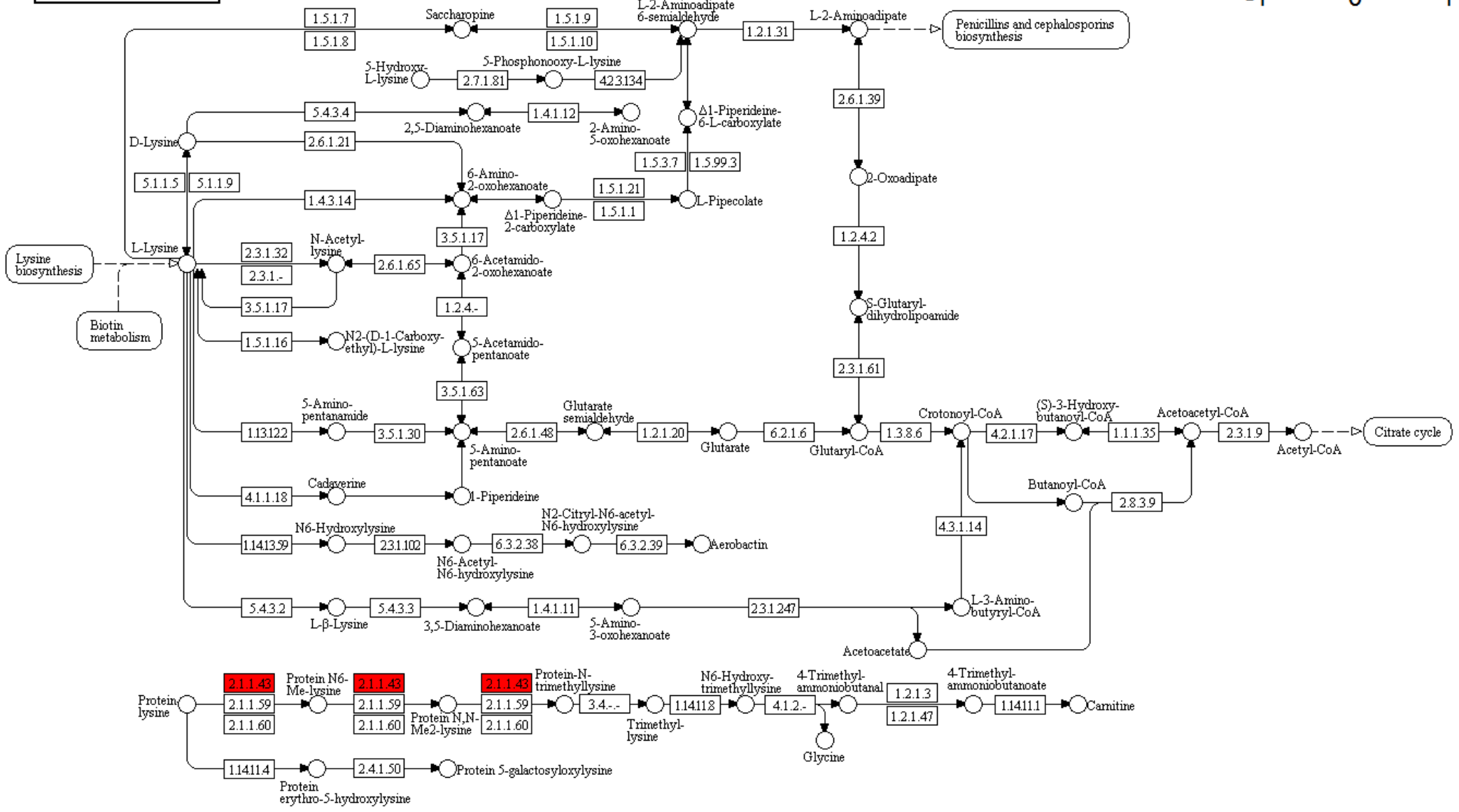
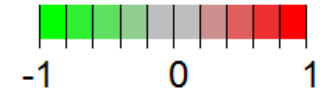
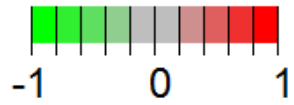


LYSINE DEGRADATION

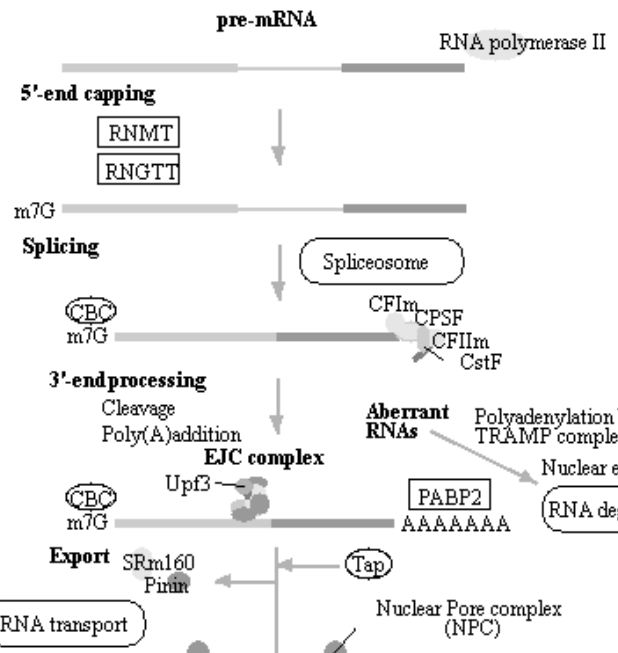


Data on KEGG graph
Rendered by Pathview

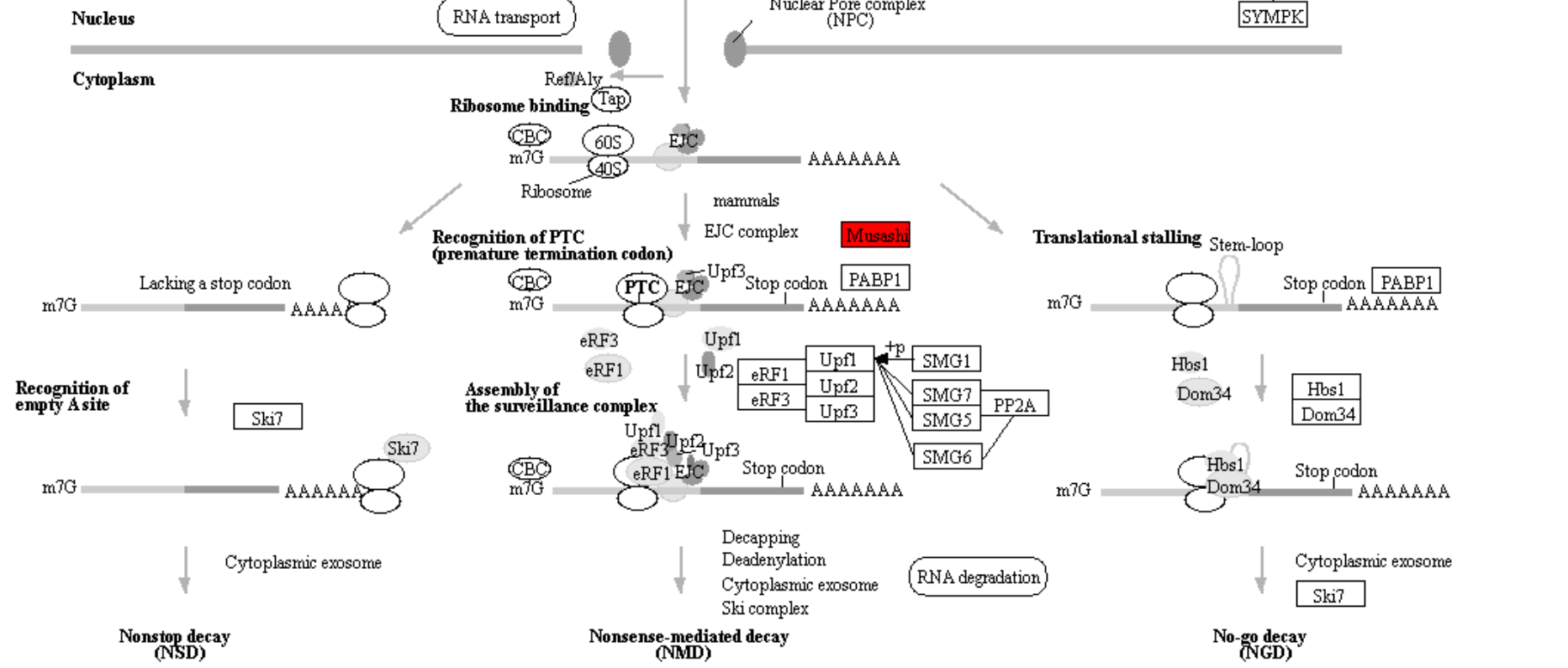
mRNA SURVEILLANCE PATHWAY



- Cap binding complex (CBC)**
- CBP80
 - CBP20
- Exon-junction complex (EJC)**
- | | | | |
|-------|--------|-------|---------|
| Upf3 | | | ACIN1 |
| Y14 | MLN51 | SAP18 | RNPS1 |
| MAGOH | EIF4A3 | Pimin | Ref/Aly |
- Transiently interacting factors**
- | | | |
|-----|-------|--------|
| Tap | UAP56 | SRm160 |
| p15 | PYM | |



- pre-mRNA 3'-end processing machinery**
- Cleavage factor Im (CFIm) complex**
- CPSF5
 - CPSF6/7
 - PAP
- Cleavage factor IIm (CFIIm) complex**
- Clp1
 - Pcf11
- Cleavage and polyadenylation specificity factor (CPSF) complex (Saccharomyces cerevisiae)**
- | | | | | |
|-------|-------|-------|------|-------|
| CPSF1 | CPSF2 | CPSF3 | MPE1 | PSF2 |
| Fip1 | CPSF4 | | SWD2 | REF2 |
| | | | GLC7 | SSU72 |
- Cleavage stimulation factor (CSTF) complex**
- CSTF1
 - CSTF2
 - CSTF3
 - SYMPK

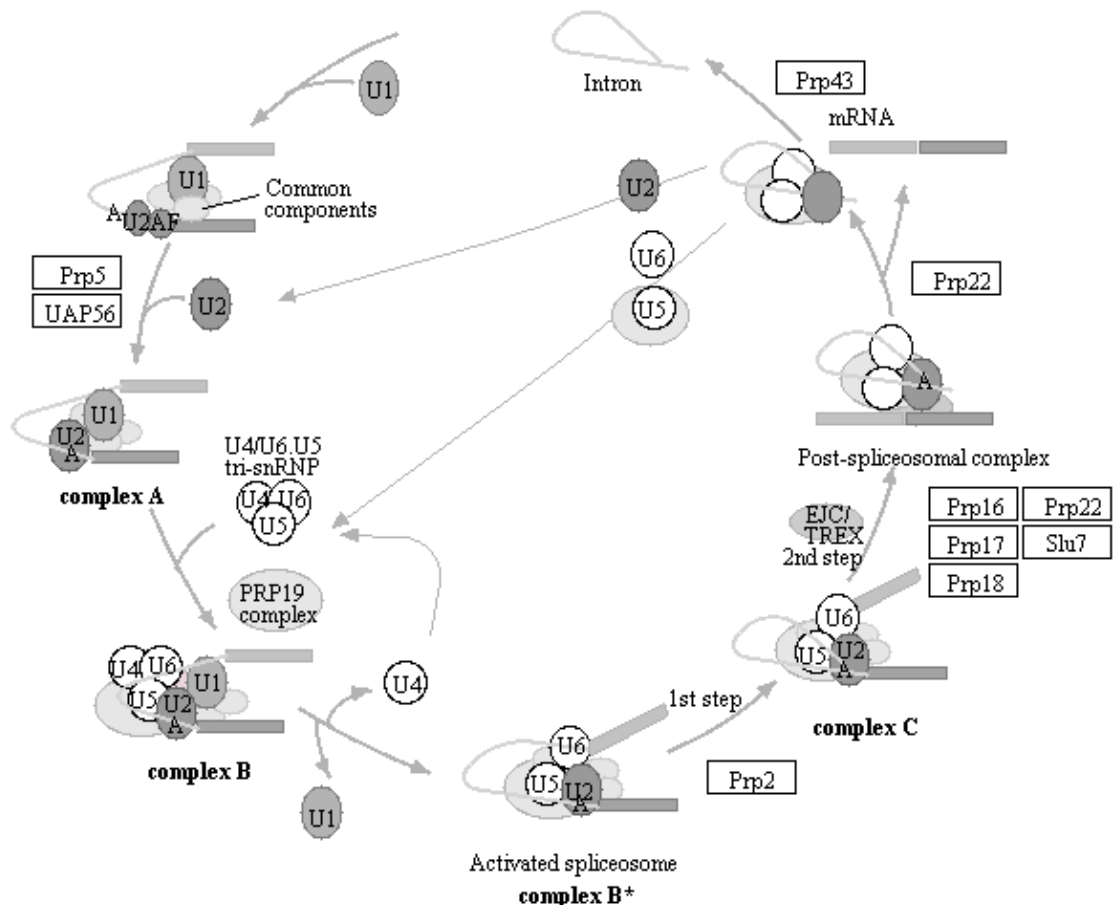
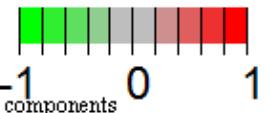


Nonstop decay (NSD)

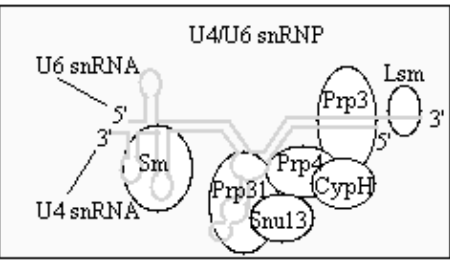
Nonsense-mediated decay (NMD)

No-go decay (NGD)

SPLICEOSOME

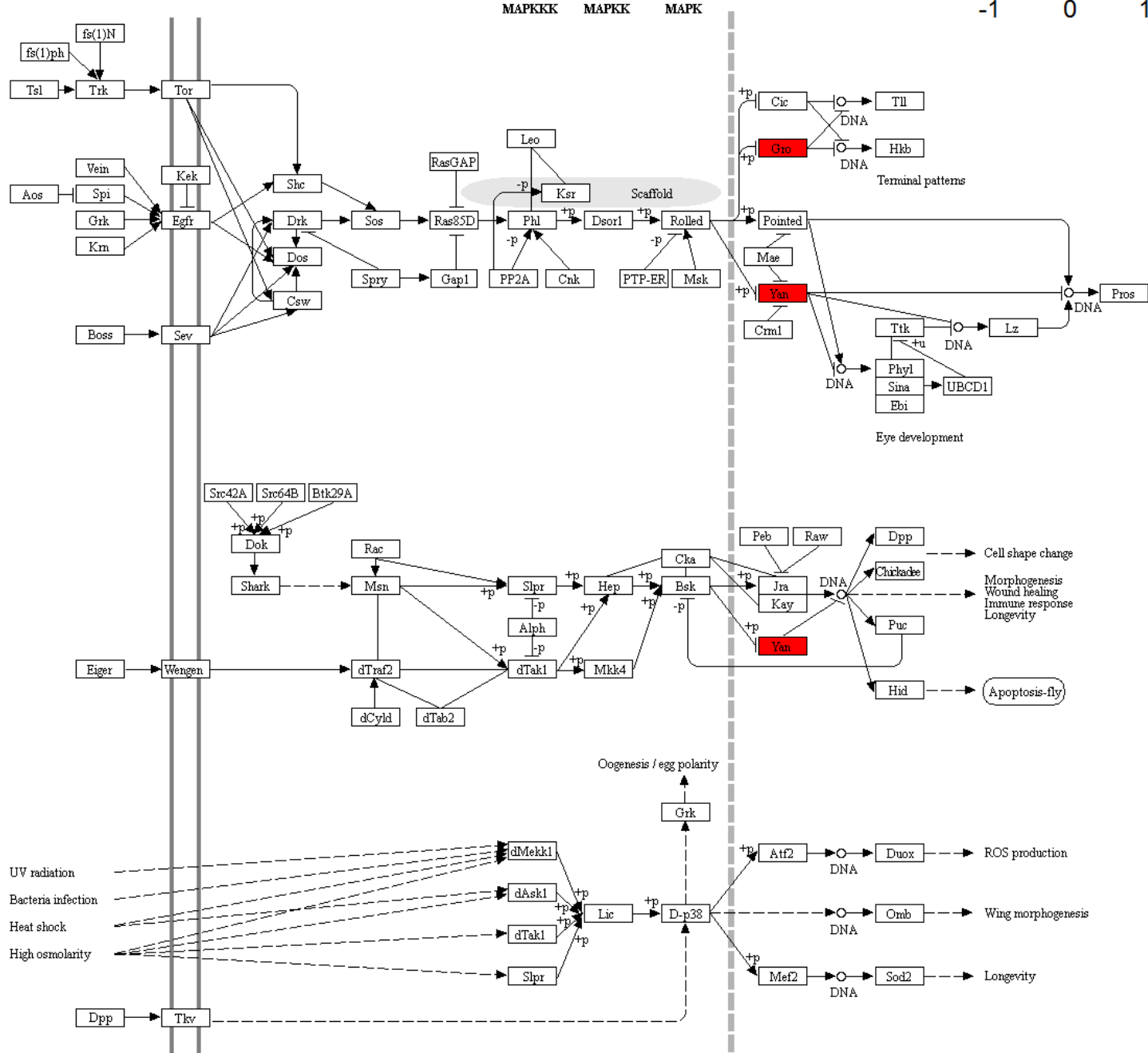
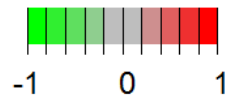


U1	U2	U4/U6	U5
U1snRNA	U2snRNA	U4snRNA	U5snRNA
Sm	Sm	U6snRNA	Sm
U1-70K	U2A'	Lsm	Snul14
U1A	U2B''	Sm	Brr2
U1C	SF3a	Prp3	Prp6
U1 related	SF3b	Prp4	Prp8
FBP11	U2 related	CypH	Prp8BP
S164	U2AF	Prp31	Prp28
p68	PUF60	Snul3	DIB1
CA150	U4/U6.U5 tri-snRNP associated	SnRNP27	
	SPF30	Sad1	
	SPF45	Snu66	
	CHERP		
	SR140		
	Prp43	Snu23	
	PAP-1	Prp38	
		PAP-1	
	Prp19 complex	EJC/TREX	Common components
	Prp19	SKIP	CBP80/20
	CDC5	Syf	hnRNPs
	SPF27	Isy1	SR
	PRL1	PPIL1	
	AD002	CypE	
	CTNNE1	CCDC12	
	HSP73	RBM22	
	Complex B specific	G10	
	NPW38	AQR	
	NPW38BP		



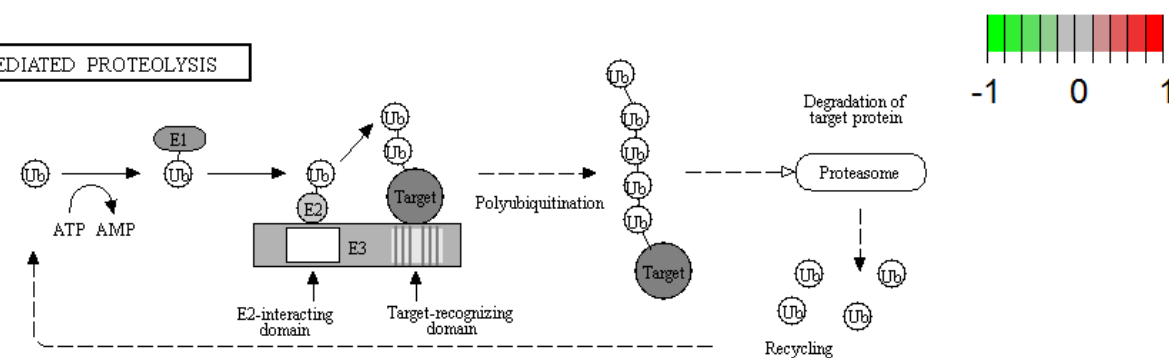
Data on KEGG graph
Rendered by Pathview

MAPK SIGNALING PATHWAY - FLY



Data on KEGG graph
Rendered by Pathview ;

UBIQUITIN MEDIATED PROTEOLYSIS



- E1**
(Ubiquitin-activating enzyme)
- | | | | |
|------|--------|--------|-------|
| UBE1 | UBLE1A | UBLE1B | UBE1C |
|------|--------|--------|-------|

- E2**
(Ubiquitin-conjugating enzyme)
- | | | | | | | | | |
|-------|--------|--------|--------|--------|-------|--------|--------|-------|
| UBE2A | UBE2B | UBE2C | UBE2D | UBE2E | UBE2F | UBE2G1 | UBE2G2 | UBE2H |
| UBE2I | UBE2J1 | UBE2J2 | UBE2L3 | UBE2L6 | UBE2M | UBE2N | UBE2O | |
| UBE2Q | UBE2R | UBE2S | UBE2U | UBE2W | UBE2Z | HIP2 | APCLCN | |

- E3**
(Ubiquitin ligase)
- HECT type E3**
-
- | | | | | |
|------|-------|--------|-------|---------|
| E6AP | UBE3B | UBE3C | Smurf | Itch |
| WWP1 | WWP2 | TRIP12 | NEDD4 | ARF-BP1 |
| EDD1 | HERC1 | HERC2 | HERC3 | HERC4 |

- U-box type E3**
-
- | | | |
|-------|-------|------|
| UBE4A | UBE4B | CHIP |
| CYC4 | PRP19 | UIP5 |

- single RING-finger type E3**
-
- | | | | | | | |
|-------|-------|--------|--------|--------|--------|-------|
| Mdm2 | CBL | Parkin | SIAH-1 | PML | TRAF6 | MEKK1 |
| COP1 | PIRH2 | cIAPs | PIAS | SYVN | NHLRC1 | AIRE |
| MGRN1 | BRCA1 | FANCL | MID1 | Trim32 | Trim37 | |

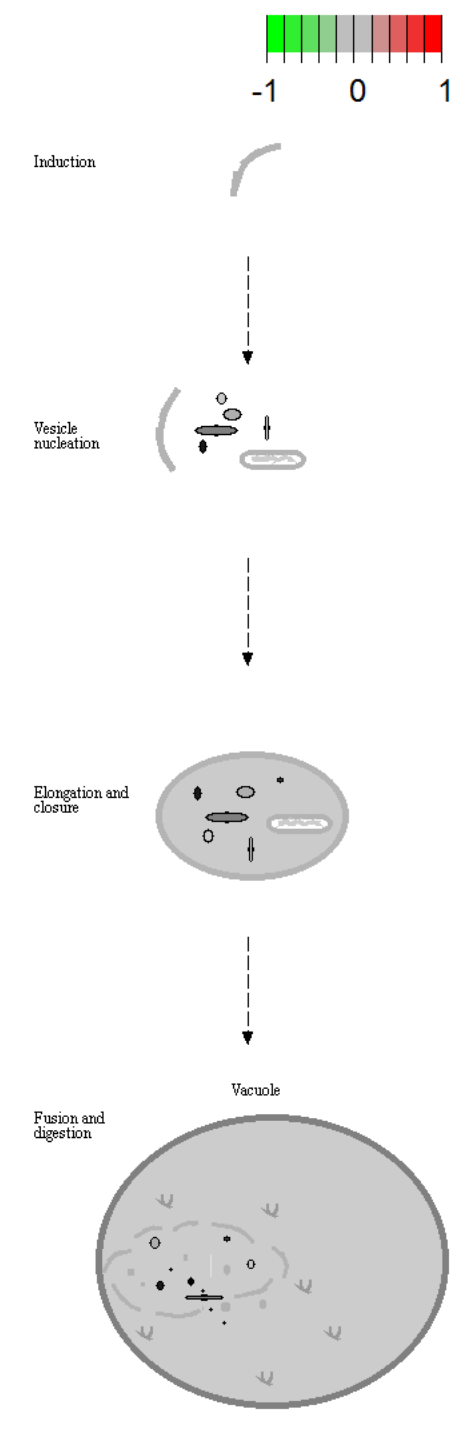
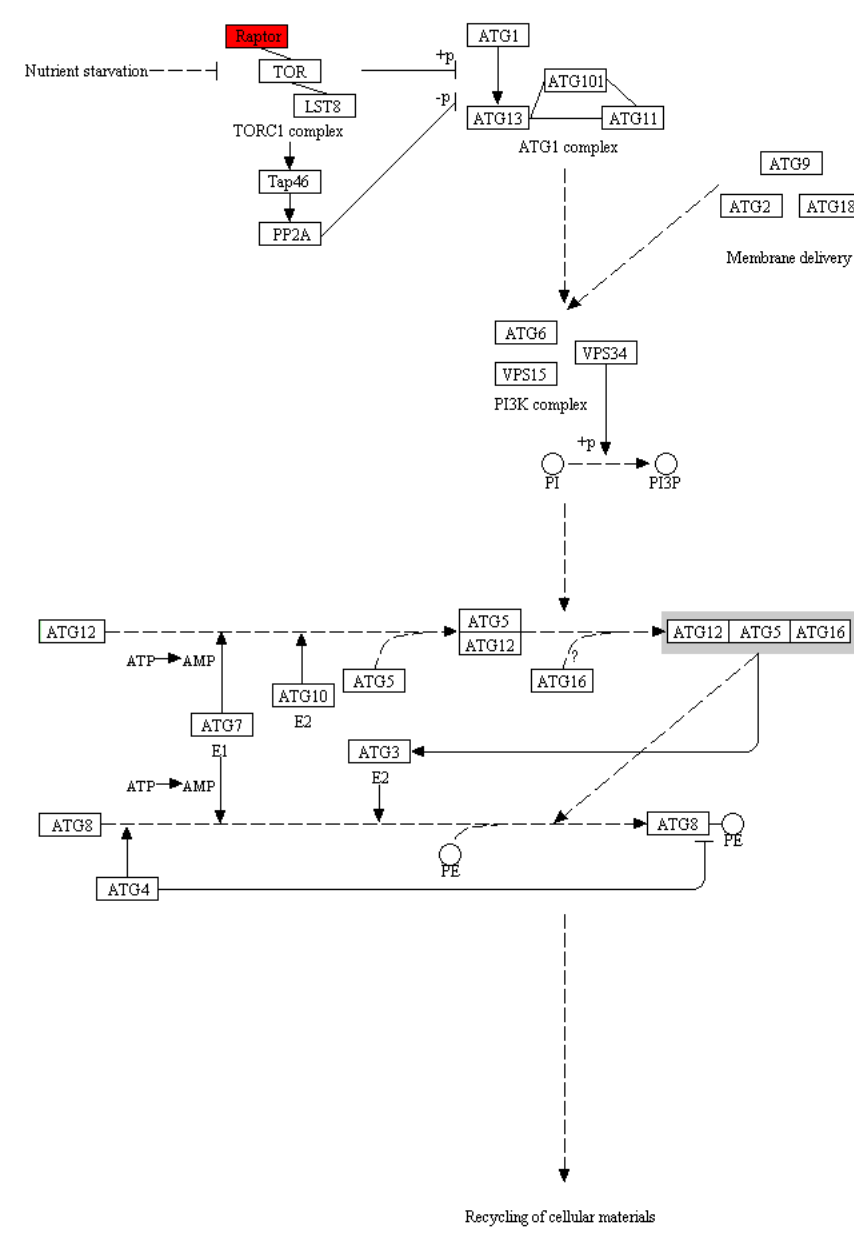
multi subunit RING-finger type E3

- Cullin-Rbx E3**
-
- | | RING finger | Cullin | Adaptor protein | Target recognizing subunit |
|--------------|-------------|--------|-----------------|----------------------------|
| SCF complex | RBX1 | Cul1 | Skp1 | F-box |
| ECV complex | RBX1 | Cul2 | EloB
EloC | VHLbox |
| Cul3 complex | RBX1 | Cul3 | | BTB |
| Cul4 complex | RBX1 | Cul4 | DDB1 | DCAF |
| ECS complex | RBX2 | Cul5 | EloB
EloC | SOC3box |
| Cul7 complex | RBX1 | Cul7 | Skp1 | Fbxw8 |

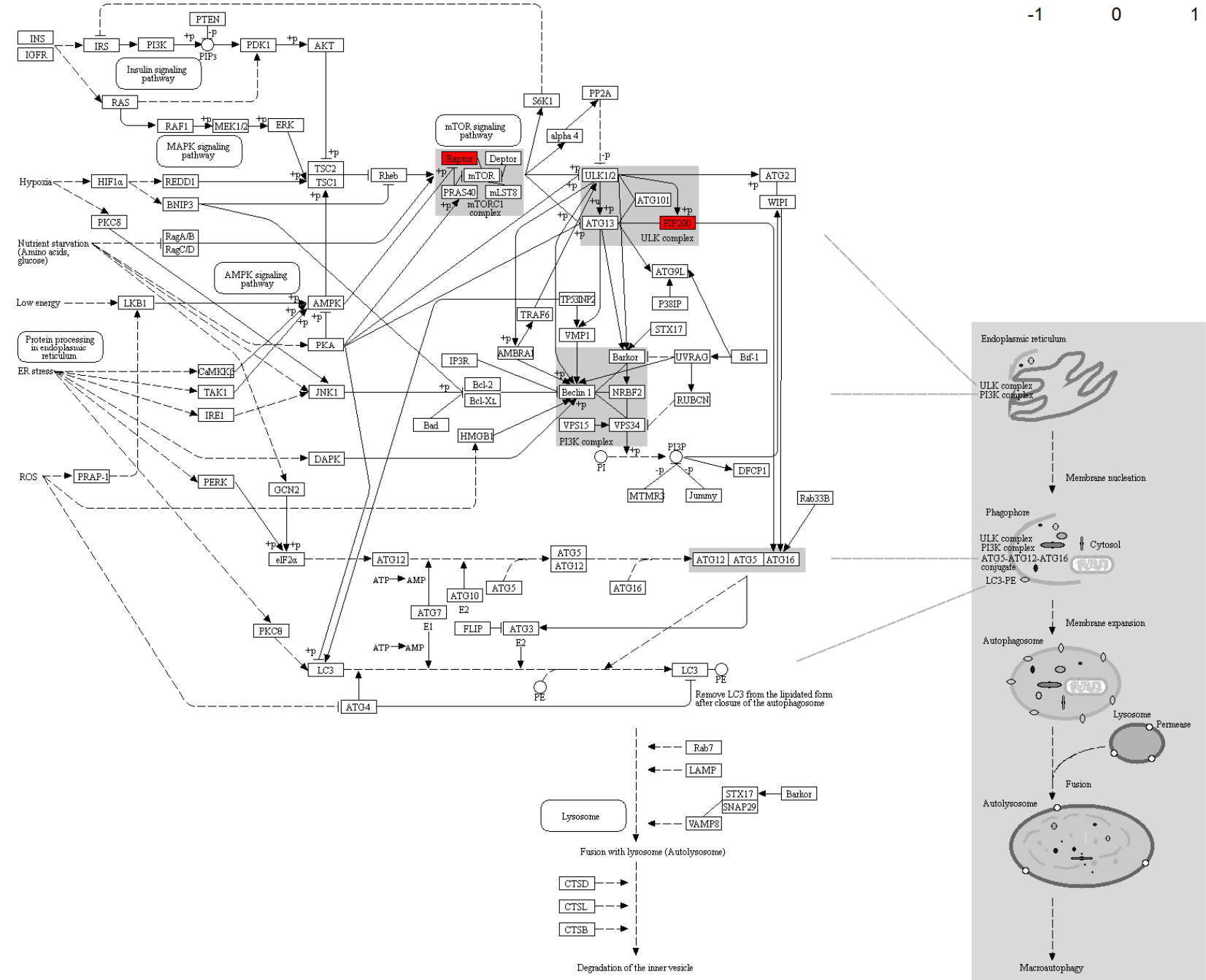
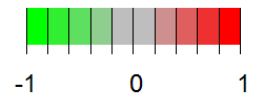
- APC/C**
-
- | RING finger | Cullin | Adaptor protein | Target recognizing subunit | Other subunits |
|-------------|--------|-----------------|----------------------------|----------------|
| Apc11 | Apc2 | ? | Cdc20 | Apc1, Apc3 |
| | | | Cdh1 | Apc4, Apc5 |
| | | | | Apc6, Apc7 |
| | | | | Apc8, Apc9 |
| | | | | Apc10, Apc12 |
| | | | | Apc13 |

Data on KEGG graph
Rendered by Pathview ;

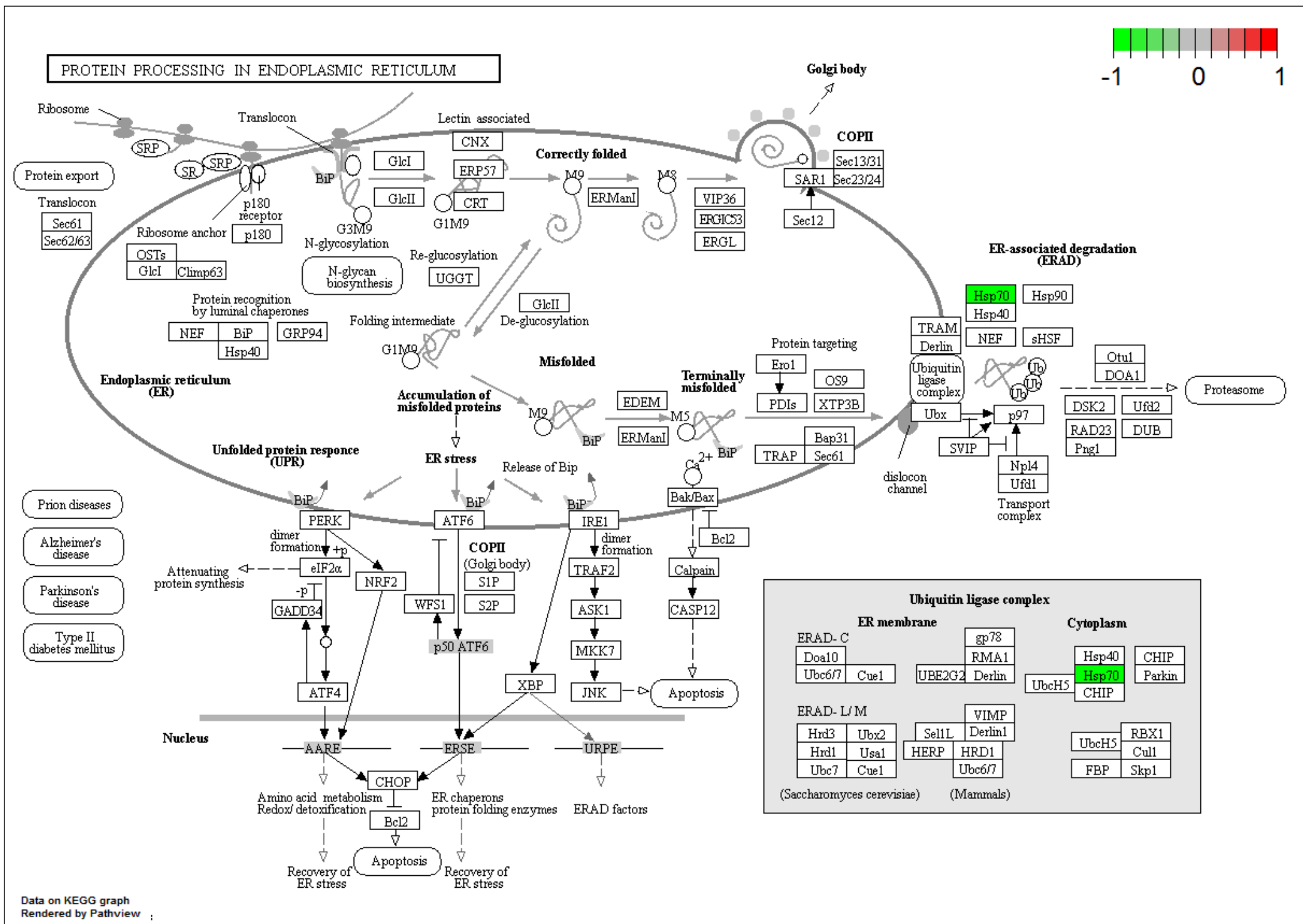
AUTOPHAGY - OTHER

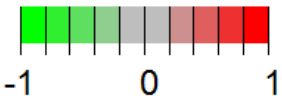


AUTOPHAGY - ANIMAL



Data on KEGG graph
Rendered by Pathview

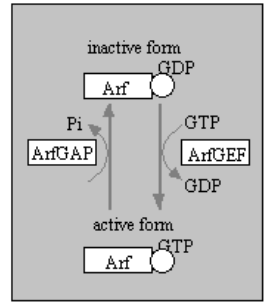
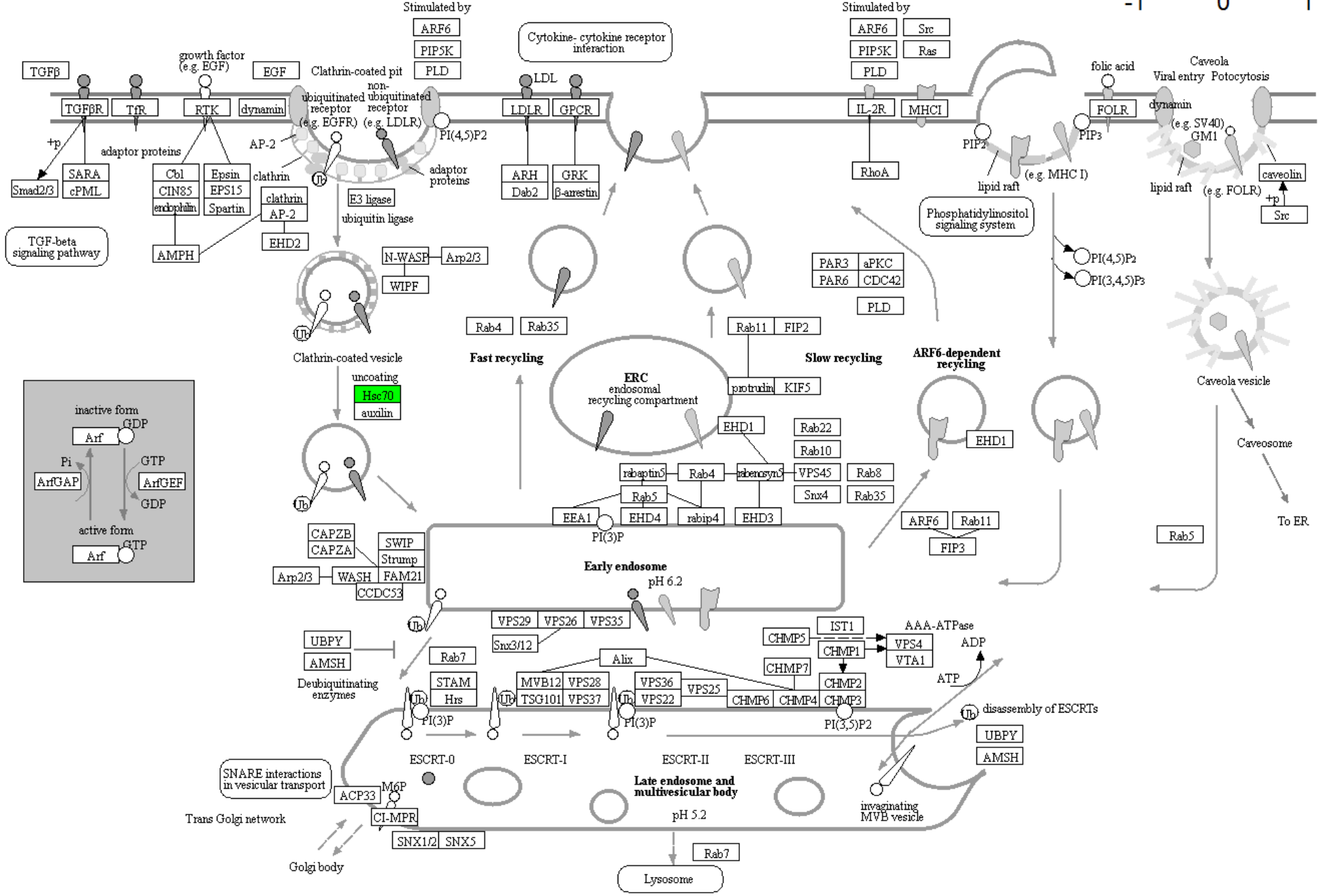




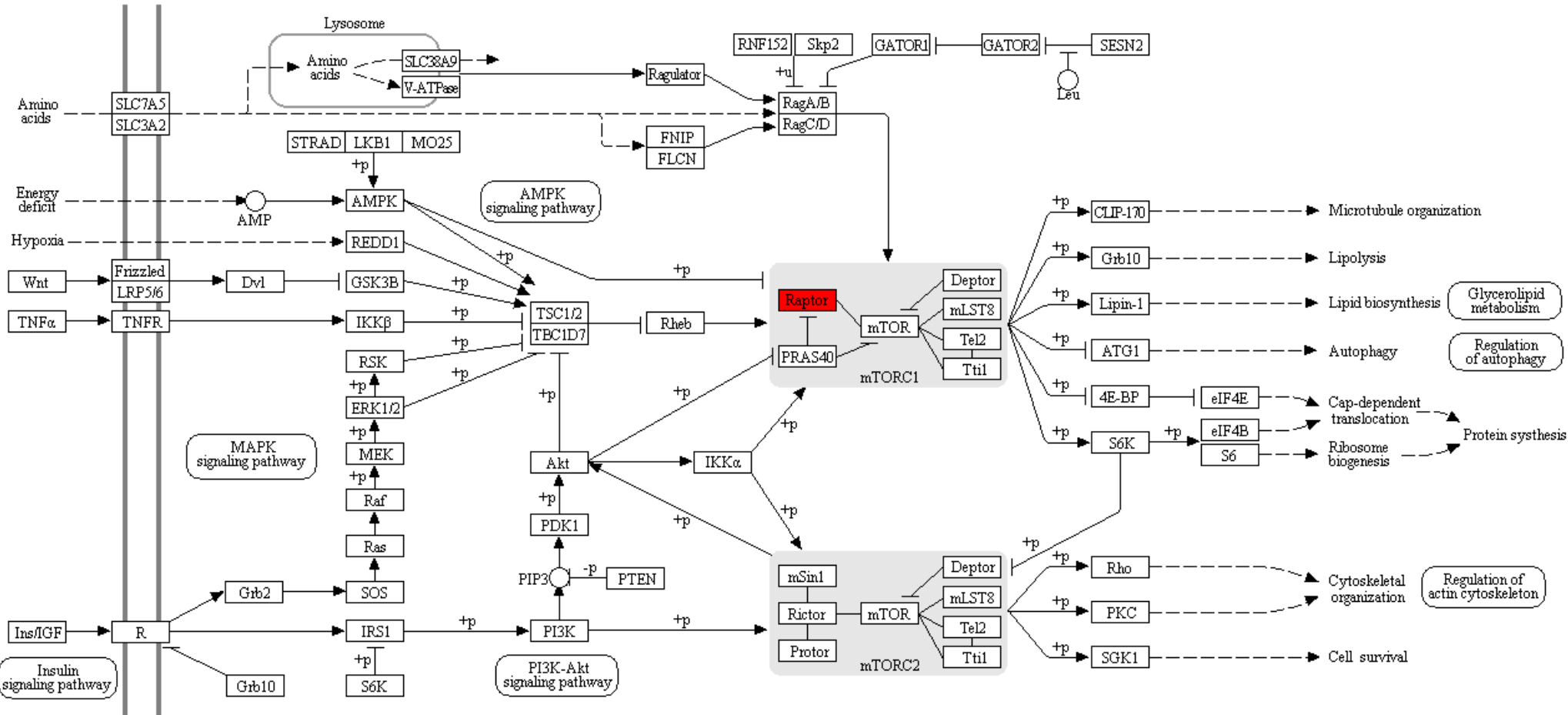
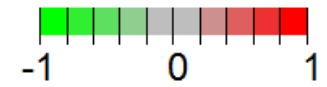
ENDOCYTOSIS

Clathrin-dependent endocytosis

Clathrin-independent endocytosis

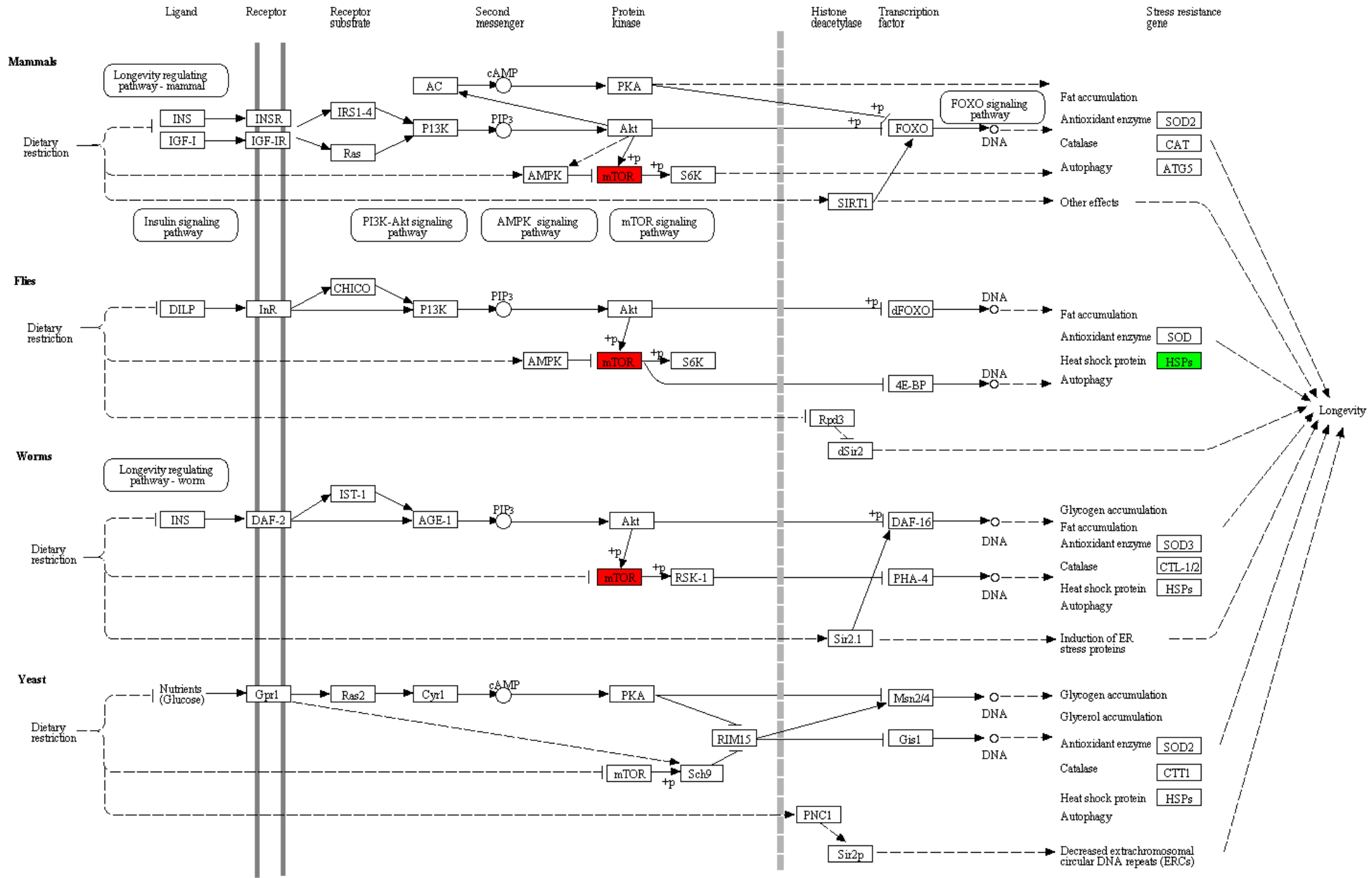
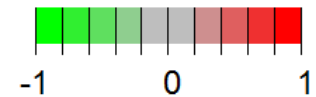


mTOR SIGNALING PATHWAY



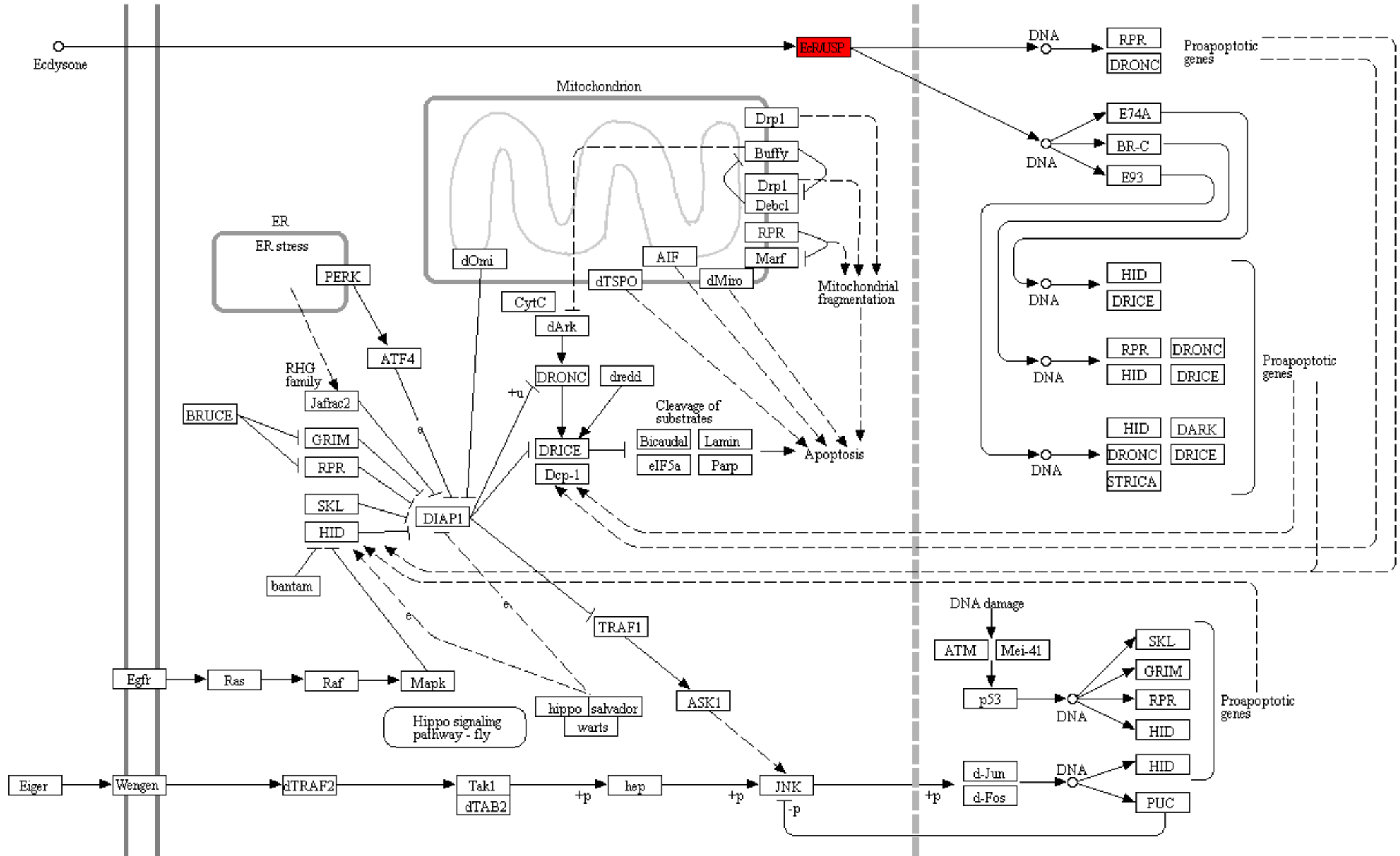
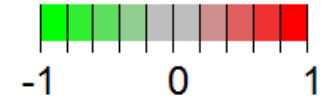
Data on KEGG graph
Rendered by Pathview ;

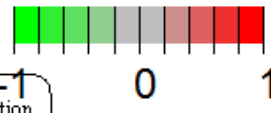
LONGEVITY REGULATING PATHWAY - MULTIPLE SPECIES



Data on KEGG graph
Rendered by Pathview

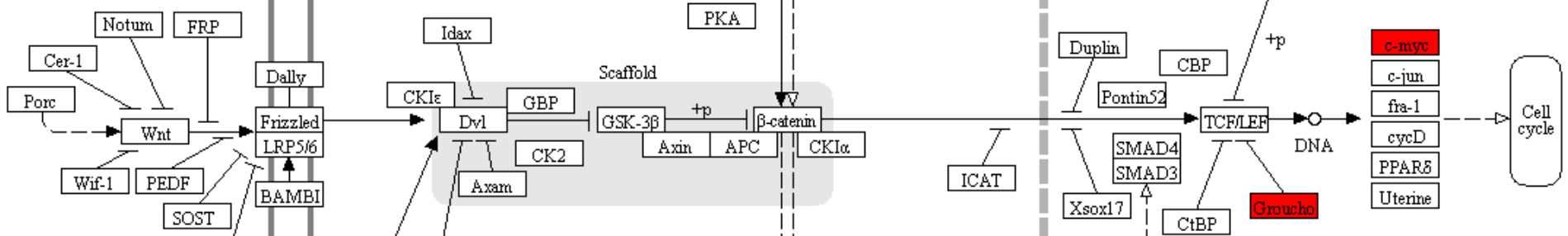
APOPTOSIS - FLY





WNT SIGNALING PATHWAY

Canonical pathway

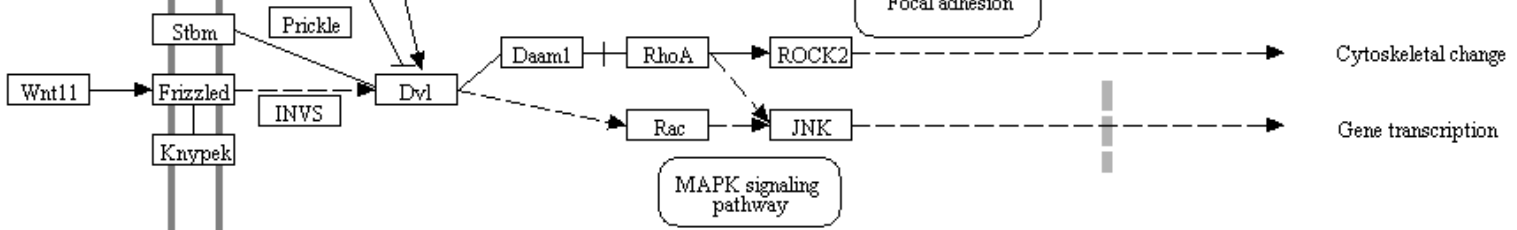


Alzheimer's disease

MAPK signaling pathway

Adherens junction

Planar cell polarity (PCP) pathway

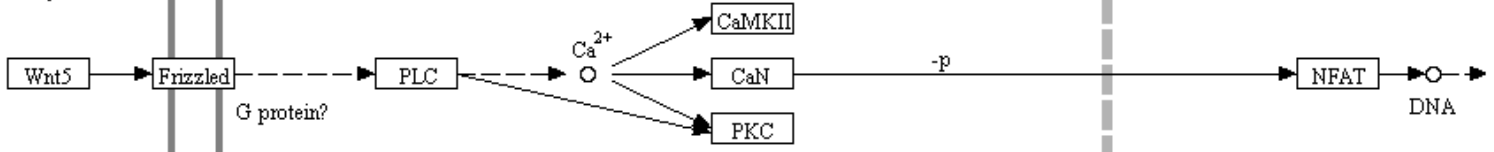


Focal adhesion

Cytoskeletal change

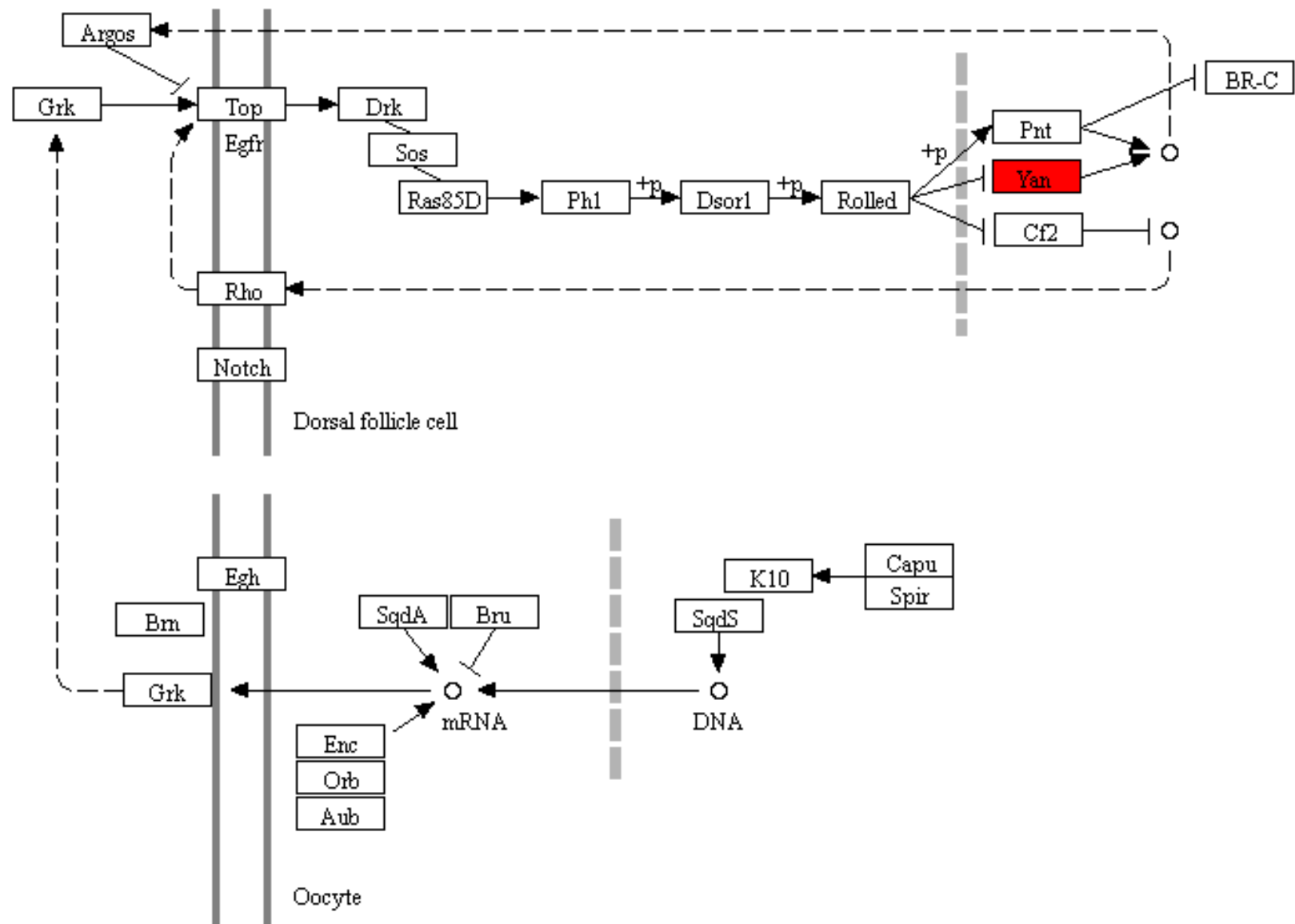
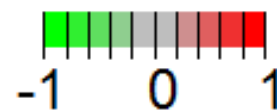
Gene transcription

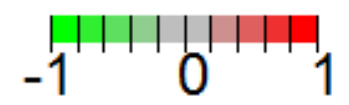
Wnt/ Ca²⁺ pathway



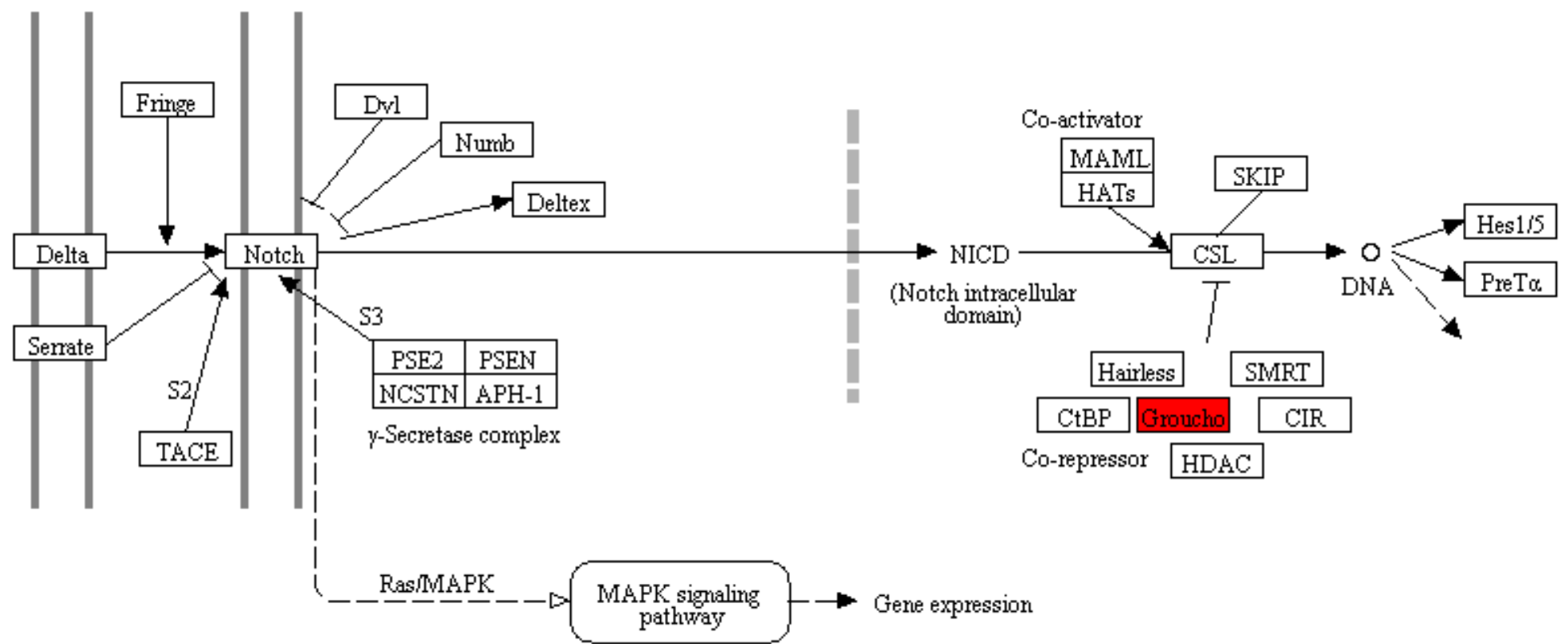
DNA

DORSO-VENTRAL AXIS FORMATION (Grk/Egfr)

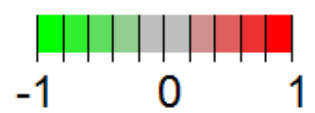




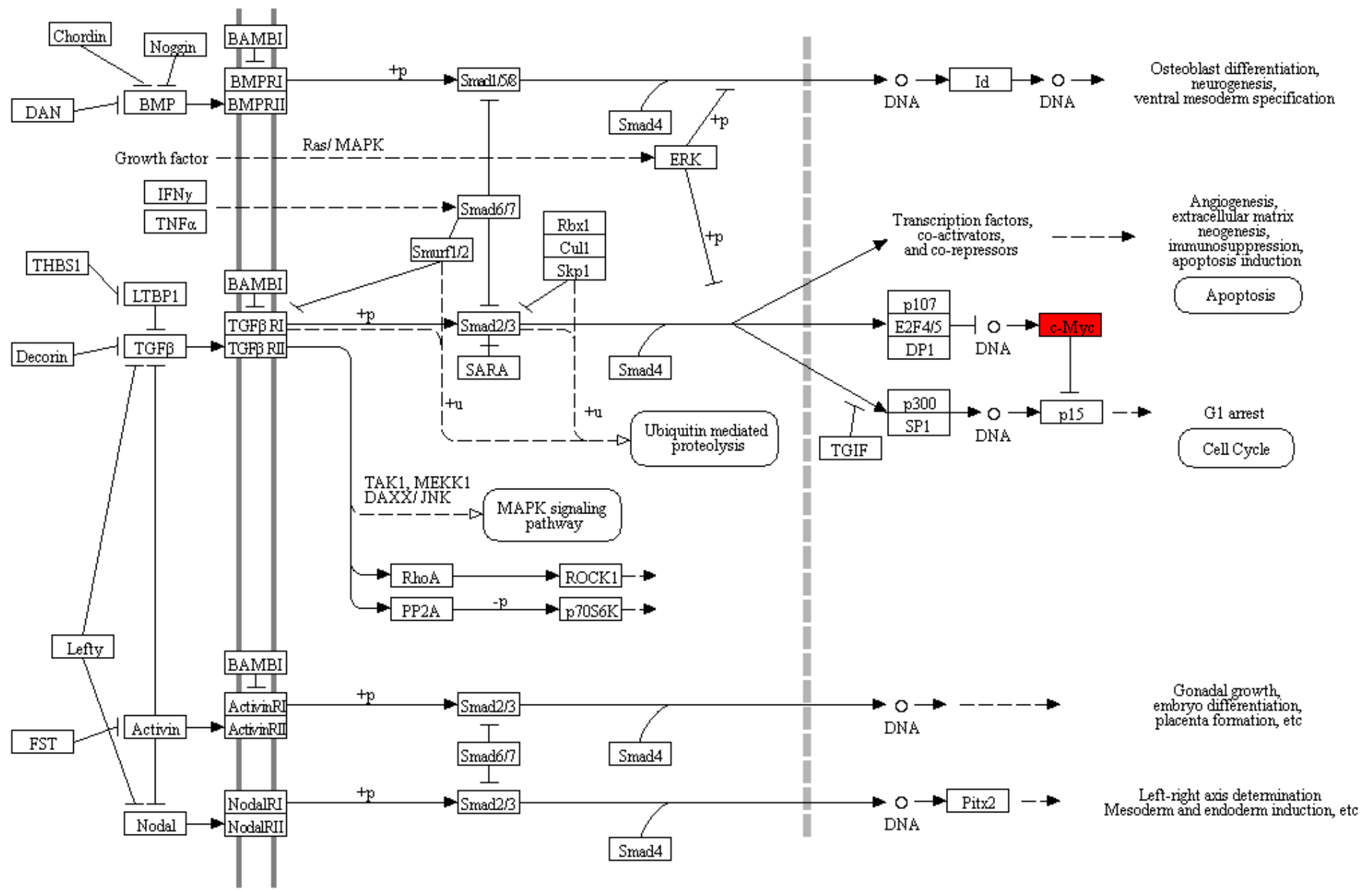
NOTCH SIGNALING PATHWAY



Data on KEGG graph
 Rendered by Pathview ;

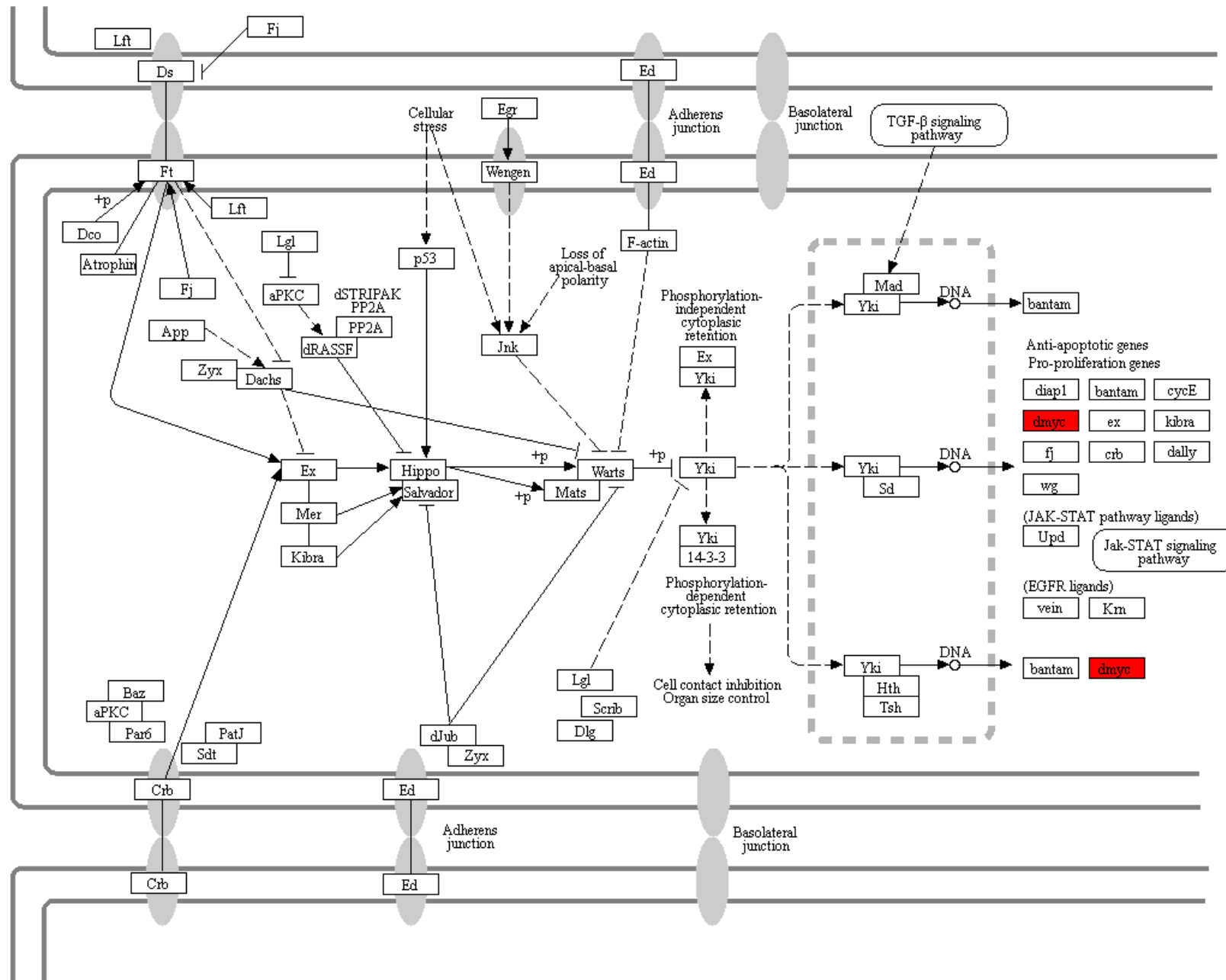
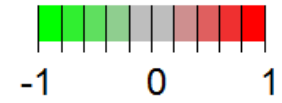


TGF-BETA SIGNALING PATHWAY



Data on KEGG graph
Rendered by Pathview

HIPPO SIGNALING PATHWAY - FLY



- | Anti-apoptotic genes | | |
|----------------------------|-------------|-------|
| Pro-proliferation genes | | |
| diap1 | bantam | cycE |
| dmyc | ex | kibra |
| fj | crb | dally |
| wg | | |
| (JAK-STAT pathway ligands) | | |
| Upd | | |
| (EGFR ligands) | | |
| vein | Km | |
| bantam | dmyc | |