4.2 DNA AND PROTEIN SYNTHESIS

Genome

- Complete set of genes in a cell
- Proteome
  - Complete set of proteins the cell can produce

Protein Synthesis

- Translation
  - Synthesising the protein at the ribosome
  - Ribosome moves along mRNA, two tRNA molecules are held at once
  - Peptide bond forms between adjacent amino acids
    - Polypeptide chain forms
    - ATP and enzyme required
  - tRNA with complementary anticodon pairs with mRNA codon
  - Ribosome attaches to the starting mRNA codon
- Transcription
  - Producing complementary mRNA from DNA
    - RNA polymerase
  - mRNA leaves via a nuclear pore
  - Pre-mRNA is spliced
    - Removal of introns
    - Pre-mRNA is only present in eukaryotes

RNA molecules

- Transfer RNA (tRNA)
  - Single stranded molecule
  - Clover leaf shape
  - Small molecule, 80 nucleotides
  - Specific amino acid attached to tRNA
  - Anticodon at one end, bases complementary to mRNA codon
- Has a ribose sugar and uracil instead of thymine
- Messenger RNA (mRNA)
  - Codon = sequence of 3 bases that codes for an amino acid, complementary to a triplet
    - Codons on mRNA determine amino acid sequence
  - Long, single stranded molecule
  - Sequence of bases is complementary to sequence of DNA
  - Produced in nucleus, leaves via nuclear pores to go to ribosomes

AQA

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