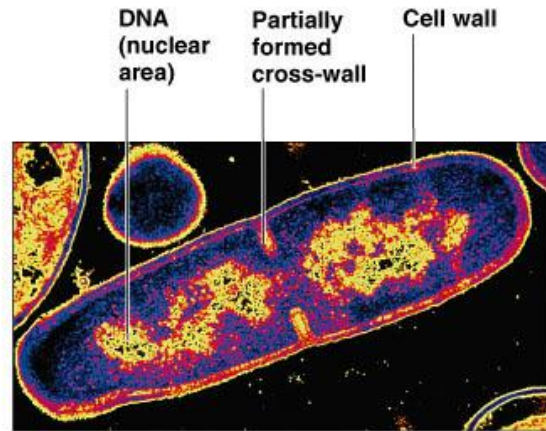
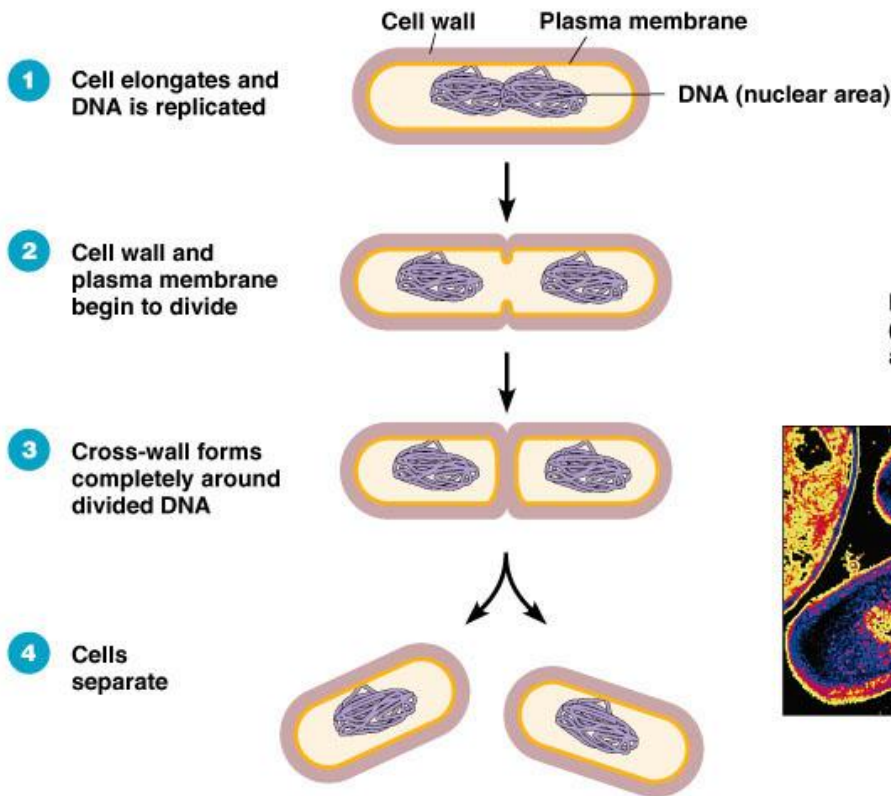


Chapter 8: Cell reproduction

Prokaryotic cell division

Purpose: reproduce



(a) A diagram of the sequence of cell division.

Copyright © 2004 Pearson Education, Inc., publishing as Benjamin Cummings.

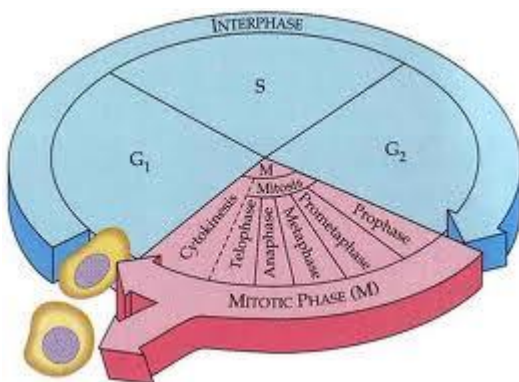
(b) A thin section of a cell of *Bacillus licheniformis* starting to divide.

Eukaryotic Cell Division

Why do cells divide?

- Growth
- Replace
- Repair

Cell Cycle



Interphase

G₁ (Gap 1) Phase

Growth and synthesis of new organelle

S Phase - Synthesis of DNA

G₂ Phase - preparation for cell division

Mitosis

Prophase - chromatin condenses to form chromosomes; centromeres divide and migrate to the poles; spindle forms; nuclear membrane breaks down

Metaphase - chromosomes line up along the equator

Anaphase - chromatids separate and migrate to the poles

Telophase - nuclear membranes form at each pole around the chromatid; spindle disappears; cytokinesis begins.

cytokinesis

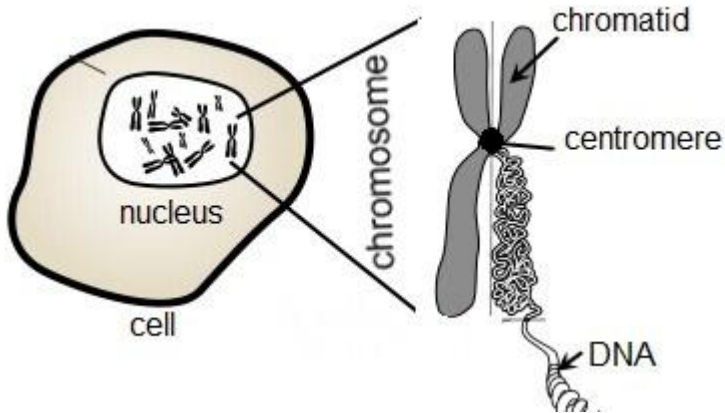
G1 Checkpoint - Check to see if DNA is damaged

G2 Checkpoint - Check to see if DNA is replicated properly

M Checkpoint - spindle assembly checkpoint, check for alignment of chromosomes

Apoptosis - programmed cell death, if any of the checks fail

Structure of a Chromosome



We have 23 pairs of chromosomes. 22 pairs are autosomes and 23rd pair is sex chromosome.

Mitosis = ASEXUAL reproduction (production of somatic cells)

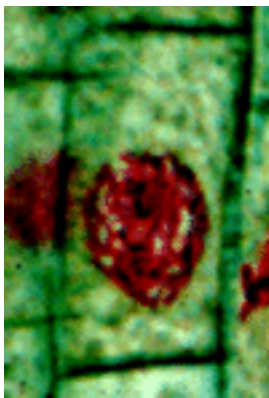
- Exact replication of cells (there is the SAME amount of DNA in parent and daughter cells)
- Cell division used for growth
- Cancer is uncontrolled mitosis

Onion Root Tip Mitosis -- Review

Interphase



Prophase



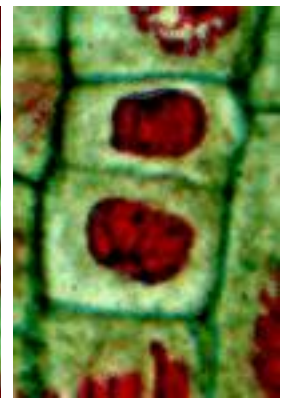
Metaphase



Anaphase



Telophase

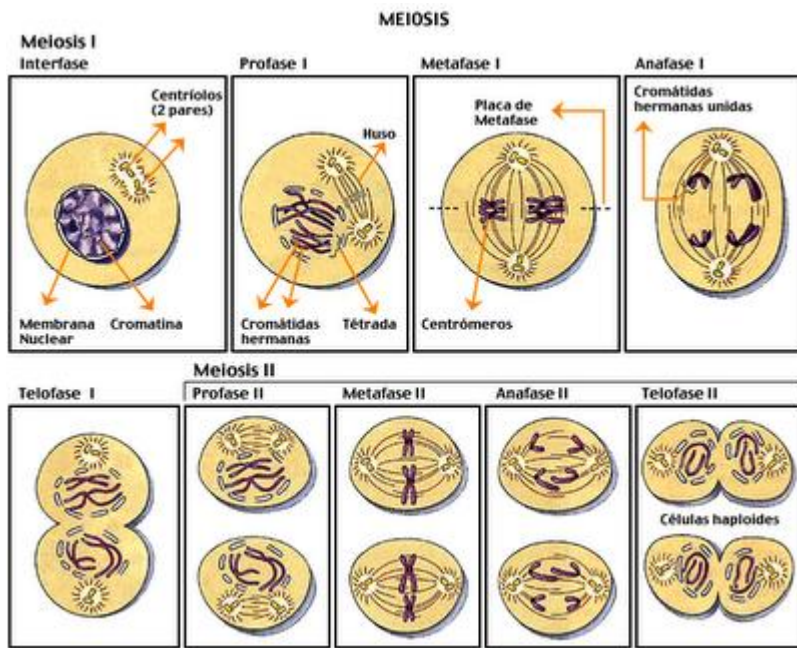


Meiosis = SEXUAL reproduction (production of gametes)

- Special male and female cells are produced (in plants- pollen and egg cells; in animals sperm and egg cells)
- Only HALF the genetic material in each cell so when the nuclei of a sperm and egg have normal amount of DNA

Why is asexual reproduction important?

Why is sexual reproduction important?



Lily Anther Meiosis -- Review

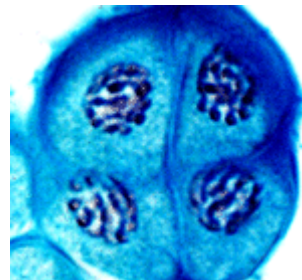
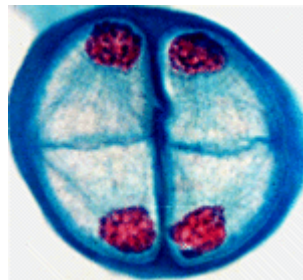
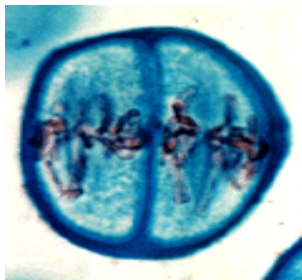
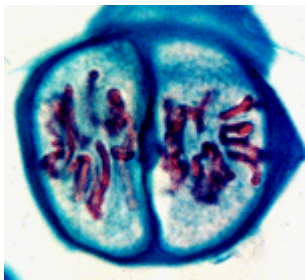
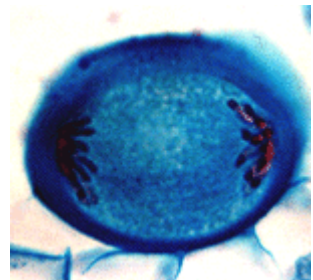
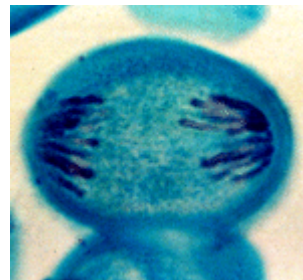
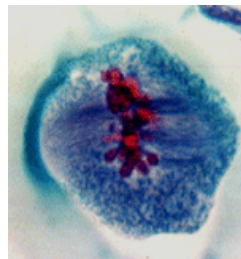
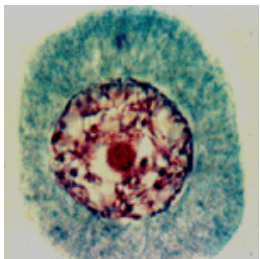
Interphase

Prophase I

metaphase I

Anaphase I

Telophase I



Stem Cell Research

Cancer Cell Research