

# Biopano 3

User Guide

## About biopano

BioPano is a data visualization open source software platform specially designed for biologists, which can be used to show gene regulation and metabolic network. It can help you build up a gene regulation and metabolic network quickly and efficiently, as well as easily modify existing network, and share their own information with others to help them. You can also use the analysis tools in the software to analyze the network, to explore the relations among nodes, to help yourself think, and therefore help you with your research. Meanwhile, you can also export the network in our software into other formats and make use of a more powerful network analysis tool to gain a deep understanding of the network.

## How to get biopano

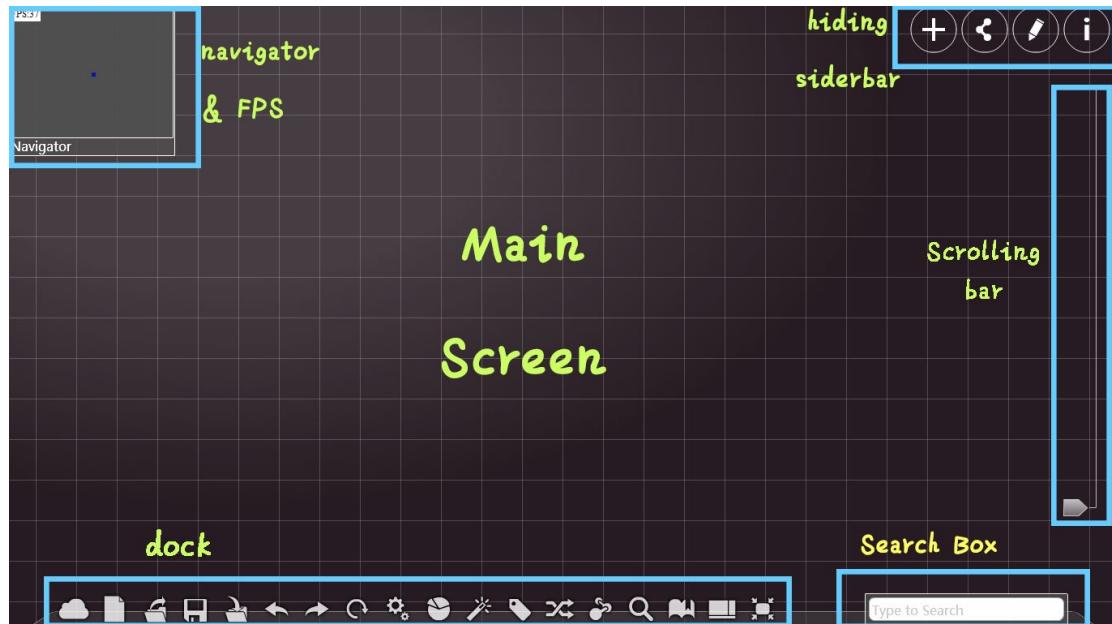
Download from [www.biopano.org](http://www.biopano.org)

## Copying Right

The software comply with BSD open source license. For further details, see "copying" with our software.

# Overview

When you open our software, you can see:



**Notice:**

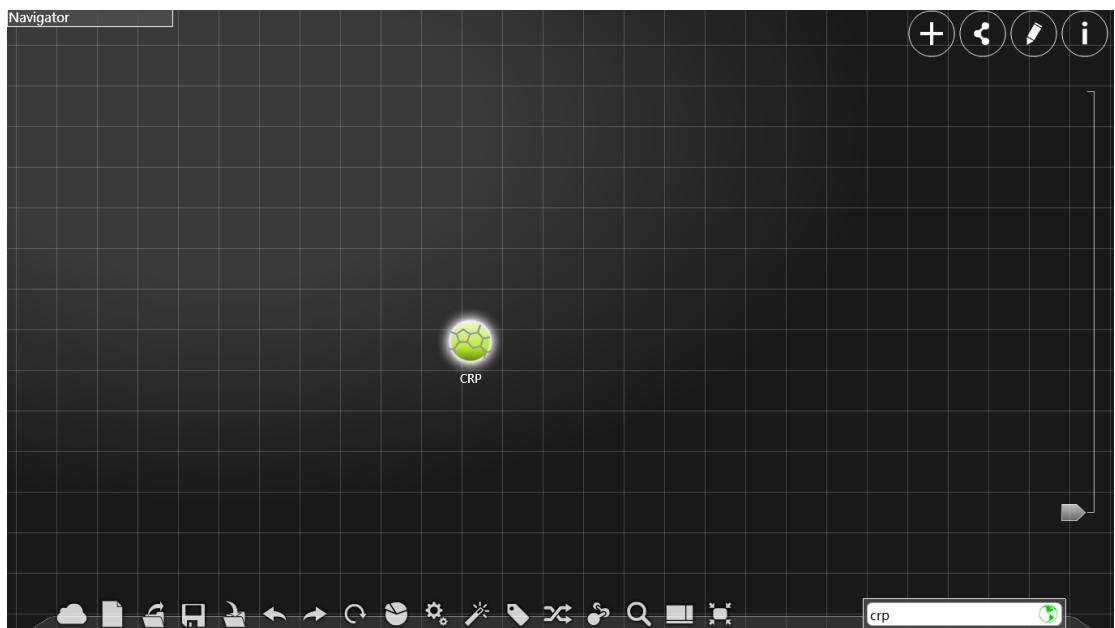
1. In this article, whenever we say "click" we always mean clicking the left button of the mouse once, while when we say "double click" we mean clicking the left button of the mouse twice)
2. some picture in this article aren't based on the newest version, but don't influence your reading

# Main Screen

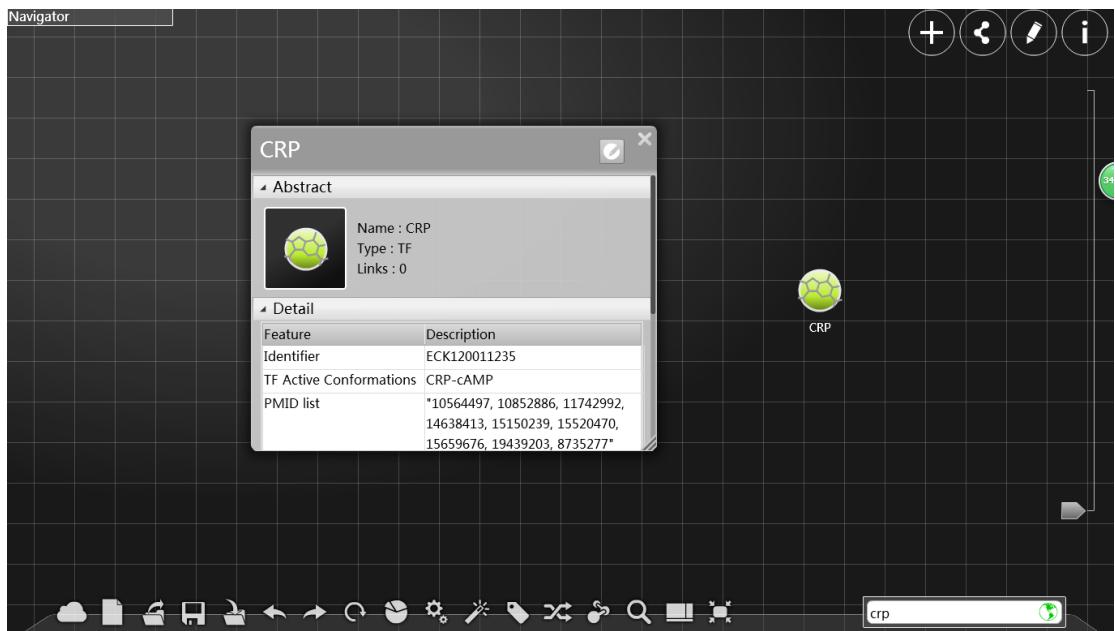
## Operation on nodes:

Press the right button of the mouse and drag it to the targeted position.

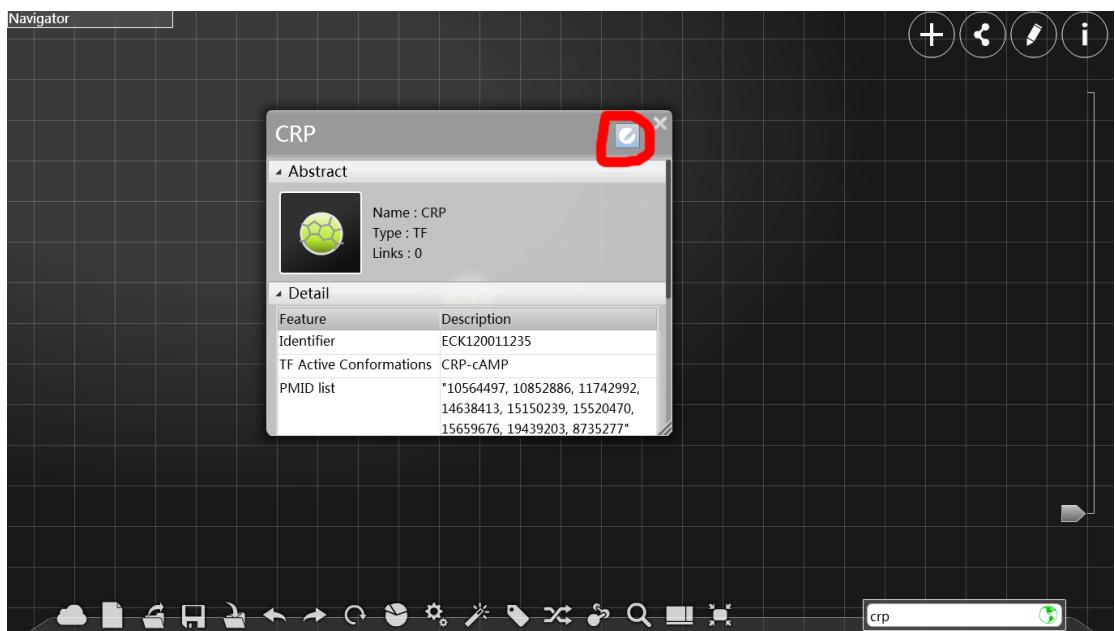
Do not release it until it is move to the targeted spot. (The white fluorescent around the node means that the node is selected )



Double click the node to display the detailed information of it in an information window. (Please make sure that the network condition is good)

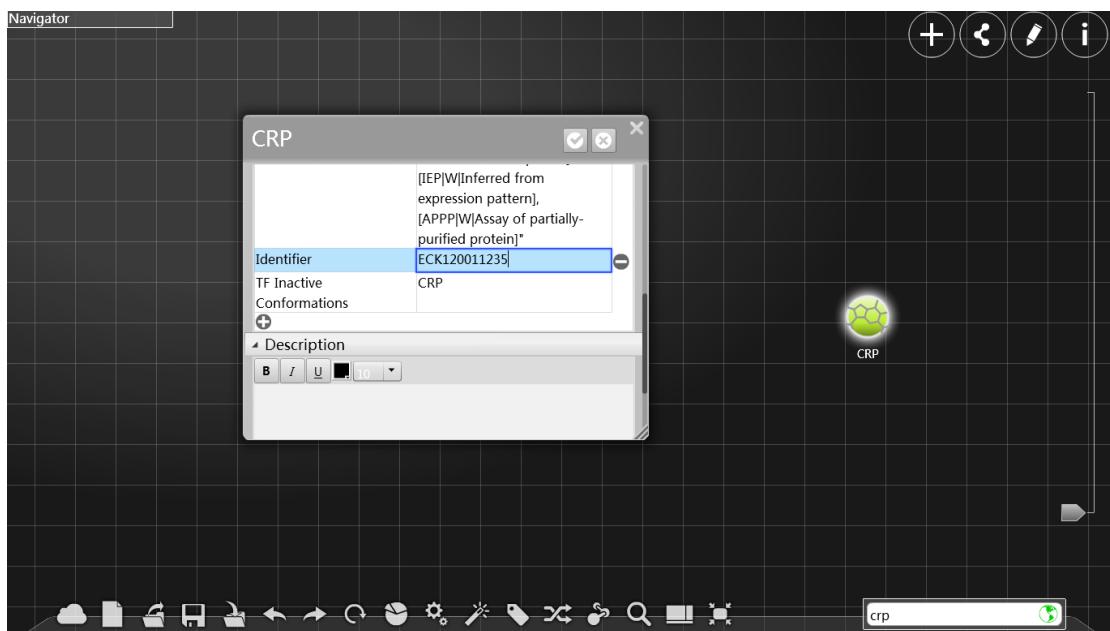


Click the "edit" icon in the information window to edit the information of the node.

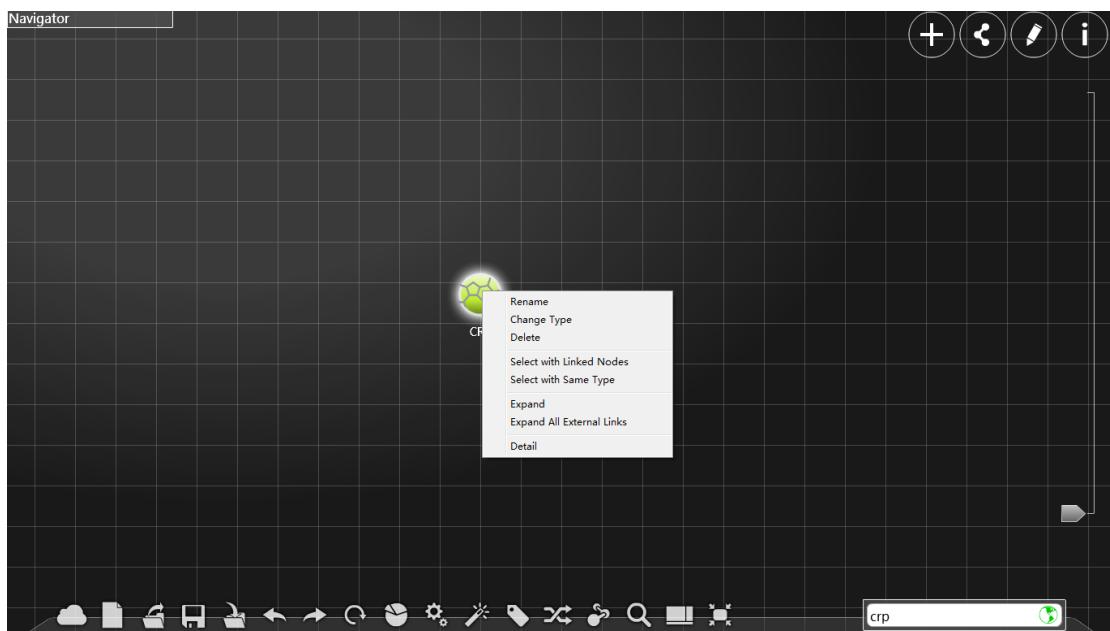


Click the "node" button, you can modify the property values and its property names. Click the "-" sign on the end of each row of the property table to delete the relevant property. You can also click the "+" sign to

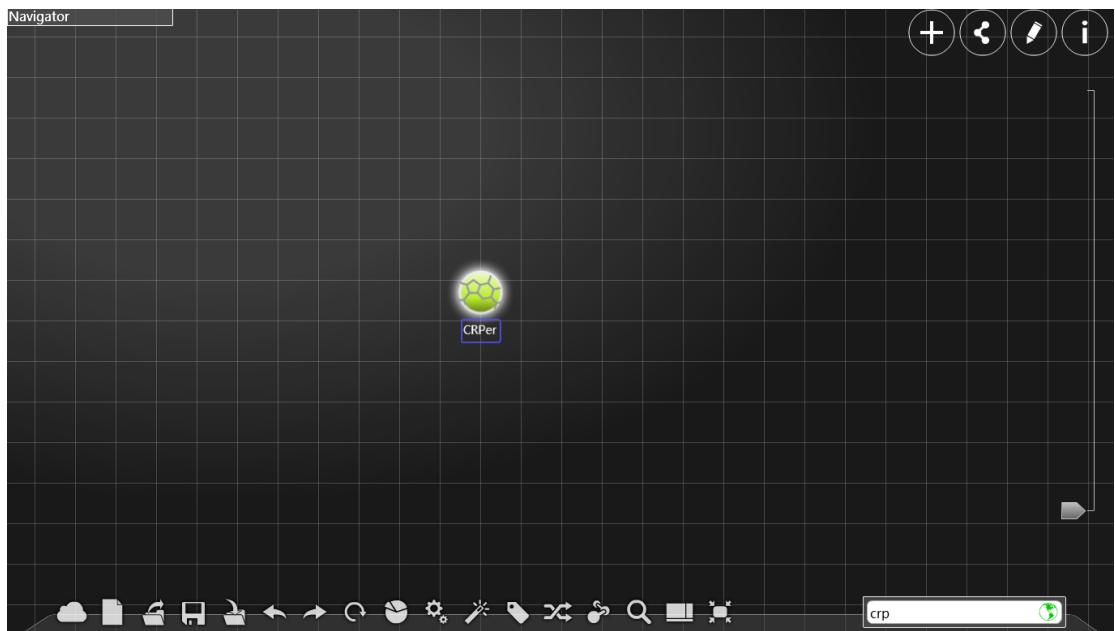
create a new property.



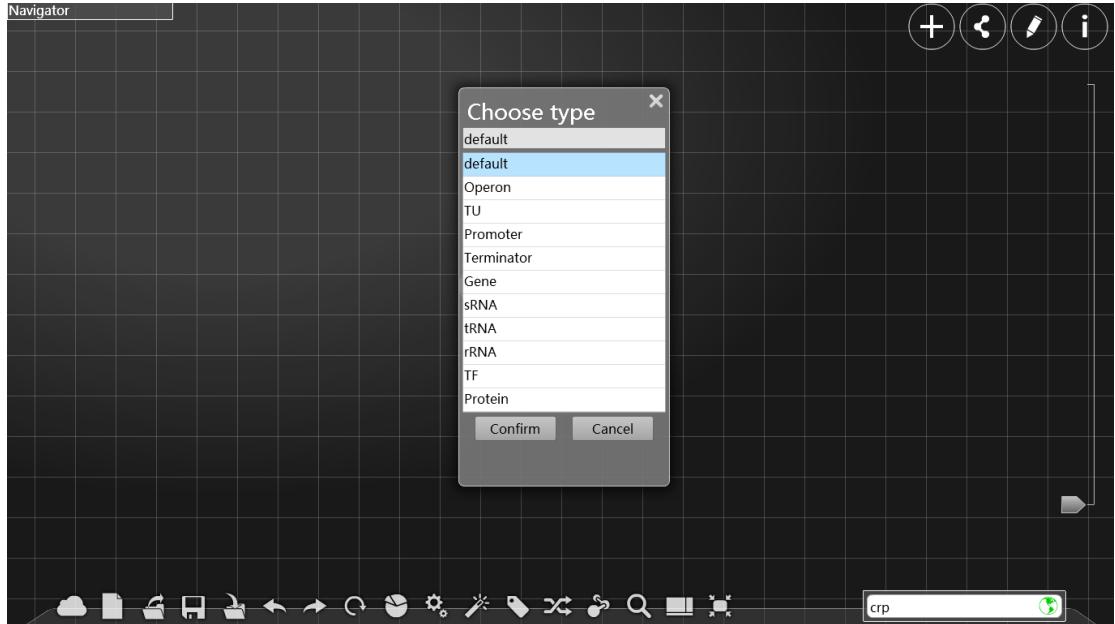
Click the right bottom of the mouse on node to see a menu for the node.



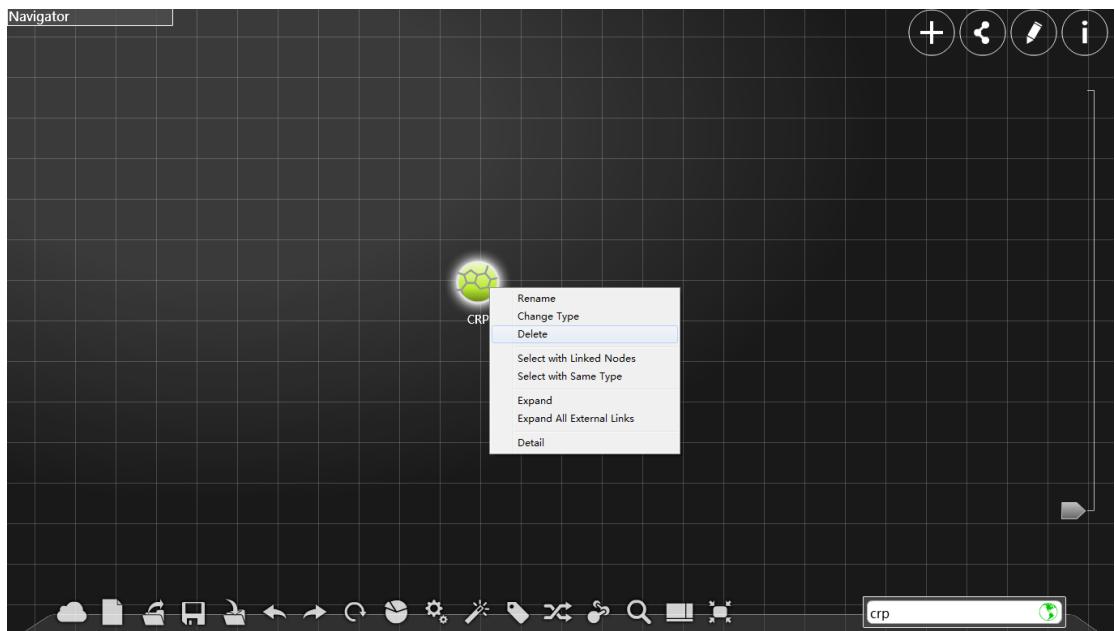
**Rename:** Click "rename", and then you can input the new name in the blue input box.



**Change type:** Choose and click one type in the sub-window list, and then click "confirm", the type of this node will change into your optional type.  
Click "cancel" to exit the sub-window.

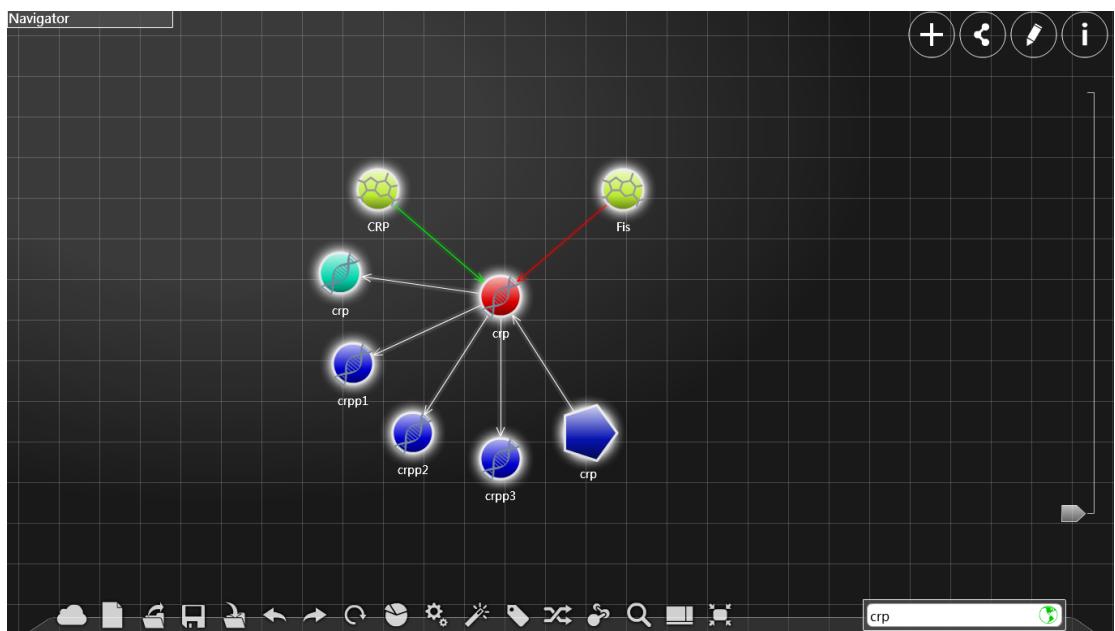


**Delete:** Delete the node.



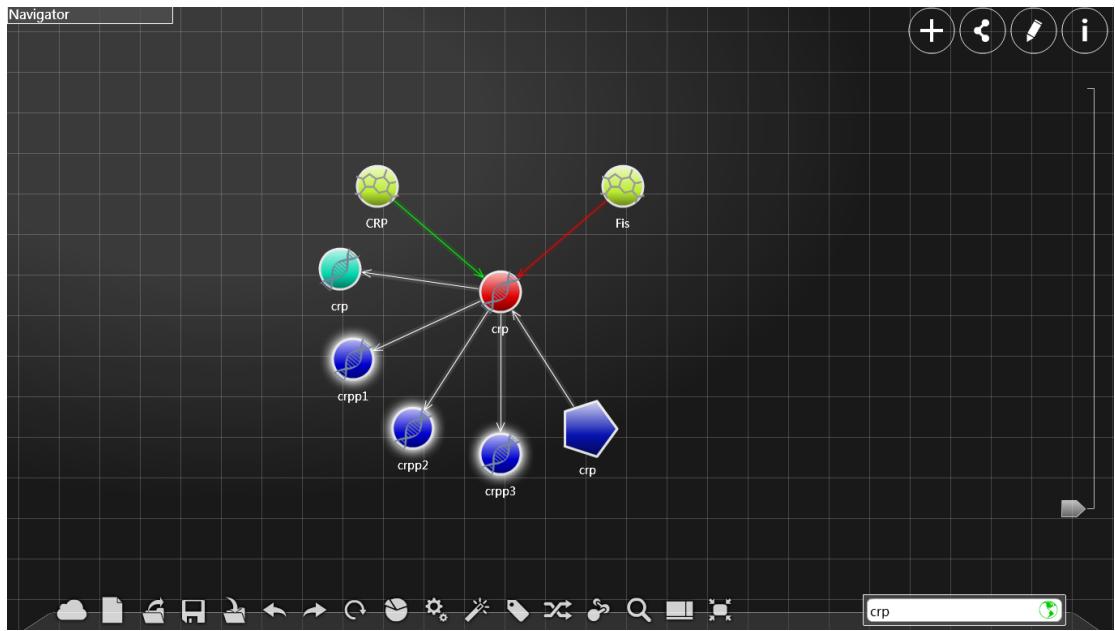
## Select with linked Node:

Click it, you will select this node and all node linked it.

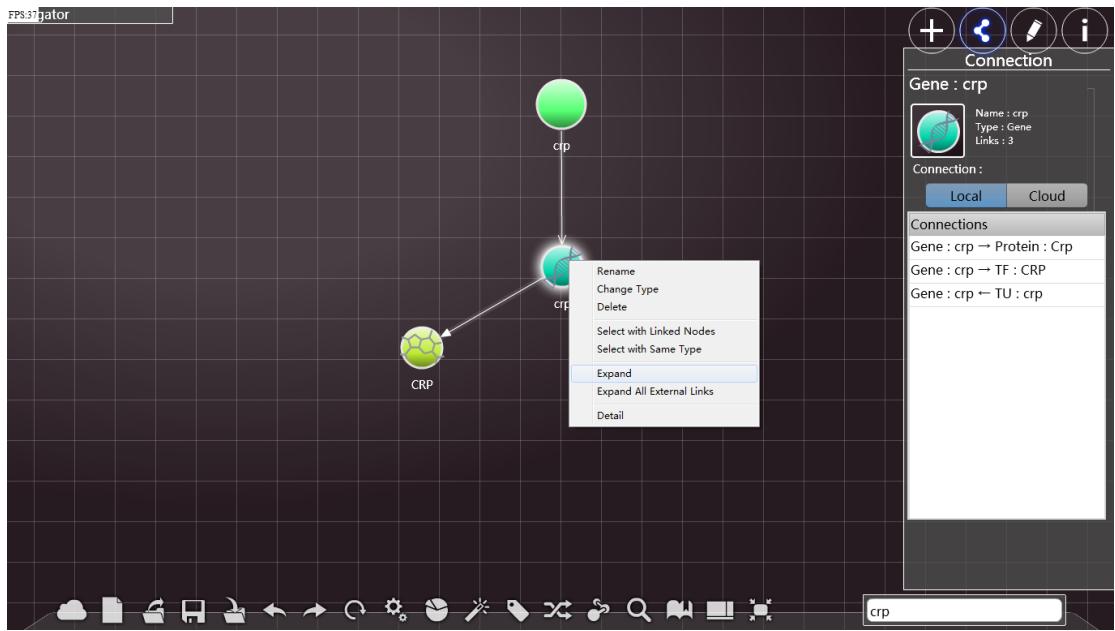


## Select with Same Node

Click it, you will select all node which types is the same as your selected node in main screen.



**Expand:** Selectively expand the network according to the links in the database based on this node. For advanced functions of expansion, see "<" sidebar.

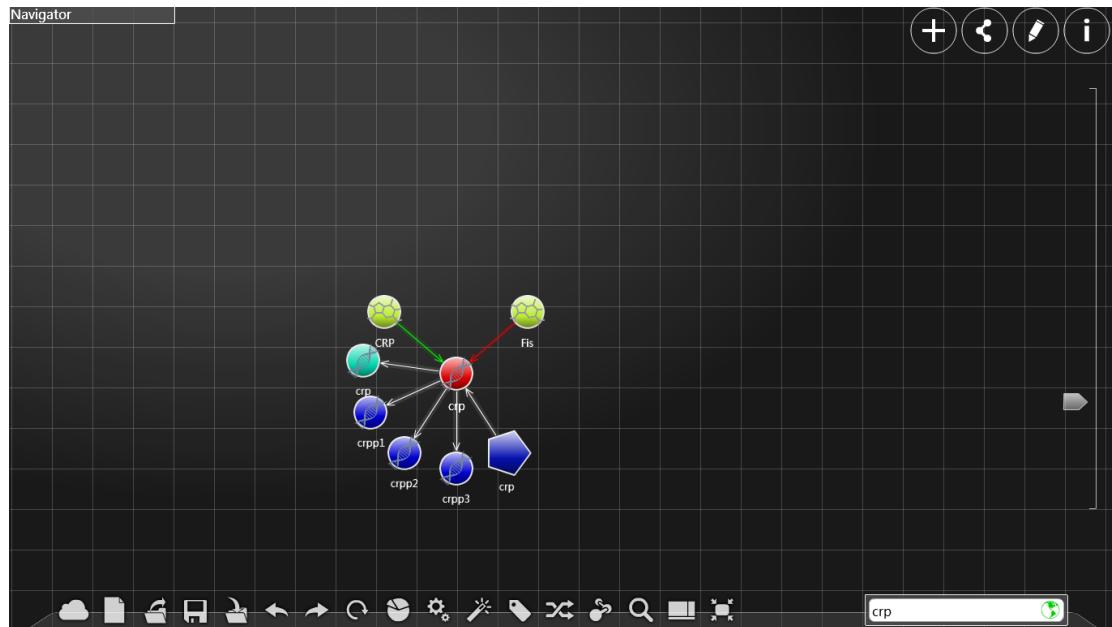


**Expand with all external links**

Expand the network according to the links in the database based on this

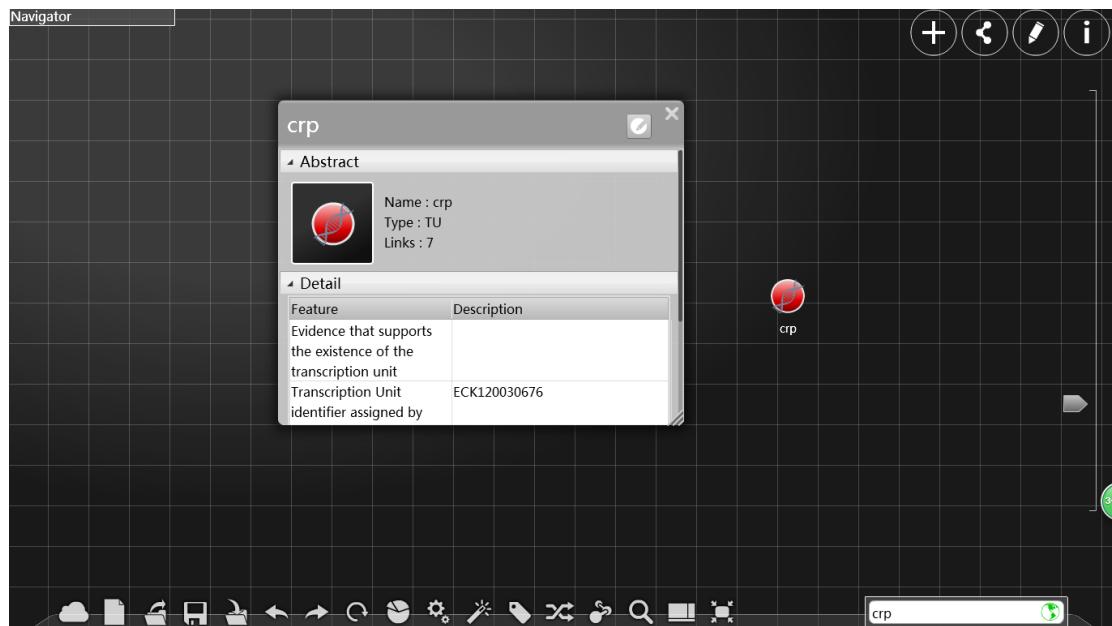
node. (Please make sure that the network condition is good)

(The picture below shows the effect of crp expansion)



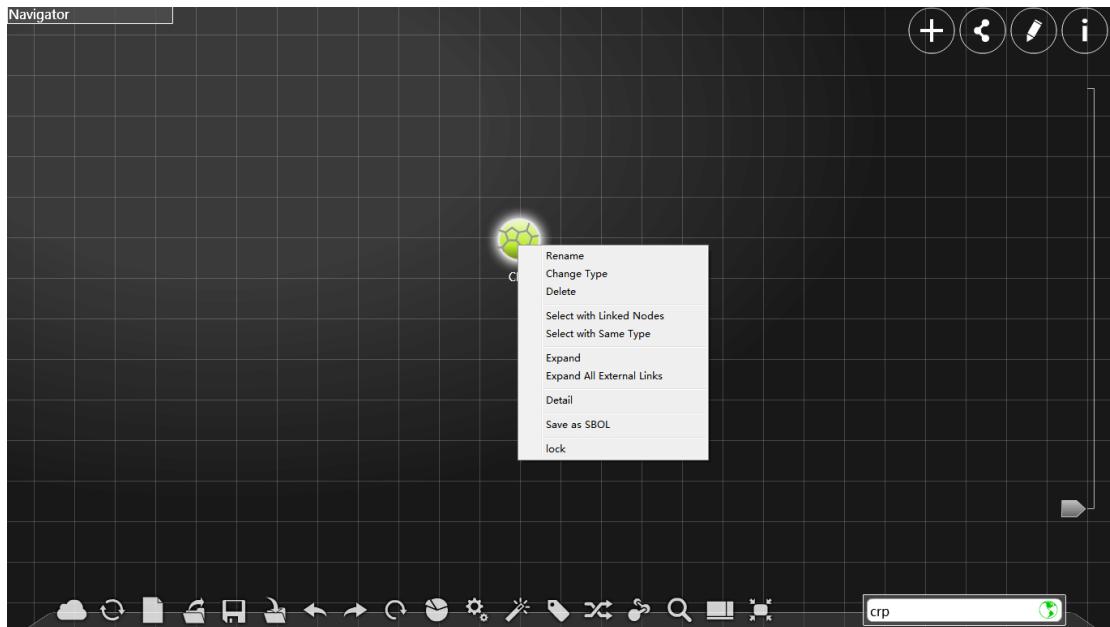
Detail: Display the detailed information of the node. (Please make sure

that sure that the network condition is good)



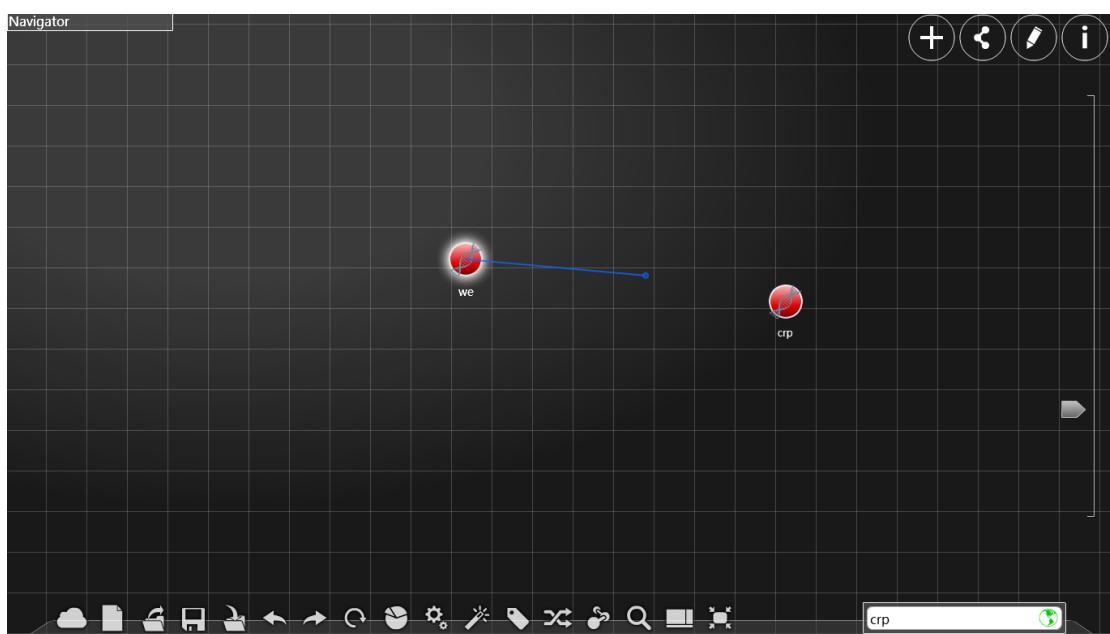
Save as SBOL

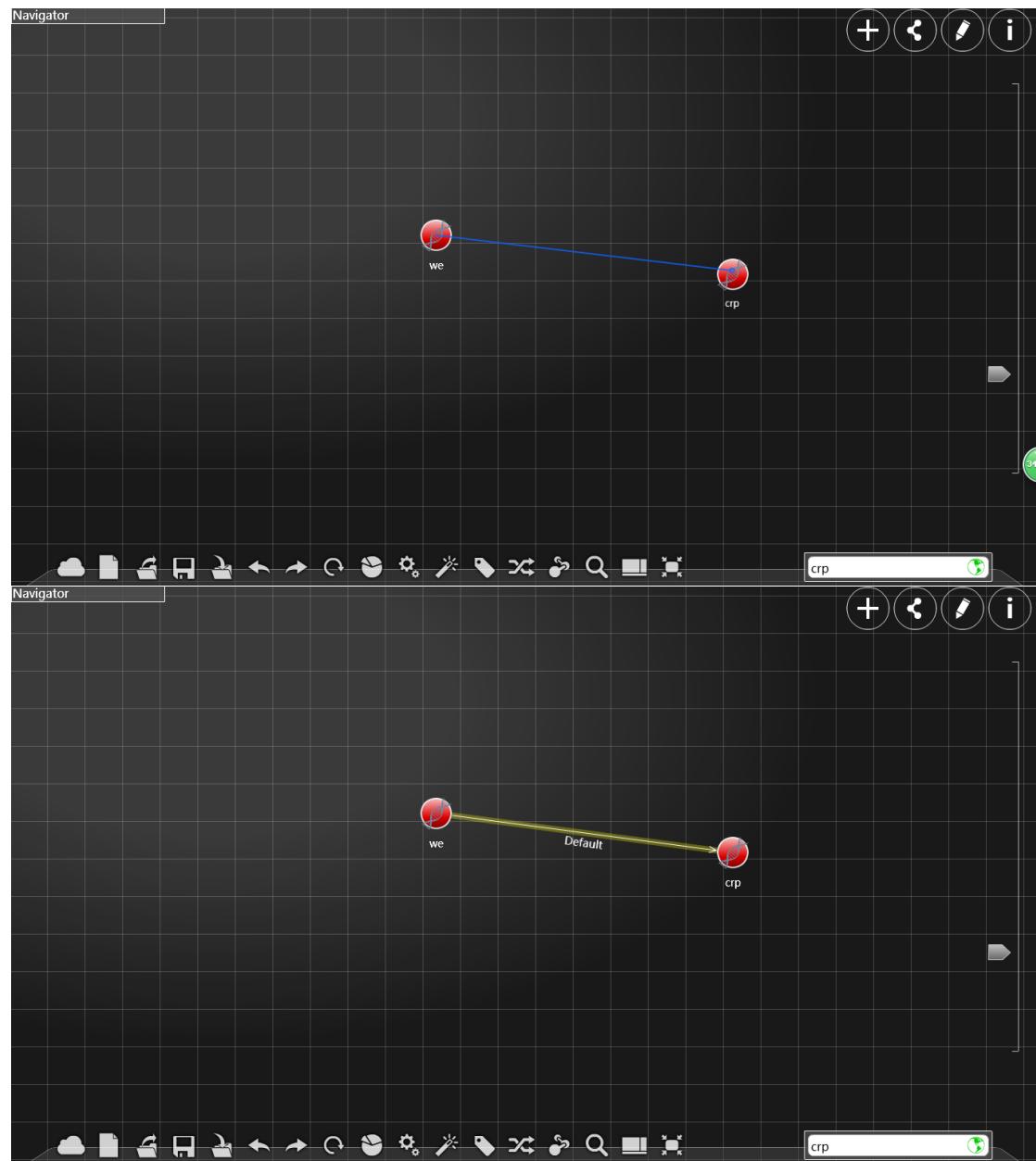
Save detailed information of a selected node as a SBOL file.



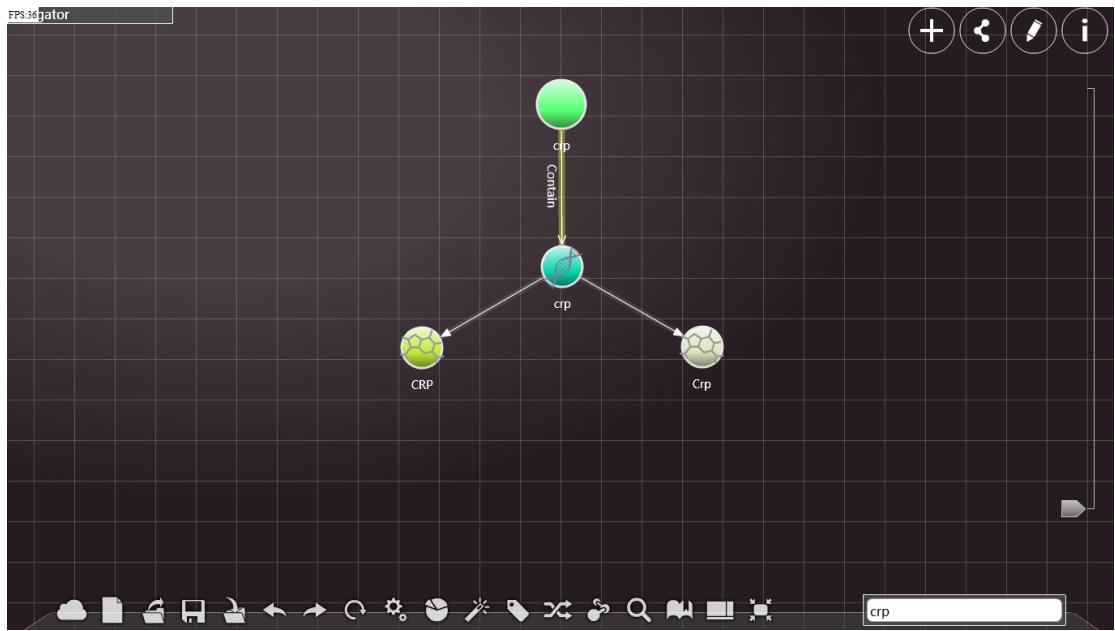
### Operation on edges:

Create an edge. Press the right button of the mouse on a node and drag it so as to draw a line. Do not release the button until you reach the destination of the edge, and then you will have create a edge segment from the original point to the destination point.

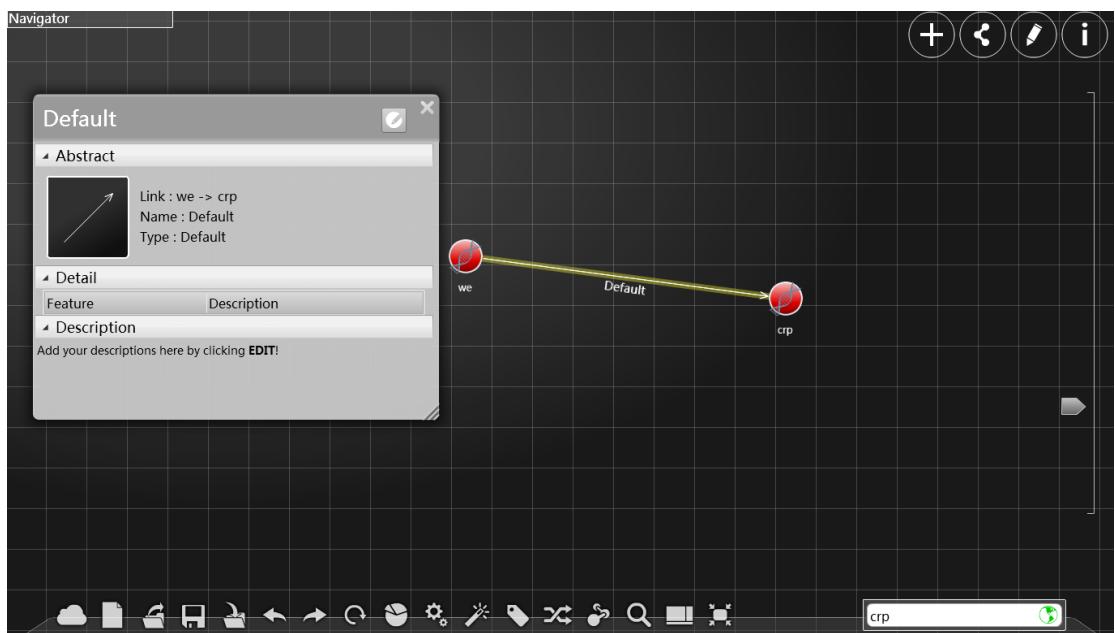




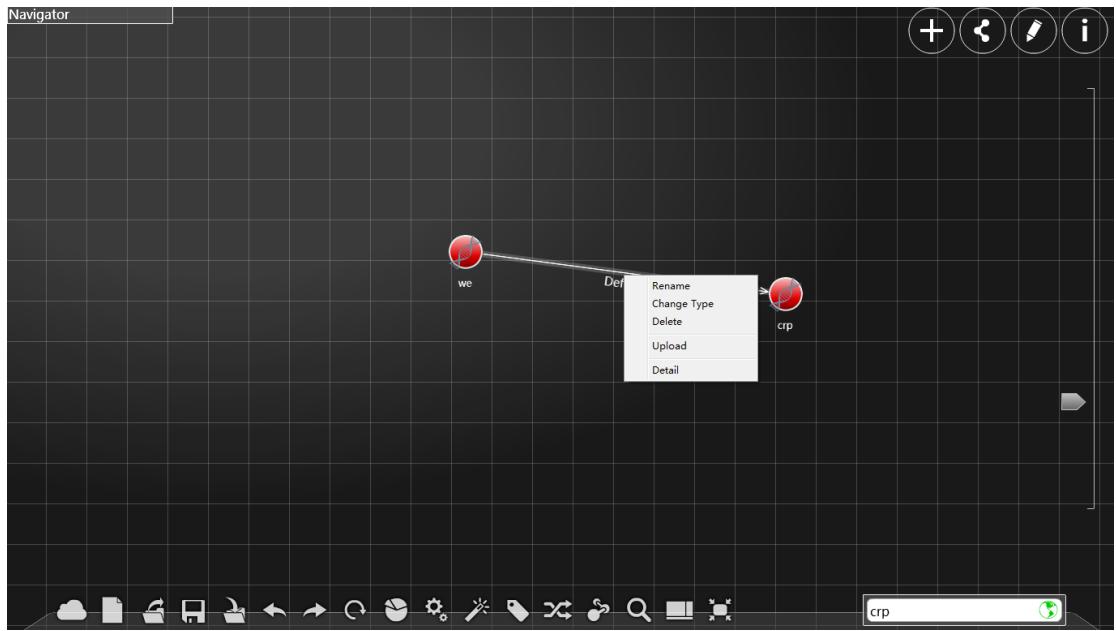
Click the edge and its name appear.



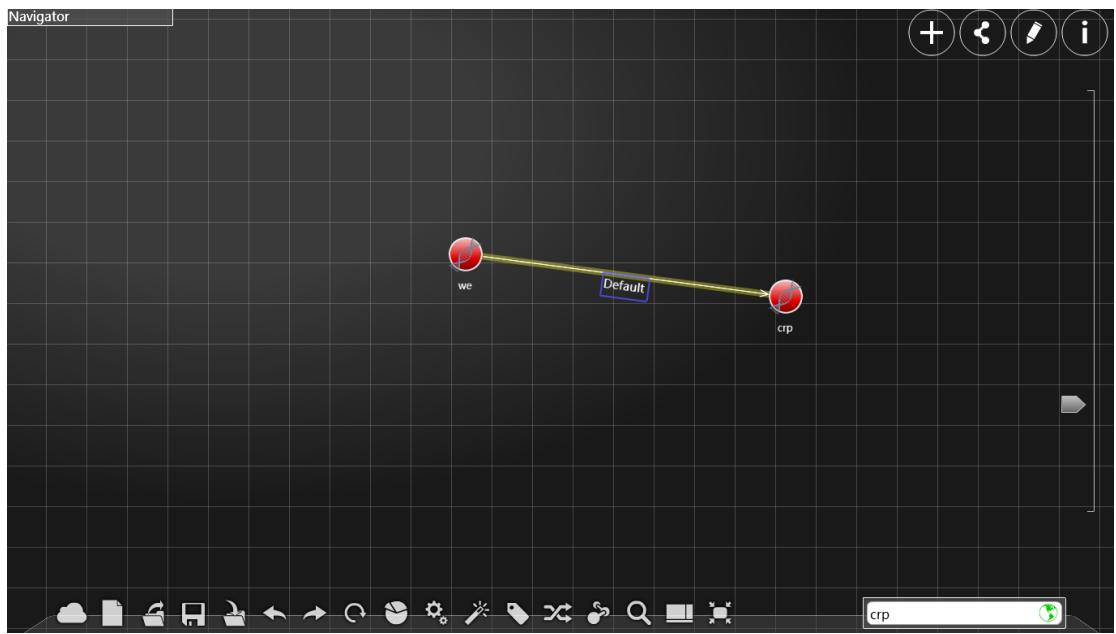
Double click the edge to see its detailed information in the information window.



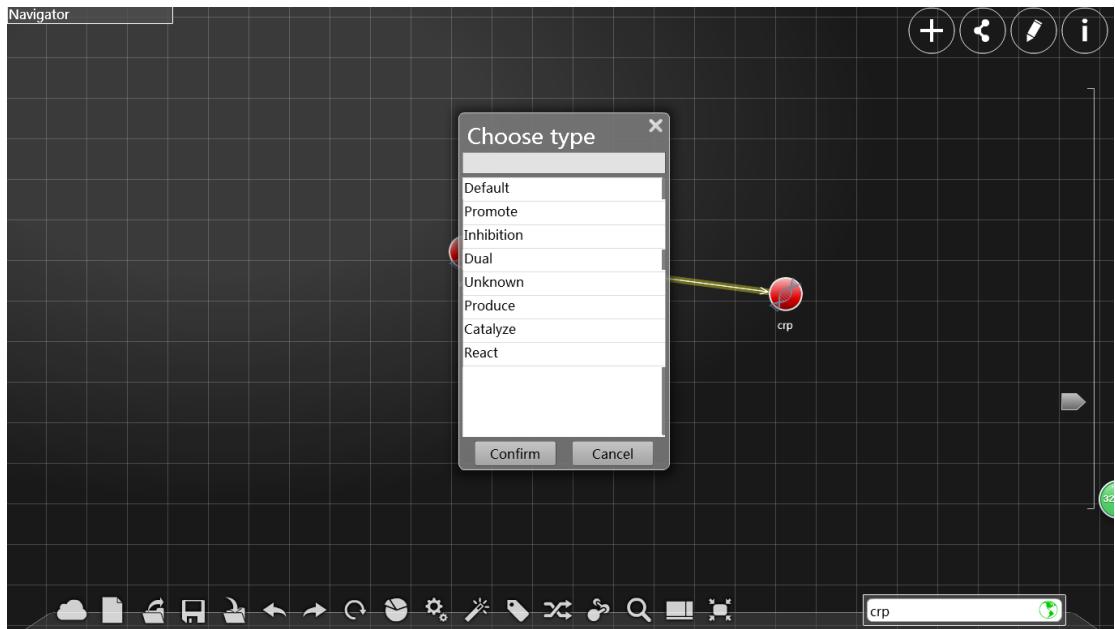
Click the line once in the right bottom of the mouse:



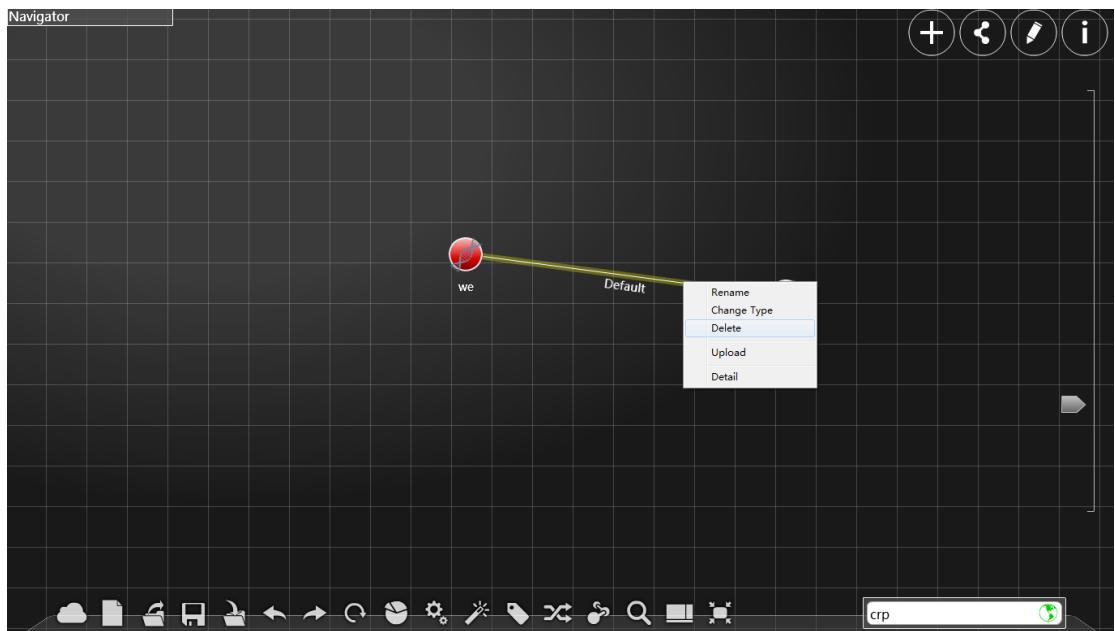
Click "rename" to input the new name in the blue input box.



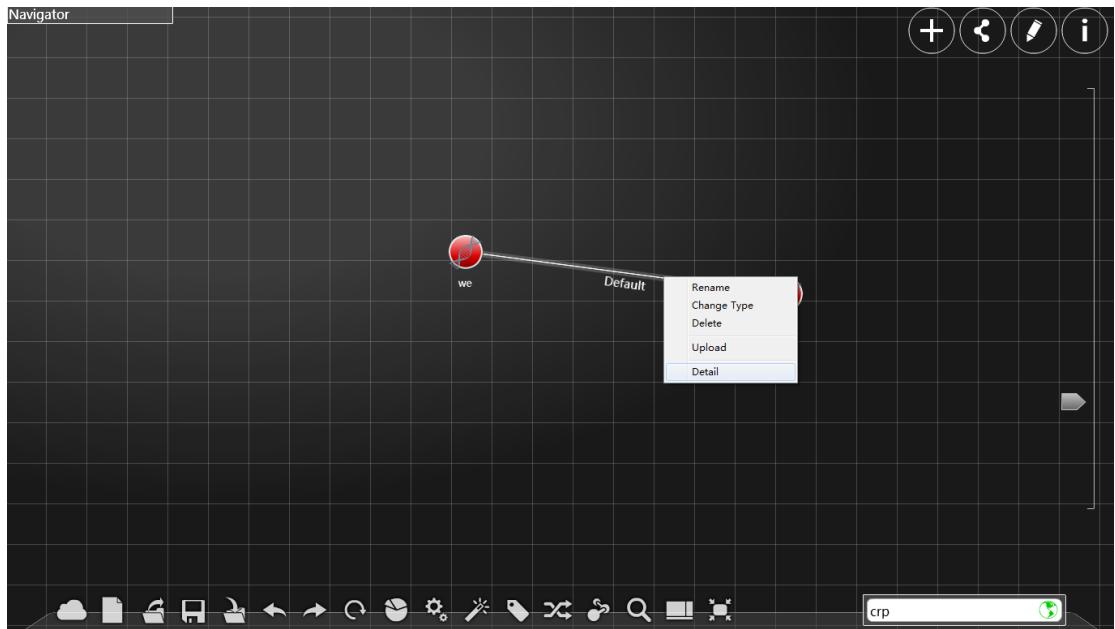
Change type (just like the change of node's type)



**Delete** : Delete this edge

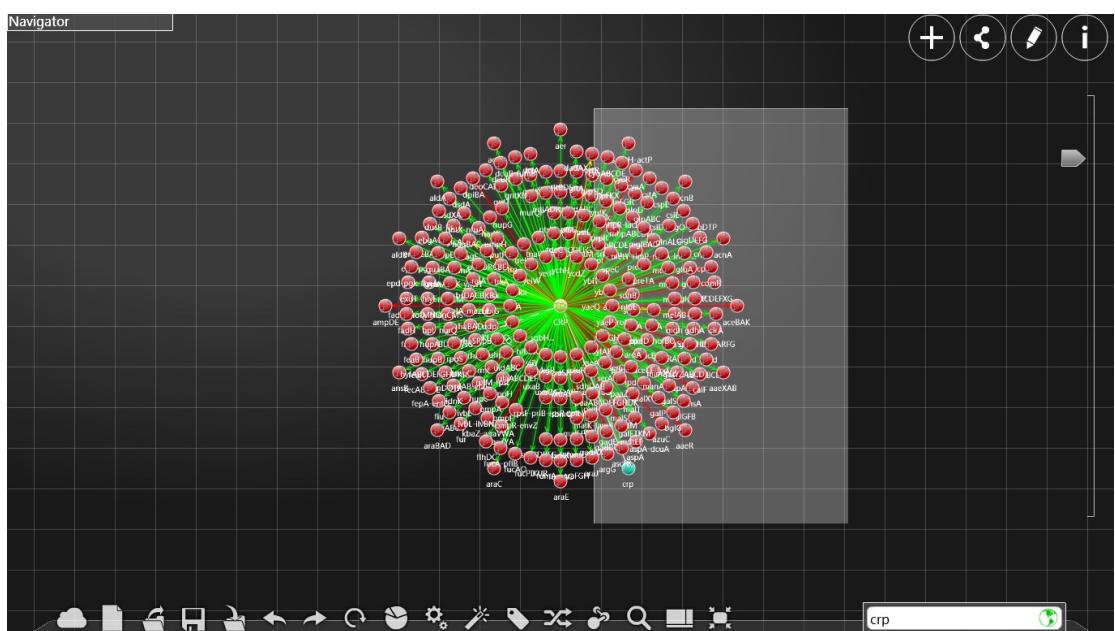


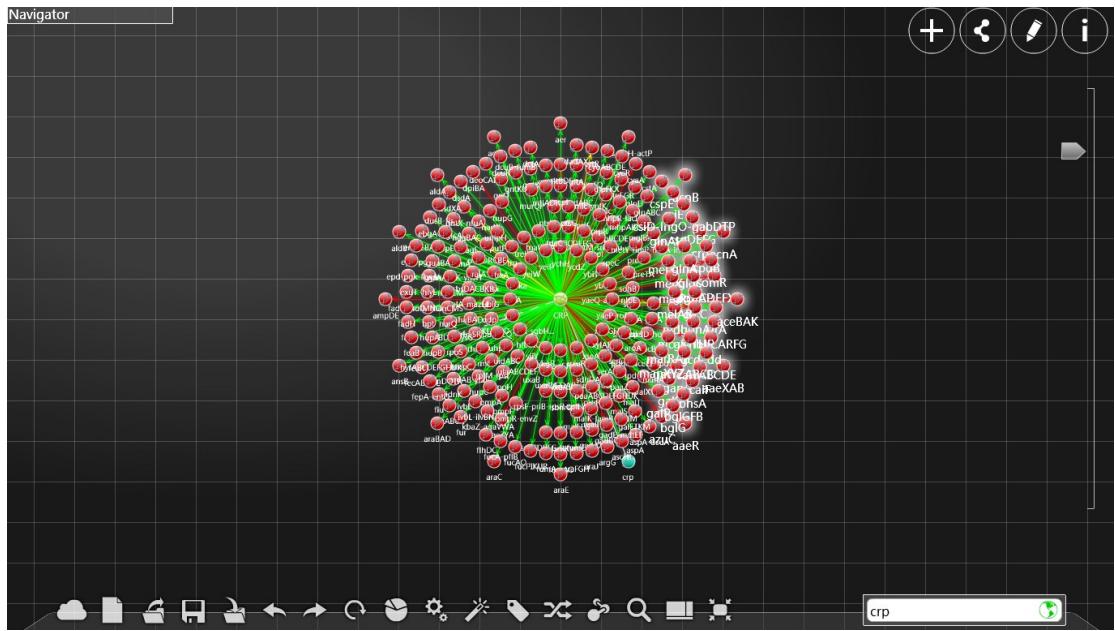
**Detail**: Display the detailed information of the node. (Please make sure that the network condition is good)



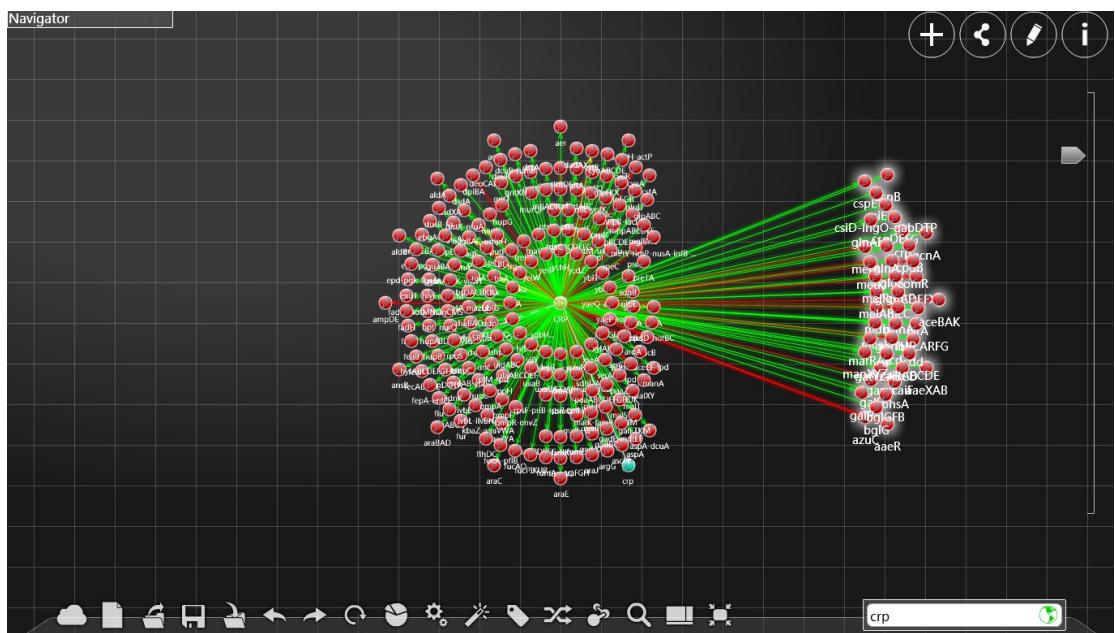
## Operation on areas:

Press the right button of the mouse and drag it to create a rectangular area in the vacant region. Once you release the button, you will have selected all the points in the area.





Select more than one to drag the areas or delete the points. (The relative positions of the points will not be changed.)



## Shortcuts

Ctrl-s save as xml, see "save" in the "dock" portion

Ctrl-o open a local file, see "open" in the "dock" portion

Ctrl-Z undo, see "undo" in the "dock" portion

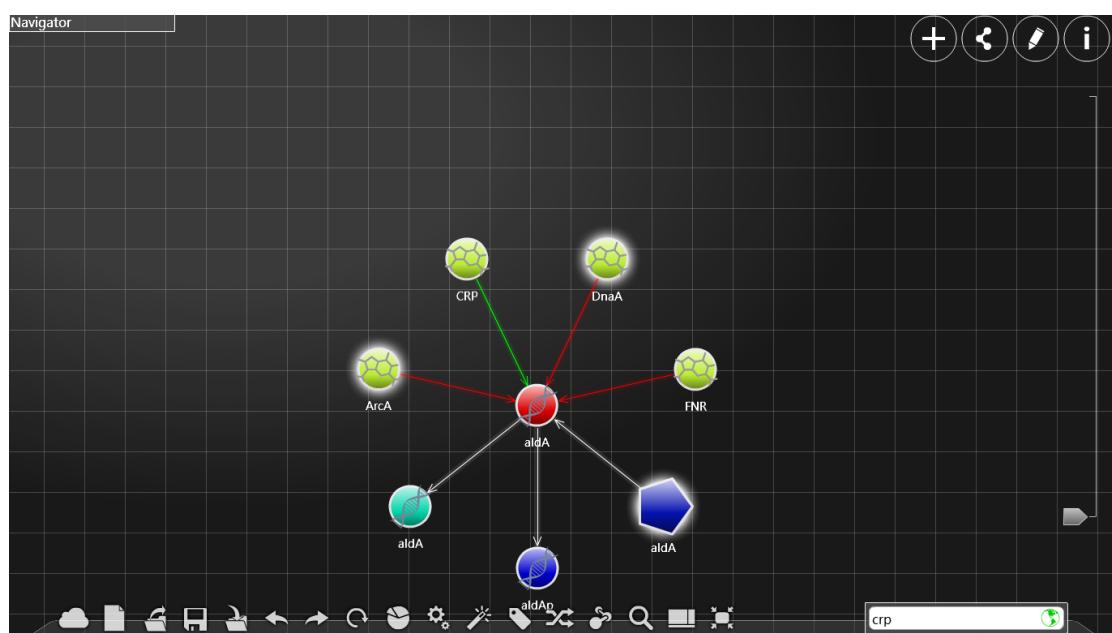
Ctrl-Y redo the operation, see "redo" in the "dock" portion

Ctrl-F search, see "open" in the "dock" portion

Press the "Delete" key on the keyboard to delete the selected points or lines.

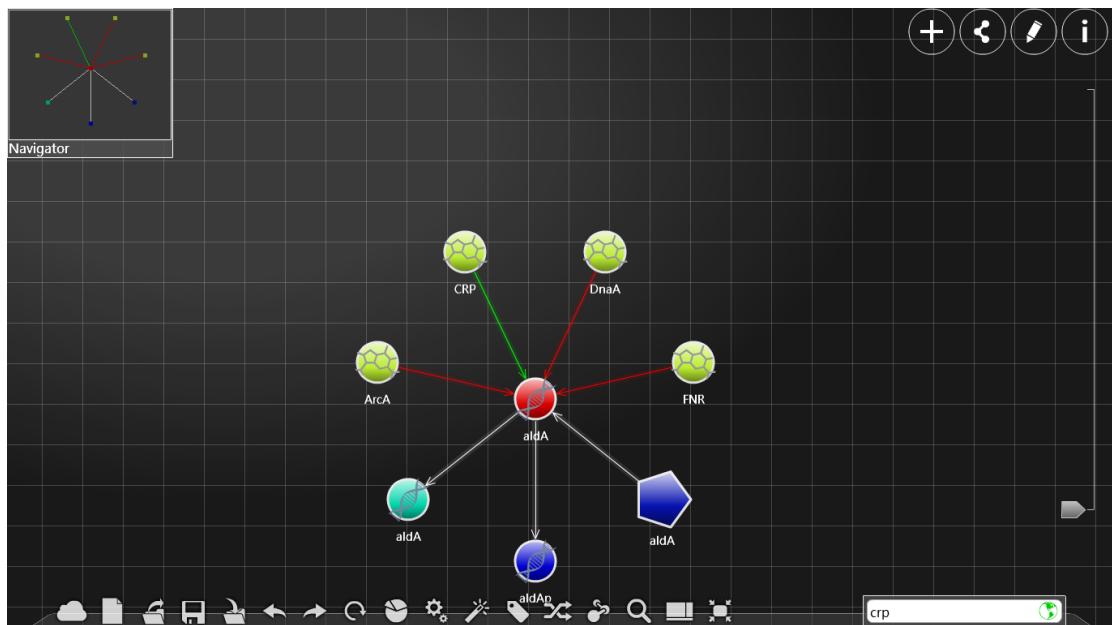
Select one point or line, and then press the "shift" button on the keyboard so that you can select more than one points or lines.

Press the "Esc" button on the keyboard to exit the full-screen mode, and if you have selected a point or a line, you can also press it to cancel that.



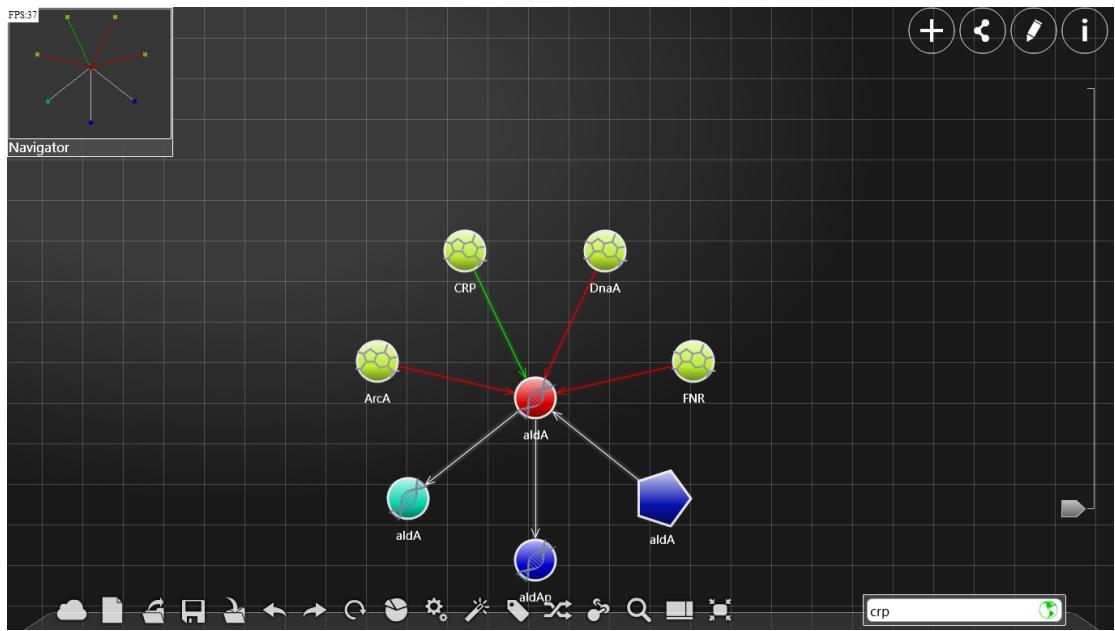
## Navigator

Click "Navigator" to open the small map. You can have an overview of the arrangement of the nodes and click once to quickly jump to the part of the graph you want to see.



FPS

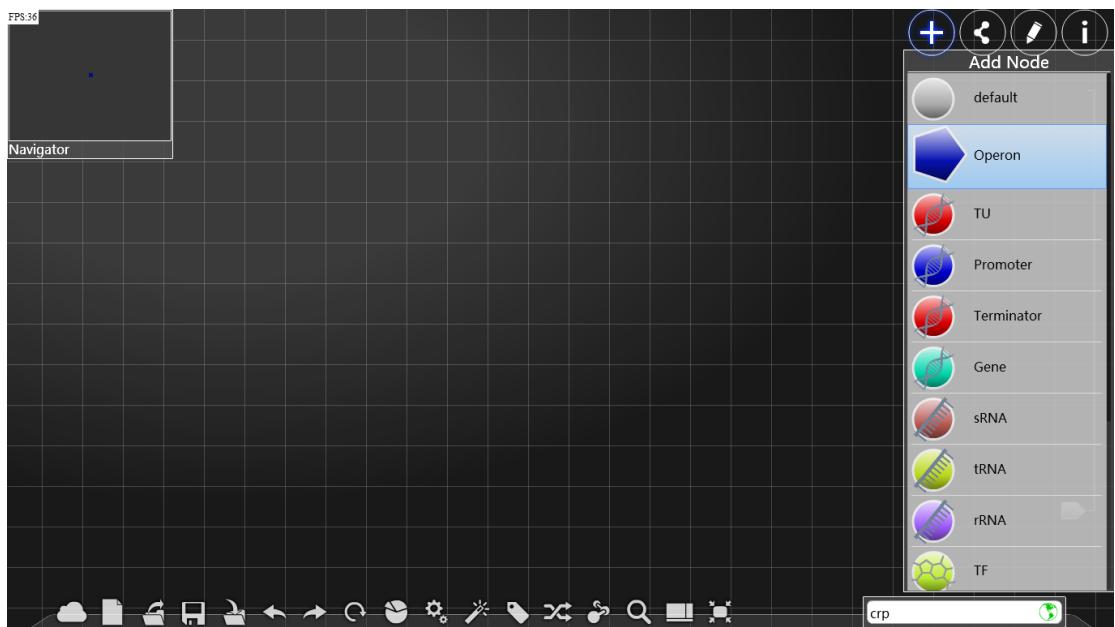
FPS means "frames per second", and usually this number is 36. You can choose to display or not to display it by clicking "show fps" in "Option" in "dock". For details, see the document on "Option" in dock.



## Hiding Sidebar

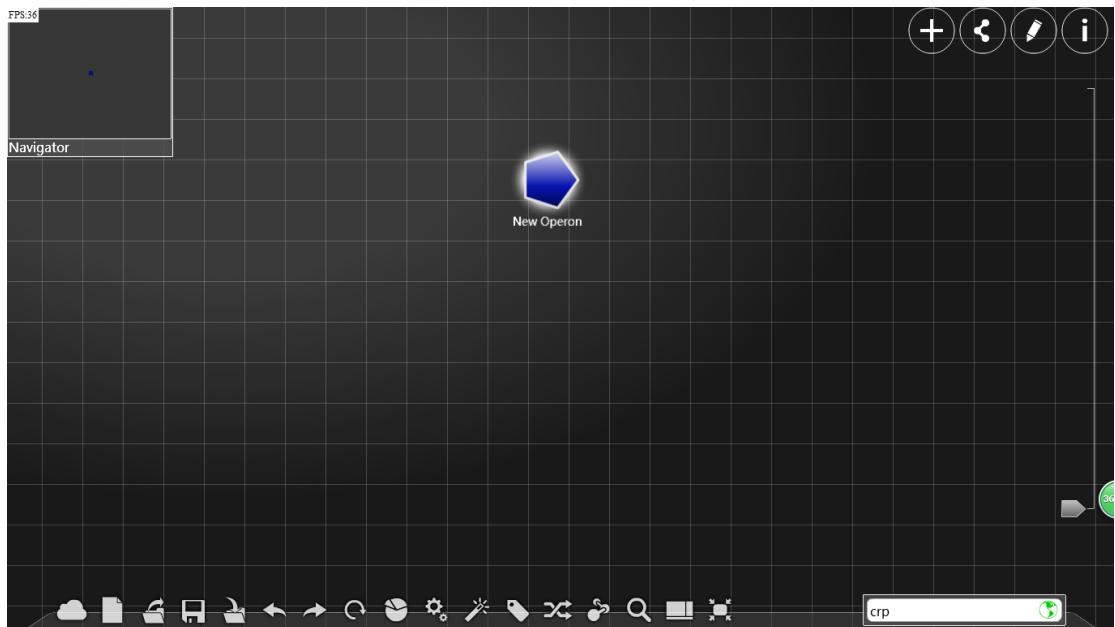
+

Click once and you will see "add sidebar".



Select the type of the new node and click once to see it, then choose a

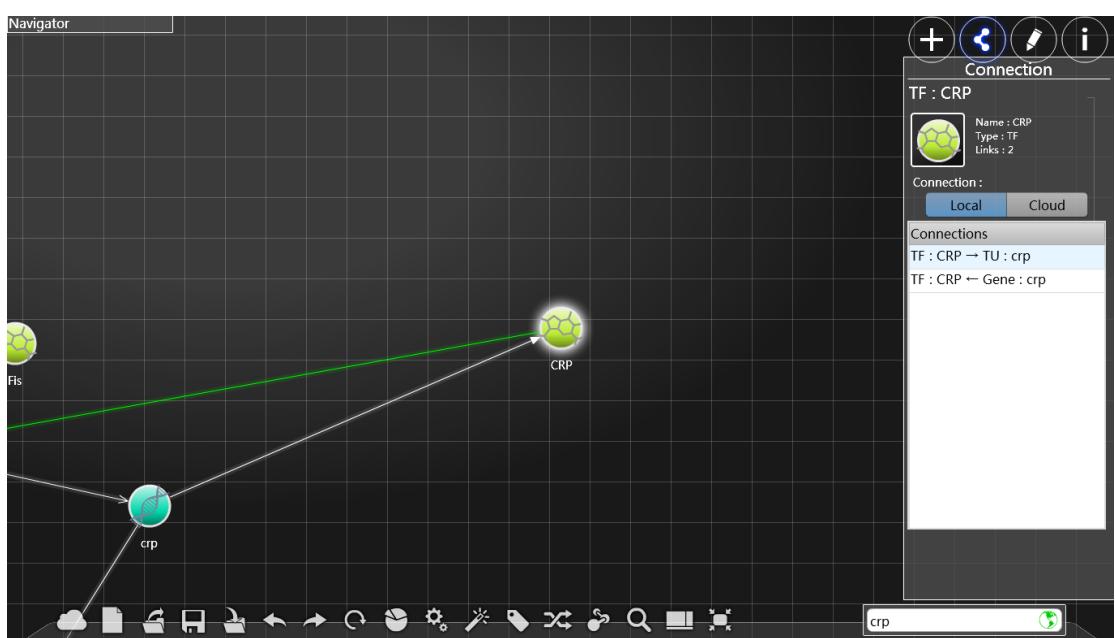
suitable area and click to create it formally. Then you can rename it.



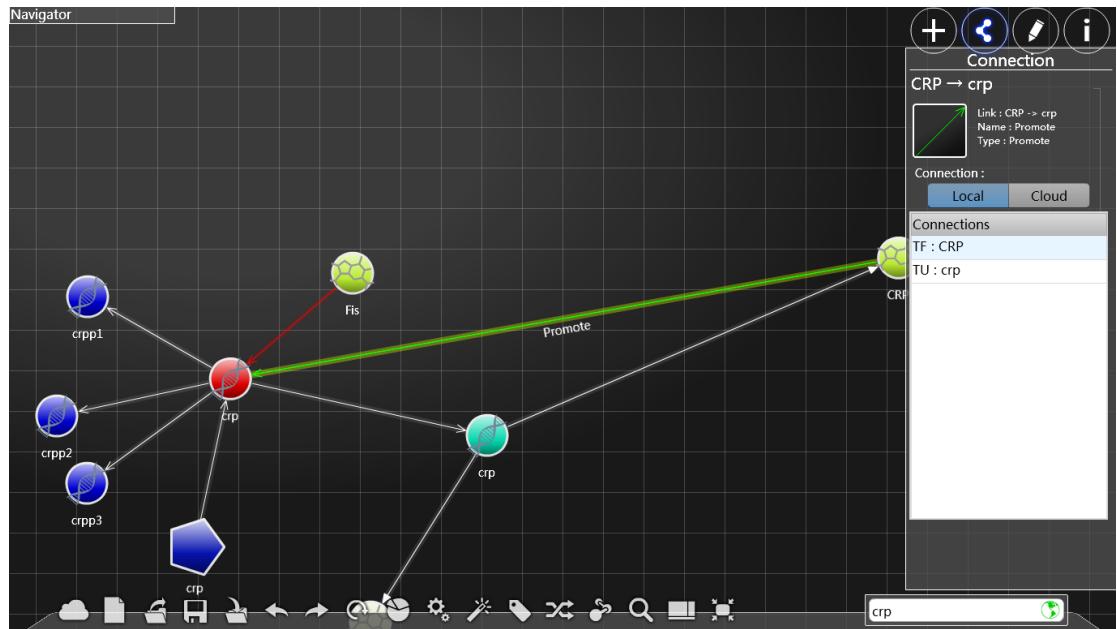
<

Once you have selected a certain node or a edge, click "<" to see the "connect sidebar", by making use of which you can see the points or the edges links to the node or the edge.

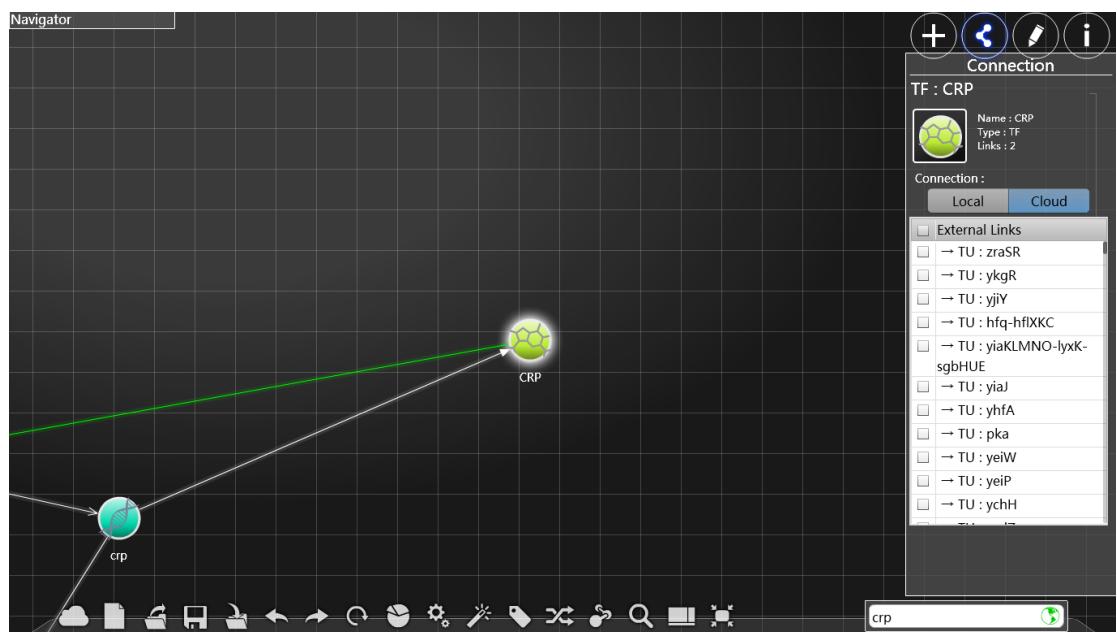
(The picture below shows all edges and nodes linked with crp)



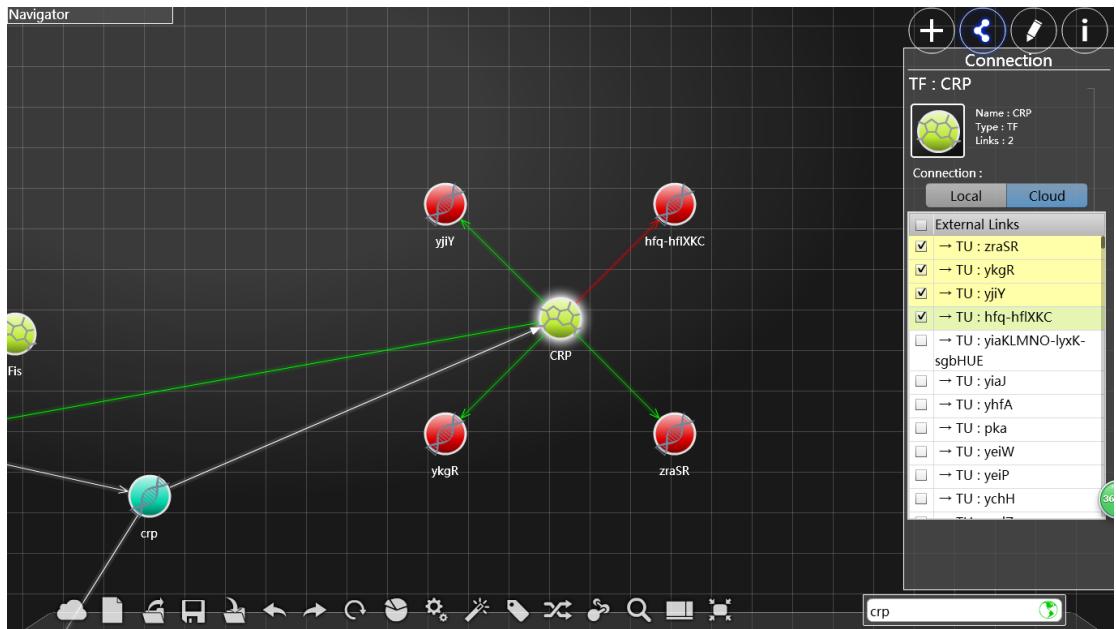
Click the corresponding node or edge and you can select the node in main screen or view the details of the edge or node.



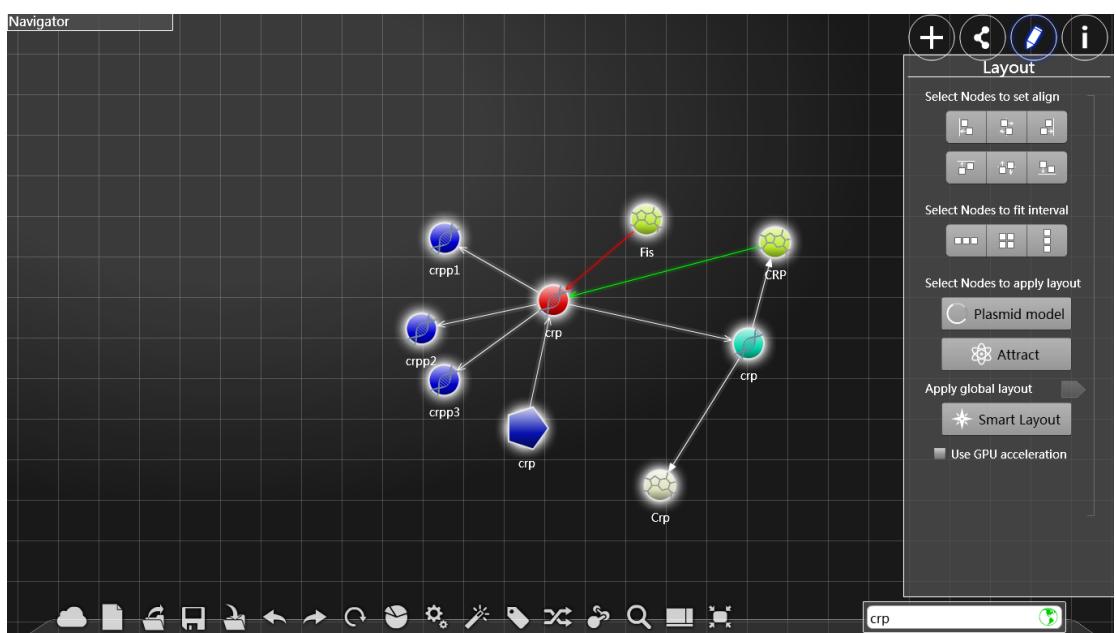
Click cloud, all nodes and edges in the cloud database that are connected with the node will be shown (please make sure the network connection is fine). The picture below shows all edges and nodes connected with CRP.



Click box before selected edges in list, the corresponding edges and the node will appear in the main screen.

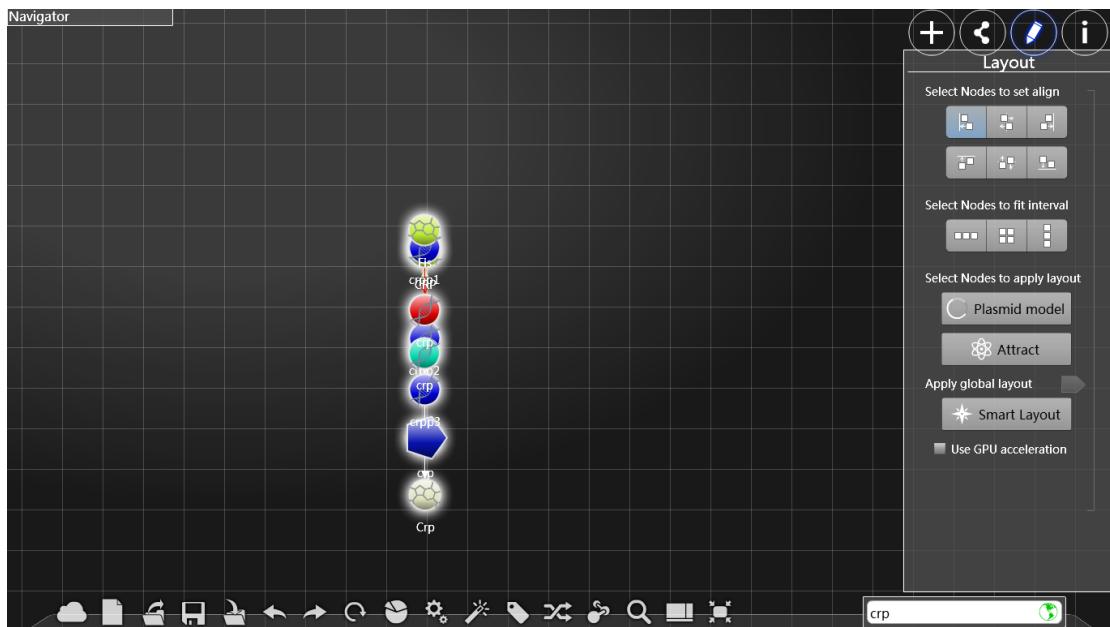


Select a few nodes, click "/" to see the "arrangement sidebar".



Buttons in the first row: Click the first button, and all the selected nodes will be arranged in a vertical line on the left of the screen. Click the second button, and all the selected nodes will be arranged in a vertical line in the middle of the screen. Click the third button, and all the selected nodes will be arranged in a vertical line on the right of the screen.

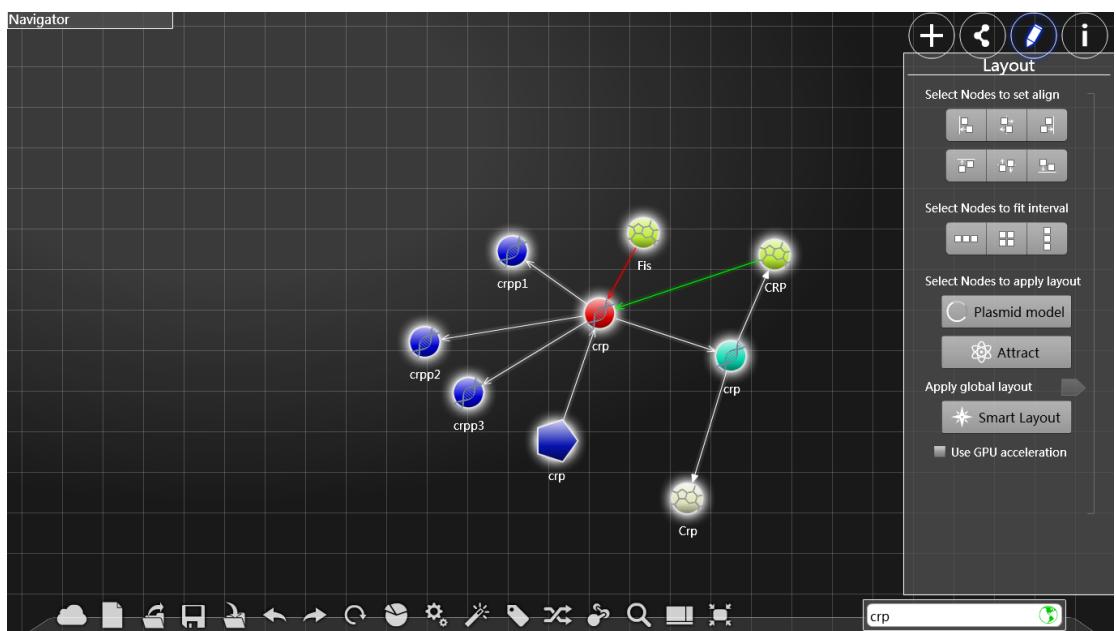
(The picture below shows the front picture after clicking the first button in the first row, the next four picture is relative to the front picture)



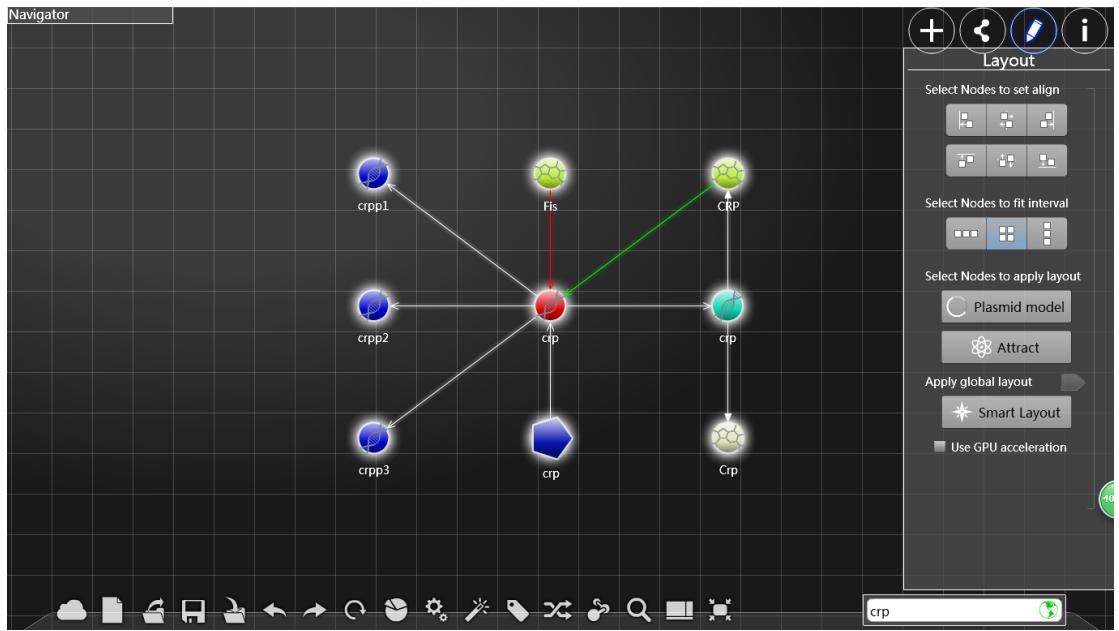
Buttons in the second row: Click the first button, and all the selected nodes will be arranged in a horizontal line on the top of the screen. Click the second button, and all the selected nodes will be arranged in a horizontal line in the middle of the screen. Click the third button, and all the selected nodes will be arranged in a horizontal line on the bottom of the screen. (The picture below shows effects after clicking the second button in the second row)



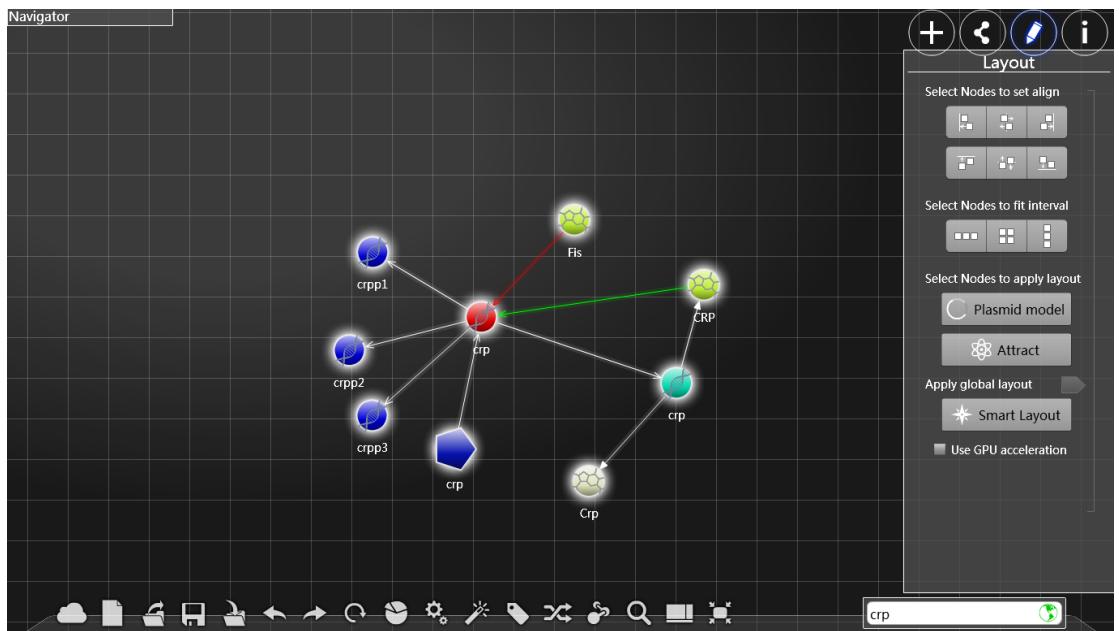
Click the first button in the third row, and all the selected nodes will be arranged in the way that the horizontal distance of horizontally adjacent nodes are the same, and the vertical positions of the nodes will not be changed.



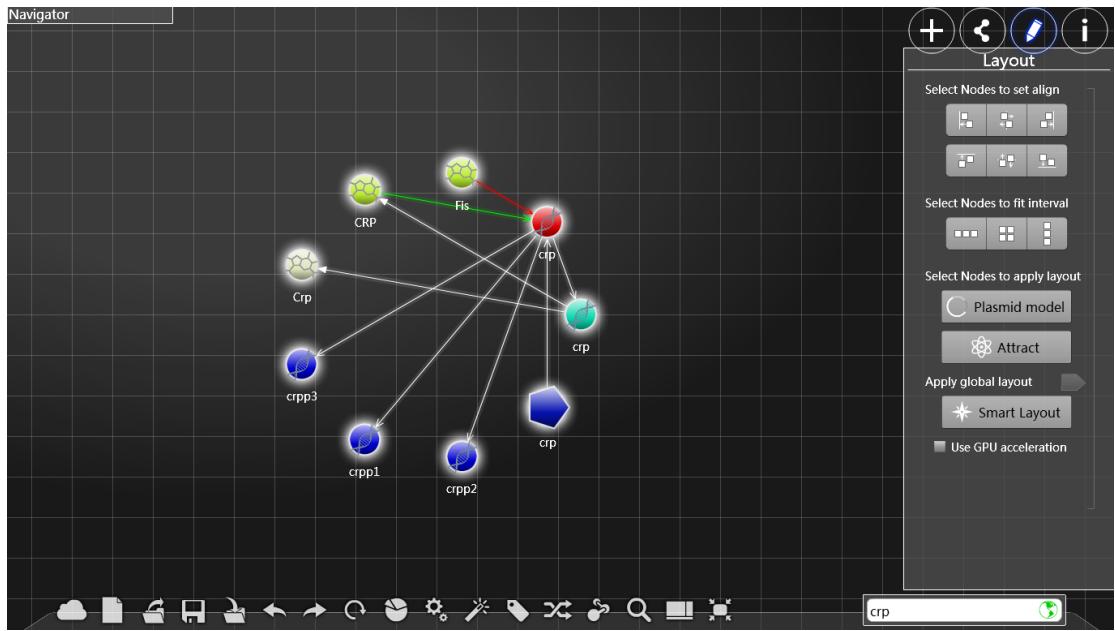
Click the second button in the third row, and all the selected nodes will be arranged to form a graph like a lattice.



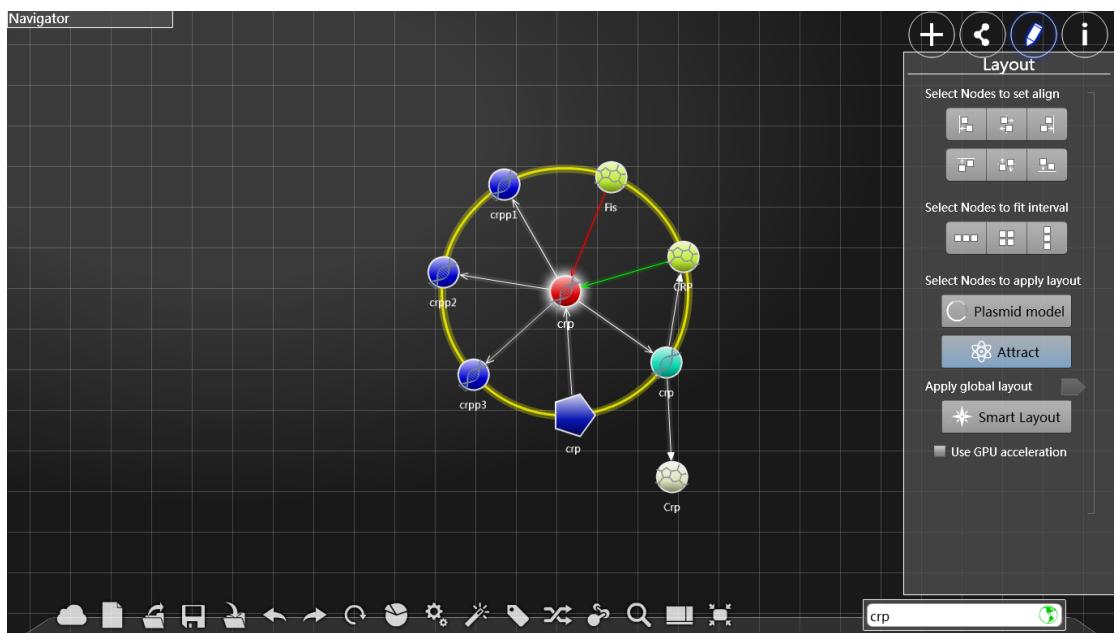
Click the third button in the third row, and all the selected nodes will be arranged in the way that the vertical distance of vertically adjacent nodes are the same, and the horizontal positions of the nodes will not be changed.



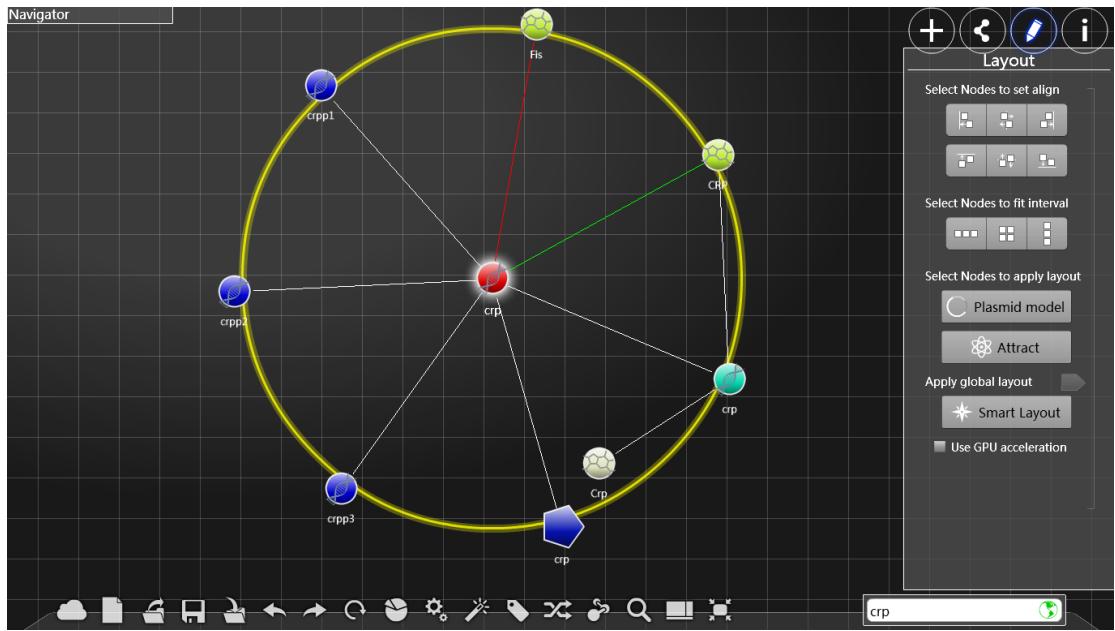
Plasmid model: The points selected are arranged on a circle.



Attract: Arrange the nodes that are linked to a certain node on a circle centered at it.

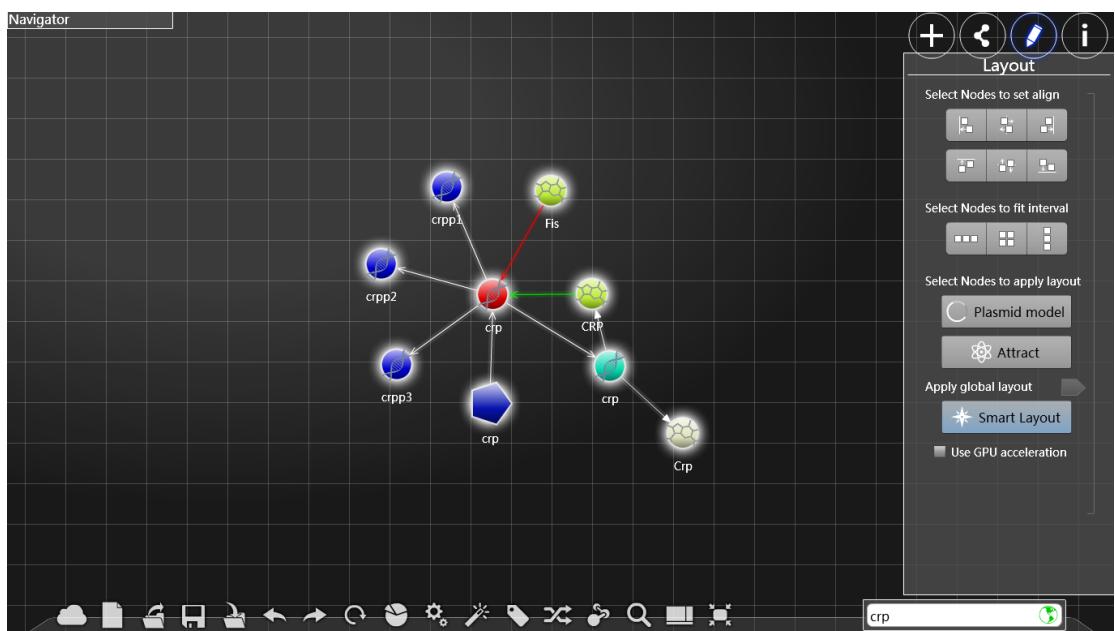


Press the right button of the mouse and drag it to adjust the size of the yellow circle, so as to control the distance among the linked nodes.



Click the vacant region or press the "Esc" button on the keyboard to eliminate the yellow circle.

Make use of a tension-repulsion model to make the arrangement elegantly displayed.

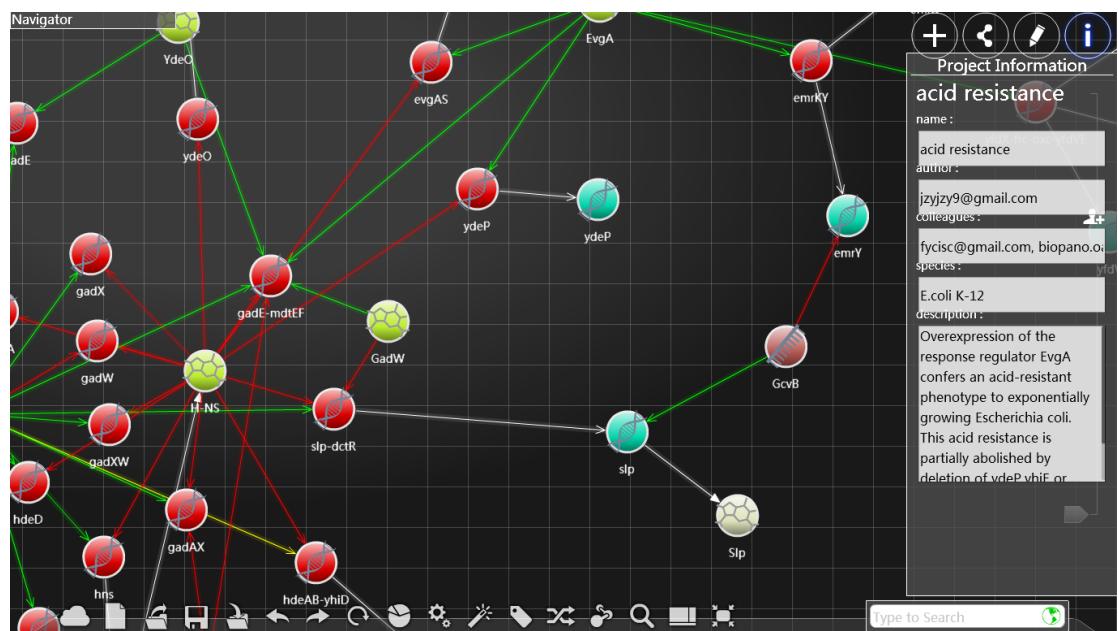


Click the small box in front of the GPU acceleration to use openCL to accelerate the algorithm when next time you click "smart layout" and reduce

the time for arranging the massive amount of nodes. If your GPU does not support openCL, the software will inform you of that by displaying "openCL not activated" at the bottom.

i

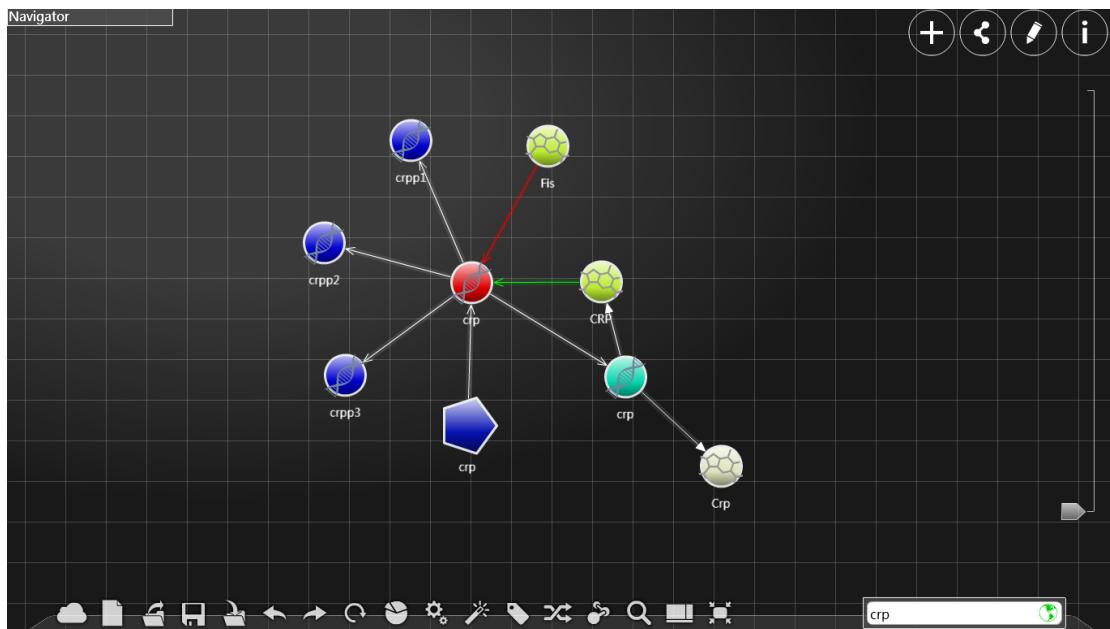
Click "i" to expand the sidebar of project, which displays the project information on the screen. For details, see the introduction on "cloud" button in "dock".



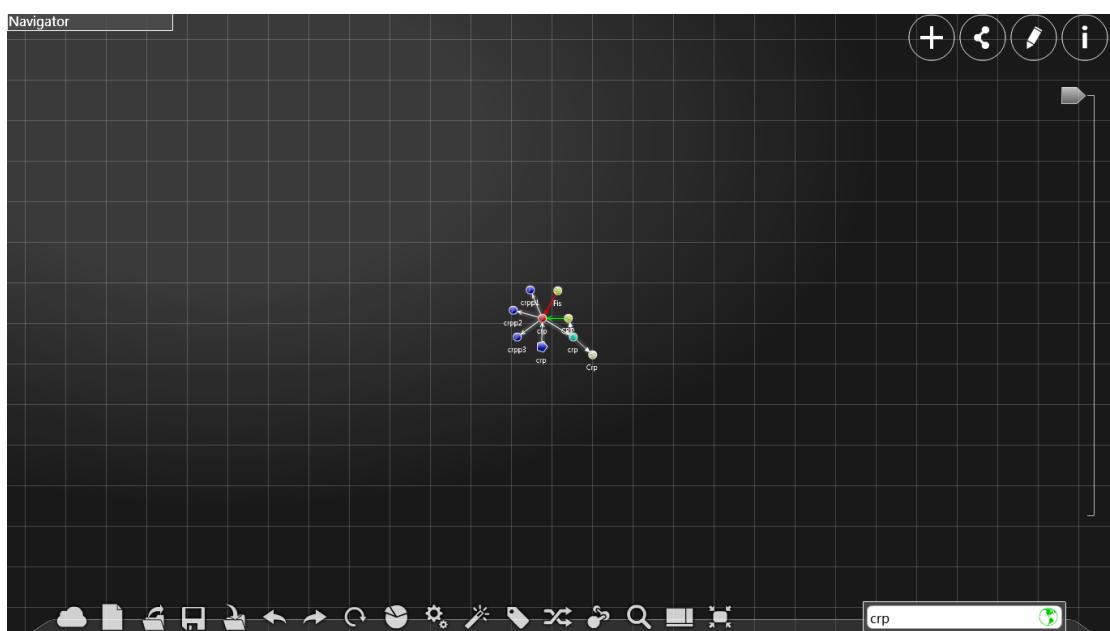
Scroll bar:

This is a scroll bar by which you can change the scale of stage. If you want

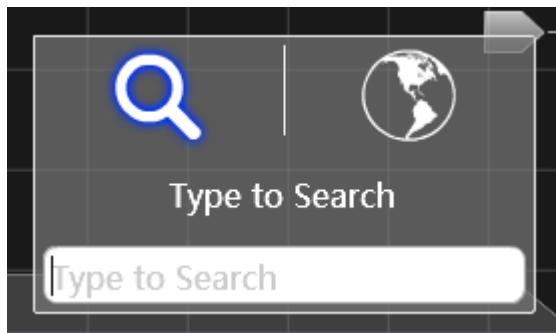
to see the detail part of the node net, you can scroll the bar down to magnify it. If you want to have an overview of the net, you can scroll the bar to the top, then you can scan the net conveniently.



After scroll the bar to the top



Searching Panel:



The searching panel contains two icons and the default is local search.

Input characters to search for the local nodes that match the name. Click the one with a earth icon, and then input characters in the input box to search in the massive database for nodes from the internet that match the node. Only when you connect to the internet can you use this function. Select one of lists to add operations(The details coincide with the operation on the sidebar).

## Dock



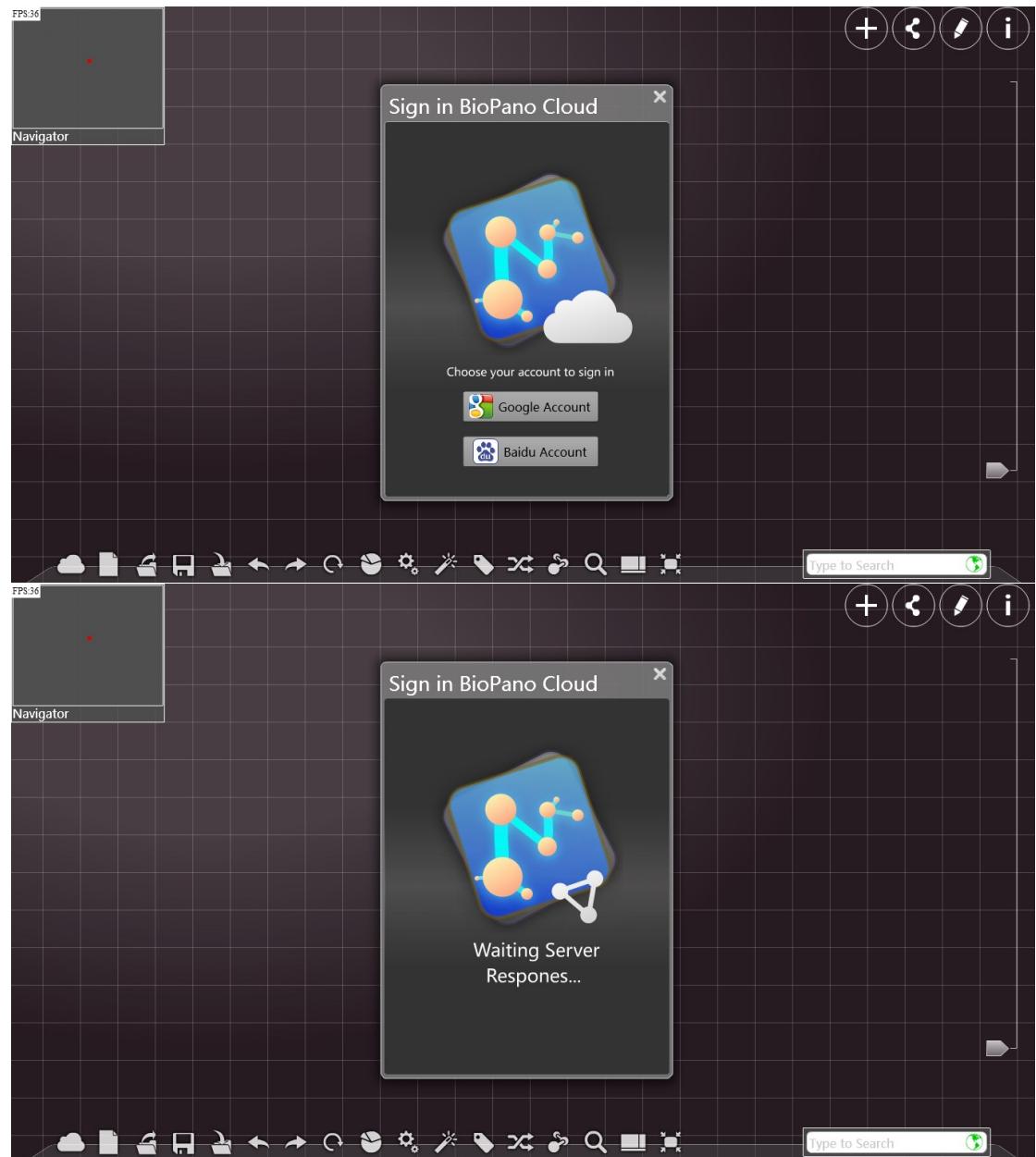
When the mouse is put on a certain button, the icon will be enlarged and the name of it will emerge. You can then click the right button of the mouse to perform the corresponding operation.

From left to right, the buttons are used to :

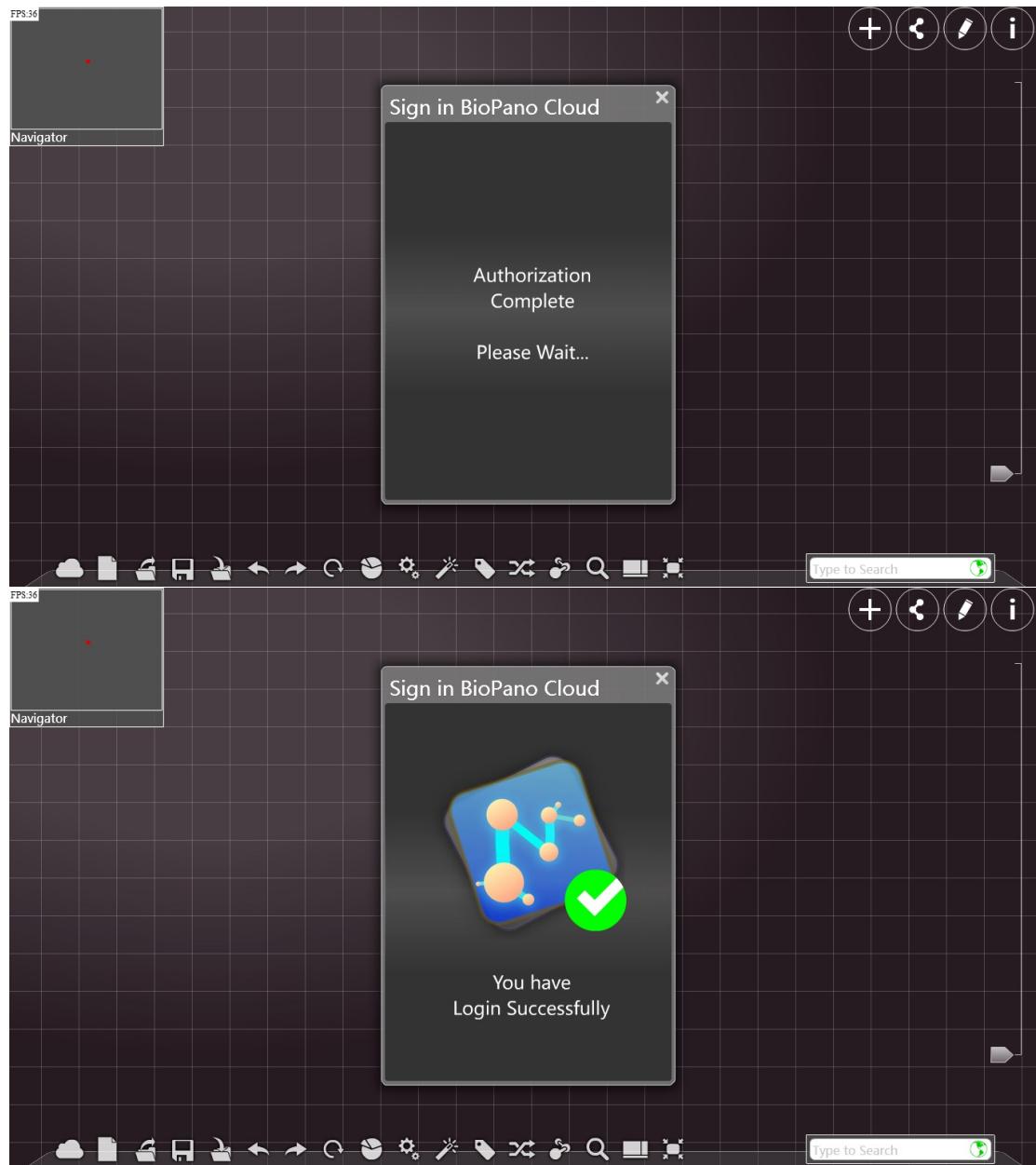
## Cloud

Click one to see two icons, which stand for Baidu and Google respectively.

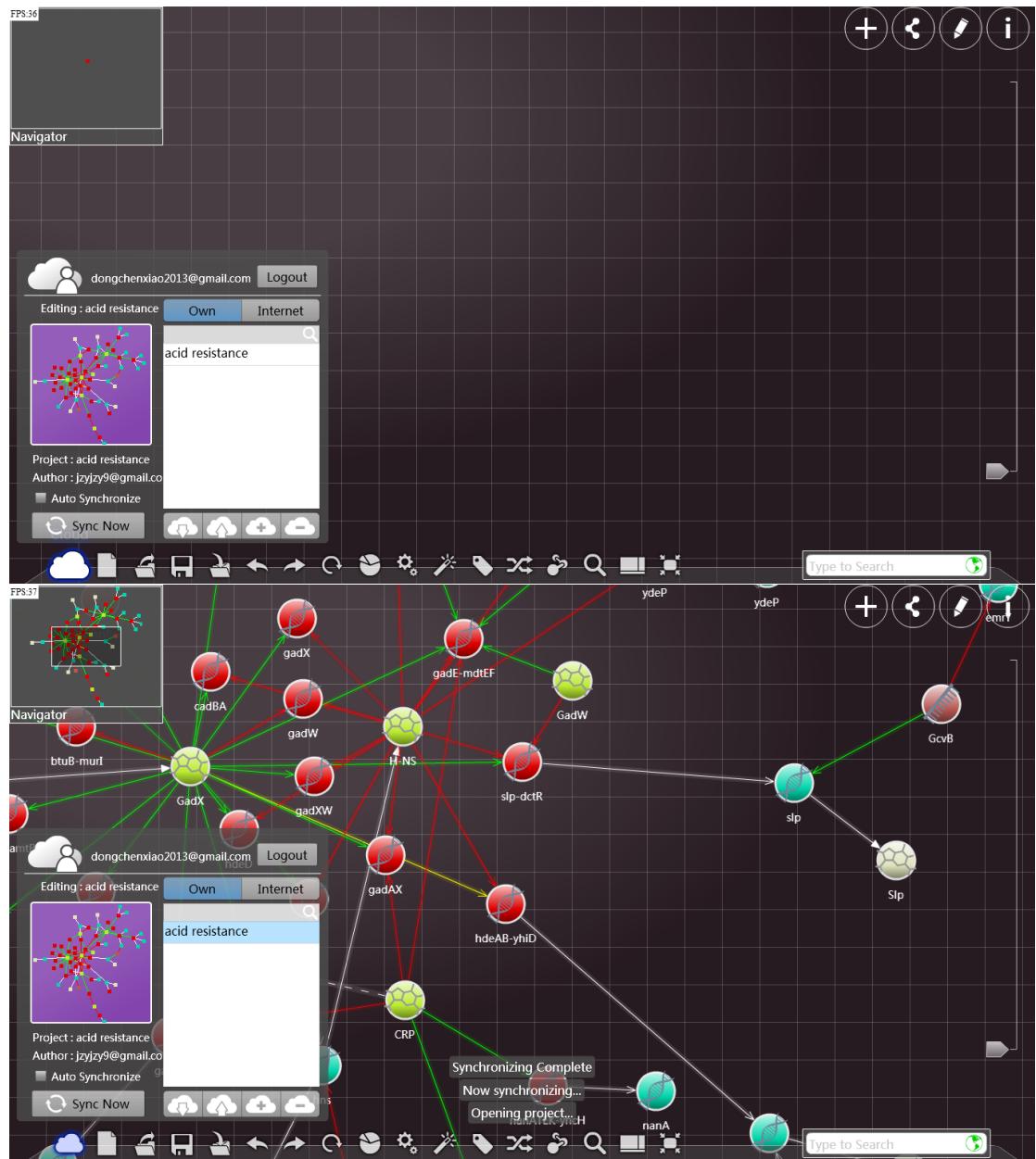
Select one of them and click it, and then you can login to Biopano by using a relative account.



Click the button to enter the interface of Google or Baidu. You can input the username and the password to login, as is shown below:



Click "cloud" again to enter the user interface. You can click the "logout" button to logout. Click the "own" button to view the projects that you are in. Click the "Internet" button to check out all the projects on the internet. Click one of the projects to view the details of the project.



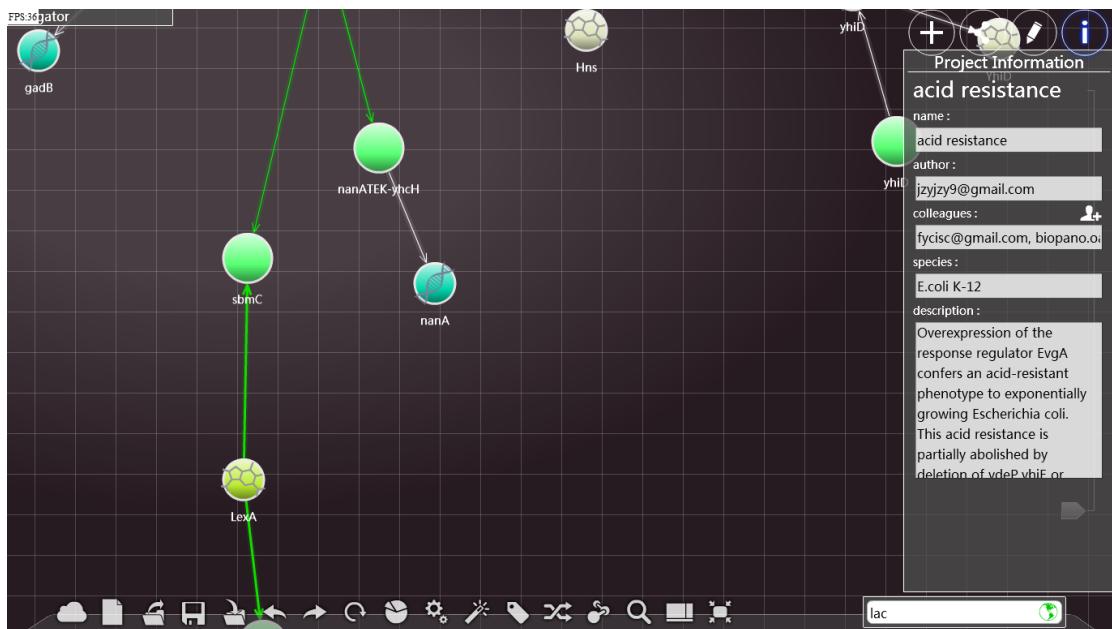
Click the first icon at the bottom of the screen to open the selected project.

Click the second icon at the bottom of the screen to upload the net in your screen to the selected project.

Click the third icon at the bottom of the screen to build a new project.

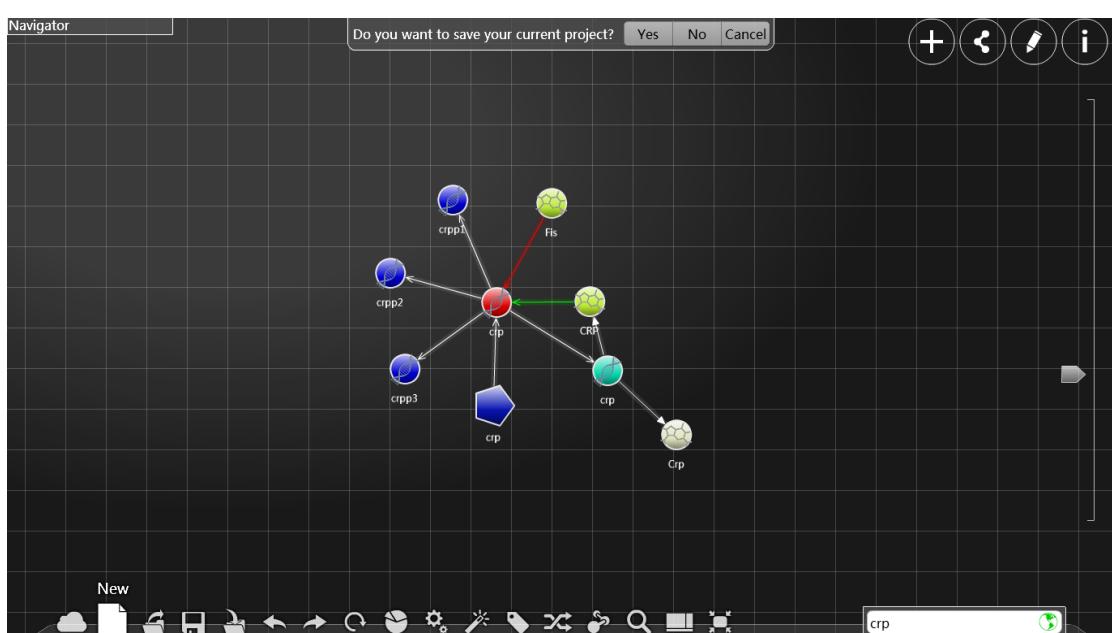
Click the last icon at the bottom of the screen to delete the selected project. (but you must be the author of this project)

Click 1 sidebar to view the visual project information, including name, author, colleagues species, description



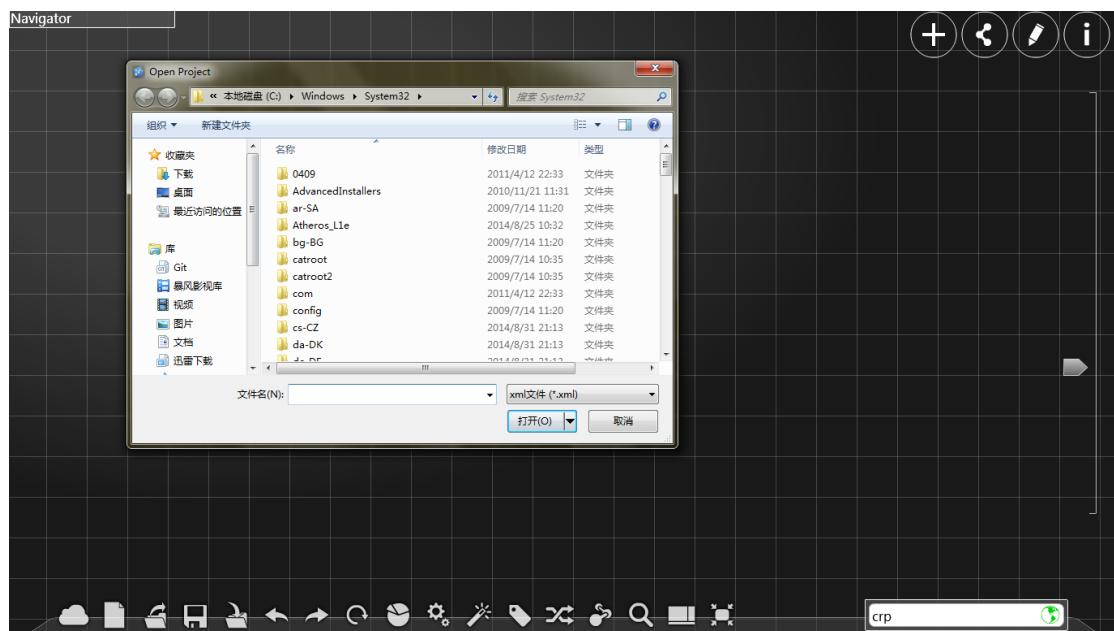
**NEW:**

Open a new empty project. Since software can only deal with one single project at a time, you will be asked if you want to save the change whenever you modify a project.



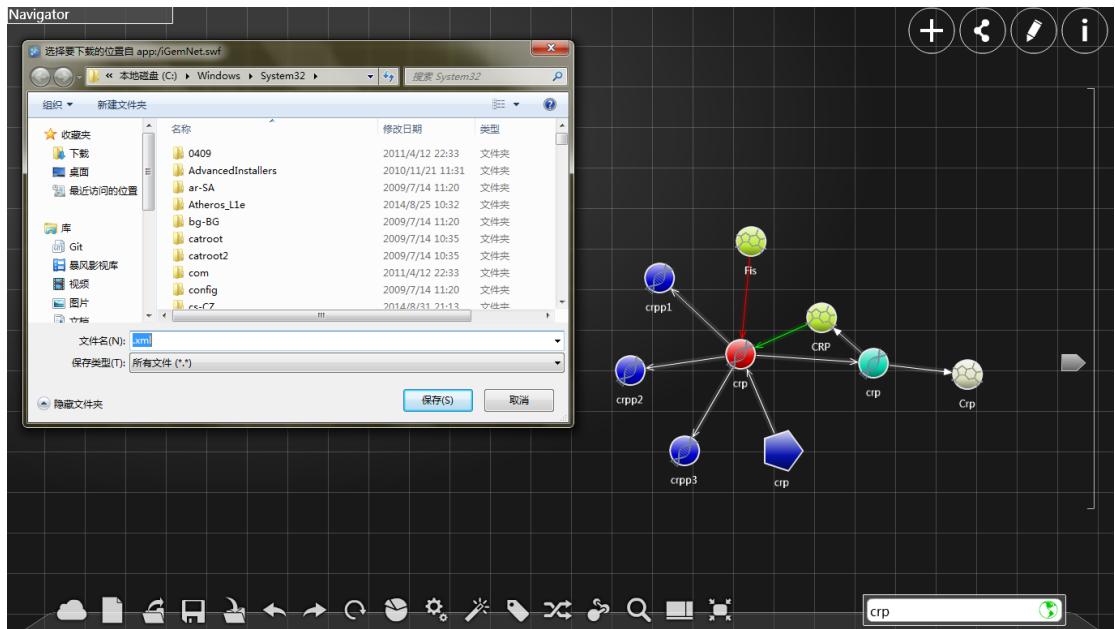
## Open:

Open from a saved project (in the form of XML). Select a file in the window.



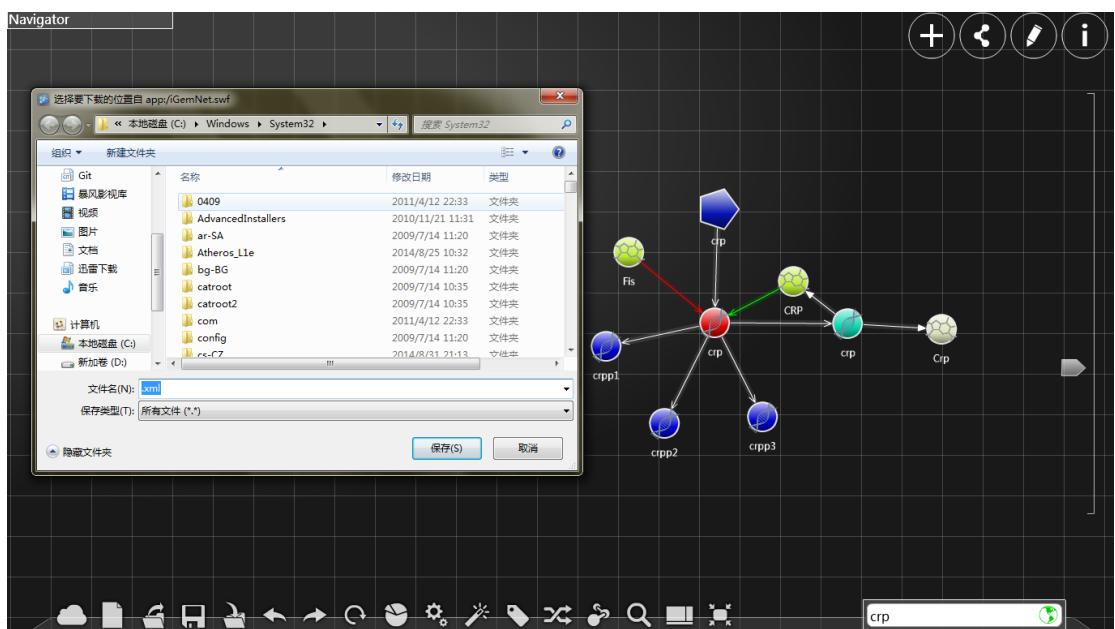
## Save:

Save the current project to file (in the form of XML). Select a file location in the window.



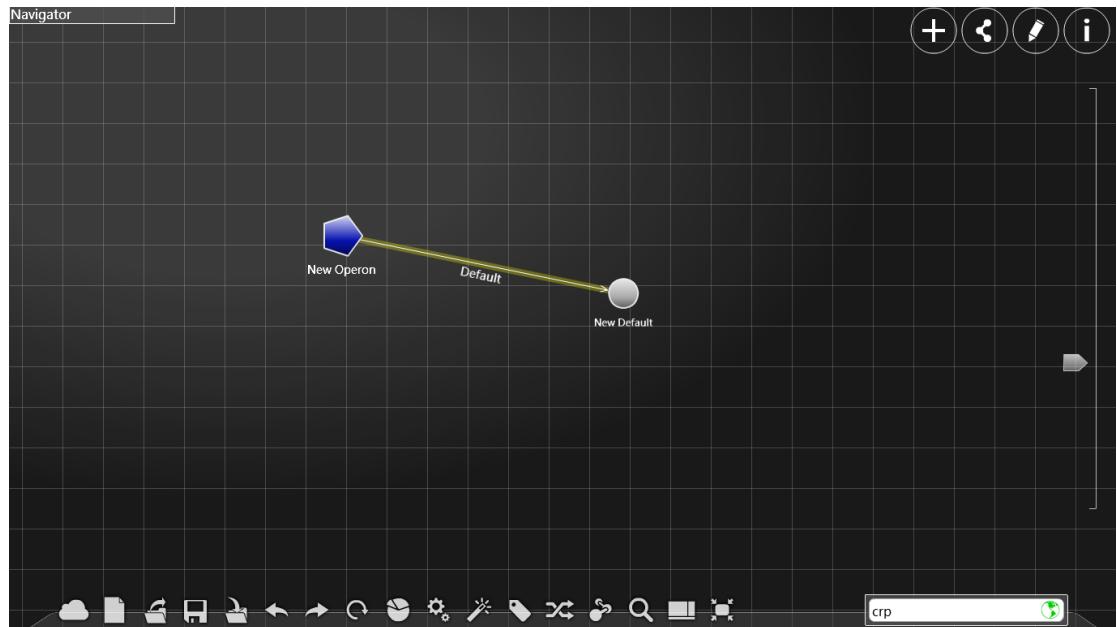
### Save copy:

Save copy: Save the current project to some form. The details coincide with the ones of saving as xml files. You can choose to select a specific file format to save a copy as.

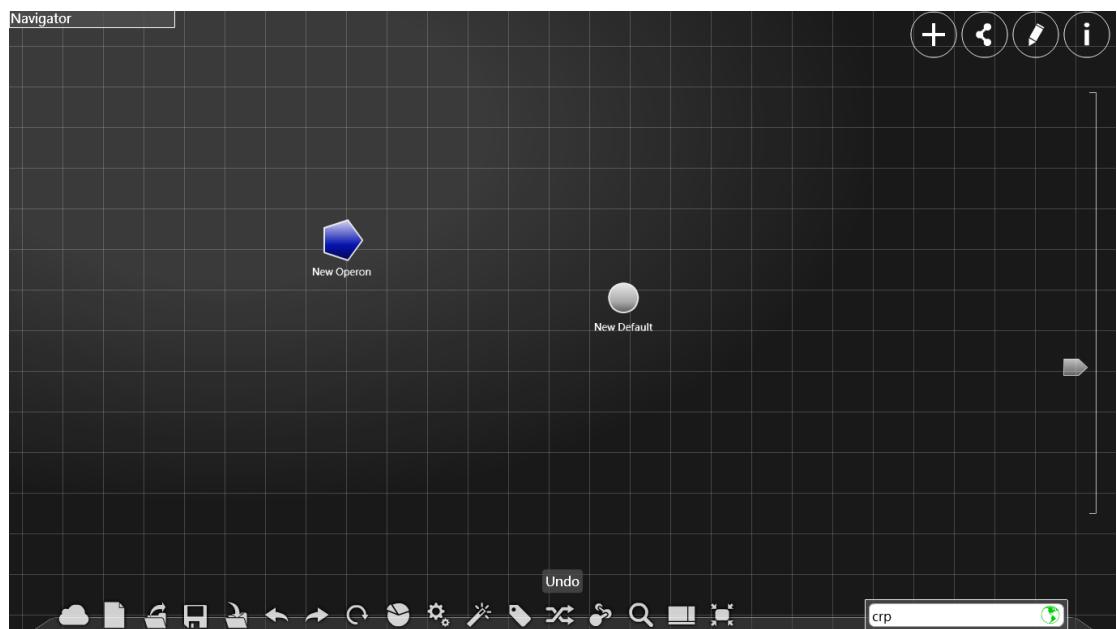


### Undo: (when you regret doing sth)

For example, if you just created an edge and yet you do not want it, you can just click "undo" to delete it.



The edge will disappear automatically after this operation.

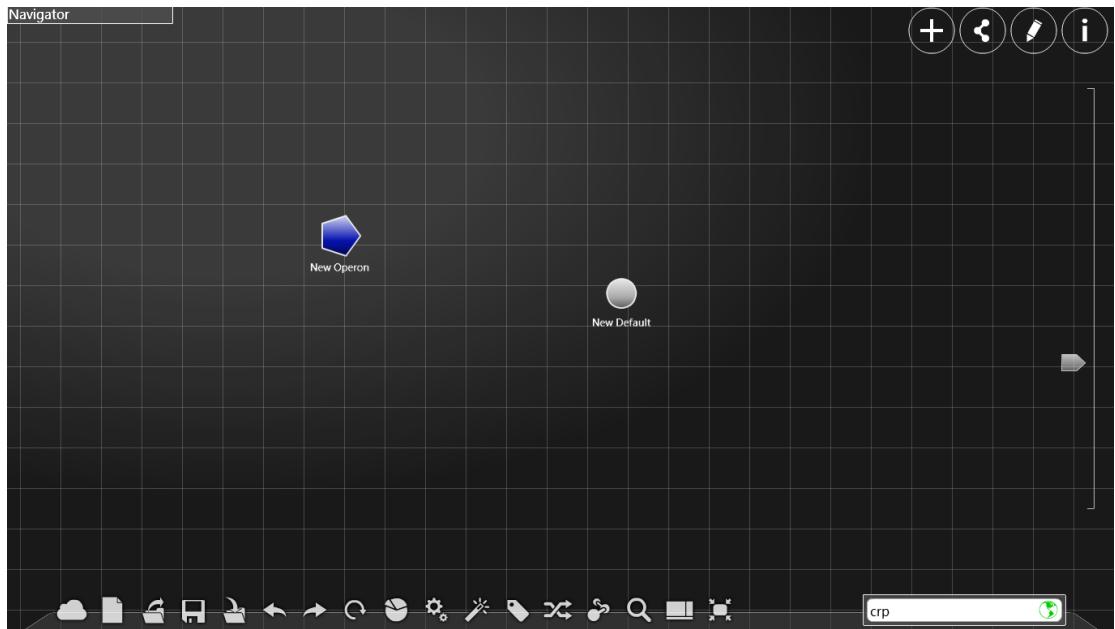


However, please notice that some specific operations are irrevocable.

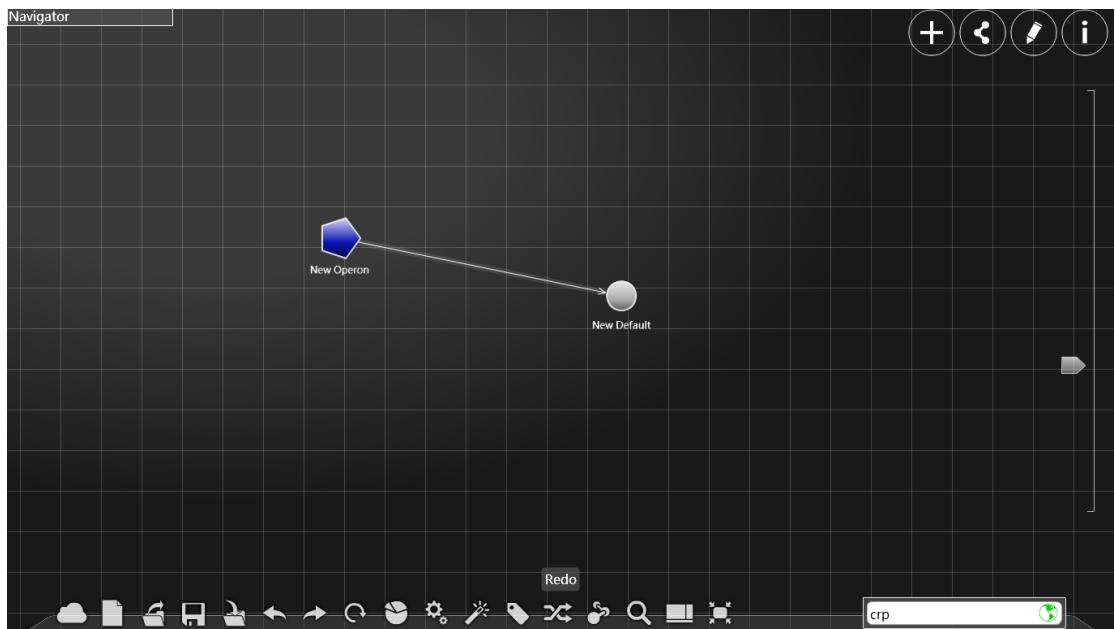
**Redo** (when you regret undoing sth):

For example, as the case stated above, you can click "redo" to let the edge

you just deleted reappear.

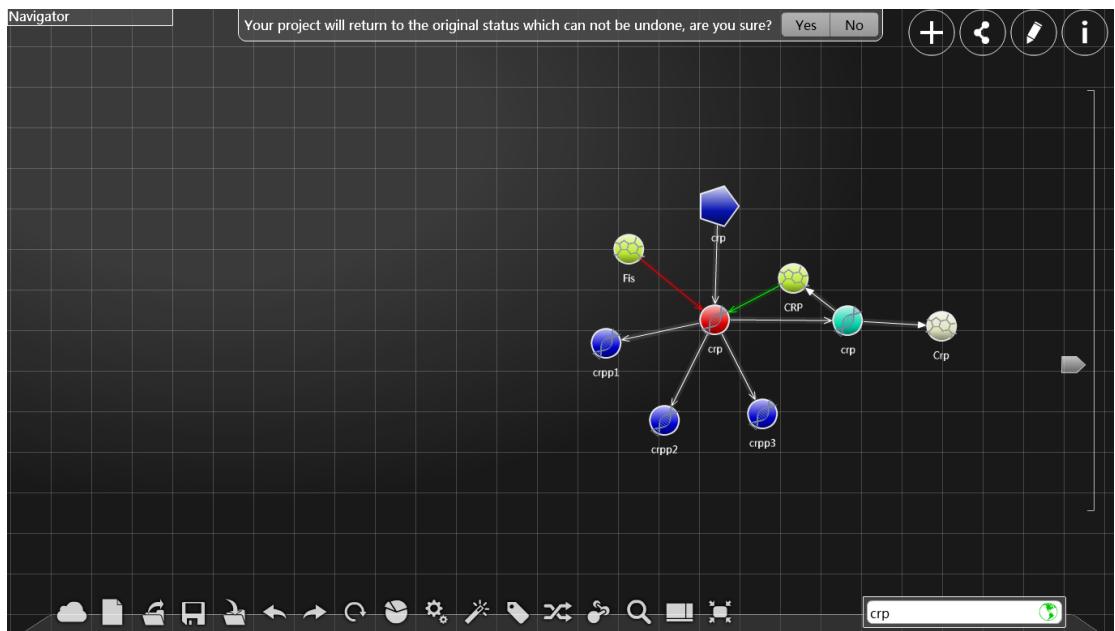


After your operation, the edge will reappear.



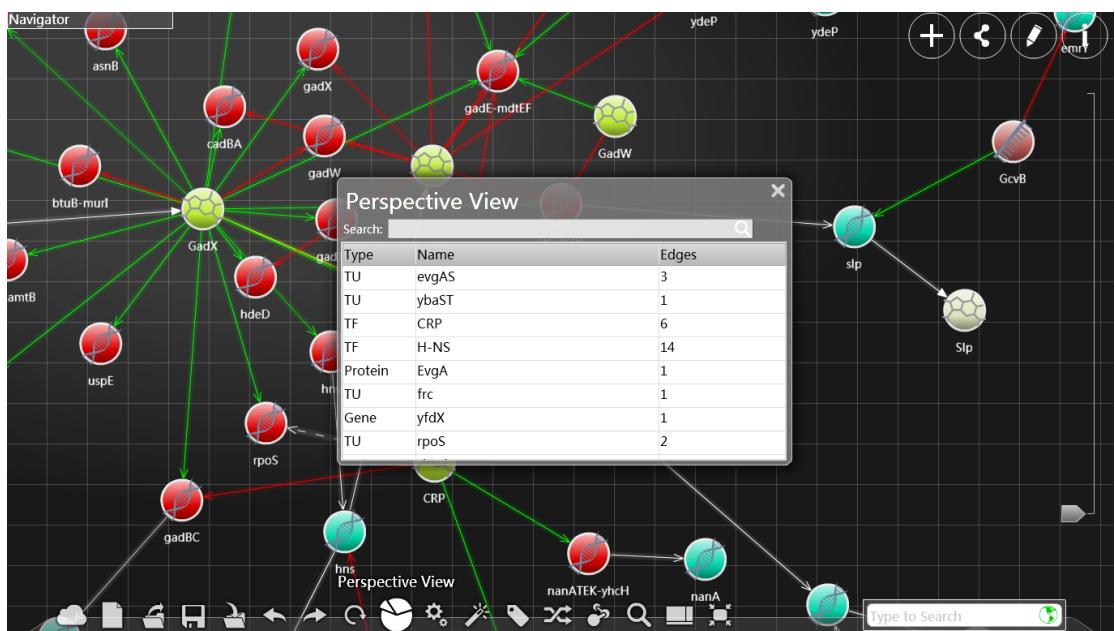
Revert file (when you want to discard your changes and revert to the former file)

You can revoke all the modifications you have made. But you must click yes to make sure your operation



## Perspective view

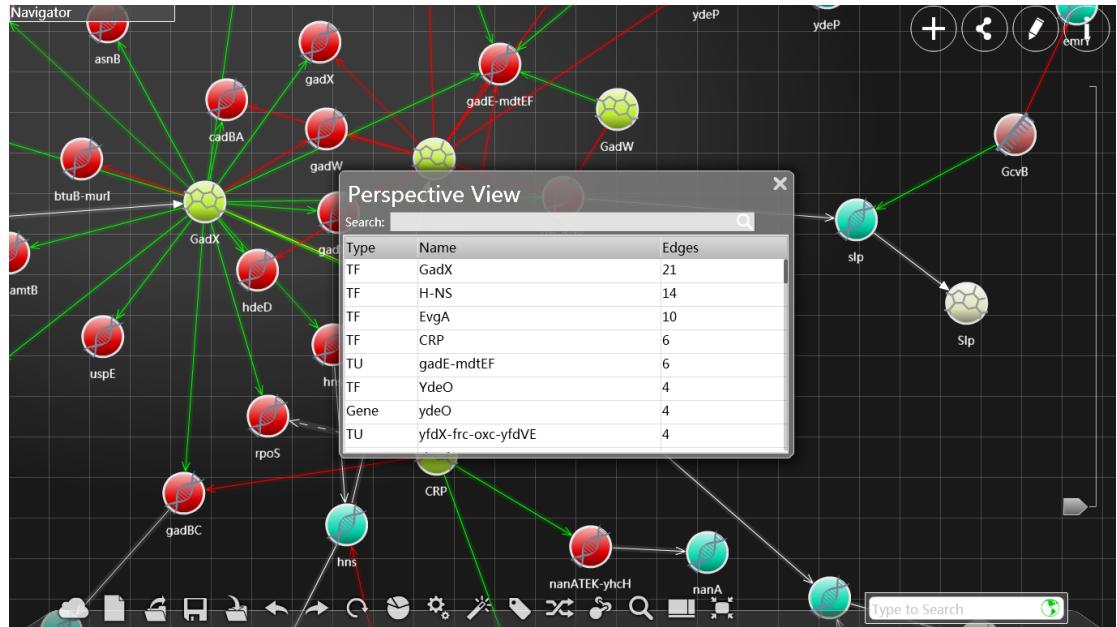
Click the right button of the mouse to see the perspective view panel, on which the types, names, and the number of links of all the nodes will be displayed.



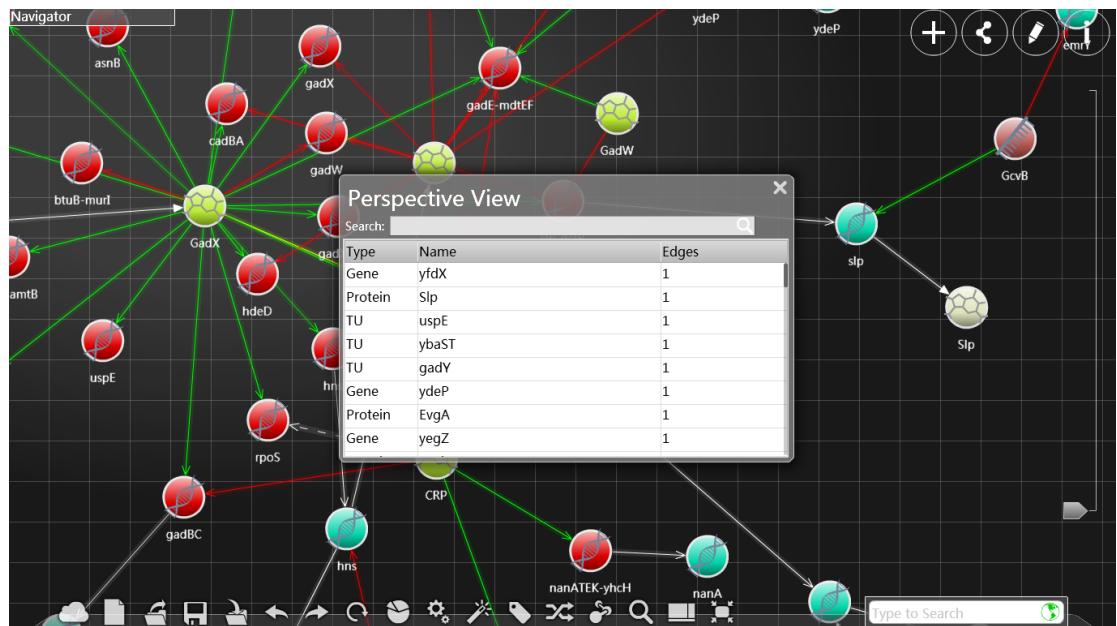
Click the right button of the mouse on one of "type", "name", "edges", the

list will range relied on nodes' value.

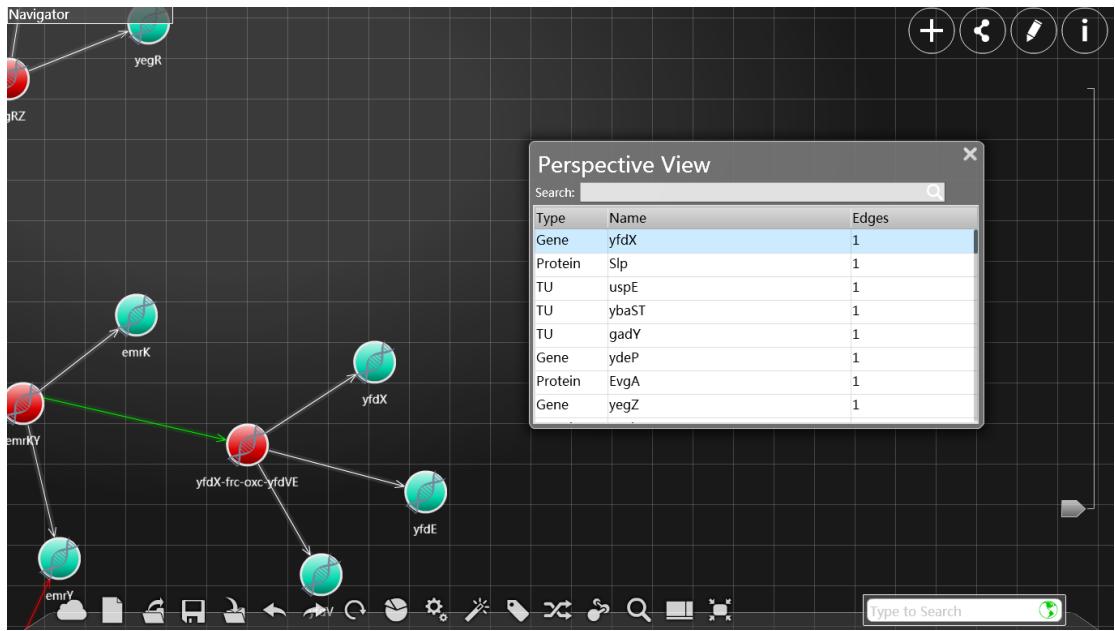
(In the picture below we show the cas when one clicks the property "Edges")



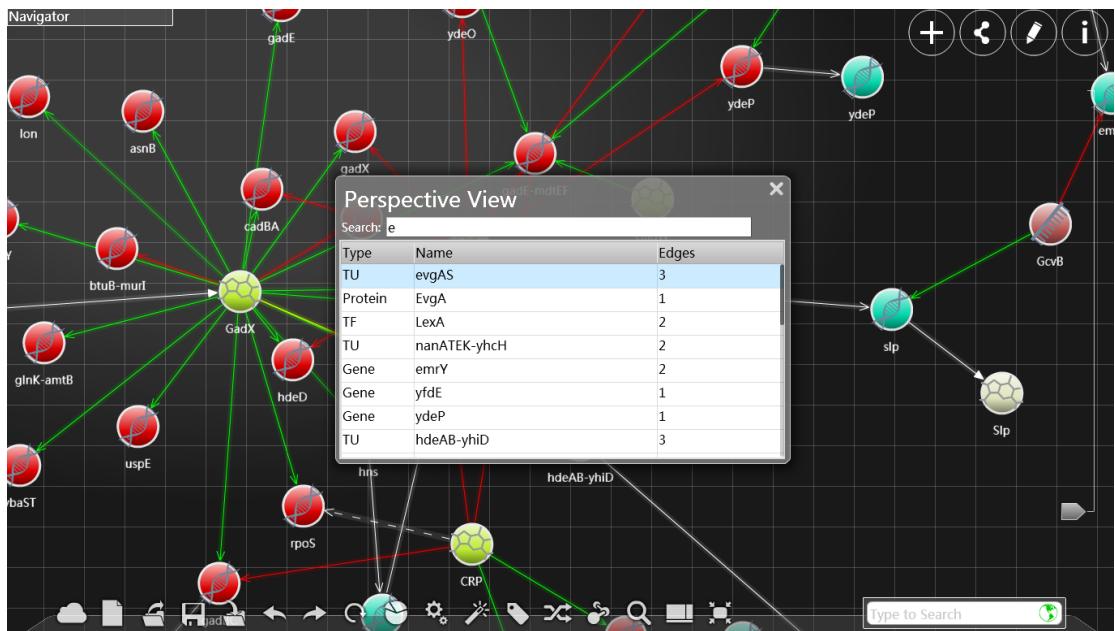
Click the right button on the same property again, you will see the order of the nodes in the table reversed.



Click a node on the right button of the mouse to select it.

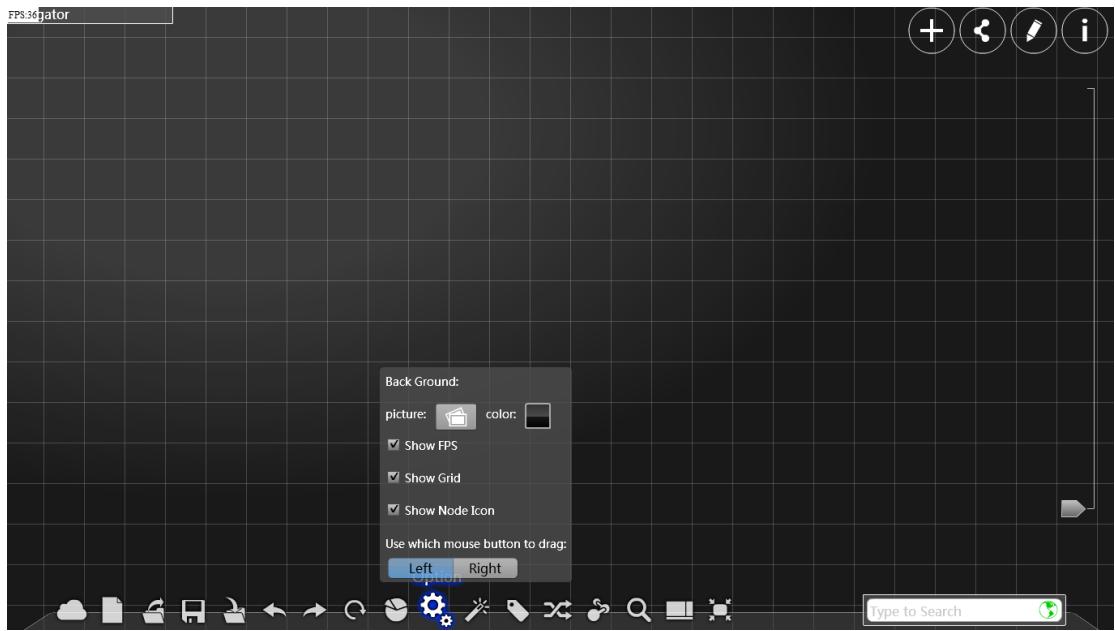


Input characters in the search box to seek for nodes that match the name, which will be displayed in a list.

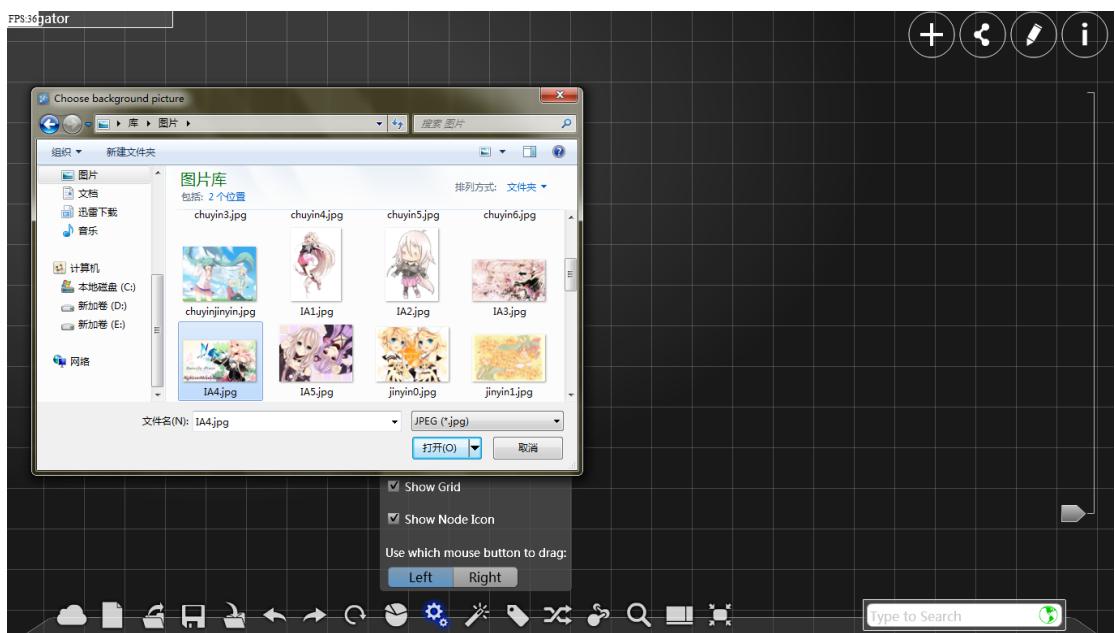


## Option Panel

Click the right button to see the Option Panel, on which you can design the background and some elements in display.

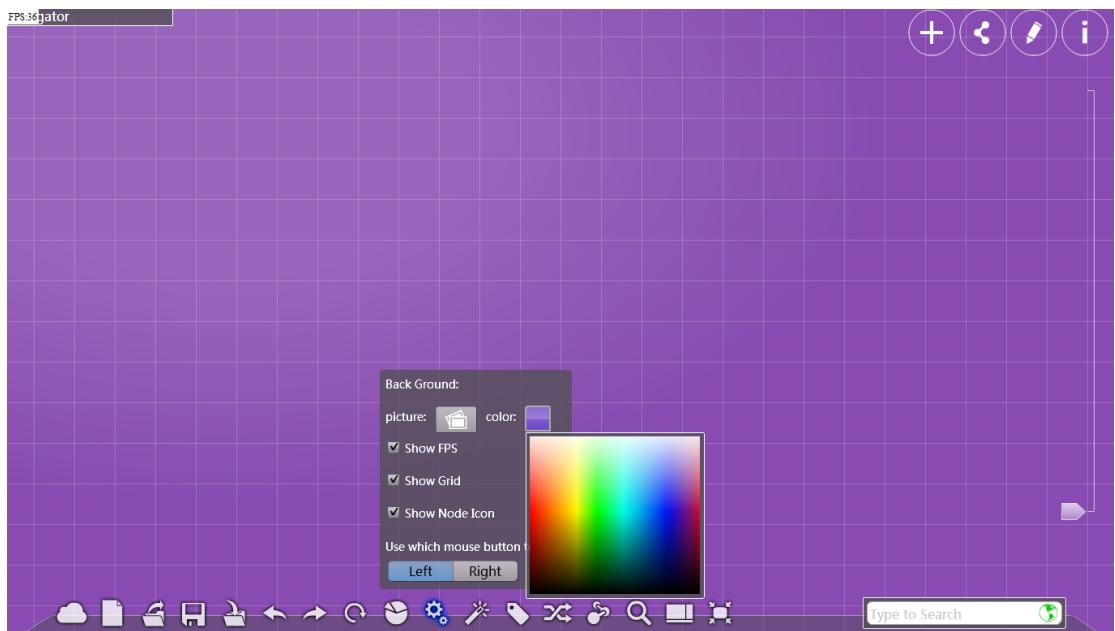


Click the right button of the mouse on the icon near the word "picture" to select a picture of your own to be the background.

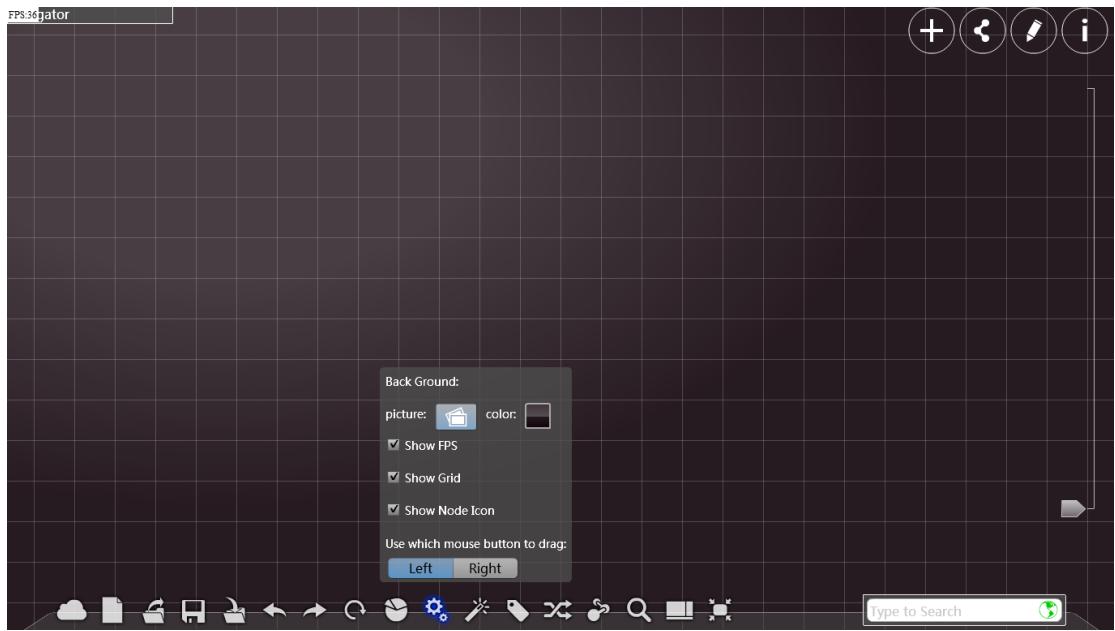




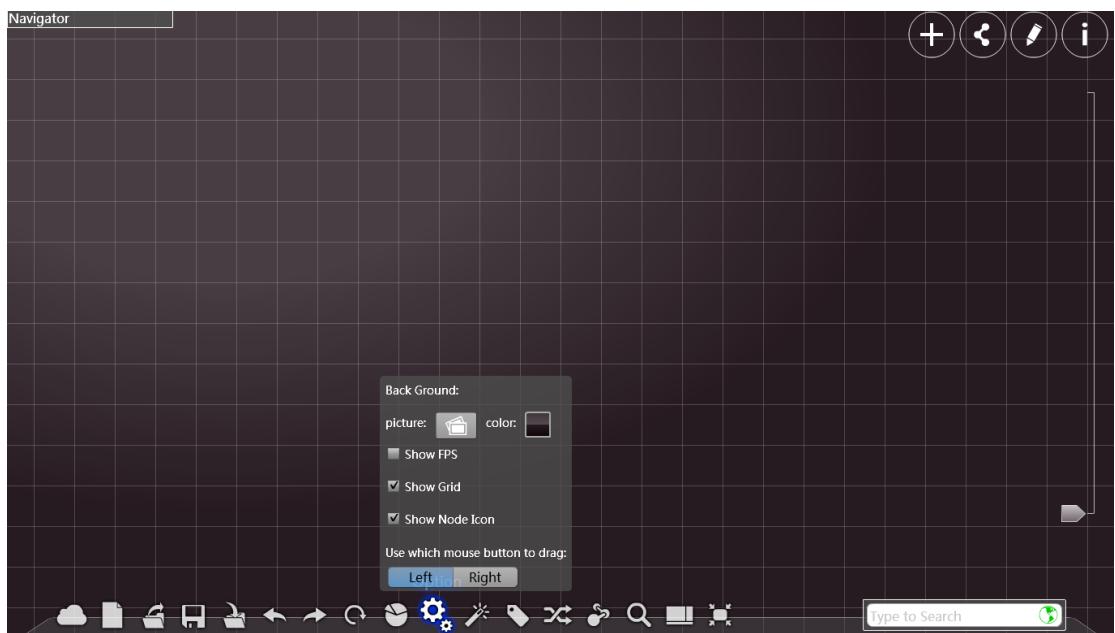
Click the right button of the mouse on the icon near the word "color" to modify the color of your background.



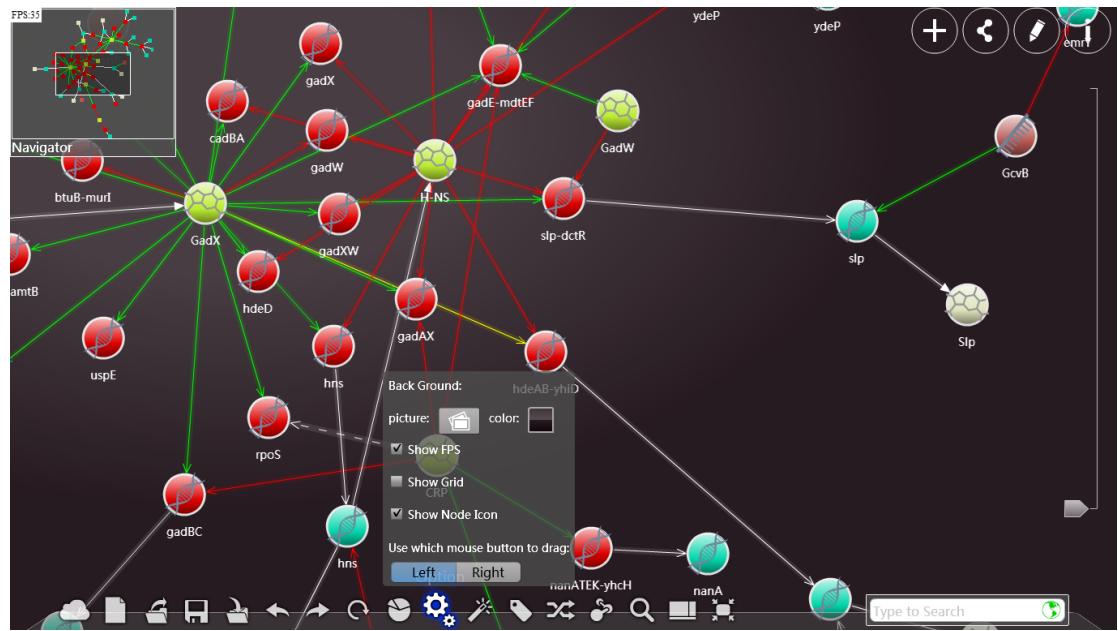
Tick the small box near the words "Show FPS", "Show Grid", "Show Node Icon" to modify the way in which to display the elements. Here is what you see if you tick all the three items.



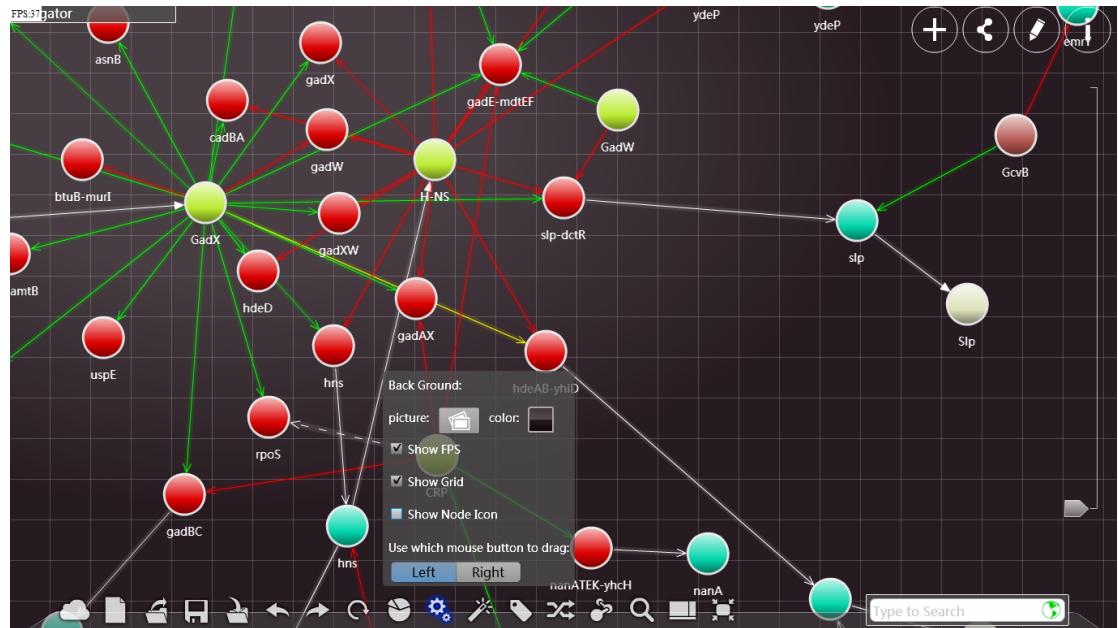
Here is what you see if you cancel the displaying of FPS.



Here is what you see if you cancel the displaying of grids.



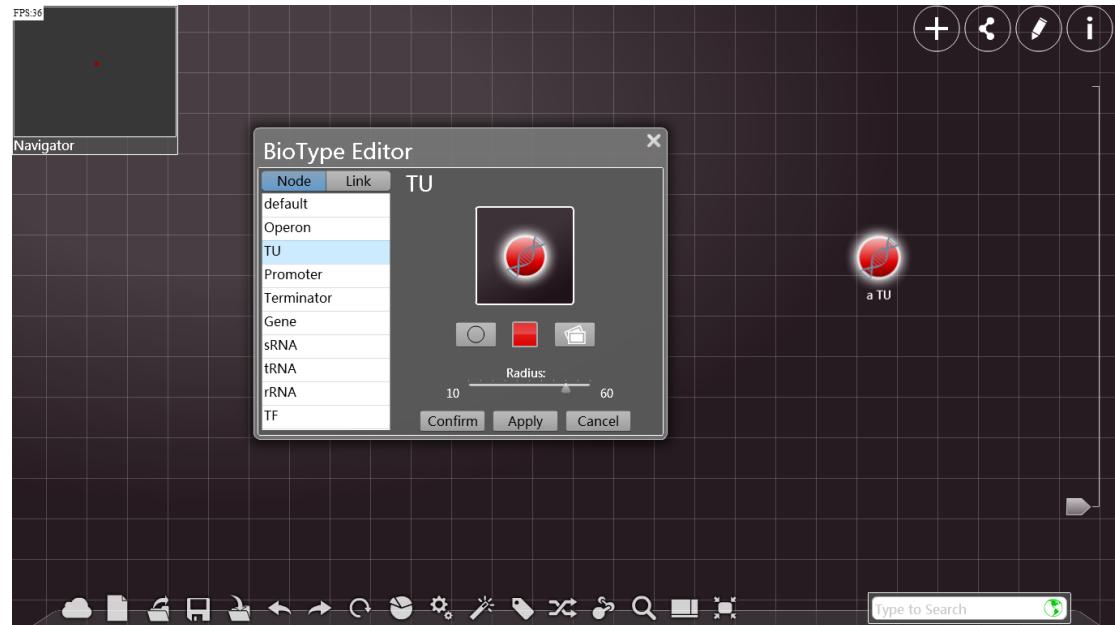
Here is what you see if you cancel the displaying of Node Icons.



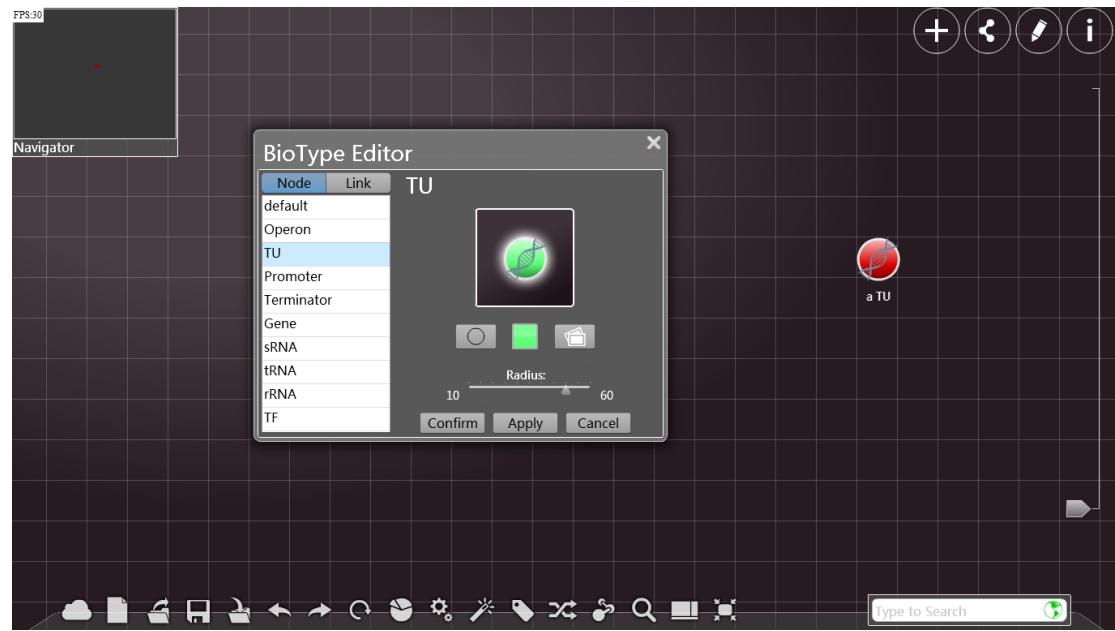
Click "left" or "right" to choose a method of dragging. Select "right(left)" and then press the right(left) button of the mouse in the vacant area of the main screen to drag the viewport (Do not release it until the operation is completed).

## Design nodes and lines

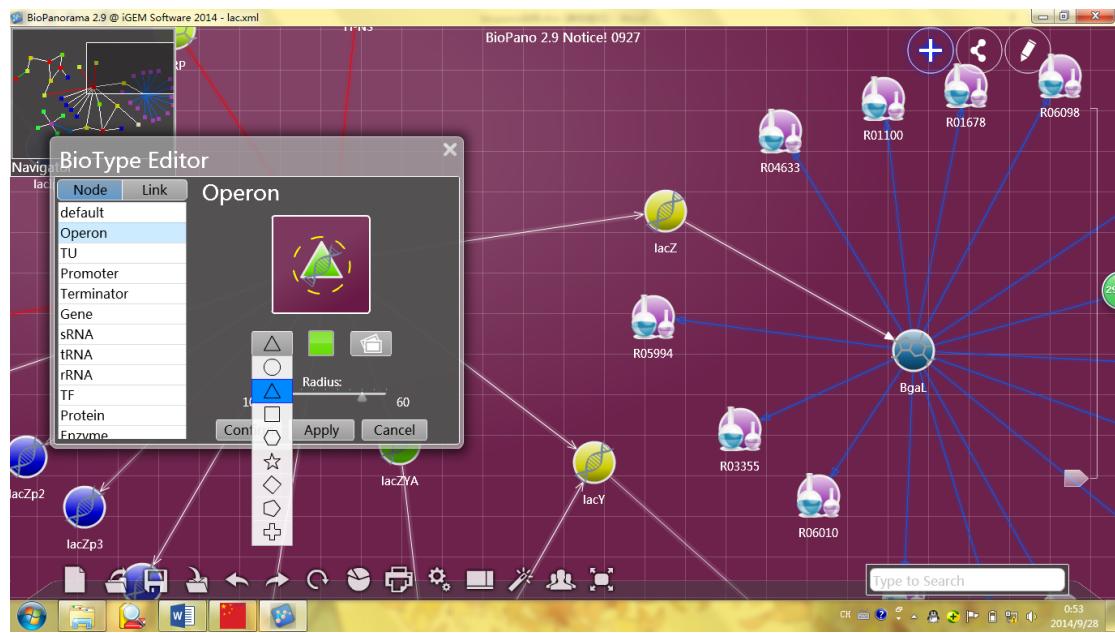
Click to see the BioType Panel.



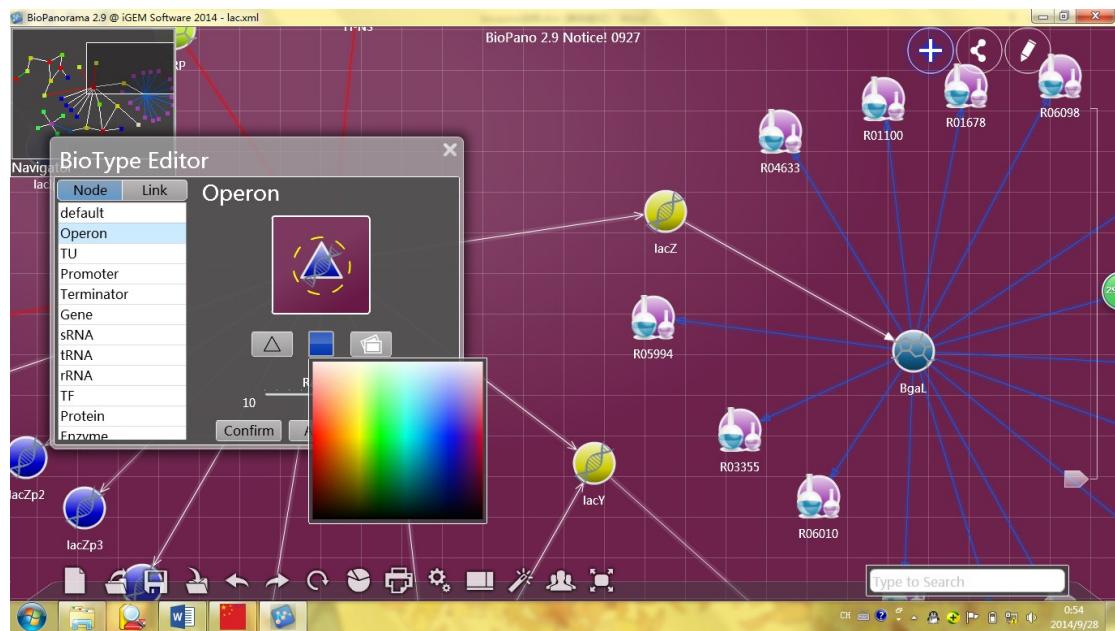
Click any type in the list below "Node" to modify this term.



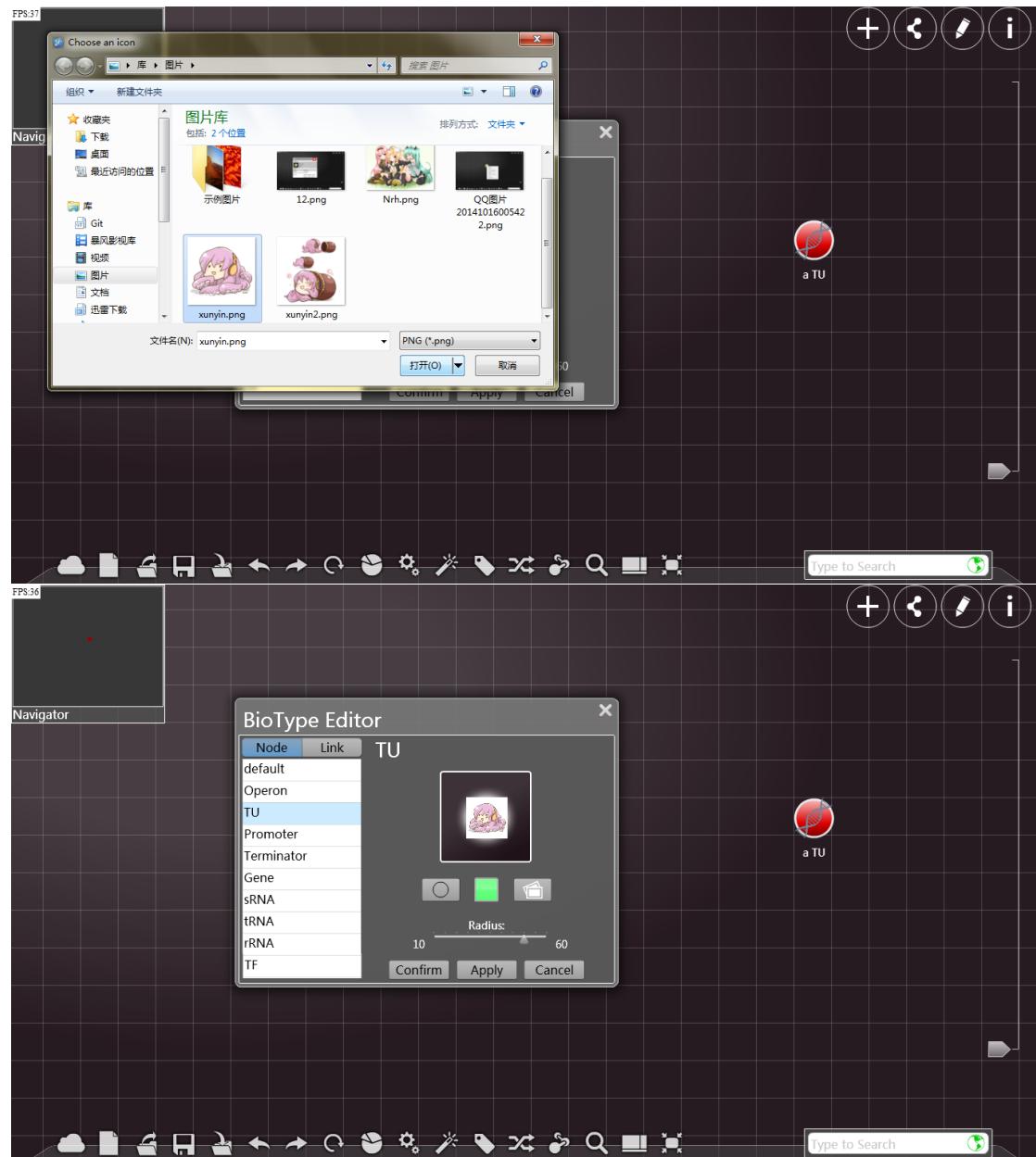
Click the figure to see the inner details. Click to modify the shape of the nodes, as shown in the picture below:



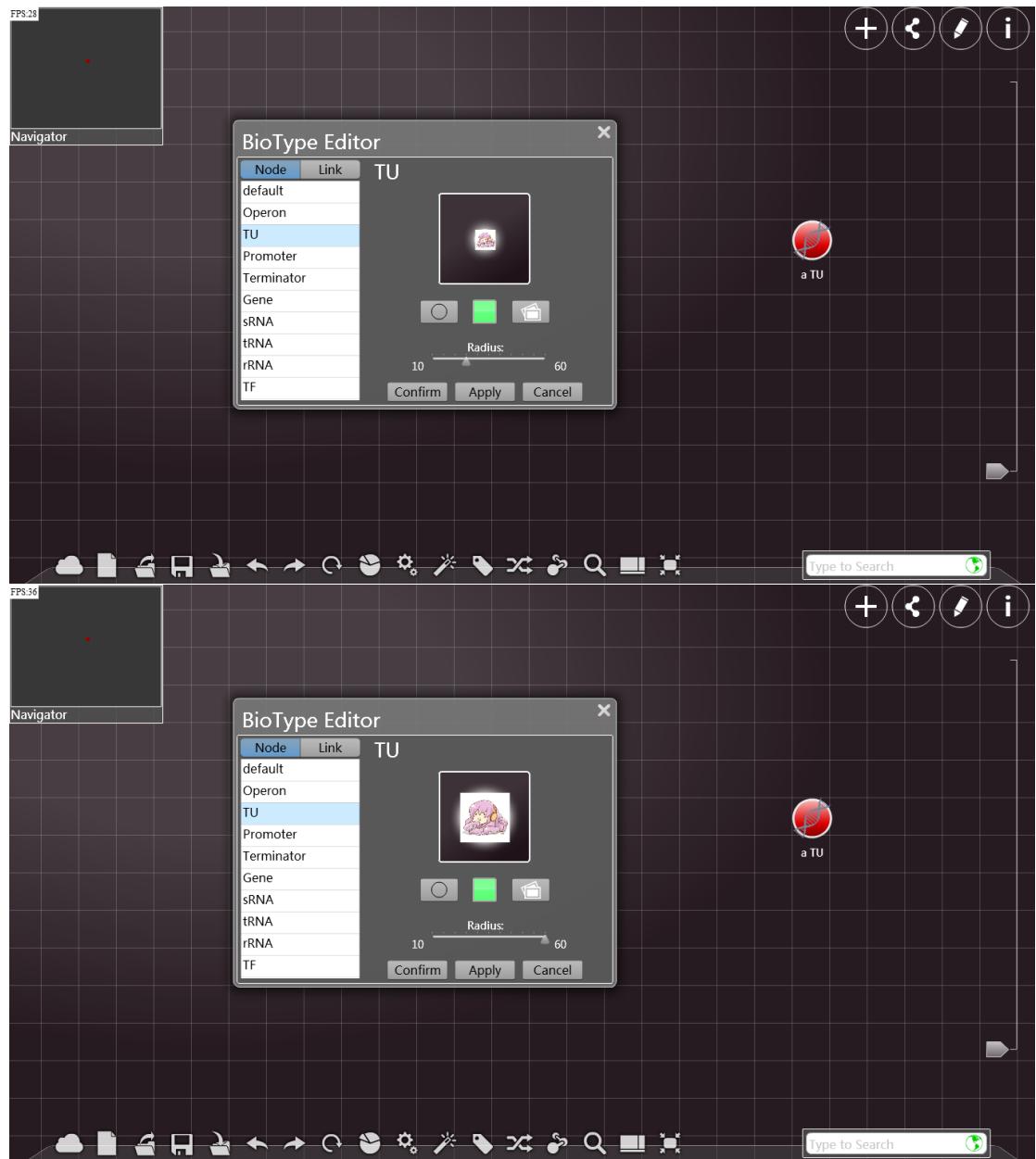
Click the color box to see the palette, where you can choose the color you like:



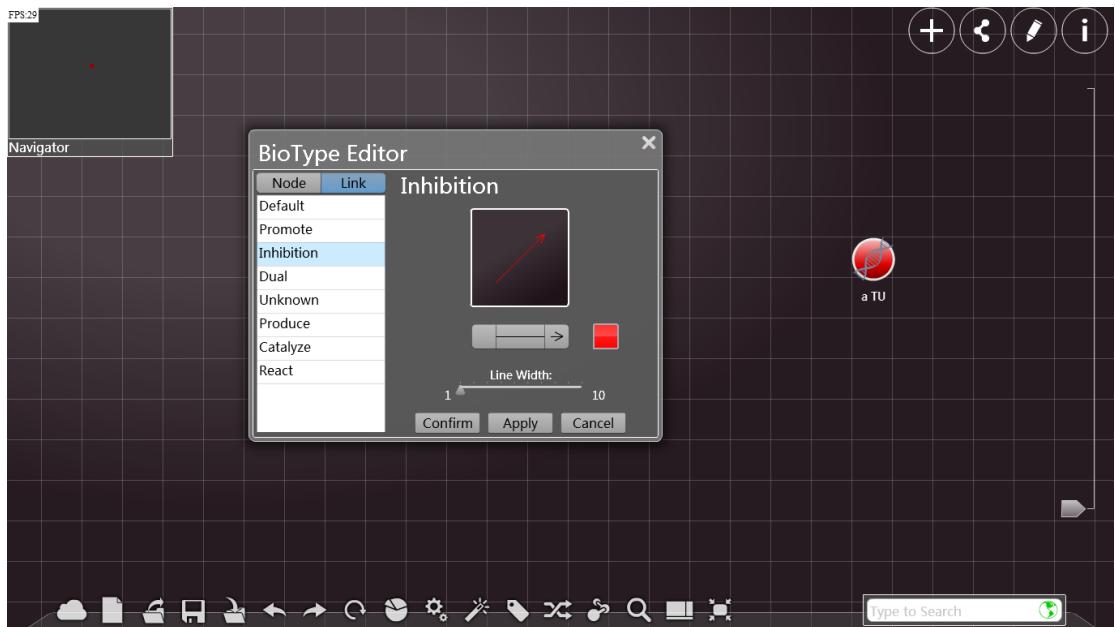
Click the picture to see a windows, where you can choose a pattern to be applied in a series of nodes. (Only .png files are supported currently)



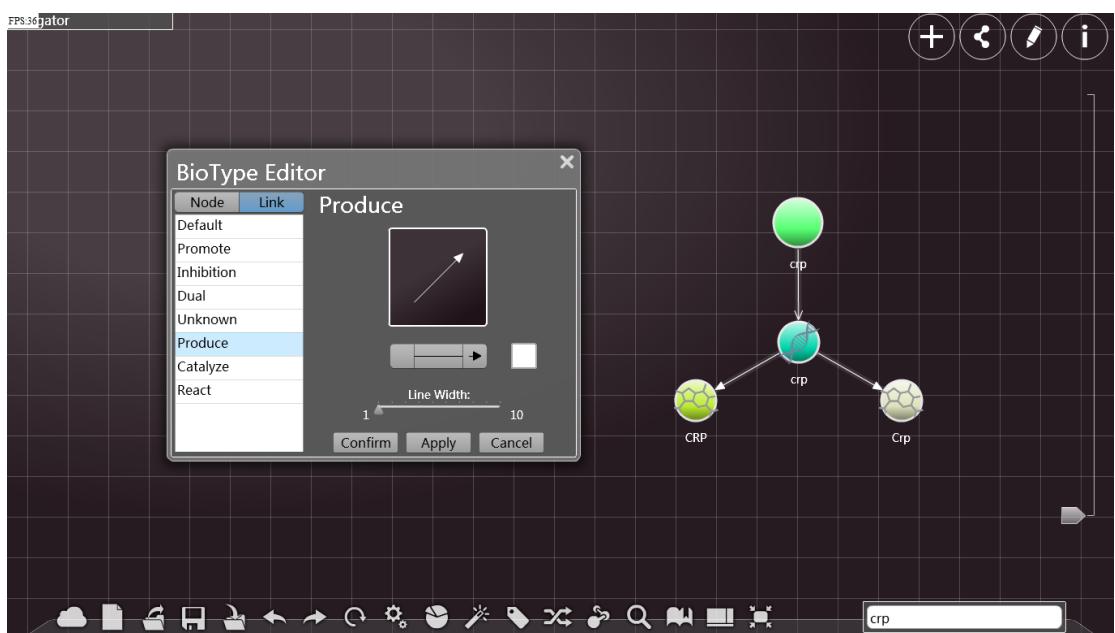
Adjust the size of the nodes by modifying "Radius". (Press the right button of the mouse to do it, and do not release the button until it is done.)



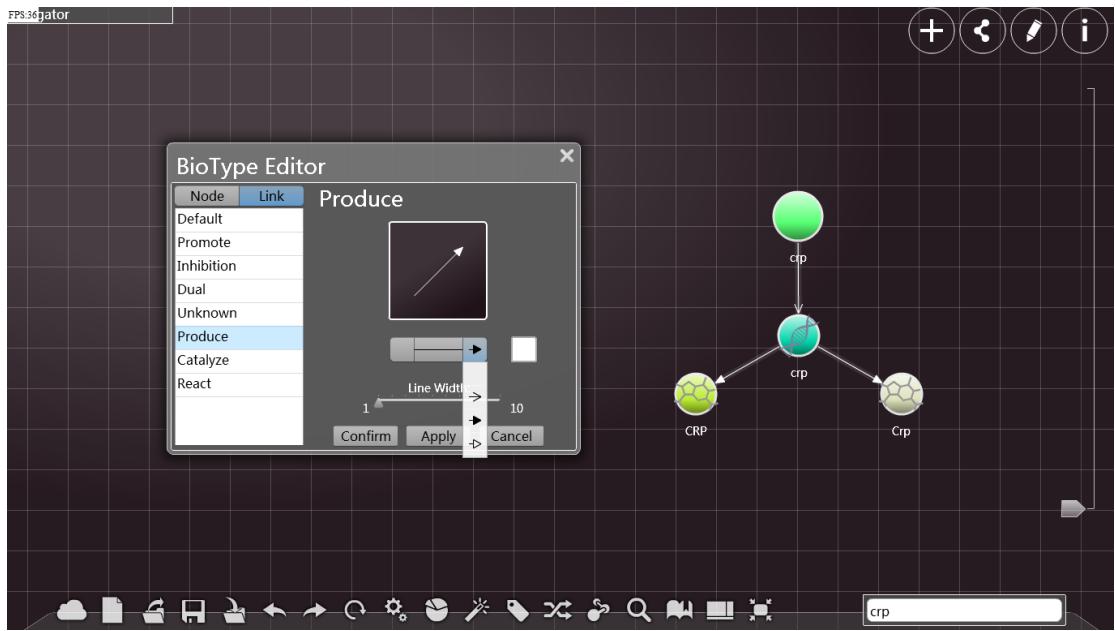
Click "link" to turn to design the edges.



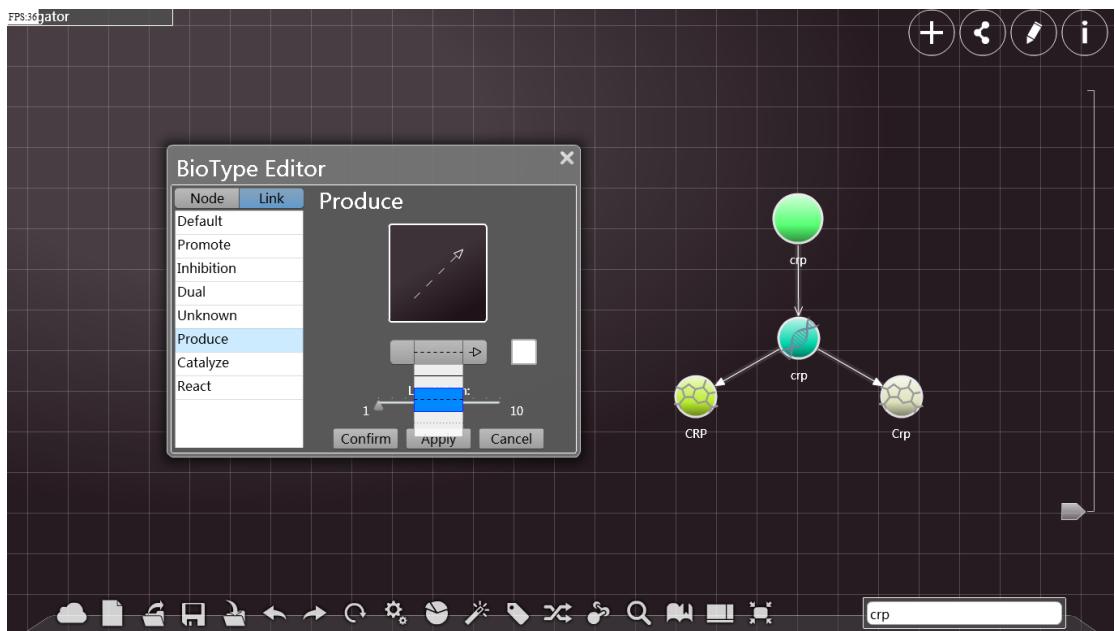
Click a certain type to edit the edges of that type.



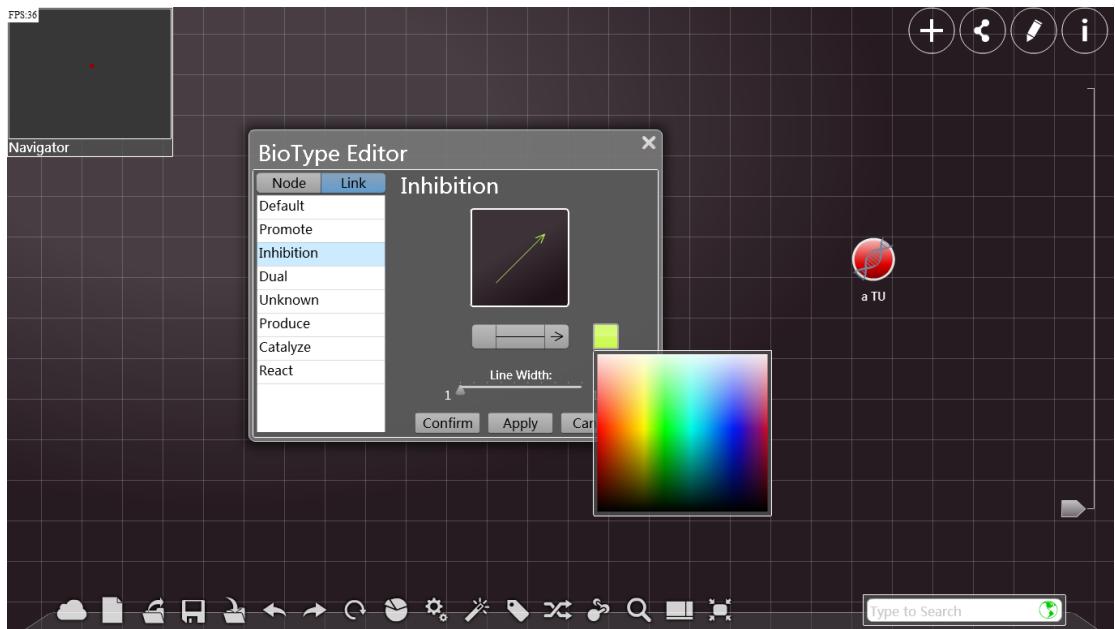
Click the two ends of the arrow to select a shape for the arrows.



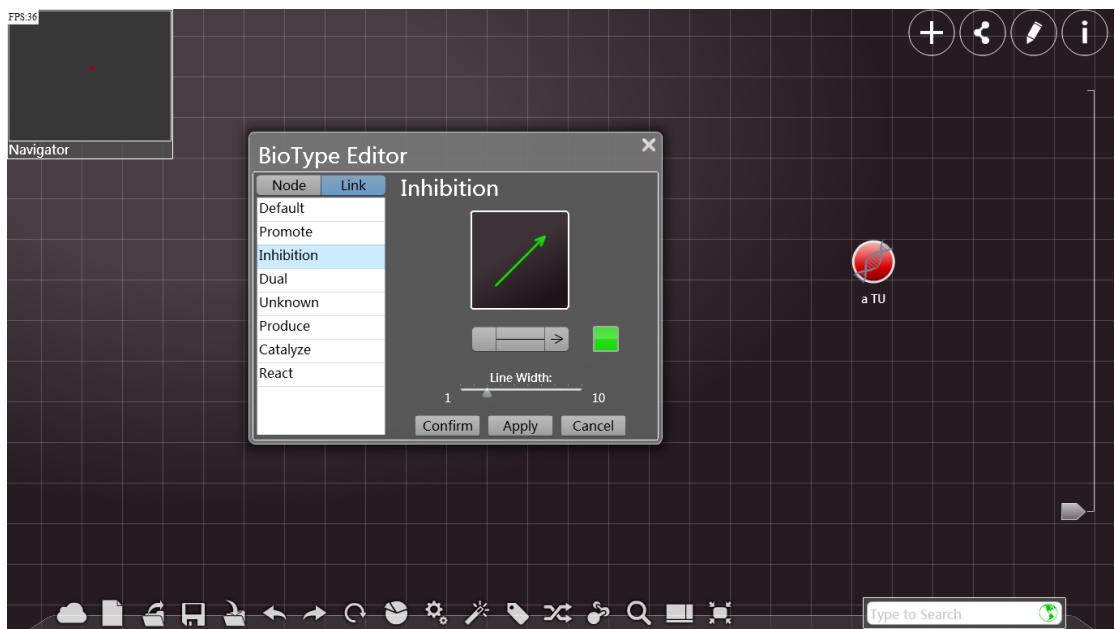
Click the line segment of the arrow to select a shape for it.



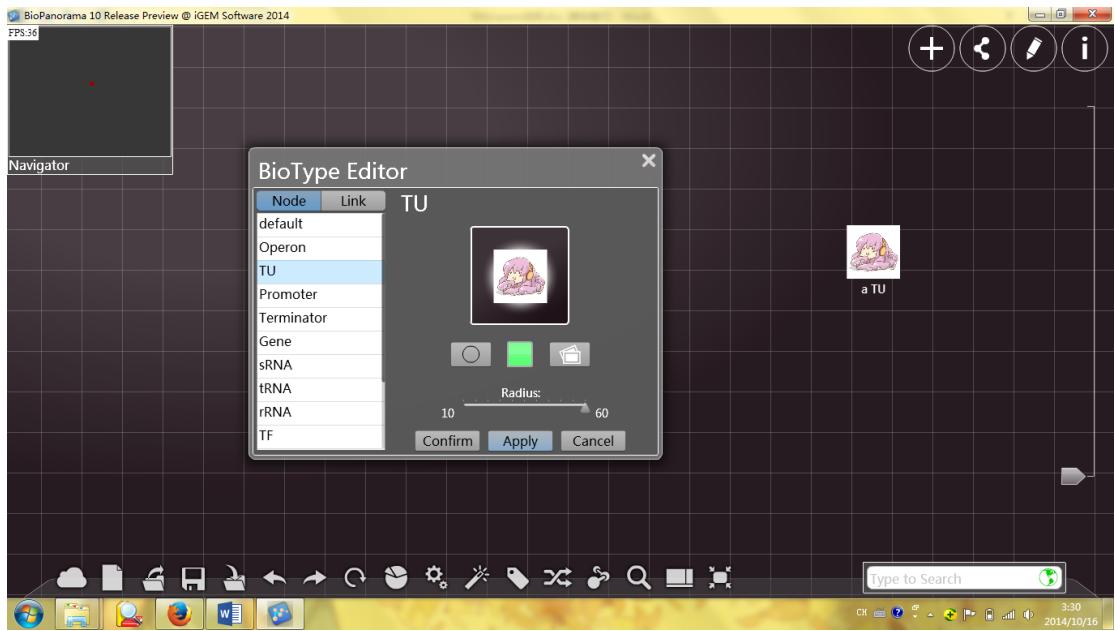
Click the color box to see the palette, where you can choose the color you like:



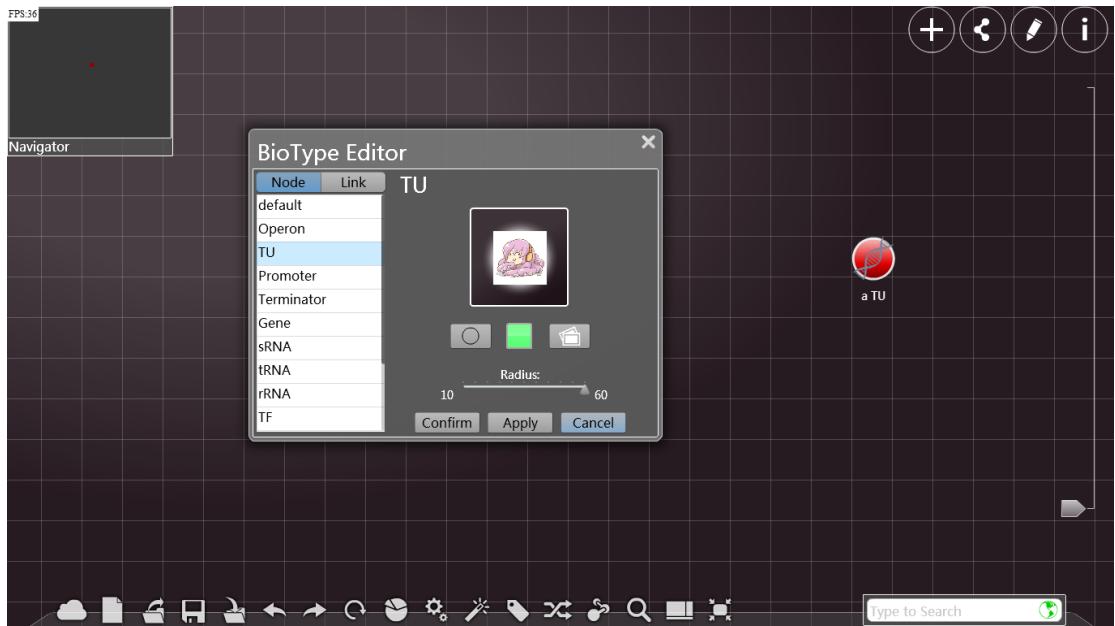
Adjust the size of the nodes by modifying "Radius". (Press the right button of the mouse to do it, and do not release the button until it is done.)



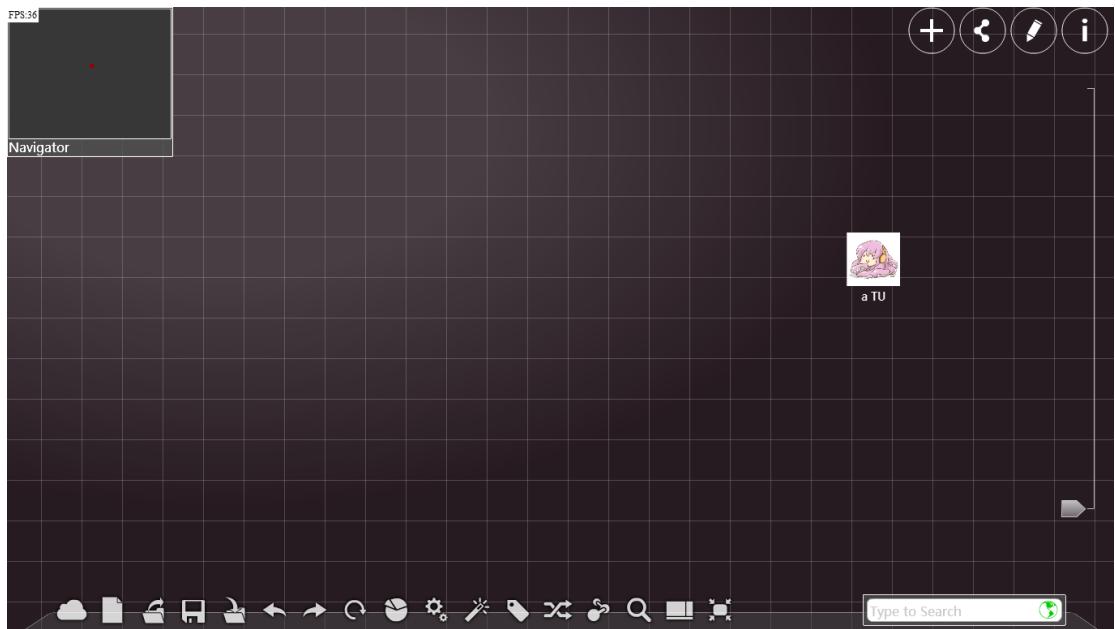
After modification, you can click "Apply" to see the outcoming result, and you can do more to adjust it if you are not satisfied with the result.



Click "cancel" to cancel the modification.

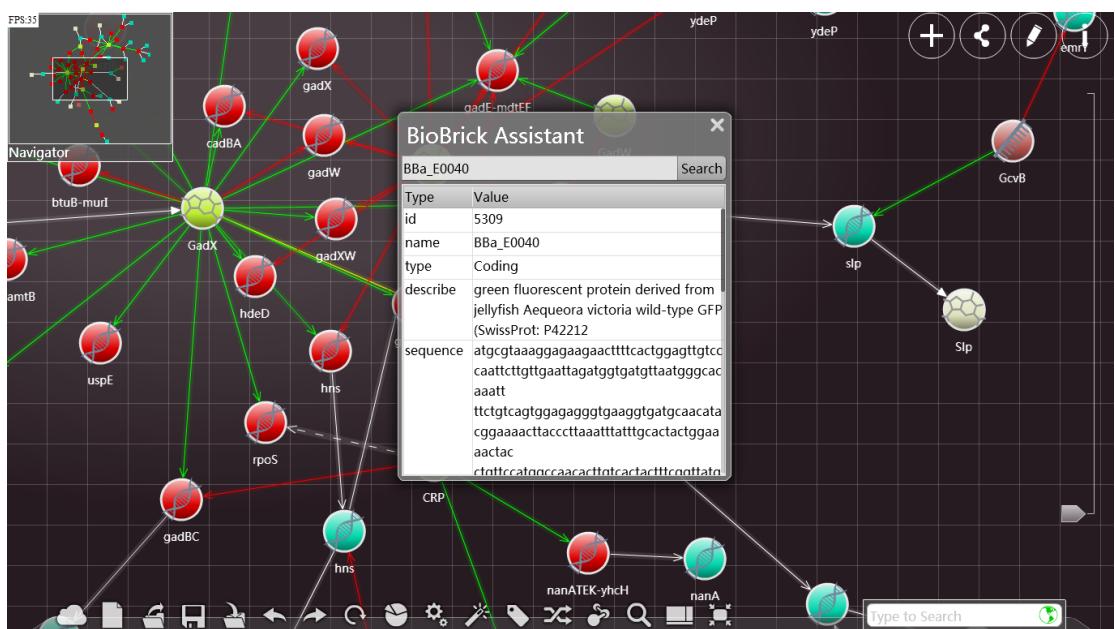


Click "confirm" to confirm the modification.



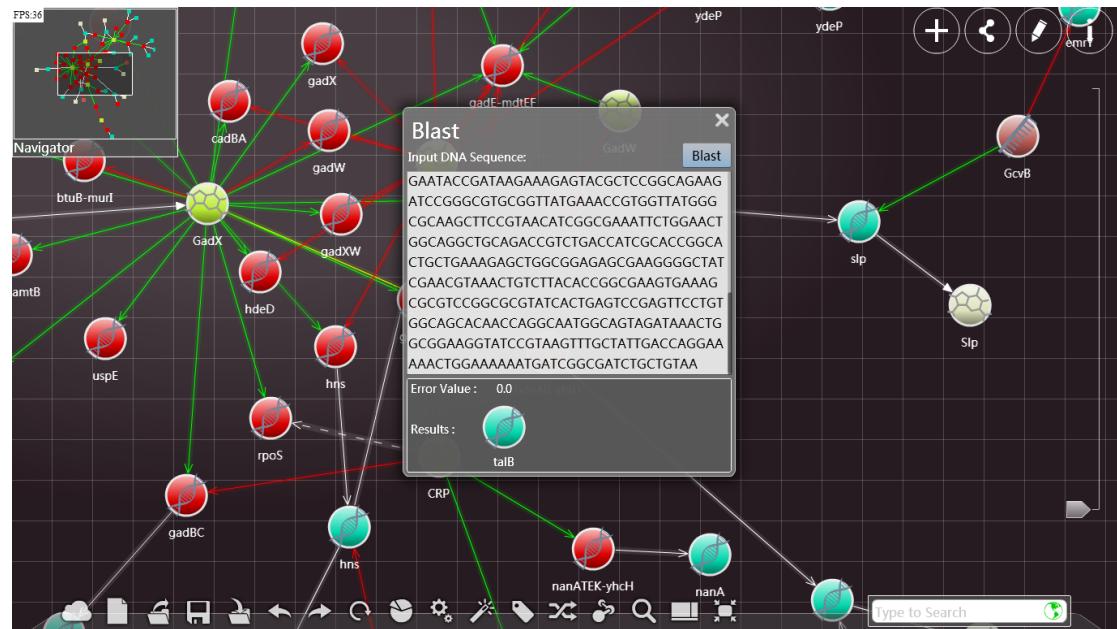
## Biobrick

Click "biobrick" to see the window "biobrick assistant". Input accurate name of the parts to search for the relevant parts and see the properties of them.



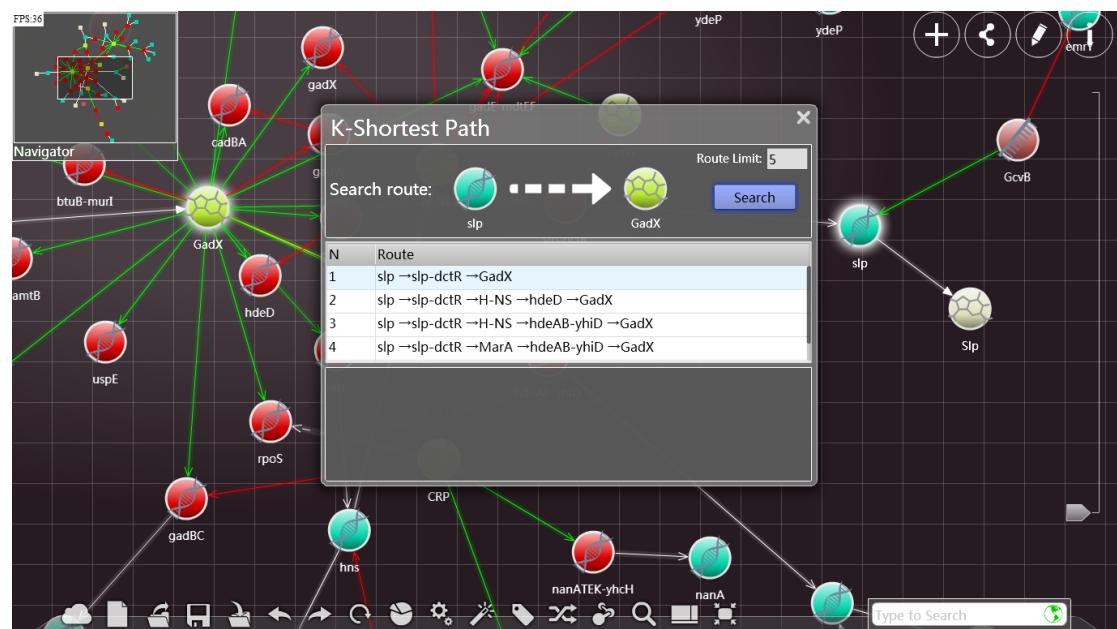
## Blast

Input a gene sequence that needs to be detected, then click "Blast" to search in the database for the gene sequences that are homologous to it.



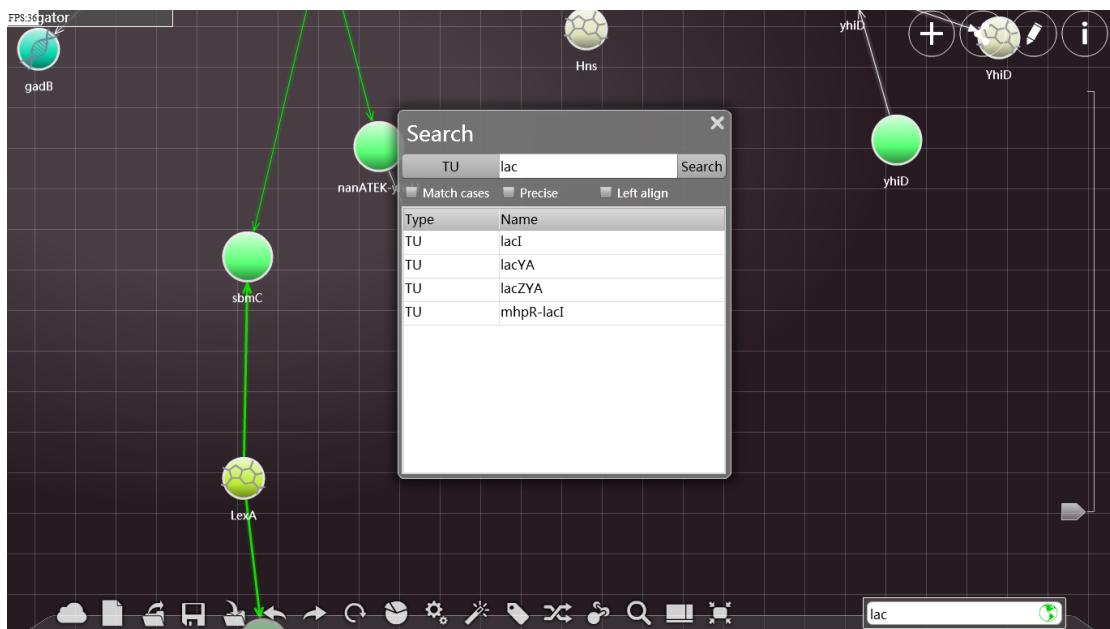
k short

Select two nodes. Click "k-short" and then click "search" to get all the pathways that link them together in the database.



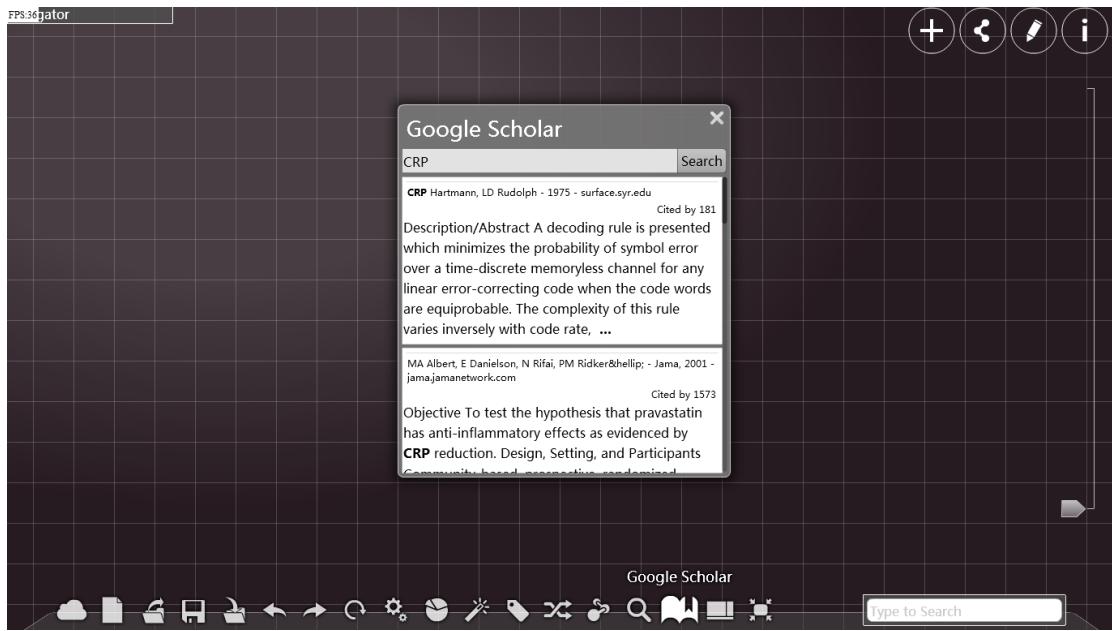
## Search

You can do searching work in the advanced search window. You can choose a certain type before you do it, or use some advanced options such as "match case", "precise" and "left align" to make the process even more effective.



## Google Scholar

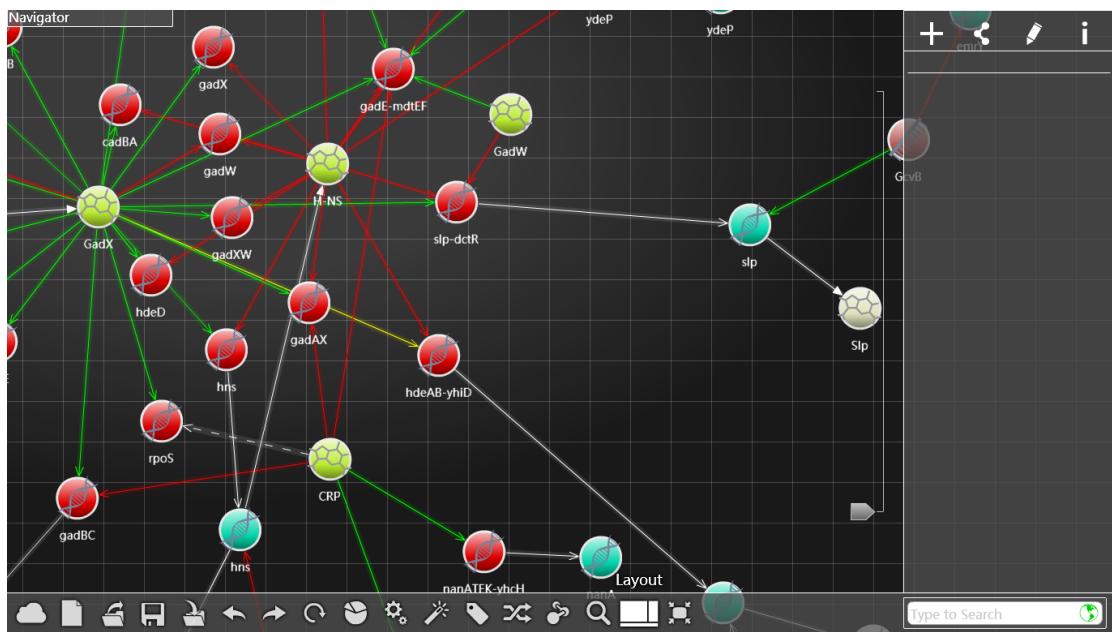
Input the key word or a node name, you can search it by google scholar. you can search and read paper here.



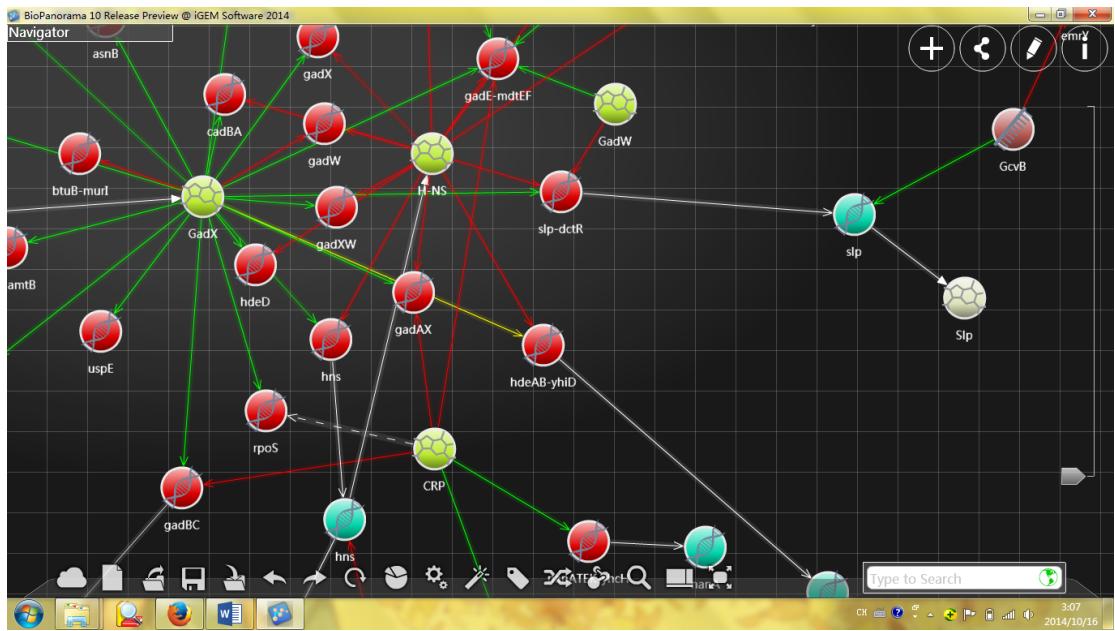
## Layout

Change the mode of which the sidebar and buttons at the bottom are

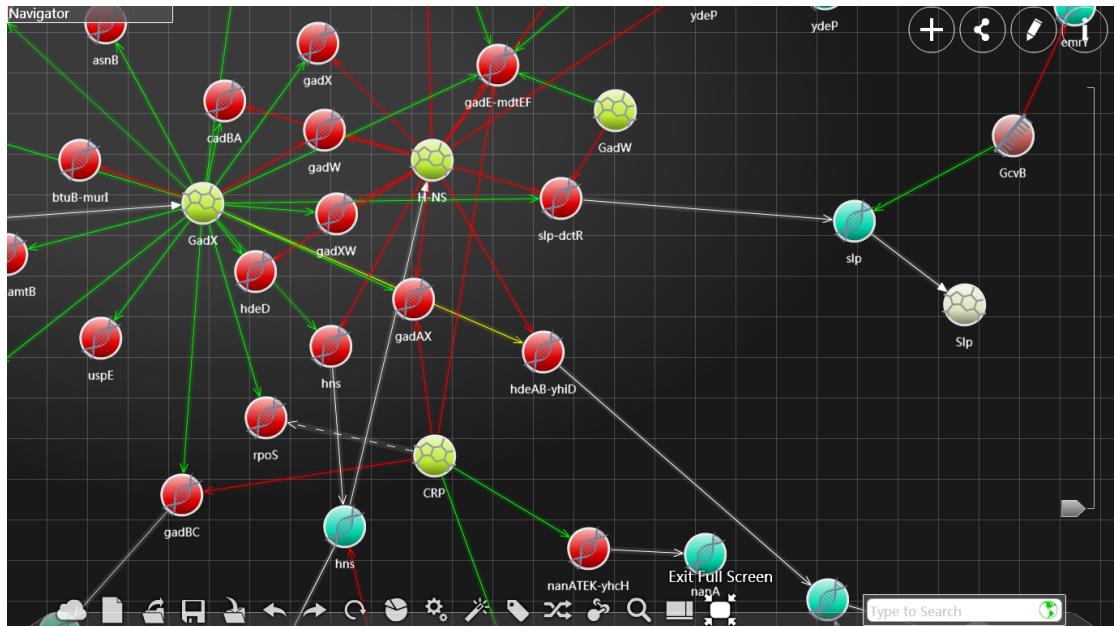
arranged. Click again to resume.



## Full screen



Click "Full Screen" to view the network displayed in the fullscreen mode.



Click again to exit the fullscreen mode.

## Connect us

Email us to [support@biopano.org](mailto:support@biopano.org)