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Exam 1

What is the theory of preformation?

A gamete contains a complete miniature adult called a humunculus

What is mitosis? What is meiosis?

- mitosis results in 2 identical cells (2n)
- meosis results in 4 unique cells (n)

Describe DNA. What all is in DNA?

DNA is ladder like and is a double helix
- Nucleotides made of a base, a sugar, and phosphate

What is RNA? Which carbon in DNA will lack oxygen, making is "deoxy".

- same as DNA BUT it's single stranded and has "U" instead of "T" and ribose suger
- the seoond carbon

What is the central dogma of biology? Proteins are:

DNA → RNA → Protein

- the end product of gene expression

What are restriction enzymes?

they are in bacterial DNA and are used to cut DNA at specific sites

What is biotechnology?

-using recombinant DNA to make products

What criteria make model organisms useful to study?

-easy to grow
- short life cycle
- Produce many offspring
- straightforward genes

What must a molecule do to be able to serve as genetic material?

- replicate
- store info
- express info
- allow variation

What are nucleotides? What do they consist of?

- A base, Pentose sugar, & phosphate

-Nucleosides lack a phosphate group

What bases are purines? Which are pyrimidines? (Hint: Pure As Gold)

Purines → A & G

Pyrimidines → C, T, & U

List each base that will be found in DNA as well as the ones found in RNA?

DNA: A C T G

RNA: A C U G

Wha is the difference between nucleotide and nucleoside?

-Nucleasides lack phosphate groups

Which bonds keep the sides of the ladder together? Which bonds keep the rungs of the ladder together?

-phosphodiester on the ladder

-Hydrogen on the rungs

If I have found that my dogs DNA is 24% Adednine, what is the compostion of all my other bases?

24 = A + 24 = 48 100 - 48 = 52 ÷ 2 = 26

26 = C

26 = G

What model of DNA replication did Watson and crick propose? Describe it.

semiconservative

- one new + one old = replicated strand

- genetic info stored in bases

What DNA is most biologically active? Which ones lack guanine? Which is left-handed?

B D & E Z

What are the three classes of RNA?

mRNA
tRNA
rRNA

What is a retrovirus?

A virus with an RNA core

What UV level will proteins absorb at? What will nucleic acids absorb at?

280 260

Which bases form a triple bond? Describe their hyperchromic shift.

G≡C

Because they need more energy to break, DNA with these bonds shift later than A=T bonds

How long is DNA? What must be done to fit it in the nucleus?

6.6 feet

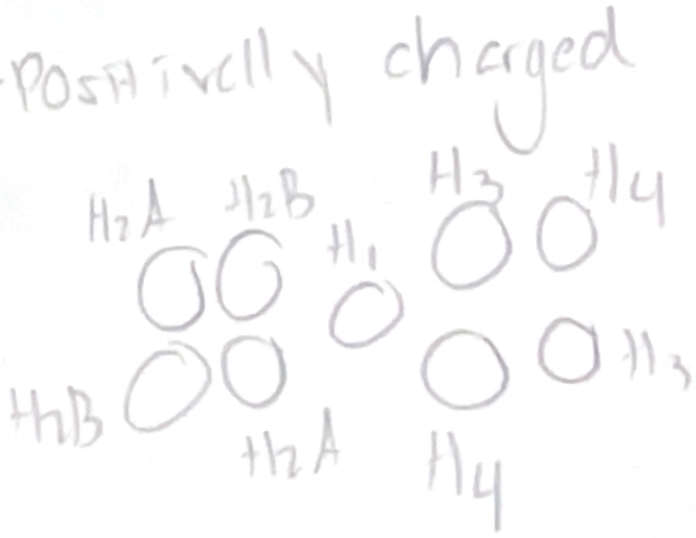
It needs to be supercoiled.

What is chromatin? What phase of DNA replication is it seen in?

DNA wound around positively charge proteins called histones. found in interphase

What are histones? What are the 5 types? Draw an ectomere made up of two tetramers.

-positively charged proteins (lots of lysine and arginine)



What is chromatin remodeling? Where is it done?

- changing chromatins structure to allow for DNA-Protein interactions
  - Histone tails

List a describe all 3 types of chemical modifications.

Acetylation: Acetyltransferase adds an acetyl group

methylation: Methyltransferase adds a methyl group

Phosporolation: Kinase adds a phosphate group

What is euchromatin? What is heterochromatin?

eu - uncoiled & active

Hetero- condensed & inactive

What are pseudogenes?

Noncoding regions of DNA

- makeup a large number of our genome