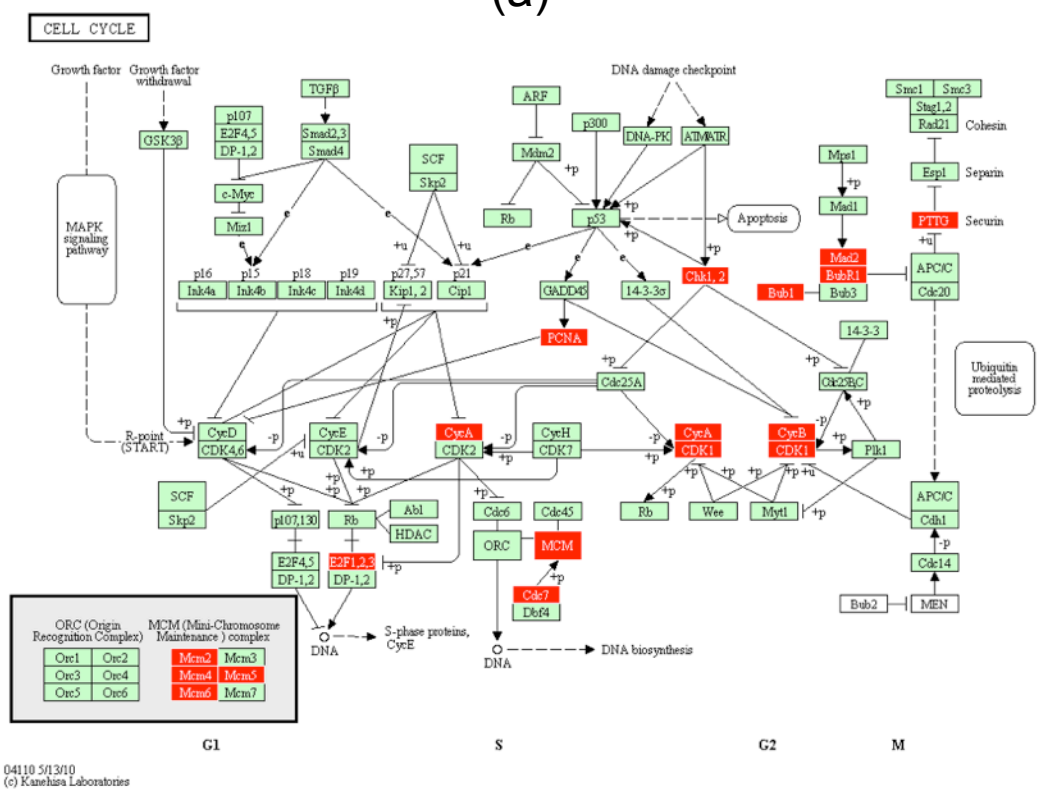
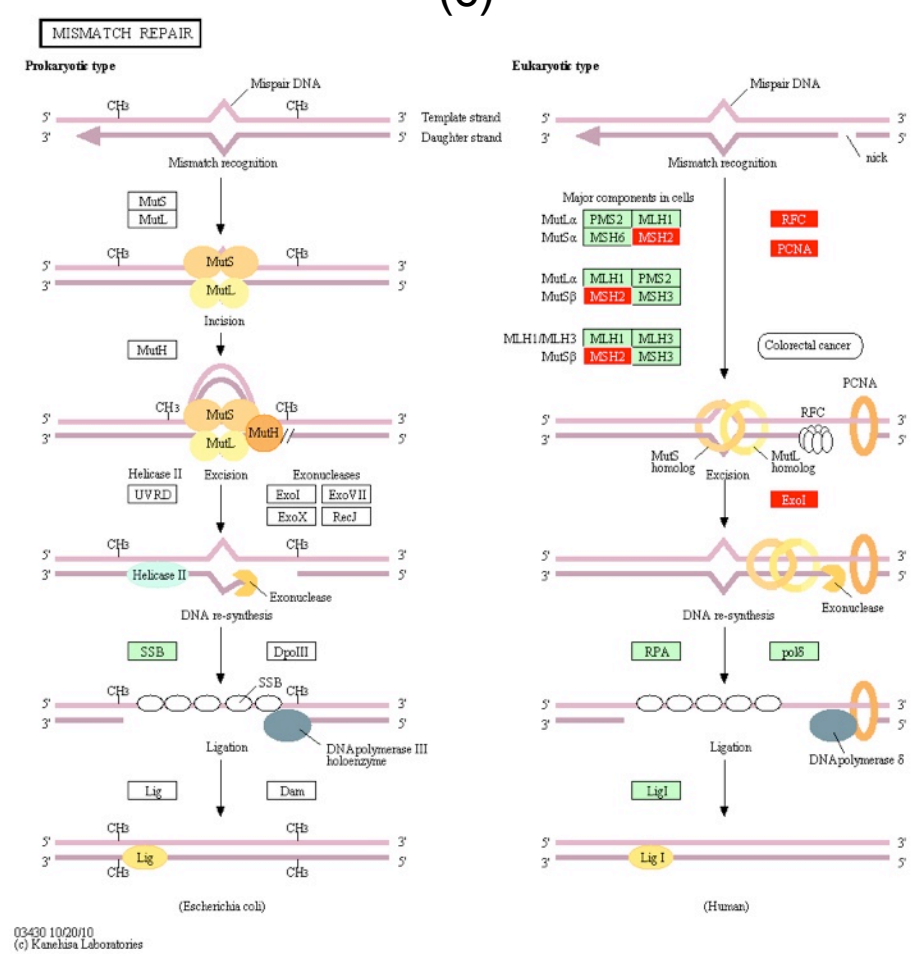
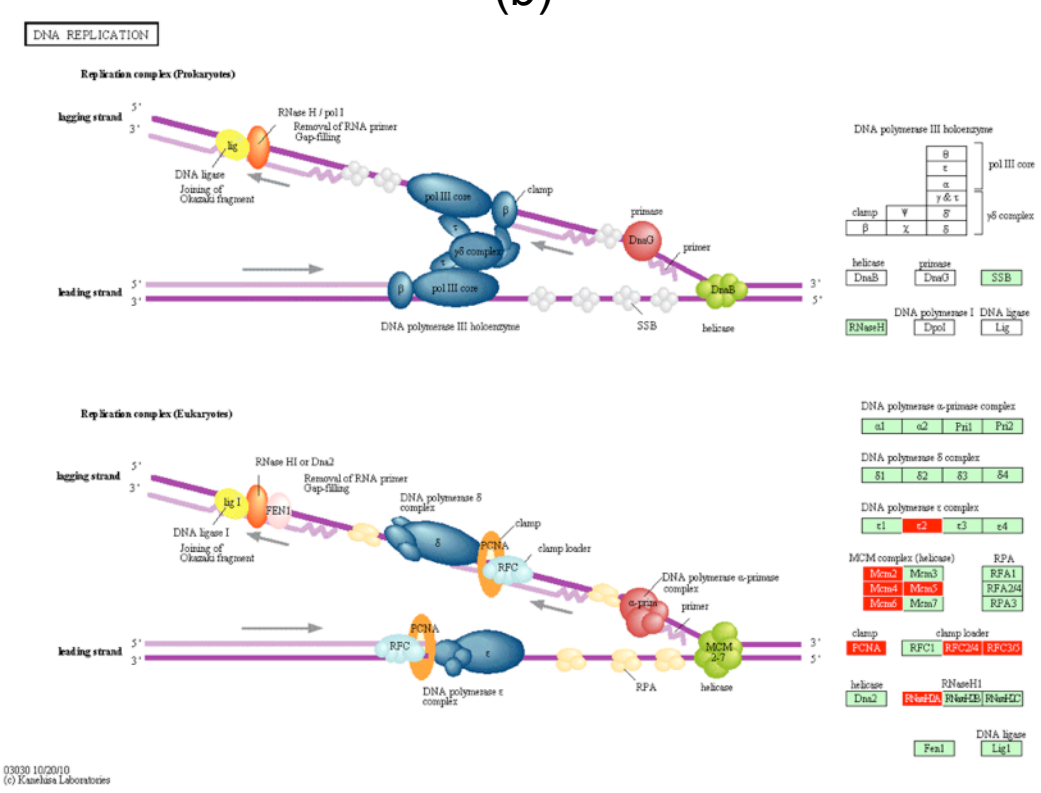
(a)


CELL CYCLE
Growth factor
Growth factor withdrawal
DNA damage checkpoint
MAPK signaling pathway
Apoptosis
Ubiquitin mediated proteolysis
R-point (START)
ORC (Origin Recognition Complex)
MCM (Mini-Chromosome Maintenance) complex
S-phase proteins, CycE
DNA biosynthesis
G1
S
G2
M
04110 5/13/10
(c) Kanehisa Laboratories

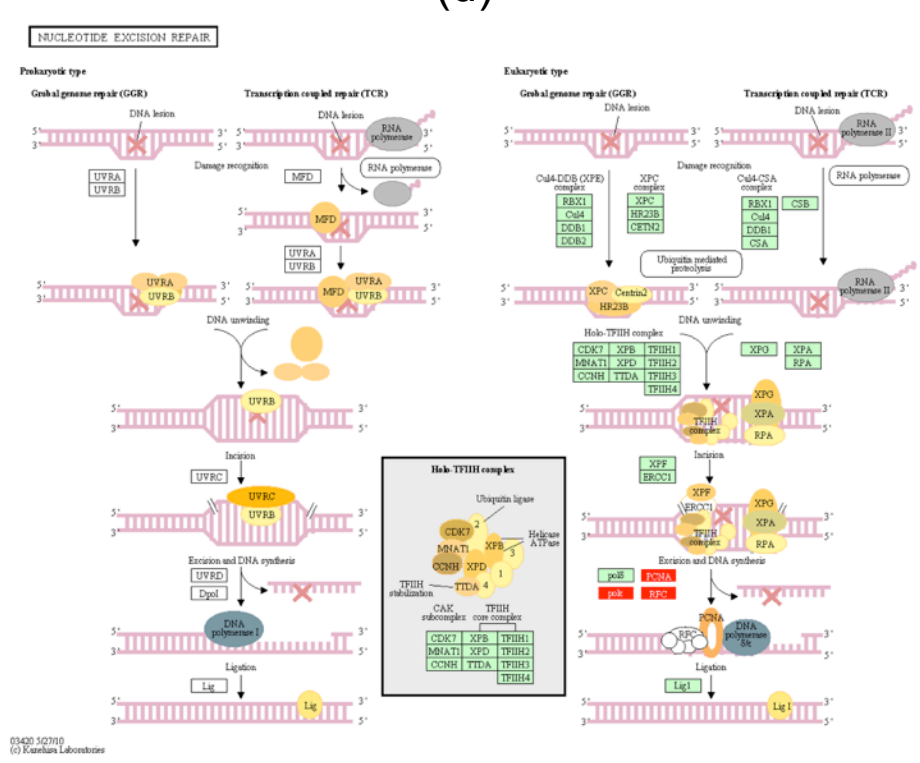
(c)


MISMATCH REPAIR
Prokaryotic type
Eukaryotic type
Mispair DNA
Template strand
Daughter strand
Mismatch recognition
Incision
Helicase II
Excision
Exonucleases
DNA re-synthesis
Ligation
DNA polymerase III holoenzyme
Colorectal cancer
(Escherichia coli)
(Human)
03430 10/20/10
(c) Kanehisa Laboratories

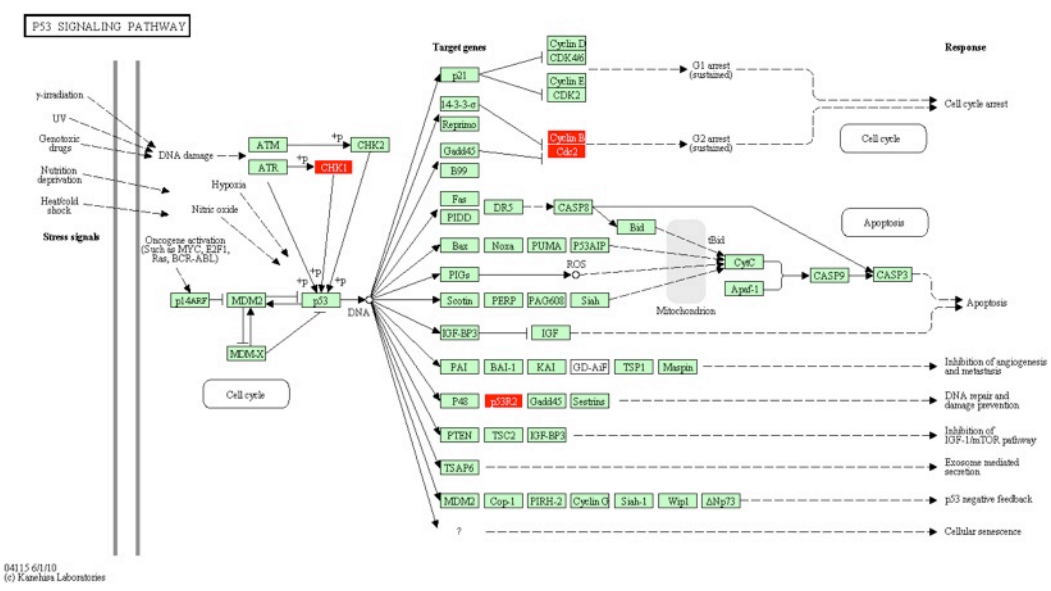
(b)


DNA REPLICATION
Replication complex (Prokaryotes)
Replication complex (Eukaryotes)
lagging strand
leading strand
DNA polymerase III holoenzyme
03030 10/20/10
(c) Kanehisa Laboratories

(d)


NUCLEOTIDE EXCISION REPAIR
Prokaryotic type
Eukaryotic type
Global genome repair (GGR)
Transcription coupled repair (TCR)
Holo-TFIIH complex
03420 5/27/10
(c) Kanehisa Laboratories

(e)


P53 SIGNALING PATHWAY
Target genes
Response
Stress signals
Cell cycle
Apoptosis
04115 6/1/10
(c) Kanehisa Laboratories