Teaching

Teaching materials for Experiment in microbiology and biochemical engineering laboratory Course

- 2019 netbiolab experiment teaching material
- 2019 netbiolab experiment teaching material

Teaching materials for Yonsei Bioinformatics Course

- 2018 Bioinformatics Kallisto Practice
- 2018 Bioinformatics WebNext Practice
- 2018 Bioinformatics Machine Learning Practice

Teaching materials for BIML workshop

- BIML2017 practice 2 PPT file & python scripts
- BIML2016 practice 1 PPT file
- BIML2016 practice 2 python scripts
1. www.cytoscape.org

Cytoscape is an open source software platform for visualizing complex networks and integrating these with any type of attribute data. A lot of Apps are available for various kinds of problem domains, including bioinformatics, social network analysis, and semantic web.

Learn more...
Download 3.7.1

Platform Specific Installers
Java 6 is required and is automatically installed for Windows and Mac OS

Mac OS X
Windows 64bit
Linux
Windows 32bit
This is the last version of Cytoscape for Windows 32bit. Please consider upgrading your system to a 64 bit processor and using a 64 bit Java VM so you can take advantage of substantial improvements in Cytoscape speed and memory usage that enable faster processing and larger networks.

Archive Distributions
Zip Archive
for Windows
GZIP Archive
for Mac/Linux
How to check your computer’s OS version. (windows case)
Download java from
http://java.sun.com/javase/downloads/index.jsp
Download Java 8 that suits your OS.

Install Java and Cytoscape by default setting.
Trouble shooting Java crashes

Run Notepad as “Administrator”

File ➔ Open ➔ cytoscape file ➔ Open the file: Cytoscape_vmoptions
Trouble shooting Java crashes

Run Notepad as “Administrator”

File → Open → cytoscape file → Open the file: Cytoscape_vmoptions

Convert -Xmx1250m into –Xmx512m and save
LAB 6:

Visualization and analysis of functional gene networks using Cytoscape
1. **Network**: HumanNet v.1

a probabilistic functional gene network of 18,714 validated encoding genes of *Homo sapiens*. (Insuk et al, 2011)

We used subset of the network: ‘breast cancer related genes’
2. **Expression data**: RNA-seq data
   Samples are from 3 Breast cancer patients and 3 normal. Breast cancer patients have specific type of cancer: **Triple Negative Breast Cancer**
   Data downloaded from: Gene Expression Omnibus (GEO) → A whole collection of various expression data
3. Gene Ontology: Gene-Function annotation data
Described in 3 domains
- Molecular Function
- Cellular Component
- Biological Process

Gene Ontology diagram showing relationships between gene functions and processes.

Gene symbols: GPR32, ATG5, RBM17, RBPJ, DOCK6, etc.
Gene expression analysis

Gene ontology analysis

Network
Running Cytoscape
Import network

testnet.sif
Import expression data

DO_breastcancer.pvals
Maximum color
Installing BINGO

1. Apps → App manager → Install from File → BINGO.jar
Running BINGO

1) Select all genes in the network (Ctrl + A)
2) Apps → BINGO
3) BINGO settings
   - Type cluster name: any names
   - Select ontology file: custom: “file gene_ontology_ext.obo”
   - Select namespace: ---
   - Select organism/annotation: custom “file: GOBP.BiNGO.txt”
Corrected p value
Report

Assignment: Draw given Network with Cytoscape on your own.

Things to include
1. Date of the experiment and the day (Mon, Tue, Wed, Thur, Fri)
2. Results with “figures of your own” (1 network file with gradient color, 1 with BINGO output)
3. Discussion
4. References

Discussion should include:
• What the network visualization tells you.
  (What information does the network give you? What can you tell from the expression data and function enrichment analysis using Bingo? 
  → No correct answer for this. Just write what you think)

  • Other type of visualization may give you additional points. If you have made modifications, describe what you have done in the report

Data to draw the network can be found in: www.netbiolab.org → teaching
Find Cytoscape at: www.cytoscape.org
Report

Lab Address: Science Research Center (과학원) S323 Questions:
Monday, Tuesday Thursday class: 조재원 (dreadcupper@naver.com)
Wednesday, Friday class: 이성호 (shlee354@gmail.com)

Due date : Experiment date ➔ Due date
Monday class (4/8) ➔ 4/15 (18:00)
Tuesday class (4/2) ➔ 4/9 (18:00)
Wednesday class(4/3) ➔ 4/10 (18:00)
Thursday class (4/4) ➔ 4/11 (18:00)
Friday class (4/5) ➔ 4/12 (18:00)