

Chapter 2

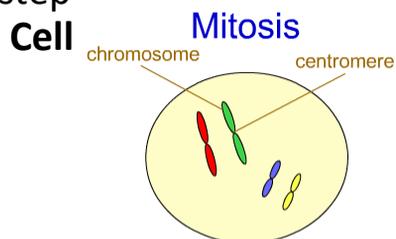
Mitosis & DNA Replication

Mitosis

- Mitosis is a 5 step process of **Cell Division**

- **IPMAT**

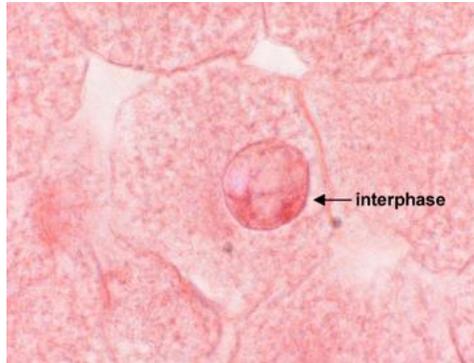
- Interphase
- Prophase
- Metaphase
- Anaphase
- Teleophase



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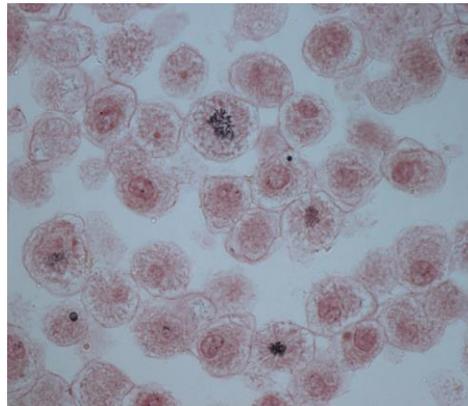
Interphase

- Ninety percent or more of the cell cycle is spent in interphase.
- Cellular **organelles replicate**.
- the **DNA replicates**, and protein synthesis occurs.
- The chromosomes are not visible and the DNA appears as **uncoiled chromatin**.



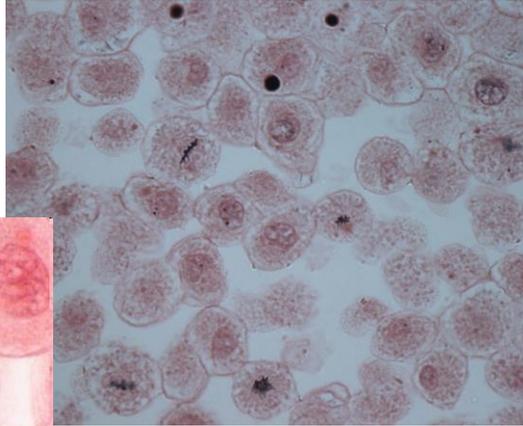
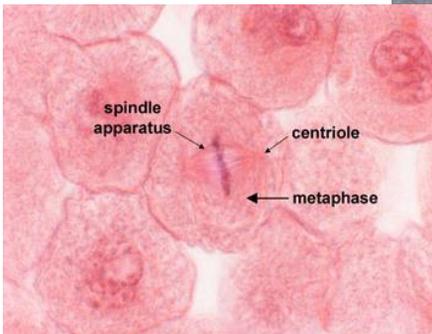
Prophase

- Chromosomes condense and coil
- Centrioles (in animal cells) move toward poles w/ spindle fibers (Fishing Line) attached to centromeres
- Longest of the phases (except for Interphase)
- Nucleolus and nuclear membrane dissolve



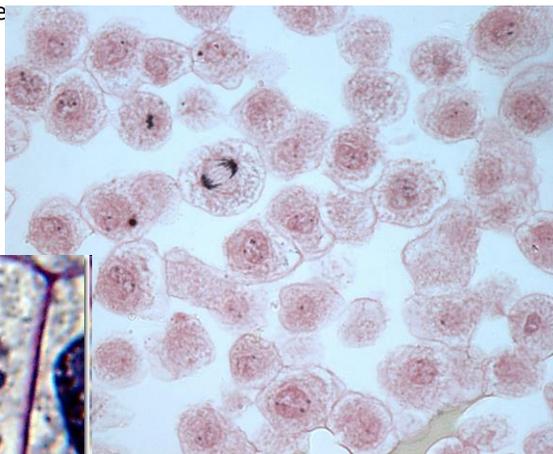
Metaphase

- Shortest of the phases
- Duplicated chromosomes line up at the equator



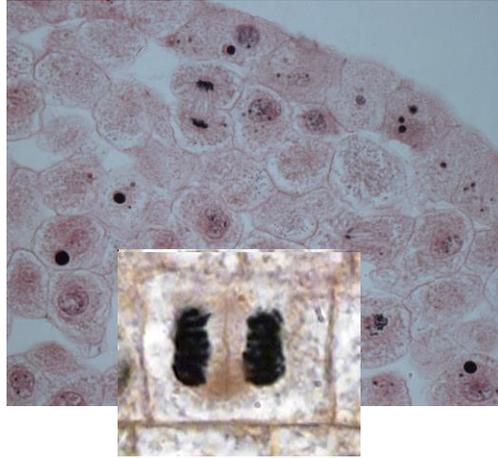
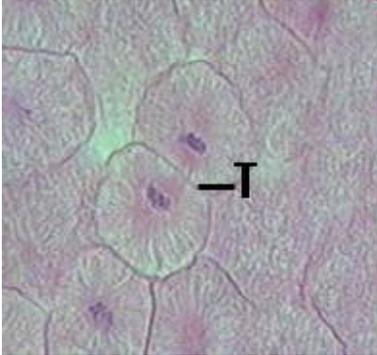
Anaphase

- Centromeres split allowing Chromatids to be pulled towards the poles
- Phase ends when chromosomes reach the poles and stop moving



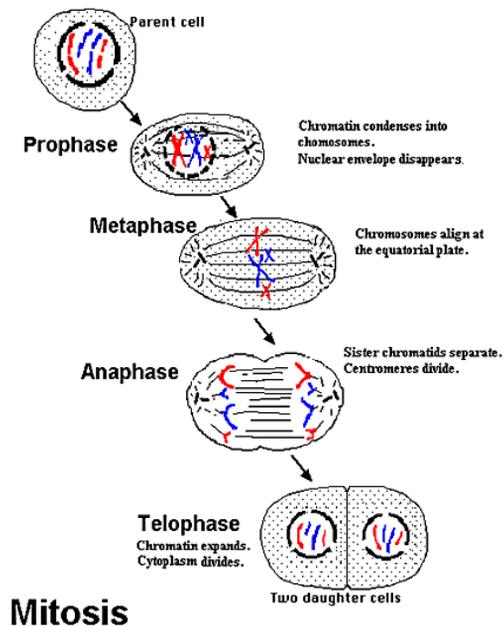
Telophase

- **Chromosomes uncoil** and becomes “thready” chromatin material again
- **New nuclear membrane** and nucleolus develop
- “Water balloon” pinches off the cell forming two separate daughter cells (cytokinesis)



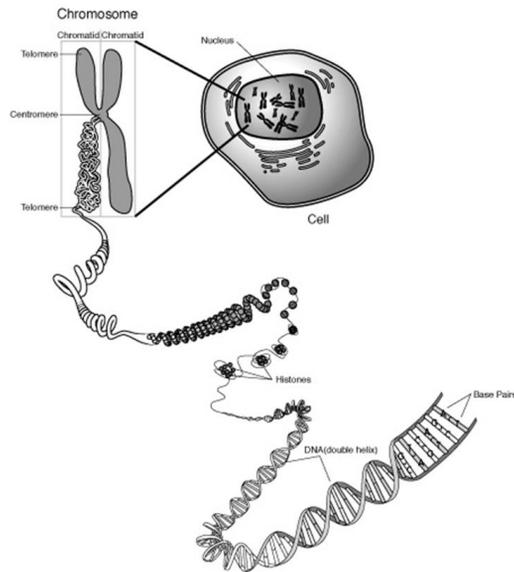
Mitosis Summary

- Mitosis is a 5 step process of **Cell Division**
- IPMAT
 - Interphase
 - Prophase
 - Metaphase
 - Anaphase
 - Teleophase



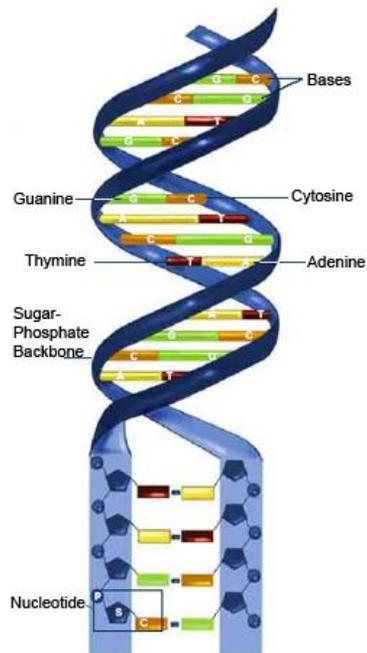
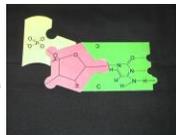
DNA – DeoxyriboNucleic Acid

- Carries all of the genetic information needed to carry on all of the cells day-to-day requirements
- During Mitosis, DNA is replicated into two identical strands then distributed into each daughter cell.
- DNA is found on chromosomes which are located in the nucleus.
- One chromosome consists of **two chromatids** held together by a **centromere**.
- Each upper & lower half of a chromatid is a **telomere**



DNA Structure

- **Double Helix** – twisted ladder
- Identified by **Watson & Crick**
- Made of 3 part segments called **nucleotides**
 - **Phosphate group**
 - **Sugar molecule**
 - **Nitrogenous base**
 - A = Adenine,
 - G= Guanine,
 - T= Thymine
 - C= Cytosine
 - **A-T**
 - **C-G**



DNA Replication

- Occurs when enzyme “unzips” DNA
- Millions of new nucleotides floating thru the nucleus
- More enzymes brings nucleotides to attach them correctly to the exposed strands of DNA
- Creates two identical strands of original DNA molecule

