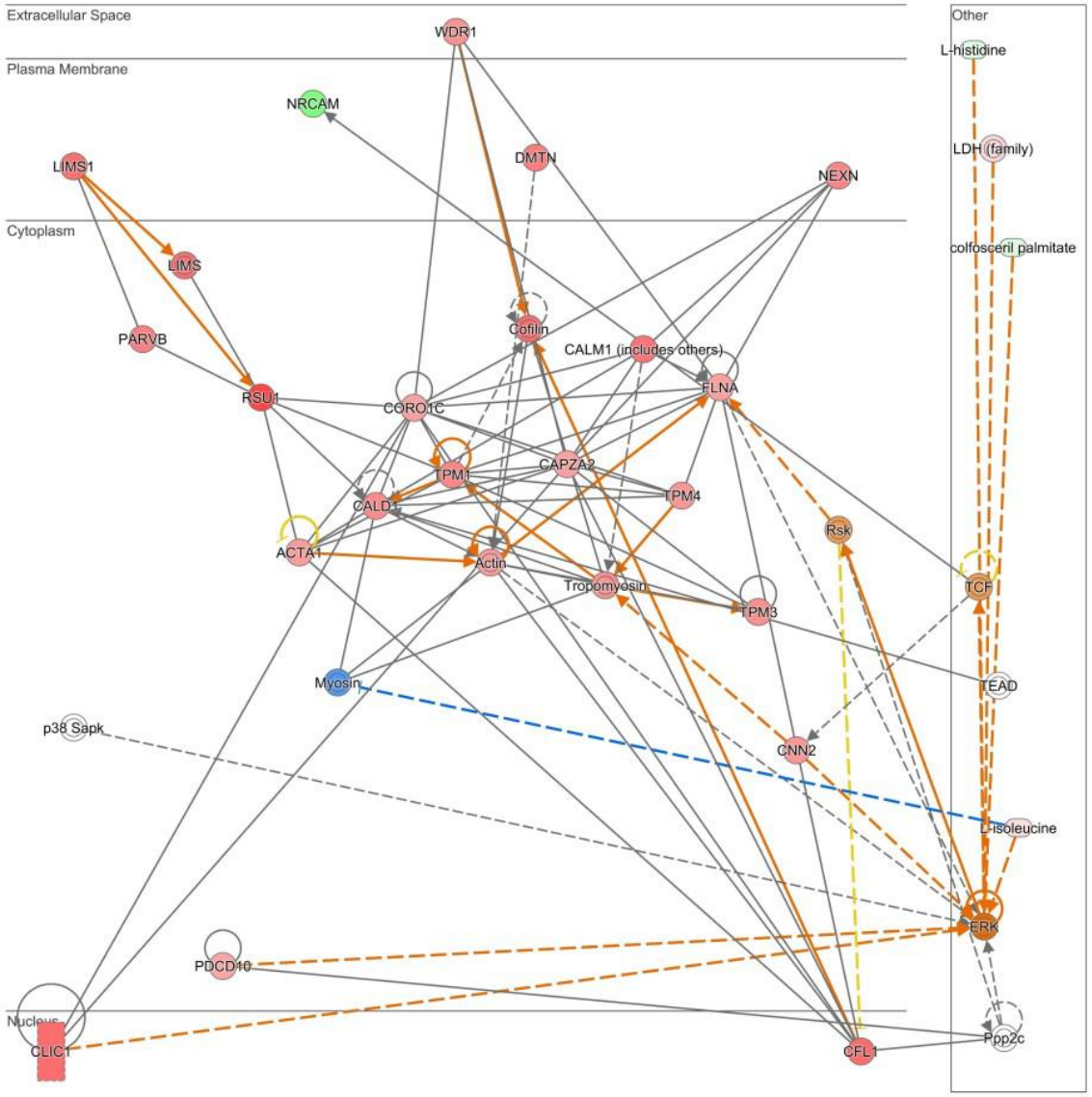
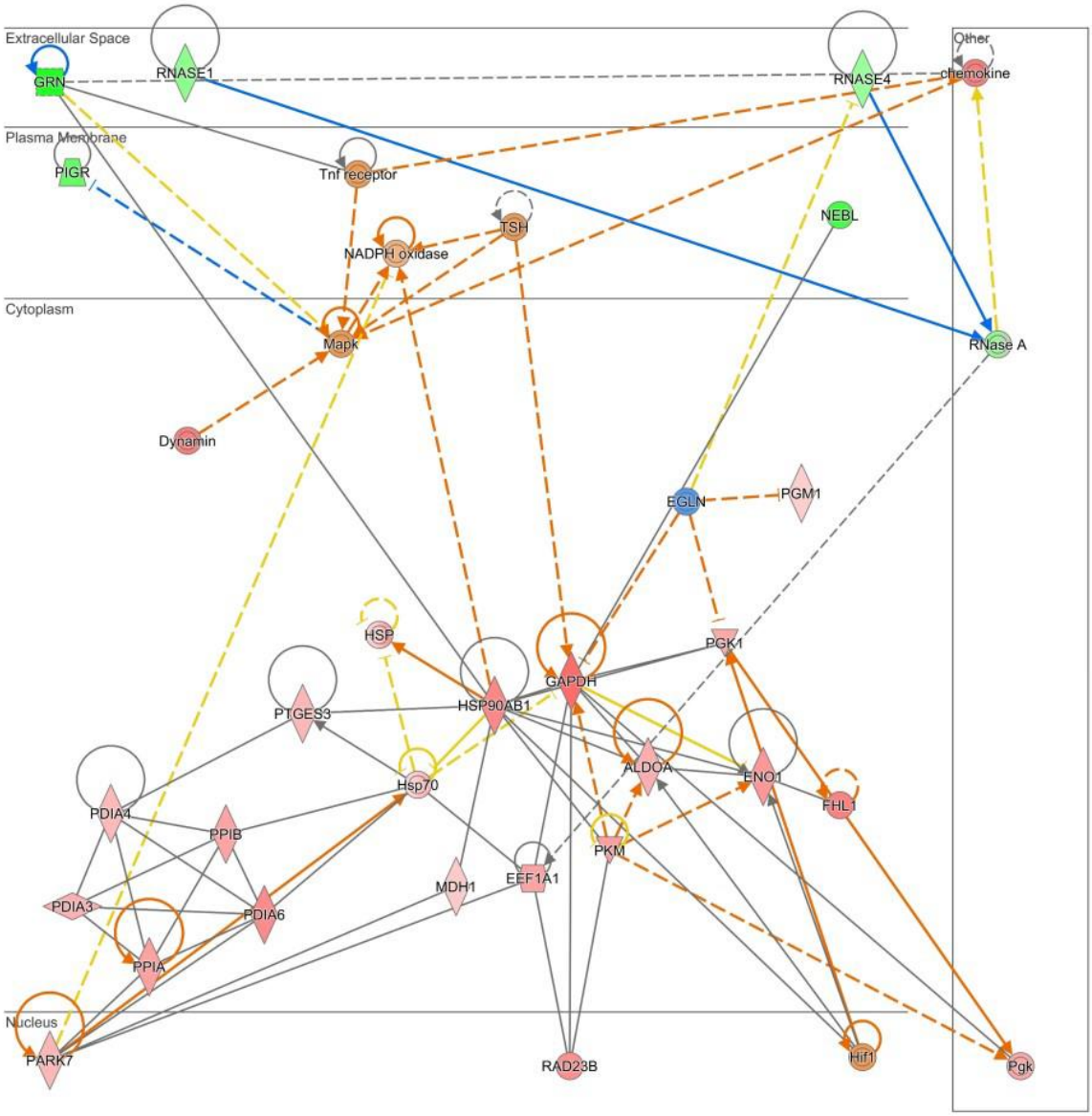
Supplementary Material: Convergence of Plasma Metabolomics and Proteomics Analysis to Discover Signatures of High-Grade Serous Ovarian Cancer

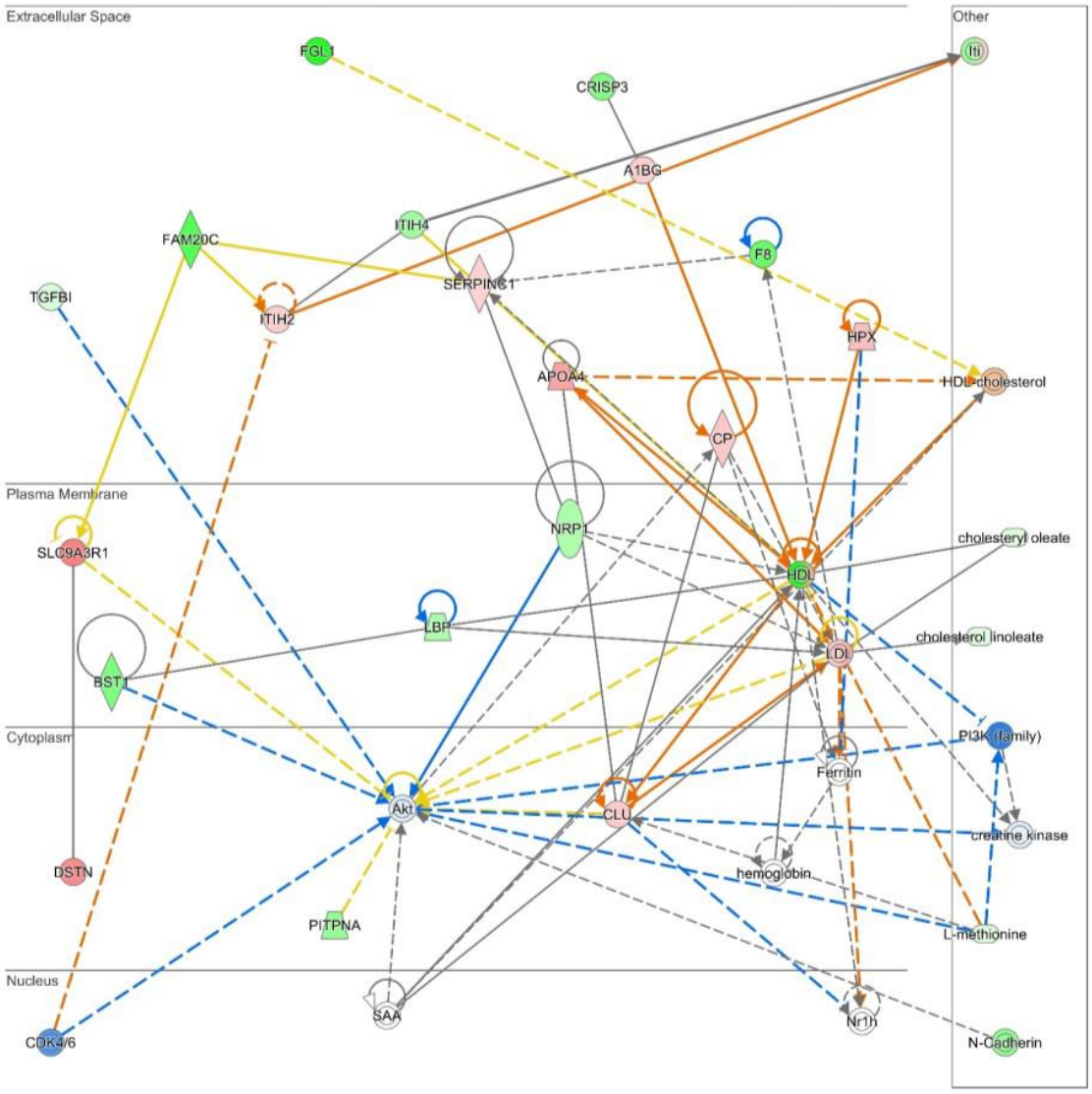
Hee-Sung Ahn, Jeonghun Yeom, Jiyoung Yu, Young-Il Kwon, Jae-Hoon Kim and Kyunggon Kim



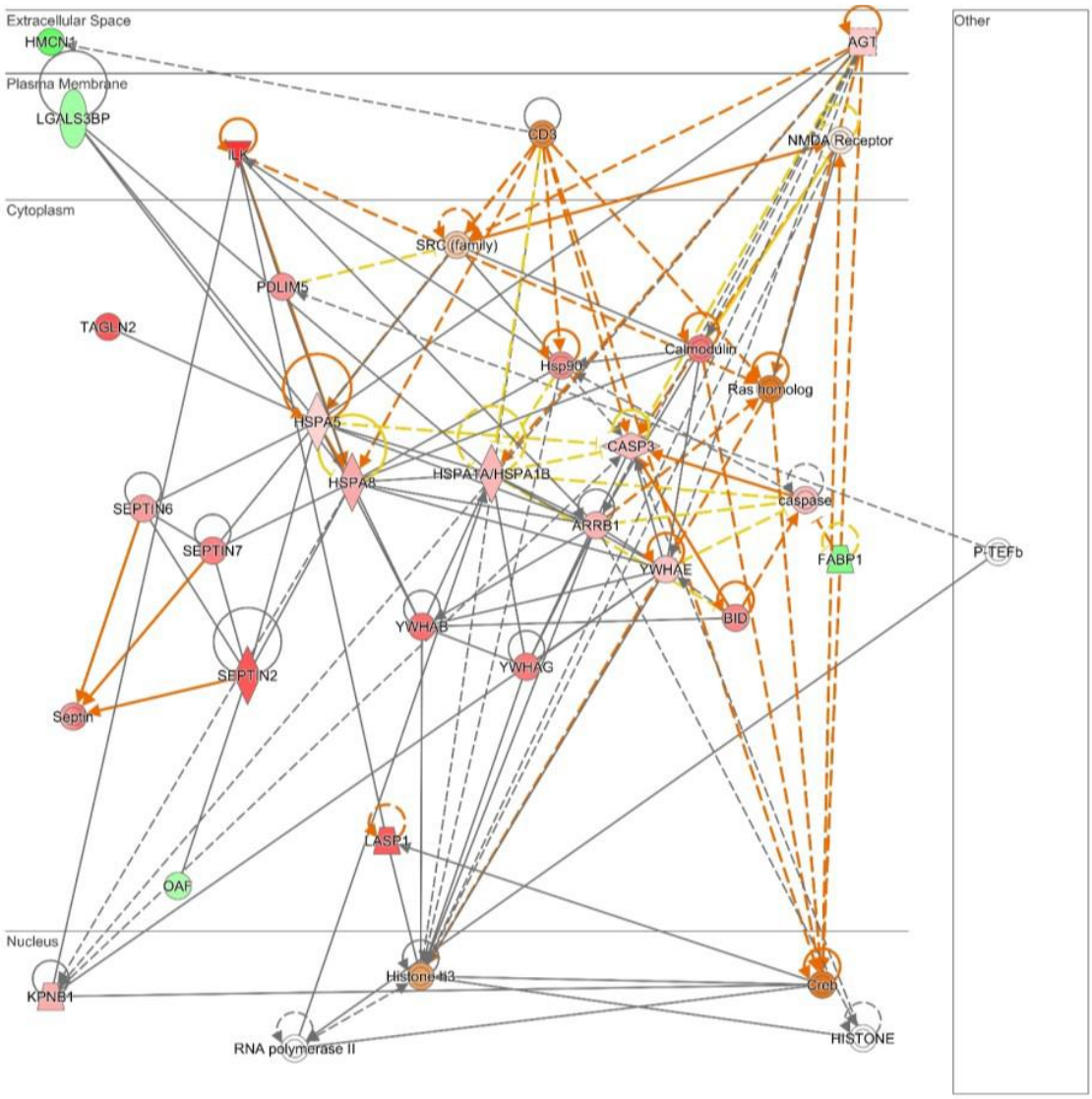
(**A**) Network #1


Extracellular Space
Plasma Membrane
Cytoplasm
Nucleus
Other
GRN
RNASE1
RNASE4
chemokine
PIGR
Tnf receptor
TSH
NADPH oxidase
NEBL
Mapk
RNase A
Dynamin
EGLN
PGM1
HSP
PGK1
GAPDH
PTGES3
HSP90AB1
ALDOA
ENO1
FHL1
Hsp70
PDIA4
PPIB
PKM
MDH1
EEF1A1
PDIA3
PDIA6
PPIA
PARK7
RAD23B
Hif1
Pgk

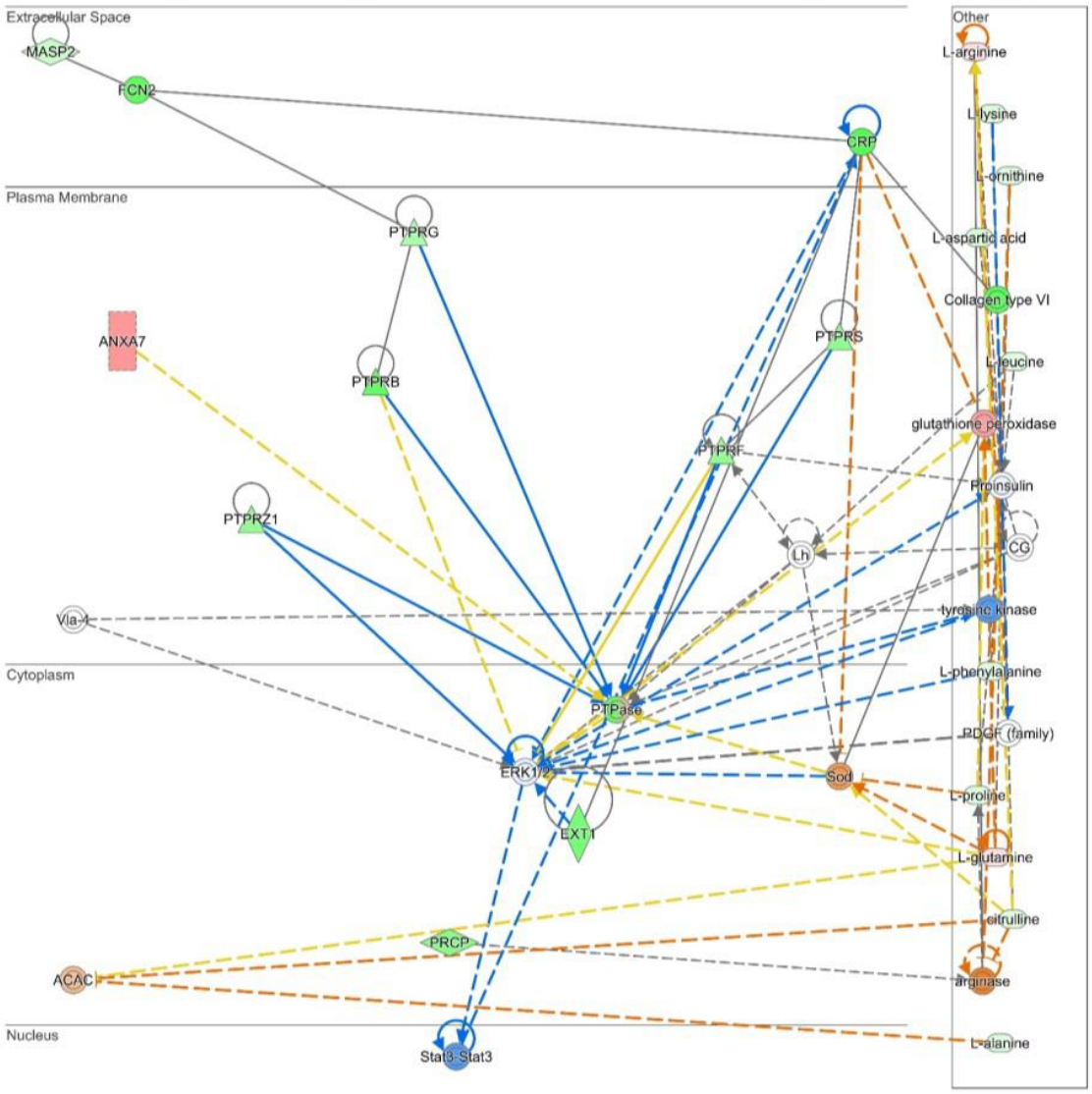
(**B**) Network #2


Extracellular Space
Other
Plasma Membrane
Cytoplasm
Nucleus
FGL1
CRISP3
A1BG
Iti
ITIH4
FAM20C
F8
SERPINC1
TGFBI
ITIH2
HPX
APOA4
HDL-cholesterol
CP
NRP1
SLC9A3R1
cholesteryl oleate
HDL
LBP
cholesterol linoleate
LDL
BST1
PI3K (family)
Ferritin
Akt
CLU
creatine kinase
DSTN
hemoglobin
PITPNA
L-methionine
SAA
Nr1h
N-Cadherin
CDK4/6

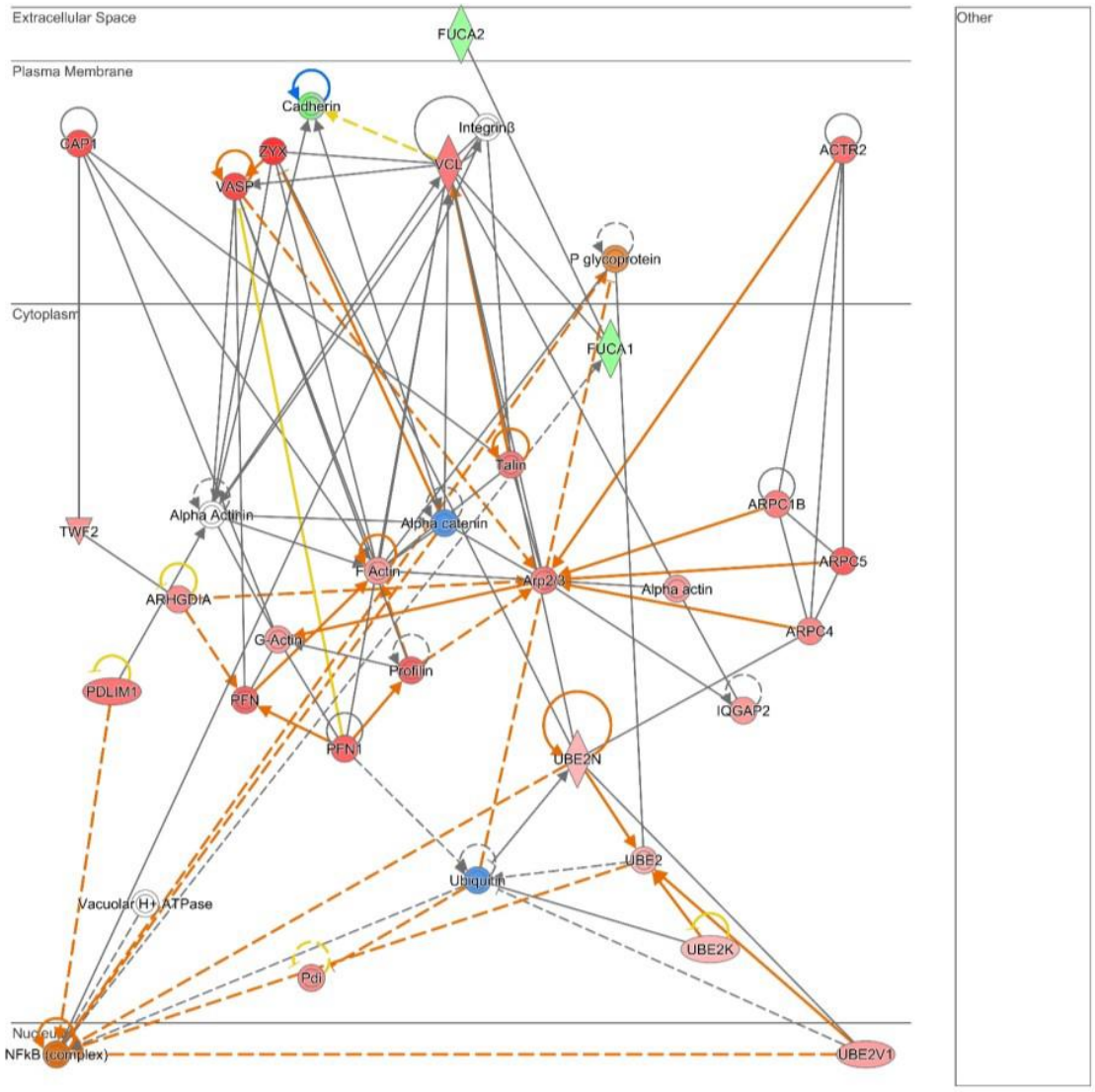
(**C**) Network #3


Extracellular Space
Plasma Membrane
Cytoplasm
Nucleus
Other
HMCN1
LGALS3BP
ILK
CD3
AGT
NMDA Receptor
SRC (family)
PDLIM5
TAGLN2
Hsp90
Calmodulin
Ras homolog
HSPA5
HSPA8
HSPA1A/HSPA1B
CASP3
caspase
SEPTIN6
SEPTIN7
SEPTIN2
Septin
ARRB1
YWHAE
FABP1
P-TEFb
BID
YWHAB
YWHAG
CASP1
OAF
KPNB1
Histone H3
Creb
HISTONE
RNA polymerase II

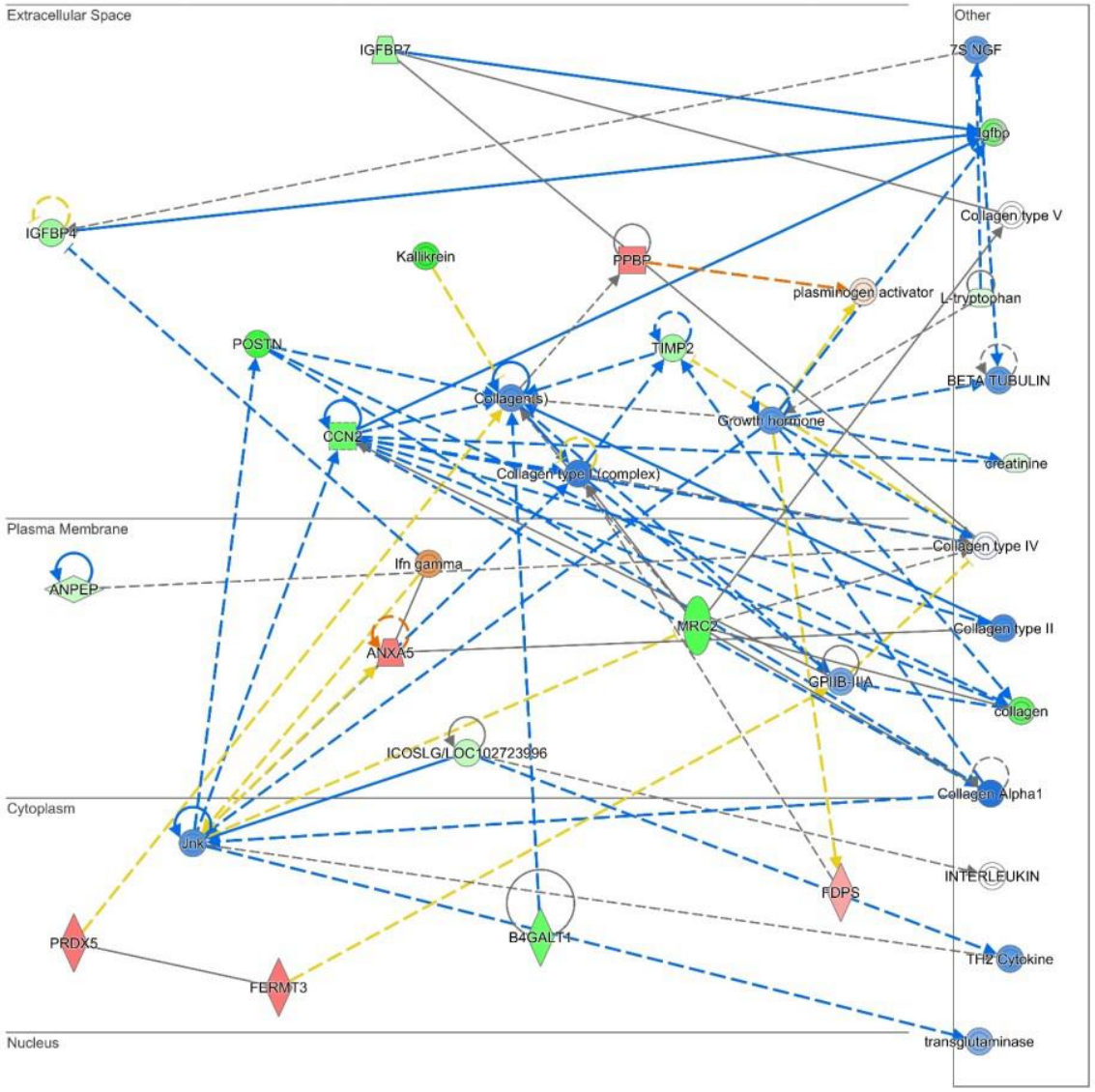
(**D**) Network #4


Extracellular Space
Plasma Membrane
Cytoplasm
Nucleus
Other
MASP2
FCN2
CRP
PTPRG
ANXA7
PTPRB
PTPRS
PTPRF
PTPRZ1
Vla-1
PTPase
ERK1/2
Sod
EXT1
PRCP
ACAC
Stat3 Stat3
L-arginine
L-lysine
L-ornithine
L-aspartic acid
Collagen type VI
L-leucine
glutathione peroxidase
Proinsulin
Lh
CG
tyrosine kinase
L-phenylalanine
PDGF (family)
L-proline
L-glutamine
citrulline
arginase
L-alanine

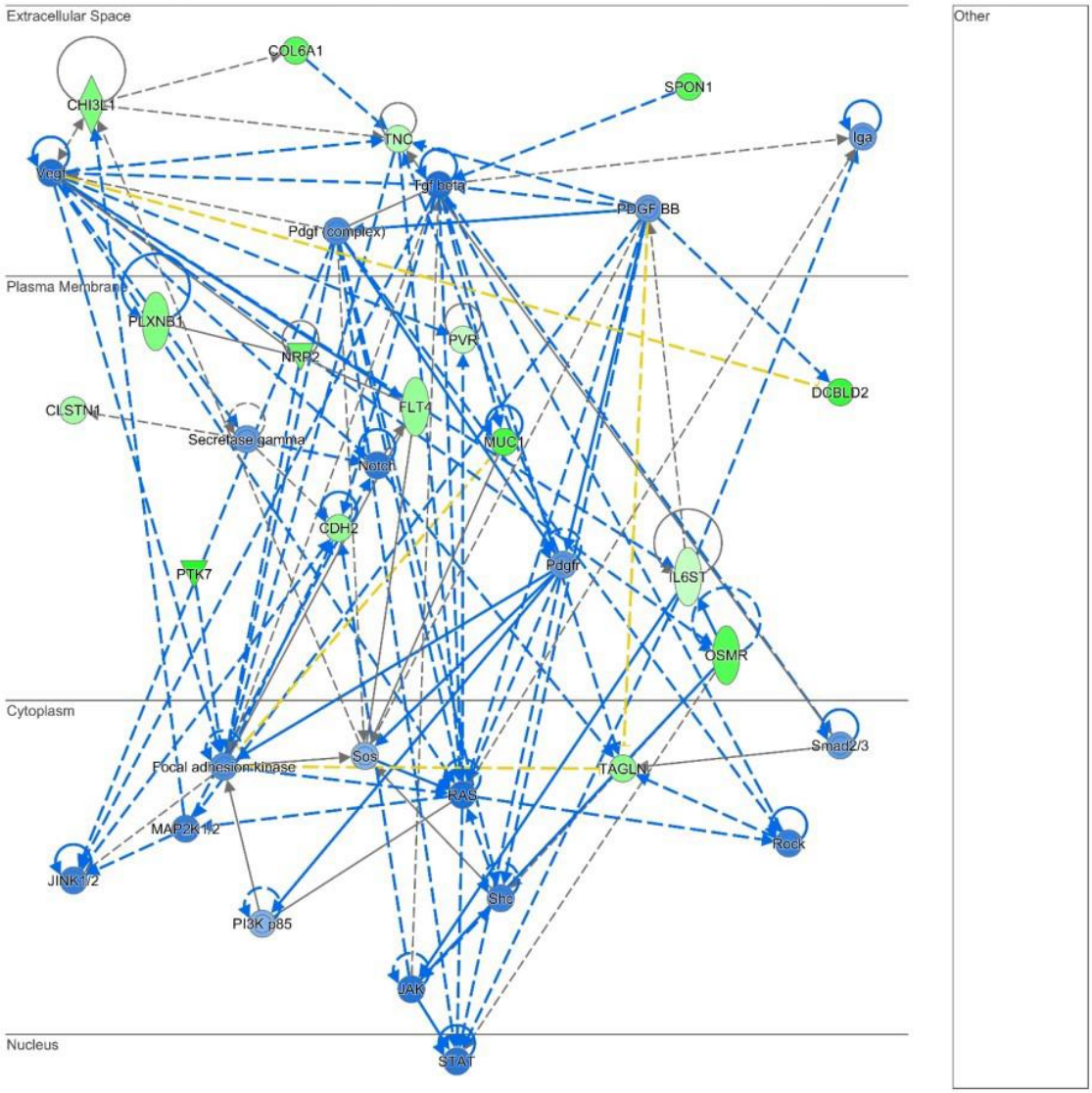
(**E**) Network #5


Extracellular Space
Plasma Membrane
Cytoplasm
Other
FUCA2
Cadherin
Integrinβ
CAP1
ZYX
VCL
VASP
ACTR2
P glycoprotein
FUCA1
Talin
Alpha Actinin
Alpha catenin
ARPC1B
TWF2
F Actin
ARPC5
Arp2/3
Alpha actin
ARHGDIA
ARPC4
G-Actin
Profilin
PDLIM1
PFN
IQGAP2
PFN1
UBE2N
UBE2
Ubiquitin
Vacuolar H+ ATPase
UBE2K
Pdi
NFkB (complex)
UBE2V1

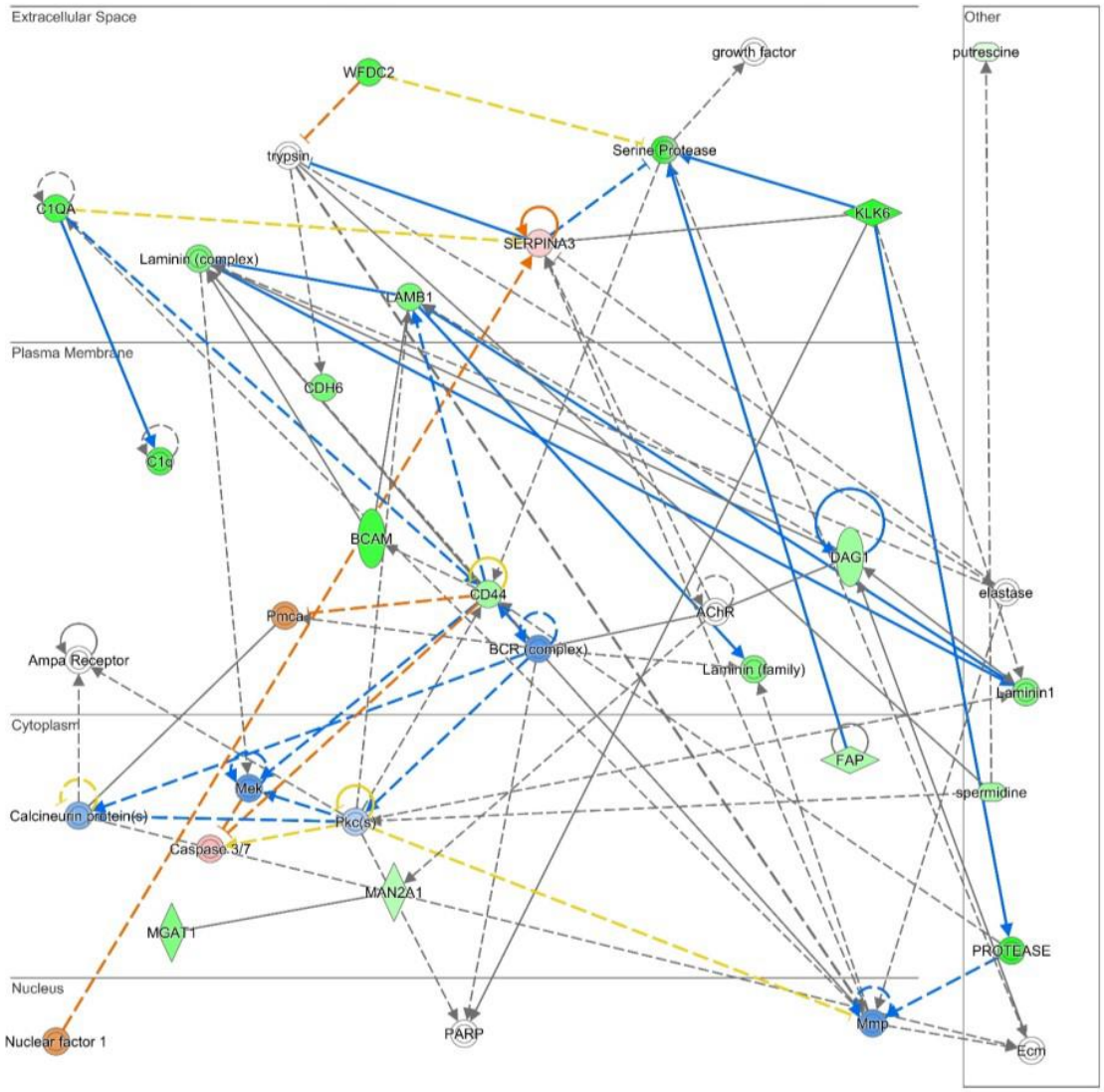
(**F**) Network #6


Extracellular Space
Other
IGFBP7
ZS NGF
Igfbp
IGFBP4
Collagen type V
Kallikrein
PPBP
plasminogen activator
L-tryptophan
POSTN
TIMP2
BETA TUBULIN
Collagen(s)
Growth hormone
CCN2
creatinine
Collagen type I (complex)
Plasma Membrane
Collagen type IV
Ifn gamma
ANPEP
MRC2
Collagen type II
ANXA5
GPIIB-IIA
collagen
ICOSLG/LOC102723396
Collagen Alpha1
Cytoplasm
Jnk
INTERLEUKIN
FDPS
PRDX5
B4GALT1
TH2 Cytokine
FERMT3
Nucleus
transglutaminase

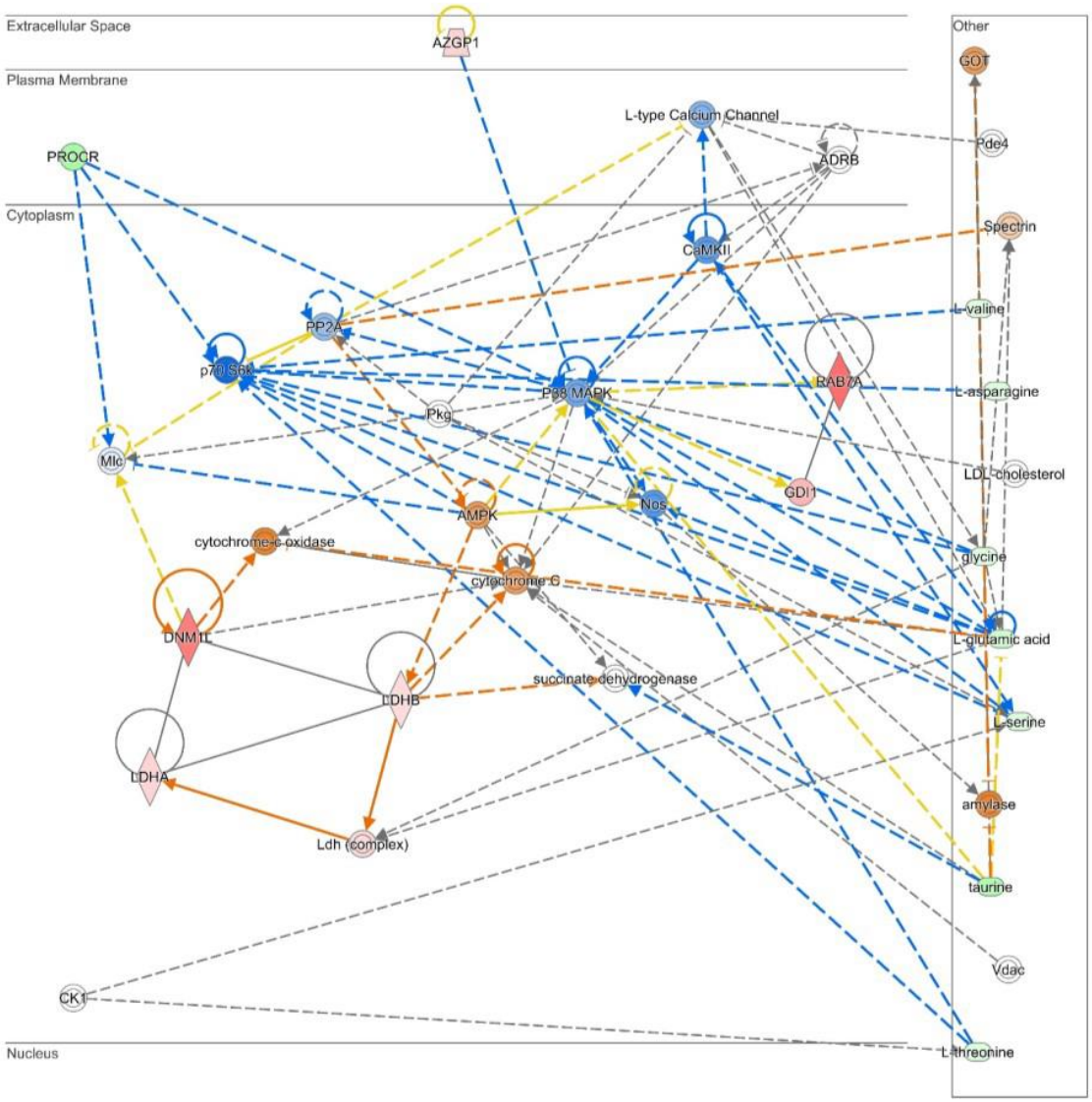
(**G**) Network #7.


Extracellular Space
Other
COL6A1
SPON1
CHI3L1
TNC
Iga
Vegf
Tgf beta
PDGF BB
Pdgf (complex)
Plasma Membrane
PLXNB1
PVR
NRP2
DCBLD2
CLSTN1
FLT4
Secretase gamma
MUC1
Notch
CDH2
PTK7
Pdgfr
IL6ST
OSMR
Cytoplasm
Smad2/3
Sos
Focal adhesion kinase
TAGLN
RAS
MAP2K1/2
Rock
JNK1/2
Shc
PI3K p85
JAK
Nucleus
STAT

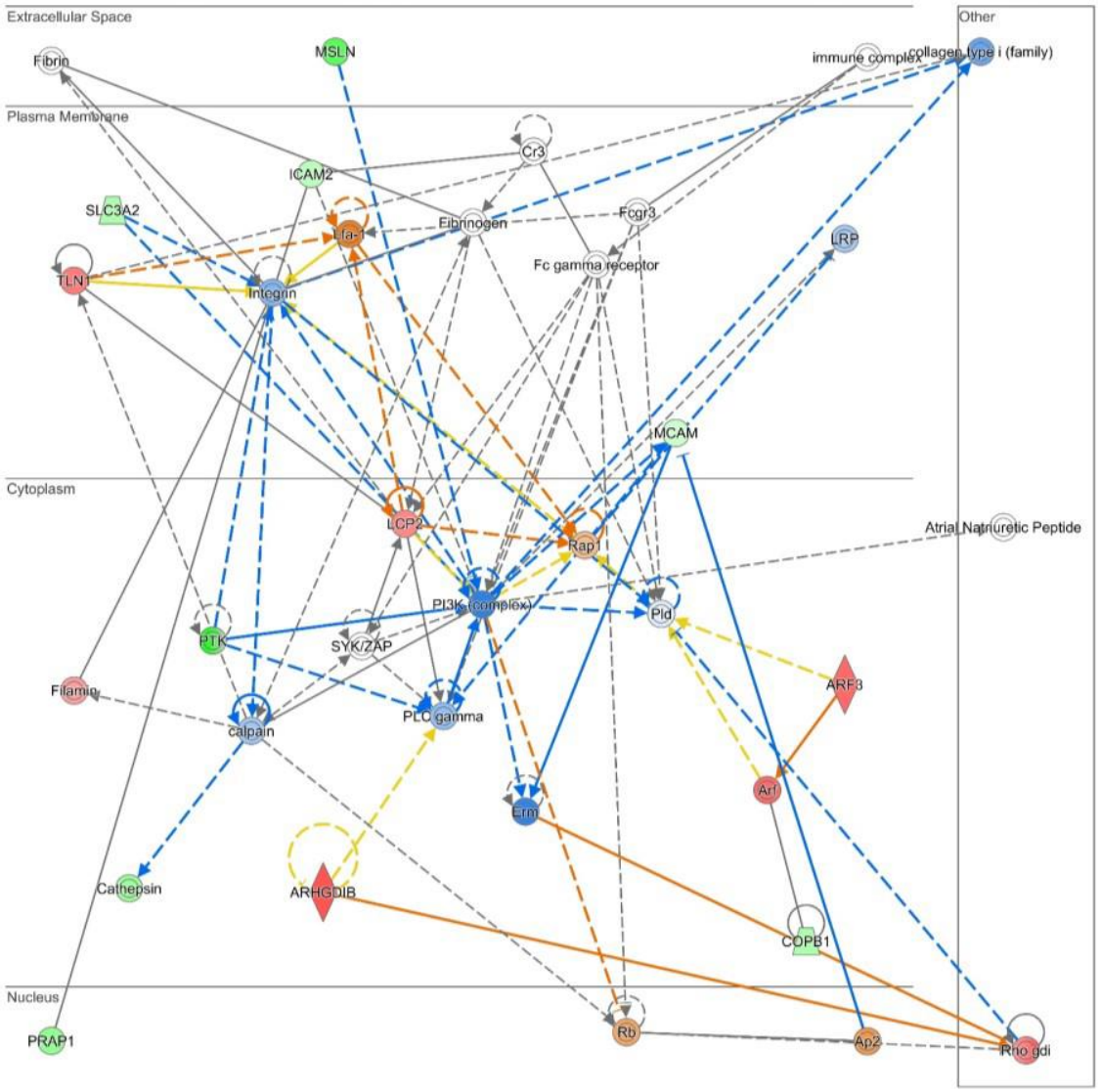
(**H**) Network #8


Extracellular Space
Other
Plasma Membrane
Cytoplasm
Nucleus
growth factor
putrescine
WFDC2
trypsin
Serine Protease
C1QA
KLK6
SERPINA3
Laminin (complex)
LAMB1
CDH6
C1q
BCAM
DAG1
CD44
elastase
Pmca1
AChR
Ampa Receptor
BCR (complex)
Laminin (family)
Laminin1
FAP
Mek
spermidine
Calcineurin protein(s)
Pkc(s)
Caspase 3/7
MAN2A1
MGAT1
PROTEASE
PARP
Mmp
Ecm
Nuclear factor 1

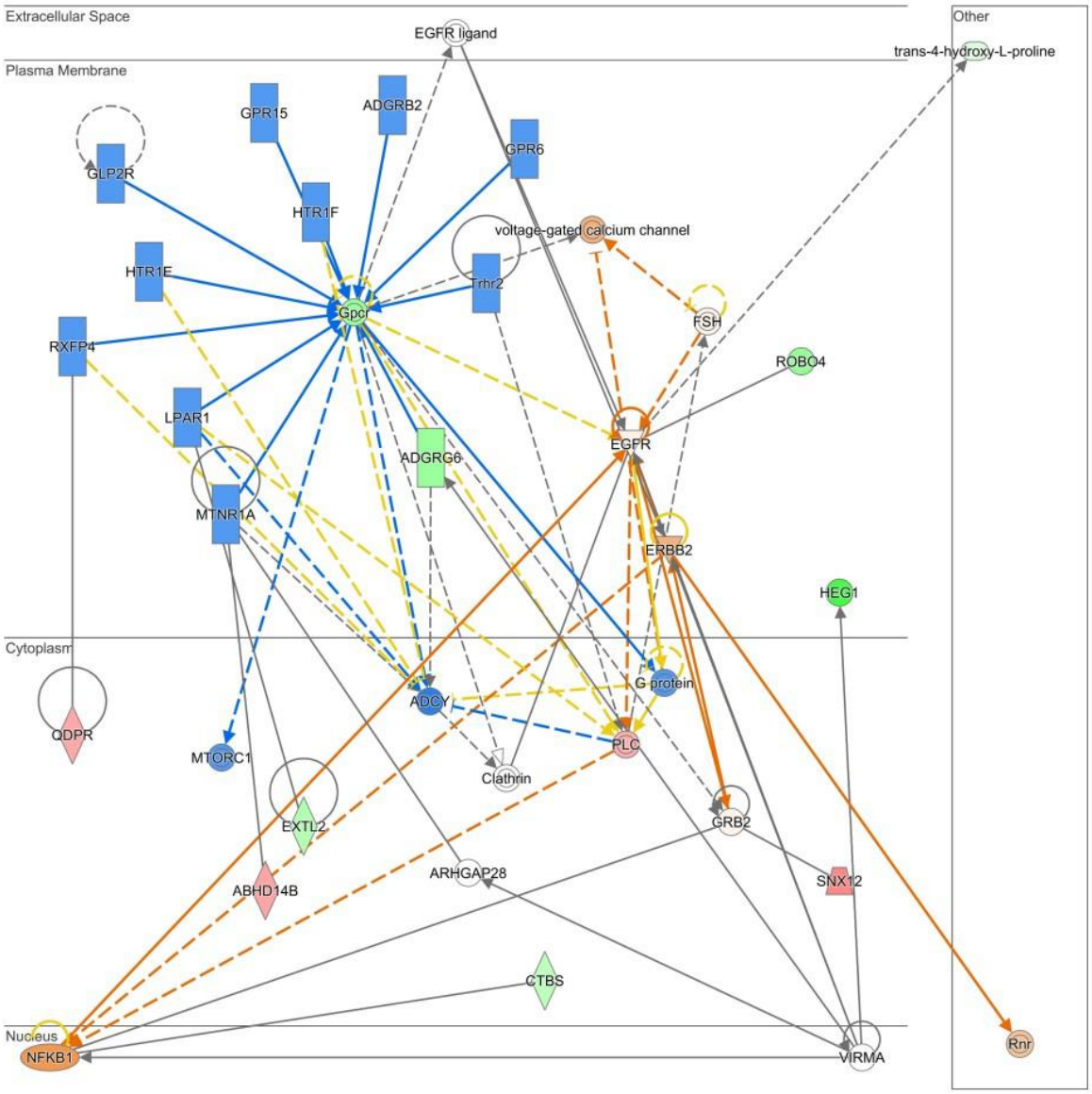
(**I**) Network #9


Extracellular Space
Plasma Membrane
Cytoplasm
Nucleus
Other
AZGP1
PROCR
L-type Calcium Channel
ADRB
CaMKII
PP2A
p70 S6k
P38 MAPK
RAB7A
Ipkg
Mlc
AMPK
Nos
GDI1
cytochrome-c-oxidase
cytochrome C
DNM1L
LDHB
succinate dehydrogenase
LDHA
Ldh (complex)
CK1
GOT
Pde4
Spectrin
L-valine
L-asparagine
LDL-cholesterol
glycine
L-glutamic acid
L-serine
amylase
taurine
Vdac
L-threonine

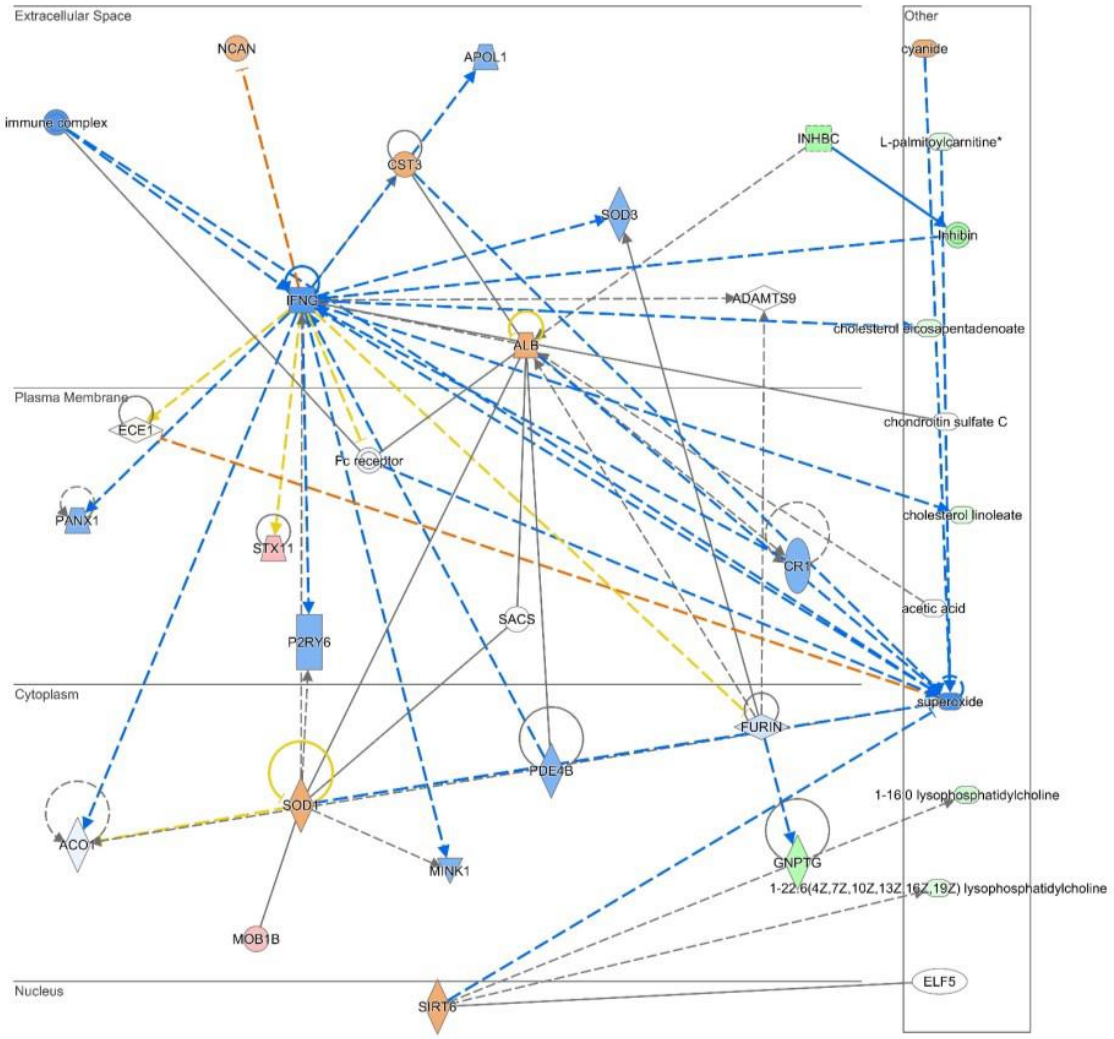
(**J**) Network #10


Extracellular Space
Other
Plasma Membrane
Cytoplasm
Nucleus
Fibrin
MSLN
immune complex
collagen type i (family)
Cr3
ICAM2
SLC3A2
Lfa-1
Fibrinogen
Fcgr3
LRP
TLN1
Integrin
Fc gamma receptor
MCAM
LCP2
Rap1
Atrial Natriuretic Peptide
PI3K (complex)
Pld
PTK
SYK/ZAP
Filamin
ARF3
calpain
PLC gamma
Arf
Erm
Cathepsin
ARHGDIB
COPB1
Rb
Ap2
Rho gdi
PRAP1

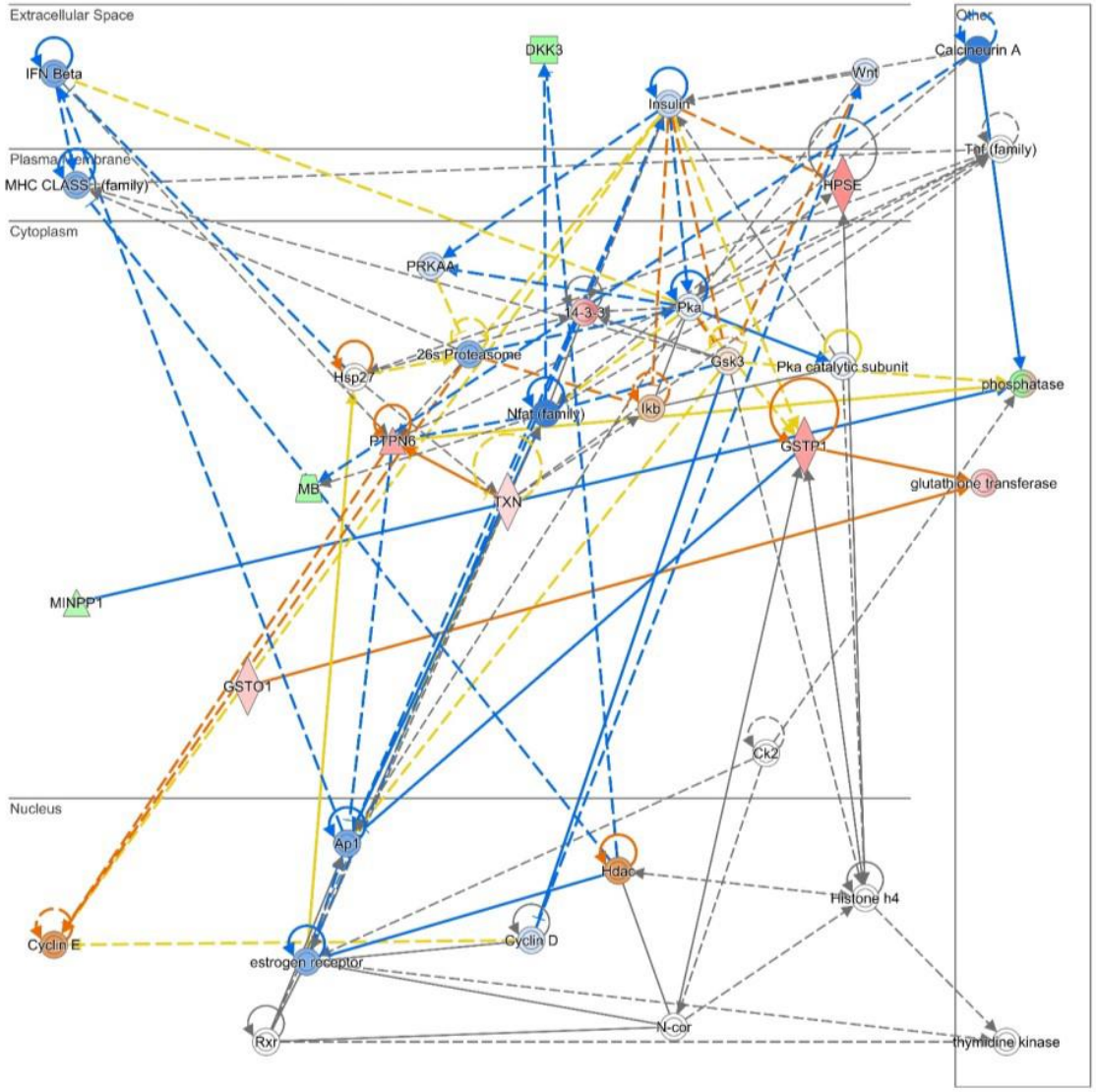
(**K**) Network #11


Extracellular Space
Plasma Membrane
Cytoplasm
Nucleus
Other
EGFR ligand
trans-4-hydroxy-L-proline
GPR15
ADGRB2
GPR6
GLP2R
HTR1F
voltage-gated calcium channel
HTR1E
Thr2
Gpcr
FSH
RXFP4
ROBO4
LPAR1
EGFR
ADGRG6
MTNR1A
ERBB2
HEG1
G protein
QDPR
ADCY
PLC
MTORC1
Clathrin
GRB2
EXTL2
ARHGAP28
SNX12
ABHD14B
CTBS
NFKB1
VIRMA
Rnr

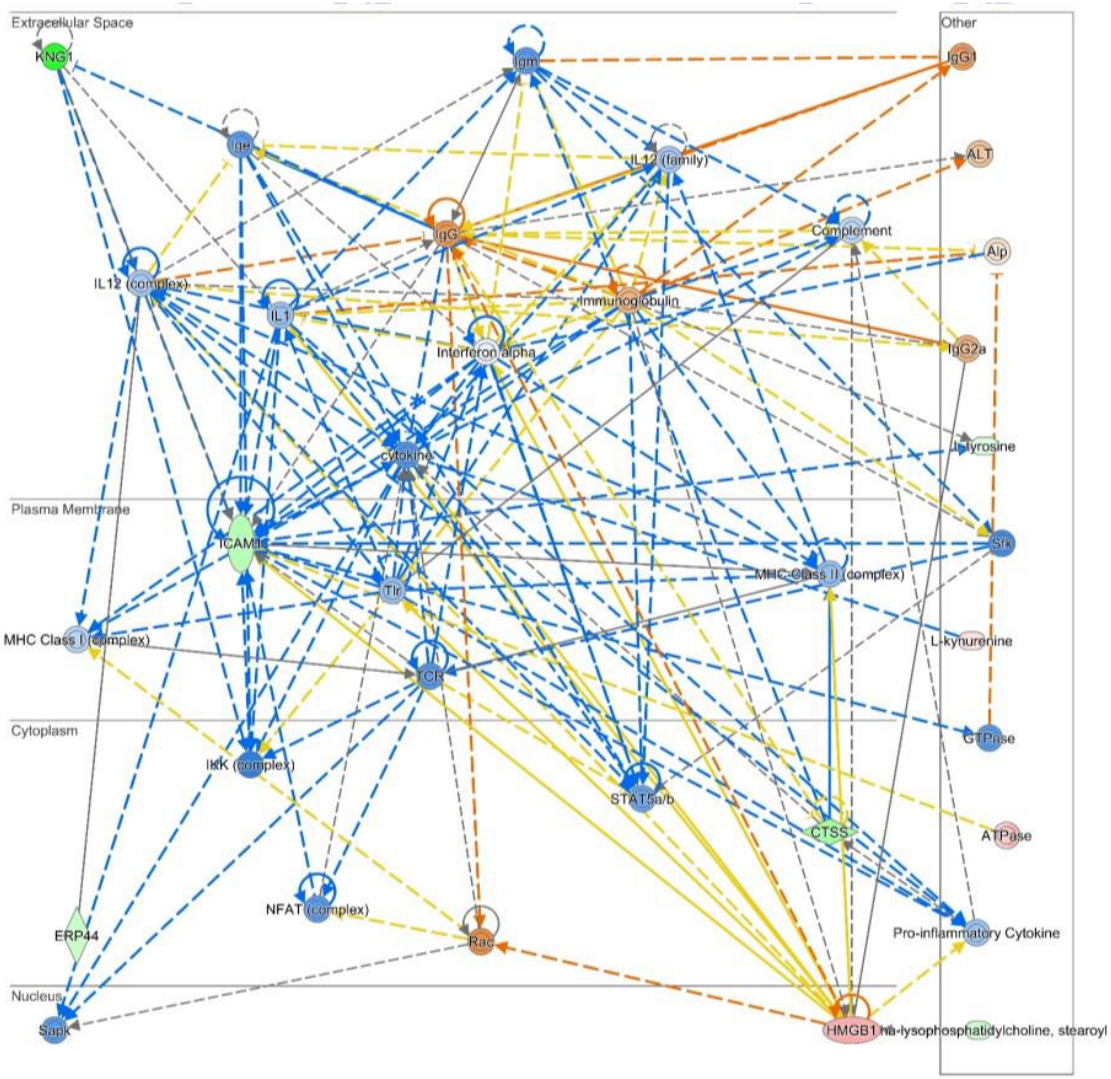
(**L**) Network #12


Extracellular Space
Other
NCAN
APOL1
cyanide
immune complex
INHBC
L-palmitoylcarnitine*
CST3
SOD3
Inhibin
IFNG
ADAMTS9
cholesterol eicosapentadenoate
ALB
Plasma Membrane
chondroitin sulfate C
ECE1
Fc receptor
PANX1
cholesterol linoleate
STX11
CR1
acetic acid
SACS
P2RY6
Cytoplasm
superoxide
FURIN
PDE4B
1-16:0 lysophosphatidylcholine
SOD1
ACO1
MINK1
GNPTG
1-22:6(4Z,7Z,10Z,13Z,16Z,19Z) lysophosphatidylcholine
MOB1B
Nucleus
ELF5
SIRT6

(**M**) Network #13


Extracellular Space
Other
IFN Beta
DKK3
Calcineurin A
Wnt
Insulin
Plasma Membrane
Tcf (family)
MHC CLASS1 (family)
HPSE
Cytoplasm
PRKAA
14-3-3
Pka
26s Proteasome
Hsp27
Gsk3
Pka catalytic subunit
phosphatase
Nfat (family)
Ikb
PTPN6
GSTP1
MB
TXN
glutathione transferase
MINPP1
GSTO1
Ck2
Nucleus
Ap1
Hdac
Histone h4
Cyclin E
Cyclin D
estrogen receptor
N-cor
Rxr
thymidine kinase

(**N**) Network #14



(**O**) Network #15

Figure 1. The 15 enriched networks (**A**–**O**) identified by IPA in ovarian cancer patients vs. healthy controls based on metabolites and differential abundant proteins.

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