they

DNA Replication & Recombination

Fill in the blank:

DNA serves as a template for replication

DNA replication begins at the ORI, creating a replication fork

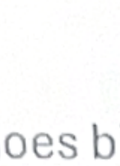
Bacterial DNA replication begins at the ORIC (they only have 1 start spot)

What does bidirectional DNA replication mean? What is a replicon?

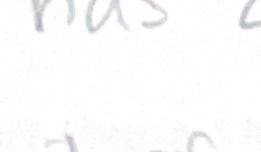
- It has 2 forks that migrate in opposite directions.
- A unit of length for DNA replication, Is like saying there is 12 inches in a foot.

Describe all 3 modes of DNA replication. Which is the most accurate?

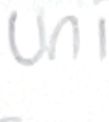
semiconservative: 1 old and 1 new = 1 strand



conservative: 1 new + 1 new = 1 strand



DiSPersive: DNA gets dispersed through 2 strands.



What 4 things MUST be present for DNA replication? What does each do?

-DNA polymerase I to do the replication / read
-DNA template to bring info
-Primers are required to start
- DNTP bases to build strand

Describe chain elongation.

3'-3' direction

3'-OH exposed and P from other group added to bond. will give off 2 P

Properties	I	II	III
Initiation	X	X	X
5'-3' polymerization	✓	✓	✓
3'-5' exonuclease	✓	✓	✓
5'-3' exonuclease	✓	X	X

What DNA Polymerases are involved in DNA repair?

I, II, IV and V

Describe the holoenzyme.

Active form of DNA poly III has 1 core enzyme and a alpha, epsilon, and omega sub unit

What are the 7 key issues that need to be solved for DNA replication to happen?

- unwinding helix
- make primers
- remove primers
- reduce supercoiling
- lagging strand
- fill gaps
- Proof read

Describe the initial stages of DNA replication using the following terms: DNAa, DNA helicase, SSBP, and DNA gyrase.

DNAa binds to the ORI and creates a replication bubble. DNA helicase helps unwind the strand and recruits the holoenzyme. SSBP binds to the open strands to prevent it from rebinding. DNA gyrase relives the tension from unwinding.

What direction of DNA synthesis. What is the leading and the lagging strand?

It is bidirectional

leading: continuous synthesis. Read 3'-5' but made 5'-3

lagging: discontinuous. creates okazaki fragments

What are Okazaki fragments and what "glues" them together?

The sections of the lagging strand "glued" by DNA ligase

What allows DNA to be able to proofread and correct any errors?

DNA poly exonudease in 3'-5'

Compare and contrast bacteria and Eukarya DNA replication.

Eukaryotic: more DNA, many ORI, linear DNA has pre-RC, and uses DNA poly alpha, epsilon and delta

bacteria: 1 ORI, circular DNA, no pre-RC, less DNA

What is the prereplication complex in eukaryotes? What are its three DNA polymerases?

They are added in during G1 of interphase. Are like a flag at where to start.

DNA Poly Alpha, delta, and epsilon