**Cytoscape Guide – Version 3.0.1**

* Downloading Cytoscape
  1. Search “Cytoscape” in Google and select the first search result. This will redirect you to the official Cytoscape page.
  2. Click on the “Download Cytoscape” button. Follow the download instructions for your operating system.
* Creating a compatible data file

1. Enter data into a MS Excel file. Separate targets and interactions in their own cells

* i.e. “Salmon” “is eaten by” “Bear” in three separate cells in the same row.

1. To simplify Cytoscape use for students, use only one type of interaction per data sheet.

* i.e. Do not enter both “eats” and “is eaten by” relationships in the same sheet.

1. Save spreadsheet as an Excel Workbook.

* Importing a file to Cytoscape
  1. In the Cytoscape file menu, select “New”-> “Network” -> “Empty Network.”
  2. Click “File” -> “Import” -> “Table” -> “File.” A new window will open.
  3. Select your Excel Workbook and click “Open.”
  4. You should see your data in the Preview section of the window. In the “Advanced” section, select the “Show Text File Import Options” checkbox. This allows you to edit the way your data is imported into the program. If your data is split into too many categories (i.e. The phrase “is eaten by” is split into three columns), uncheck the “Space” box under the Text File Import Options heading.
  5. Use the colorful menus at the top of the page to select categories for your data.
* i.e. Source Interaction – Column 3, Interaction Type – Column 2, Target Interaction – Column 1. (This selection is specifically for directional energy transfers such as “Salmon is eaten by bear” in which ‘salmon’ is the target node and ‘bear’ is the source node.)
  1. Select “Import” at the bottom of the page. This will direct you back to the main Cytoscape window and should display your visualized data web.
  2. Drag nodes away from each other to ensure that edges connect the intended nodes. You can also click on the “Apply Preferred Layout” icon in the main toolbar next to the zoom icons to automatically arrange the network or select any of the options in the main “Layout” menu.
* Editing Nodes and Edges
  1. To choose default display options for all network elements, select the VizMapper tab under the Control Panel. Click on the “Defaults” box to open a window with selections to modify the default settings. To add directional arrows to all edges, double click on the “Edge Source Arrow Shape” panel and select an arrow shape. Any other default property can be edited in this way.
  2. To modify the visual properties of a single node or edge, right click on the edge or node you’d like to change and hover over “Edit” -> “Bypass Visual Style” to display edit options for that specific network element.
  3. To move a node, either drag one around or click on one and use the arrow keys to reposition it.
* Adding Nodes and other Elements
  1. Right click on the network window.
  2. Hover over “Add” to display options.
* Adding Edges
  1. Right click on a source node you want to modify.
  2. Select “Edit” -> “Add Edge.”
  3. Click on the target node.
* Navigating a Network

Multiple options for visually navigating through a network are available in Cytoscape. To zoom in and out, either scroll manually or click on the magnifying icons in the toolbar. Clicking the “1:1” icon allows you to view the entire network at once, while clicking the dotted-edged box zooms in on a selected portion of the network. To select a portion of the network, simply click and drag your mouse over a section of the network. The selected network elements will be highlighted. You can also center-click and drag the network around (“panning”) to move around the network window.

* Running a Pathway Simulation

The PathExplorer app allows Cytoscape users to identify patterns and relationships between networks by locating directional paths between nodes. To download this app, click on “Apps” in the main menu and select “App Manager.” In the “Install Apps” tab is a list of applications and their descriptions. Select the “PathExplorer” app and click “Install” at the bottom of the window. All downloaded applications will be listed under the “Currently Installed” tab. Once PathExplorer is downloaded, a PathExplorer option will be available in the right-click menu of every node. Selecting “PathExplorer” -> “Find paths to here” highlights every source node connected to the chosen node. Alternately, “PathExplorer” -> “Find paths from here” highlights all incoming target nodes. Highlighted paths can be cleared by selecting “PathExplorer” -> “Clear path.” A node can be silenced by selecting “PathExplorer” -> “Exclude node.”

* Adding Node Attributes

Node attributes represent additional data about network members. This could include expression levels in gene networks or food chain roles in ecosystem relationships. To add attributes to a pre-existing network from a data file, complete the following steps:

1. Enter attribute data into a MS Excel file. Put node names in one column *as entered in original network table.* Cytoscape is case-sensitive, so make sure your node names are identical in both files. Enter attribute values in another column. A single attribute can only be one type of data. For example, a “WebRole” attribute of a food web network could not contain both words and numbers. However, you can create multiple attributes in one file of different data types by entering them in separate columns.
2. In Cytoscape, select “File” -> “Import” -> “Table” -> “File.” This will open a new window. Click on your Excel attribute file and select “Open.”
3. At the top of the window, make sure the “Import Data as:” field is set to “Node Table Columns.” Select the name of your network in the dropdown menu next to “Network Collection.” The name of your network can be found in the Network Control Panel on the left side of the main Cytoscape interface. The “Key Column for Network” field should be set to “shared name.”
4. Click “Okay.”

To add attributes to a pre-existing network within Cytoscape, complete the following steps:

1. Locate the Table Panel beneath the main network display area. Click on the blank page icon from the Table Panel toolbar. Selecting “New Single Column” adds an attribute with one data value to every node. Selecting “New List Column” allows you to input a series of data for every node.
2. Hover over the column type you want to add. Click on the type of data you intend to input. ‘Integers’ are non-decimal values, ‘long integers’ are larger integer values, ‘strings’ are words, ‘floating points’ are decimal values, and ‘booleans’ are conditional values (true, false).
3. Double click any column cell you want to modify or add data to in the Table Panel list of attributes.

The Table Panel contains all attributes and their controls. Click the green checkmark icon to display all attributes (referred to in Cytoscape as ‘columns’). To rename an attribute, right click on the column header and select “Rename column.”