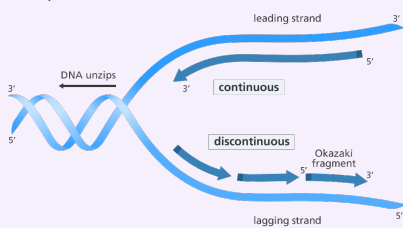


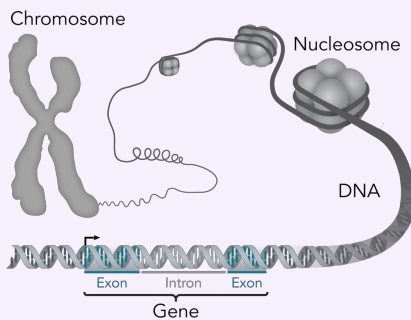
DNA Replication

DNA replication fork



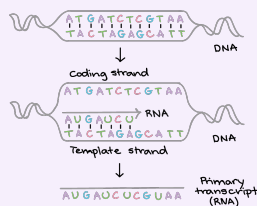
helicases- untwist double helix
topoisomerase- breaks, swivels, & rejoins
primer- initial stretch of RNA
DNA polymerases- adds nucleotides

Chromosome Structure



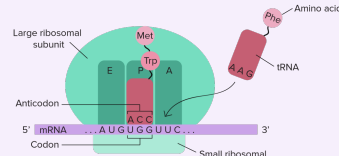
histones make up nucleosomes

Transcription



-RNA polymerase synthesizes RNA
-promoter initiates, terminator (bacteria)/p-
olyadenylation 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-repl-
icating DNA

conjugation
F plasmid produces sex pilli,
allow DNA to transfer