

1 Reading Assignment 7. Section 1.9

Read Section 1.9 and answer the following:

1. What is the "genetic code"?

The code linking the 4 character alphabet of a DNA molecule with the 20 letter alphabet of proteins. The correspondence between each triplet of bases of the DNA and the coded amino acid.

2. What is a "Reading Frame"?

A subset of the 64 possible triplets combinations codes for amino acids.

3. What is a potential effect of high radiation energy on DNA?

Can cause random damage to the DNA molecule.

4. What kind of errors can arise during DNA replication?

There can be of two types: replacements of DNA bases by others or deletions or insertions of any number of bases.

5. What can happen if there is a mutation in a stop codon?

The protein will be terminated prematurely and will usually be non-functional whereas if a stop codon mutates into a codon for an amino acid residue the translation continues, elongating the amino acid chain until the next stop codon is encountered.

6. Describe a way in which a new species can appear.

A new species can therefore originate when some individuals, for whatever reason, do not mate with the rest of the population for a sufficient length of time.

7. What is the difference between homologous, analogous, paralogous and orthologous proteins?

- **Homologous:** Two proteins that derived from a common ancestor.
- **Analogous:** Two proteins that resemble each other but there is no evidence of common evolutionary origin.
- **Paralogous:** Two proteins that derived from a common ancestor, but have arisen after a duplication event.
- **Orthologous:** Two proteins believed to have diverged from each other because of speciation events.