

Lab : 1/ Second semester (Medical Biology)

Dep: Clinical laboratories / first stage

The Cell Cycle

Five Phases of the Cell Cycle

G₁ - primary growth phase

S – synthesis; DNA replicated

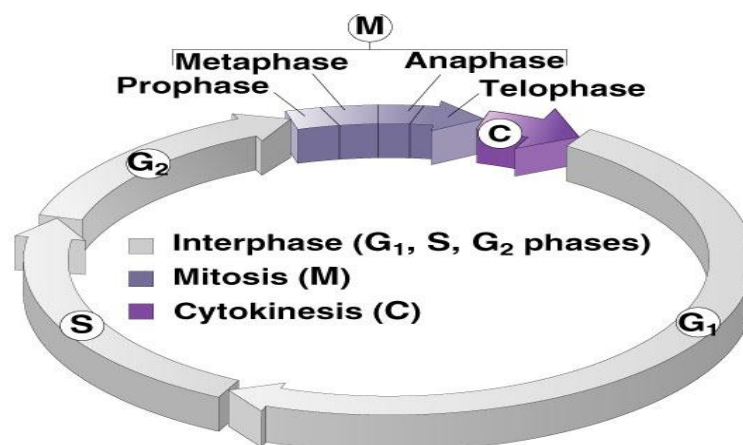
G₂ - secondary growth phase

collectively these 3 stages are called interphase

M - mitosis

C - cytokinesis

Cell Cycle



Interphase - G₁ Stage

1st growth stage after cell division

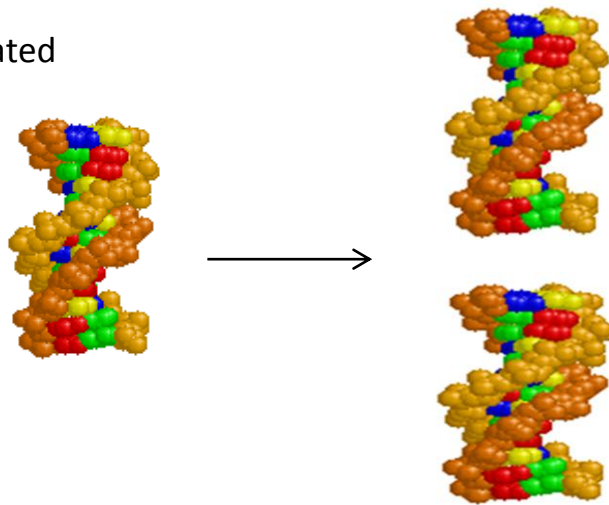
Cells mature by making more cytoplasm & organelles

Cell carries on its normal metabolic activities

Interphase – S Stage

Synthesis stage

DNA is copied or replicated



Interphase – G₂ Stage

2nd Growth Stage

Occurs after DNA has been copied

All cell structures needed for division are made (e.g. centrioles)

Both organelles & proteins are synthesized

Mitosis

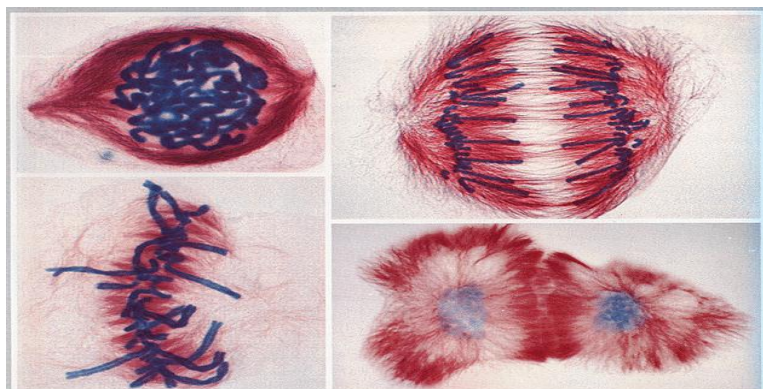
Division of the nucleus

Also called karyokinesis

Only occurs in eukaryotes

Has four stages

Doesn't occur in some cells such as brain cells



Early Prophase

Chromatin in nucleus condenses to form visible chromosomes

Mitotic spindle forms from fibers in cytoskeleton or centrioles (animal)

Late Prophase

Nuclear membrane & nucleolus are broken down

Chromosomes continue condensing & are clearly visible

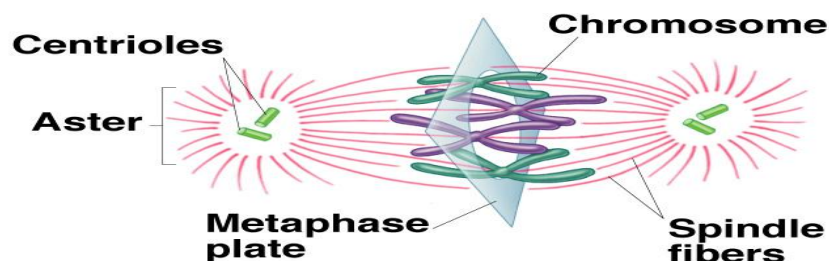
Spindle fibers called kinetochores attach to the centromere of each chromosome

Spindle finishes forming between the poles of the cell

Metaphase

Chromosomes, attached to the kinetochore fibers, move to the center of the cell

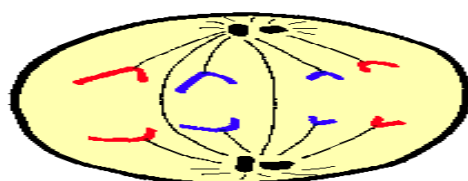
Chromosomes are now lined up at the equator



Anaphase

Occurs rapidly

Sister chromatids are pulled apart to opposite poles of the cell by kinetochore fibers



Telophase

Sister chromatids at opposite poles

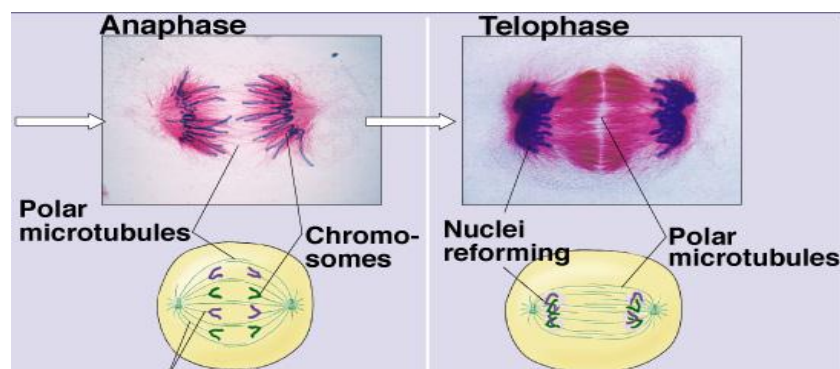
Spindle disassembles

Nuclear envelope forms around each set of sister chromatids

Nucleolus reappears

CYTOKINESIS occurs

Chromosomes reappear as chromatin



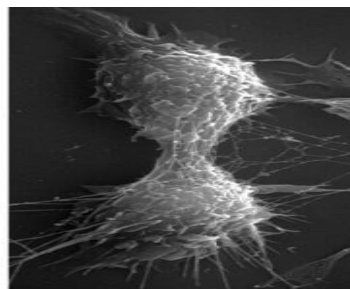
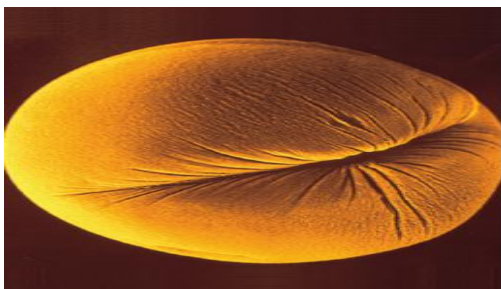
Cytokinesis

Means division of the cytoplasm

Division of cell into two, identical halves called daughter cells

In plant cells, cell plate forms at the equator to divide cell

In animal cells, cleavage furrow forms to split cell



Daughter Cells of Mitosis

Have the same number of chromosomes as each other and as the parent cell from which they were formed

Identical to each other, but smaller than parent cell

Must grow in size to become mature cells (G_1 of Interphase)