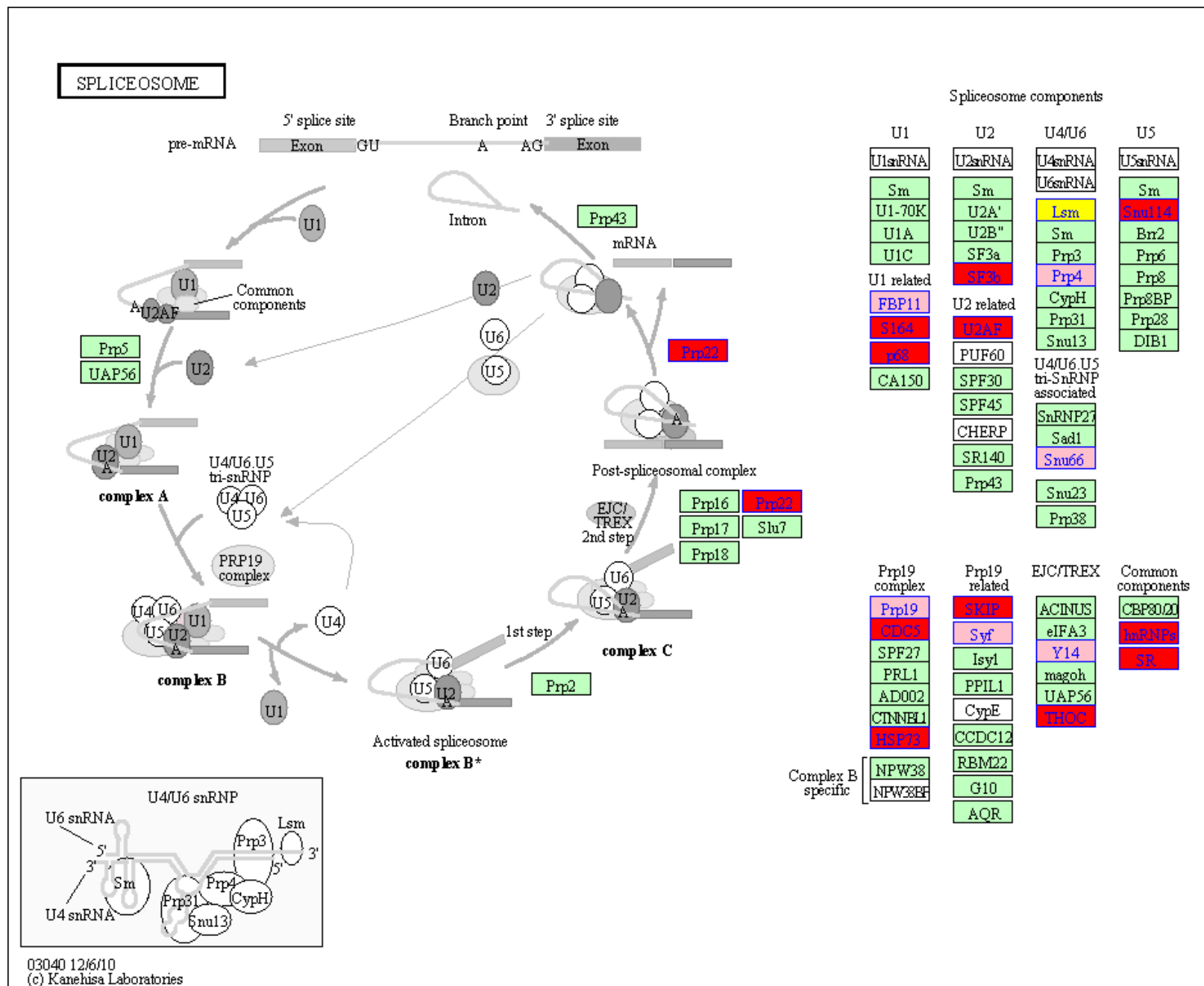
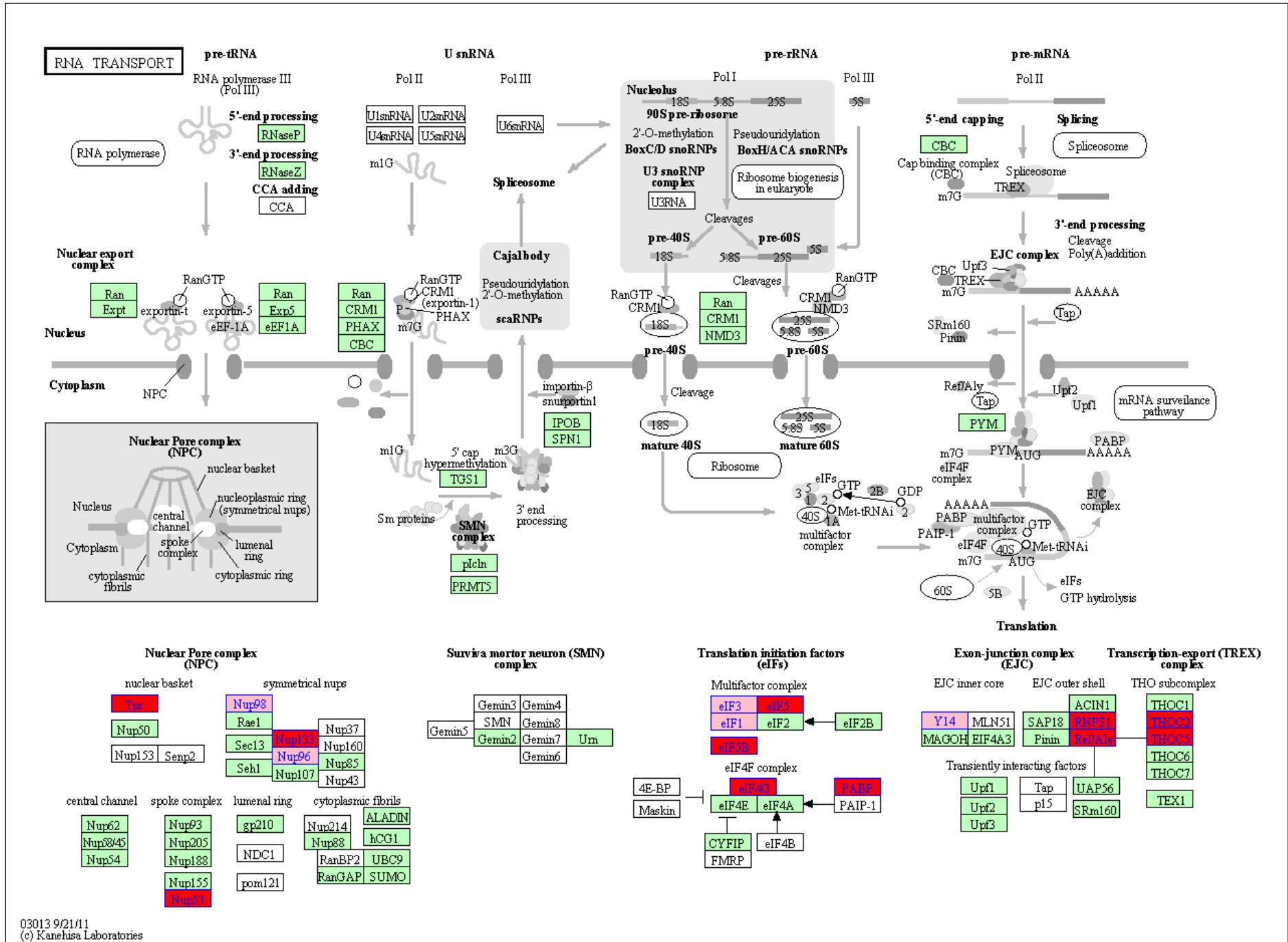
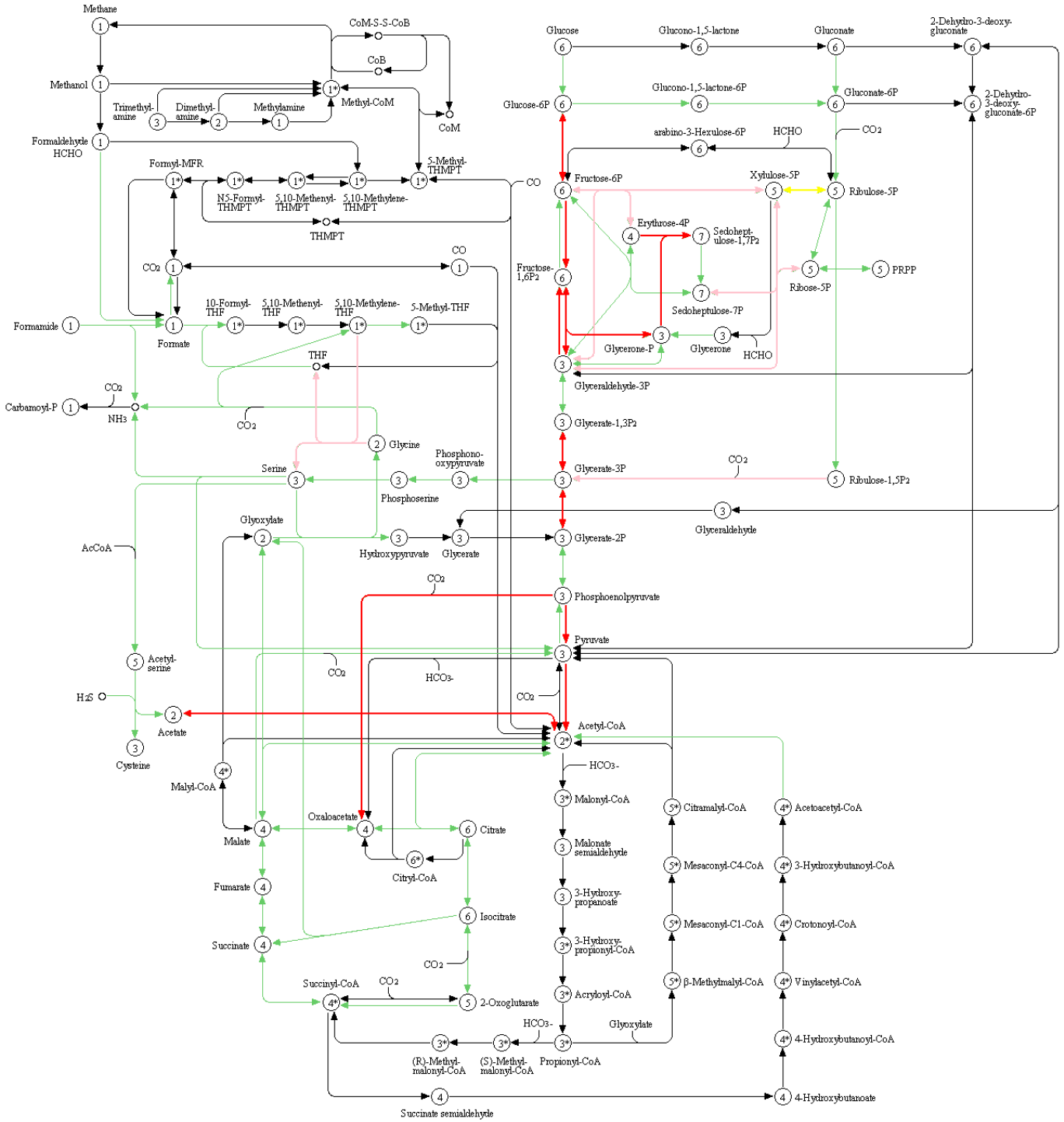


Figure S3
A

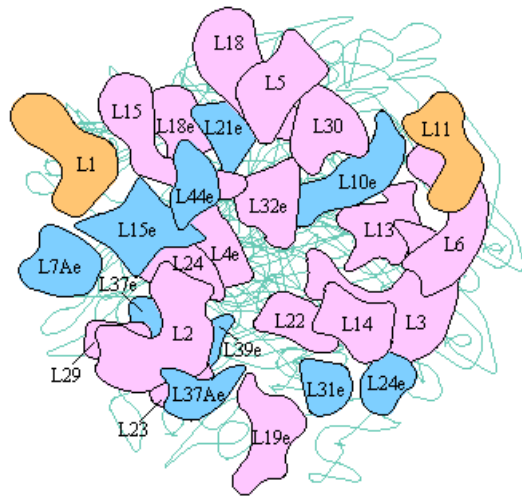


C

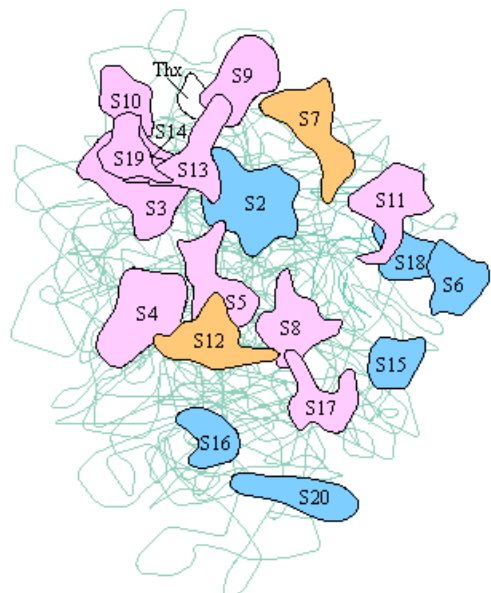


D**CARBON METABOLISM**

RIBOSOME



Large subunit (*Haloarcula marismortui*)



Small subunit (*Thermus aquaticus*)

Ribosomal RNAs

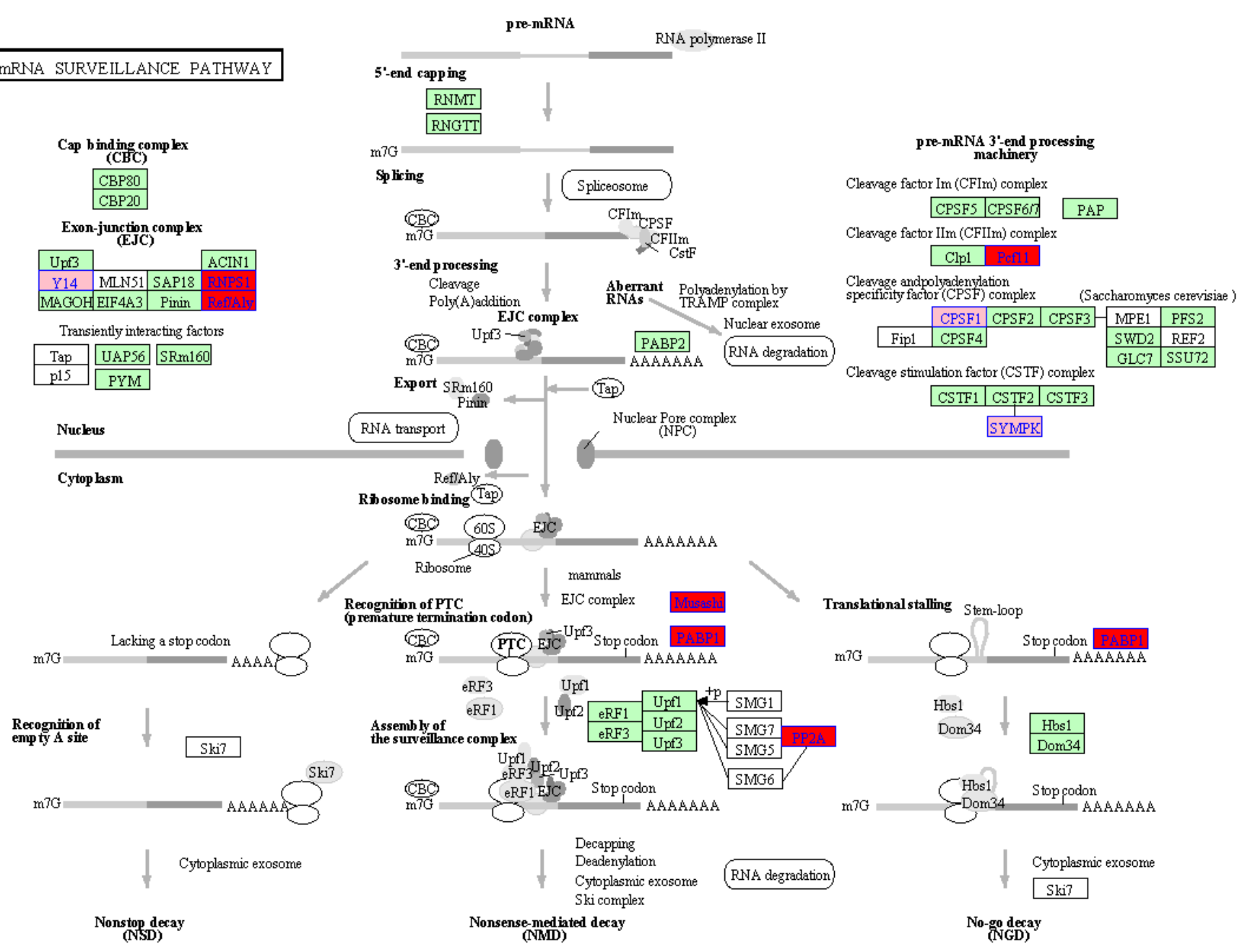
Bacteria / Archaea	23S	5S		16S
Eukaryotes	25S	5S	5.8S	18S

Ribosomal proteins

EF-Tu	S10	L3	L4	L23	L2	S19	L22	S3	RP-L16	L29				
	S20e	L3e	L4e	L23Ae	L8e	S15e	L17e	S3e	L10e		L35e	L7/L12 stalk		
SecY	S17	L14	L24		L5	S14	S8	L6		L18	S5	L30	L15	
	S11e	L23e	L26e	S4e	L11e	S29e	S15Ae	L9e	L32e	L19e	L5e	S2e	L7e	L27Ae
IF1	L34e	L14e	L36		S13	S11	S4	RpoA	L17	L13	S9			
			S18e	S14e	S9e	L18e	L13e					S16e		
EF-Tu,G	S7	S12		L7A	RpoC,B	L7/L12	L12	L10	L1	L11				
	S5e	S23e	L30e	L7Ae		L3/L12	L13	L10Ae	L12e					
EF-Ts	S2		IF2	S15	IF3	L35	L20	L34	RF1	L31	L32	L9	S18	S6
	S3Ae	S13e												
L28	L33	L21		L27	FtsY,Fth	S16	L19	S1	S20	S21	L25			
	L10e	L13e	L15e	L21e	L24e	L31e	L35Ae	L37e	L37Ae	L39e	L40e	L41e	L44e	
S3Ae	S6e	S8e	S17e	S19e	S24e	S25e	S26e	S27e	S27Ae	S28e	S30e	LX		
L6e		L18Ae	L22e	L27e	L28e	L29e	L36e	L38e						
S7e	S10e	S12e	S21e											

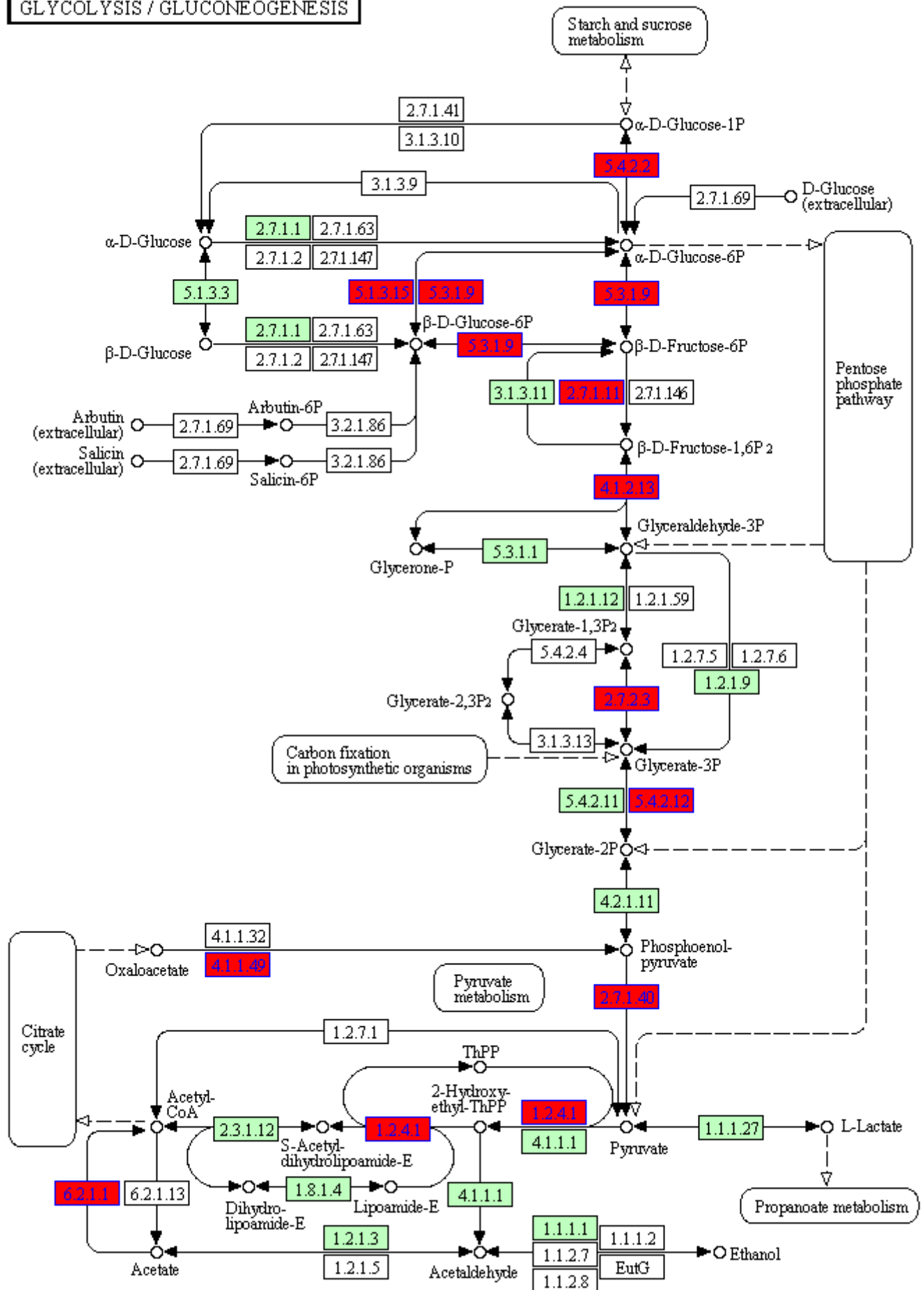
F

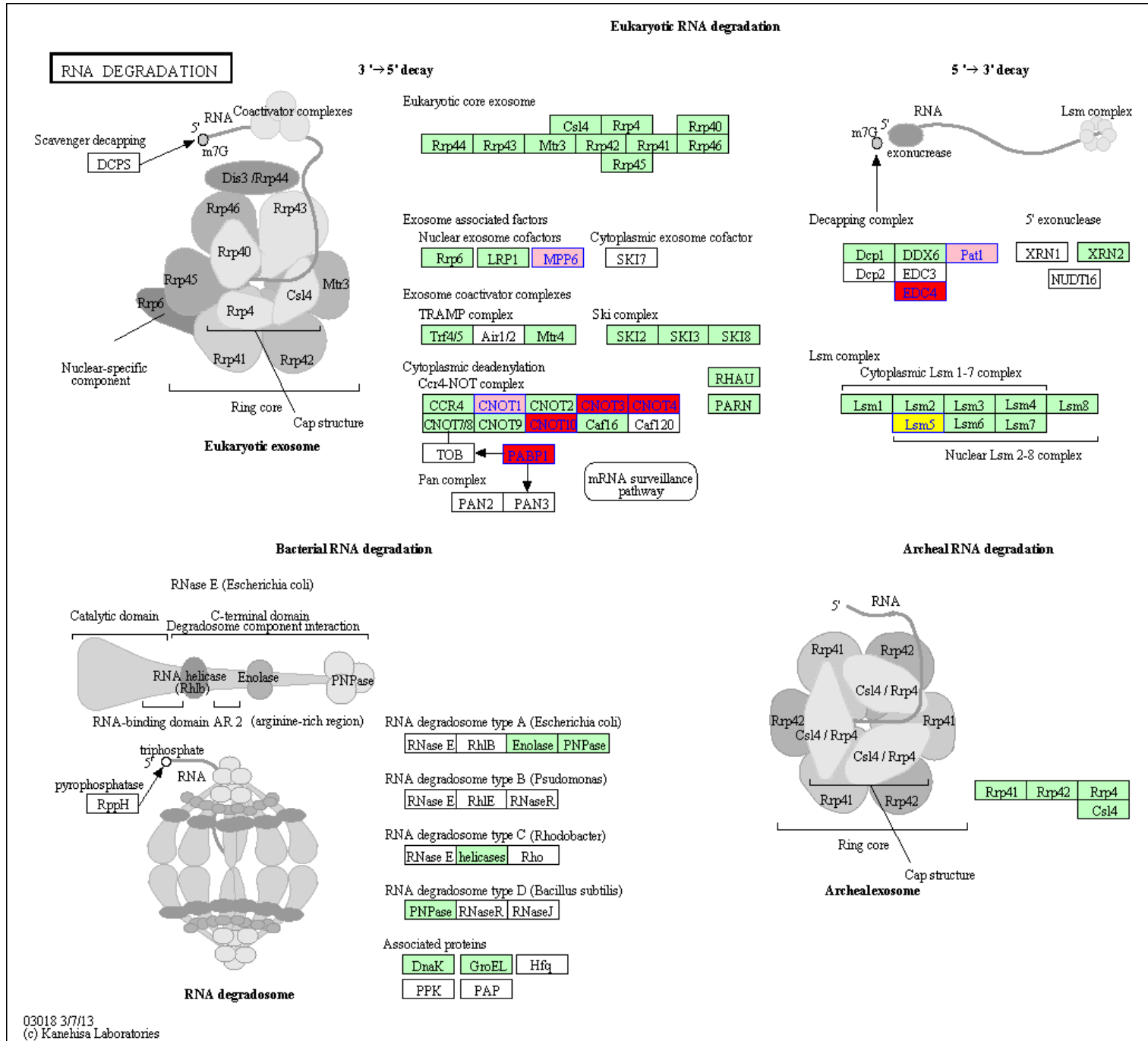
mRNA SURVEILLANCE PATHWAY



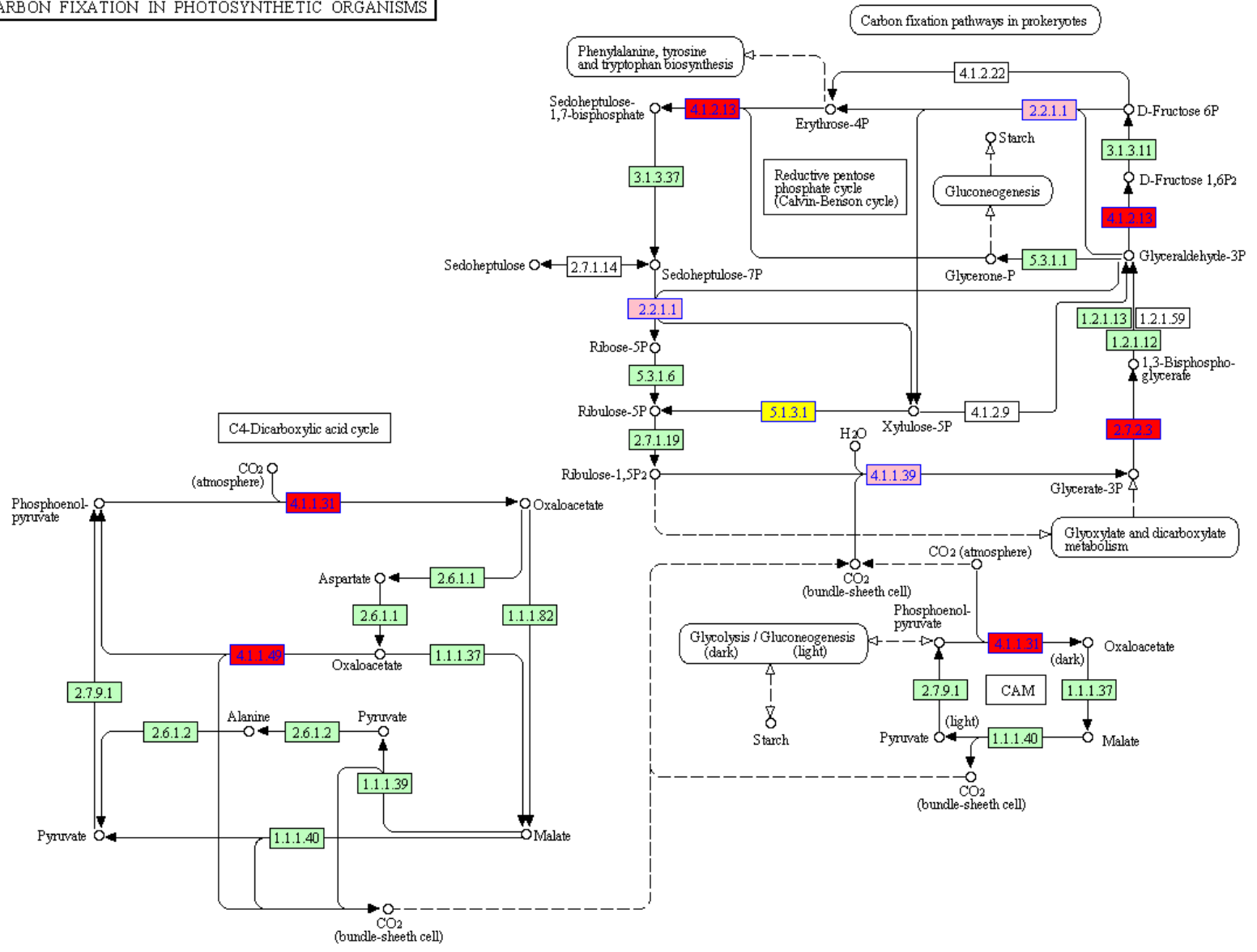
G

GLYCOLYSIS / GLUCONEOGENESIS

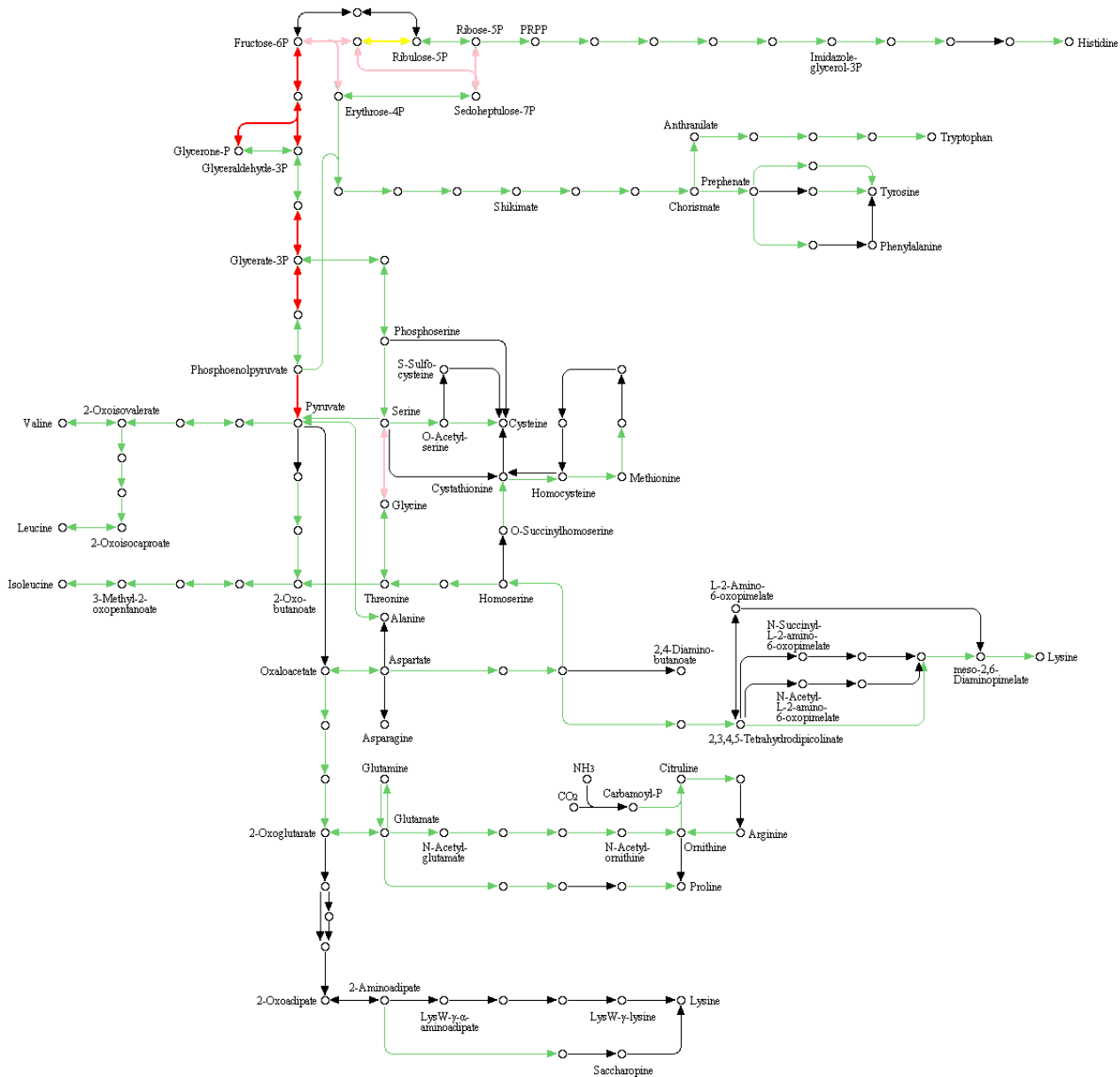




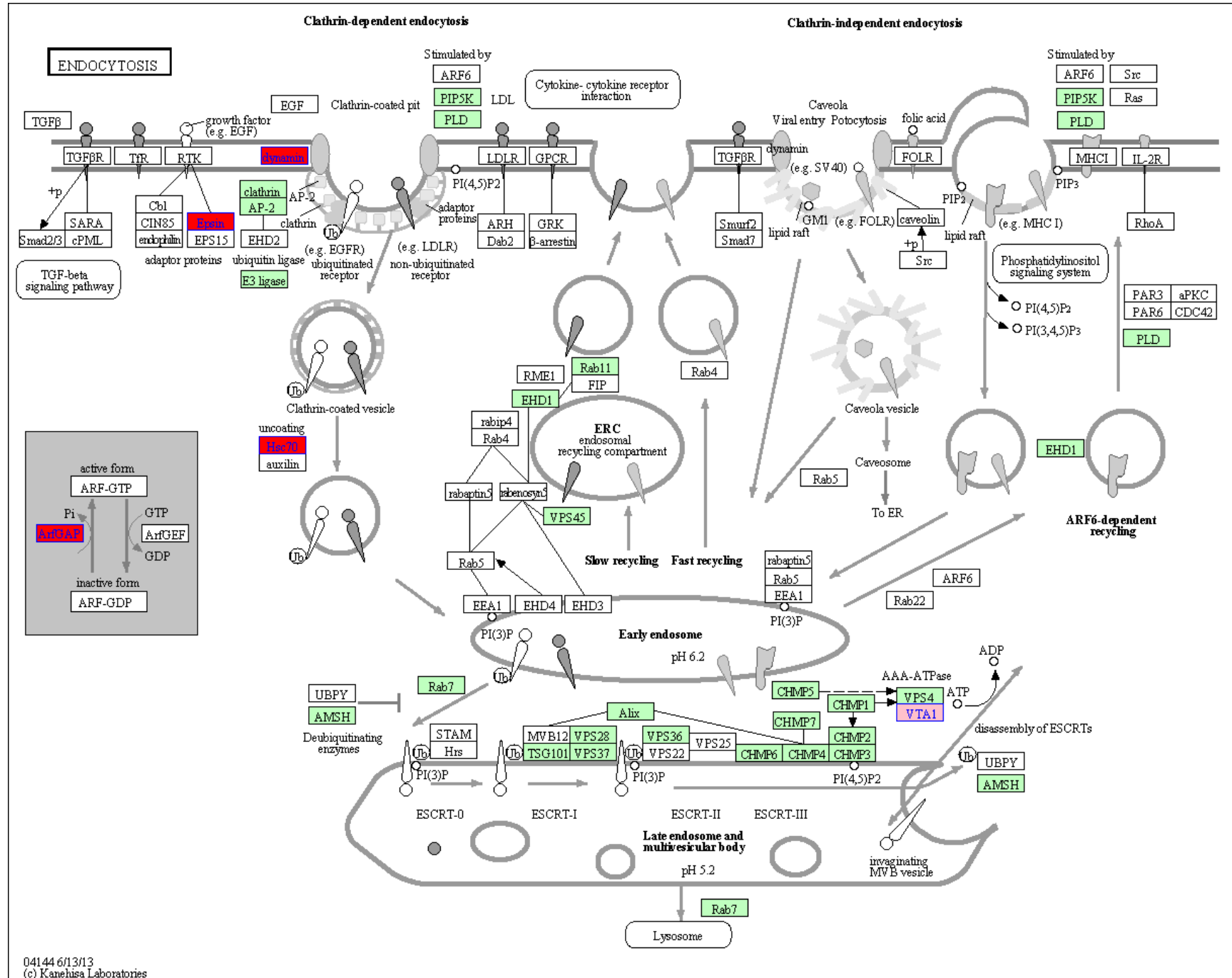
CARBON FIXATION IN PHOTOSYNTHETIC ORGANISMS



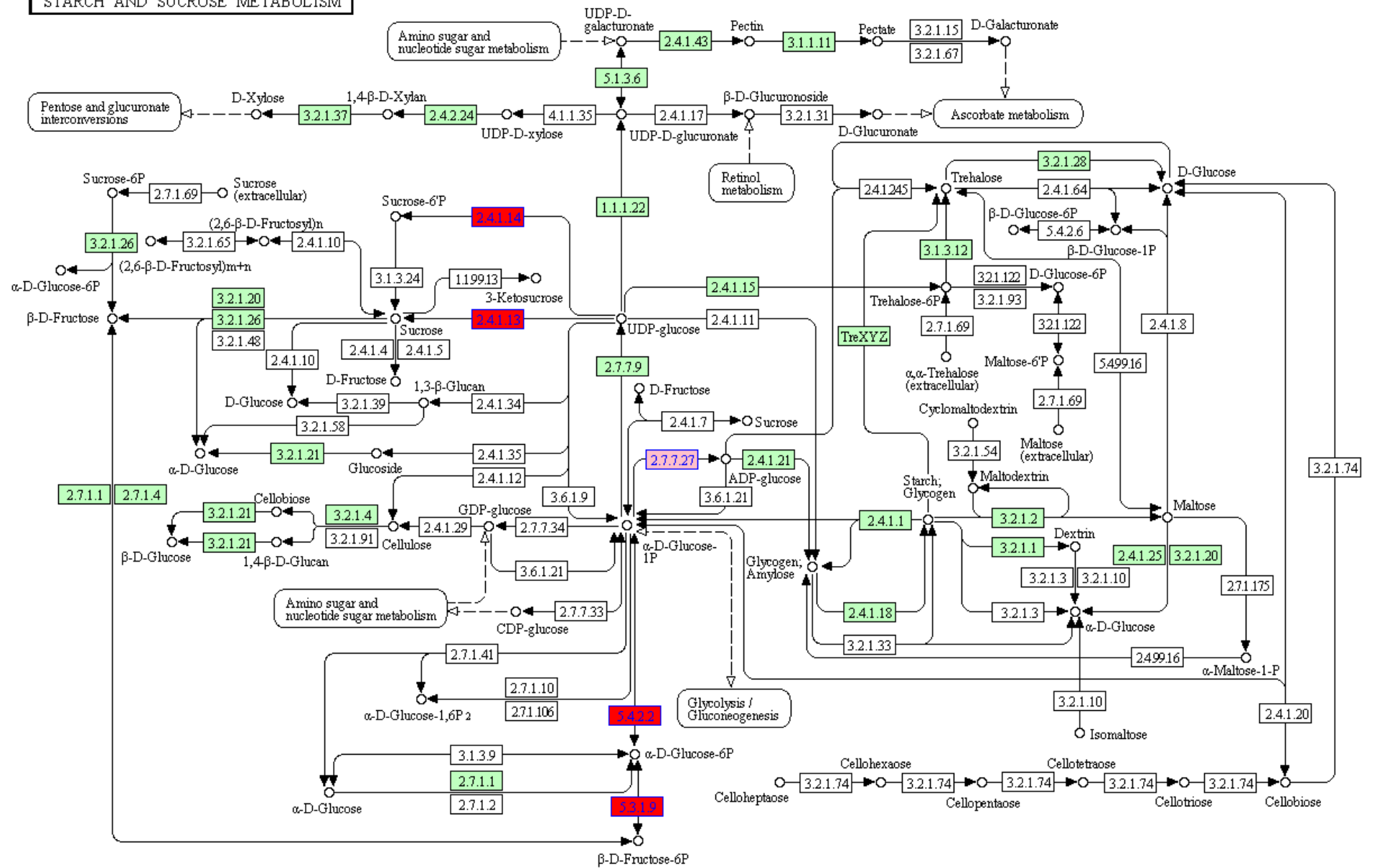
BIOSYNTHESIS OF AMINO ACIDS



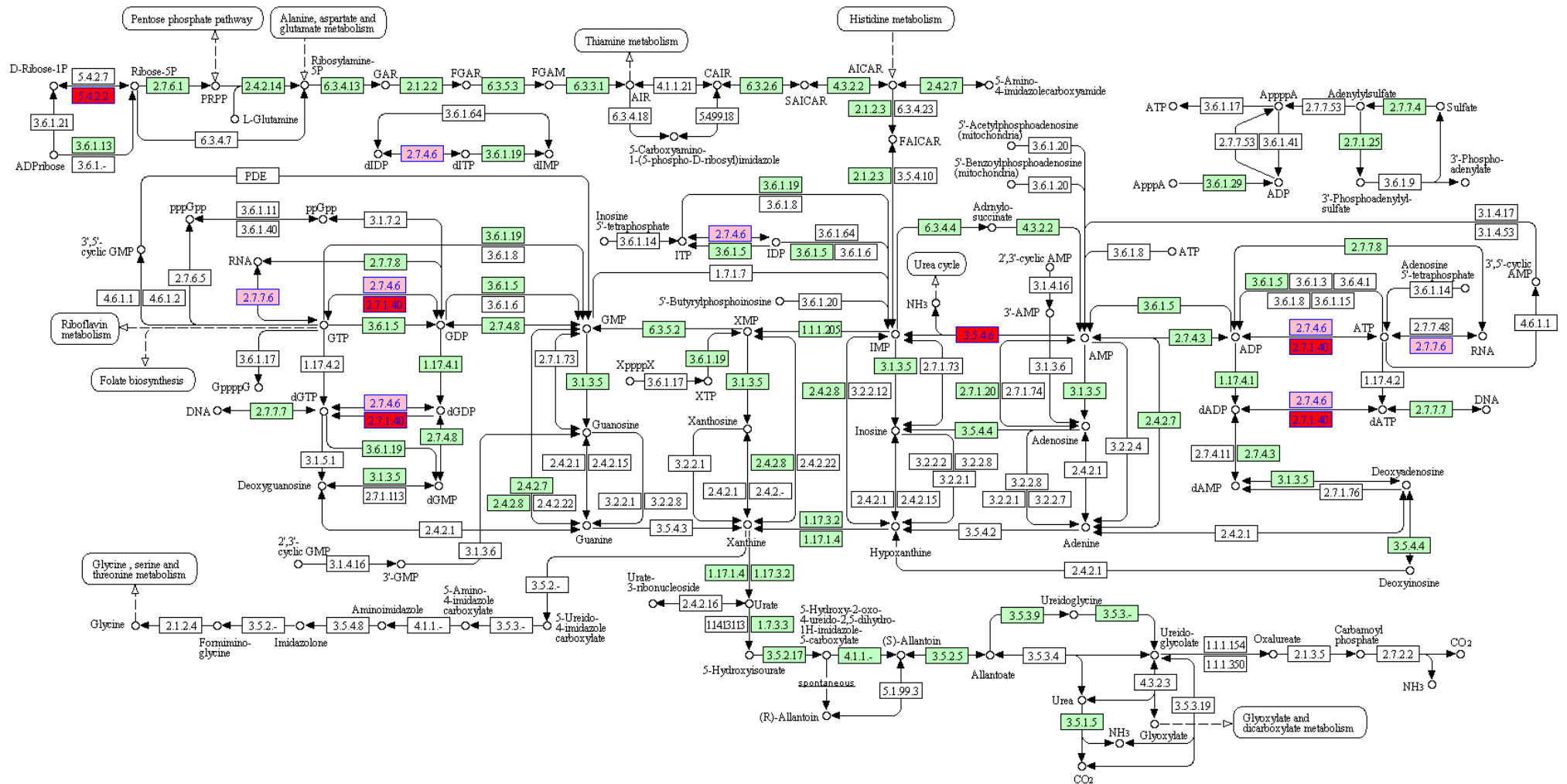
K



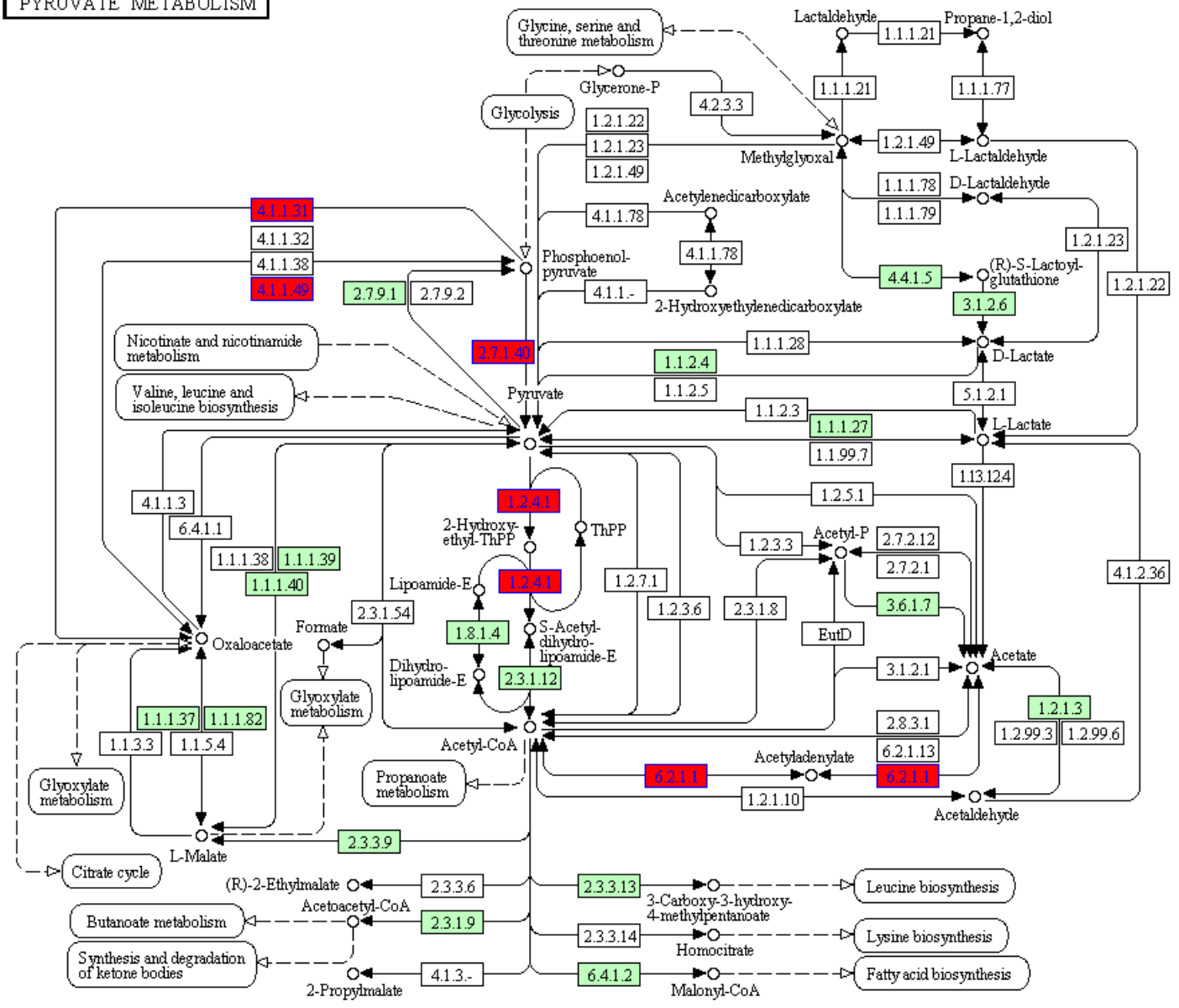
STARCH AND SUCROSE METABOLISM

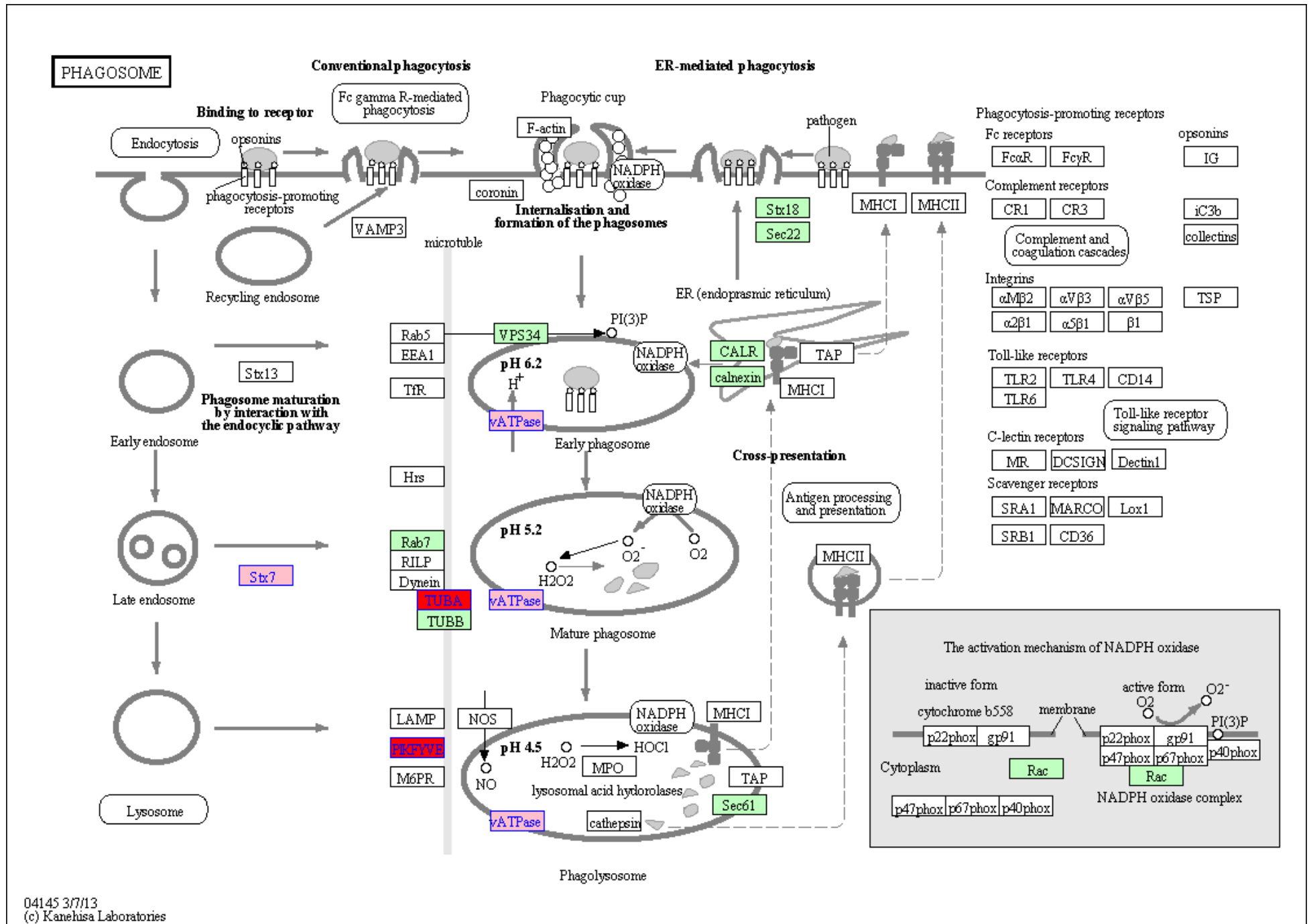


PURINE METABOLISM

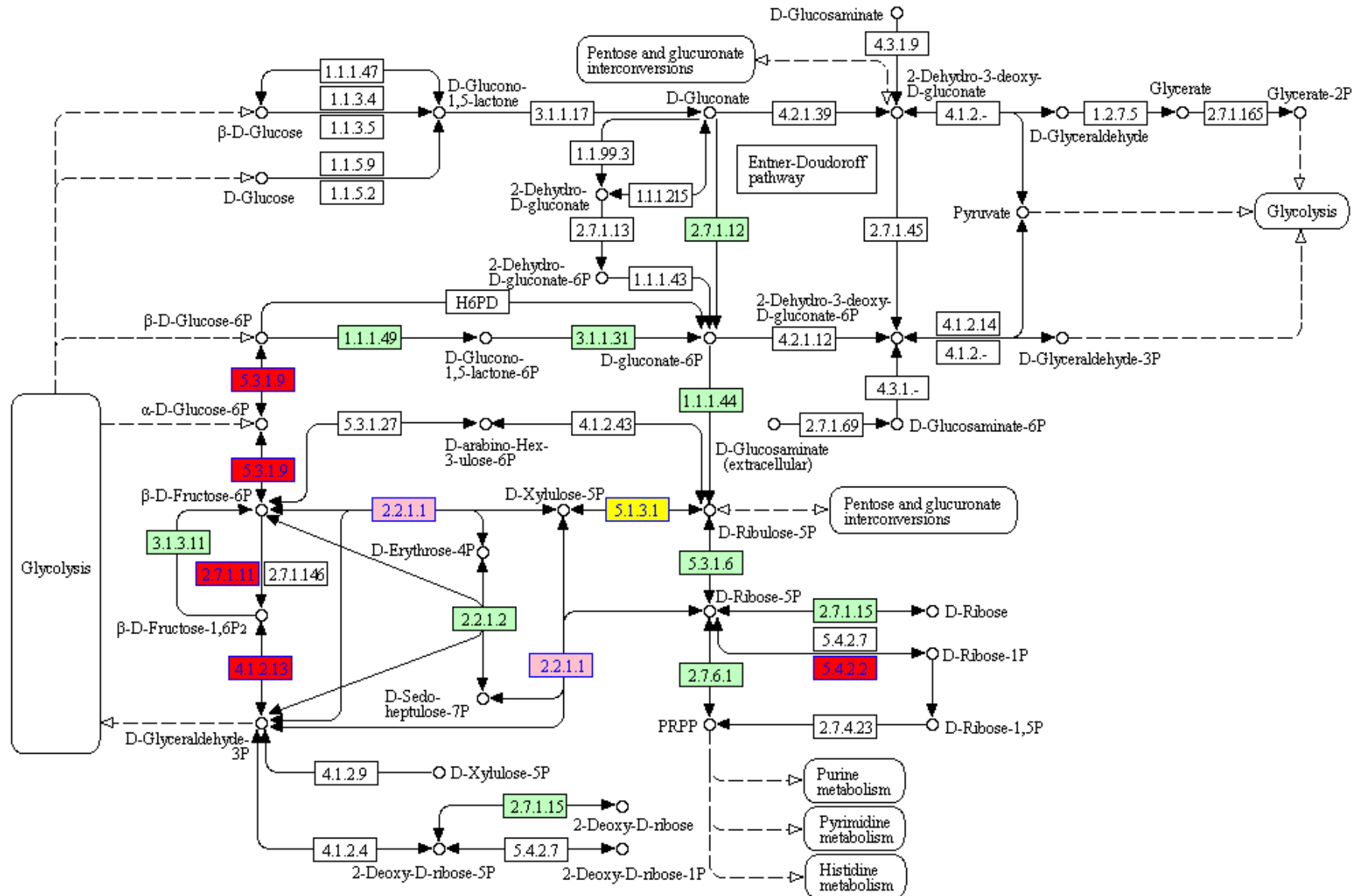


PYRUVATE METABOLISM

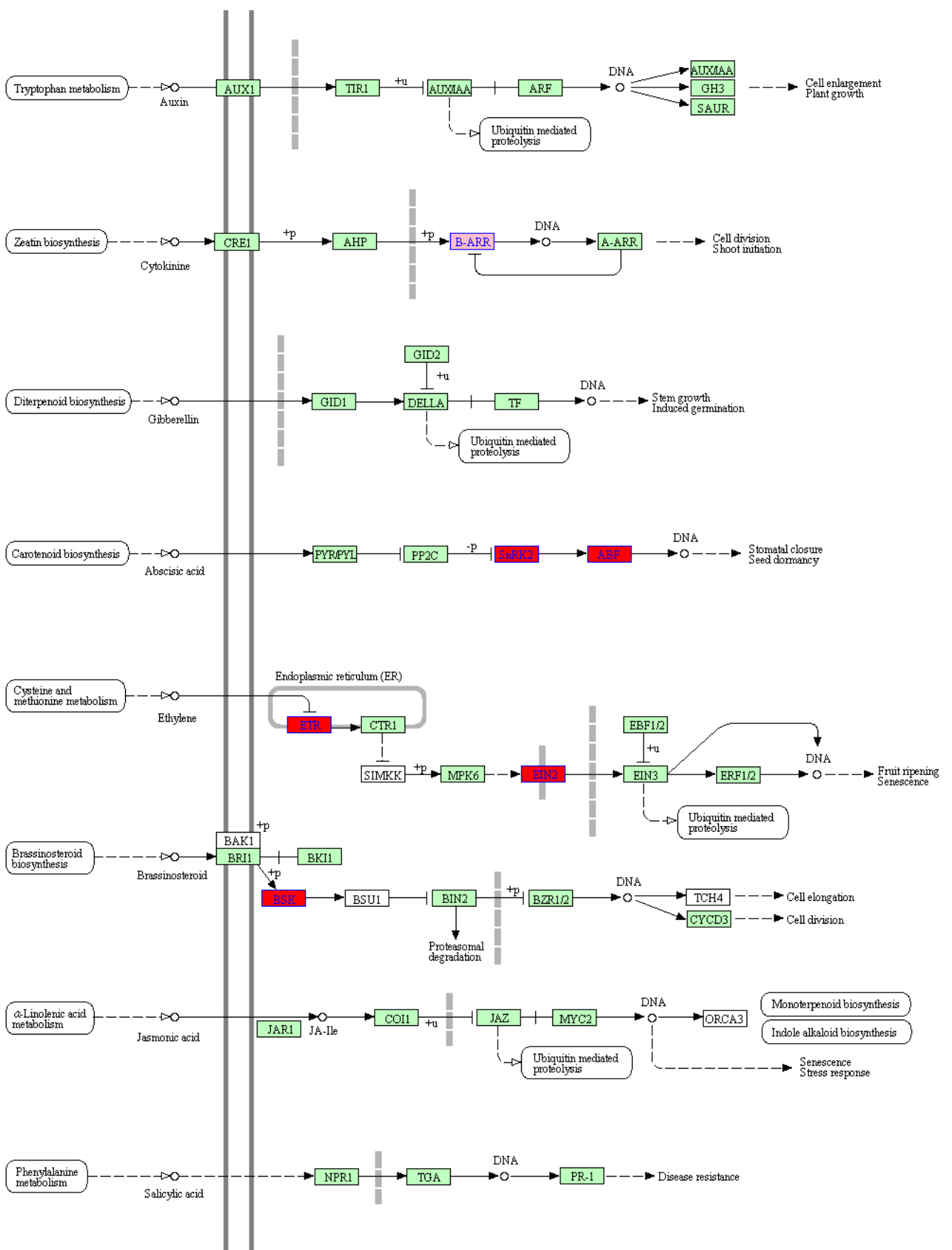




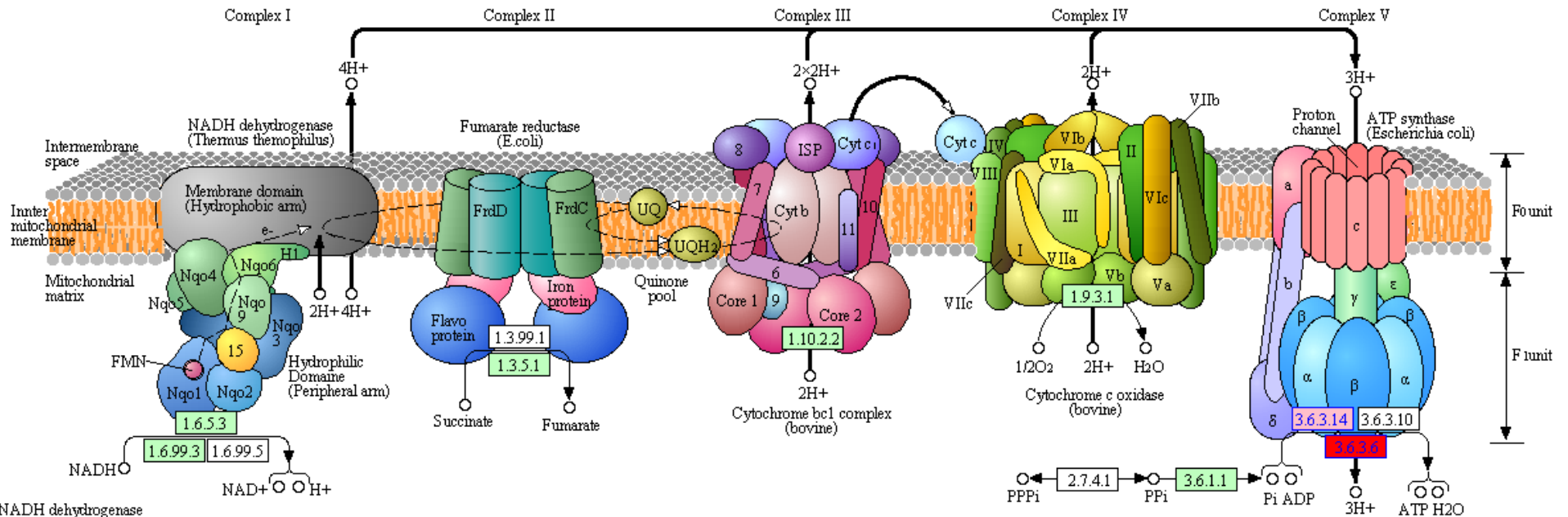
PENTOSE PHOSPHATE PATHWAY



PLANT HORMONE SIGNAL TRANSDUCTION



OXIDATIVE PHOSPHORYLATION



NADH dehydrogenase

E	ND1	ND2	ND3	ND4	ND4L	ND5	ND6										
E	Ndufs1	Ndufs2	Ndufs3	Ndufs4	Ndufs5	Ndufs6	Ndufs7	Ndufs8	Ndufv1	Ndufv2	Ndufv3						
B/A	NuoA	NuoB	NuoC	NuoD	NuoE	NuoF	NuoG	NuoH	NuoI	NuoJ	NuoK	NuoL	NuoM	NuoN			
B/A	NdhC	NdhK	NdhJ	NdhH	NdhA	NdhI	NdhG	NdhE	NdhF	NdhD	NdhB	NdhL	NdhM	NdhN	HoxE	HoxF	HoxU
E	Ndufa1	Ndufa2	Ndufa3	Ndufa4	Ndufa5	Ndufa6	Ndufa7	Ndufa8	Ndufa9	Ndufa10	Ndufab1	Ndufa11	Ndufa12	Ndufa13			
E	Ndufb1	Ndufb2	Ndufb3	Ndufb4	Ndufb5	Ndufb6	Ndufb7	Ndufb8	Ndufb9	Ndufb10	Ndufb11	Ndufc1	Ndufc2				

Succinate dehydrogenase / Fumarate reductase

E	SDHC	SDHD	SDHA	SDHB		
B/A	SdhC	SdhD	SdhA	SdhB		
			FrdA	FrdB	FrdC	FrdD

Cytochrome c reductase

E/B/A	ISP	Cyt b	Cyt 1				
E	COR1	QCR2	QCR6	QCR7	QCR8	QCR9	QCR10

Cytochrome c oxidase

E	COX10	COX3	COX1	COX2	COX4	COX5A	COX5B	COX6A	COX6B	COX6C	COX7A	COX7B	COX7C	COX8	E/B/A	COX11	COX15	COX17
B/A	CyoE	CyoD	CyoC	CyoB	CyoA													
		CoxD	CoxC	CoxA	CoxB													
		QoxD	QoxC	QoxB	QoxA													

Cytochrome c oxidase, cbb3-type

B	I	II	IV	III
---	---	----	----	-----

Cytochrome bd complex

B/A	CydA	CydB
-----	------	------

F-type ATPase (Bacteria)

beta	alpha	gamma	delta	epsilon	c	a	b
------	-------	-------	-------	---------	---	---	---

F-type ATPase (Eukaryotes)

beta	alpha	gamma	OSCP	delta	epsilon	c	a
b	e	f6	f	8			
d	f	h	j	k	g		

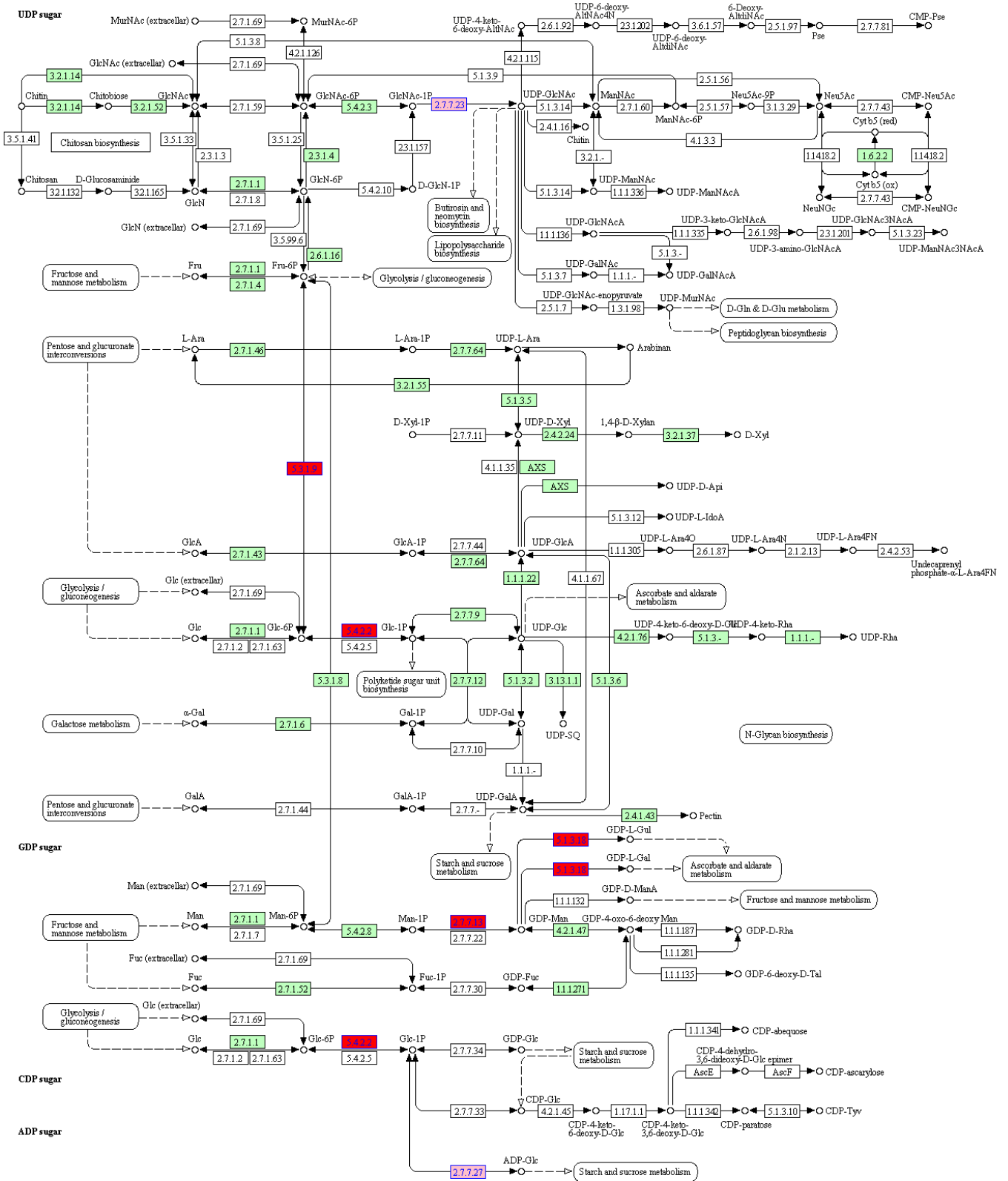
V-type ATPase (Prokaryotes)

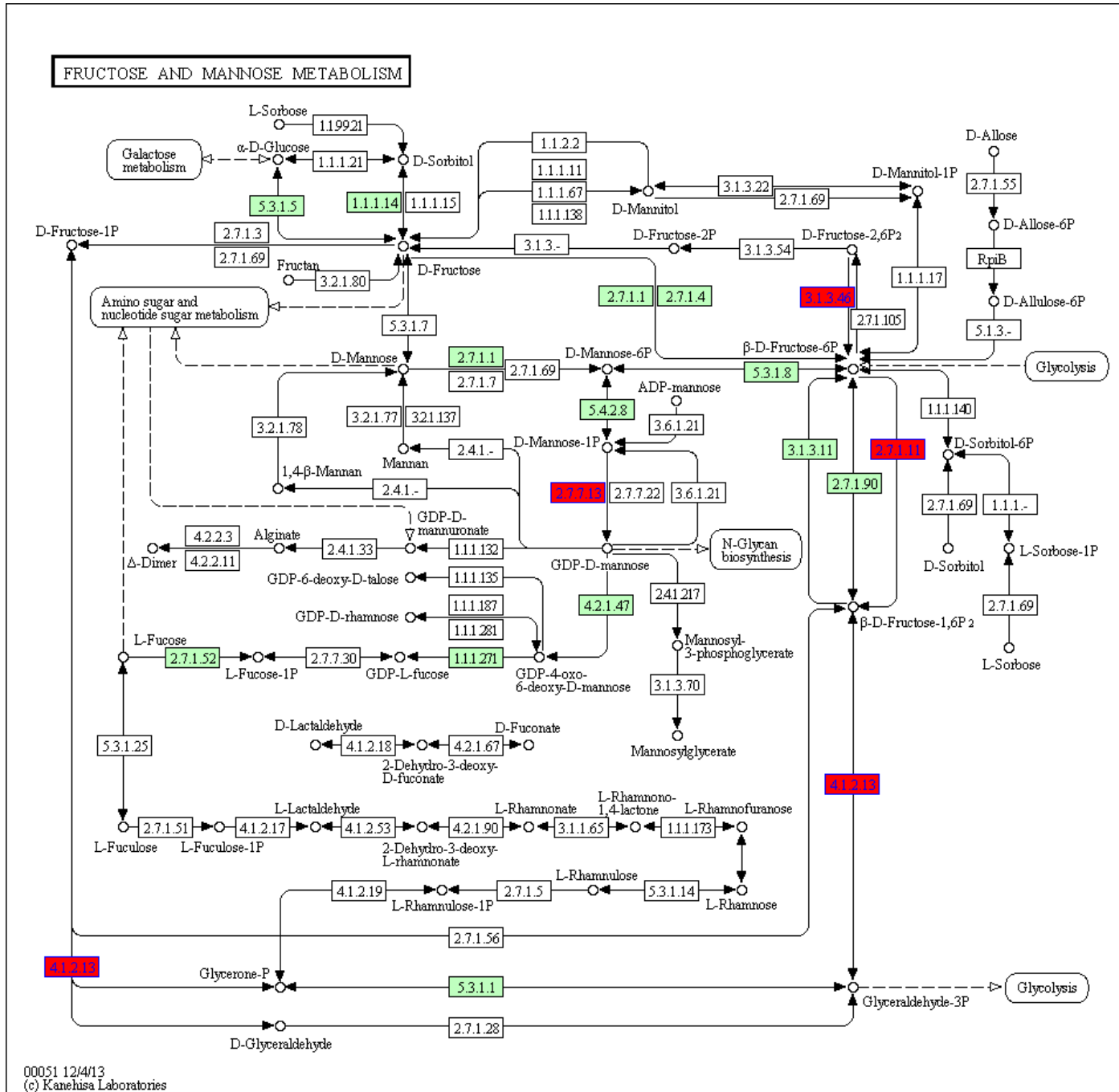
A	B	C	D	E	F	I	K
---	---	---	---	---	---	---	---

V-type ATPase (Eukaryotes)

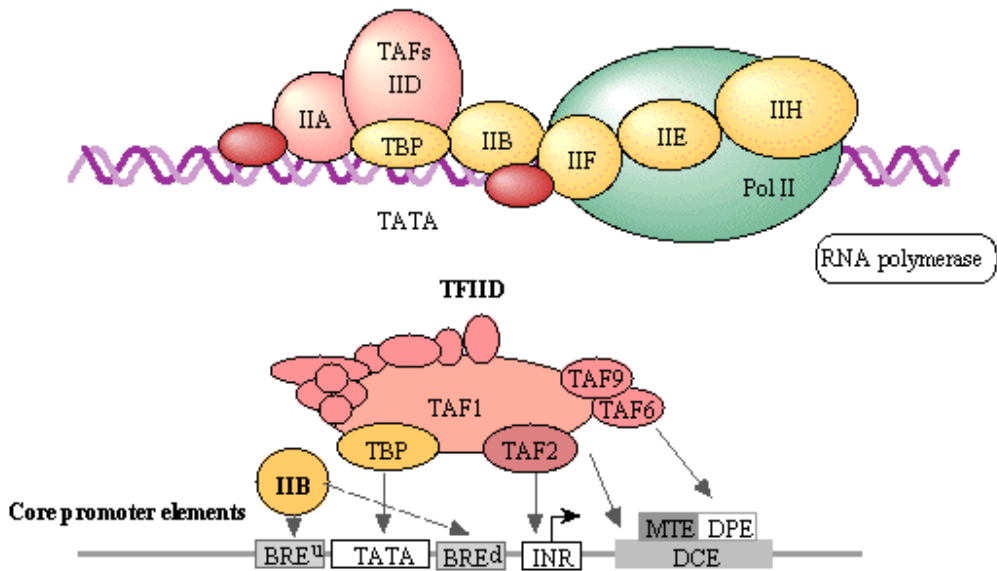
A	B	C	D	E	F	G	H
I	AC39	54kD	S1	lipid			

AMINO SUGAR AND NUCLEOTIDE SUGAR METABOLISM

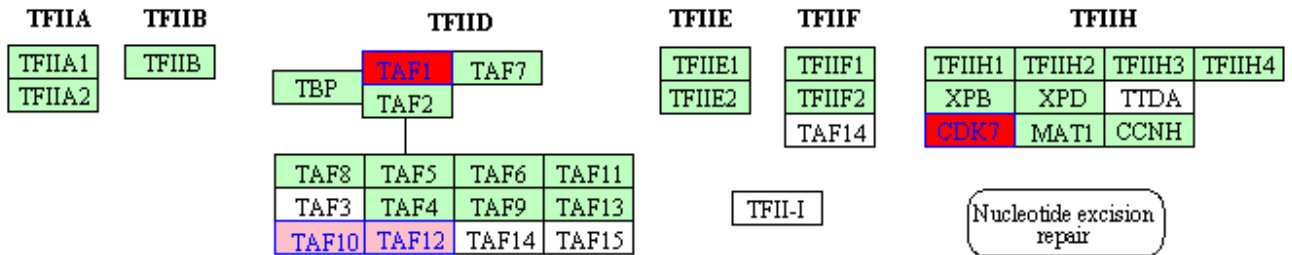


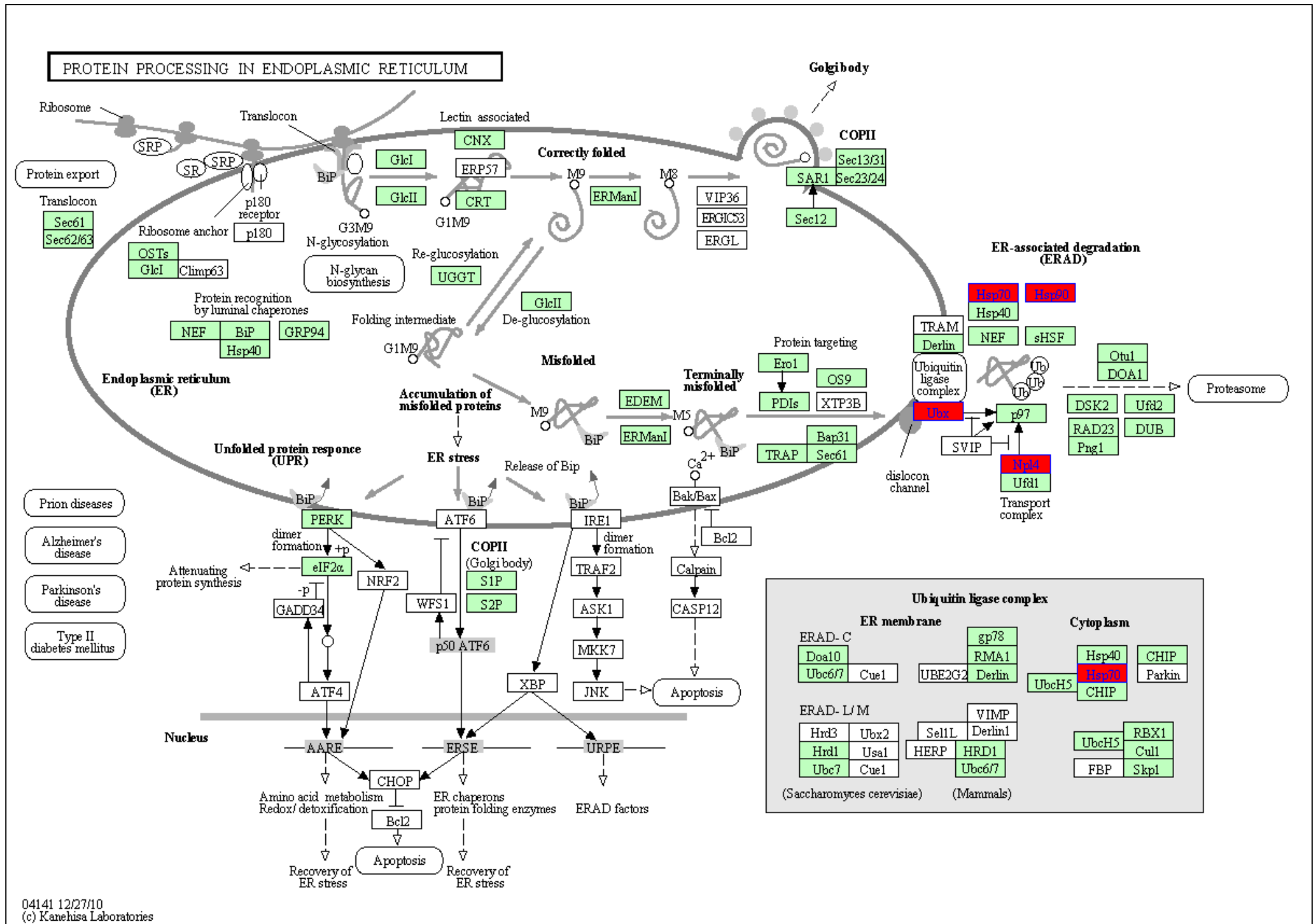


BASAL TRANSCRIPTION FACTORS (EUKARYOTES)

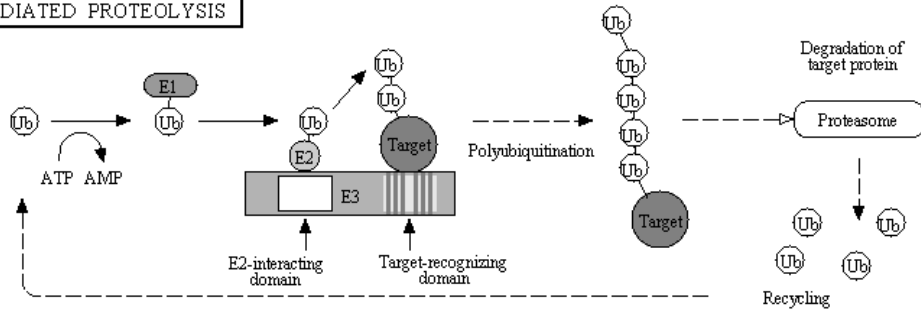


General transcription factors for RNA polymerase II





UBIQUITIN MEDIATED PROTEOLYSIS



E1
(Ubiquitin-activating enzyme)

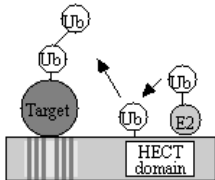
UBE1	UBLE1A	UBLE1B	UBE1C
------	--------	--------	-------

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	APC1CN	

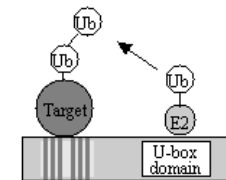
E3
(Ubiquitin ligase)

HECT type E3



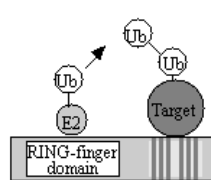
E6AP	UBE3B	UBE3C	Smurf	Itch
WWP1	WWP2	TRIP12	NEDD4	AP1-3
EDD1	HERC1	HERC2	HERC3	HERC4

U-box type E3



UBE4A	UBE4B	CHIP
CYC4	PRP19	UIP5

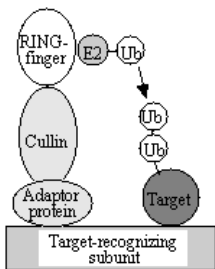
single RING-finger type E3



Mdm2	CBL	Parkin	SH3H1	PML	TRAF6	MEKK1
COP1	PIRH2	cIAPs	PIAS	SYVN	NHLRC1	AIRE
MGRN1	BRCA1	FANCL	MID1	Trim32	Trim37	

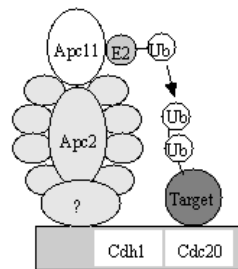
multi subunit RING-finger type E3

Cullin-Rbx E3



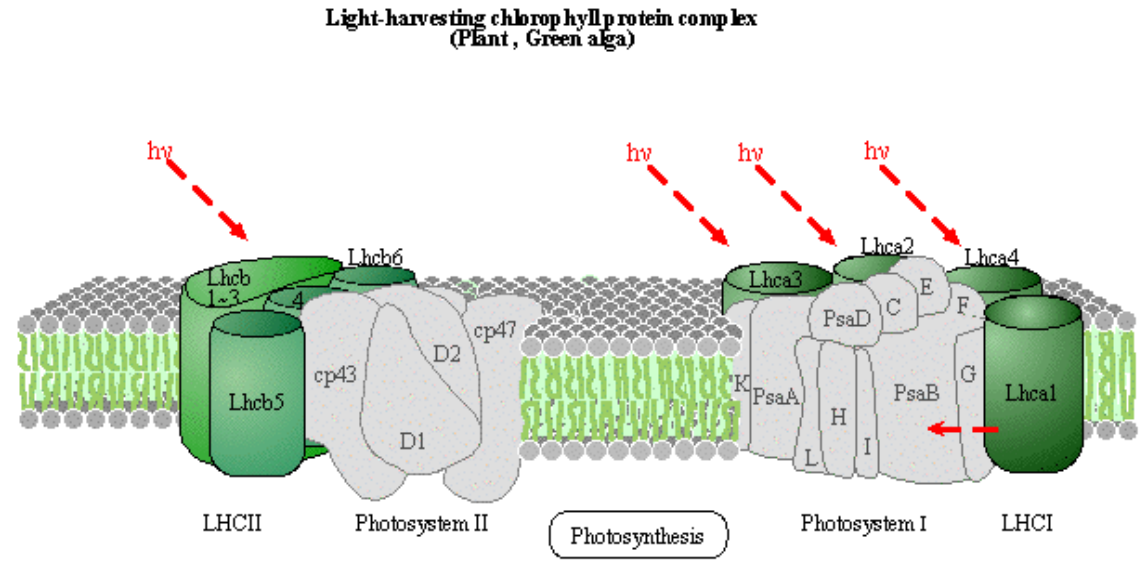
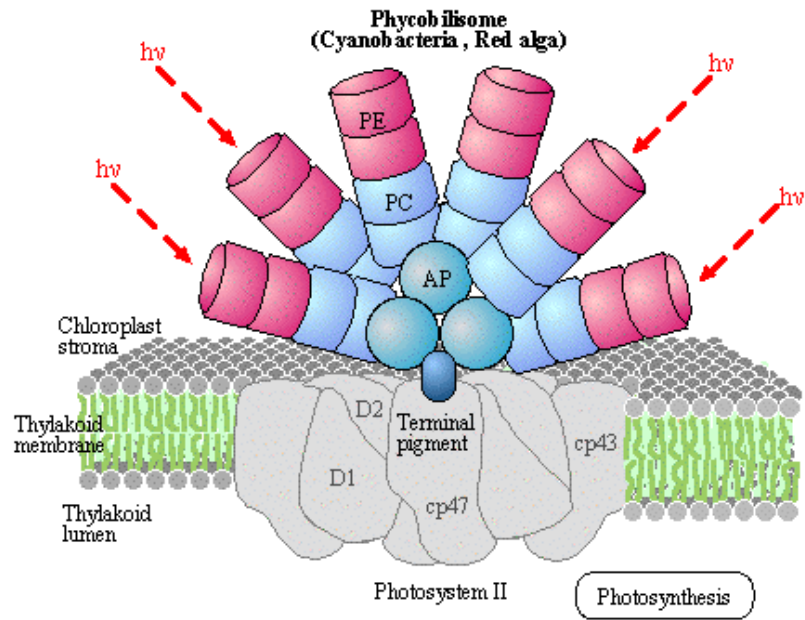
	RING finger	Cullin	Adaptor protein	Target recognizing subunit
SCF complex	RBX1	Cul1	Skp1	F-box
ECV complex	RBX1	Cul2	EloB EloC	VHLbox
Cul3 complex	RBX1	Cul3		BTB
Cul4 complex	RBX1	Cul4	DDB1	DCAF
ECS complex	RBX2	Cul5	EloB EloC	SOC3box
Cul7 complex	RBX1	Cul7	Skp1	Fbxw8

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

PHOTOSYNTHESIS - ANTENNA PROTEINS



Allophycocyanin(AP)

ApcA	ApcB	ApcC	ApcD	ApcE	ApcF
------	------	------	------	------	------

Phycocyanin(PC) / Phycoerythrocyanin(PEC)

CpcA	CpcB	CpcC	CpcD	CpcE	CpcF	CpcG
------	------	------	------	------	------	------

Phycoerythrin(PE)

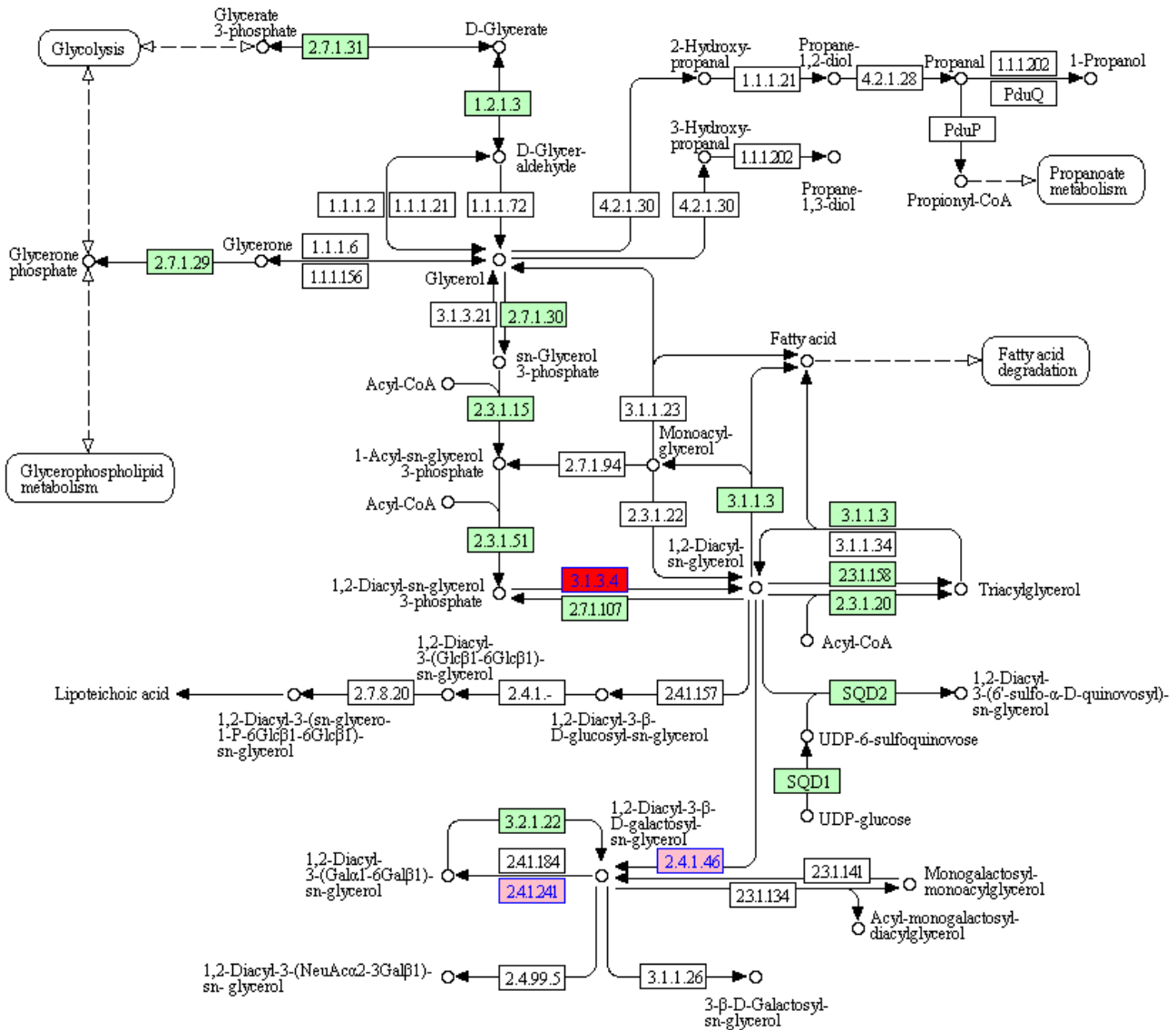
CpeA	CpeB	CpeC	CpeD	CpeE	CpeR	CpeS	CpeT	CpeU	CpeY	CpeZ
------	------	------	------	------	------	------	------	------	------	------

Light-harvesting chlorophyll protein complex(LHC)

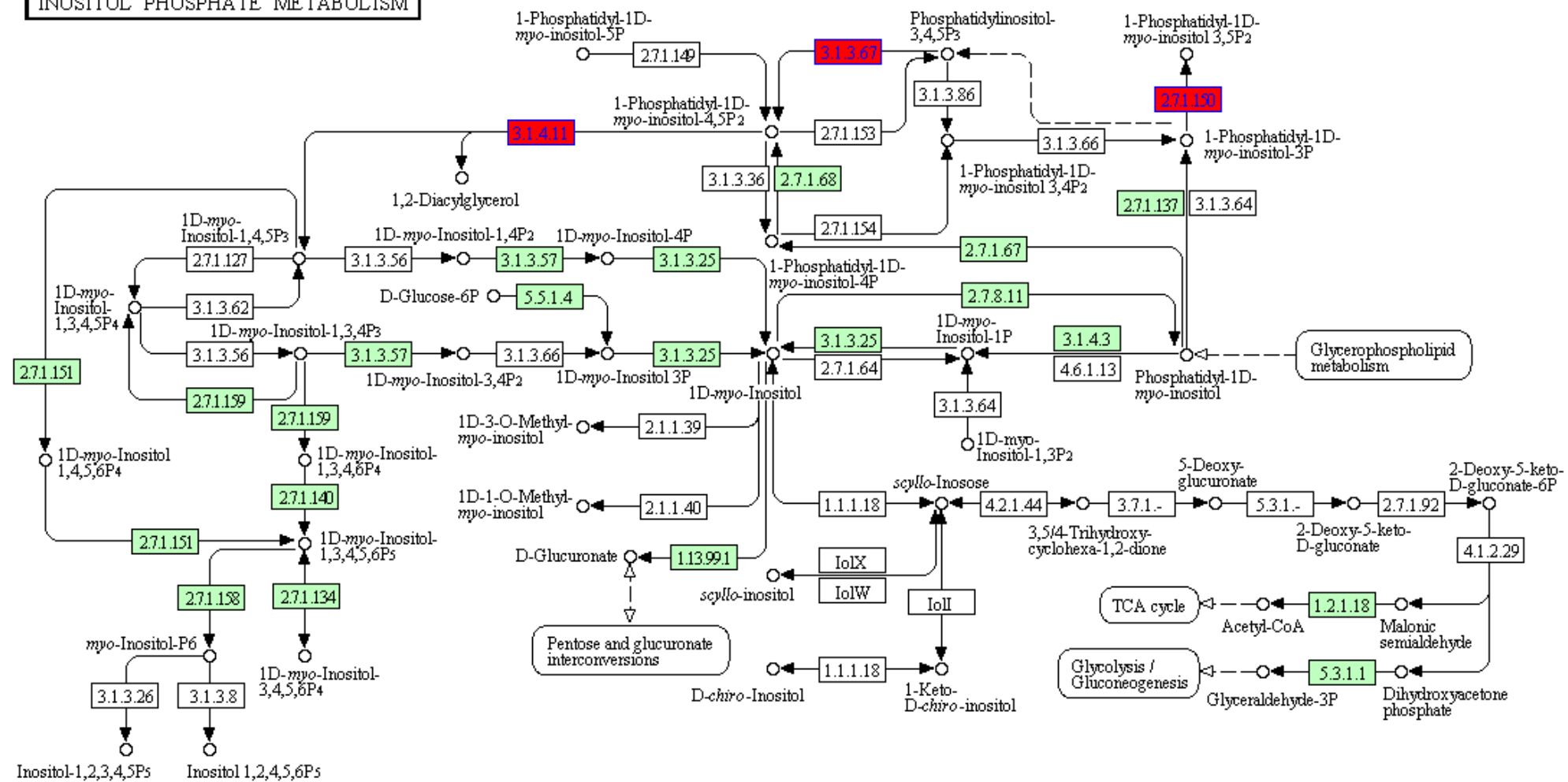
Lhca1	Lhca2	Lhca3	Lhca4	Lhca5
-------	-------	-------	-------	-------

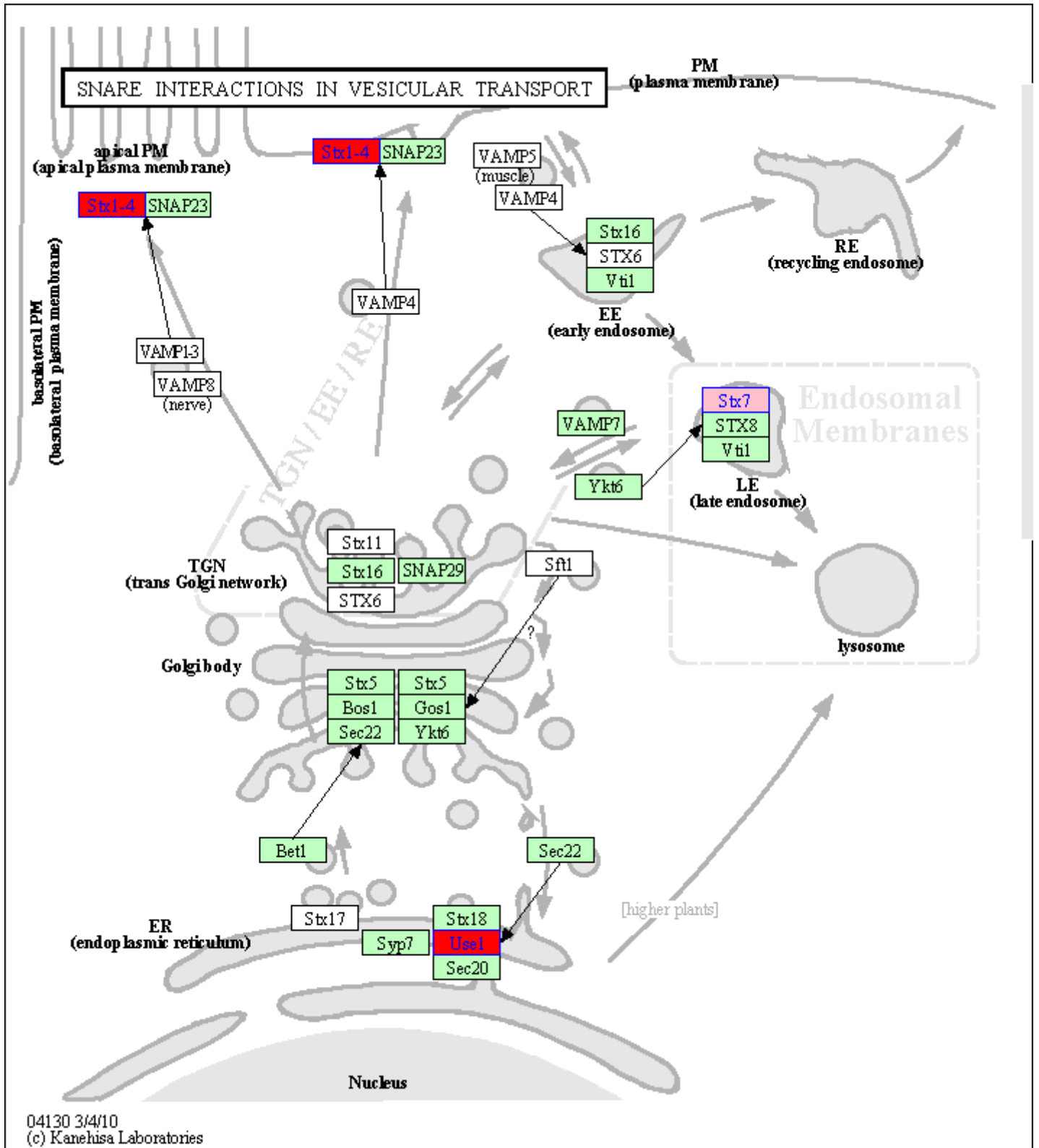
Lhcb1	Lhcb2	Lhcb3	Lhcb4	Lhcb5	Lhcb6	Lhcb7
-------	-------	-------	-------	-------	-------	-------

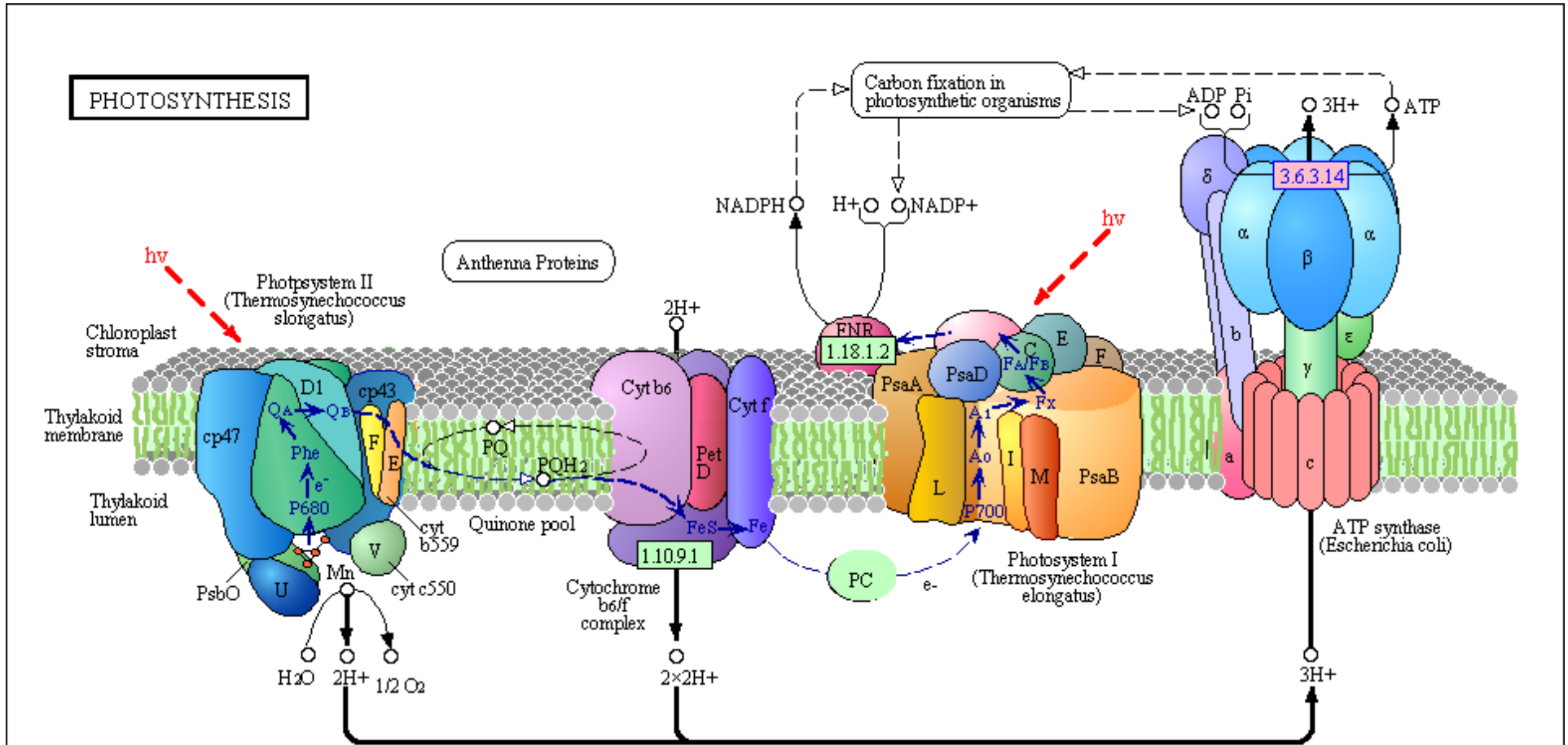
GLYCEROLIPID METABOLISM



INOSITOL PHOSPHATE METABOLISM







PHOTOSYNTHESIS

Carbon fixation in photosynthetic organisms

Chloroplast stroma
Thylakoid membrane
Thylakoid lumen
Photosystem II (Thermosynechococcus slongatus)
Antenna Proteins

Photosystem II

D1	D2	cp43	cp47	cyt b559			
PsbA	PsbD	PsbC	PsbB	PsbE	PsbF		
MSP OEC							
PsbL	PsbJ	PsbK	PsbM	PsbH	PsbI	PsbO	PsbP
PsbQ	PsbR	PsbS	PsbT	PsbU	PsbV	PsbW	PsbX
PsbY	PsbZ	Psb27	Psb28	Psb28-2			

Cytochrome b6/f complex

PetB	PetD	PetA	PetC	PetL	PetM	PetN	PetG
------	------	------	------	------	------	------	------

Photosynthetic electron transport

PC	Fd	FNR	cyt c6
PetE	PetF	PetH	PetJ

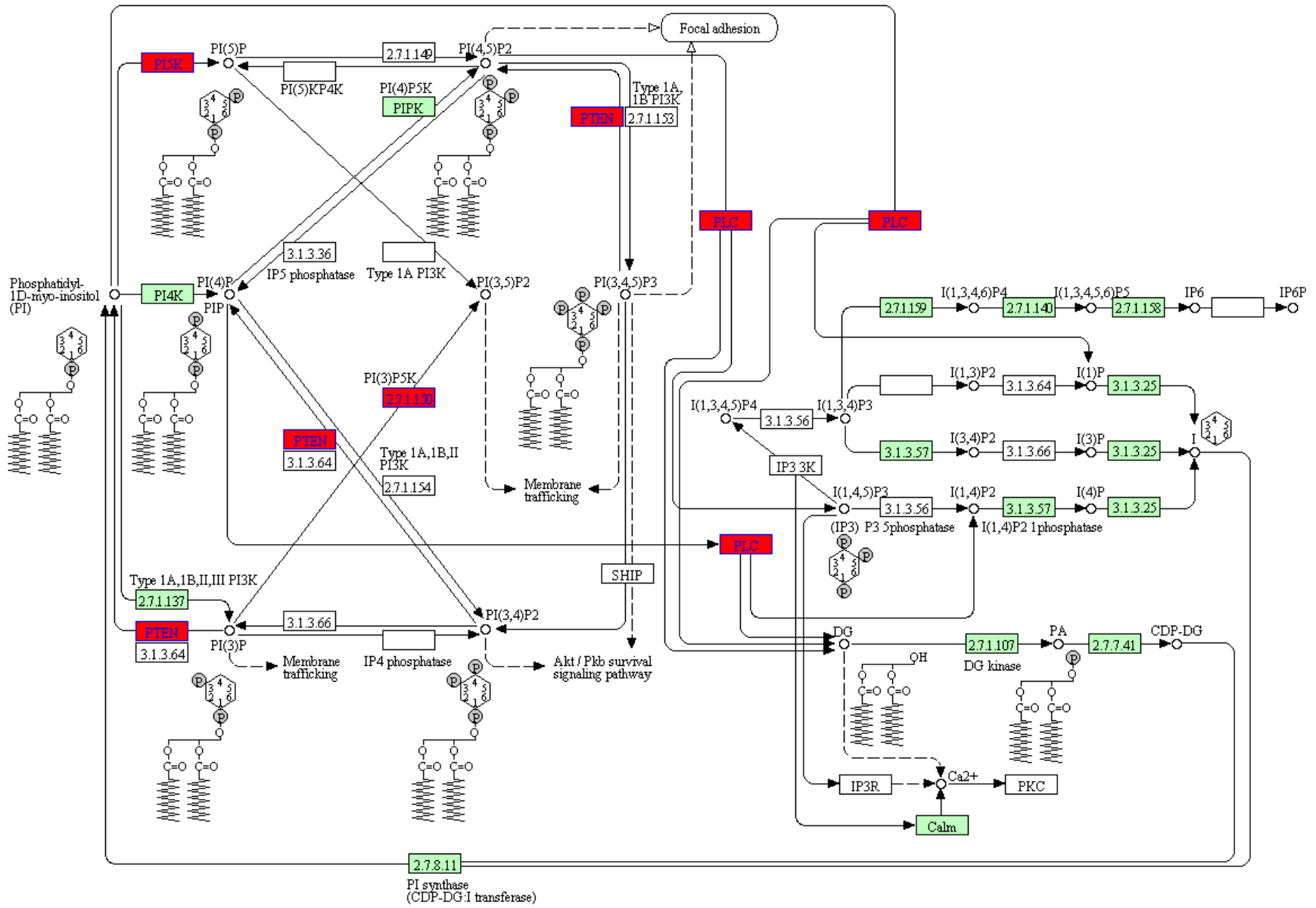
Photosystem I

PsaA	PsaB	PsaC	PsaD	PsaE	PsaF	PsaG	PsaH
PsaI	PsaJ	PsaK	PsaL	PsaM	PsaN	PsaO	PsaX

F-type ATPase

beta	alpha	gamma	delta	epsilon	c	a	b
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PHOSPHATIDYLINOSITOL SIGNALING SYSTEM



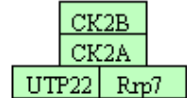
RIBOSOME BIOGENESIS IN EUKARYOTES

Ribosomal RNAs

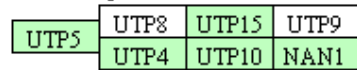


90S pre-ribosome components

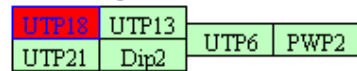
UTP-C complex



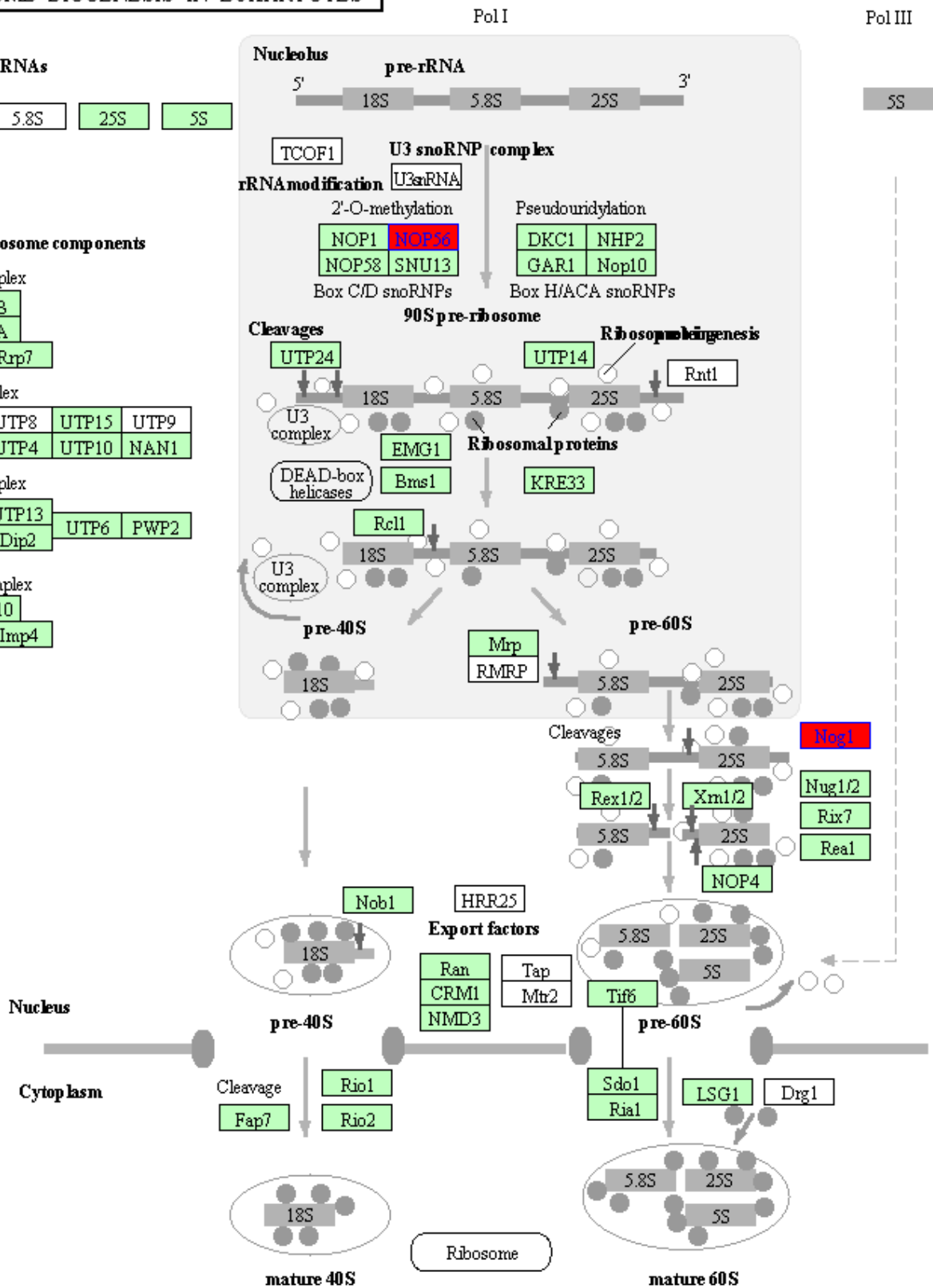
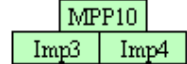
t-UTP complex



UTP-B complex



MPP10 complex



PYRIMIDINE METABOLISM

