Visualizing and Analyzing Biological Network Data in Cytoscape 2.1

Cytoscape is an open source software project for integrating biomolecular interaction networks with high-throughput expression data and other molecular states into a unified conceptual framework. Although applicable to any system of molecular components and interactions, Cytoscape is most powerful when used in conjunction with large databases of protein-protein, protein-DNA, and genetic interactions that are increasingly available for humans and model organisms. Cytoscape's software Core provides basic functionality to lay out and query networks; to visually integrate networks with expression profiles, phenotypes, and other molecular states; and to link networks to databases of functional annotations. The Core is extensible through a straightforward plugin architecture, allowing rapid development of additional computational analyses and features. Cytoscape core functionality and interesting new plugins will be demonstrated and discussed.

Highlighted plugins will include:
- **cPath Plugin** - enables Cytoscape users to query, retrieve and visualize interactions retrieved from the cPath protein-protein interaction database.
- **Agilent Literature Search Plugin** - is a meta-search tool for automatically querying multiple text-based search engines in order to aid biologists faced with the daunting task of manually searching and extracting associations among genes/proteins of interest.
- **Active Modules Plugin** - enables Cytoscape to search for significant networks, or active subnetworks, as described in Bioinformatics. 2002 Jul;18 Suppl 1:S233-40.
- **MCODE Plugin** - finds clusters (highly interconnected regions) in any network loaded into Cytoscape.
- **Motif Finder Plugin** runs a Gibbs sampling motif detector on sequences corresponding to the selected nodes in the current network.

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**Major application area**
Systems Biology

**Platform requirements**
Cytoscape requires Java 1.4.2 and higher versions of the Java runtime, and runs on platforms supporting current JVMs. Unix/Linux, Mac OS X and Windows are fully supported and tested.

**Availability/license**
Cytoscape is developed and released under the GNU Lesser General Public License (LGPL).

**How to obtain the software**
For more information about Cytoscape, including downloading of current releases, user documentation, etc., please visit: [http://www.cytoscape.org](http://www.cytoscape.org)

**References**