AQA Biology A-level

4.2 - DNA and protein synthesis

Flashcards

What is the genome?

What is the genome?

The complete set of genetic information contained in the cells of an organism.

What is the proteome?

What is the proteome?

The complete set of proteins that can be produced by a cell.

Describe the structure of messenger RNA (mRNA).

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A long, single strand. Its base sequence is complementary to the DNA it was transcribed from.

Suggest advantages of using mRNA rather than DNA for translation.

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- shorter & contains uracil = breaks down quickly so no excess polypeptide forms
- single-stranded & linear = ribosome moves along strand & tRNA binds to exposed bases
- contains no introns

Describe the structure of transfer RNA (tRNA).

Describe the structure of transfer RNA (tRNA).

A single strand of around 80 nucleotides that is folded over into a clover leaf shape. On one end is an anti-codon, on the opposite end is an amino acid binding site.

What is produced by transcription?

What is produced by transcription?

mRNA.

Where does transcription take place?

Where does transcription take place?

In the nucleus.

Outline the process of transcription.

Outline the process of transcription.

- DNA uncoils into two strands with exposed bases. One used as a template.
- Free nucleotides line up next to their complementary bases, and are joined together by RNA polymerase.

What happens to mRNA after transcription?

What happens to mRNA after transcription?

In eukaryotic cells, pre-mRNA must be spliced to remove introns, leaving only the coding regions. Then it moves out of the nucleus and attaches to a ribosome.

What is produced by translation?

What is produced by translation?

Proteins.

Where does translation take place?

Where does translation take place?

In the cytoplasm (on ribosomes).

Outline the process of translation.

Outline the process of translation.

- The anti-codon of tRNA attaches to complementary bases on the mRNA.
- Amino acids bonded to tRNA form peptide bonds, continuing to form a polypeptide chain until a stop codon is reached.
- This process requires ATP.