


Slide 1

Basic Life Functions: Reproduction

*And God blessed them;
and God said to them,
"Be fruitful and multiply,
and fill the earth,
and subdue it; and rule over
the birds of the sky, and over
every living thing that moves
on the earth."
Genesis 1:28*



BIO 100 John E. Silvius, Professor of Biology

Slide 2

Cellular Reproduction - Overview

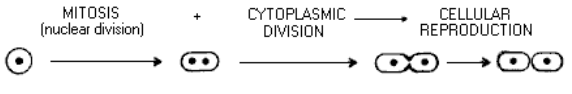
CELL THEORY

"living organisms are composed of cells"

IMPLICATIONS

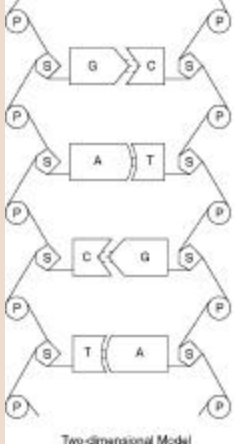
1. Genetic material is "localized" within cells where it exerts control over cell metabolism
2. Therefore, **growth** in size and volume requires "cellular reproduction"

MITOSIS (nuclear division) + CYTOPLASMIC DIVISION → CELLULAR REPRODUCTION




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DNA Structure



Two-dimensional Model

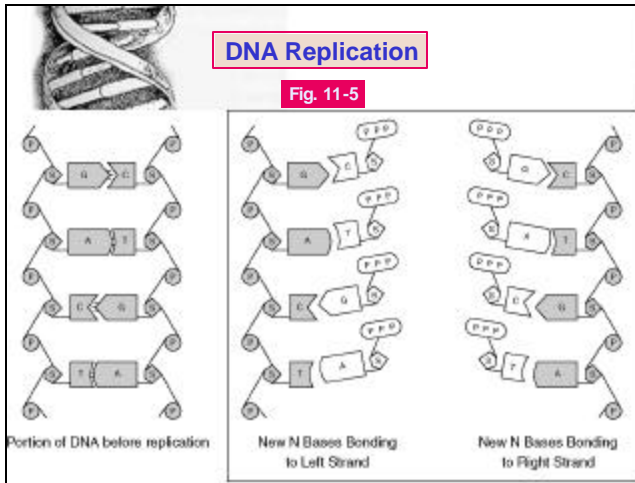


DNA Double Helix Model

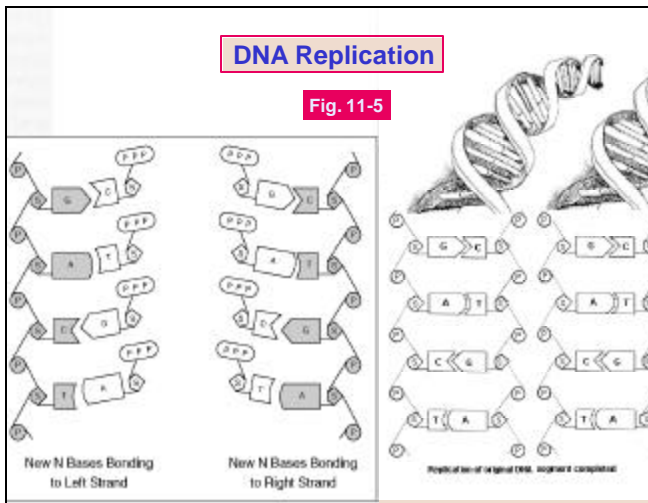
P = phosphate
S = deoxyribose sugar
A = adenine
T = thymine
G = guanine
C = cytosine

Fig. 11-2

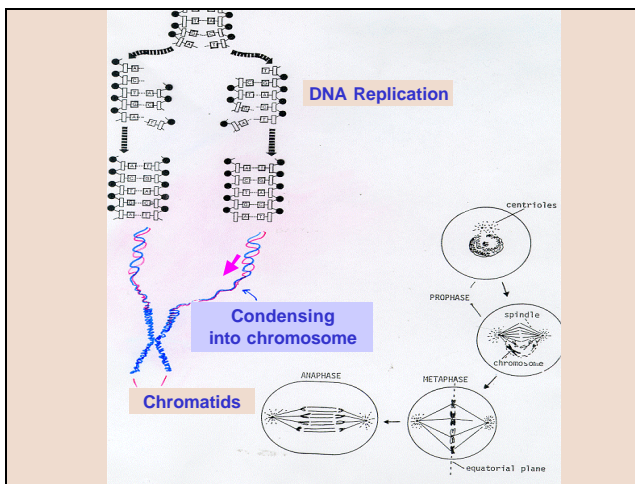
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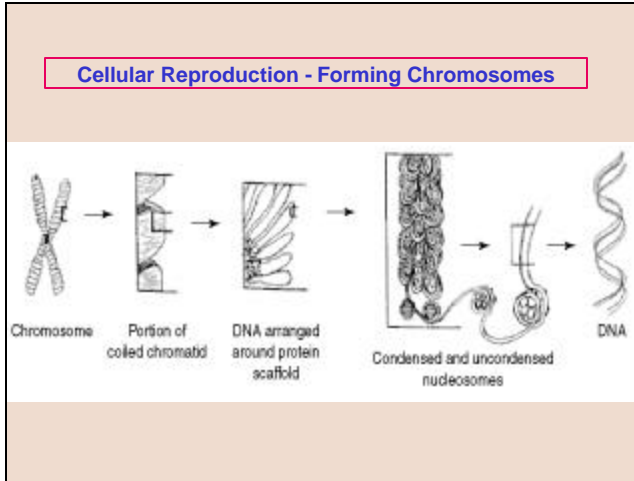
Slide 5



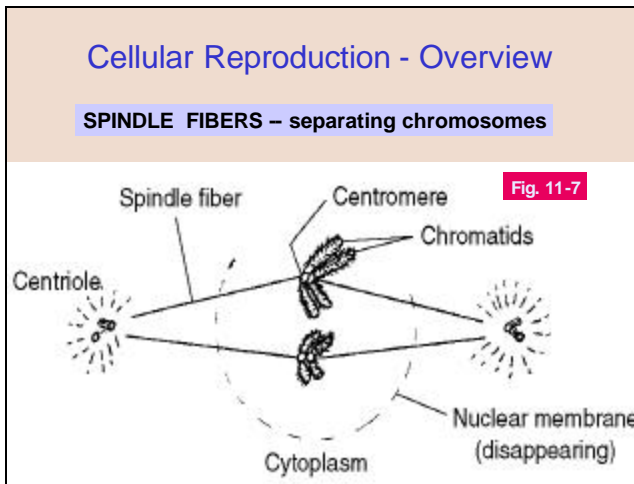
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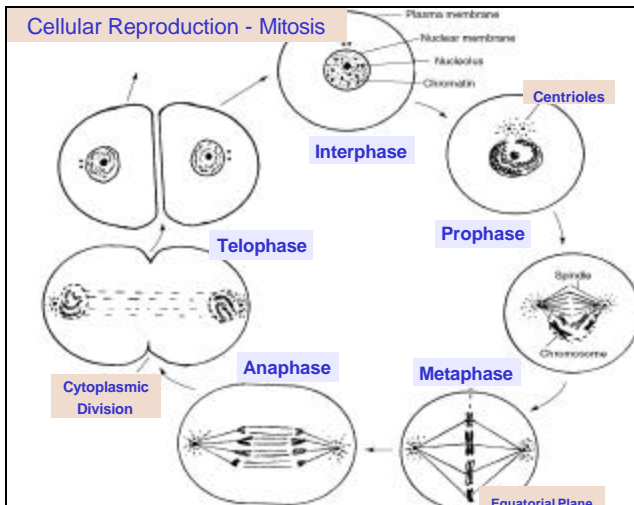
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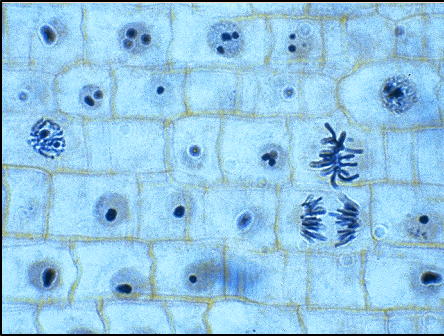
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Functions of Mitosis

1. **GROWTH** -- from embryonic regions



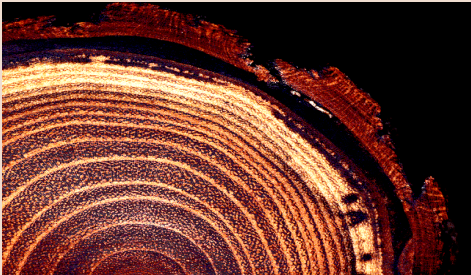
A light micrograph of a plant tissue section stained with a blue dye. The cells are arranged in a grid-like pattern. Several cells are in different stages of mitosis, showing condensed chromosomes and spindle fibers. The nuclei are stained dark blue, and the cytoplasm is a lighter blue.

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Functions of Mitosis

1. **GROWTH** -- from embryonic regions

2. **MAINTENANCE** -- e.g. wound healing



A cross-section of a tree trunk showing growth rings. The rings are concentric and have a distinct pattern of light and dark wood. The outer edge shows the bark, and the inner part shows the pith.

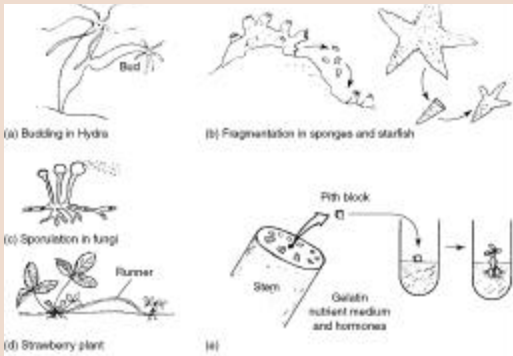
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Functions of Mitosis

1. **GROWTH** -- from embryonic regions

2. **MAINTENANCE** -- e.g. wound healing

3. **ASEXUAL REPRODUCTION**



Four diagrams illustrating asexual reproduction:

- (a) Budding in Hydra: A diagram showing a Hydra with a small bud forming on its side.
- (b) Fragmentation in sponges and starfish: A diagram showing a sponge being broken into pieces and a starfish being broken into pieces, with arrows indicating the formation of new individuals from the fragments.
- (c) Spore formation in fungi: A diagram showing a fungus with spores being released from its fruiting body.
- (d) Strawberry plant: A diagram showing a strawberry plant with runners and a new plantlet forming from a runner. Below it, a diagram shows a stem being placed in a beaker of water, with a label 'Pith block' and 'Growth nutrient medium and hormones'.
