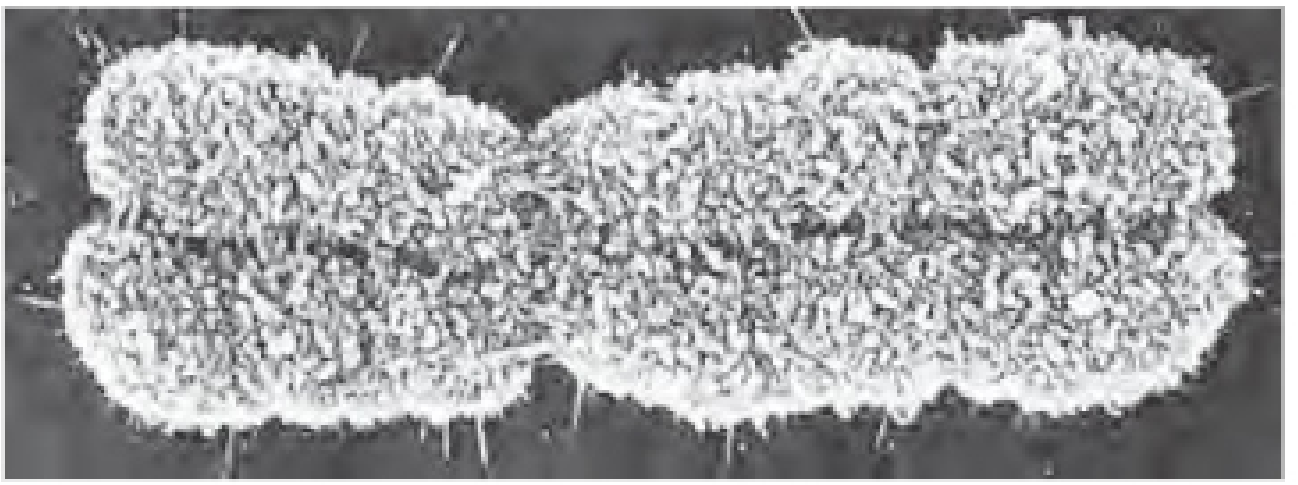
Biol 1107 chap 12 notes 03/19/2013

Chapter 12:

Character	Prokaryotes	Eukaryotes
Genome	Single, circular or linear	Multiple, linear chromosomes
Nucleus	None	Yes
Cell division	Binary fission	Mitosis
Cell cycle	None	Interphase (G1, S, G2), mitosis

Cell cycle- the life of a cell from the time it first forms from a dividing parent cell from the time it first forms from a dividing parent call until its own division into 2 daughter cells
Most cell division (except meiosis) involves distribution of identical DNA to 2 daughter cells
Genome- a cell's endowment of DNA
DNA is packaged into chromosomes
Chromosomes- one very long linear DNA molecule associated with many proteins
DNA carries genes, the units of info that specify an organism's inherited traits
Chromatin- entire complex of DNA and proteins that serve as building material for chromosomes
When not dividing, chromosomes are in form of thin, long chromatin fiber
After replication, chromosomes condense: chromatin fibers become densely coiled and folded, making chromosomes shorter and thick
Somatic cells (nonreproductive cells/ body cells)- have two sets of chromosomes (diploid, 2n)
46 chromosome, 2 sets of 23 in humans
Gametes (reproductive cells: sperm and eggs) have half as many chromosomes as somatic cells (haploid, 1n)
1 set of 23 in humans
Sister chromatids- joined copies of original chromosome
Each contain identical DNA molecules
Attached to each other by cohesins
Attachment known as sister chromatid cohesion
Centromere- region containing specific DNA sequences where the chromatid is attached most closely to its sister chromatid
Part of chromatid on either side of centromere is known as an arm

Sister chromatids:



12.2:

Mitosis- division of genetic material in nucleus

Cytokinesis- division of cytoplasm

Zygote- fertilized egg

Cell cycle can be divided into:

Mitotic (M) phase- mitosis and cytokinesis, shortest part of cell cycle

Interphase (90%)- a cell that is about to divide grows and copies its chromosomes in preparation for cell division

G_1 phase (first gap)- most variable in time, cell doing job in organism

S phase- only times chromosomes are duplicated

G_2 phase (second gap)

During these subphases, a cell that will eventually divide grows by producing proteins and cytoplasmic organelles

The Mitotic Spindle:

First begins to form during prophase

Made up of microtubules and proteins

Microtubules of cytoskeleton disassemble to supply material to construct mitotic spindle

Polymerizes through subunits of protein Tubulin, Depolymerizes by losing subunits

Assembly of spindle microtubules start at centrosome

Centrosome- a subcellular region containing material that functions through cell cycle to organize the cell's microtubules

Pair of centrioles are located at center of centrosomes. These centrioles are nonessential to cell division

During interphase, centrosome duplicates to form 2 centrosomes that remain together near nucleus