Protein Synthesis Notes: Transcription and Translation

Review---DNA vs. RNA

Steps of Protein Synthesis

Step 1- Transcription
- Function: A single strand of ___________ is made from ___________.
- Location: In the _____________.
- Steps of Transcription
  1. ___________ (an enzyme) attaches to DNA at a special sequence that serves as a “start signal”.
  2. The DNA strands are ___________ and one strand serves as a template.
  3. The RNA bases attach to the complementary DNA template, and _______ is made!
  4. The RNA polymerase recognizes a ‘stop’ part on the DNA molecule and ___________.
     The mRNA leaves the ___________ and travels to the ___________.
- Transcription Practice: Transcribe this strand of DNA into RNA (no T’s in RNA!)
  DNA: A A T C T A G A T C A T T A
  RNA: ___________

Step 2- Translation
- Function: Pieces of RNA make ___________, which then make _________.
- Location: In the _____________.
- There are different types of RNA:
  1. mRNA: messenger RNA
     - Carries a ___________ (genetic code) from the nucleus to the ribosome (how to make proteins)
  2. tRNA: transfer RNA
     - _______________________ amino acids to the ribosome
Steps of Translation
1. ______________ leaves the nucleus and binds to a ________________________.
2. The ribosome looks for _________________________.
   - **Codon**: group of ___________ nucleotides on the messenger RNA that specifies one amino acid.
3. ______________ (transfer RNA) carries amino acids to the mRNA.
4. This tRNA has an________________ that matches the codon on the mRNA strand.
   - ________________: group of 3 unpaired nucleotides on a tRNA strand.
5. Each ________________ is dropped off and a chain forms. When the chain is completed, it disconnects and makes a ________________________!

Translation Practice: What amino acids do these codons stand for?
1. AUG-_________________
2. GGA-_________________
3. GAG-_________________
4. CAA-_________________
5. What amino acid does the anticodon CGU stand for? ________________
6. Find the amino acid sequence for the following mRNA sequence (translation):
   
   A U G C G A C G A A U U U A A

7. Transcription and Translation---DNA: A A T C T A G A T C A T T A

   RNA: __________________________________________

   AA : __________________________________________

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<th>First position</th>
<th>Second position</th>
<th>Third position</th>
</tr>
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<td>UCU Ser</td>
<td>UAU Tyr</td>
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<td>UCC Ser</td>
<td>UAC Tyr</td>
</tr>
<tr>
<td>UUA Leu</td>
<td>UCA Ser</td>
<td>UAA Stop</td>
</tr>
<tr>
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<td>UCG Ser</td>
<td>UAG Stop</td>
</tr>
<tr>
<td>CUU Leu</td>
<td>CCC Pro</td>
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<tr>
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<tr>
<td>GUG Val</td>
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<td>GAG Gly</td>
</tr>
</tbody>
</table>

Leaves the nucleus and goes to the...

Making Proteins

Leaves the nucleus and goes to the...

Are made of smaller units called