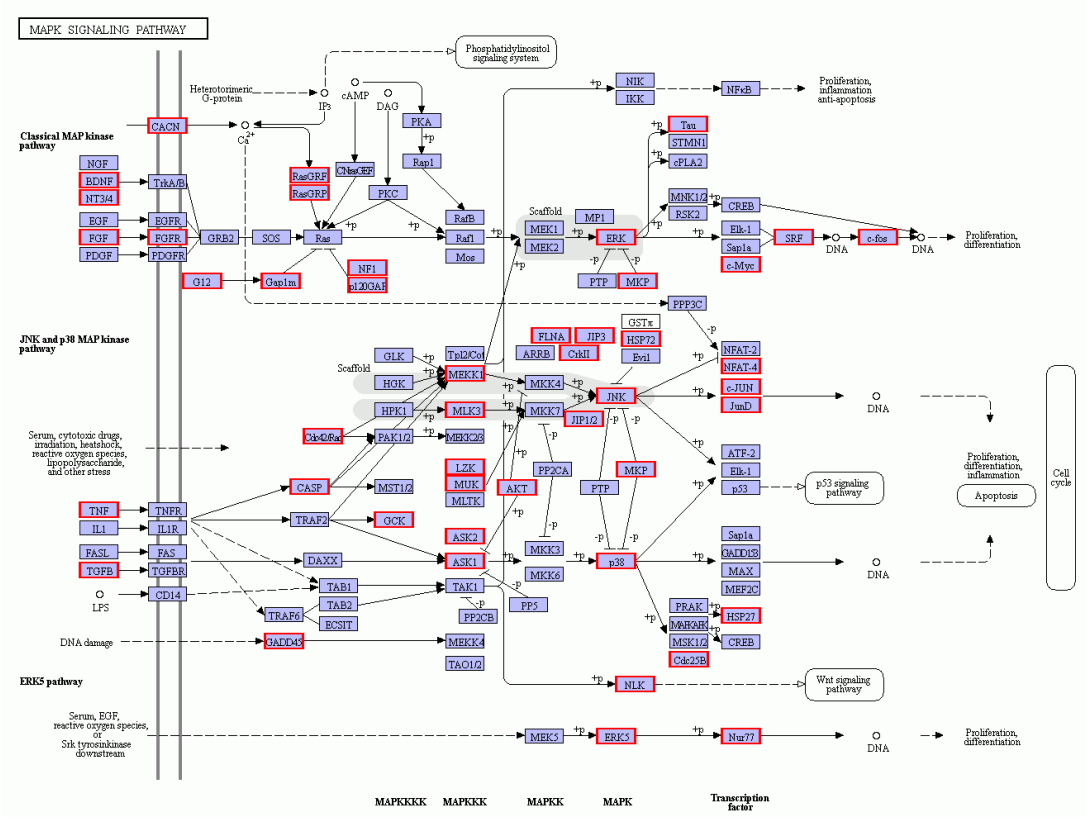
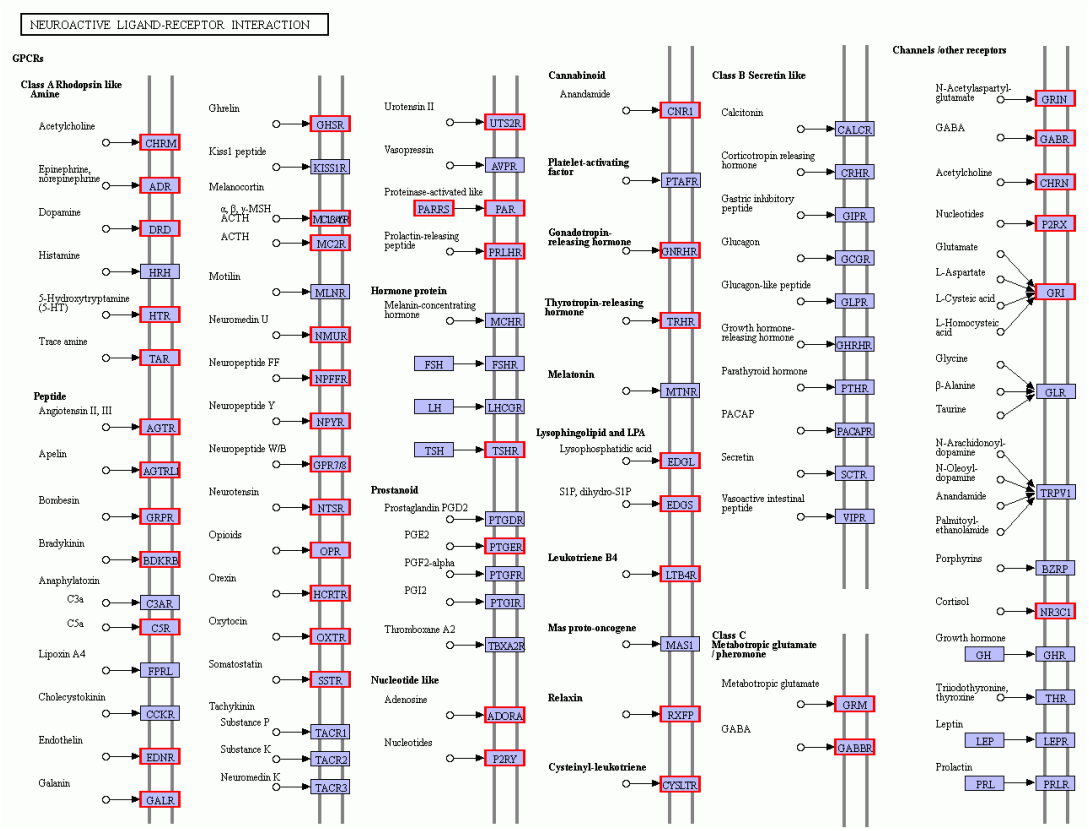
Supplementary Figure 1. The morphological picture of *O. evermanni*.

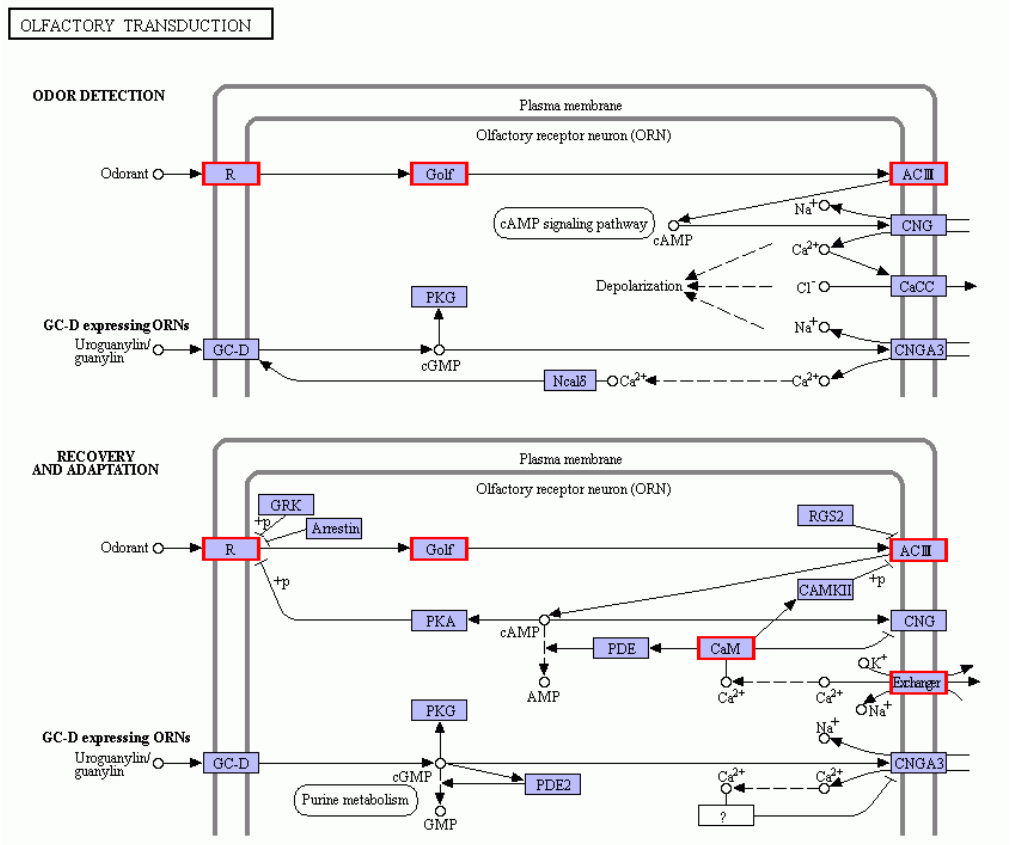
(A)



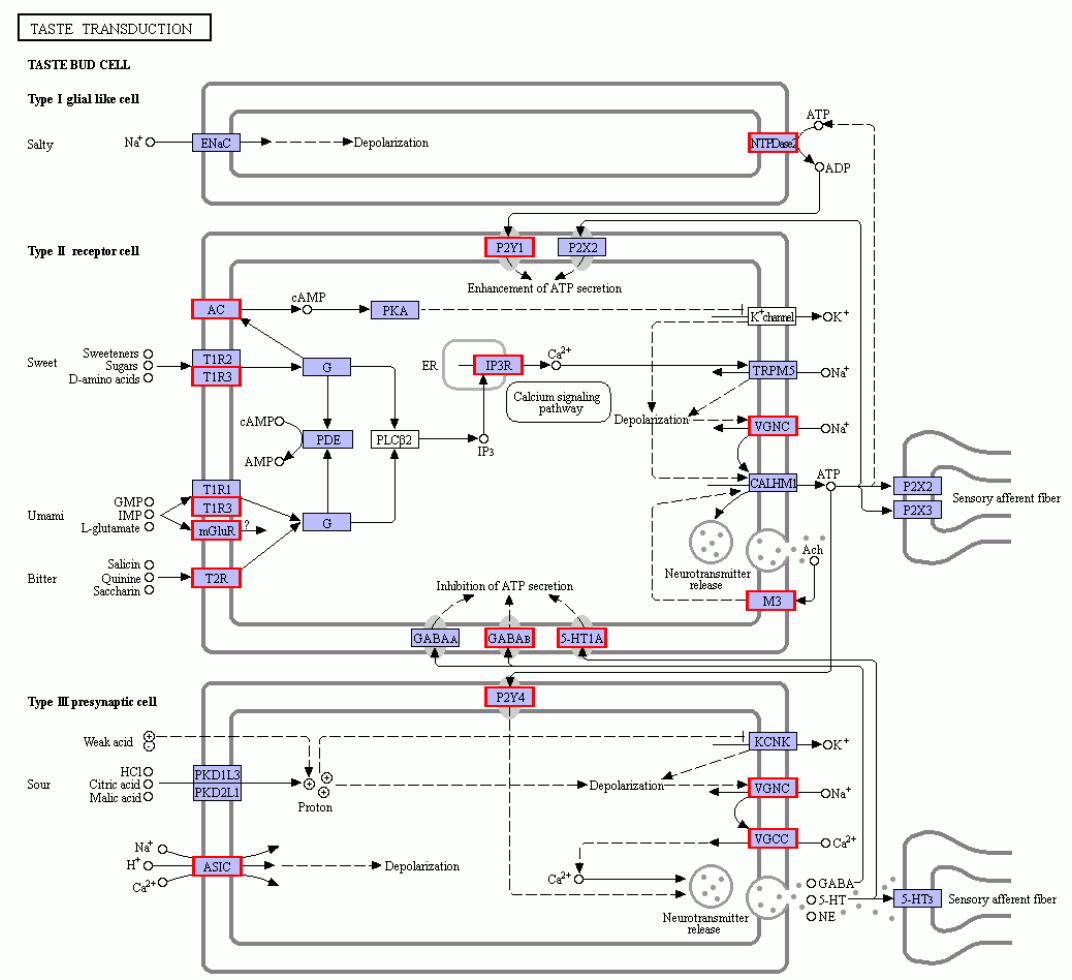
(B)


NEUROACTIVE LIGAND-RECEPTOR INTERACTION
GPCRs
Class A Rhodopsin like Amine
Acetylcholine
CHRM
Epinephrine, norepinephrine
ADR
Dopamine
DRD
Histamine
HRH
5-Hydroxytryptamine (5-HT)
HTR
Trace amine
TAR
Peptide
Angiotensin II, III
AGTR
Apelin
AGTRL1
Bombesin
GRPR
Bradykinin
BDKRB
Anaphylatoxin
C3a
C3AR
C5a
C5R
Lipoxin A4
FPRL
Cholecystokinin
CCKR
Endothelin
EDNR
Galanin
GALR
Ghrelin
GHSR
Kiss1 peptide
KISS1R
Melanocortin
α, β, γ-MSH
ACTH
MC1/4R
ACTH
MC2R
Motilin
MLNR
Neuromedin U
NMUR
Neuropeptide FF
NPFFR
Neuropeptide Y
NPYR
Neuropeptide W/B
GPR7/8
Neurotensin
NTSR
Opioids
OPR
Orexin
HCRTR
Oxytocin
OXTR
Somatostatin
SSTR
Tachykinin
Substance P
TACR1
Substance K
TACR2
Neuromedin K
TACR3
Urotensin II
UTS2R
Vasopressin
AVPR
Proteinase-activated like
PARRS
PAR
Prolactin-releasing peptide
PRLHR
Hormone protein
Melanin-concentrating hormone
MCHR
FSH
FSHR
LH
LHCGR
TSH
TSHR
Prostanoid
Prostaglandin PGD2
PTGDR
PGE2
PTGER
PGF2-alpha
PTGFR
PGI2
PTGIR
Thromboxane A2
TBXA2R
Nucleotide like
Adenosine
ADORA
Nucleotides
P2RY
Cannabinoid
Anandamide
CNR1
Platelet-activating factor
PTAFR
Gonadotropin-releasing hormone
GNRHR
Thyrotropin-releasing hormone
TRHR
Melatonin
MTNR
Lysophingolipid and LPA
Lysophosphatidic acid
EDGL
S1P, dihydro-S1P
EDGS
Leukotriene B4
LTB4R
Mas proto-oncogene
MAS1
Relaxin
RXFP
Cysteinyl-leukotriene
CYSLTR
Class B Secretin like
Calcitonin
CALCR
Corticotropin releasing hormone
CRHR
Gastric inhibitory peptide
GIPR
Glucagon
GCGR
Glucagon-like peptide
GLPR
Growth hormone-releasing hormone
GHRHR
Parathyroid hormone
PTHR
PACAP
PACAPR
Secretin
SCTR
Vasoactive intestinal peptide
VIPR
Class C Metabotropic glutamate /pheromone
Metabotropic glutamate
GRM
GABA
GABBR
Channels /other receptors
N-Acetylaspartyl-glutamate
GRIN
GABA
GABR
Acetylcholine
CHRN
Nucleotides
P2RX
Glutamate
L-Aspartate
L-Cysteic acid
L-Homocysteic acid
GRI
Glycine
β-Alanine
Taurine
GLR
N-Arachidonoyl-dopamine
N-Oleoyl-dopamine
Anandamide
Palmitoyl-ethanolamide
TRPV1
Porphyrins
BZRP
Cortisol
NR3C1
Growth hormone
GH
GHR
Triiodothyronine, thyroxine
THR
Leptin
LEP
LEPR
Prolactin
PRL
PRLR

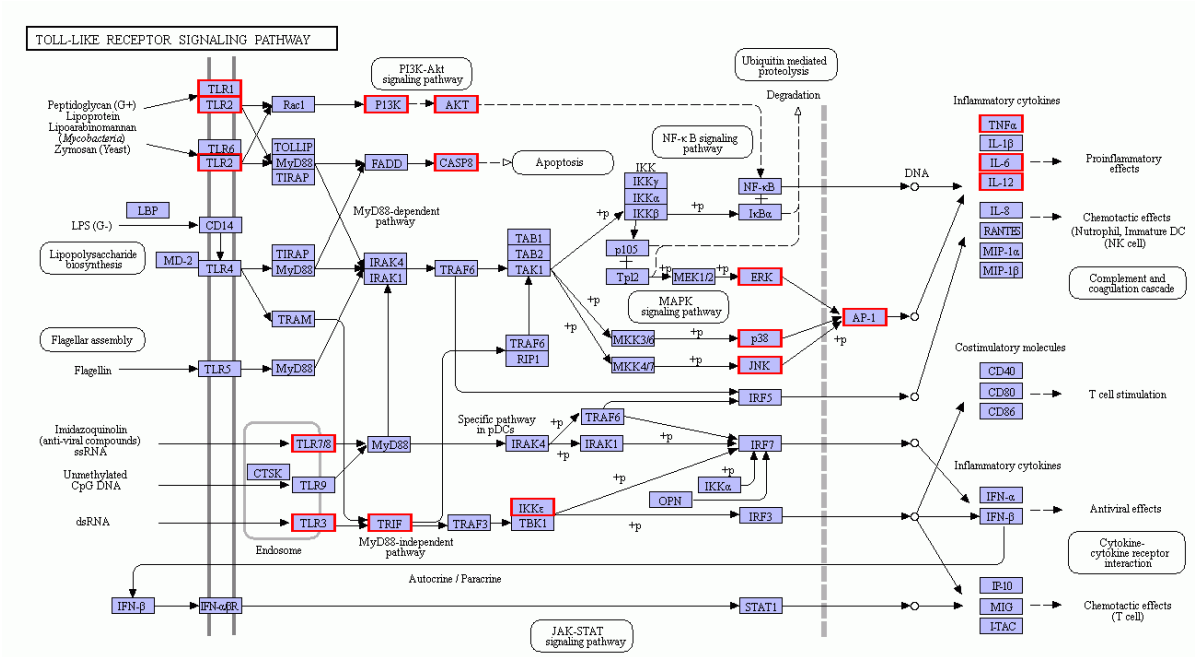
(C)


OLFACTORY TRANSDUCTION
ODOR DETECTION
Plasma membrane
Olfactory receptor neuron (ORN)
Odorant
R
Golf
ACIII
cAMP signaling pathway
cAMP
Na+
CNG
Ca2+
Depolarization
Cl-
CaCC
PKG
GC-D expressing ORNs
Uroguanylin/ guanylin
GC-D
cGMP
CNGA3
Ncal8
Ca2+
RECOVERY AND ADAPTATION
GRK
+p
Arrestin
RGS2
CAMKII
PKA
PDE
CaM
AMP
K+
Exchanger
Na+
Purine metabolism
PDE2
GMP
?

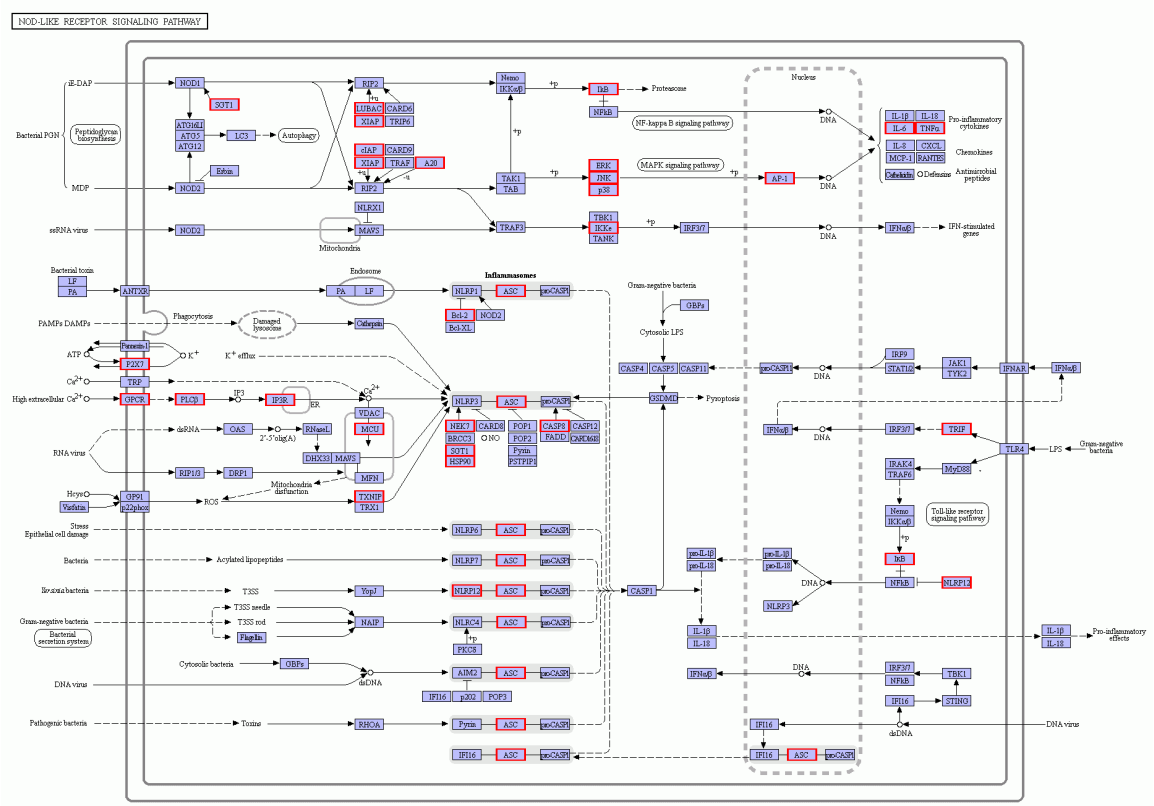
(D)


TASTE TRANSDUCTION
TASTE BUD CELL
Type I glial like cell
Salty
ENaC
Depolarization
NTPDase2
ATP
ADP
Type II receptor cell
P2Y1
P2X2
Enhancement of ATP secretion
AC
cAMP
PKA
K+ channel
Sweet
Sweeteners
Sugars
D-amino acids
T1R2
T1R3
G
ER
IP3R
Ca2+
TRPM5
Calcium signaling pathway
Depolarization
cAMP
PDE
PLCβ2
IP3
AMP
VGNC
Umami
GMP
IMP
L-glutamate
T1R1
T1R3
mGluR
Bitter
Salicin
Quinine
Saccharin
T2R
CALHM1
P2X2
P2X3
Sensory afferent fiber
Neurotransmitter release
Ach
M3
Inhibition of ATP secretion
GABAA
GABAB
5-HT1A
Type III presynaptic cell
P2Y4
Weak acid
KCNK
Sour
HCl
Citric acid
Malic acid
PKD1L3
PKD2L1
Proton
Depolarization
VGNC
VGCC
Na+
H+
Ca2+
ASIC
Depolarization
Ca2+
GABA
5-HT
NE
Neurotransmitter release
5-HT3
Sensory afferent fiber

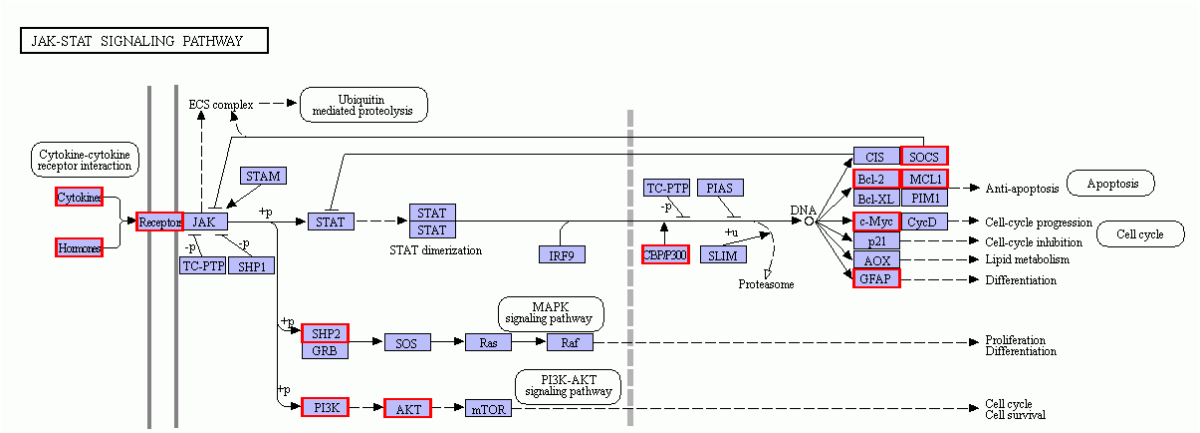
(E)


TOLL-LIKE RECEPTOR SIGNALING PATHWAY
Peptidoglycan (G+)
Lipoprotein
Lipoarabinomannan (Mycobacteria)
Zymosan (Yeast)
TLR1
TLR2
TLR6
TLR2
Rac1
PI3K-Akt signaling pathway
PI3K
AKT
Ubiquitin mediated proteolysis
Degradation
TOLLIP
MyD88
TIRAP
FADD
CASP8
Apoptosis
NF-κB signaling pathway
IKK
IKKγ
IKKα
IKKβ
NF-κB
IκBα
DNA
Inflammatory cytokines
TNFα
IL-1β
IL-6
IL-12
Proinflammatory effects
LBP
LPS (G-)
CD14
MyD88-dependent pathway
IL-8
RANTES
MIP-1α
MIP-1β
Chemotactic effects (Nutrophil, Immature DC (NK cell)
Lipopolysaccharide biosynthesis
MD-2
TLR4
TIRAP
MyD88
IRAK4
IRAK1
TRAF6
TAB1
TAB2
TAK1
p105
Tpl2
MEK1/2
ERK
MAPK signaling pathway
AP-1
Complement and coagulation cascade
TRAM
TRAF6
RIP1
MKK3/6
MKK4/7
p38
JNK
Flagellar assembly
Flagellin
TLR5
MyD88
IRF5
Costimulatory molecules
CD40
CD80
CD86
T cell stimulation
Imidazoquinolin (anti-viral compounds) ssRNA
Specific pathway in pDCs
TRAF6
IRAK4
IRAK1
IRF7
Unmethylated CpG DNA
CTSK
TLR9
TLR7/8
MyD88
dsRNA
TLR3
TRIF
TRAF3
IKKε
TBK1
OPN
IKKα
IRF3
Inflammatory cytokines
IFN-α
IFN-β
Antiviral effects
Endosome
MyD88-independent pathway
Cytokine-cytokine receptor interaction
Autocrine / Paracrine
IFN-β
IFNαβR
STAT1
IP-10
MIG
ITAC
Chemotactic effects (T cell)
JAK-STAT signaling pathway

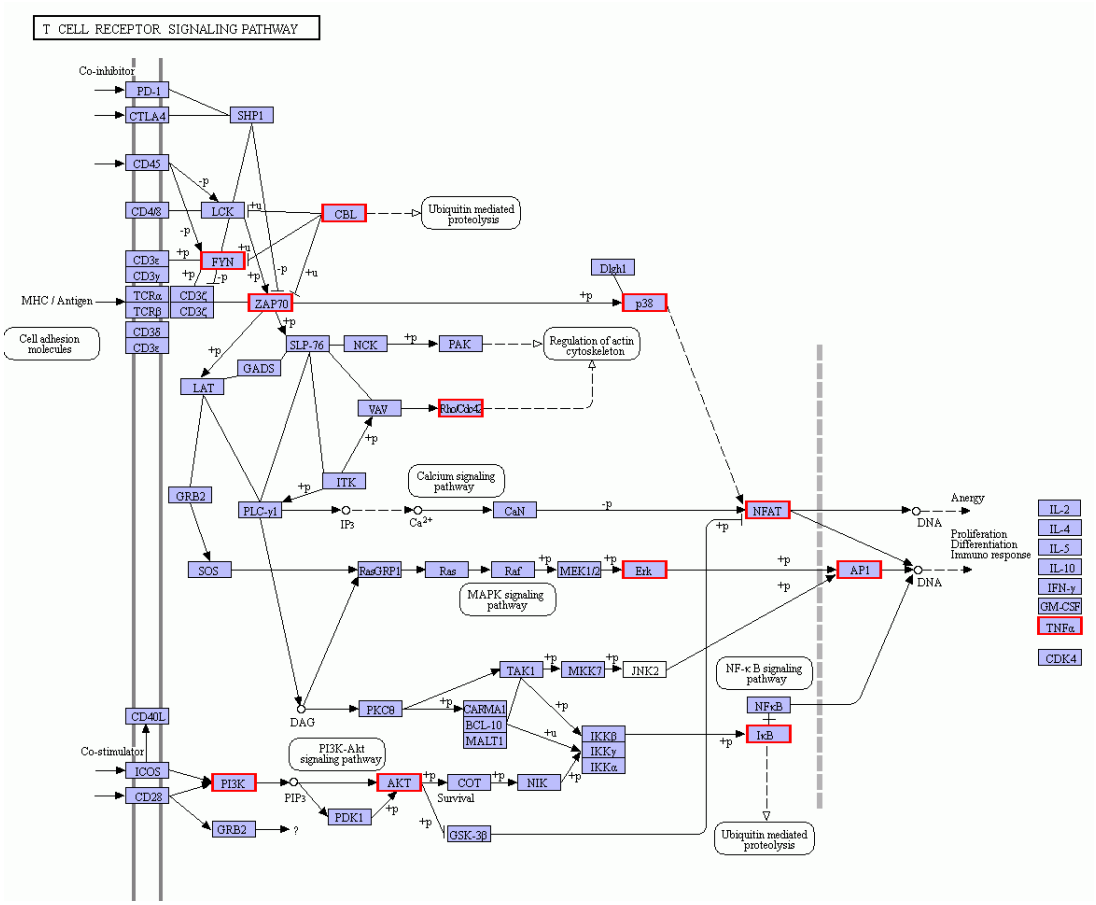
(F)


NOD-LIKE RECEPTOR SIGNALING PATHWAY
iE-DAP
Bacterial PGN
MDP
ssRNA virus
Peptidoglycan biosynthesis
NOD1
NOD2
S3T1
ATG16L1
ATG5
ATG12
LC3
Autophagy
Ebin.
RIP2
LUBAC
XIAP
CARD6
TRIP6
cIAP
CARD9
TRAF
A20
NLRX1
MAVS
Mitochondria
Nemo
IKKs/g
IκB
Proteasome
NFkB
NF-kappa B signaling pathway
TAK1
TAB
ERK
JNK
p38
MAPK signaling pathway
AP-1
TRAF3
TBK1
IKKε
TANK
IRF3/7
IFNαβ
IFN-stimulated genes
Nucleus
DNA
IL-1β
IL-18
IL-6
TNFα
Pro-inflammatory cytokines
IL-8
CXCL
MCP-1
RANTES
Chemokines
Cathelicidin
Defensins
Antimicrobial peptides
Bacterial toxins
LF
PA
ANTXR
Endosome
Inflammasomes
NLRP1
ASC
proCASP1
Bcl-2
Bcl-XL
NOD2
PAMPs DAMPs
Phagocytosis
Damaged lysosome
Cathepsin
ATP
Pannexin 1
P2X7
K+ efflux
TRP
High extracellular Ca2+
OPCR
PLCβ
IP3
IP3R
ER
Ca2+
VDAC
MCU
NLRP3
NEK7
CARD8
BRCC3
NO
SGT1
HSP90
POP1
POP2
Pyrin
PSTPIP1
CASP8
FADD
CASP12
CARD16
GSDMD
Pyroptosis
Gram-negative bacteria
GBPs
Cytosolic LPS
CASP4
CASP5
CASP11
proCASP11
IRF9
STAT1/2
JAK1
TYK2
IFNAR
IFNαβ
RNA virus
dsRNA
OAS
2'-5' oligA)
RNaseL
DHX33
MAVS
MPN
RIP1/3
DRP1
Mitochondria dysfunction
ROS
Hcyse
Viroporins
GP91
p22phox
TXNIP
TRX1
Stress
Epithelial cell damage
Bacteria
Acylated lipopeptides
Legionella bacteria
T3SS
T3SS needle
T3SS rod
Gram-negative bacteria
Bacterial secretion system
FlagIn
Cytosolic bacteria
DNA virus
Pathogenic bacteria
Toxins
RHOA
Pyrin
NLRP6
NLRP7
NLRP12
NLRC4
NAIP
PKCδ
AIM2
dsDNA
IFI16
p202
POP3
YopJ
pro-IL1β
pro-IL18
CASP1
IL-1β
IL-18
NLRP3
IRF3/7
TBK1
STING
TRIF
TLR4
LPS
IRAK4
TRAF6
MyD88
Nemo
IKKs/g
Toll-like receptor signaling pathway
NFkB
NLRP12
Pro-inflammatory effects

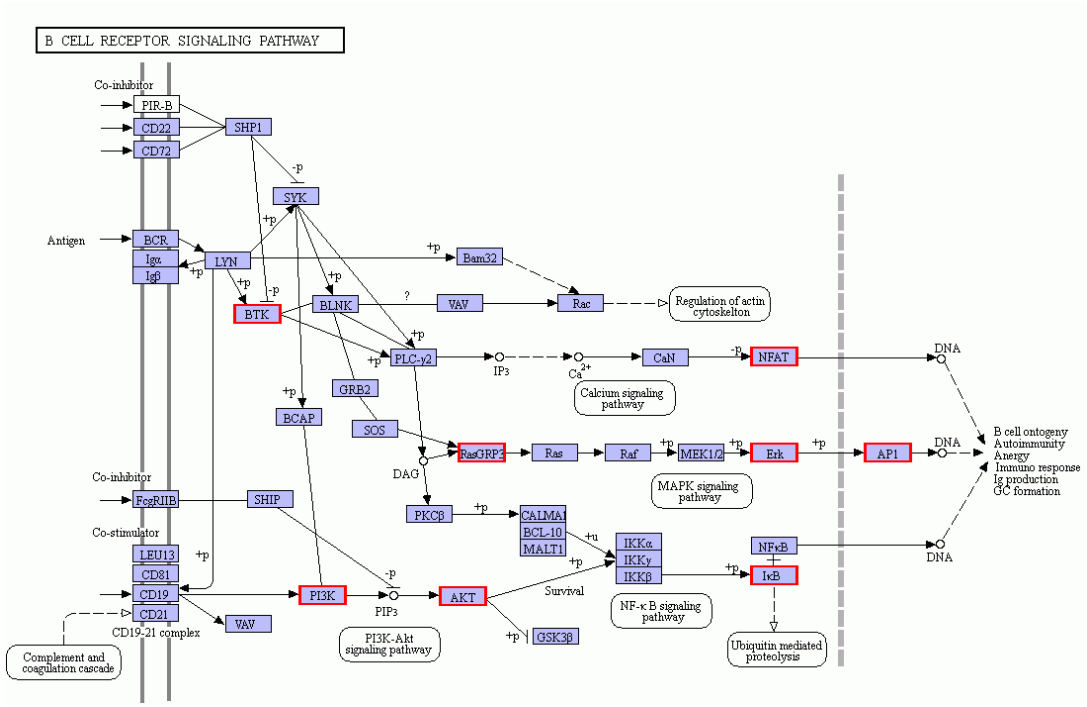
(G)


JAK-STAT SIGNALING PATHWAY
ECS complex
Ubiquitin mediated proteolysis
Cytokine-cytokine receptor interaction
Cytokines
Hormones
Receptor
JAK
STAM
STAT
STAT
STAT
STAT dimerization
IRF9
TC-PTP
SHP1
SHP2
GRB
SOS
Ras
Raf
MAPK signaling pathway
PI3K
AKT
mTOR
PI3K-AKT signaling pathway
TC-PTP
PIAS
CBP/P300
SLIM
Proteasome
DNA
CIS
SOCS
Bcl-2
MCL1
Bcl-XL
PIM1
c-Myc
CycD
p21
AOX
GFAP
Anti-apoptosis
Apoptosis
Cell-cycle progression
Cell-cycle inhibition
Cell cycle
Lipid metabolism
Differentiation
Proliferation
Differentiation
Cell cycle
Cell survival

(H)



(I)



Supplementary Figure 2. The potential pathways involved in signal transduction mechanisms and immunity. (A) MAPK signaling pathway. (B) Neuroactive ligand-receptor interaction. (C)

Olfactory transduction. (D) Taste transduction. (E) Toll-like receptor signaling pathway. (F) NOD-like receptor signaling pathway. (G) Jak-STAT signaling pathway. (H) T cell receptor signaling pathway. (I) B cell receptor signaling pathway.