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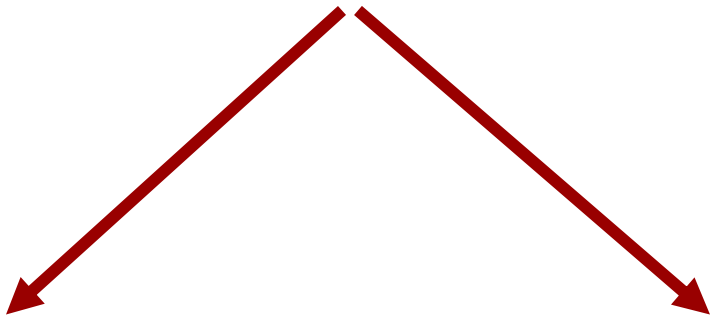
2 approaches to study Physiology



Teleological

WHY?

Mechanistic

HOW?

Physiology is closely related to

Anatomy

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Syllabus for General Physiology –)

- Homeostasis
- Body fluids
- Structure and function of cell
- Transport across membrane
- Membrane potentials

Functional levels of organization

* Chemical or molecular level

* Cellular level

* Tissue level

* Organ level

* Body system level

* Whole body level

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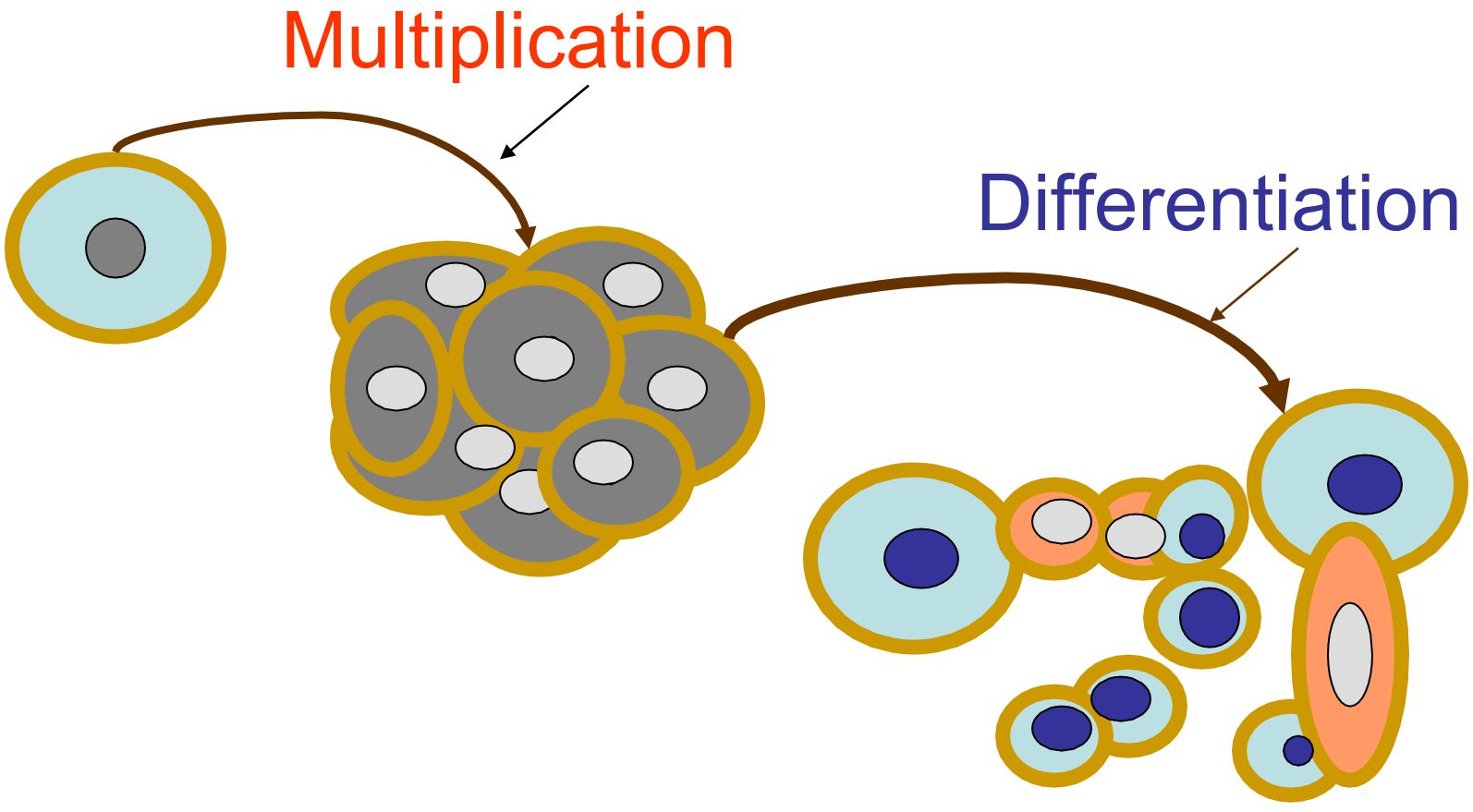
Transition

unicellular organism → multicellular organism



Typical cell & variation

Structure :- Limiting membranes

Cell Organelles – membrane bound

- without membrane

Structure & functions of Organelles

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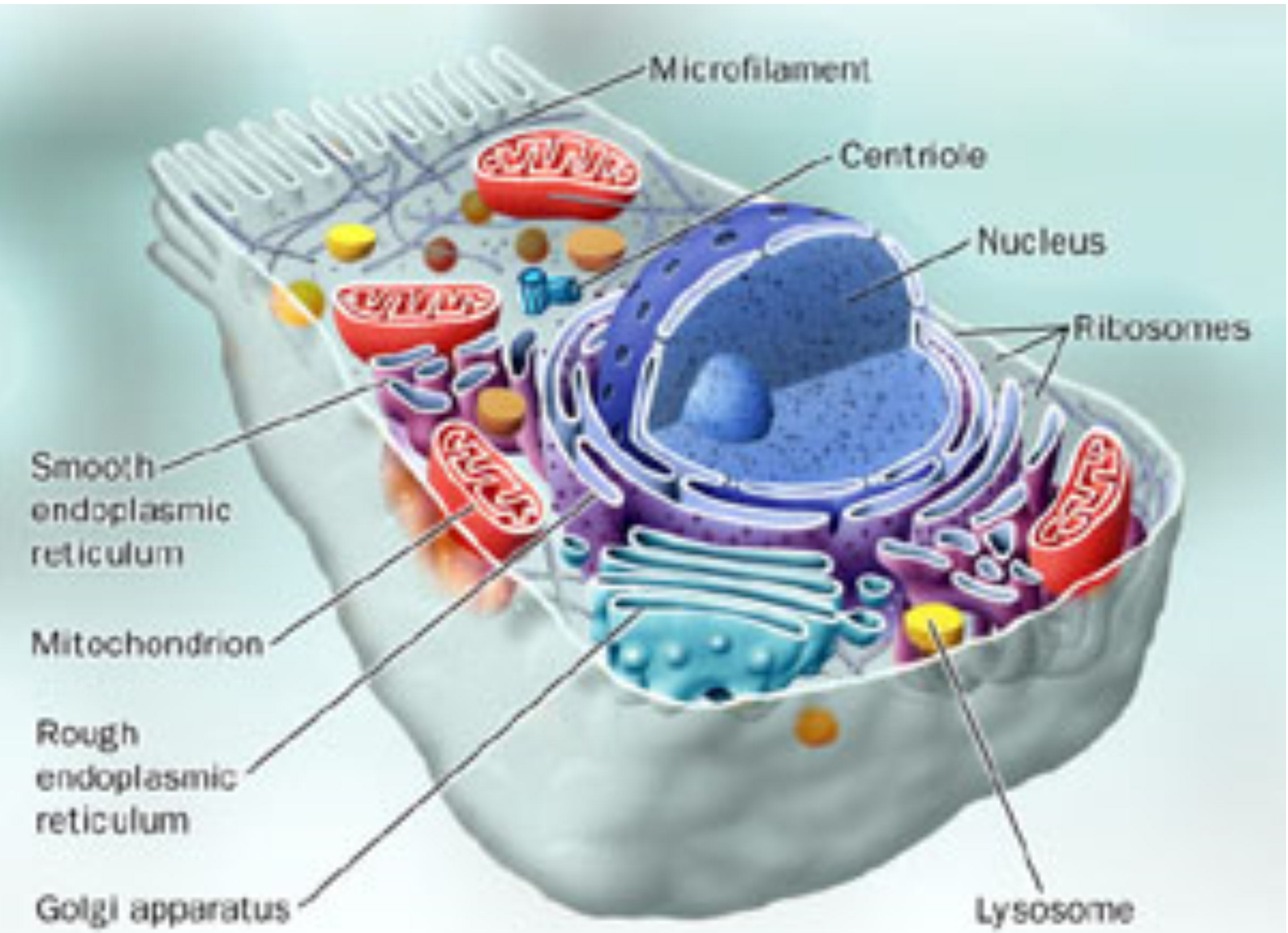

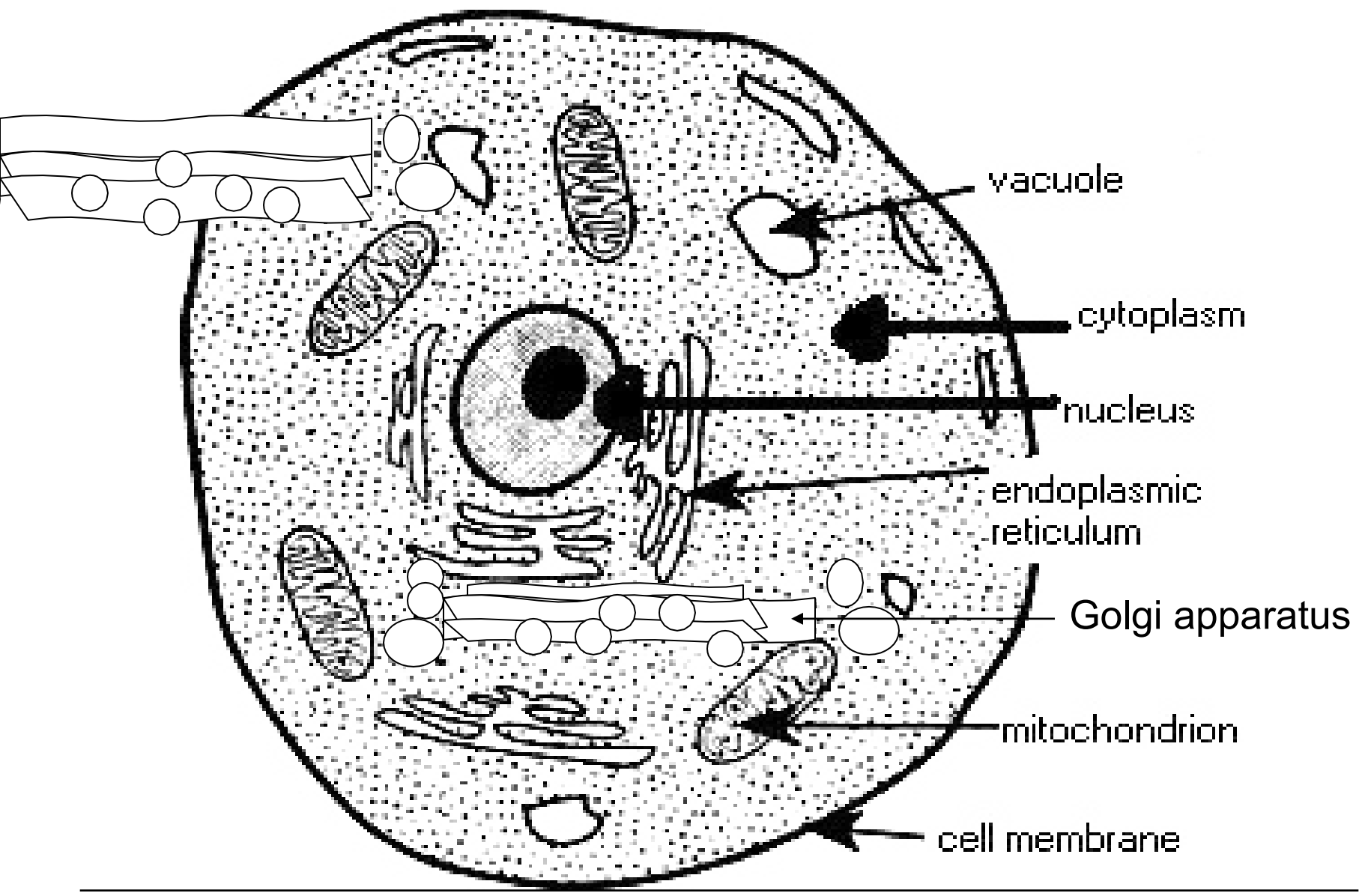

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Functions of cell as a whole

- Obtaining O2 & nutrients from environment
- Performing chemical reactions
- Elimination of waste products
- Synthesis of proteins for structure, growth
- Controlling exchange of material
- Intracellular movement of materials
- Sensitiveness &response to environment
- Reproducing

Other functions

-Endocytosis
- Pinocytosis
- Receptor mediated
- Phagocytosis

- Exocytosis

- Intercellular junctions
  - Tight junctions
  - Gap junctions
  - Desmosomes

-Movement of cilia ,flagella

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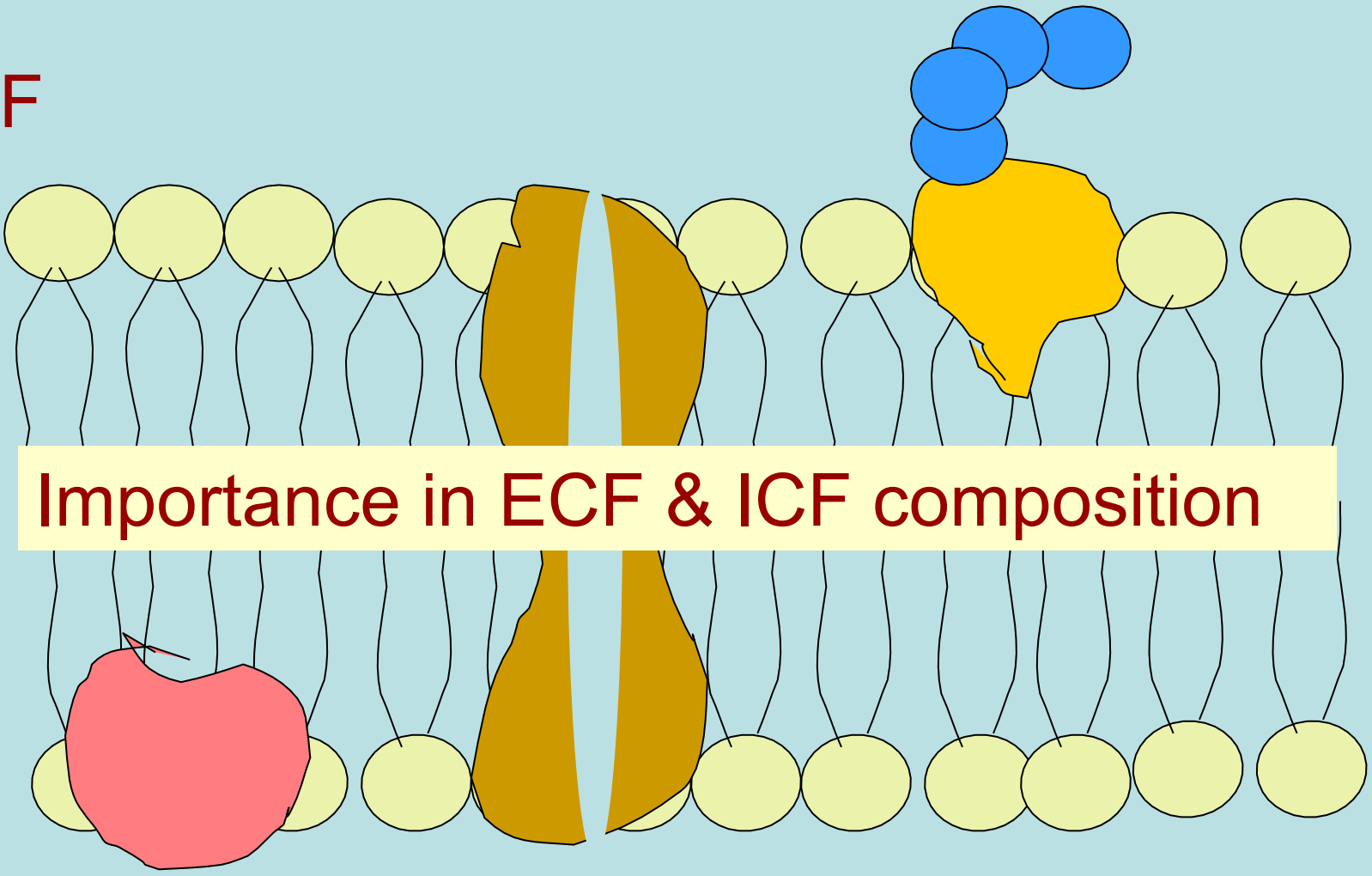
ECF



Importance in ECF & ICF composition

ICF

Intercellular communication

Paracrine | Endocrine | Neurocrine

Intercellular communication

transport of substances across the cell membrane

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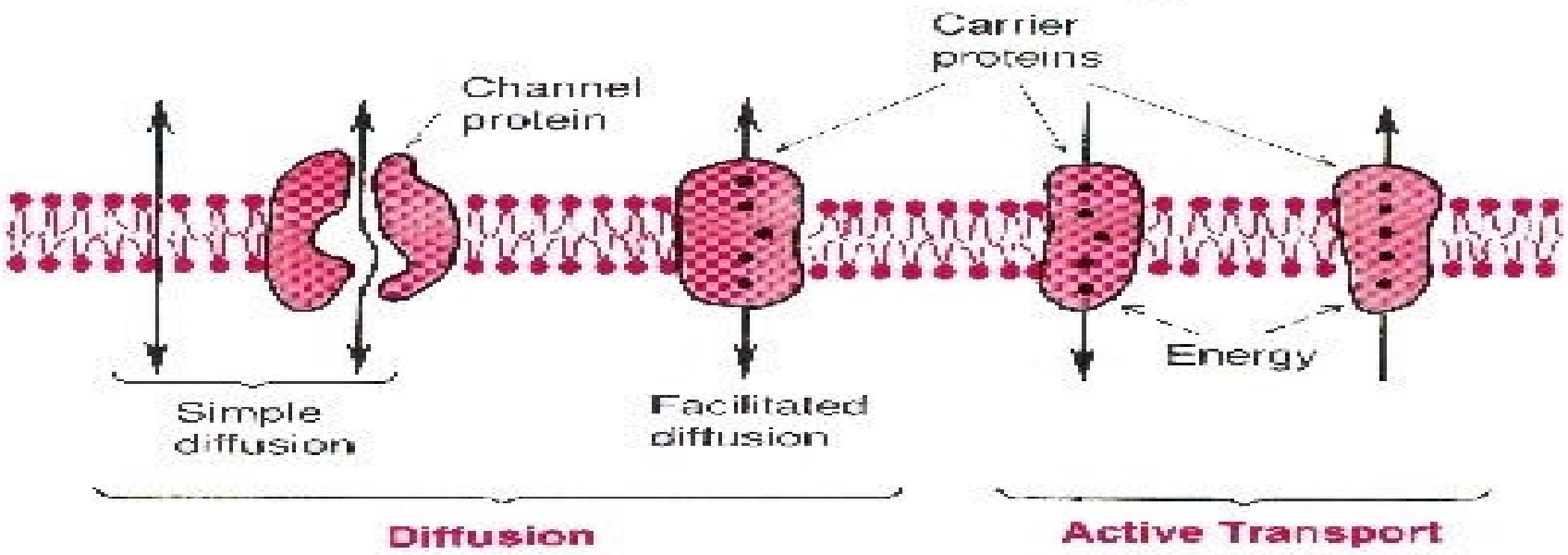
Methods of transport

- Passive
  - -Diffusion
    - Simple
      - Lipid bilayer
    - facilitated
      - Protein channels
        - Leaky channels
        - Gated channels
          - voltage gated
          - Ligand gated
  - Osmosis
  - Filtration
- Active

Cell Membrane Transport



1) Lipid soluble through phospholipid matrix.

2) Water soluble through protein channels – gated or non-gated.

3) Carrier mediated transport – e.g. facilitated diffusion

4) Osmosis of water through protein channels.

1) Direct active transport – e.g. sodium-potassium pump.

2) Indirect active transport – e.g. co-transport.

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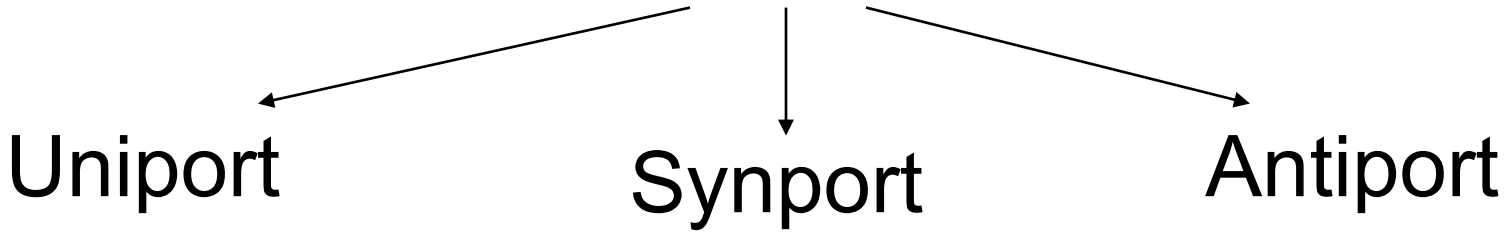
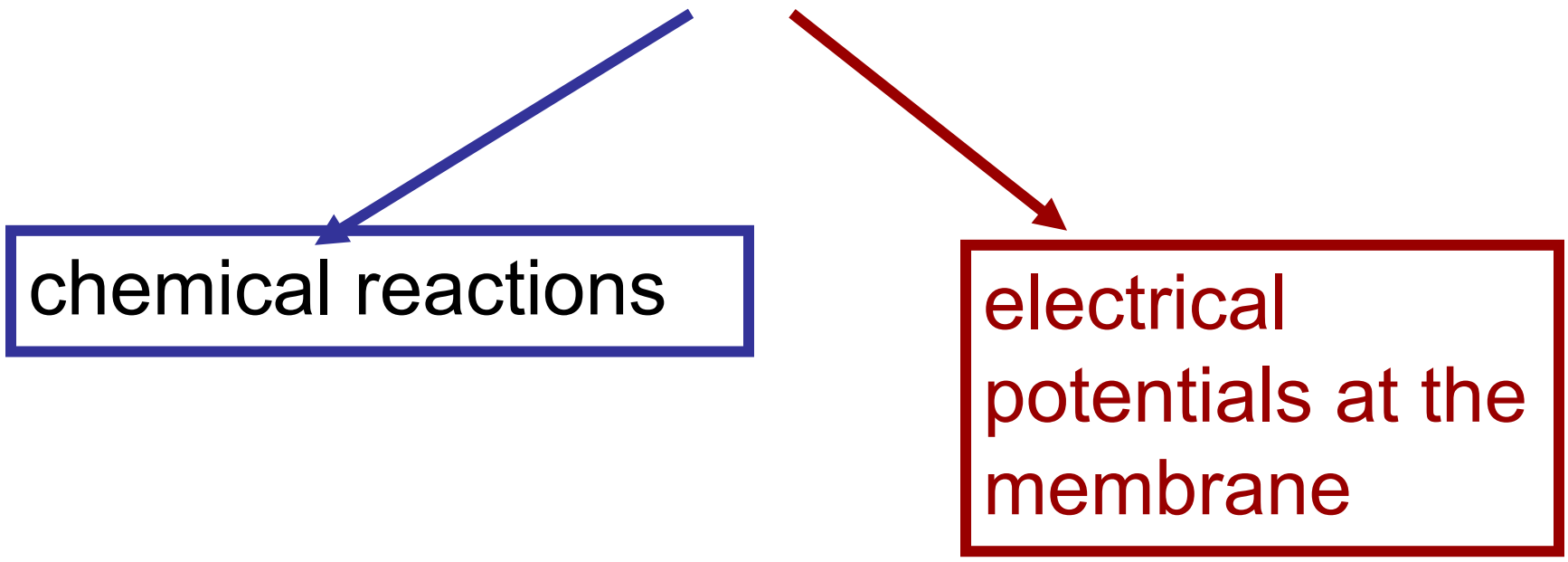
Active transport

- Primary active transport
- Secondary active transport

Types of transporters



Substances transported for



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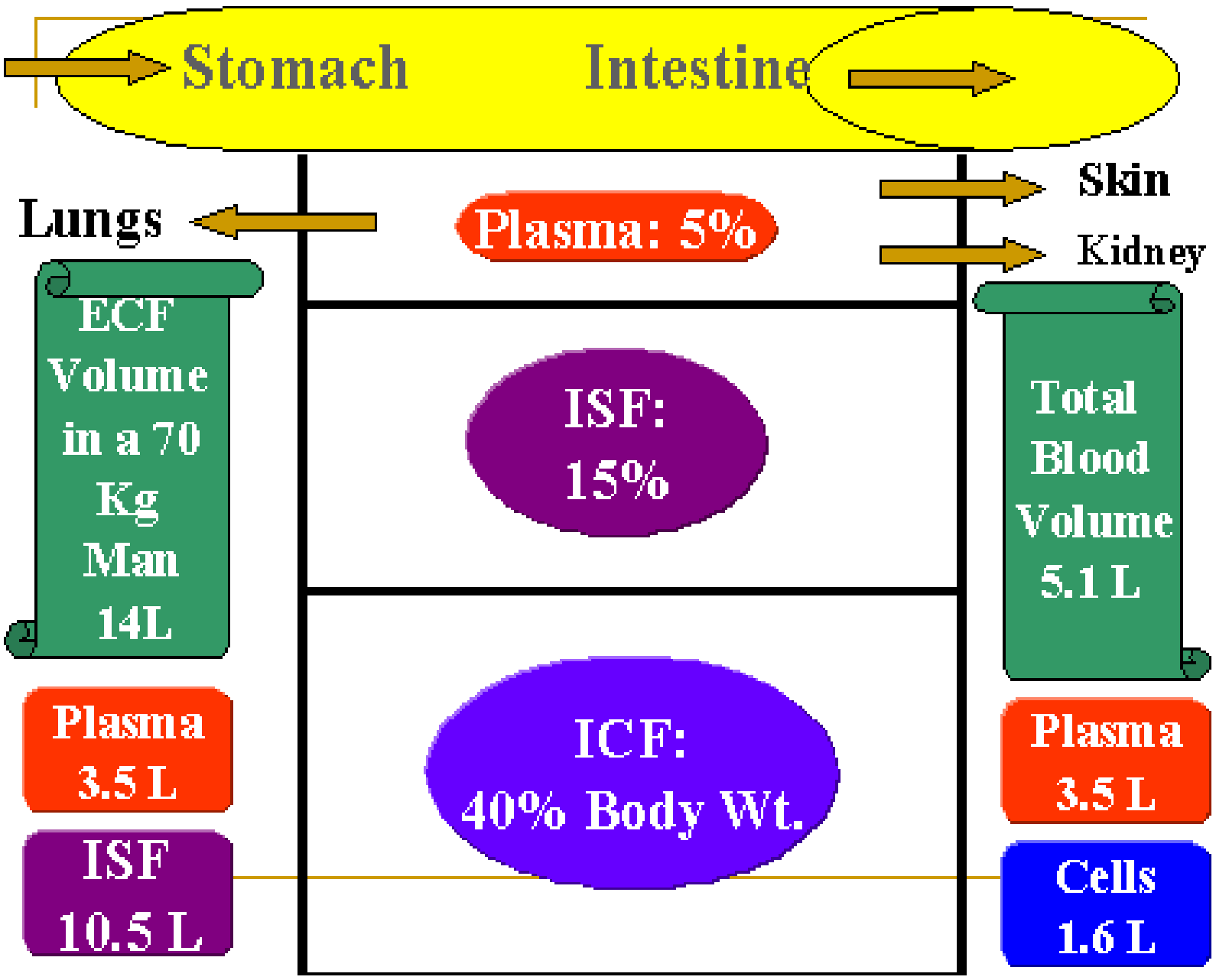

Body fluid compartments- 60% of body wt.

ICF-2/3

ECF – 1/3

- Interstitial fluid
- plasma
- Transcellular

Measured by dye dilution method

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Term used for describing conc. Of solutions in Physiology

Molarity & Normality (equivalent)

Osmolarity and tonicity

pH & buffers

Terms used in homeostasis

Milieu Interior

Parameters

Role of each system

controlled

Mechanisms involved- → negative
Mechanisms involved- → positive

Feedback mechanisms

Feed forward mechanisms

Gain , limitations

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