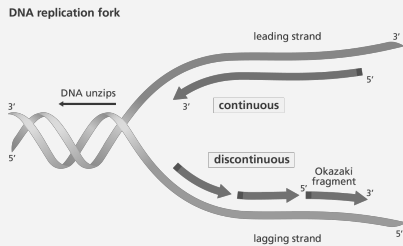
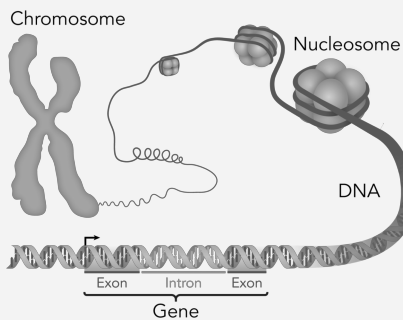


DNA Replication



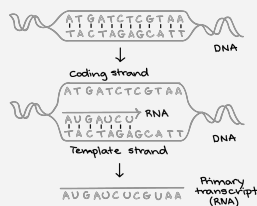
helicases- untwist double helix
topoisomerase- breaks, swivels, & rejoins
primer- initial stretch of RNA
DNA polymerases- adds nucleotides

Chromosome Structure



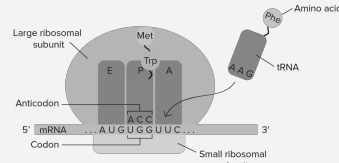
histones make up nucleosomes

Transcription



-RNA polymerase synthesizes RNA
-promoter initiates, terminator (bacteria)/polyadenylation sequence (eukaryotes) ends
-TATA box= crucial to initiation complex
-mods: 5' cap, poly-A tail, RNA splicing

Translation



initiation factors- bring components together w/GTP
elongation factors- add amino acids to chain
release factors- binds to A site codon & hydrolyzes bond in P site
processing: protein folding & mods

Mutations

base-pair substitutions
replacement of nucleotide w/another; silent=no effect, missense=change 1 amino acid, nonsense=changes amino acid codon to stop codon

insertions & deletions
additions or losses of nucleotide pairs

Regulation of Genes

operon
stretch of DNA required for enzyme production (repressible & inducible)

repressor
blocks attachment of RNA polymerase

corepressor
cooperates w/repressor to turn operon off

activator
stimulates transcription (ex: cAMP)

miRNA, siRNA
degrades target mRNA, blocks translation

Biotechnology

restriction enzymes
cut DNA sequences at palindrome restriction sites

ligase
seals breaks

vector
vehicle of DNA to replace or express genetic material

Polymerase Chain Reaction
produces copies of DNA w/o cells

cDNA
DNA produced w/ reverse transcriptase

Viruses

capsid
protein coat, made of capsomeres

lytic cycle
phage enters cell, takes control, replicates, lyses cell

lysogenic cycle
viruses replicate w/o destroying host

prophage
dormant virus within host genome

retrovirus
synthesize cDNA from RNA w/ reverse transcriptase

Bacteria

binary fission
asexual reproduction (variation w/mutation)

transformation
recombination of pieces of DNA into a live bacterium

transduction
bacteriophages carry genes host-host

plasmid
foreign, small, circular, self-replicating DNA

conjugation
F plasmid produces sex pilli, allow DNA to transfer