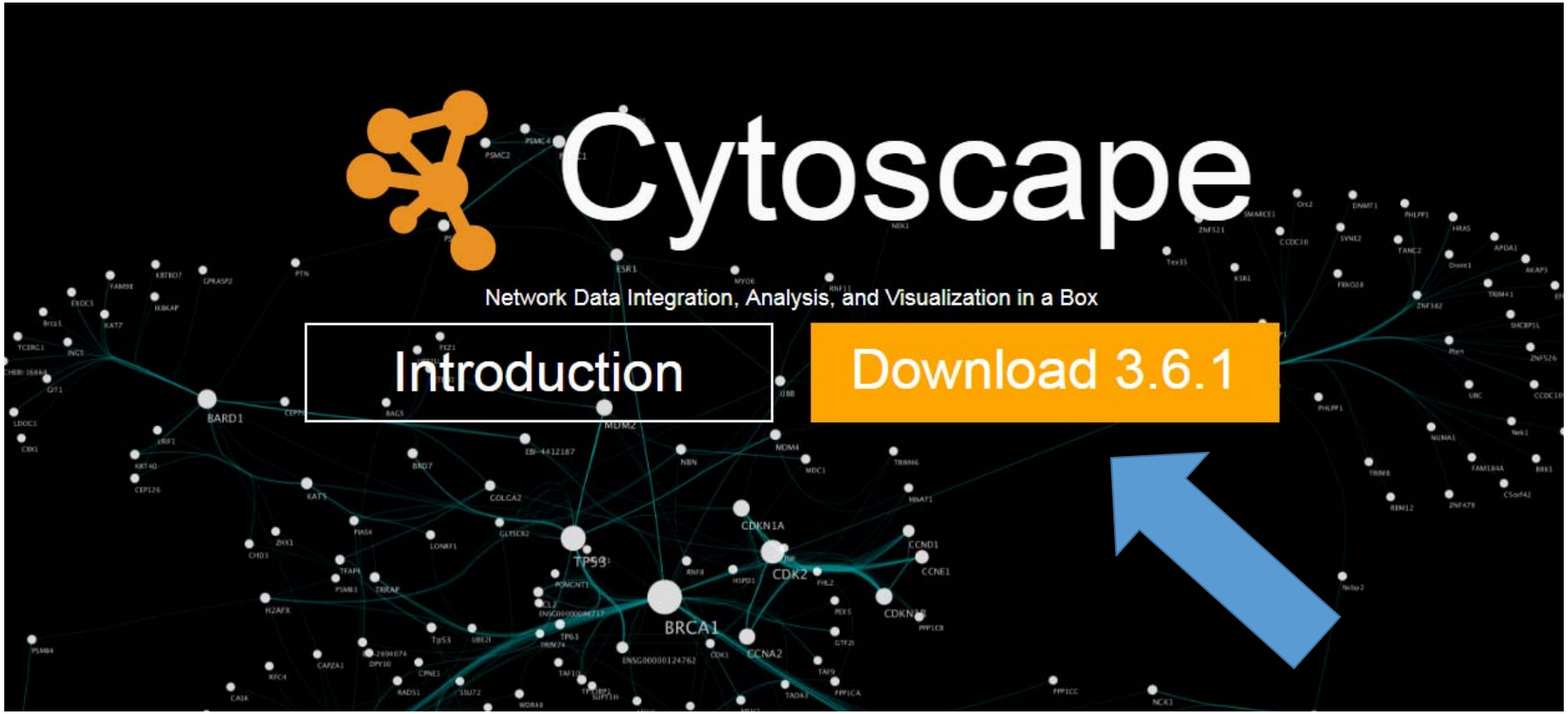
1. www.cytoscape.org



Download Cytoscape 3.6.1

for Windows (64 bit)

Java 8 will be automatically installed if not already present

Java 9 is not yet supported

Problems? Read this page first

Release Notes

Other Platforms

Old Versions

Donate

This is a tax deductible donation to a 501(c)(3) nonprofit organization,
The Cytoscape Consortium, Tax ID: 20-4909879.

Window 32bit

MAC OS

Download 3.6.1

Platform Specific Installers

Java 8 is required and is automatically installed for Windows and Mac OS

Mac OS X

Windows 64bit

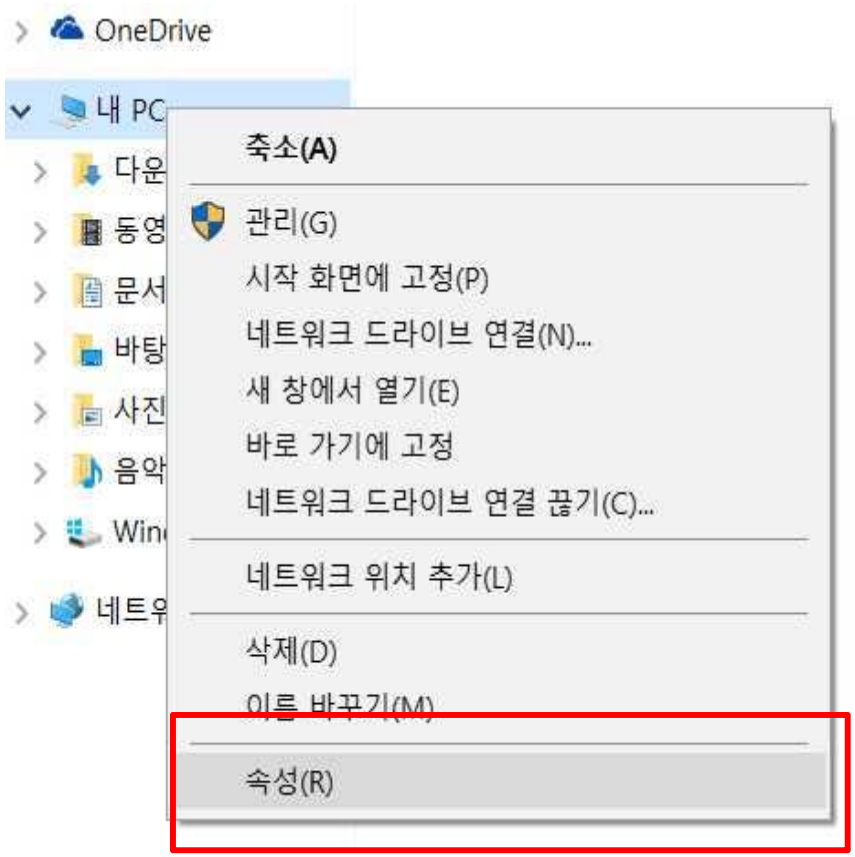
Linux

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.

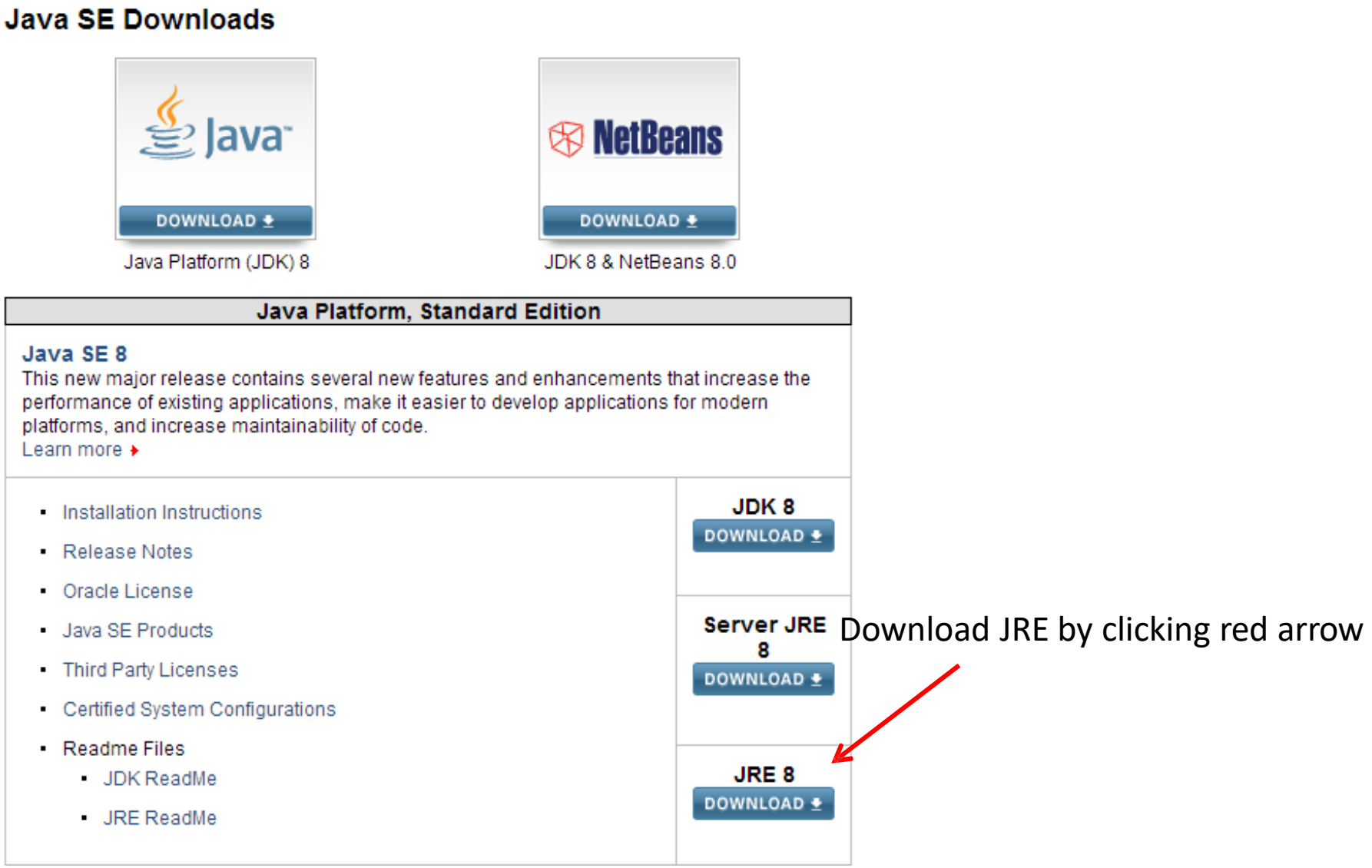
Archive Distributions

How to check your computer's OS version. (windows case)



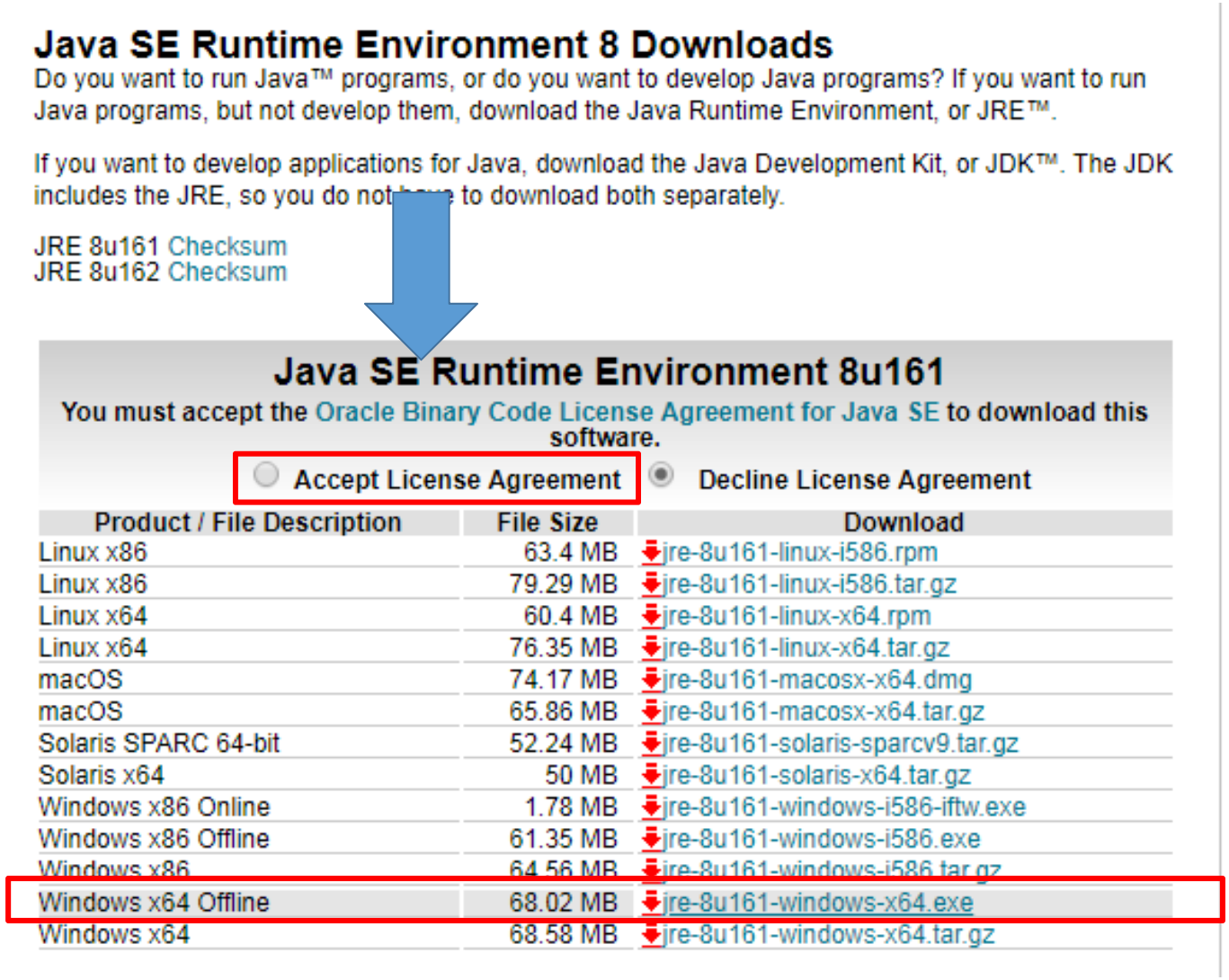
Download java from

http://java.sun.com/javase/downloads/index.jsp



Download JRE by clicking red arrow

Download Java 8 that suits your OS.



Java SE Runtime Environment 8 Downloads

Do you want to run Java™ programs, or do you want to develop Java programs? If you want to run Java programs, but not develop them, download the Java Runtime Environment, or JRE™.

If you want to develop applications for Java, download the Java Development Kit, or JDK™. The JDK includes the JRE, so you do not have to download both separately.

JRE 8u161 Checksum
JRE 8u162 Checksum

Java SE Runtime Environment 8u161

You must accept the Oracle Binary Code License Agreement for Java SE to download this software.

Accept License Agreement Decline License Agreement

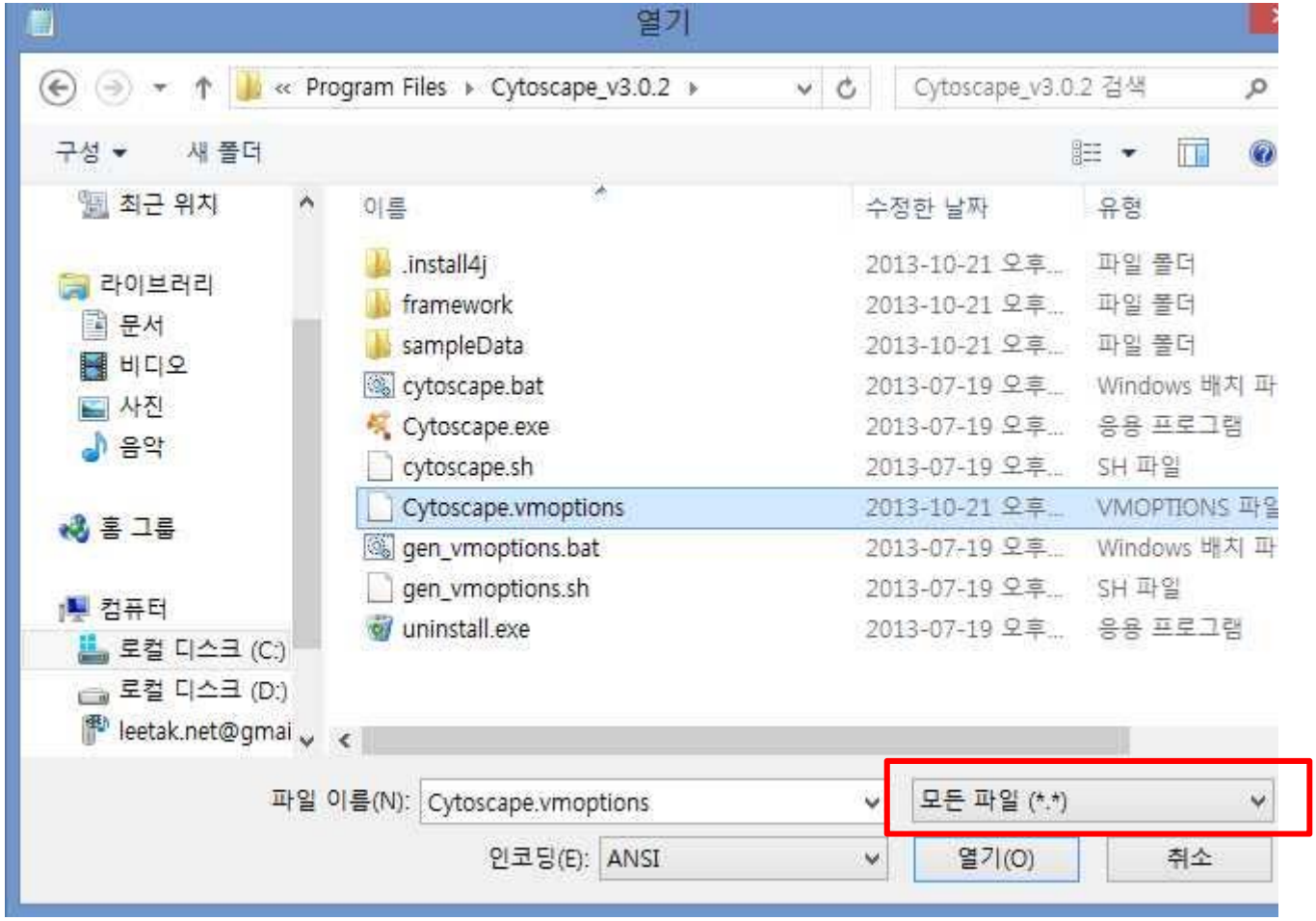
Product / File Description	File Size	Download
Linux x86	63.4 MB	jre-8u161-linux-i586.rpm
Linux x86	79.29 MB	jre-8u161-linux-i586.tar.gz
Linux x64	60.4 MB	jre-8u161-linux-x64.rpm
Linux x64	76.35 MB	jre-8u161-linux-x64.tar.gz
macOS	74.17 MB	jre-8u161-macosx-x64.dmg
macOS	65.86 MB	jre-8u161-macosx-x64.tar.gz
Solaris SPARC 64-bit	52.24 MB	jre-8u161-solaris-sparcv9.tar.gz
Solaris x64	50 MB	jre-8u161-solaris-x64.tar.gz
Windows x86 Online	1.78 MB	jre-8u161-windows-i586-iftw.exe
Windows x86 Offline	61.35 MB	jre-8u161-windows-i586.exe
Windows x86	64.56 MB	jre-8u161-windows-i586.tar.gz
Windows x64 Offline	68.02 MB	jre-8u161-windows-x64.exe
Windows x64	68.58 MB	jre-8u161-windows-x64.tar.gz

Install Java and Cytoscape by default setting.

자바 충돌 문제 해결

메모장을 “관리자 권한”으로 실행

파일 → 열기 → cytoscape 파일 → Cytoscape_vmoptions 파일을 열기



모든 파일 선택

자바 충돌 문제 해결

메모장을 “관리자 권한”으로 실행

파일 → 열기 → cytoscape 파일 → Cytoscape_vmoptions 파일을 열기

-Xmx1250m 을 –Xmx512m으로 수정하여 저장

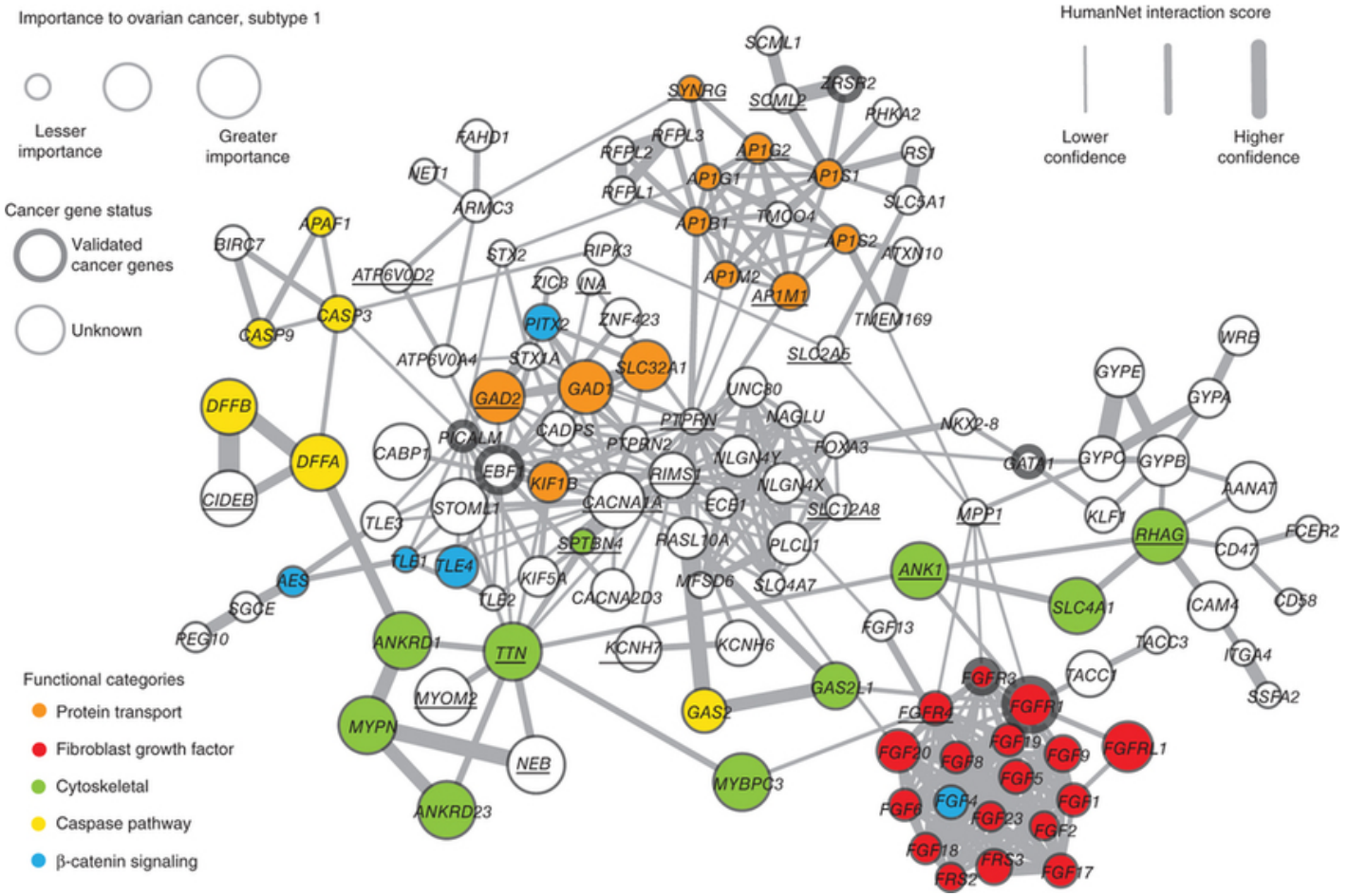
LAB 6 :

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’

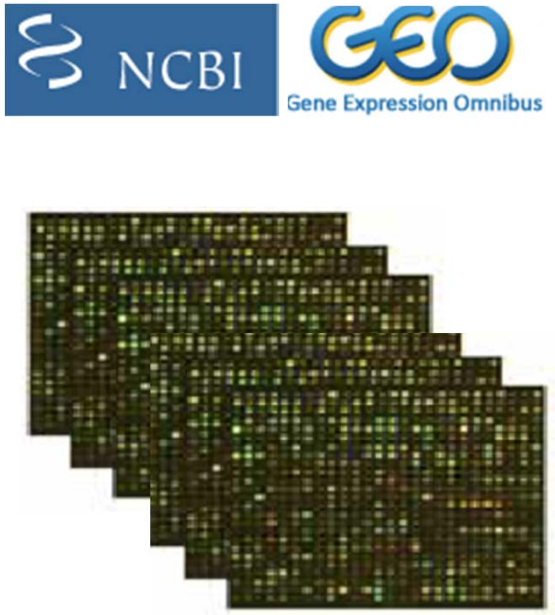


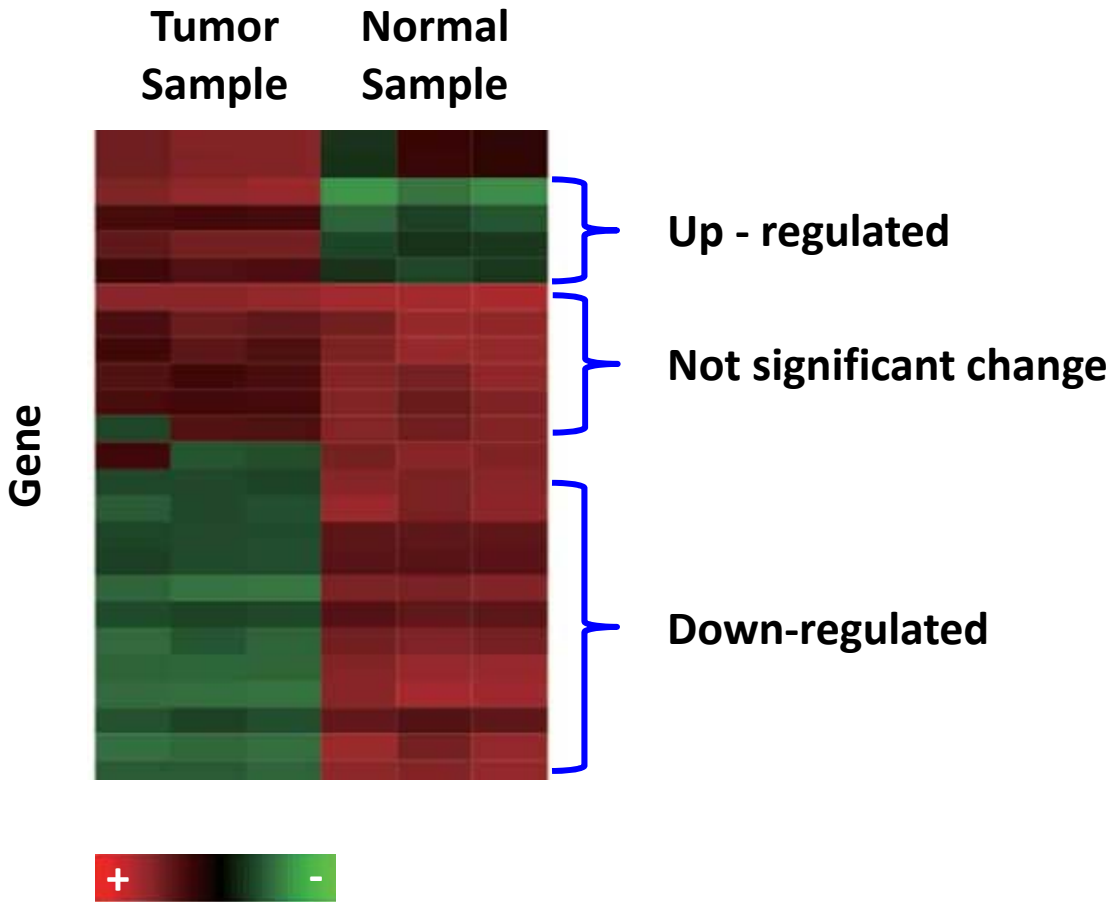
2. Expression data: RNA-seq data

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

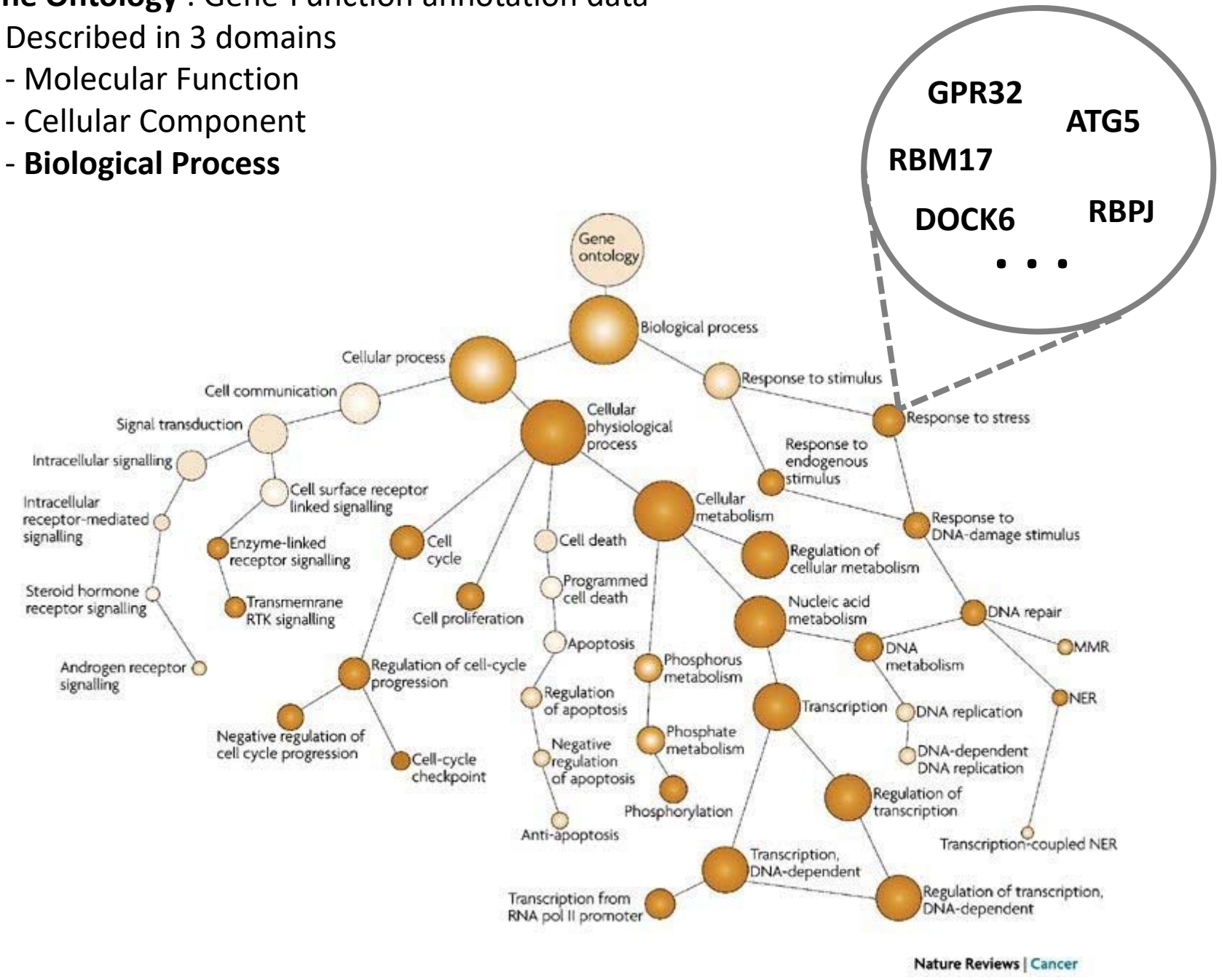


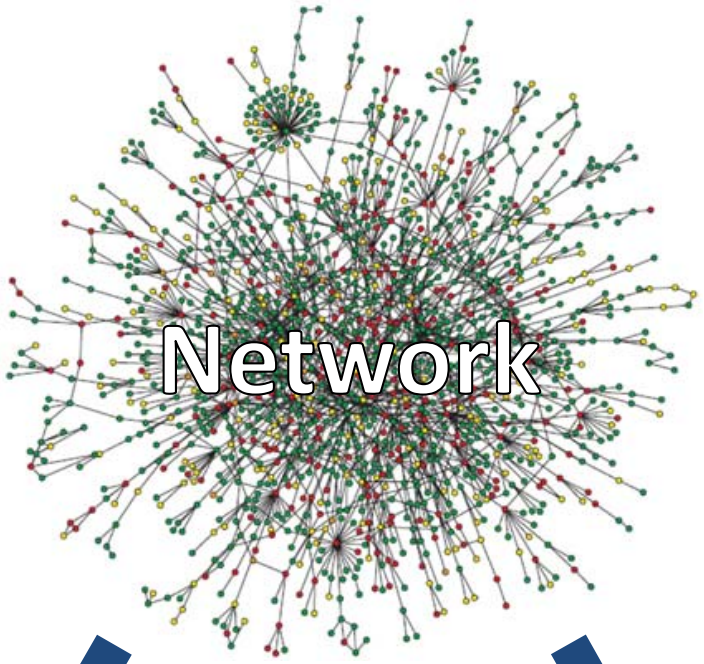


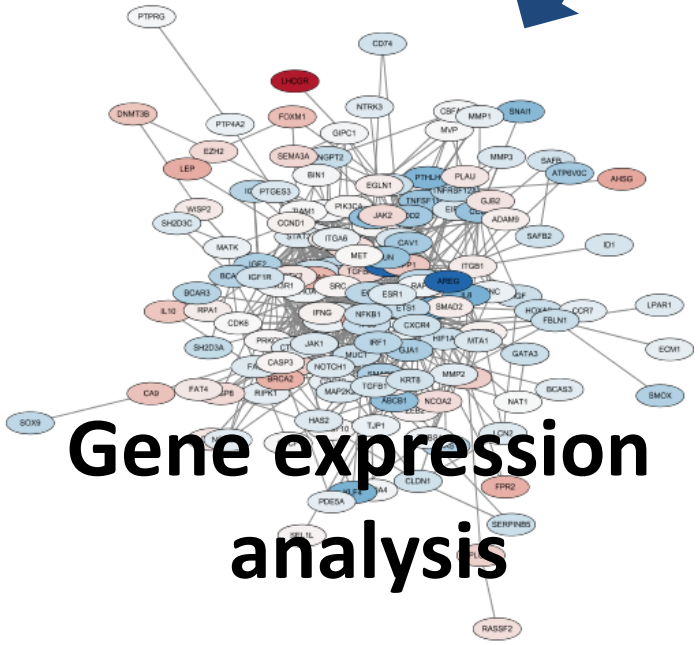
3.Gene Ontology : Gene-Function annotation data

Described in 3 domains

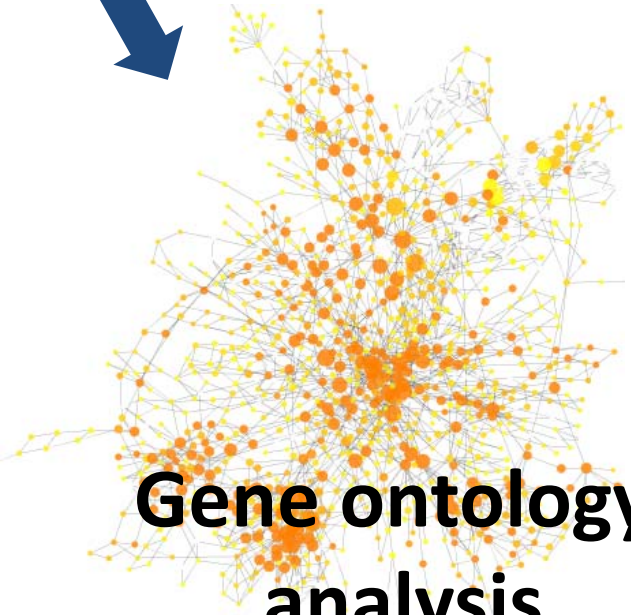
- Molecular Function
- Cellular Component
- **Biological Process**





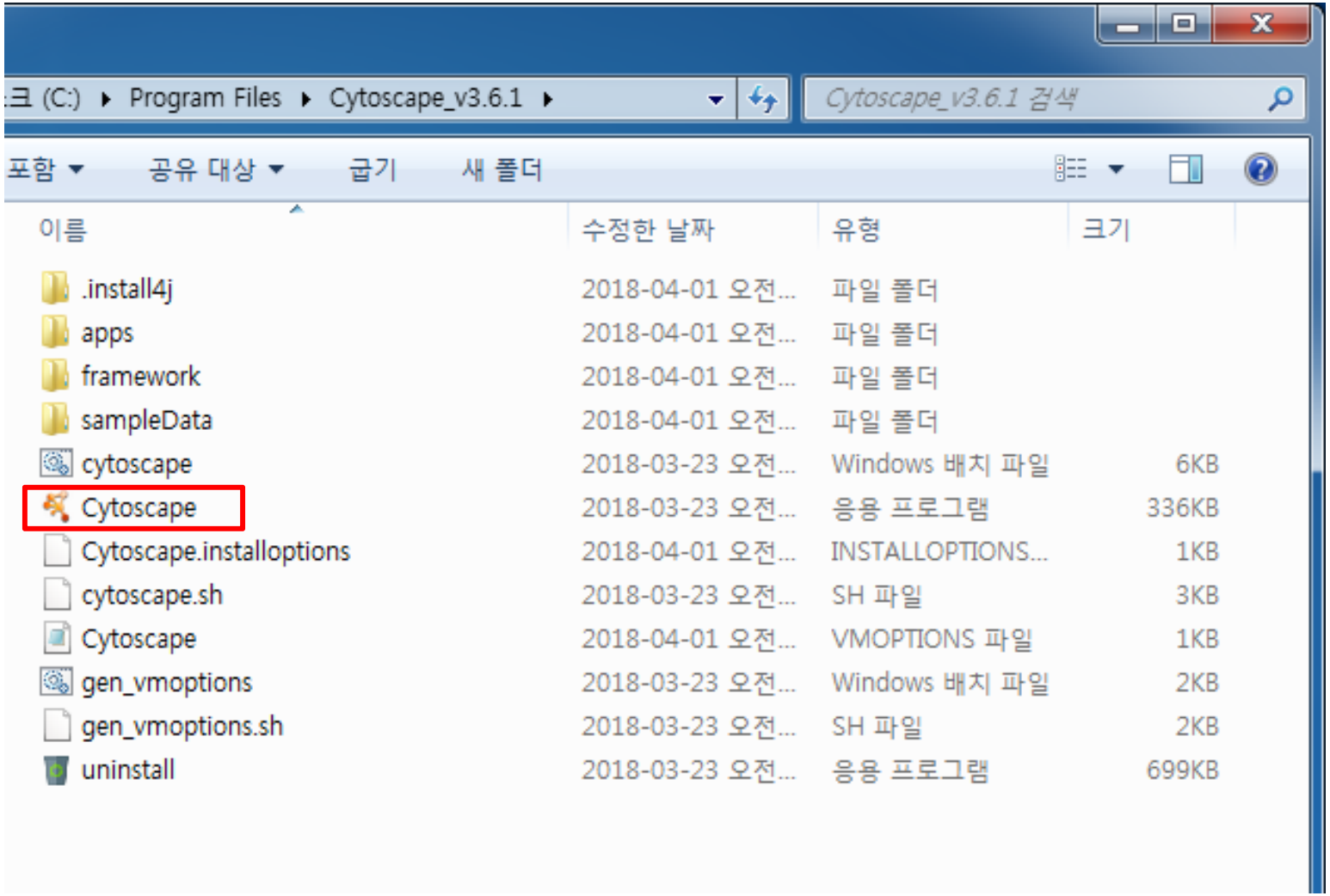


Gene expression analysis

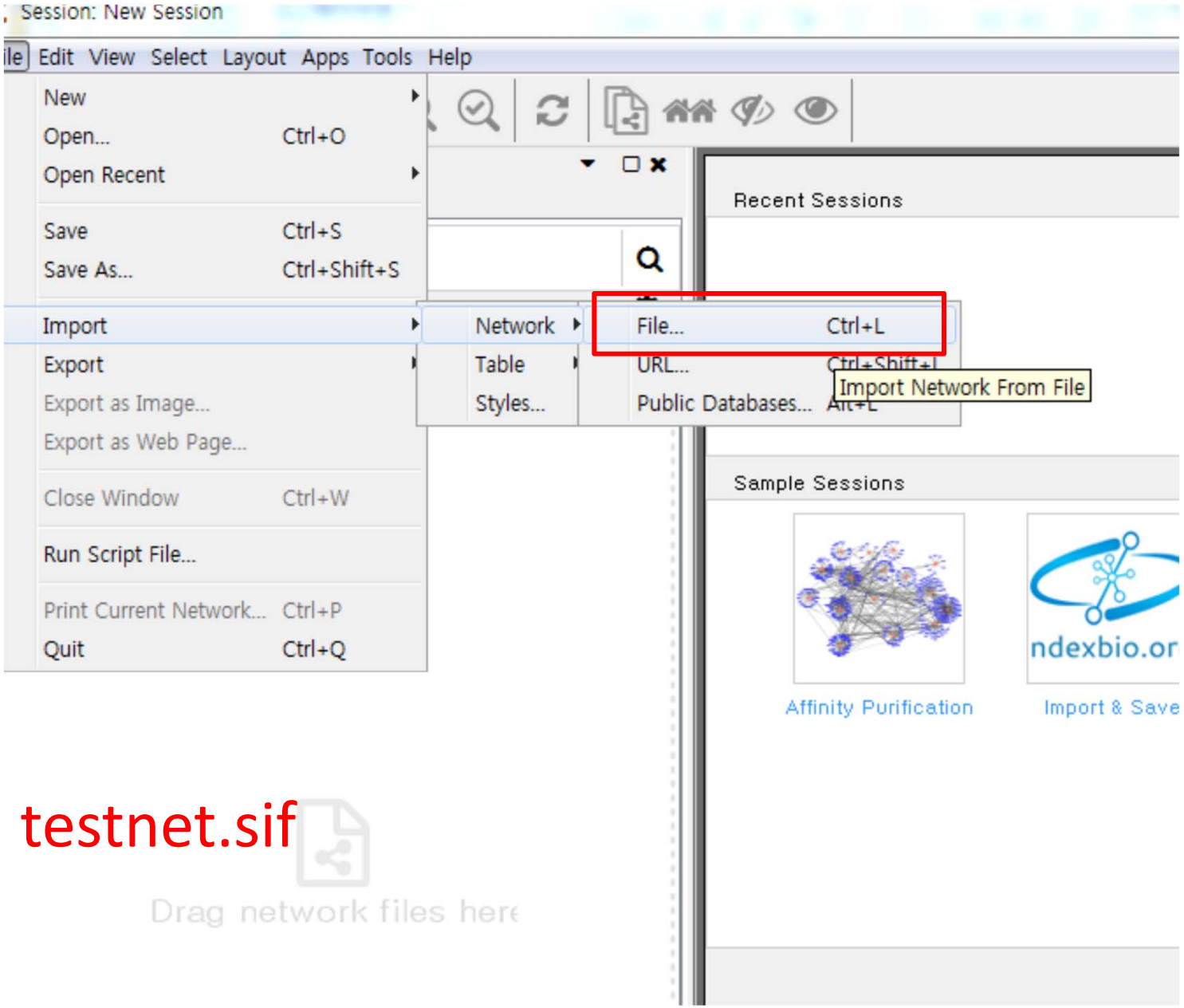


Gene ontology analysis

Running Cytoscape



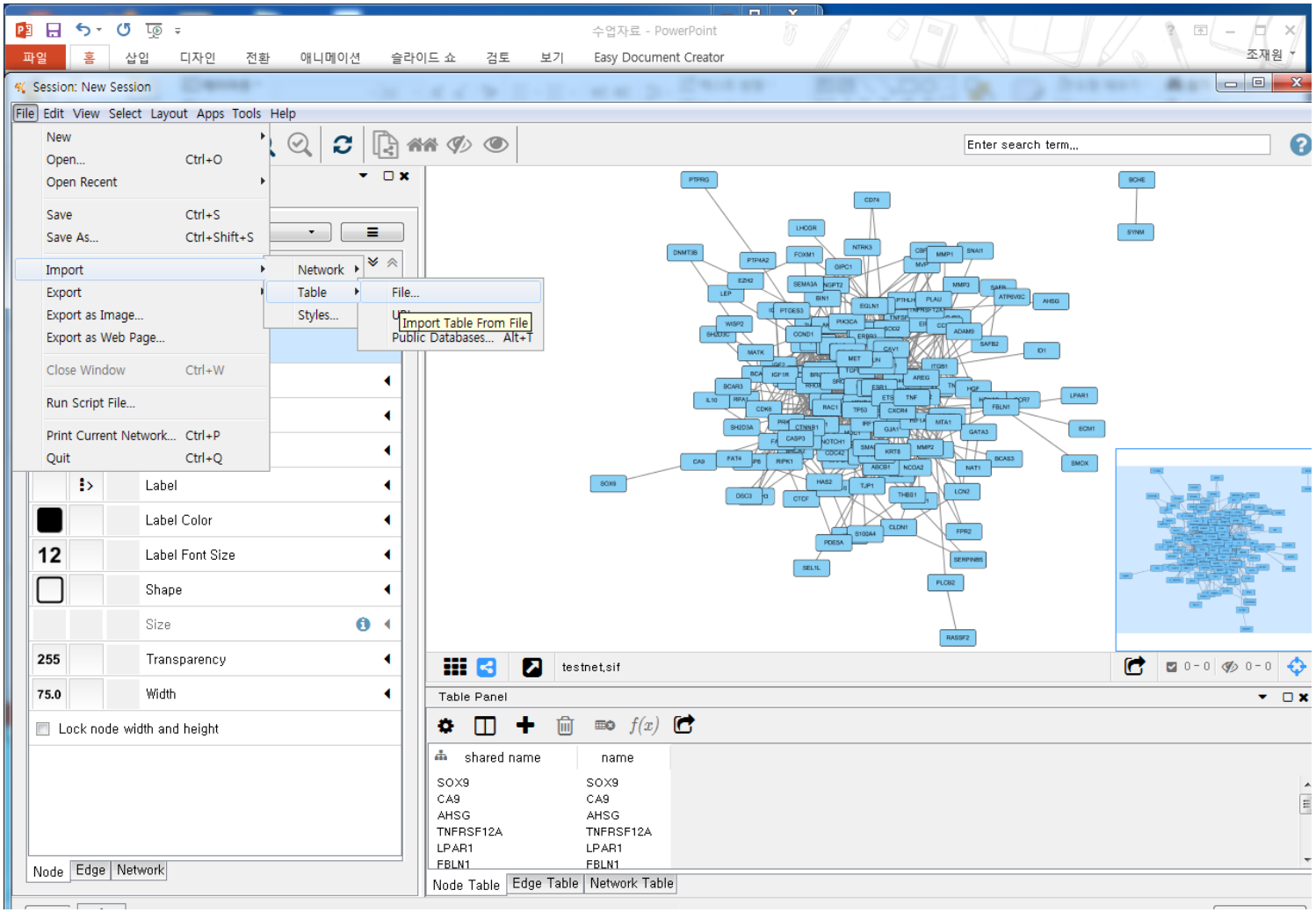
Import network

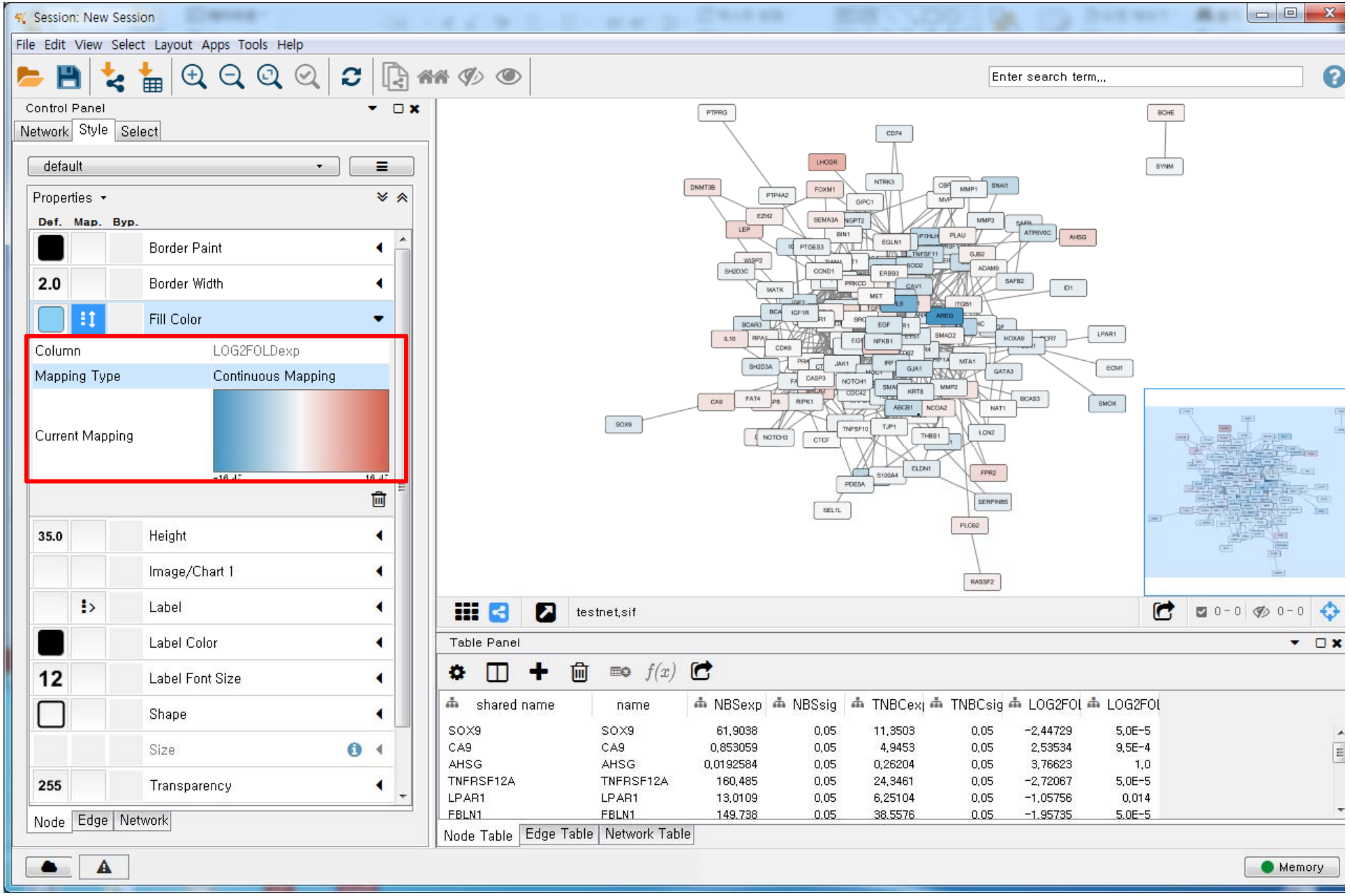


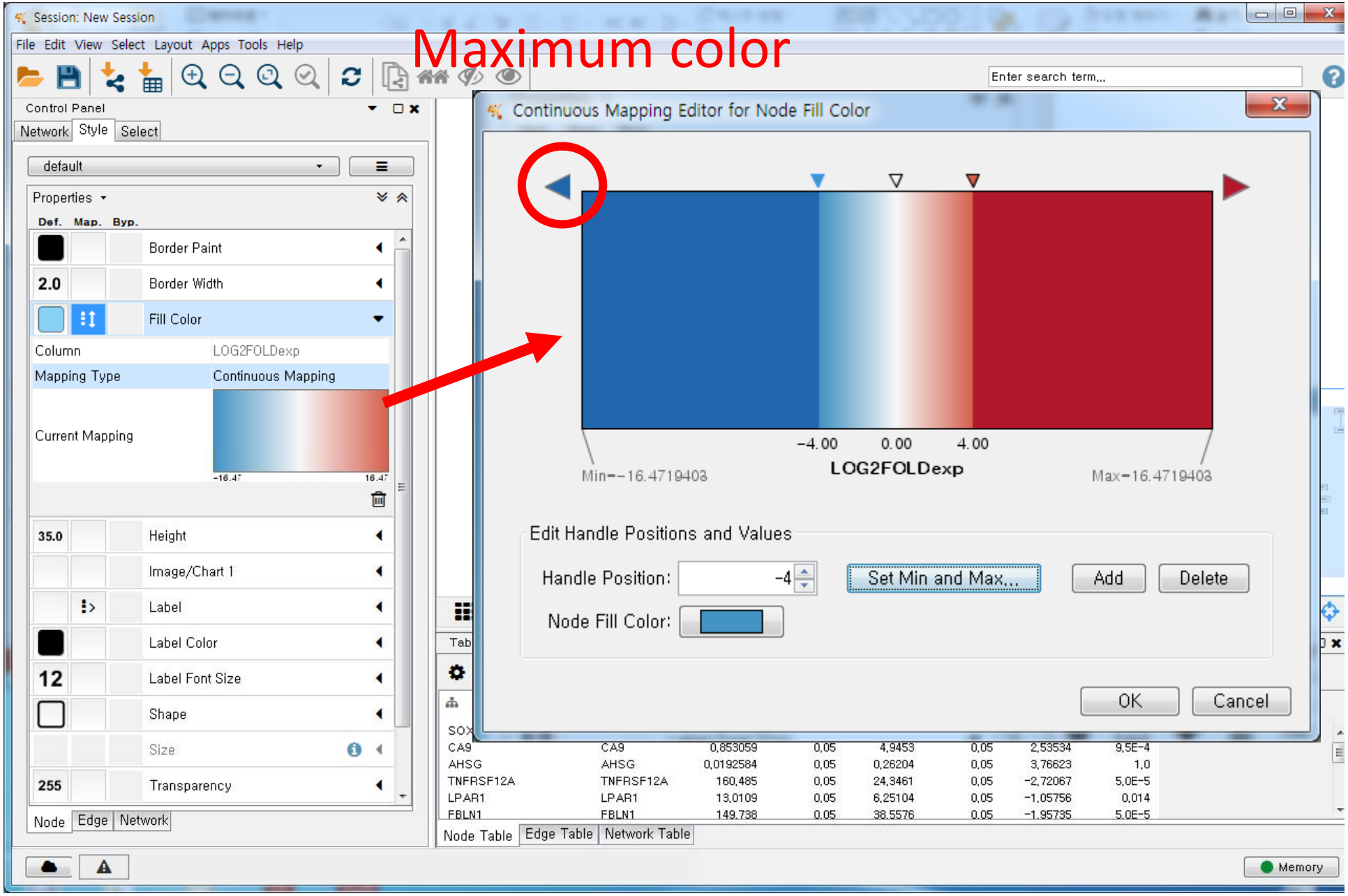
testnet.sif

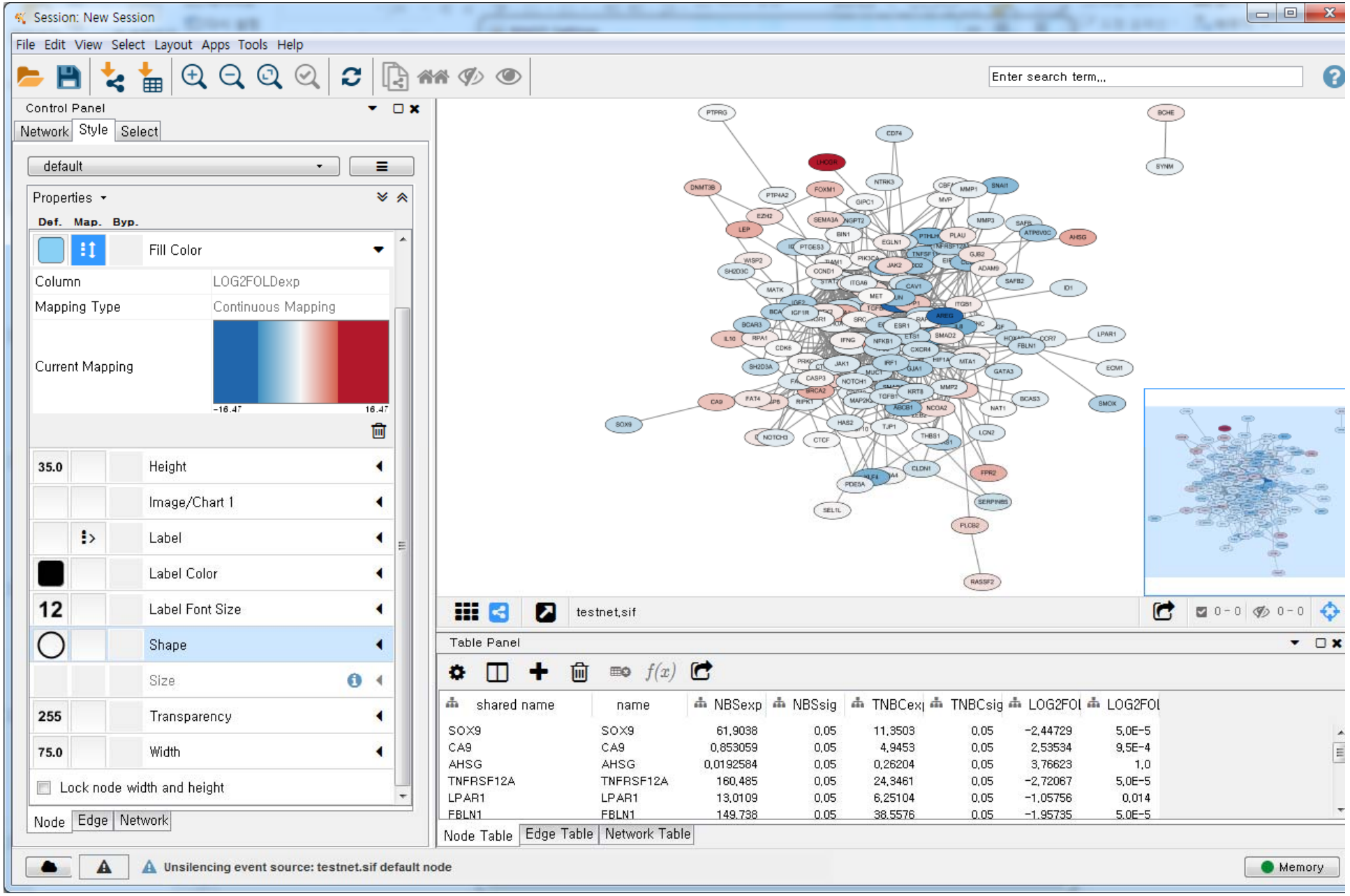
Import expression data

DO_breastcancer.pvals



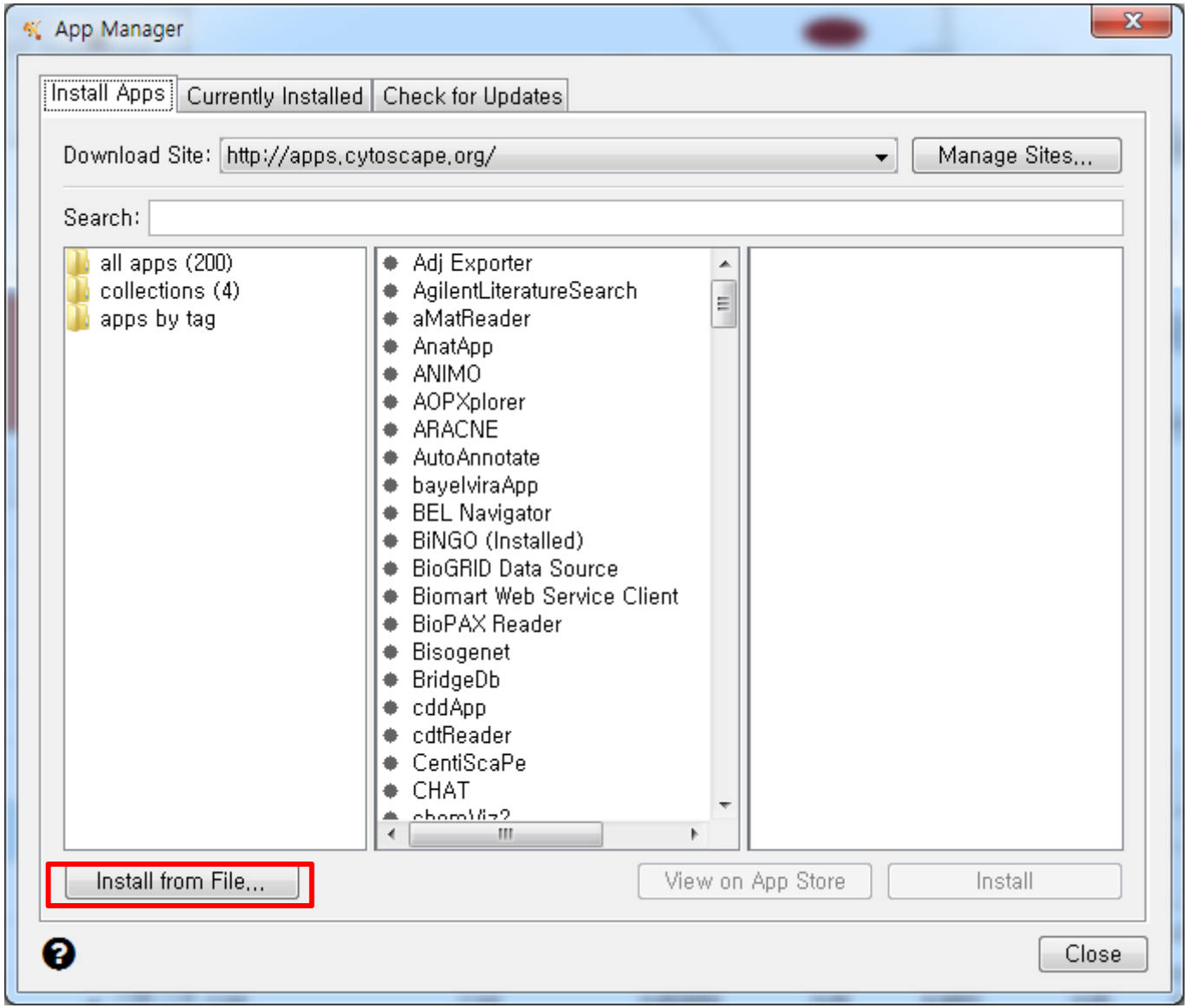

Session: New Session
File Edit View Select Layout Apps Tools Help
Enter search term...
Control Panel
Network Style Select
default
Properties
Def. Map. Byp.
Border Paint
2.0
Border Width
Fill Color
Column
LOG2FOLDexp
Mapping Type
Continuous Mapping
Current Mapping
35.0
Height
Image/Chart 1
Label
Label Color
12
Label Font Size
Shape
Size
255
Transparency
Node Edge Network
testnet.sif
Table Panel
shared name
name
NBSexp
NBSsig
TNBCex
TNBCsig
LOG2FOl
LOG2FOl
SOX9 SOX9 61,9038 0,05 11,3503 0,05 -2,44729 5,0E-5
CA9 CA9 0,853059 0,05 4,9453 0,05 2,53534 9,5E-4
AHSG AHSG 0,0192584 0,05 0,26204 0,05 3,76623 1,0
TNFRSF12A TNFRSF12A 160,485 0,05 24,3461 0,05 -2,72067 5,0E-5
LPAR1 LPAR1 13,0109 0,05 6,25104 0,05 -1,05756 0,014
FBLN1 FBLN1 149,738 0,05 38,5576 0,05 -1,95735 5,0E-5
Node Table Edge Table Network Table
Memory


Maximum color
Session: New Session
File Edit View Select Layout Apps Tools Help
Enter search term...
Control Panel
Network Style Select
default
Properties
Def. Map. Byp.
Border Paint
2.0
Border Width
Fill Color
Column
LOG2FOLDexp
Mapping Type
Continuous Mapping
Current Mapping
-16.47
16.47
35.0
Height
Image/Chart 1
Label
Label Color
12
Label Font Size
Shape
Size
255
Transparency
Node Edge Network
Continuous Mapping Editor for Node Fill Color
-4.00
0.00
4.00
Min=-16.4719403
LOG2FOLDexp
Max=16.4719403
Edit Handle Positions and Values
Handle Position:
-4
Set Min and Max...
Add
Delete
Node Fill Color:
OK
Cancel
SOX
CA9 CA9 0,853059 0,05 4,9453 0,05 2,53534 9,5E-4
AHSG AHSG 0,0192584 0,05 0,26204 0,05 3,76623 1,0
TNFRSF12A TNFRSF12A 160,485 0,05 24,3461 0,05 -2,72067 5,0E-5
LPAR1 LPAR1 13,0109 0,05 6,25104 0,05 -1,05756 0,014
FBLN1 FBLN1 149,738 0,05 38,5576 0,05 -1,95735 5,0E-5
Node Table Edge Table Network Table
Memory

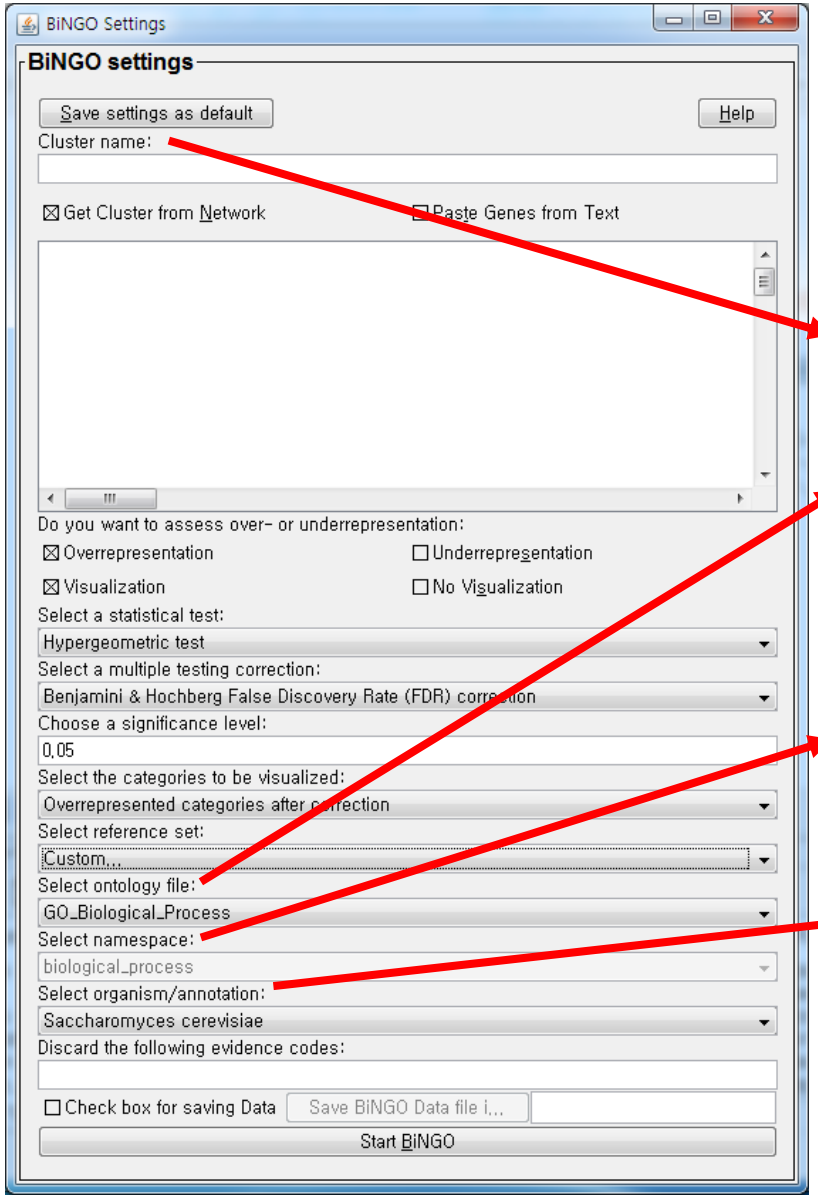

Session: New Session
File Edit View Select Layout Apps Tools Help
Enter search term...
Control Panel
Network Style Select
default
Properties
Def. Map. Byp.
Fill Color
Column LOG2FOLDexp
Mapping Type Continuous Mapping
Current Mapping
-16.47
16.47
35.0 Height
Image/Chart 1
Label
Label Color
12 Label Font Size
Shape
Size
255 Transparency
75.0 Width
Lock node width and height
Node Edge Network
testnet.sif
Table Panel
shared name name NBSexp NBSsig TNBCex TNBCsig LOG2FOl LOG2FOl
SOX9 SOX9 61,9038 0,05 11,3503 0,05 -2,44729 5,0E-5
CA9 CA9 0,853059 0,05 4,9453 0,05 2,53534 9,5E-4
AHSG AHSG 0,0192584 0,05 0,26204 0,05 3,76623 1,0
TNFRSF12A TNFRSF12A 160,485 0,05 24,3461 0,05 -2,72067 5,0E-5
LPAR1 LPAR1 13,0109 0,05 6,25104 0,05 -1,05756 0,014
FBLN1 FBLN1 149,738 0,05 38,5576 0,05 -1,95735 5,0E-5
Node Table Edge Table Network Table
Unsilencing event source: testnet.sif default node
Memory

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

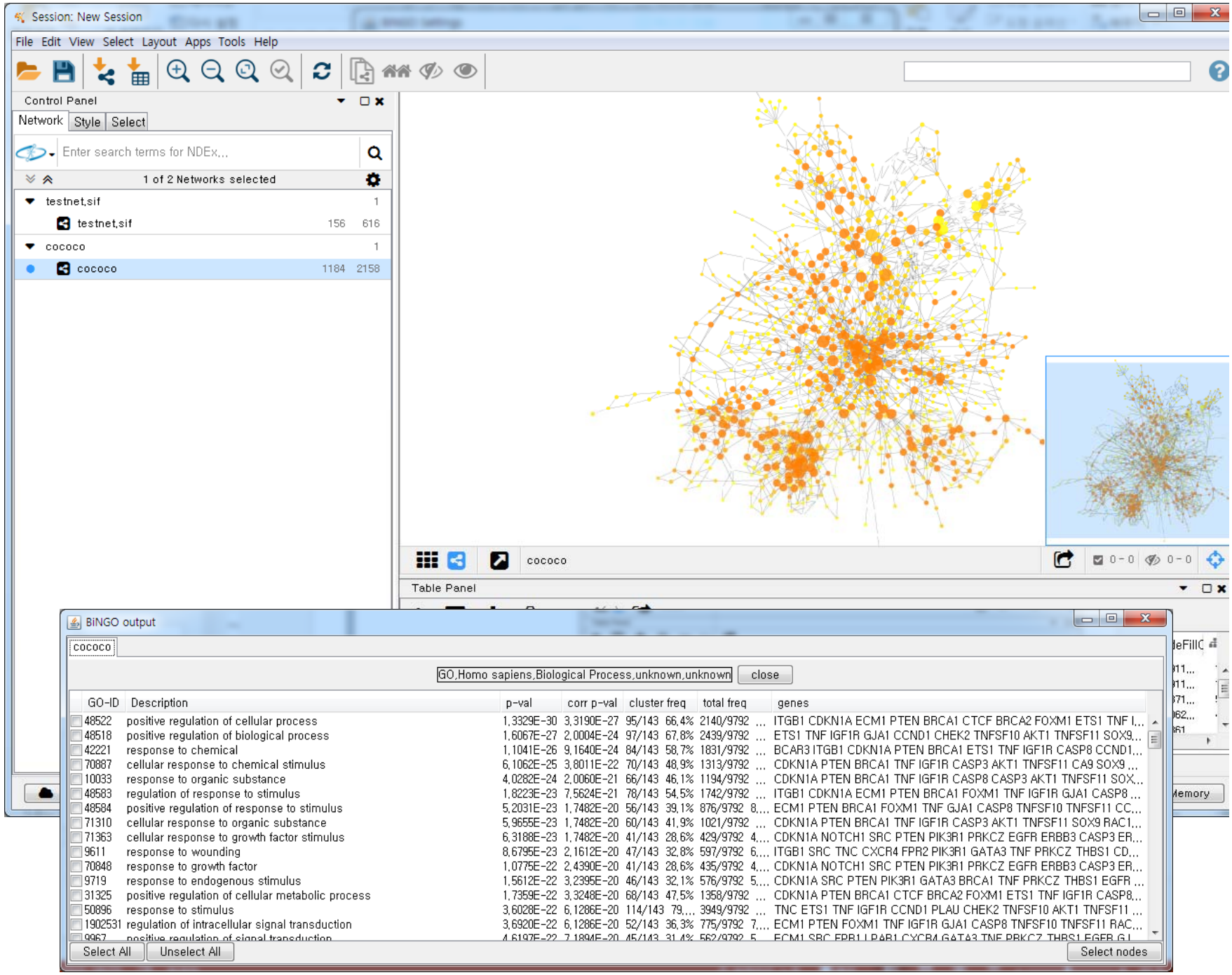
3)BiNGO settings

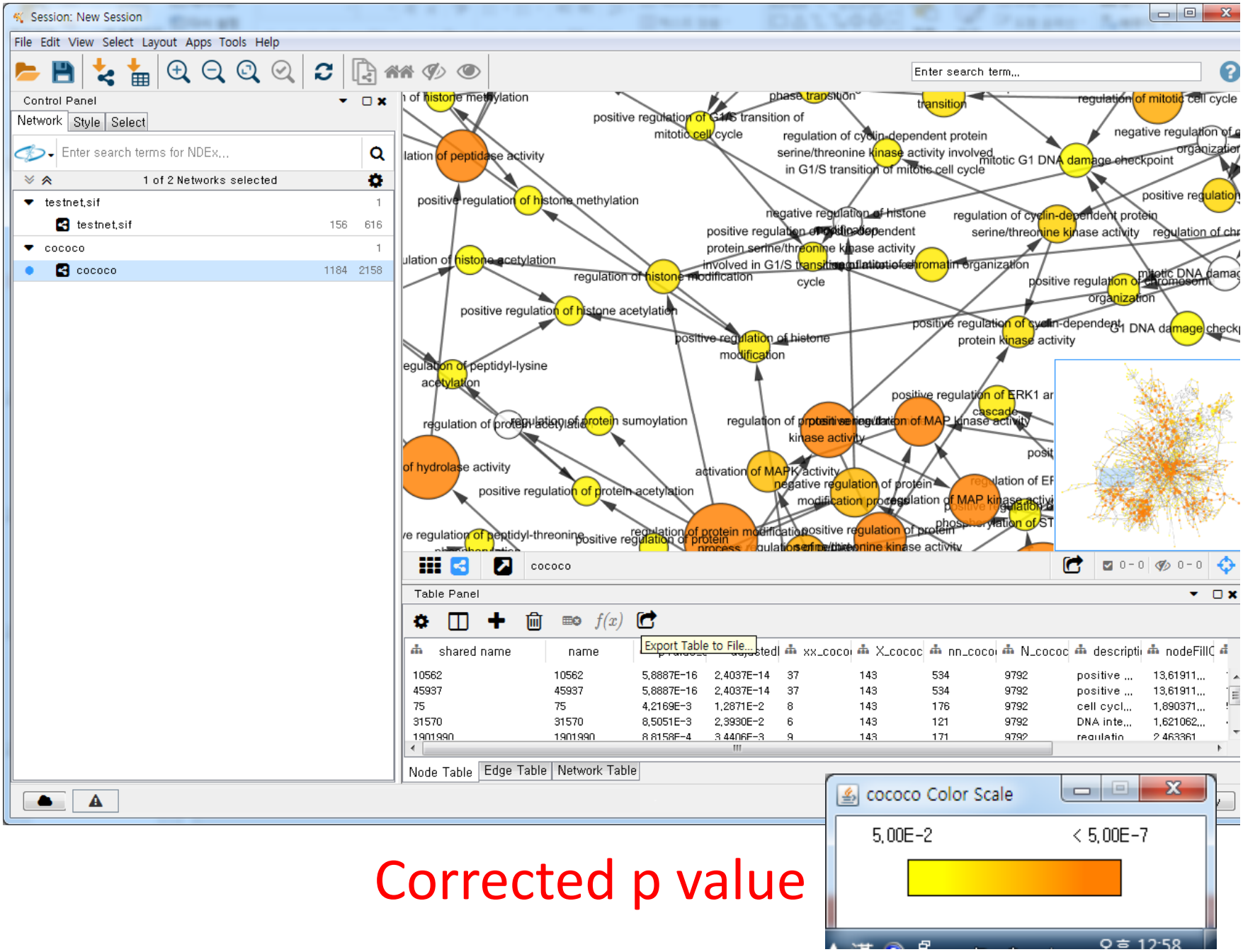
Type cluster name : any names

Select ontology file : →
custom : " file gene_ontology_ext.obo"

Select namespace → ---

Select organism/annotation →
custom " file : GOBP.BiNGO.txt"


Session: New Session
File Edit View Select Layout Apps Tools Help
Control Panel
Network Style Select
Enter search terms for NDEx...
1 of 2 Networks selected
testnet.sif 1
testnet.sif 156 616
cococo 1
cococo 1184 2158
cococo
Table Panel
BiNGO output
cococo
GO,Homo sapiens,Biological Process,unknown,unknown
close
GO-ID Description p-val corr p-val cluster freq total freq genes
48522 positive regulation of cellular process 1,3329E-30 3,3190E-27 95/143 66,4% 2140/9792 ... ITGB1 CDKN1A ECM1 PTEN BRCA1 CTCF BRCA2 FOXM1 ETS1 TNF I...
48518 positive regulation of biological process 1,6067E-27 2,0004E-24 97/143 67,8% 2439/9792 ... ETS1 TNF IGF1R GJA1 CCND1 CHEK2 TNFSF10 AKT1 TNFSF11 SOX9...
42221 response to chemical 1,1041E-26 9,1640E-24 84/143 58,7% 1831/9792 ... BCAR3 ITGB1 CDKN1A PTEN BRCA1 ETS1 TNF IGF1R CASP8 CCND1...
70887 cellular response to chemical stimulus 6,1062E-25 3,8011E-22 70/143 48,9% 1313/9792 ... CDKN1A PTEN BRCA1 TNF IGF1R CASP3 AKT1 TNFSF11 CA9 SOX9 ...
10033 response to organic substance 4,0282E-24 2,0060E-21 66/143 46,1% 1194/9792 ... CDKN1A PTEN BRCA1 TNF IGF1R CASP8 CASP3 AKT1 TNFSF11 SOX...
48583 regulation of response to stimulus 1,8223E-23 7,5624E-21 78/143 54,5% 1742/9792 ... ITGB1 CDKN1A ECM1 PTEN BRCA1 FOXM1 TNF IGF1R GJA1 CASP8 ...
48584 positive regulation of response to stimulus 5,2031E-23 1,7482E-20 56/143 39,1% 876/9792 8,... ECM1 PTEN BRCA1 FOXM1 TNF GJA1 CASP8 TNFSF10 TNFSF11 CC...
71310 cellular response to organic substance 5,9655E-23 1,7482E-20 60/143 41,9% 1021/9792 ... CDKN1A PTEN BRCA1 TNF IGF1R CASP3 AKT1 TNFSF11 SOX9 RAC1...
71363 cellular response to growth factor stimulus 6,3188E-23 1,7482E-20 41/143 28,6% 429/9792 4,... CDKN1A NOTCH1 SRC PTEN PIK3R1 PRKCZ EGFR ERBB3 CASP3 ER...
9611 response to wounding 8,6795E-23 2,1612E-20 47/143 32,8% 597/9792 6,... ITGB1 SRC TNC CXCR4 FPR2 PIK3R1 GATA3 TNF PRKCZ THBS1 CD...
70848 response to growth factor 1,0775E-22 2,4390E-20 41/143 28,6% 435/9792 4,... CDKN1A NOTCH1 SRC PTEN PIK3R1 PRKCZ EGFR ERBB3 CASP3 ER...
9719 response to endogenous stimulus 1,5612E-22 3,2395E-20 46/143 32,1% 576/9792 5,... CDKN1A SRC PTEN PIK3R1 GATA3 BRCA1 TNF PRKCZ THBS1 EGFR ...
31325 positive regulation of cellular metabolic process 1,7359E-22 3,3248E-20 68/143 47,5% 1358/9792 ... CDKN1A PTEN BRCA1 CTCF BRCA2 FOXM1 ETS1 TNF IGF1R CASP8...
50896 response to stimulus 3,6028E-22 6,1286E-20 114/143 79,... 3949/9792 ... TNC ETS1 TNF IGF1R CCND1 PLAU CHEK2 TNFSF10 AKT1 TNFSF11 ...
1902531 regulation of intracellular signal transduction 3,6920E-22 6,1286E-20 52/143 36,3% 775/9792 7,... ECM1 PTEN FOXM1 TNF IGF1R GJA1 CASP8 TNFSF10 TNFSF11 RAC...
Select All
Unselect All
Select nodes



Corrected p value

Report

Assignment : Draw given Network with Cytoscape on your own.

Things to include

1. Date of the experiment and the day (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:**
월, 목 분반: 조재원 (dreadcupper@naver.com)
화, 금 분반: 김찬영 (vxterran@gmail.com)

Due date : Experiment date → Due date
월요일 분반 (4/9) → 4/23 (18:00)
화요일 분반 (4/10) → 4/24 (18:00)
목요일 분반 (4/5) → 4/19 (18:00)
금요일 분반 (4/6) → 4/20 (18:00)