Tutorial:Agilent Literature Search

Agilent Literature Search

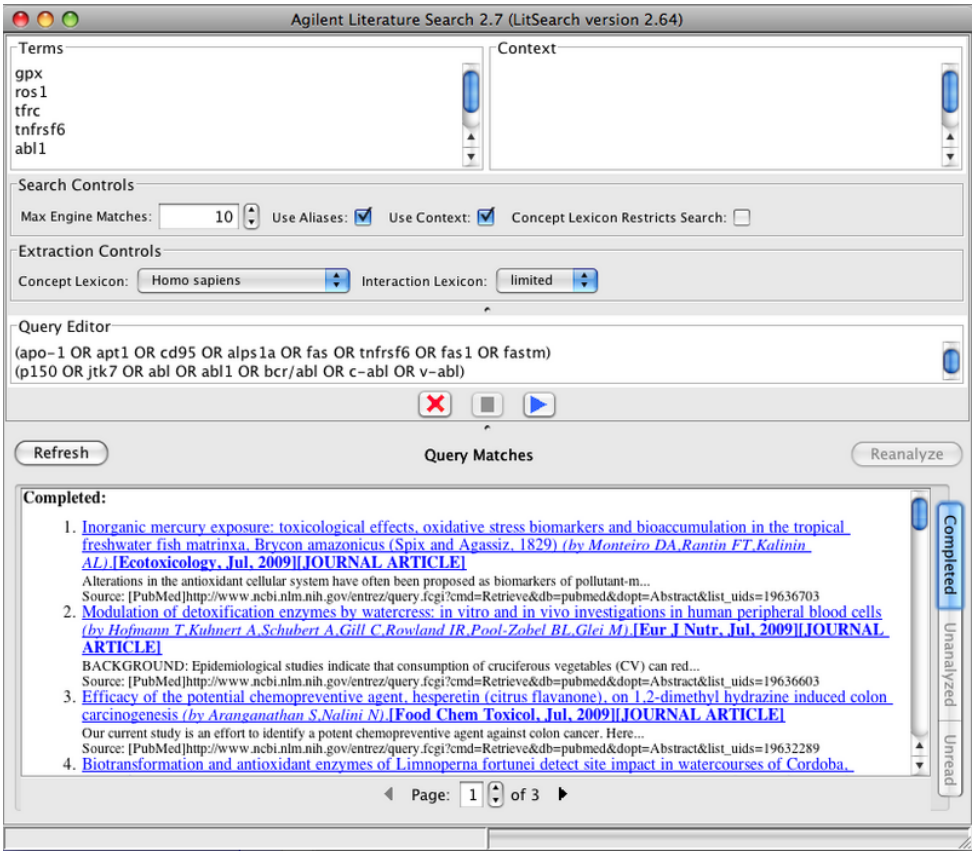
Biological Use Case: Generate biological networks by extracting associations from scientific literature and other unstructured text. This demonstration is associated with a study into cardiovascular disease, in which the interpretation of microarray data is augmented by generating biological networks for a list of highly regulated genes.

Procedure

1. Using Cytoscape version number 2.6, upload the Agilent Literature Search plugin. Go to **Plugins->Manage Plugins**. The Agilent Literature Search plugin will be in the *Available for install* folder.

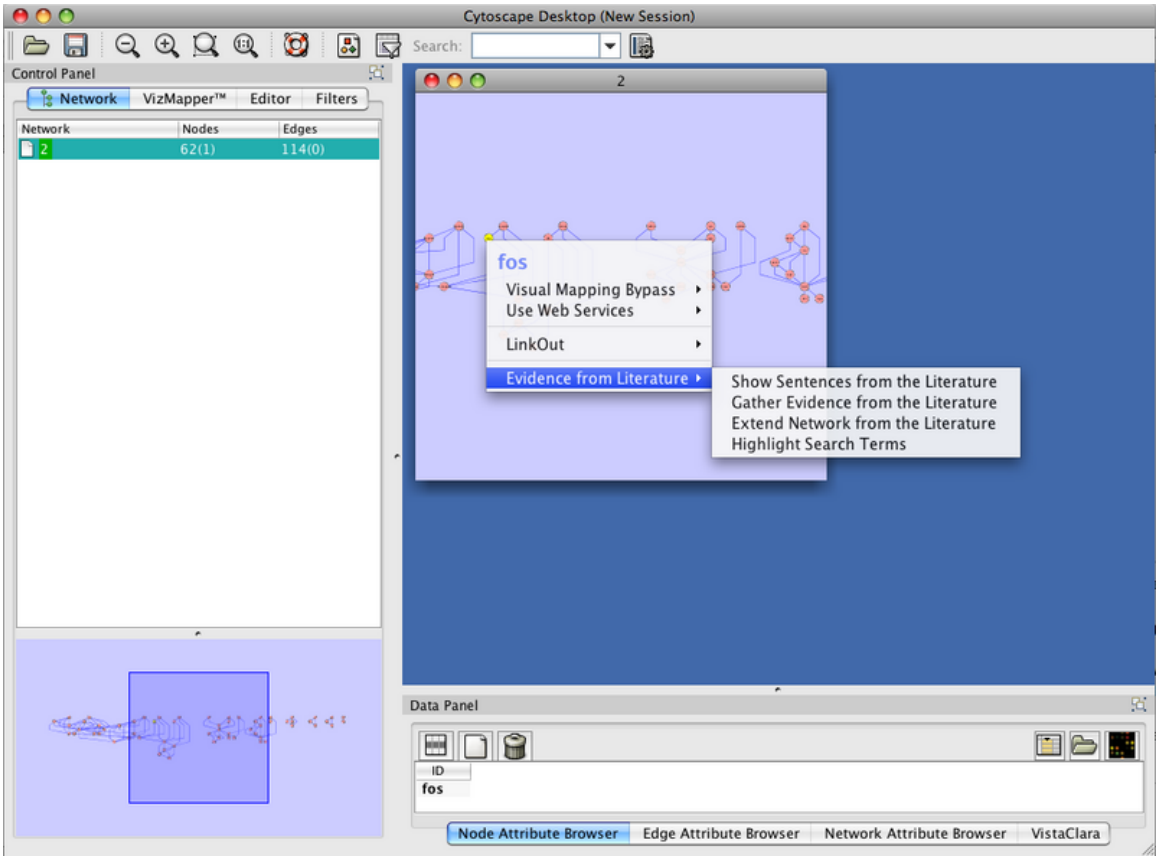
Generate a biological network for a set of genes or proteins

1. Bring up the Agilent Literature Search plugin via the Plugins menu.
2. Type a list of gene names into the **Terms** pane of Agilent Literature Search GUI. For this example use the terms *gpx1, ros1, tfrc, tnfrsf6, abl1*. These were high-scoring genes in microarray study.
3. Click on **Use Aliases** in Search Controls. You should see a set of aliases inserted into query string in the **Query Editor** pane.
4. Click **Use context** off, then back on. You should see the **Query Editor** pane eliminate the AND statement and its right hand side, then restore it when you click on **Use Context**. User context serves to limit the scope of the search, e.g. if you are interested in a particular disease.
5. Click on the blue **Play** button in the control panel. You should see the literature search tool begin to exercise queries. A term **Search in progress** message will appear in the **Query Results** pane. When the query completes, you will see a list of citations in the **Query Results** pane. You will then see a network laid out in a *New Network* window.


Agilent Literature Search 2.7 (LitSearch version 2.64)
Terms
gpx
ros1
tfrc
tnfrsf6
abl1
Context
Search Controls
Max Engine Matches: 10
Use Aliases:
Use Context:
Concept Lexicon Restricts Search:
Extraction Controls
Concept Lexicon: Homo sapiens
Interaction Lexicon: limited
Query Editor
(apo-1 OR apt1 OR cd95 OR alps1a OR fas OR tnfrsf6 OR fas1 OR fastm)
(p150 OR jtk7 OR abl OR abl1 OR bcr/abl OR c-abl OR v-abl)
Refresh
Query Matches
Reanalyze
Completed:
1. Inorganic mercury exposure: toxicological effects, oxidative stress biomarkers and bioaccumulation in the tropical freshwater fish matrinxa, Brycon amazonicus (Spix and Agassiz, 1829) (by Monteiro DA,Rantin FT,Kalinin AL).[Ecotoxicology, Jul, 2009][JOURNAL ARTICLE]
Alterations in the antioxidant cellular system have often been proposed as biomarkers of pollutant-m...
Source: [PubMed]http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=pubmed&dopt=Abstract&list_uids=19636703
2. Modulation of detoxification enzymes by watercress: in vitro and in vivo investigations in human peripheral blood cells (by Hofmann T,Kuhnert A,Schubert A,Gill C,Rowland IR,Pool-Zobel BL,Glei M).[Eur J Nutr, Jul, 2009][JOURNAL ARTICLE]
BACKGROUND: Epidemiological studies indicate that consumption of cruciferous vegetables (CV) can red...
Source: [PubMed]http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=pubmed&dopt=Abstract&list_uids=19636603
3. Efficacy of the potential chemopreventive agent, hesperetin (citrus flavanone), on 1,2-dimethyl hydrazine induced colon carcinogenesis (by Aranganathan S,Nalini N).[Food Chem Toxicol, Jul, 2009][JOURNAL ARTICLE]
Our current study is an effort to identify a potent chemopreventive agent against colon cancer. Here...
Source: [PubMed]http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=pubmed&dopt=Abstract&list_uids=19632289
4. Biotransformation and antioxidant enzymes of Limnoperna fortunei detect site impact in watercourses of Cordoba,
Page: 1 of 3
Completed
Unanalyzed
Unread

Examine literature references that support a given association (edge)

1. Right click on an edge and select **evidence from literature->show sentences from literature**. You will see a list of sentences come up in a pop-up window. Each sentences should contain the two terms for the source and target of the selected edge.



1. Click on one of the sentences. You should see a web browser page come up containing a pubMed abstract in which that sentence is contained. This is akin to having a visual table of contents for the literature around a set of biological terms of interest.
2. Right-click on one of the sentences and select **Delete**. Repeat until there are no sentences left. At the point when you delete the last remaining sentence in the **Show Sentences** windown, the edge that you are examining will be eliminated, since there is no longer evidence backing it. Any nodes that become disconnected when edge is eliminated will also be themselves eliminated.
3. Choose **Select->Evidence from Literature->Highlight Search Terms**. You will see that the original search terms you typed in are now highlighted in the network view.

Expand your network

1. Select a node in the network.
2. Right-click with the mouse and pick **Evidence from Literature->Extend Network from the Literature**.
3. You should see ner nodes appear, connected by edges to the node you selected.

Gather evidence to support an existing interaction

1. Select **File->Import->Network** and load *galfiltered.sif* from the *testData* folder.
2. Drag your mouse to select an edge in the network. Choose **Select->Evidence from Literature->Gather Edivence from the Literature**. You will see a status window come up wile the *Gather Evidence* process is executing.
3. When the process is done and the status window goes away, right click again on your chosen edge and select **Evidence from Literature->Show sentences from the literature**. You should see a list of sentences.

Article Sources and Contributors

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