BSC 2011 - 02

Developmental Biology

Patterns of Inheritance

Evolution

Ecology
Some Important Definitions

Science - the investigation of rational concepts that can be evaluated by observations and experimentation.

Hypothesis - a proposed explanation for an observed phenomenon

Theory - a hypothesis that is consistent with all available evidence
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Outline of Lecture 1

I. THE CENTRAL DOGMA
   A. DNA structure
   B. DNA Replication
   C. Chromosomes
      1. Prokaryotic
      2. Eukaryotic
   D. RNA Structure
   E. Transcription
      1. Summary
      2. Prokaryotes
      3. Eukaryotes
   F. Translation
      1. The genetic code
      2. Summary of translation
DNA structure

A linear sequence of nucleotides

Nucleotide

Phosphate
5-C sugar
Nitrogenous base
Thymine
Cytosine
Guanine
Adenine

Fig 16.3
Fig. 16.5

**DNA Structure** - the double helix

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Fig. 16.7

DNA Replication

Catalyzed by DNA-polymerase

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Chromosome numbers in Eukaryotes

Chimps - 48
Humans - 46
Fruit fly - 4
Onion - 8
Potato - ??
Chromosome numbers in Eukaryotes

Chimps - 48

Humans - 46

Fruit fly - 4

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Potato - 48
**Template strand** - the single strand of DNA that is transcribed

**RNA polymerase** - the enzyme that catalyzes the synthesis of RNA using DNA as the template

**Promoter** - the segment of the DNA template strand where RNA polymerase binds and initiates transcription
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Fig. 17.6

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Fig. 17.8, 17.9

RNA processing

5’ cap

Poly-A- tail

RNA splicing
The Genetic Code

**Codon** - 3 base sequence that codes for one amino acid or is a signal.
Fig. 17.13  Transfer RNA (tRNA)
Fig. 17.12

**Translation** of mRNA into protein
Fig. 17.25

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