Course Title

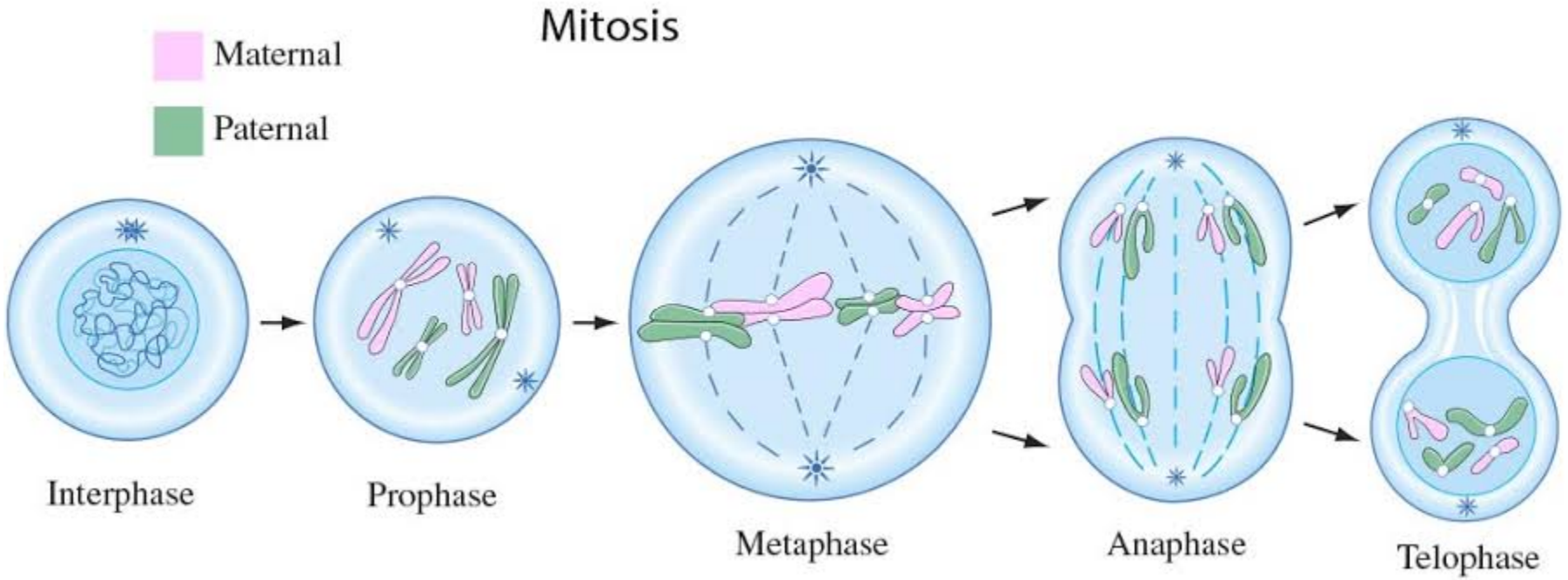
BIO 101/ **GENERAL BIOLOGY 1 (2 Units)**

PROF (MRS) I.A . KEHINDE

Section Title

- Prokaryotic and eukaryotic cells
- Cell growth, cell division and reproduction.

CELL DIVISION, REPRODUCTION AND GROWTH



CELL FUNCTIONS

- It is the basic unit of life that is responsible for all of life's processes
- It is the smallest unit that can live on its own and that makes up all living organisms and the tissues of the body.
- Cells are the lowest level of organization in every life form
- Cells comprise of several cell organelles that perform specialized functions to carry out life processes

- The discovery of cells is one of the remarkable advancements in the field of science.
- It was discovered by Robert Hooke in 1665 observed a bottle cork using compound microscope with lower magnification.
- Later, Anton Van Leeuwenhoek in 1674 also examined protists using compound microscope with higher magnification and concluded that they are living.

- In 1883, Robert Brown a Scottish botanist provided the first insights into cell structure and described the nucleus present in the cells of orchids

- **TYPES OF CELL**
- Cell types perform different functions
- Cells are grouped based on cellular structure

  Prokaryotes

  Eukaryotes

Prokaryotes: Possess cells which are without nucleus and are also single celled microorganisms e.g. Bacteria, Archaea.

- Reproduce only asexually

Eukaryotes: Possess true nuclei and they may be multicellular or unicellular. Reproduce both sexually and asexually. e.g Fungi, protozoans, plants and animals

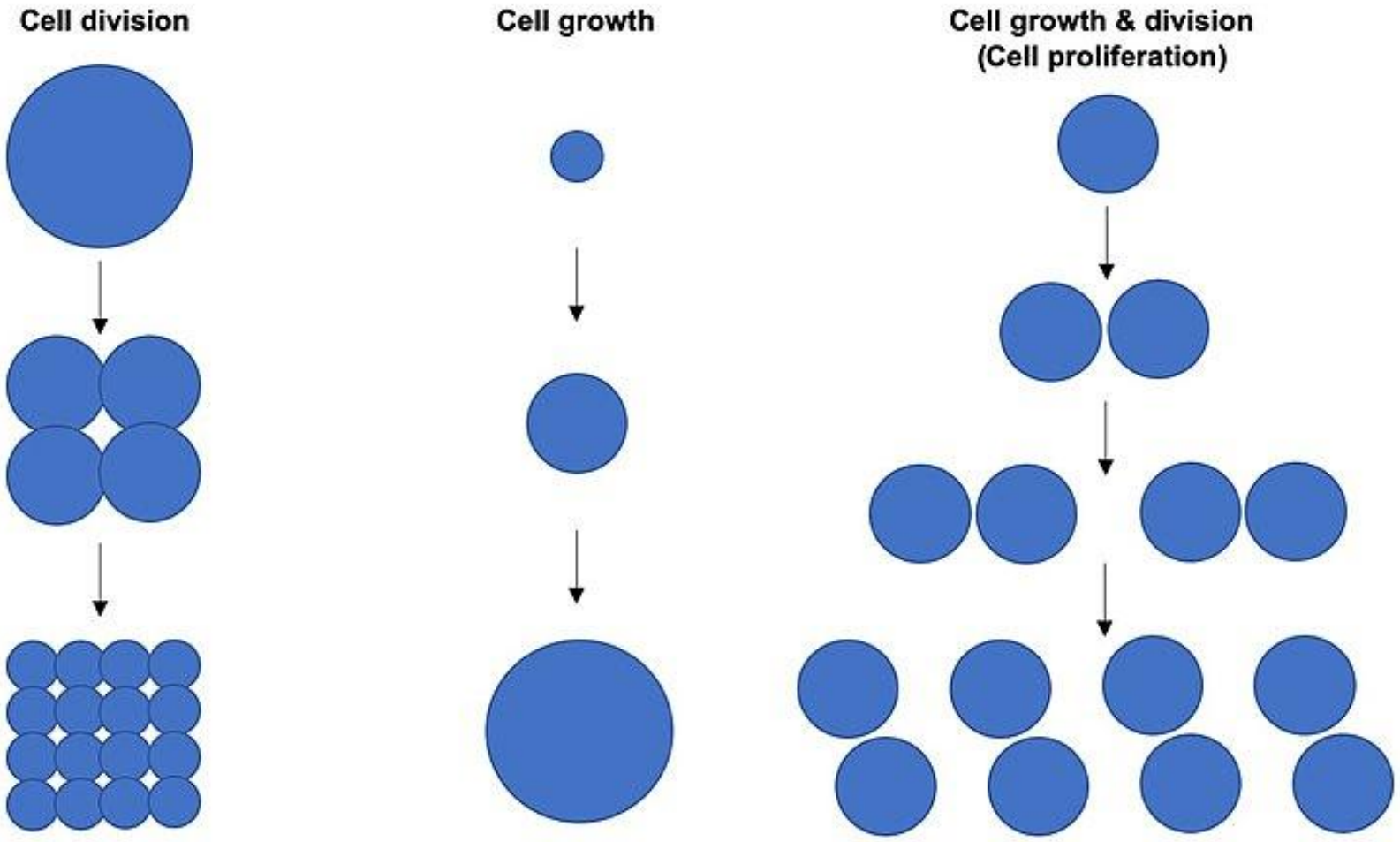
- Cells can also be grouped based on number of cells
  - **Unicellular**: Organisms with only single cell
  - **Multicellular**: organisms with more than one cells

- The sequence of event by which the cell duplicates its genome, synthesizes the other constituents of the cell and eventually divides into two daughter cells is termed **CELL CYCLE**
- Cell Division, DNA replication and Cell Growth

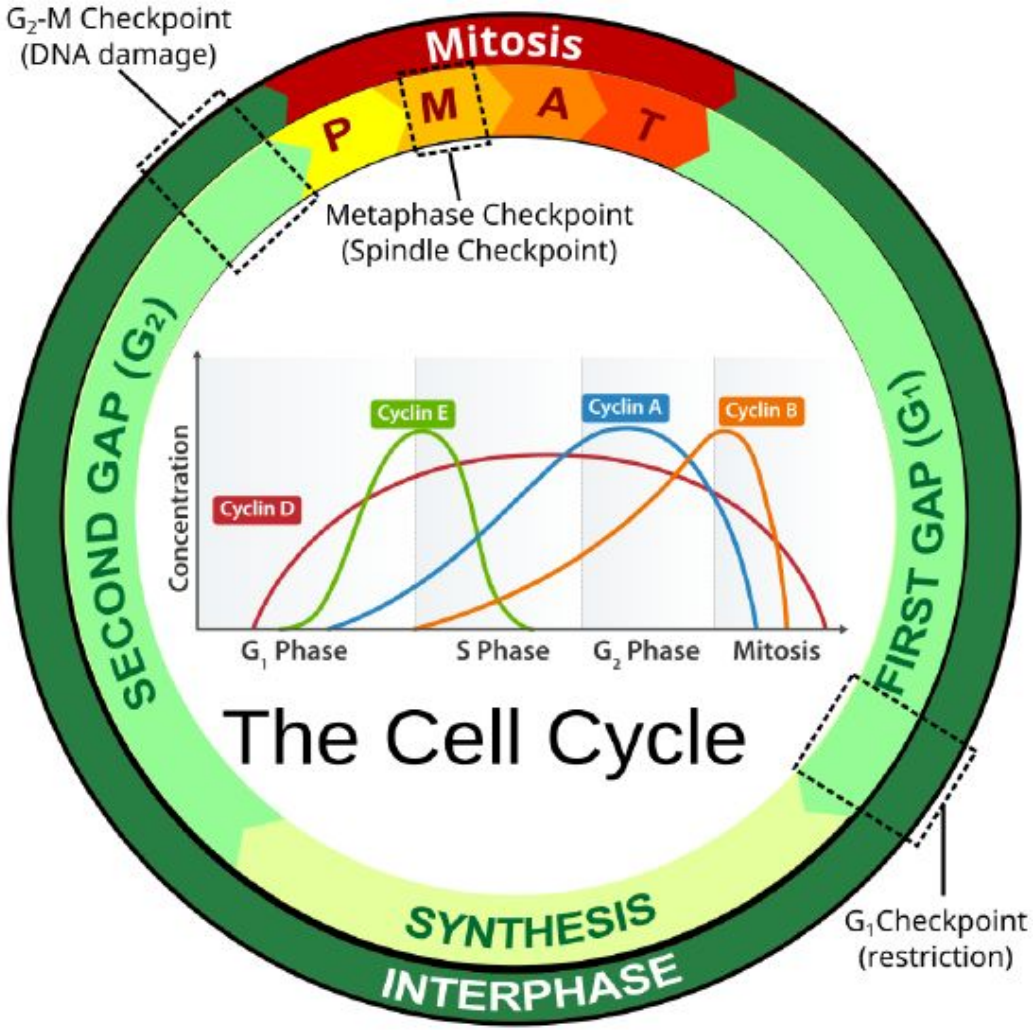
CELL DIVISION: This is the process in which one cell called parent cell divides to form new cells referred to as Daughter cells

In unicellular organisms, cell division is a means of reproduction hence simpler than multicellular organism while in multicellular it is responsible for tissue growth and maintenance

Pictorial view of cell growth and cell division



THE CELL CYCLE



WHY CELL DIVISION

Cell Growth and proliferation

- This refers to the increase in cell size or mass accumulation
- It is also increase in total mass of a cell, including both cytoplasmic, nuclear and organelle volume.
- It occurs when the overall rate of cellular biosynthetic (production of biomolecules) is greater than the overall rate of cellular degradation

Cell proliferation is the process of generating an increased number of cells through cell division.

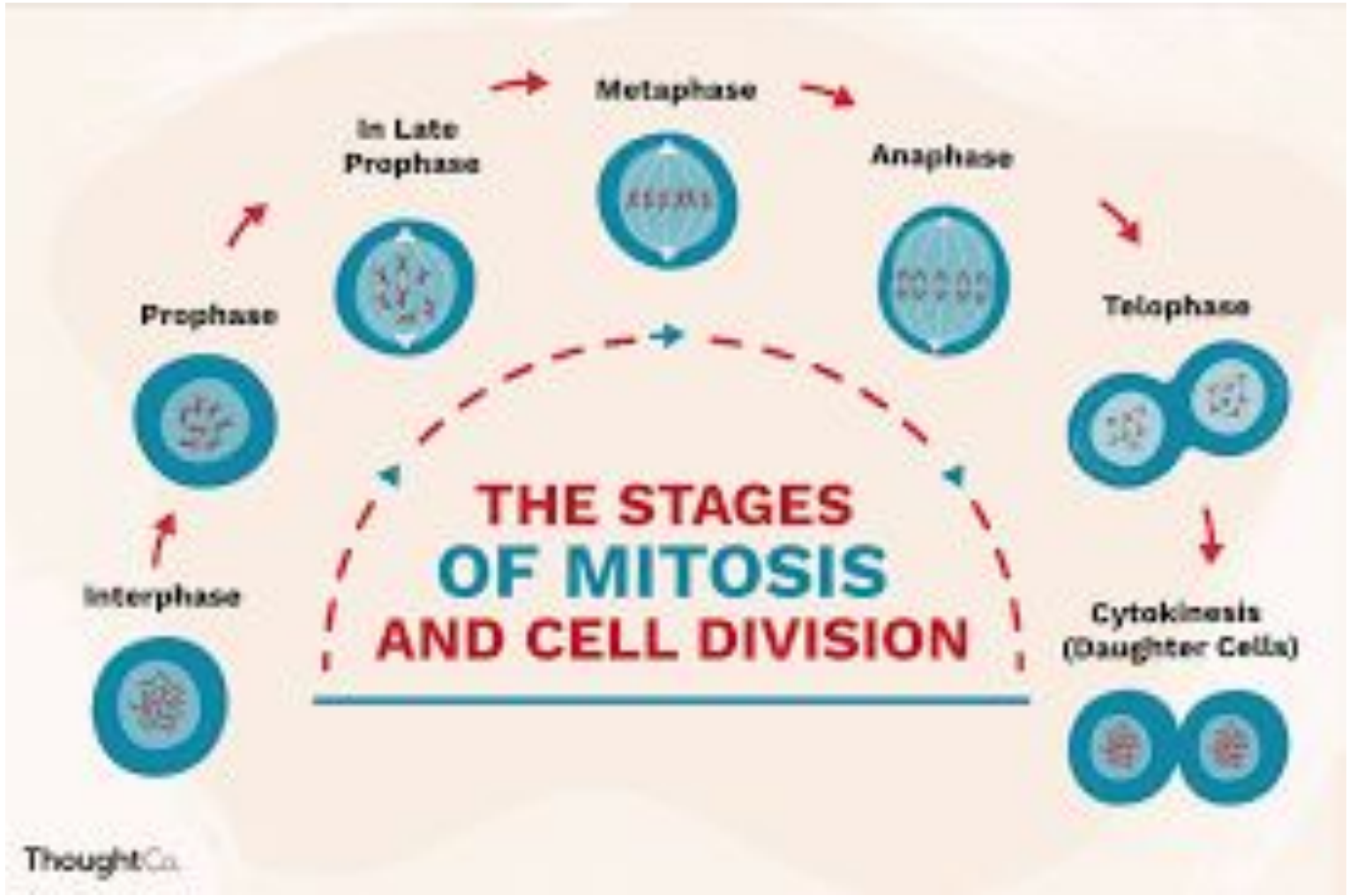
STAGES/PHASES OF CELL CYCLE

- Cell division is divided into
- **Stage 1: interphase** (the period before cell division
  - Growing (G_1); here cells grow to full size and ensure all organelles are present
  - Copying/replication of DNA also known as Synthesis (S) phase
  - Preparing for Division/ Rest phase(G_0)

- **Stage 2: Mitosis**

One nucleus divides to create 2 involving the chromosome

- **Prophase**- Chromosome and spindles fibres form (envelope) membrane breaks down
- **Metaphase**- Chromosomes line up across the centre and attach to the spindle fibre
- **Anaphase**- Centromeres split, chromatids separate and move to opposite ends
- **Telophase**- Chromosomes stretch out; new nuclear (envelope) membrane forms around the chromosomes


Metaphase
In Late Prophase
Anaphase
Prophase
Telophase
THE STAGES
OF MITOSIS
AND CELL DIVISION
Interphase
Cytokinesis (Daughter Cells)
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