LECTURE 1.

RULES AND REGULATIONS.
CELL PHYSIOLOGY.
CELL TRANSPORT MECHANISMS.

DR. SZYMON ZMORZYŃSKI

Preview from Notesale.co.uk
Page 1 of 40

TOPICS

- Introduction
- Cell physiology
- Nucleus and cell cycle
- Homeostasis and fluids
- Plasma membrane
- Transport across plasma membrane
- Membrane potentials

Physical Structure of the Cell

- The cell is not merely a bag of fluid, enzymes, and chemicals.

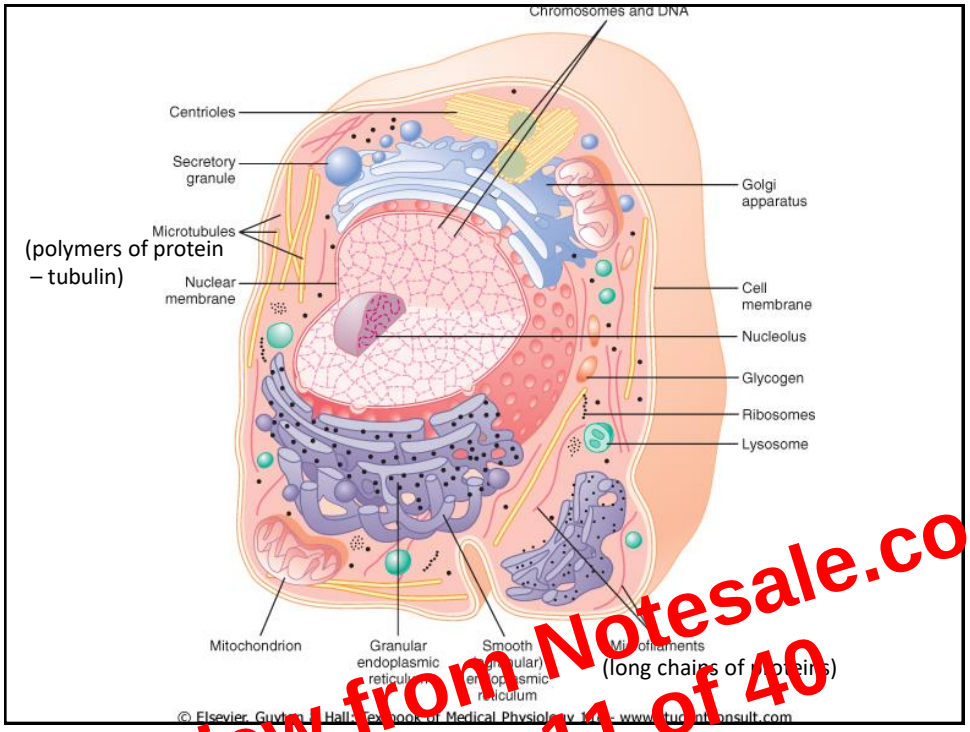
- It also contains highly organized physical structures, called ***intracellular organelles.***

Preview from Notesale.co.uk
Page 10 of 40

Physical Structure of the Cell

- Most organelles of the cell are covered by membranes composed primarily of lipids and proteins.

- These membranes include the
  - *cell membrane,*
  - *nuclear membrane,*
  - *membrane of the endoplasmic reticulum,*
  - *membranes of the mitochondria, lysosomes,* and *Golgi apparatus*



Preview from Notesale.co.uk
Page 11 of 40

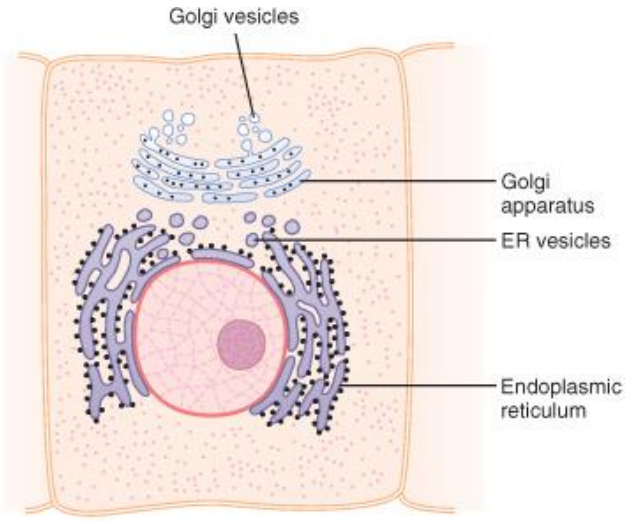
Ribosomes and the Granular Endoplasmic Reticulum

- Attached to the outer surfaces of many parts of the endoplasmic reticulum are large numbers of minute granular particles called ***ribosomes***.
- Where these are present, the reticulum is called the ***granular endoplasmic reticulum***.
- The ribosomes are composed of a mixture of RNA and proteins, and they function to synthesize new protein molecules in the cell

Golgi Apparatus

- The Golgi apparatus has membranes similar to those of the agranular endoplasmic reticulum.
- It usually is composed of four or more stacked layers of thin, flat, enclosed vesicles lying near one side of the nucleus.
- This apparatus is prominent in secretory cells, where it is located on the side of the cell from which the secretory substances are extruded.

Preview from Notesale.co.uk
Page 13 of 40



© Elsevier. Guyton & Hall: Textbook of Medical Physiology 11e - www.studentconsult.com

Homeostasis

- The term *homeostasis* means the ***maintenance of nearly constant conditions in the internal environment.***

- Essentially all organs and tissues of the body perform functions that help maintain these constant conditions.
  - For instance, the lungs provide oxygen to the extracellular fluid to replenish the oxygen used by the cells, the kidneys maintain constant ion concentrations, and the gastrointestinal system provides nutrients.

Preview from Notesale.co.uk
Page 21 of 40

Extracellular Fluid
-The "Internal Environment"

- About 60 per cent of the adult human body is fluid, mainly a water solution of ions and other substances.

- Although most of this fluid is inside the cells and is called ***intracellular fluid****,* about one third is in the spaces outside the cells and is called ***extracellular fluid****.*

- This extracellular fluid is in constant motion throughout the body. It is transported rapidly in the circulating blood and then mixed between the blood and the tissue fluids.

TOPICS

- Introduction
- Cell physiology
- Nucleus and cell cycle
- Homeostasis and fluids
- Plasma membrane
- Transport across plasma membrane
- Membrane potentials

Preview from Notesale.co.uk
Page 37 of 40

Electrical potentials exist across the membrane of virtually all cells of the body