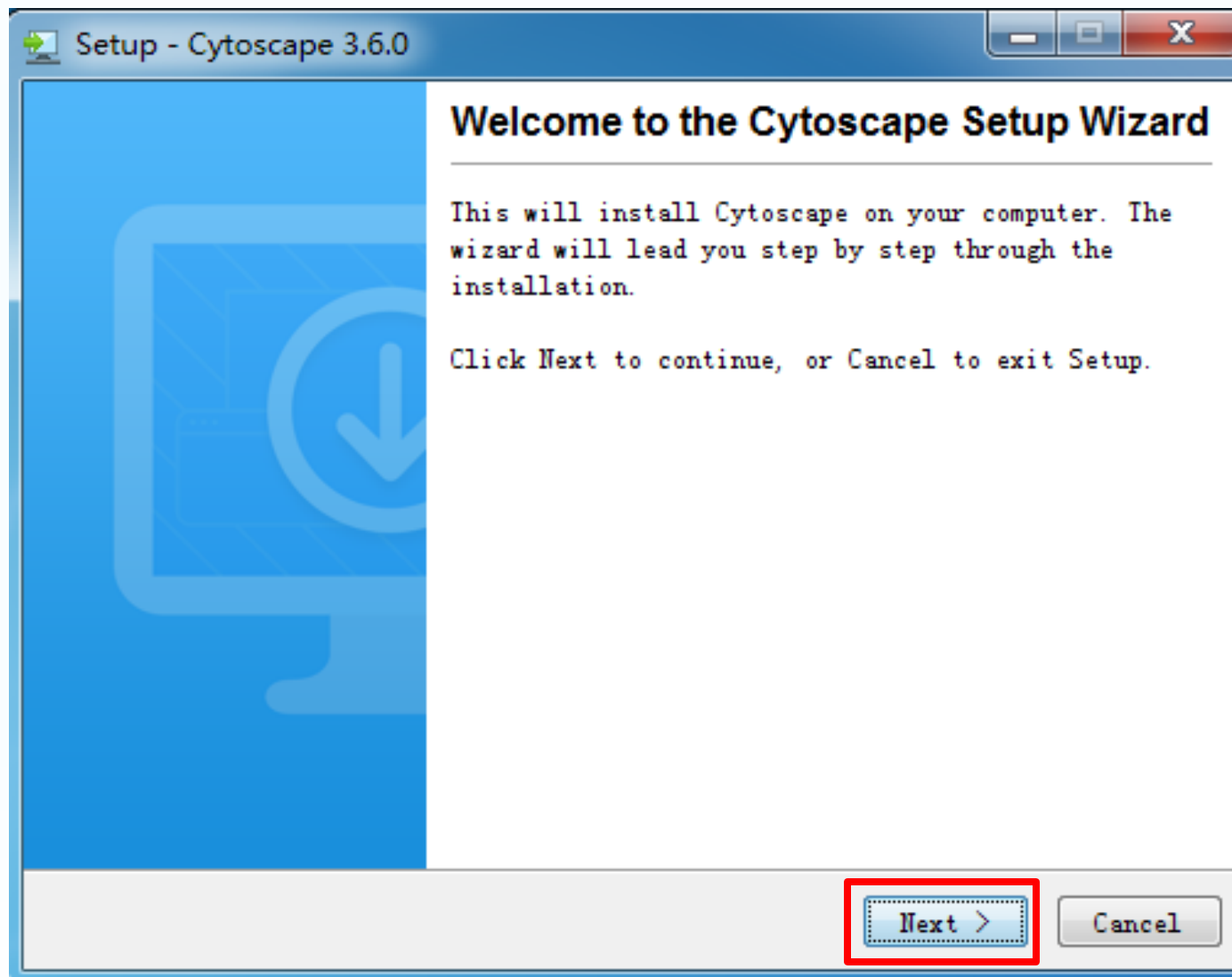
[Release Notes](#)

<http://www.oracle.com/technetwork/java/javase/downloads/jre8-downloads-2133155.html>

[Other Platforms](#)  
[Old Versions](#)

宏基因组

# Cytoscape的安装



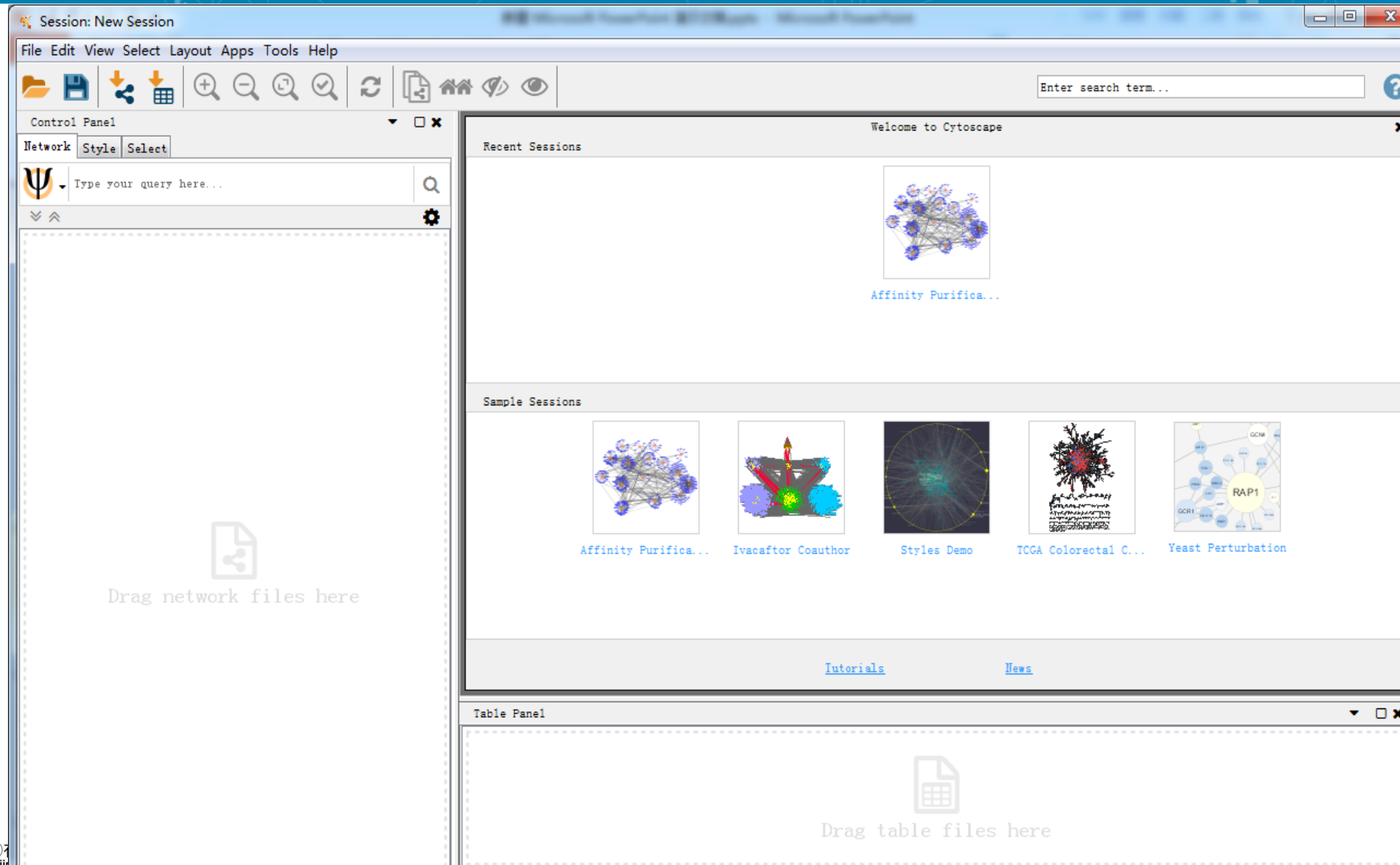
宏基因组

信宝典



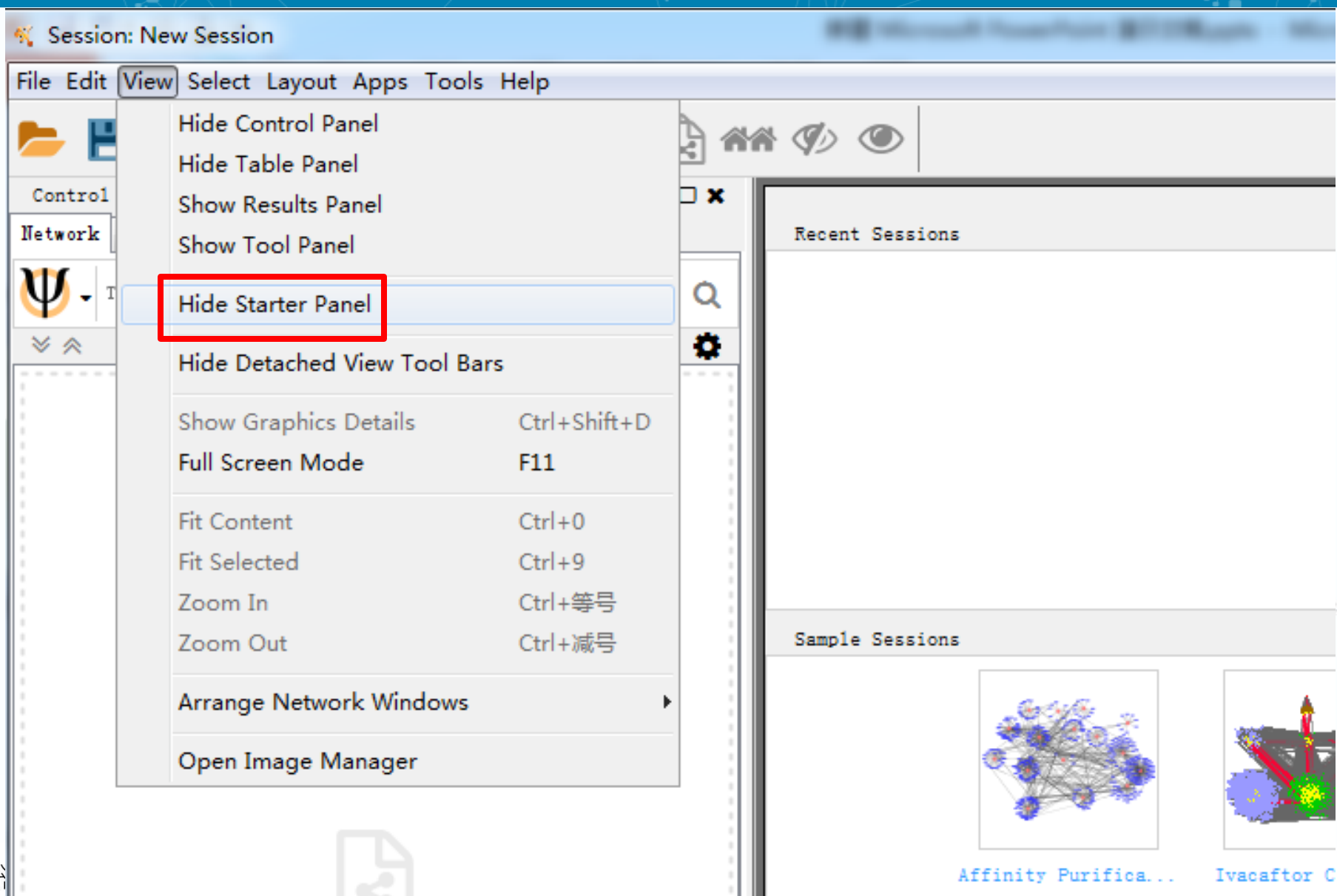


# V3.6.0 Starter Panel

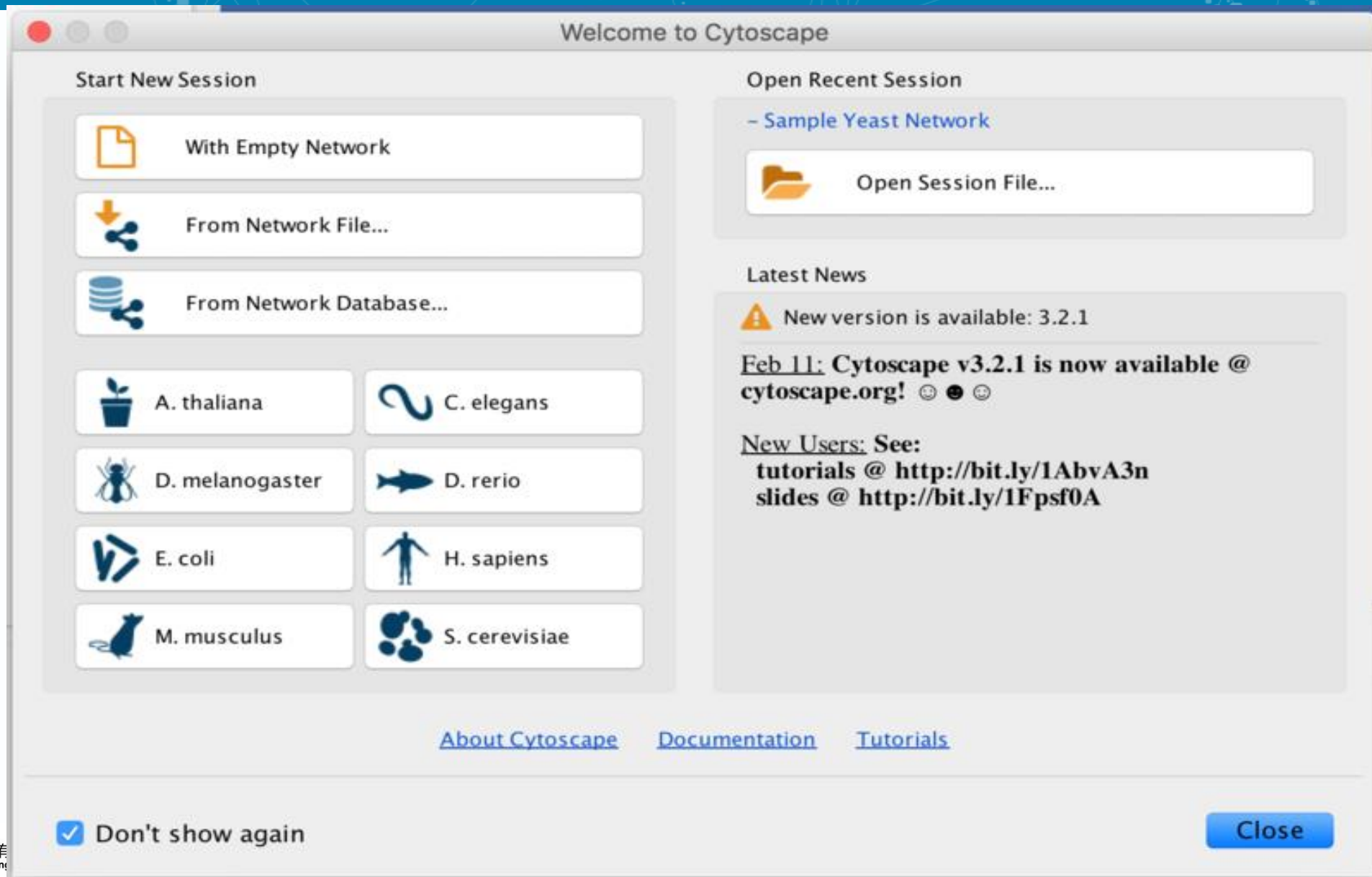


宏基因组

# 显示Starter Panel



宏基因组



基因组学

# 界面介绍

The screenshot shows the Cytoscape software interface. Red arrows point to the following components:

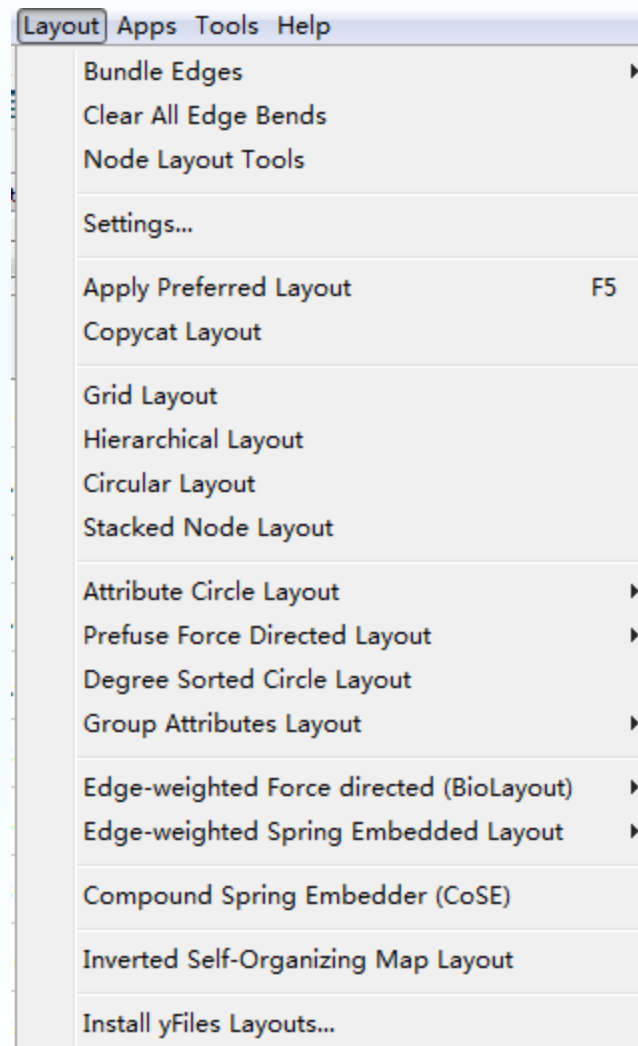
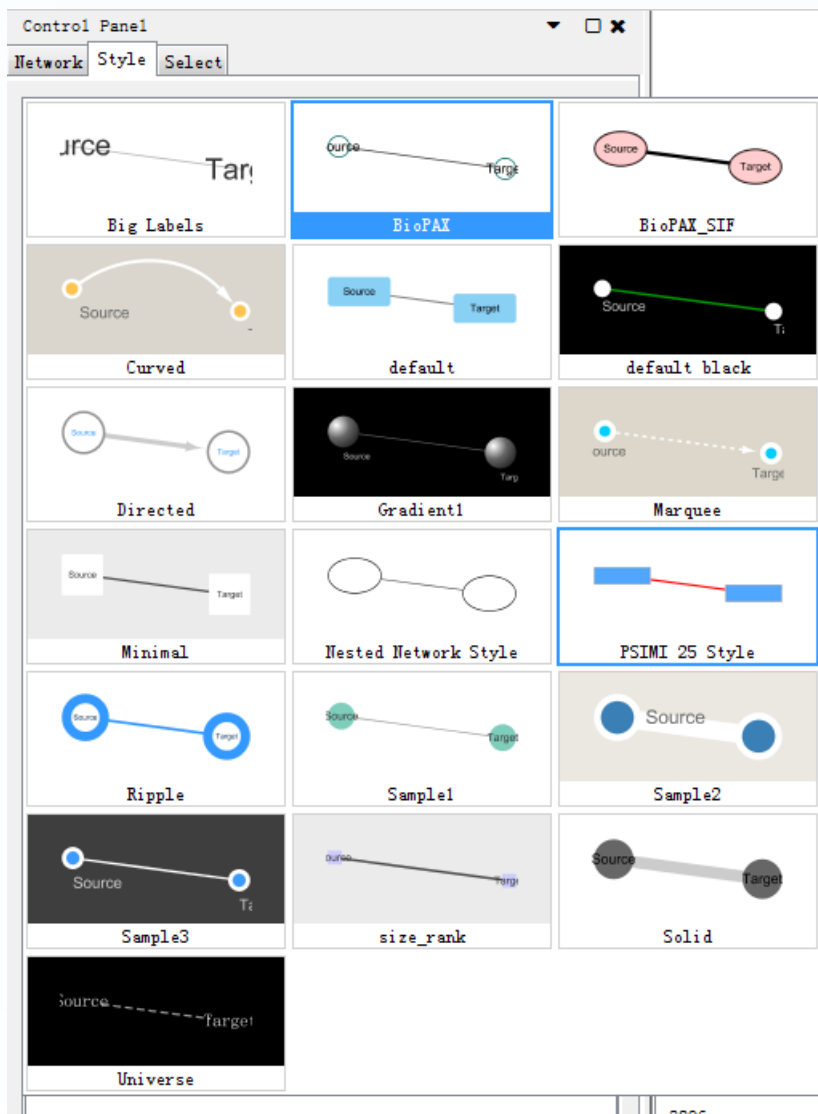
- 菜单栏 (Menu Bar):** Located at the top, containing File, Edit, View, Select, Layout, Apps, Tools, and Help.
- 工具栏 (Toolbar):** Located below the menu bar, containing icons for file operations, navigation, and visualization.
- 控制面板 (Control Panel):** Located on the left side, showing the 'PSIMI 25 Style' and various properties for nodes and edges.
- 数据板块 (Data Panel):** Located at the bottom, displaying a table of data for the selected nodes.

The main area displays a network graph with nodes and edges. A smaller inset graph is visible on the right side.

shared name	name	Taxonomy ID	Taxonomy Name	Human Readable Label	ncbi_gene_id	entrez gene/locuslink
3198	3198	9606	HOX1	HOX1	3198	[HOX1, 3198, HOXA1, BSAS, ...]
15394	15394	10090	Hox-1.6	Hox-1.6	15394	[15394, Hox-1.6, Hoxa1, ERA1]
6839	6839	9606	SUV39H1	SUV39H1	6839	[6839, SUV39H1, KMT1A, SUV...
2623	2623	9606	NFE1	NFE1	2623	[NFE1, 2623, GF-1, GF1, XL...
2815	2815	9606	GP9	GP9	2815	[GP9, GP1X, 2815, CD42a]
2896	2896	9606	GRN	GRN	2896	[GRN, GP, 2896, CLN11, PC...

宏基因组

# 图形的风格和整体布局



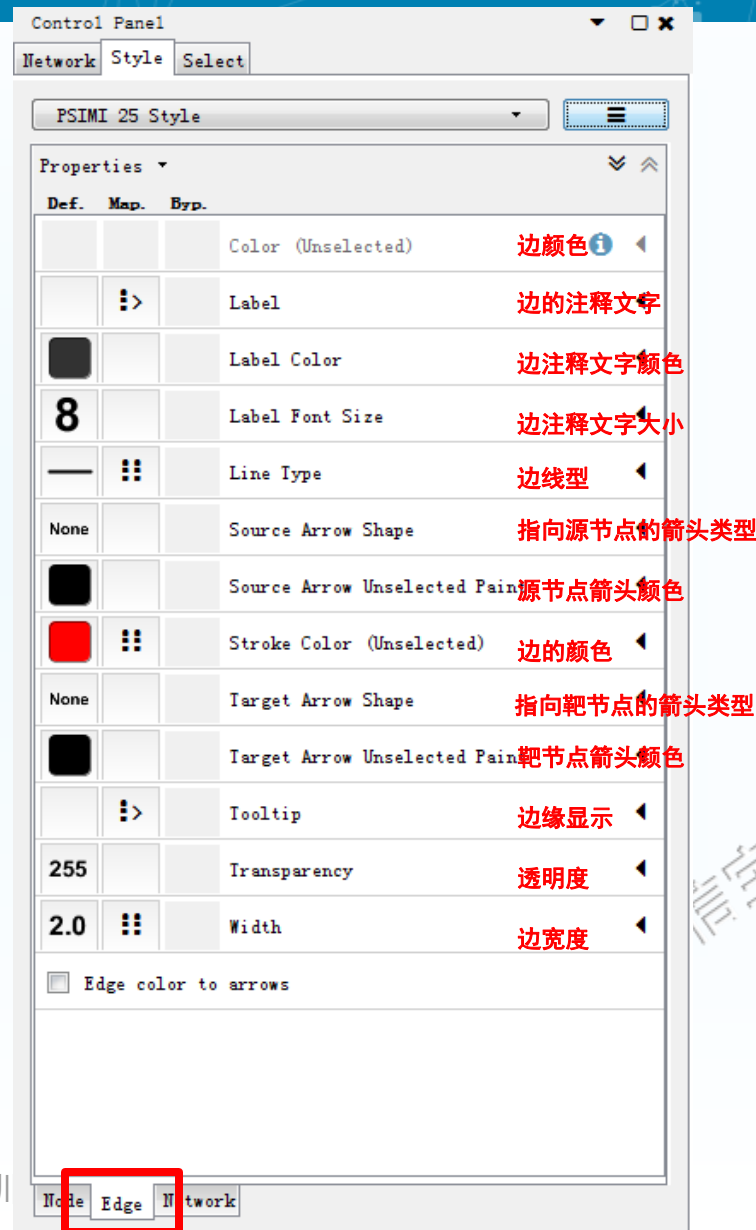
宏基因组

三叶草

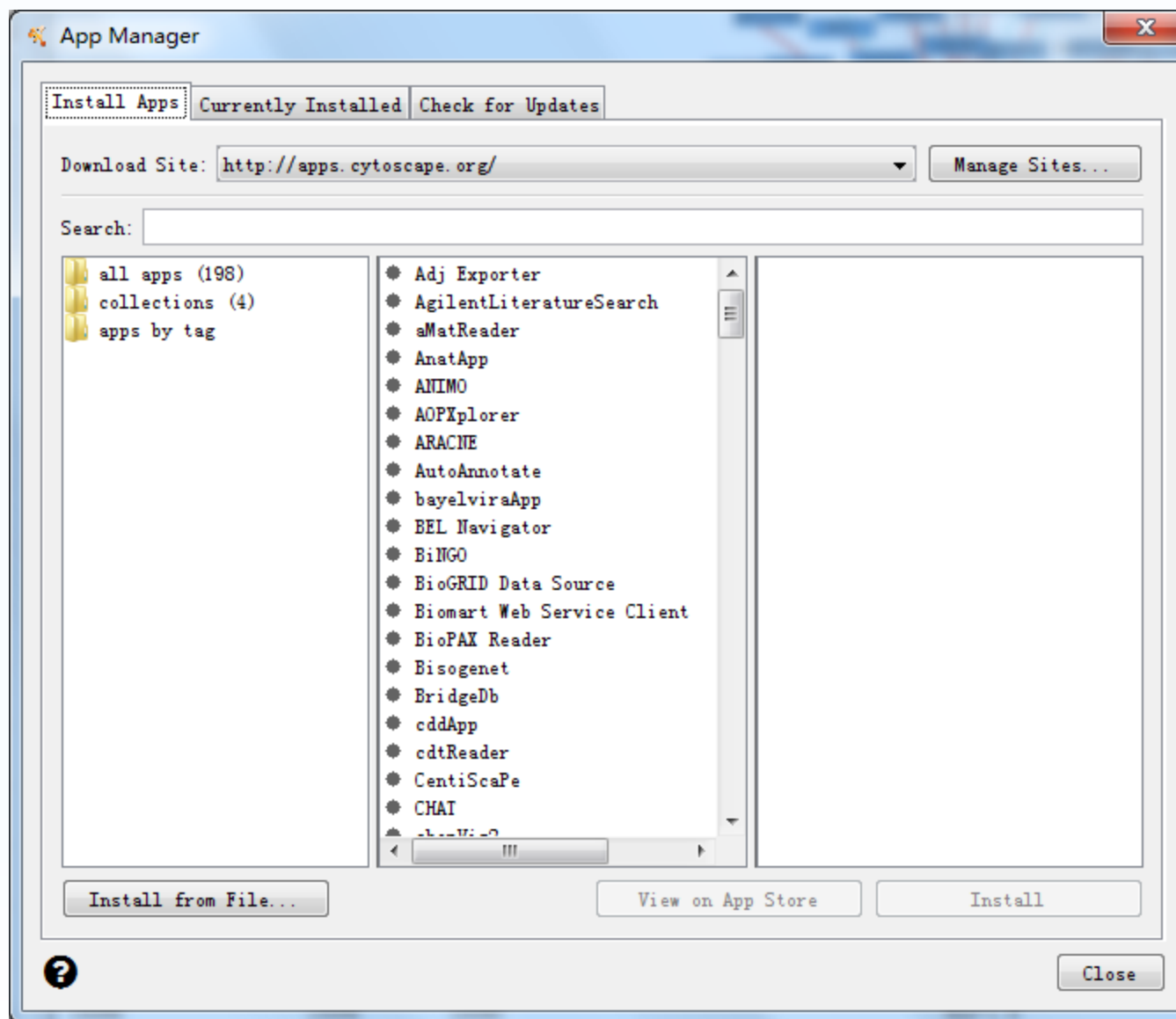
易生信



# 节点和边的参数设置



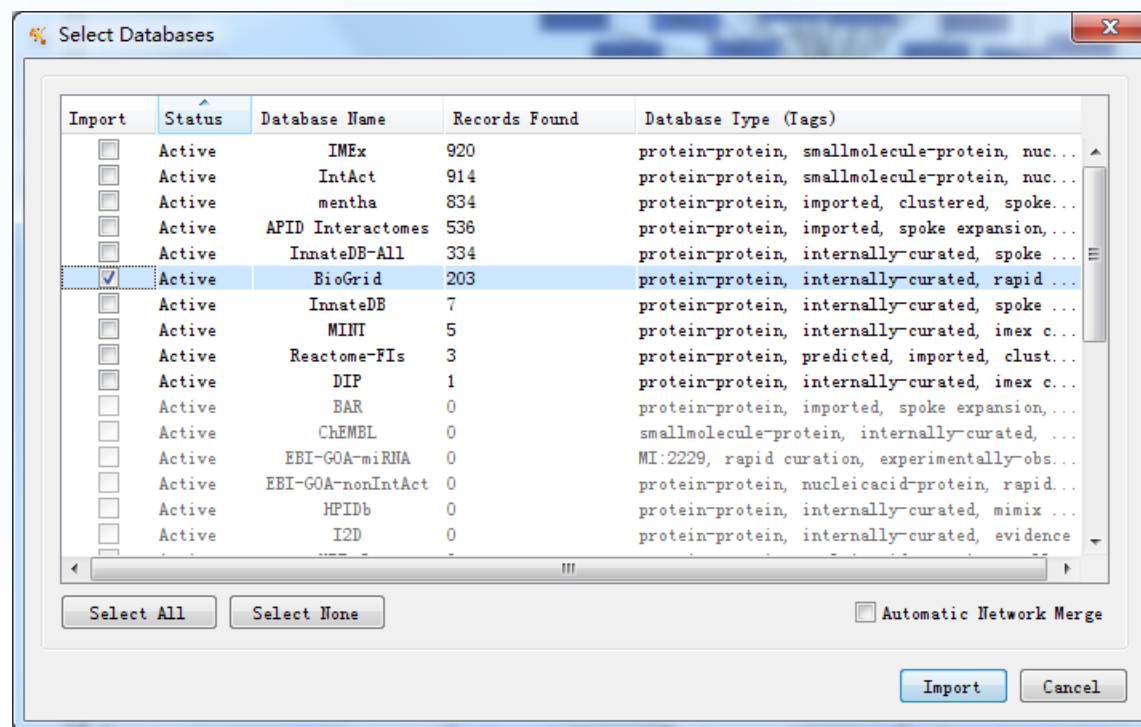
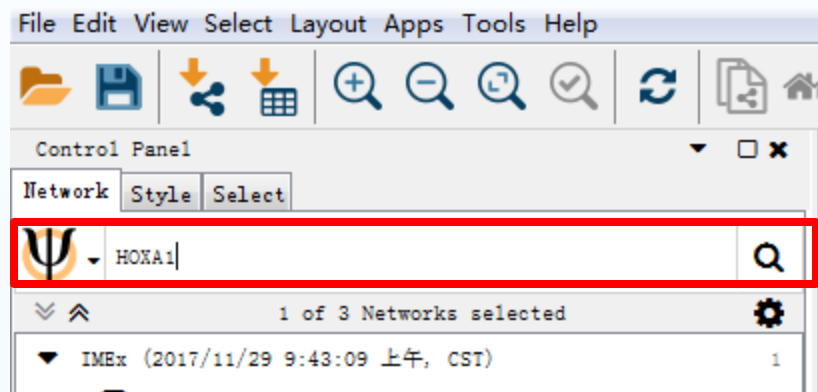
# App插件



宏基因组

生信宝典

# 直接从网络数据库导入数据

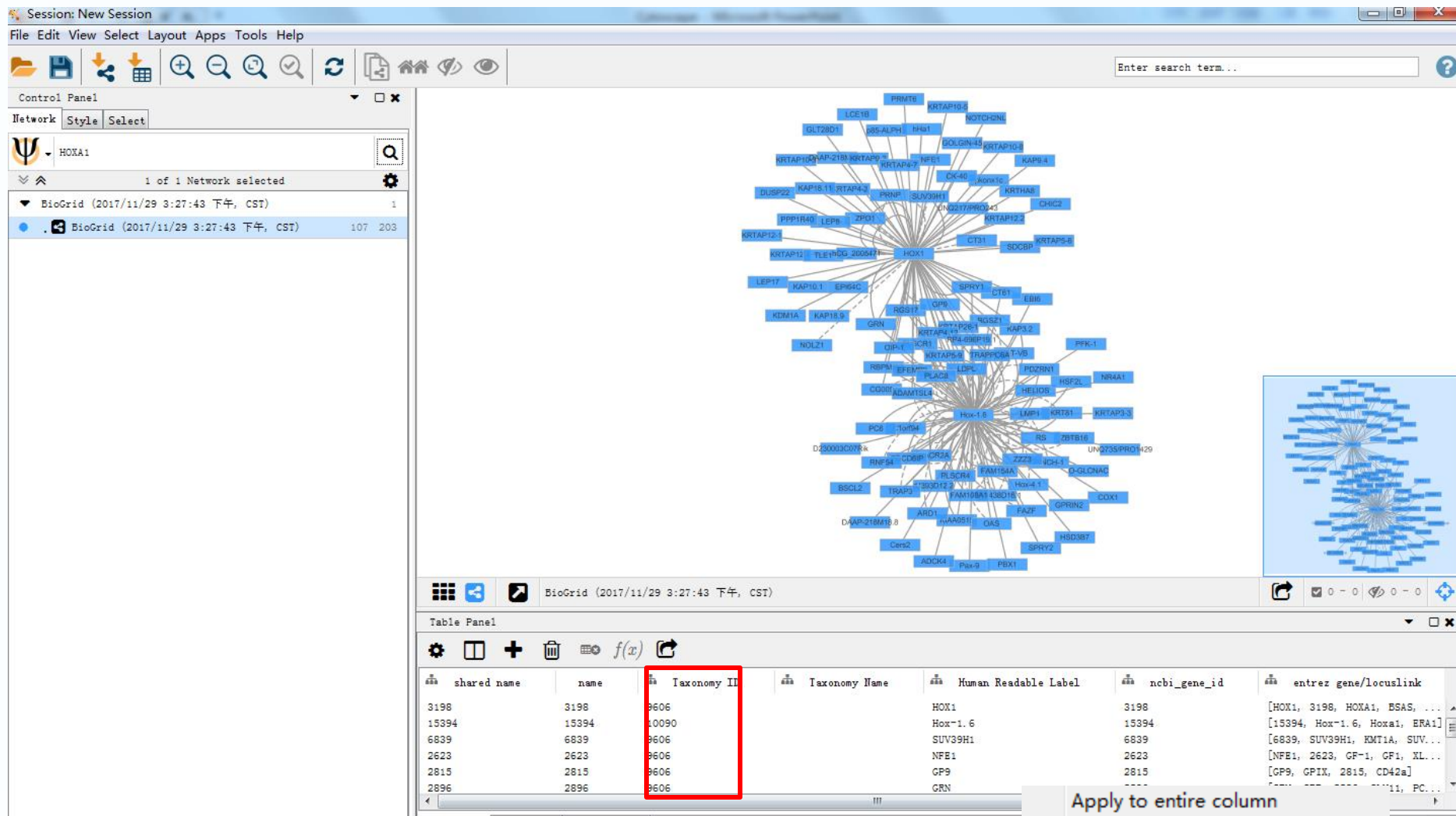


宏基因组

生信宝典

三信

# 初步形成的网络图

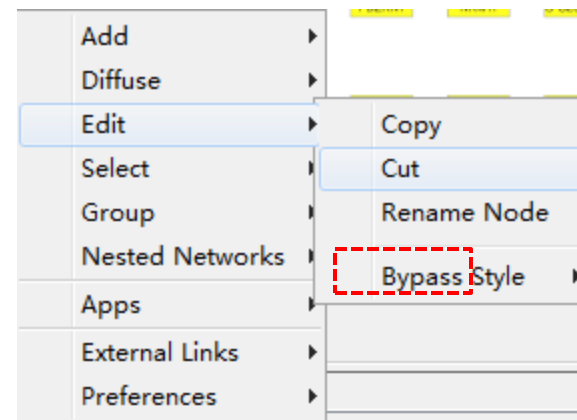
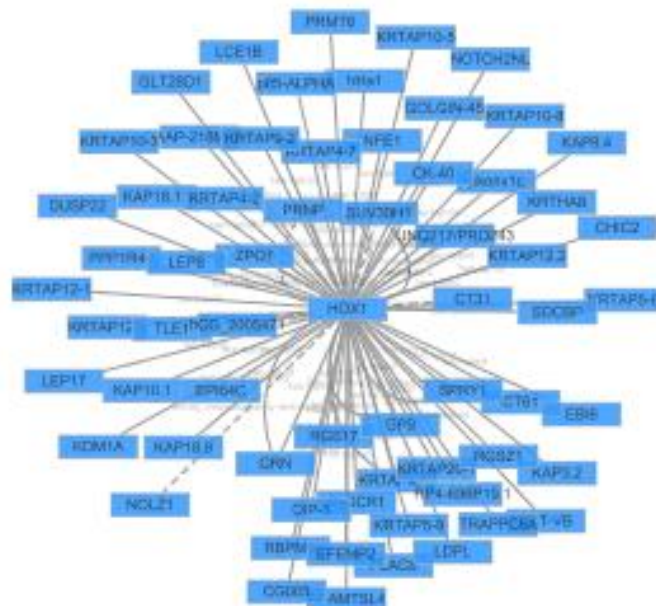


选中非目的基因，点击右键 →  
易生信，毕生缘；培训版权所有。

- Apply to entire column
- Apply to selected nodes
- Edit
- Select nodes from selected rows

宏基因组

# 删掉非目的物种的分子

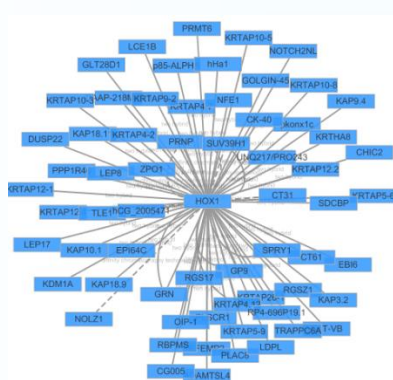


宏基因组

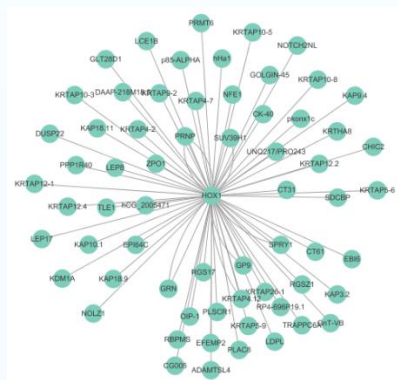
基因组



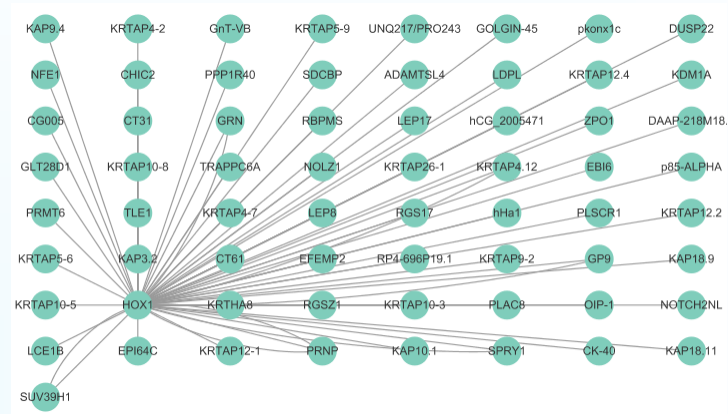
## ○ Style和layout整体布局



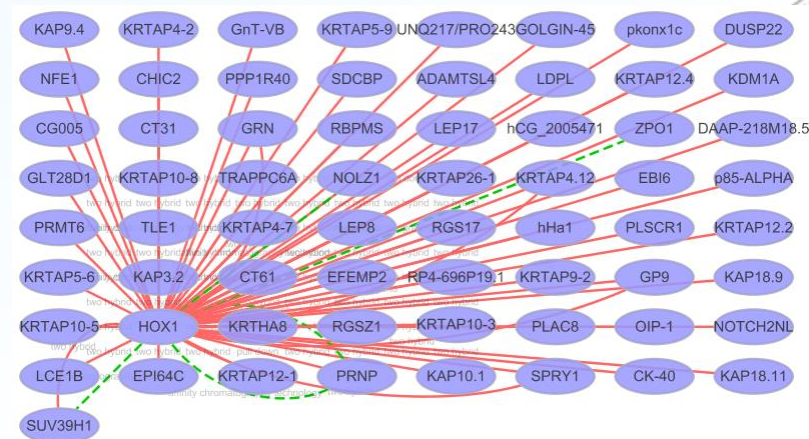
Sample1 style



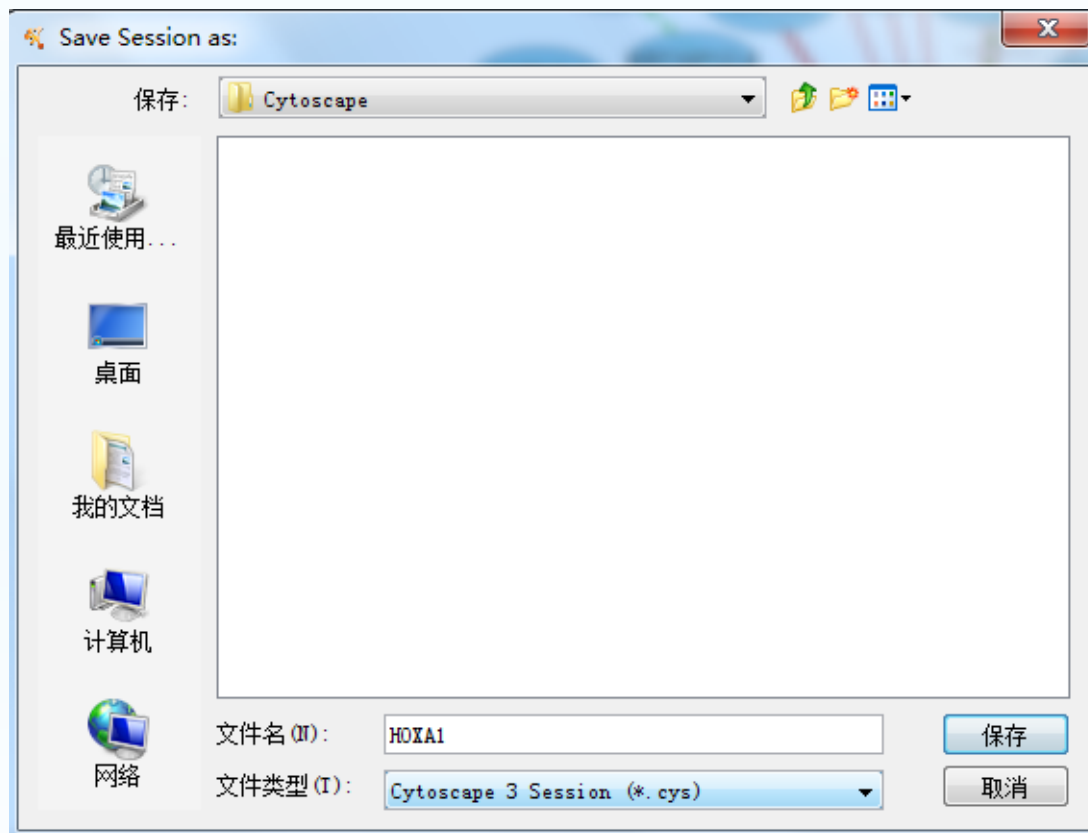
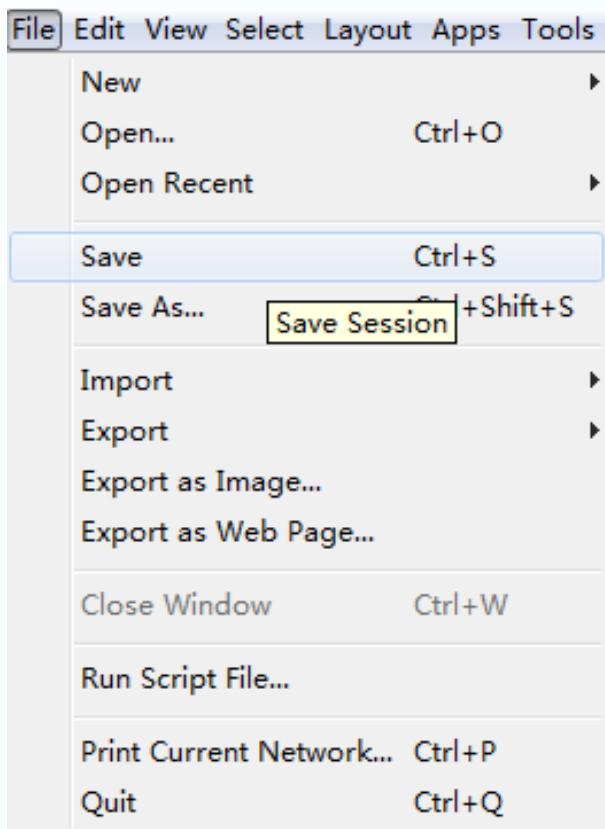
## Grid layout



## 节点和边的参数设置



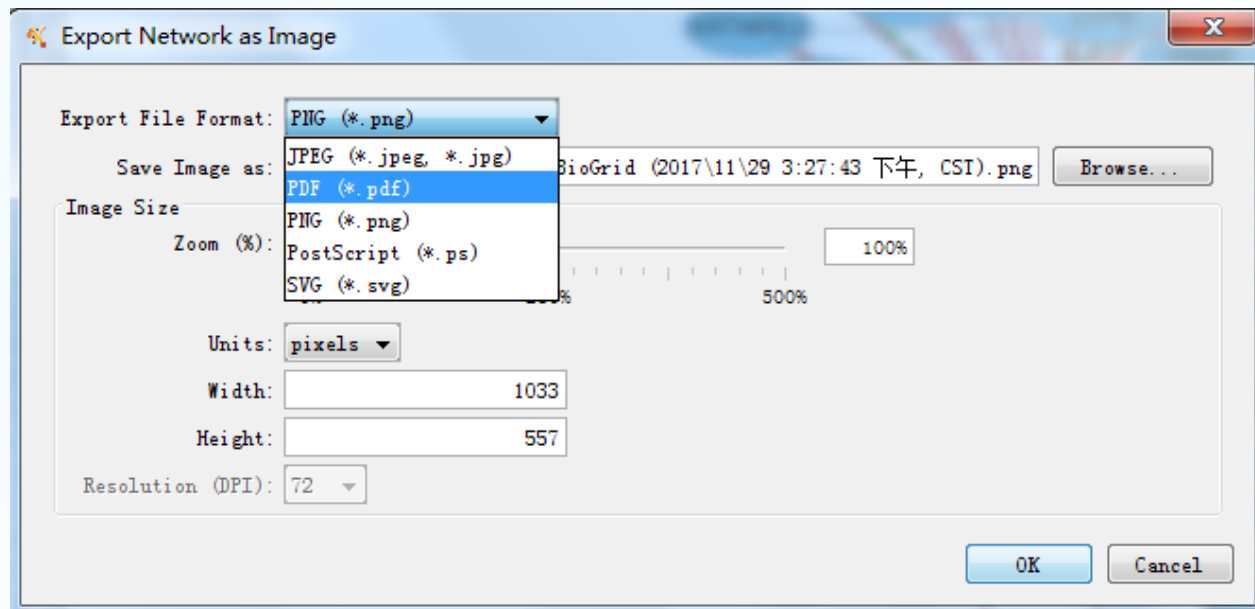
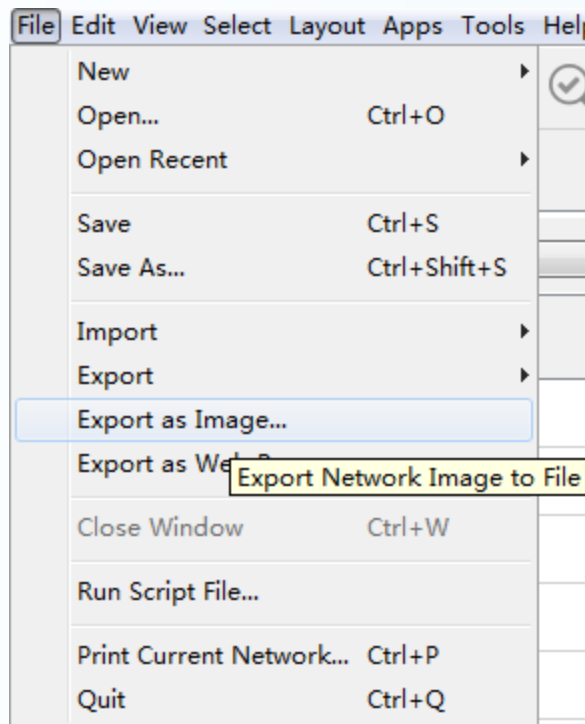
## ○ Save session



宏基因组

易生信

## ○ Save picture



宏基因组

易生信

# 本地数据导入作图-数据格式

- Cytoscape支持并识别多种格式的文件：txt、excel
- 互作网络数据文件中至少包括两列：源节点和靶节点。建议加上互作关系的类型（边的类型）

source	target
miRNA1	gene1
miRNA1	gene2
miRNA1	gene3
miRNA2	gene2
miRNA3	gene3
TF1	miRNA1
TF1	miRNA2
TF2	miRNA3

source	interaction	target
miRNA1	indirect	gene1
miRNA1	direct	gene2
miRNA1	direct	gene3
miRNA2	direct	gene2
miRNA3	direct	gene3
TF1	direct	miRNA1
TF1	direct	miRNA2
TF2	direct	miRNA3

宏基因组

易生信

易生信

# 本地数据导入作图-数据格式

- 属性数据文件，用来设置节点的显示方式。
  - 节点名称要和构建网络数据中的一致

gene	type	expression
miRNA1	miRNA	3
miRNA2	miRNA	2
miRNA3	miRNA	5
gene1	gene	1
gene2	gene	1.2
gene3	gene	2
TF1	TF	1.5
TF2	TF	1.8

宏基因组

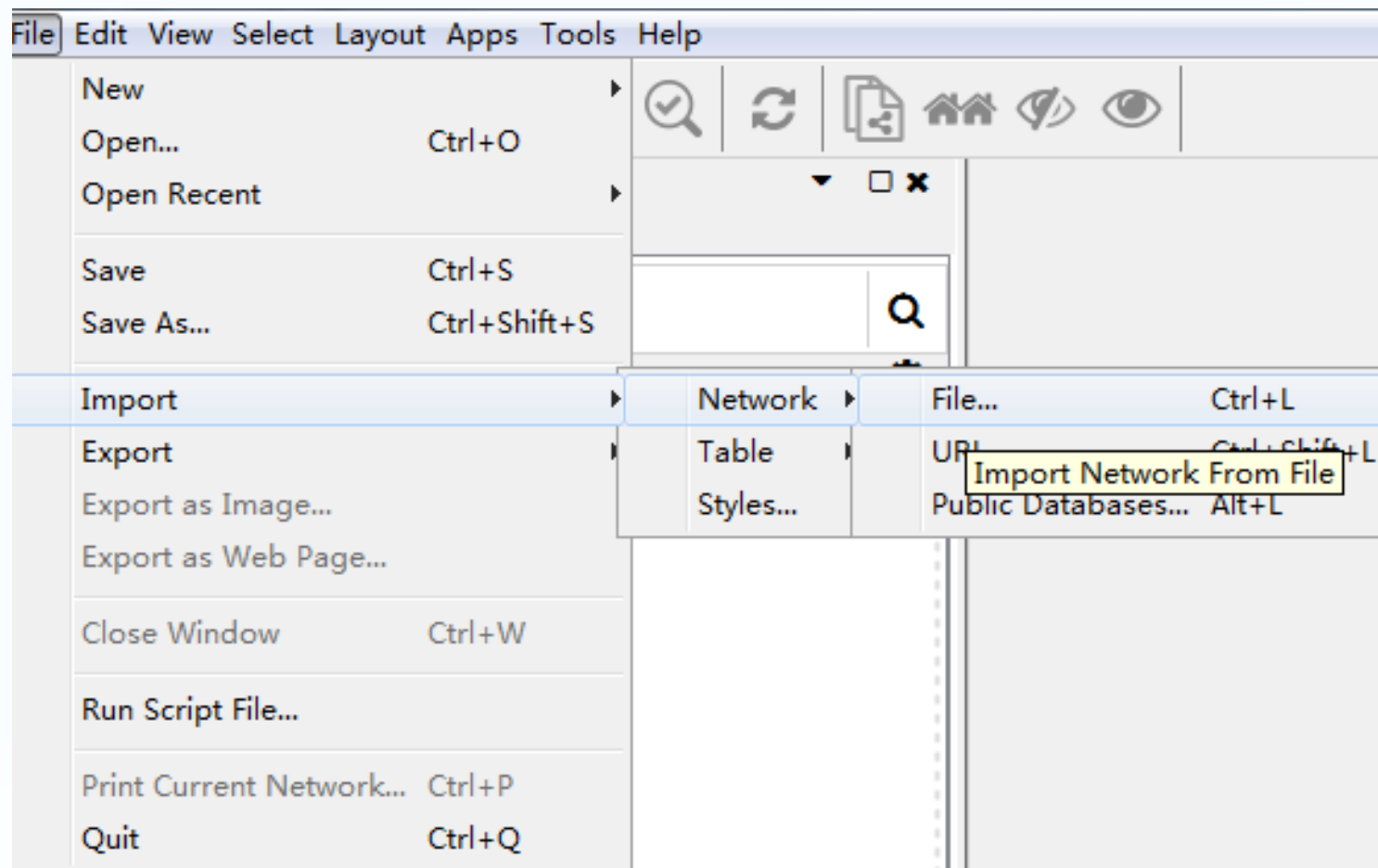
生信宝典

易生信



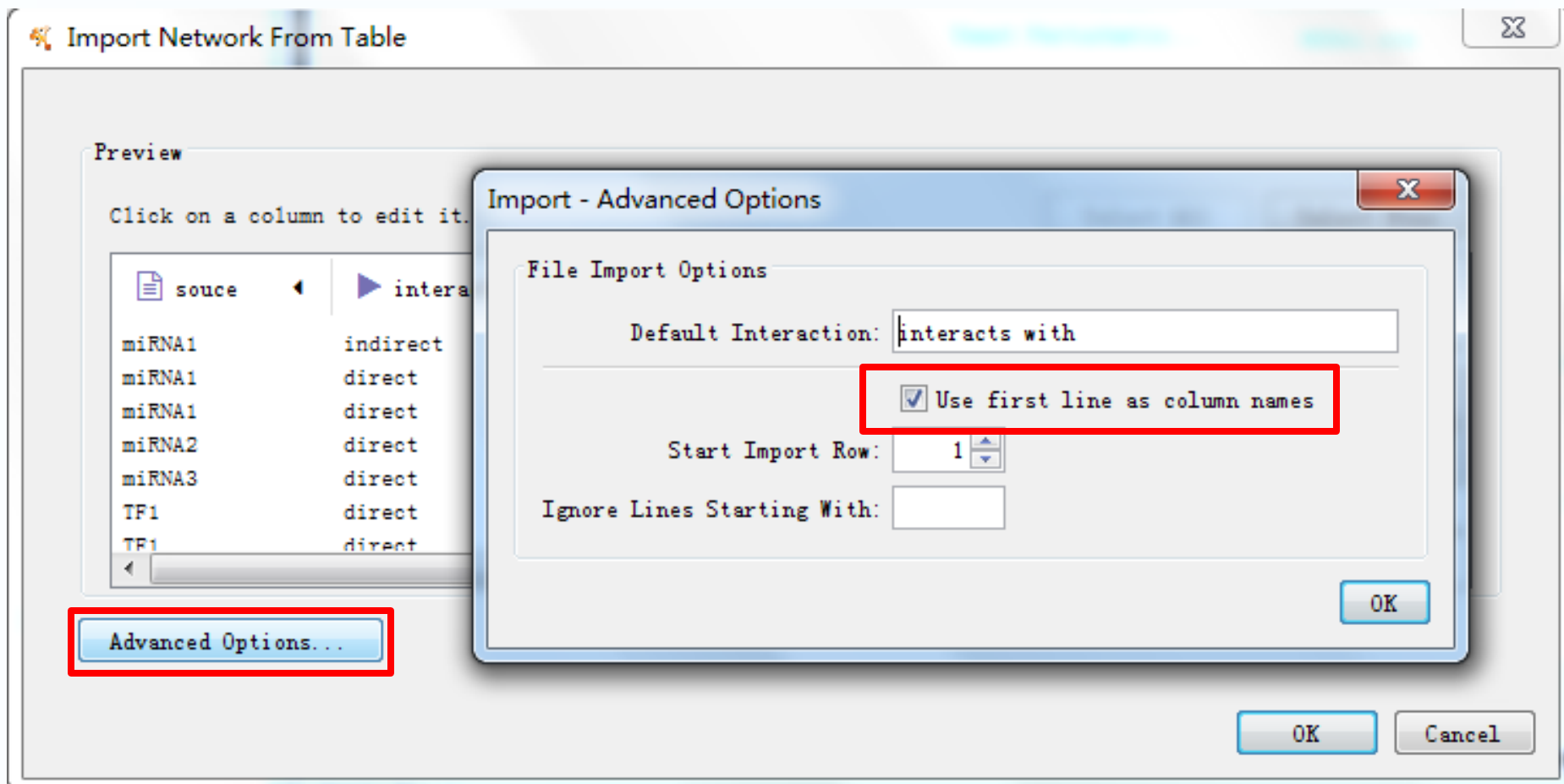


## ○ 用于构建网络的分子互作数据导入



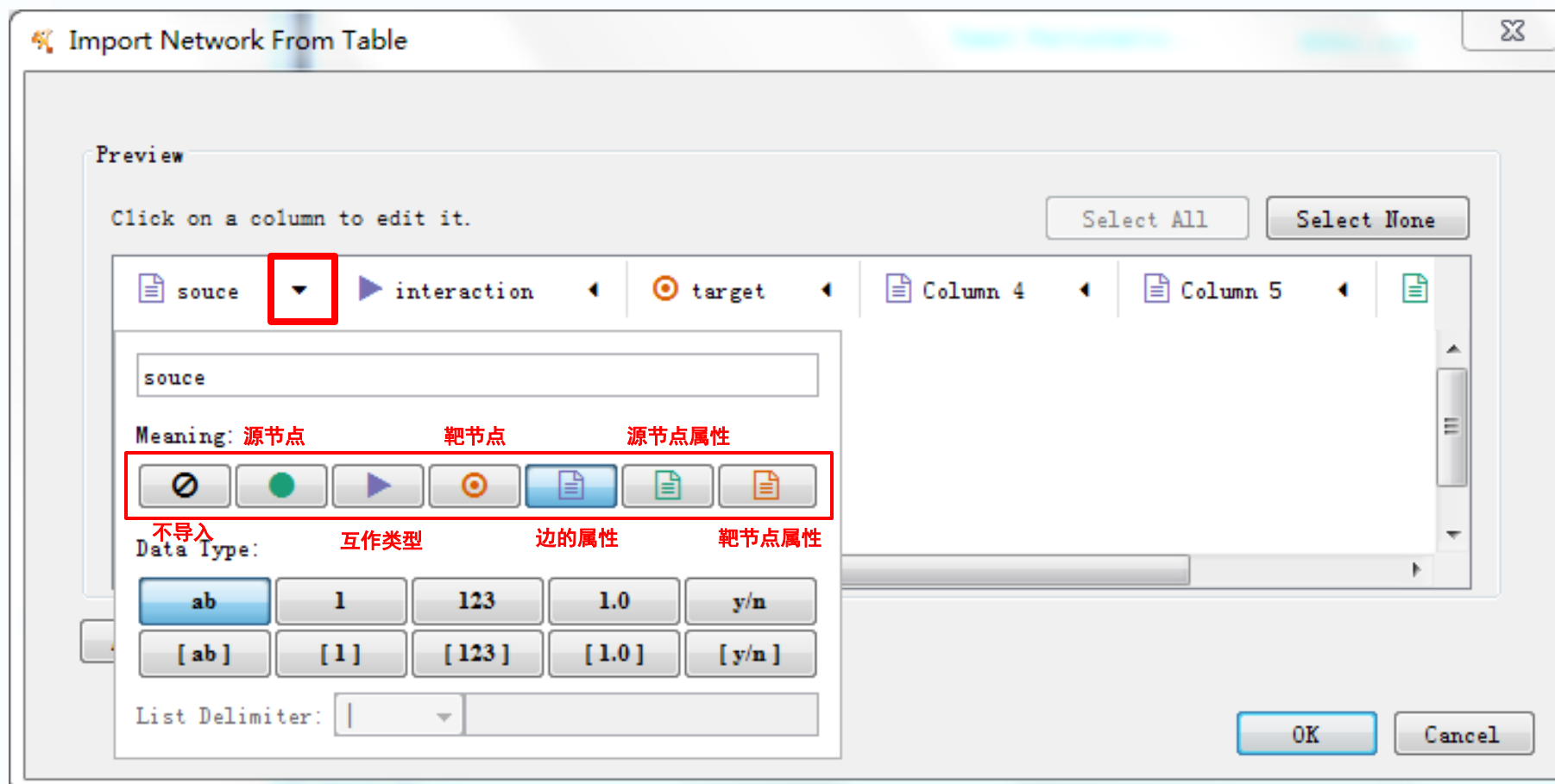
宏基因组

信宝典



宏基因组

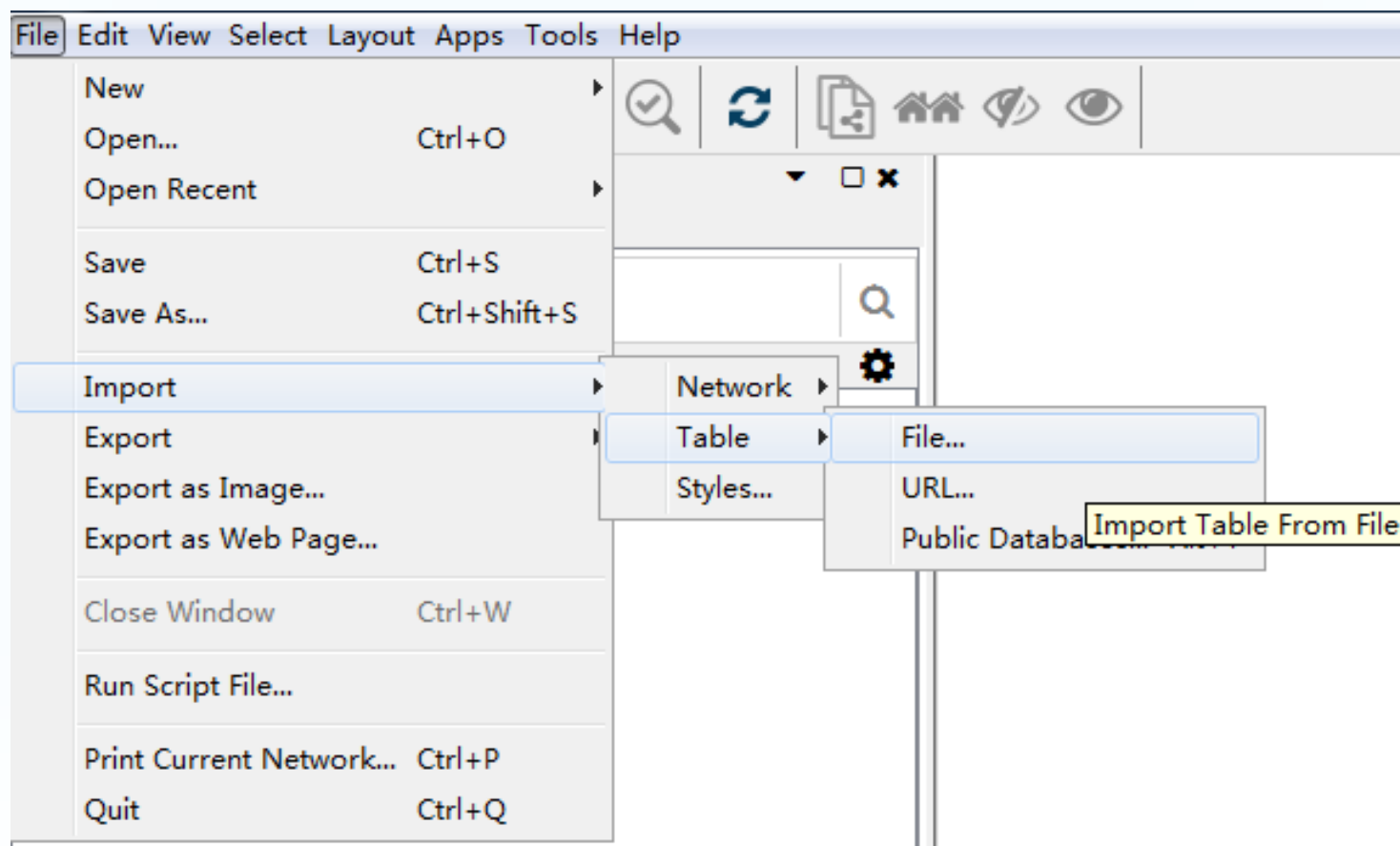
易生信



宏基因组

易生信

- 用于设置节点属性的数据导入，如基因类型、基因表达量...



宏基因组

信宝典

# 选择匹配的Key column

Import Columns From Table

Target Table Data

Where to Import Table Data: To a Network Collection

Select a Network Collection

Network Collection: Sheet1

Import Data as: Node Table Columns

Key Column for Network: shared name

Case Sensitive Key Values: ☒

Preview

Click on a column to edit it.

Select All Select None

gene type expression

gene

Meaning:

Data Type:

List Delimiter: |

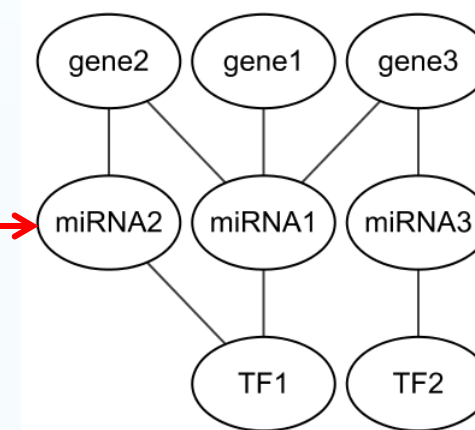
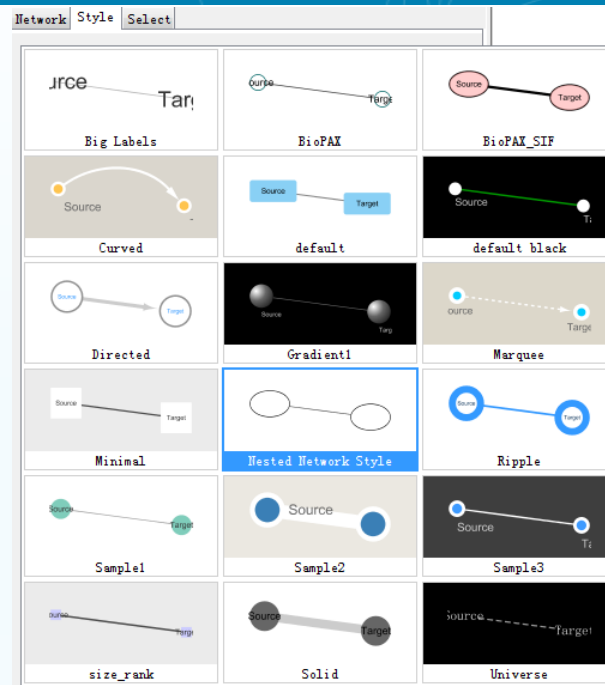
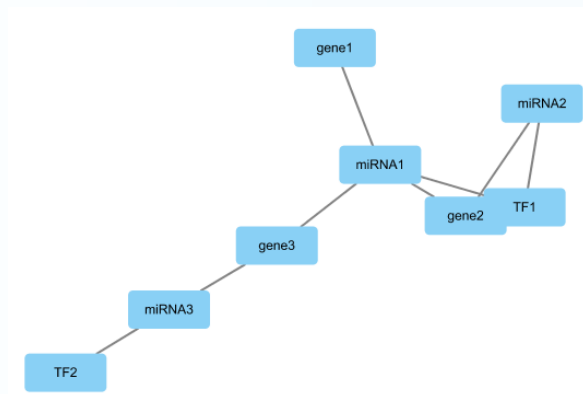
OK Cancel

宏基因组

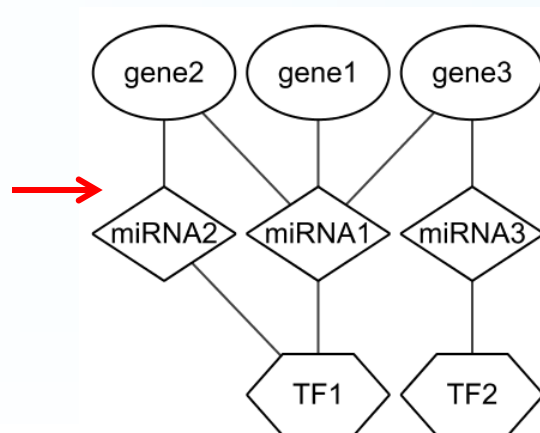
信宝典

1113

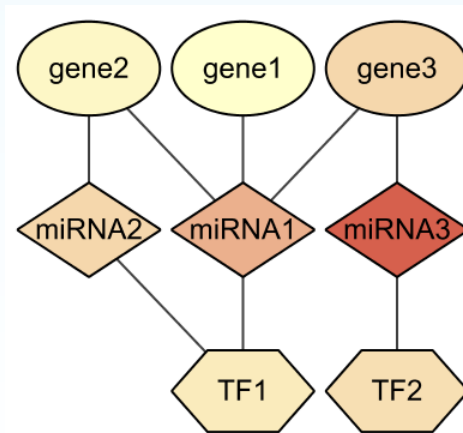




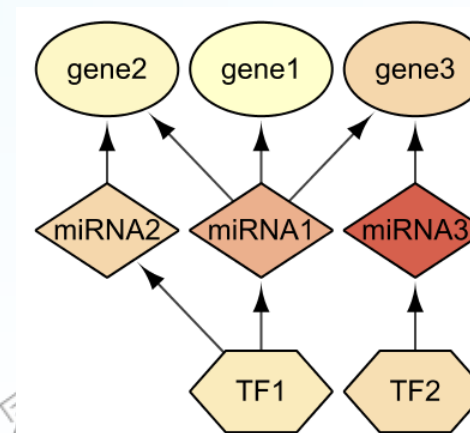
**Hierarchical layout**



**shape**

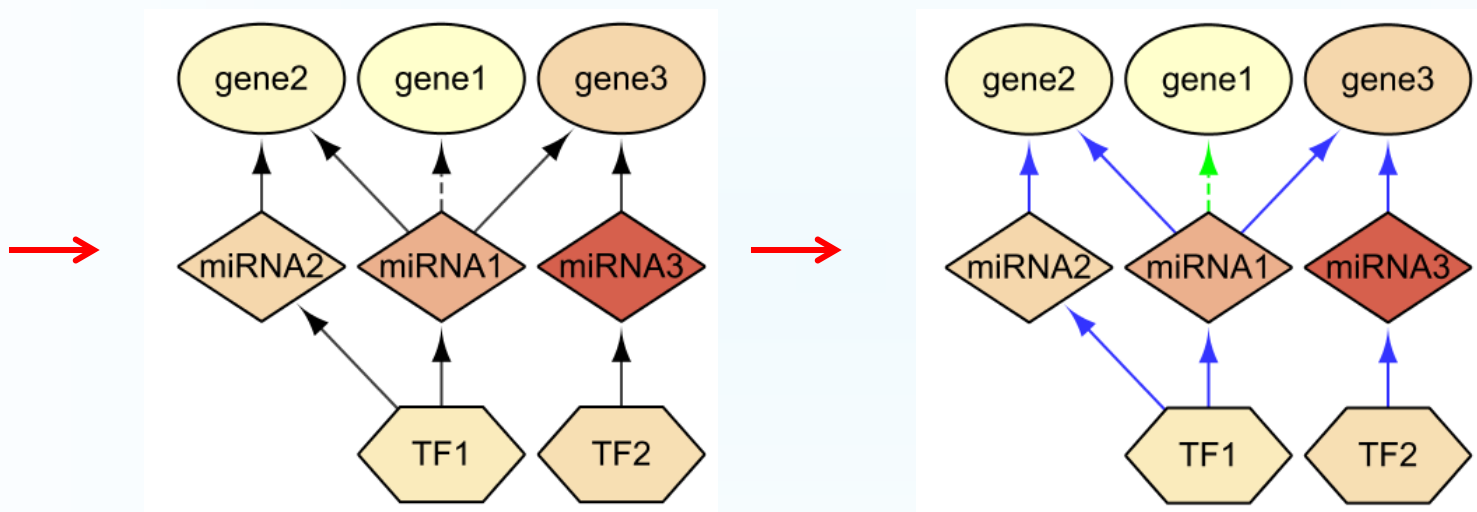


**Fill color**



**Target arrow shape**

宏基因组



Line type

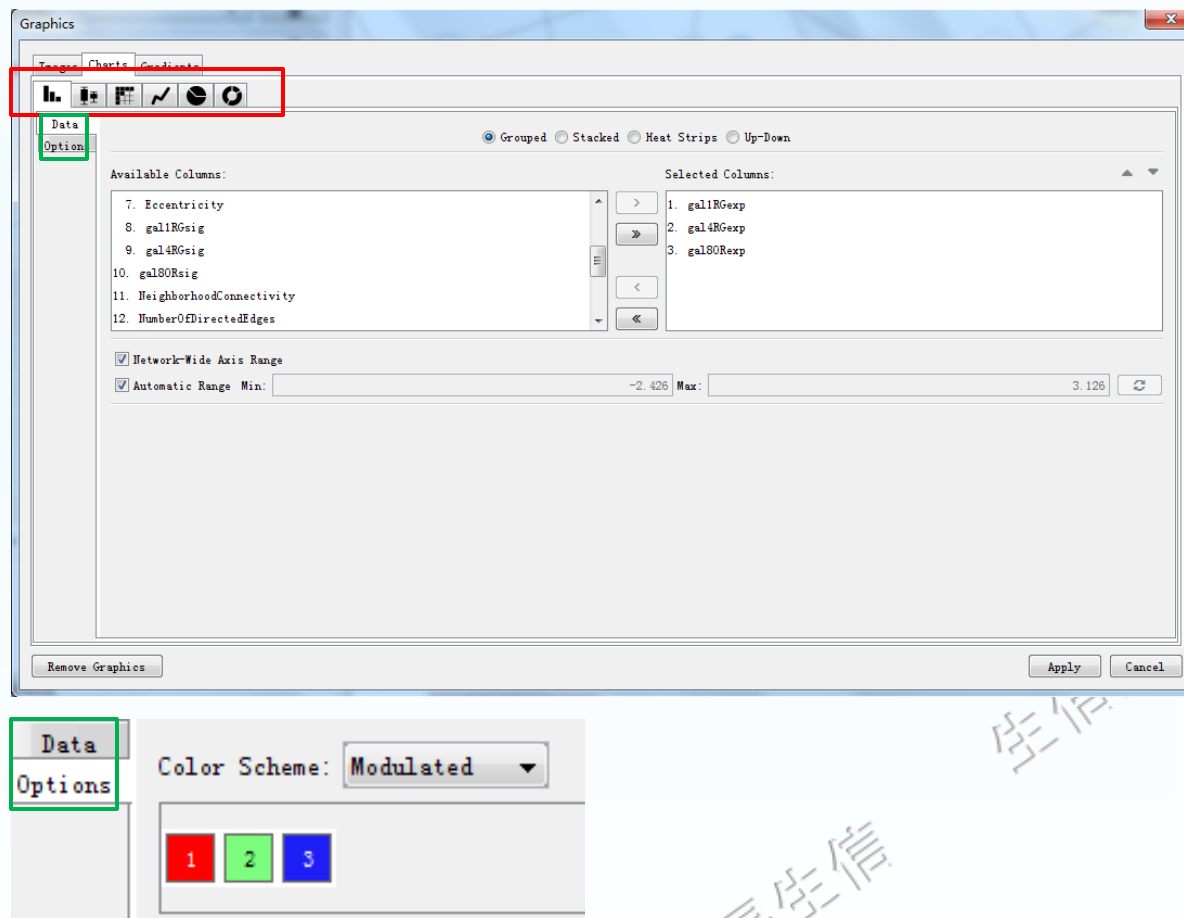
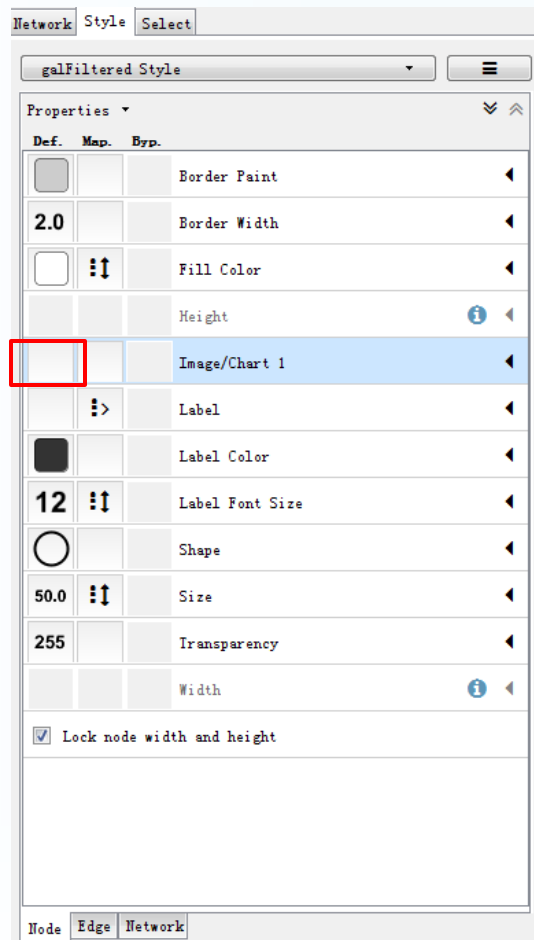
Stroke color and target  
arrow unselected paint

宏基因组

生信宝典

易生信

## Image/chart 1 设置

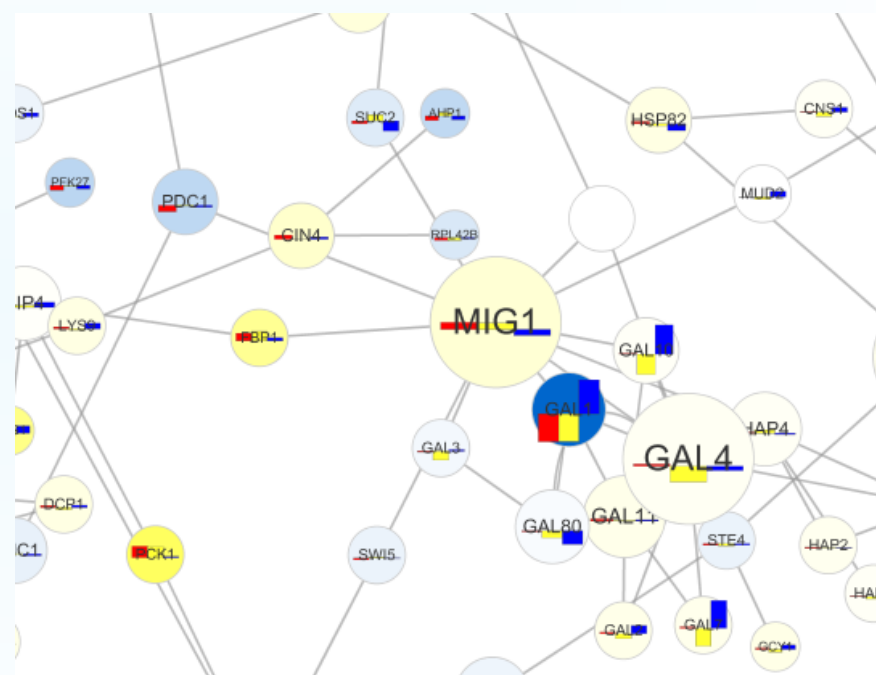
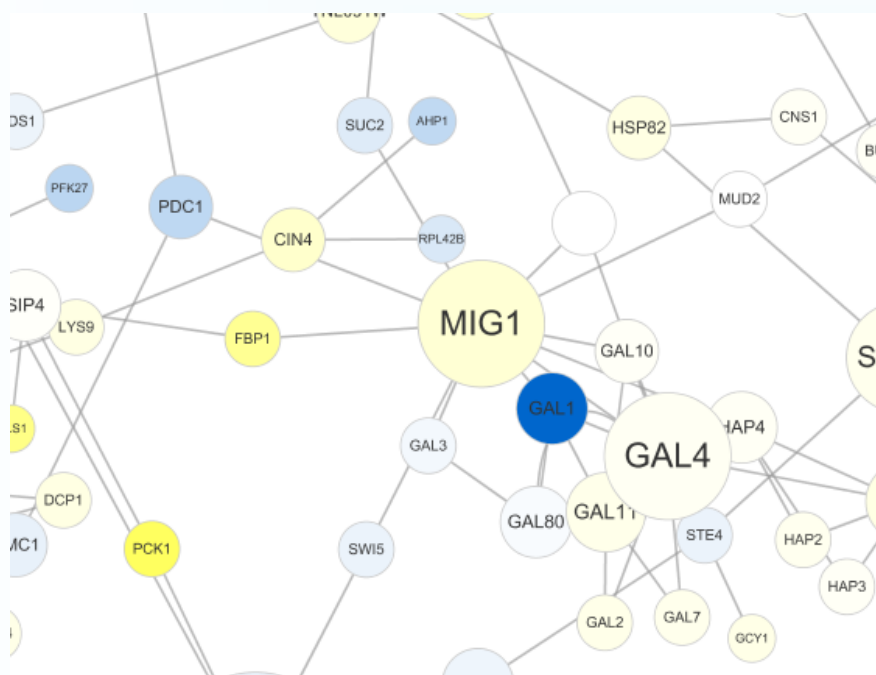


宏基因组

生信

易生信

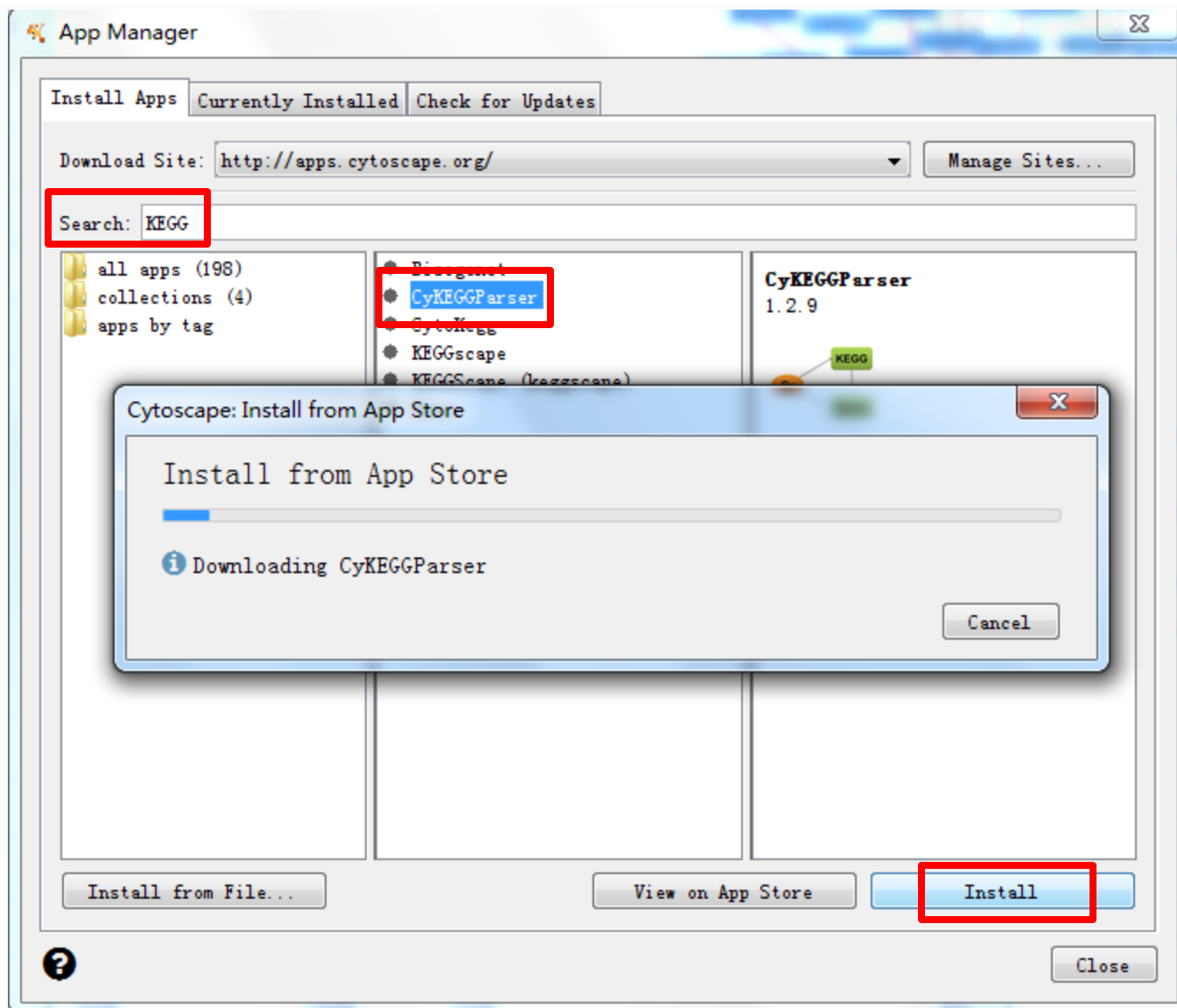
# Fun with Charts



宏基因组

易生信

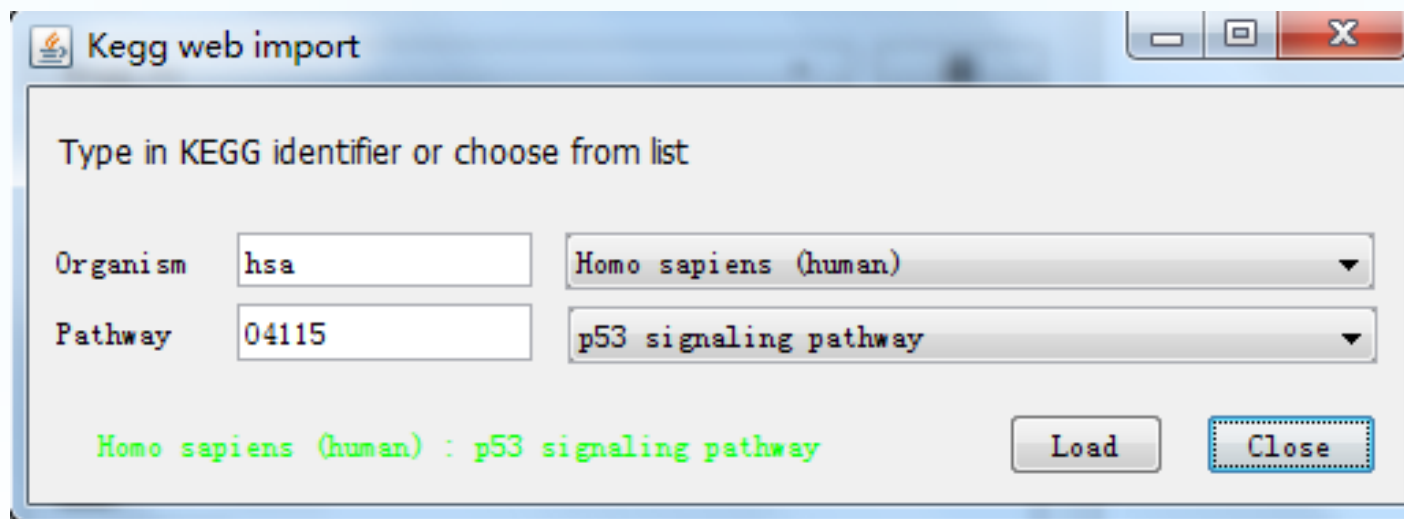
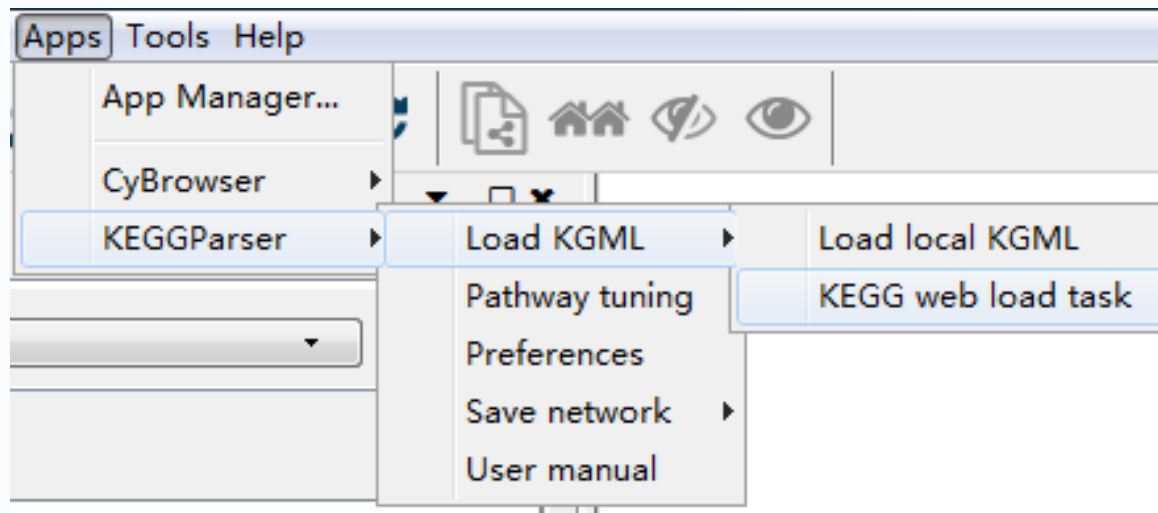
# App的安装和使用



宏基因组

生信宝典

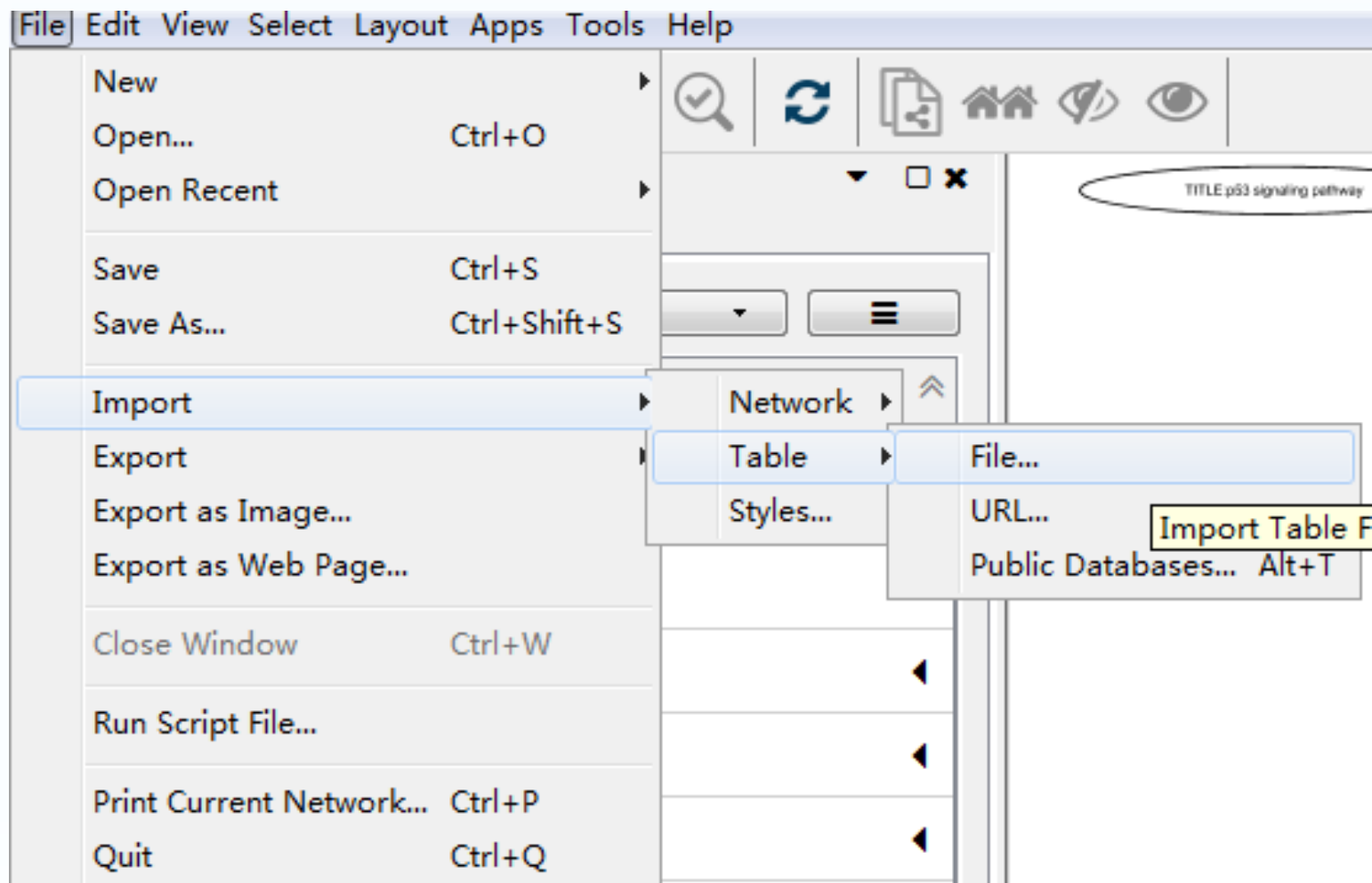




宏基因组

信宝典

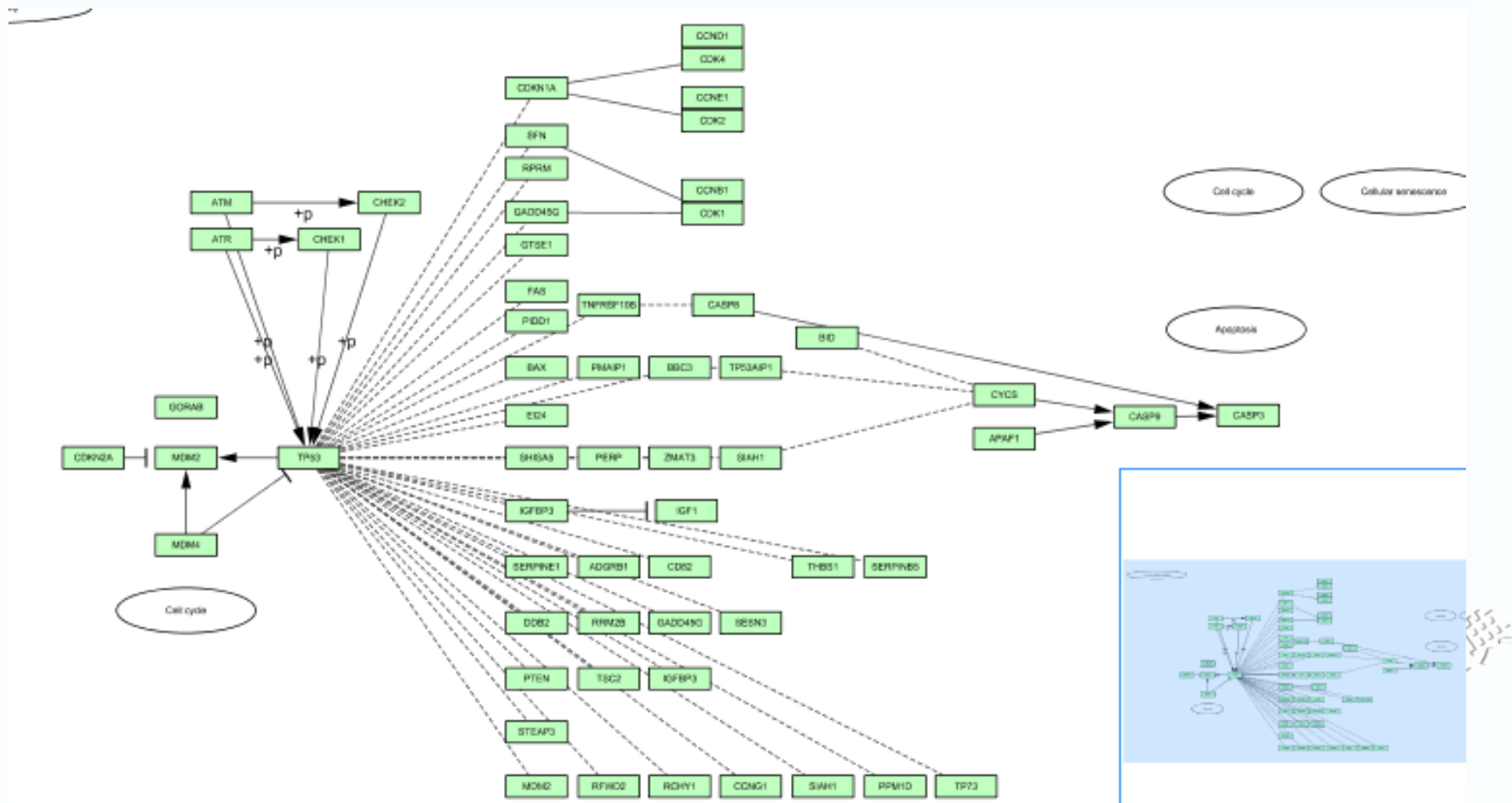
1113



宏基因组

信富典

易生信



宏基因组

易生信

# 本地数据与网络数据的整合

Import Columns From Table

Target Table Data

Where to Import Table Data: To a Network Collection

Select a Network Collection

Network Collection: 2536\_p53 signaling pathway

Import Data as: Node Table Columns

Key Column for Network: GraphicsName

Case Sensitive Key Values: ☒

Preview

Click on a column to edit it.

Select All Select None

GraphicsName	Label	Expression
Cell cycle	Cell cycle	0
Apoptosis	Apoptosis	0
TITLE:p53 signaling pathway	TITLE:p53 signaling pathway	0
Cell cycle	Cell cycle	0
TP53AIP1, P53AIP1	TP53AIP1	1
GADD45G, CR6, DDIT2, GADD45gamma, GRP1...	GADD45G	1.1
RPRM, REPRIMO	RPRM	1.2
STEAP3, AHMIO2, STMP3, TSAP6, dudlin-2	STEAP3	1.3

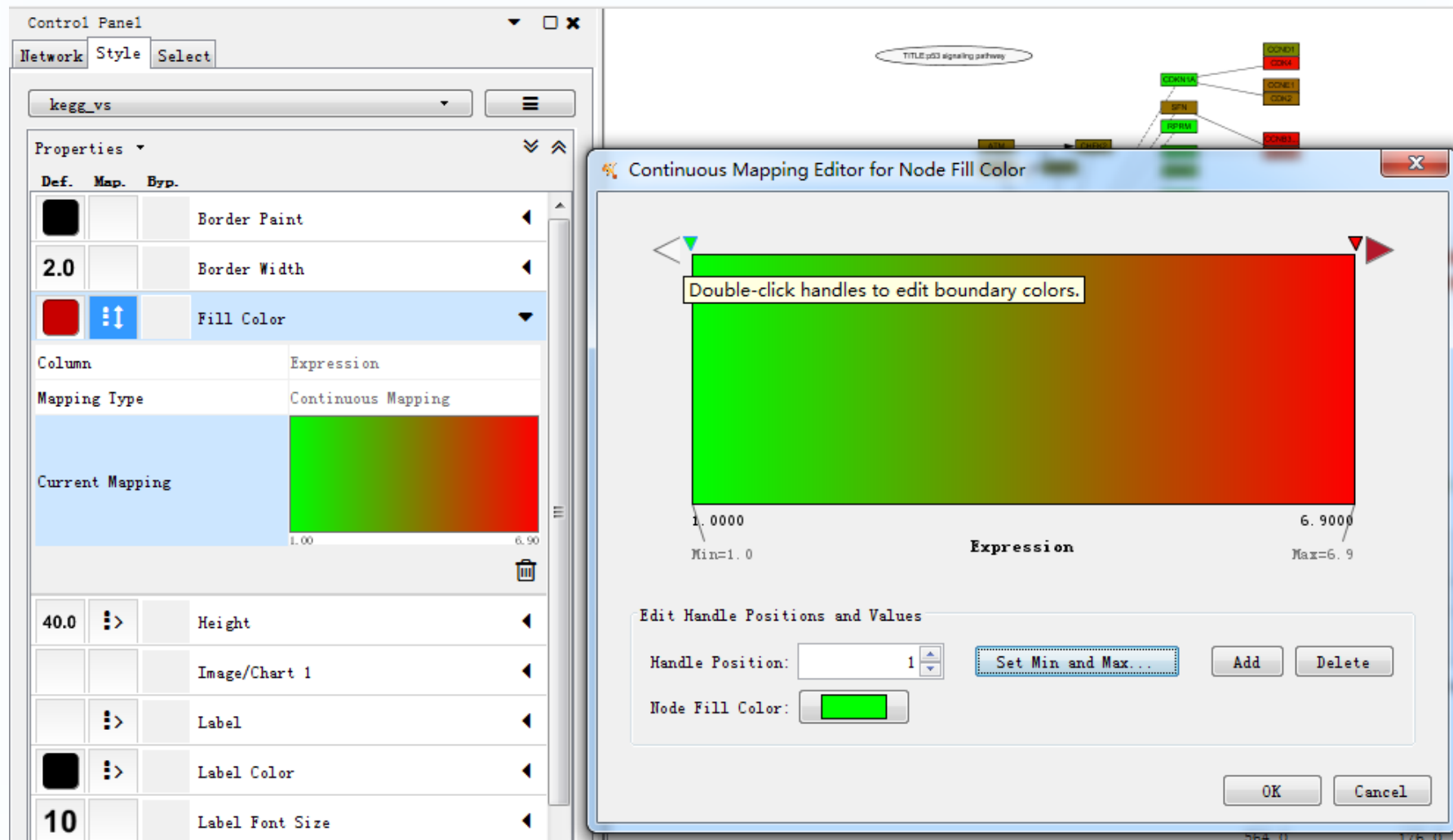
Advanced Options...

OK Cancel

宏基因组

信管类

# 基因表达量的映射



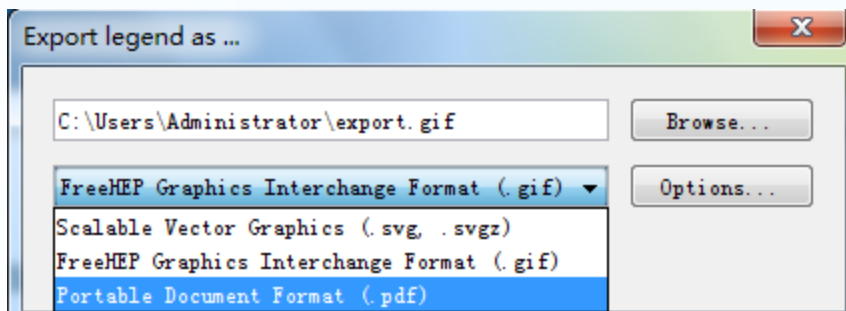
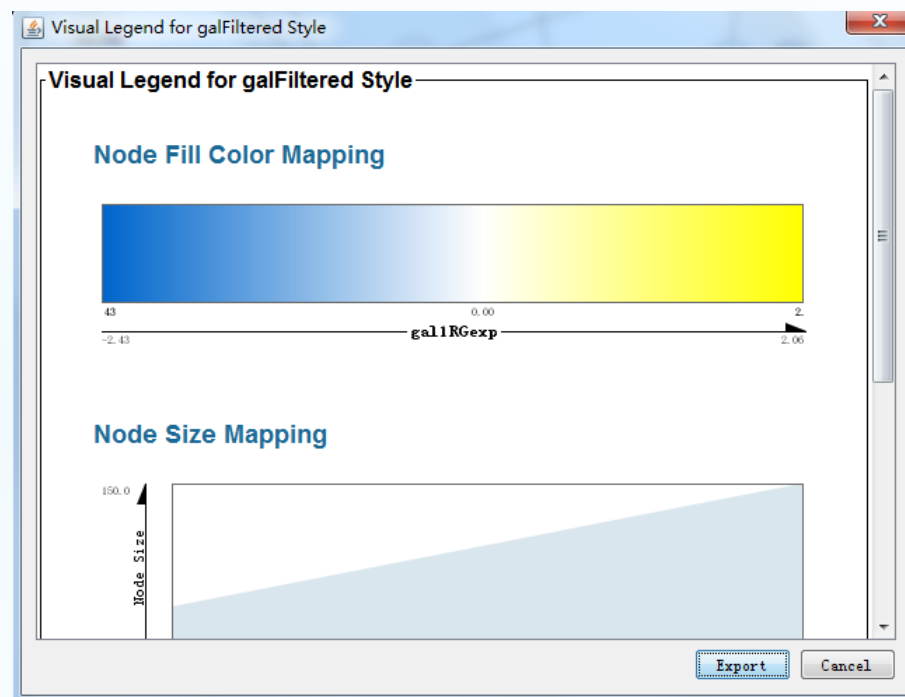
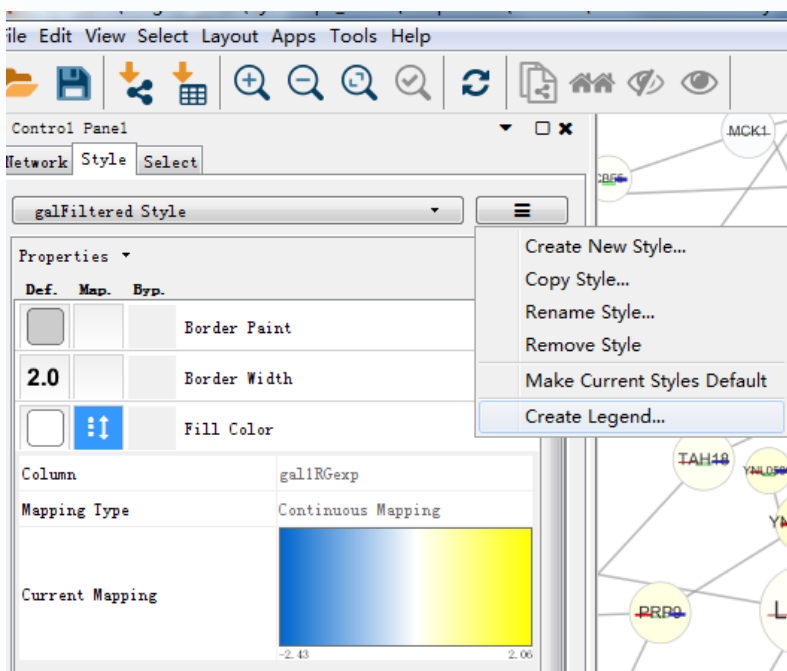
宏基因组

易生信

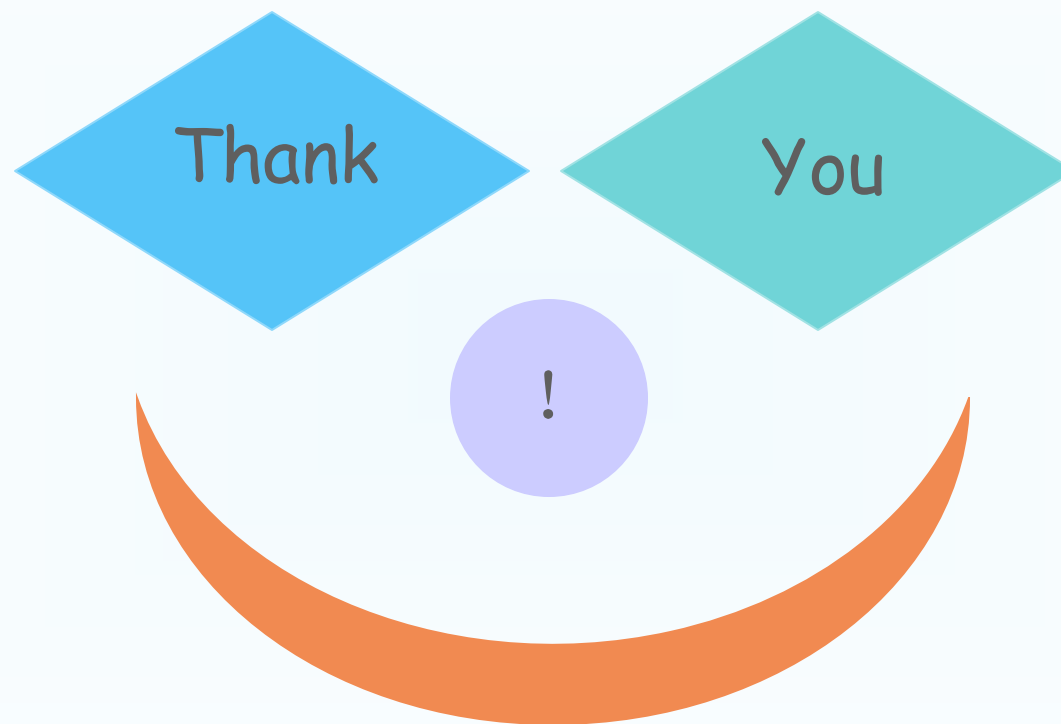




# 导出legend



# Practice makes perfect!



宏基因组

生信宝典

易生信