BSC 2011 - 02

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Patterns of Inheritance

Developmental Biology

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Evolution

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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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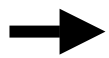

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Outline of Lecture 1

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

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Phosphate
5-C sugar
Nitrogenous base
- **T**hymine
- **C**ytosine
- **G**uanine
- **A**denine

Fig 16.3

Fig. 16.5

DNA Structure - the double helix

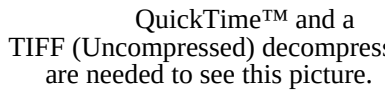

Fig. 16.7

DNA Replication

Catalyzed by DNA-polymerase

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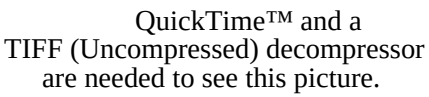
Fig.1.4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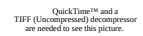
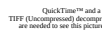
Chromosome numbers in Eukaryotes



Chimps - 48

Humans - 46

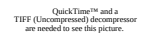


Fruit fly 4

Onion - 8

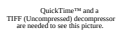
Potato - ??

Chromosome numbers in Eukaryotes



Chimps - 48

Humans - 46



Fruit fly 4

Onion - 8

Potato - 48

Fig. 17.6

Transcription

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

Fig. 17.6

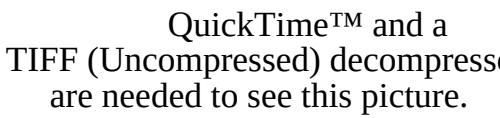

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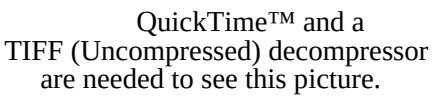
Fig. 17.6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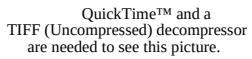
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Fig. 17.6

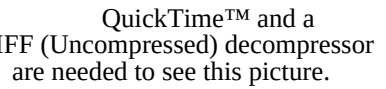
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Fig. 17.8,17.9

RNA processing

5’ cap

Poly-A- tail

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RNA splicing

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Fig. 17.4

The Genetic Code

Codon - 3 base sequence that codes for one amino acid or is a signal.

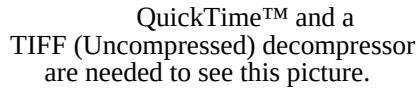
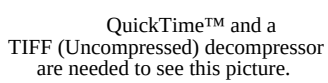


Fig. 17.13

Transfer RNA (tRNA)



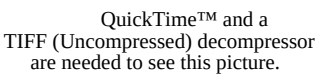


Fig. 17.12

Translation of mRNA into protein

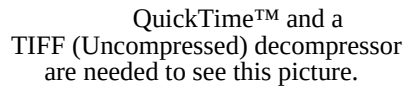


Fig. 17.25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