Essential cell biology notes:

## Chapter 1

## What is in this chapter?

- Variety of cell types
- Chemical machinery in cells (organelles)
- Microscopes
- Similarities among different cells

## Keywords/Ideas:

- **cells**: The fundamental units of life
- **cell biology:** the study of cell and their structure, function, and behavior
- Size difference: Lactobacillus is a few micrometers in length, while frog eggs are 1 mm in length.
- Shape difference: Nerve cells are very thin/long. Paramecium is shaped in a submarine with thousands of cilia (hair-like extension). Narts for ery rigid, and shaped like a box.
- Chemical difference: Some require ox some don't.
- → The differences reflect the ofference in its function. In realticellular organisms, there is a division of both among cell, allowing some cells to become specialized.
- Similarities: In all organisms, genetic information in the form of genes is carried in DNA molecules. In every cell, the long DNA polymer chain are made from the same set of four monomers (nucleotides).
- DNA is **transcribed** (read out) into **RNA** → A subset of RNA molecules is **translated** into protein.
- The Central Dogma: The flow of information from DNA to RNA to Protein.
- Proteins dictate the behavior and appearance of cells. Functions include, the cell's structural support, chemical catalyst (enzyme), molecular motors, and many more.
- Proteins are built from amino-acids. There are 20 amino acid types. Amino acids are linked in difference sequences, giving each type of protein difference threedimensional shape (conformation).
- Anything without a cell is not an organism. **Viruses** are therefore not categorized as a living organism.
- Virus: Compact packages of genetic information in the form of DNA or RNA, encased