

Team Name: _____

Genetics Trivia

Category 1: Replication

- 1) _____
- 2) _____
- 3) _____
- 4) _____
- 5) _____

Bonus: _____

Category 1 Points: _____

Category 3: Translation

- 1) _____
- 2) _____
- 3) _____
- 4) _____
- 5) _____

Bonus: _____

Category 3 Points: _____

Category 2: Transcription

- 1) _____
- 2) _____
- 3) _____
- 4) _____
- 5) _____

Bonus: _____

Category 2 Points: _____

Category 4: Anything goes

- 1) _____
- 2) _____
- 3) _____
- 4) _____
- 5) _____

Bonus: _____

Category 4 Points: _____

Total Points: _____

*normal questions: 1 pt
bonus questions: 2 pts

Team Name: _____

Questions:

Replication

1. Name the enzyme: relieves tension in double stranded DNA (topoisomerase or DNA gyrase)
2. Name the enzyme: 1st one adds nucleotides to the 3' OH, 2nd one removes RNA primer (DNA poly III, DNA poly I)
3. In which direction are nucleotides synthesized? (5' to 3')
4. Where does telomerase add nucleotides to prevent telomere shortening? (3' overhang)
5. What needs to be added in order to synthesize new DNA? (RNA primer)

bonus: An organism has a mutation rendering the SSB proteins non-functional. What is biological outcome of this mutation? (DNA strands will be binded together, inhibiting replication)

Transcription

1. What are the three differences between DNA and RNA? (RNA has uracil, ribose sugar, single stranded)
2. What elements of the DNA are transcribed but not translated? (UTR's, introns)
3. What are the different kinds of prokaryotic transcription termination? (intrinsic and rho dependent)
4. What kind of organism has distal control elements? (eukaryotes)
5. What enzyme is responsible for mRNA processing? (CTD)

bonus: Name three components of the eukaryotic TIC. (TATA box, TBP, RNA pol II, enhanceosome, TFIID)

Translation

1. name the 6 components needed for translation (small ribosome, large ribosome, mRNA, EF factors, IF factors, charged tRNA)
2. What are the 3 things mRNA processing does to pre-mRNA? (intron splicing, poly A tail, 5' cap)
3. What three sites are needed for splicing? (3', 5', and branch point)
4. Name the enzyme: loads tRNA with correct AA (amino acyl tRNA synthetase)
5. What site on the ribosome does the tRNA get charged with an AA? (A site)

bonus: A mutation has occurred in the shine-dalgarno sequence in a prokaryotic organism, what is the biological outcome of this mutation? (translation won't happen, small subunit won't bind)

Anything goes

1. Name the three components of a nucleotide (pentose sugar, nitrogenous base, phosphate group)
2. Who discovered the semi-conservative model for DNA replication? (Messelson and Stahl)
3. This is a nucleotide triplet on a tRNA molecule that aligns with a particular codon in the mRNA (anticodon)
4. What are the three components needed to charge a tRNA? (ATP, amino acid, amino acyl tRNA synthetase)
5. Name the enzyme: brings tRNA's to the ribosome during translation elongation (EF-Tu)

bonus: Name the enzyme: binds to the A site of the ribosome when translation encounters a stop codon (RF)

*normal questions: 1 pt

bonus questions: 2 pts