

Question 17.1

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II. Review of RNA structure

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Transcription

III. Transcription: A Closer Look

- **RNA polymerase** – Catalyses the transcription of RNA from DNA.
- Key features of RNA polymerase:
 - A.
 - B.
 - C.

III. Transcription: A Closer Look

- **Initiation of transcription**
(i.e. How does transcription begin?)
- Steps:
 - 1.
 - 2.
 - 3.

III. Transcription: A Closer Look

- **Transcriptional Elongation**
- Key points:
 - 1.
 - 2.
 - 3.
 - 4.

III. Transcription: A Closer Look

- **Transcriptional Termination**

(i.e. How does transcription end?)

- **Key points:**

- 1.
- 2.
- 3.

Pre-mRNA Modifications

IV. Eukaryotic modifications mRNA after transcription.

- Eukaryotic mRNA is processed in the nucleus before being transported to the cytoplasm.

- **Modifications:**

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- WHY?

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IV. Eukaryotic modifications mRNA after transcription.

- **Modifications (continued):**
- Introns
- Exons

- WHY have introns?
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Translation

V. Introduction to Translation:
The Genetic Code

- How could 4 nucleotides encode 20 amino acids?

- Codon = a three nucleotide sequence in mRNA that specifies which amino acid will be added to a growing polypeptide.

Question 17.2

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V. Introduction to Translation: The Genetic Code

Codon Chart

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VI. Translation Factors

• Key factors in translation

- Messenger RNA (mRNA)
- Amino acids
- Transfer RNA (tRNA)*
- Ribosomes*

* Will expand upon in more detail

VI. Translation Factors

- **tRNA function**

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VI. Translation Factors

- **tRNA Structure**

- Cloverleaf (planer view), L-shaped (3-D), or barrel

- One end has three bases called an anticodon

- **Anticodon =**

- Other end is the amino acid attachment site.

VI. Translation Factors

- **Ribosome**

- Coordinates pairing of tRNA with mRNA

- Two subunits (large and small)

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VI. Translation Factors

- Each ribosome has 3 sites

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VII. Building a Polypeptide: The Translation Process

- Translation occurs in three stages

1. Initiation
2. Elongation + Translocation
3. Termination

VII. Building a Polypeptide: The Translation Process

Initiation of Translation

- 1.
 - 2.
 - 3.
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VII. Building a Polypeptide: The Translation Process

Translational Elongation + Translocation

- 1.
- 2.
- 3.
- 4.

VII. Building a Polypeptide: The Translation Process

Translational termination

- Stop codons are UAA, UAG and UGA
- Stop codons do not code for an amino acid
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VII. Building a Polypeptide: The Translation Process

Polyribosomes – multiple ribosomes binding to the mRNA and synthesizing polypeptides.

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VIII. Point mutations can effect the function of a protein.

- **Point mutation =**

- **Two categories:**

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VIII. Point mutations can effect the function of a protein.

- **Base pair substitution = the replacement of one base pair with another base pair.**

- **Can result in...**

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VIII. Point mutations can effect the function of a protein.

- **Missense =**

- **Nonsense =**

VIII. Point mutations can effect the function of a protein.

- **Insertions or deletions**
 - More harmful than base pair substitutions due to there potential effect on the reading frame.

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Question 17.3

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