

Nerve Muscle Physiology



Camillo Golgi

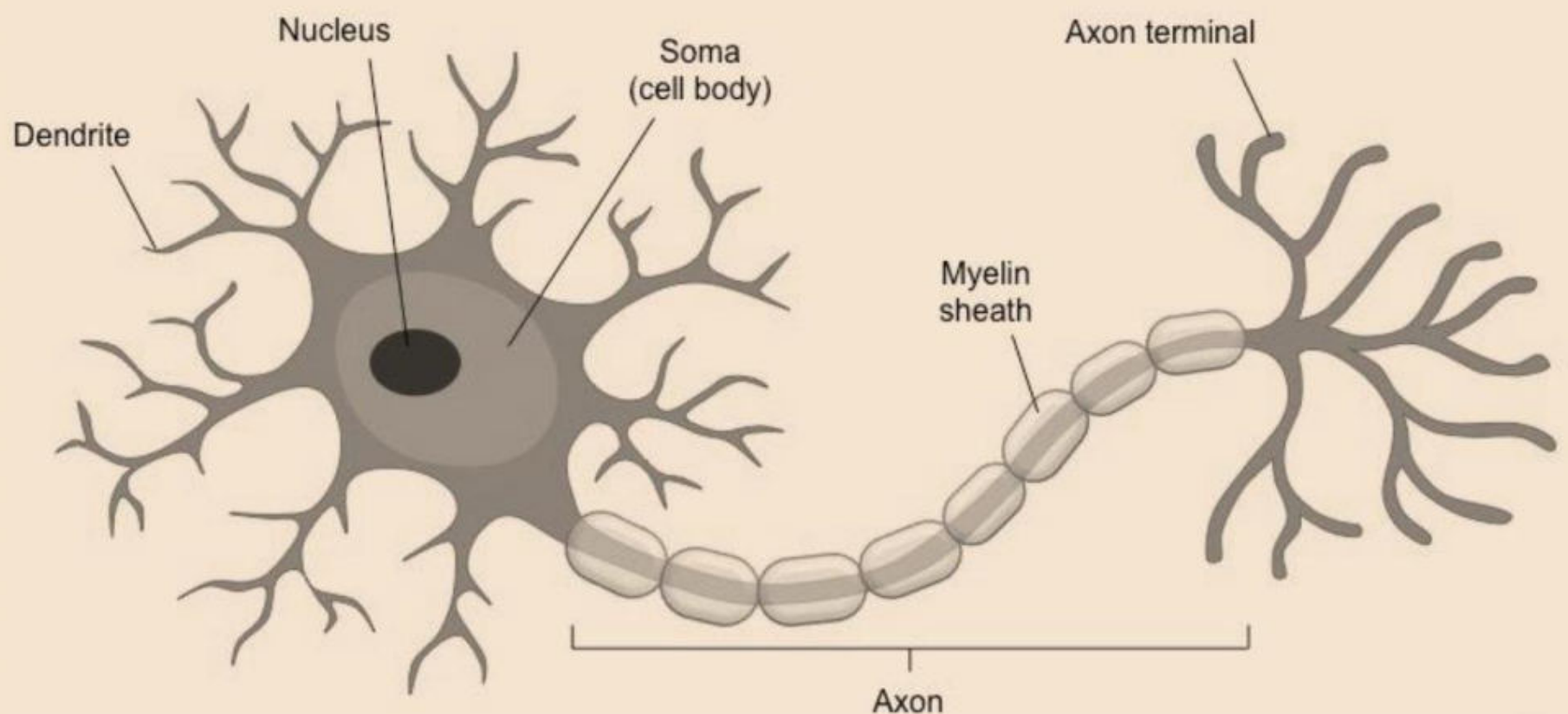
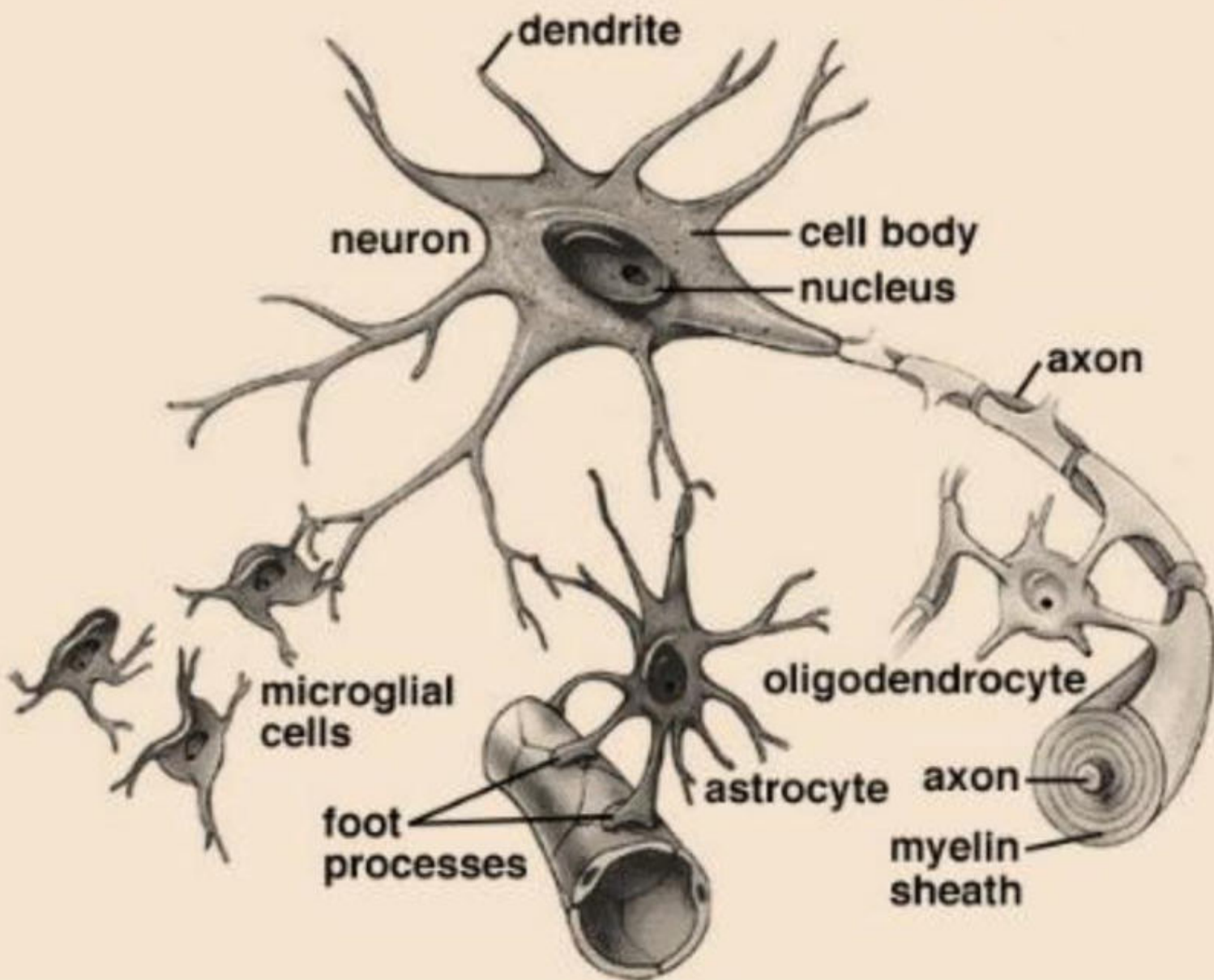


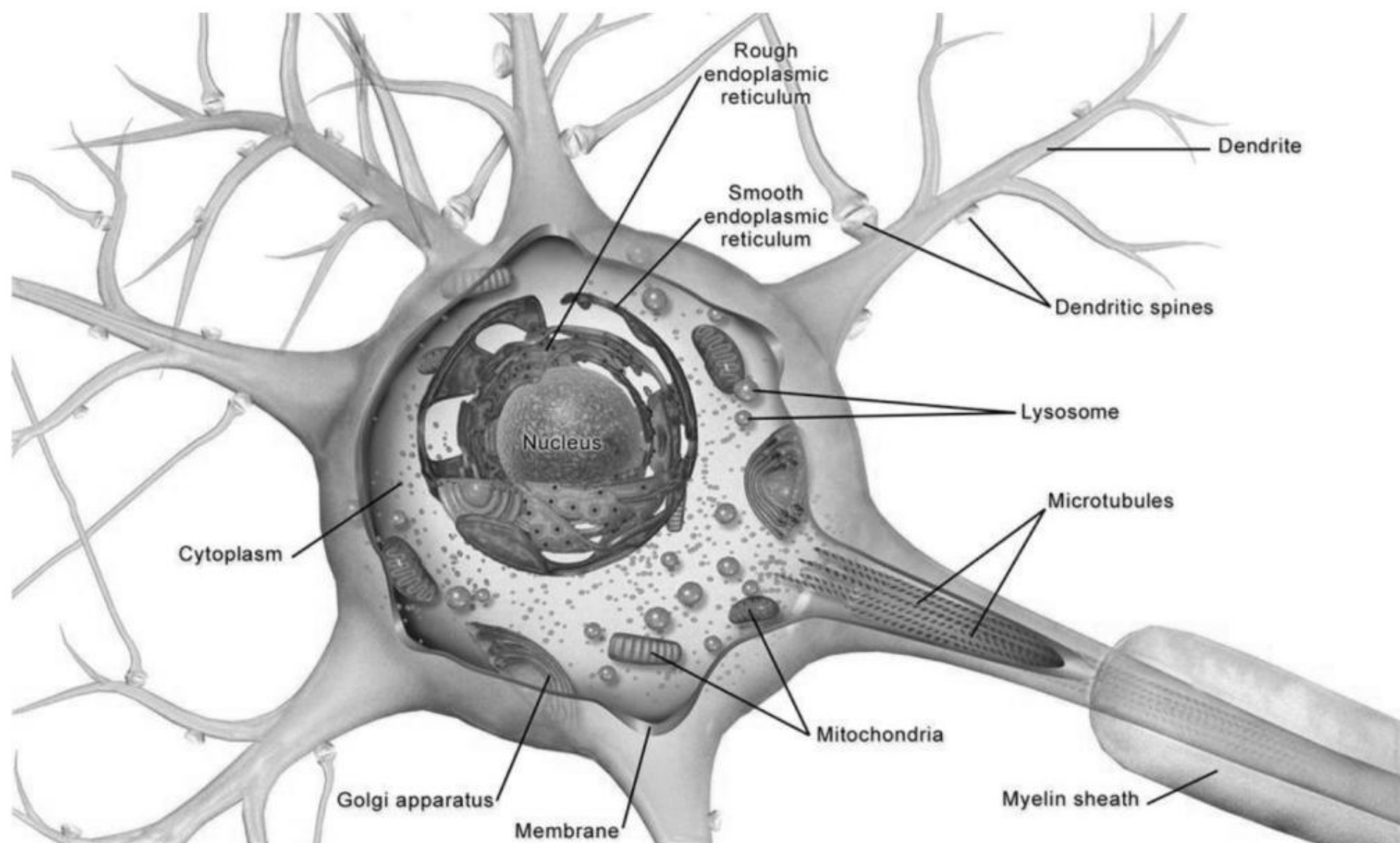
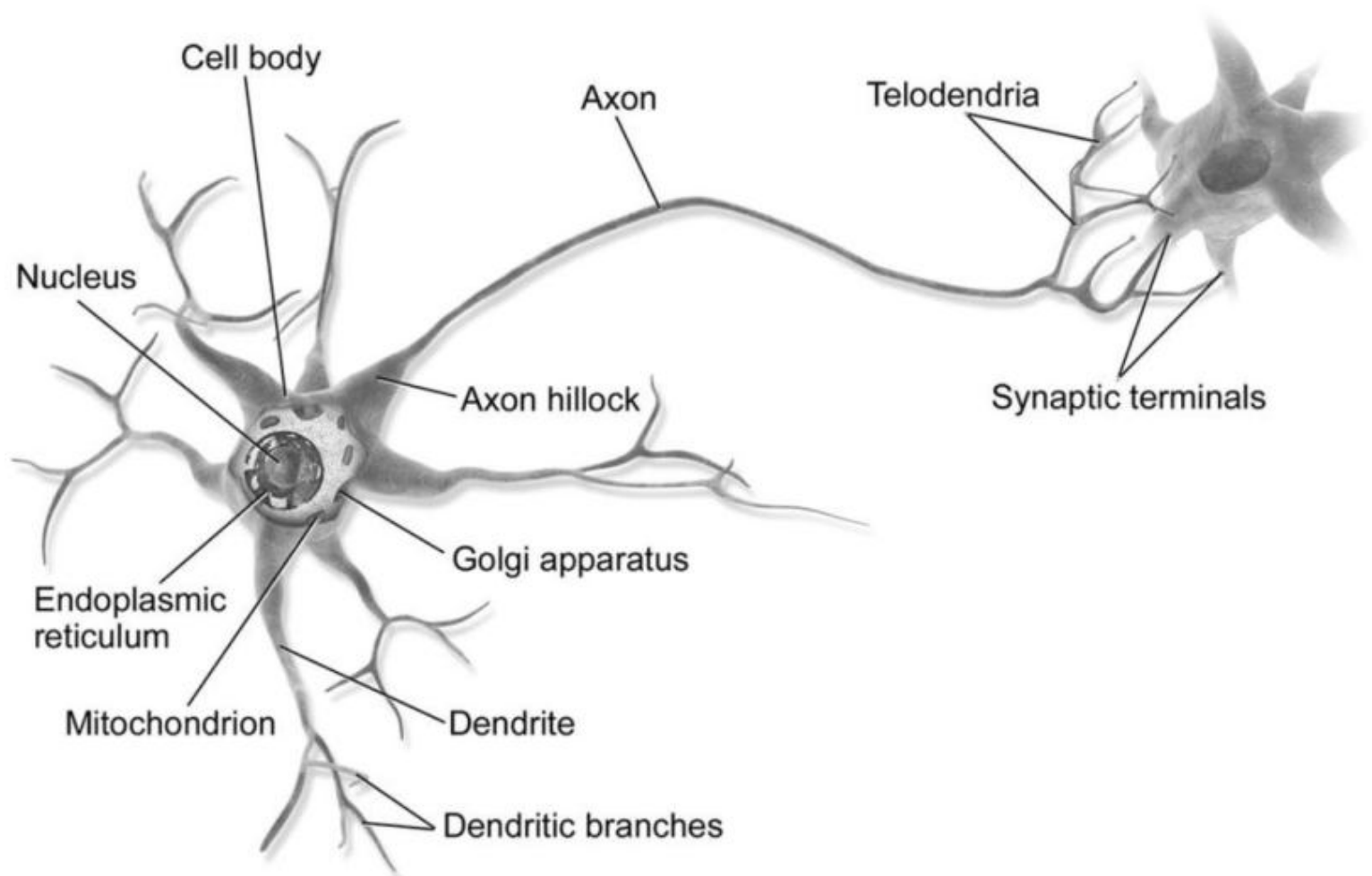
SR y Cajal

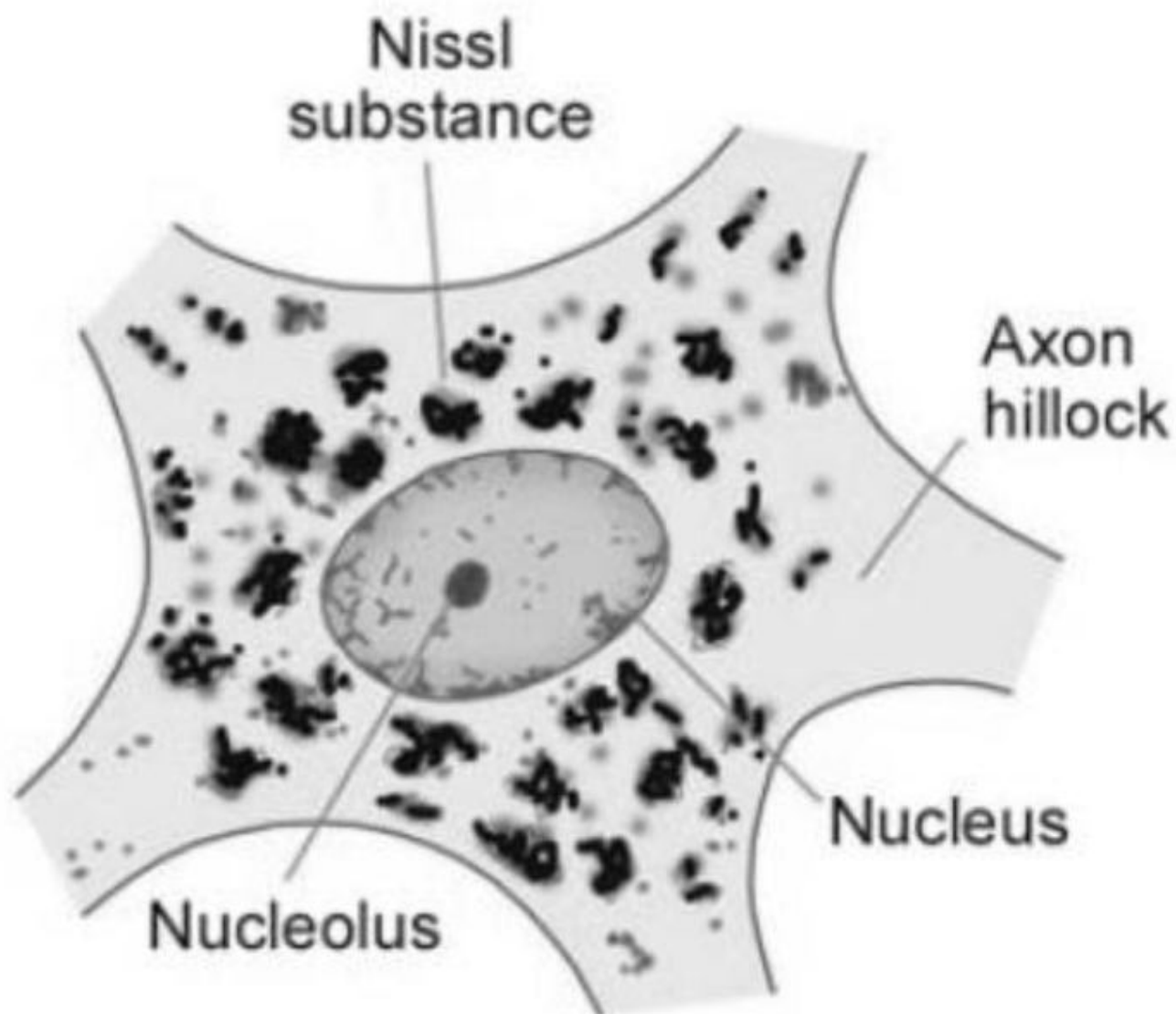
Nerve Physiology

- Introduction
 - Glial cells
 - Neuronal Structure
 - Types of neurons
 - Myelination
 - Axoplasmic transport
 - Nerve growth factors
-
- Human CNS contain 100 billion neurons
 - Glial cells – 2-10 times the number of neurons
 - **2 types of glial cells:**
 - Microglia – scavenger cells
 - Macroglia- 3 types:
 1. Oligodendrocytes
 2. Schwann cells
 3. Astrocytes- Fibrous and Protoplasmic

Neurons and neuroglia







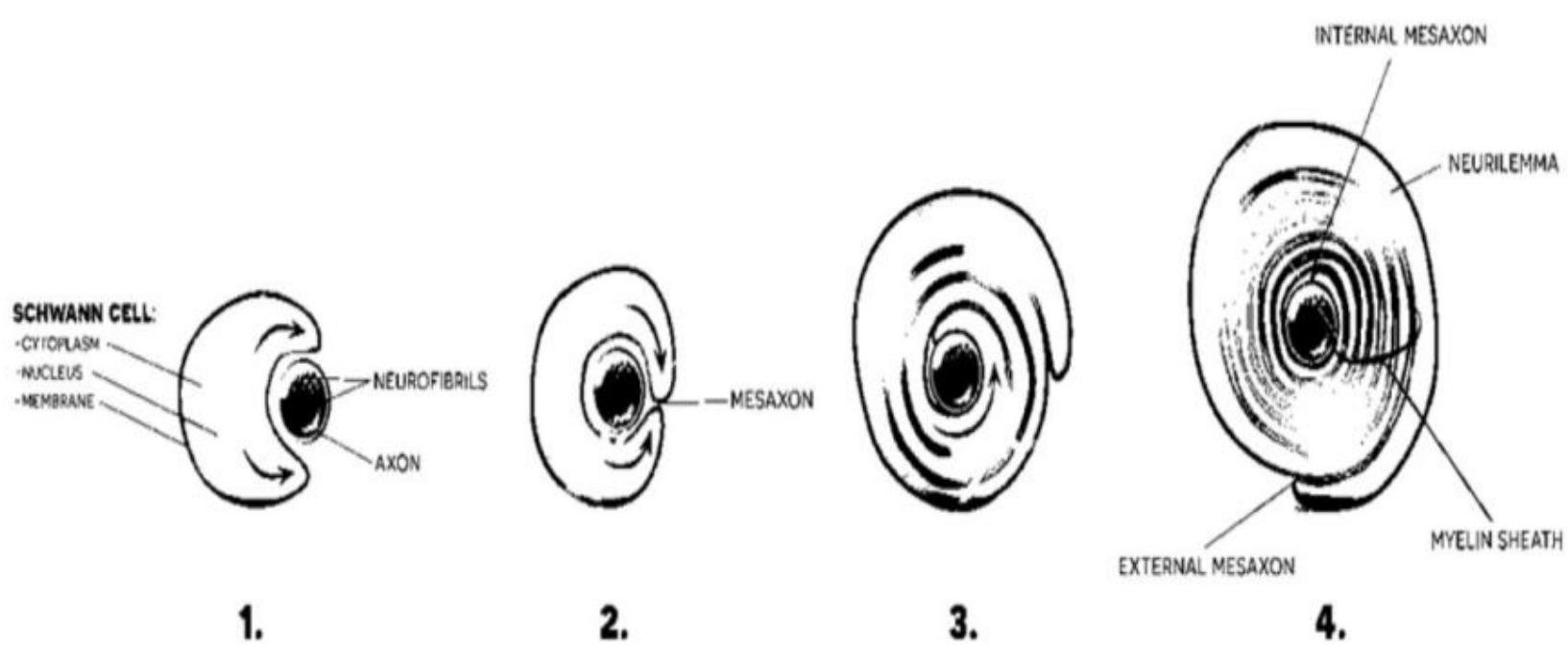
Types of axon

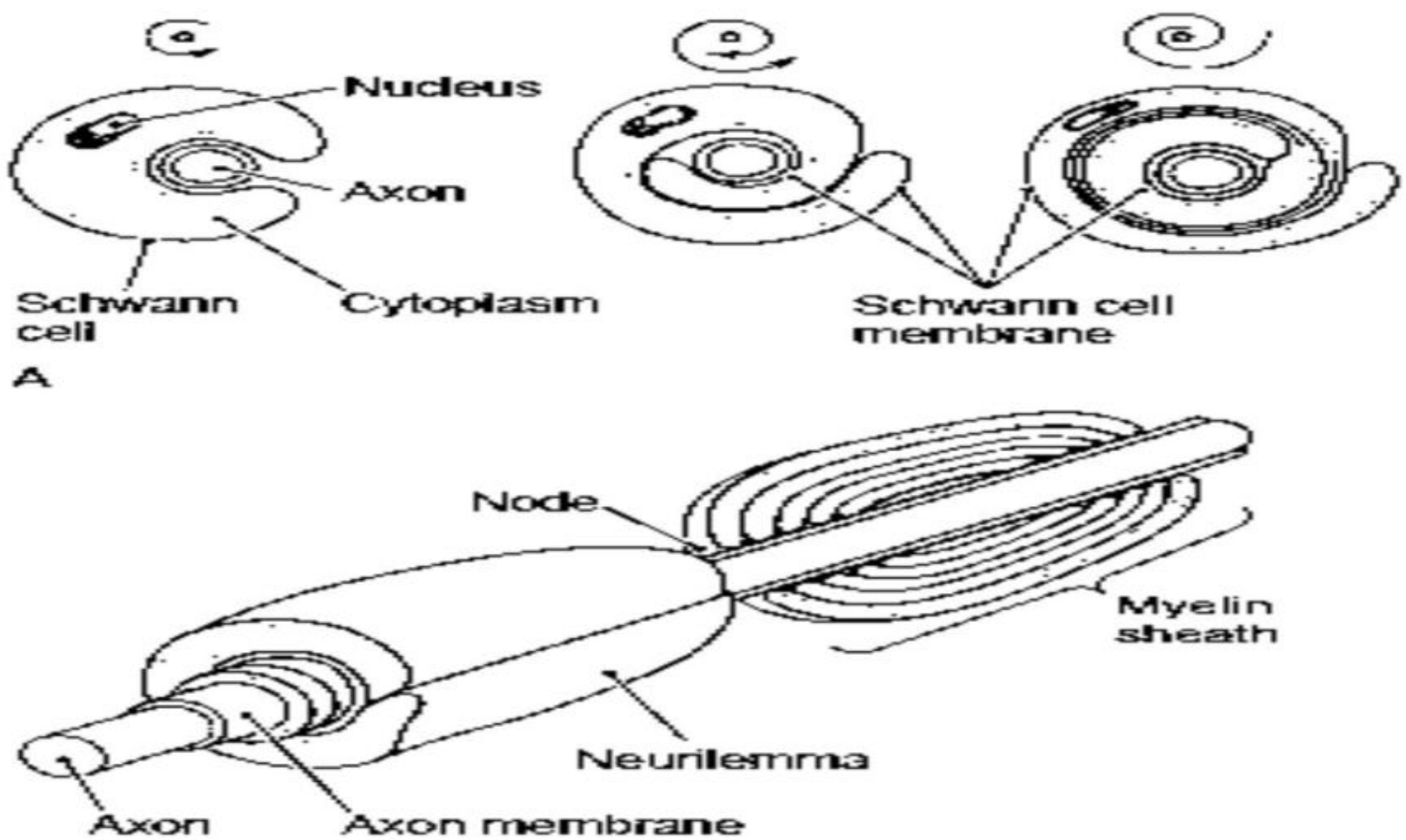
- Myelinated
- Unmyelinated

Theodor Schwann



**MYELIN SHEATH
FORMATION STAGES**





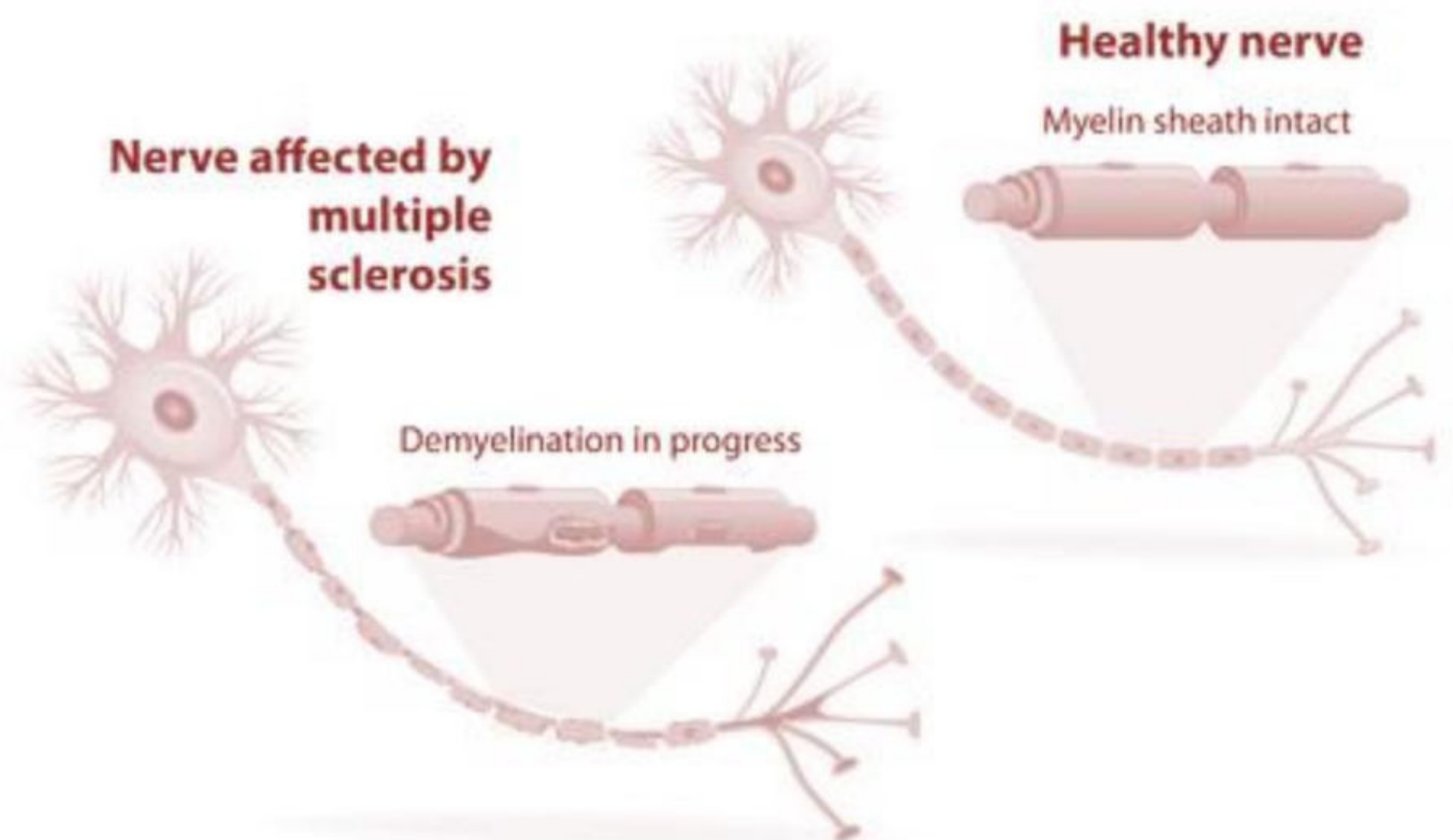
Composition of Myelin sheath

- Proteins
- Lipids- Cholesterol, Phospholipid and glycosphingolipids
- Water

Objectives of myelination

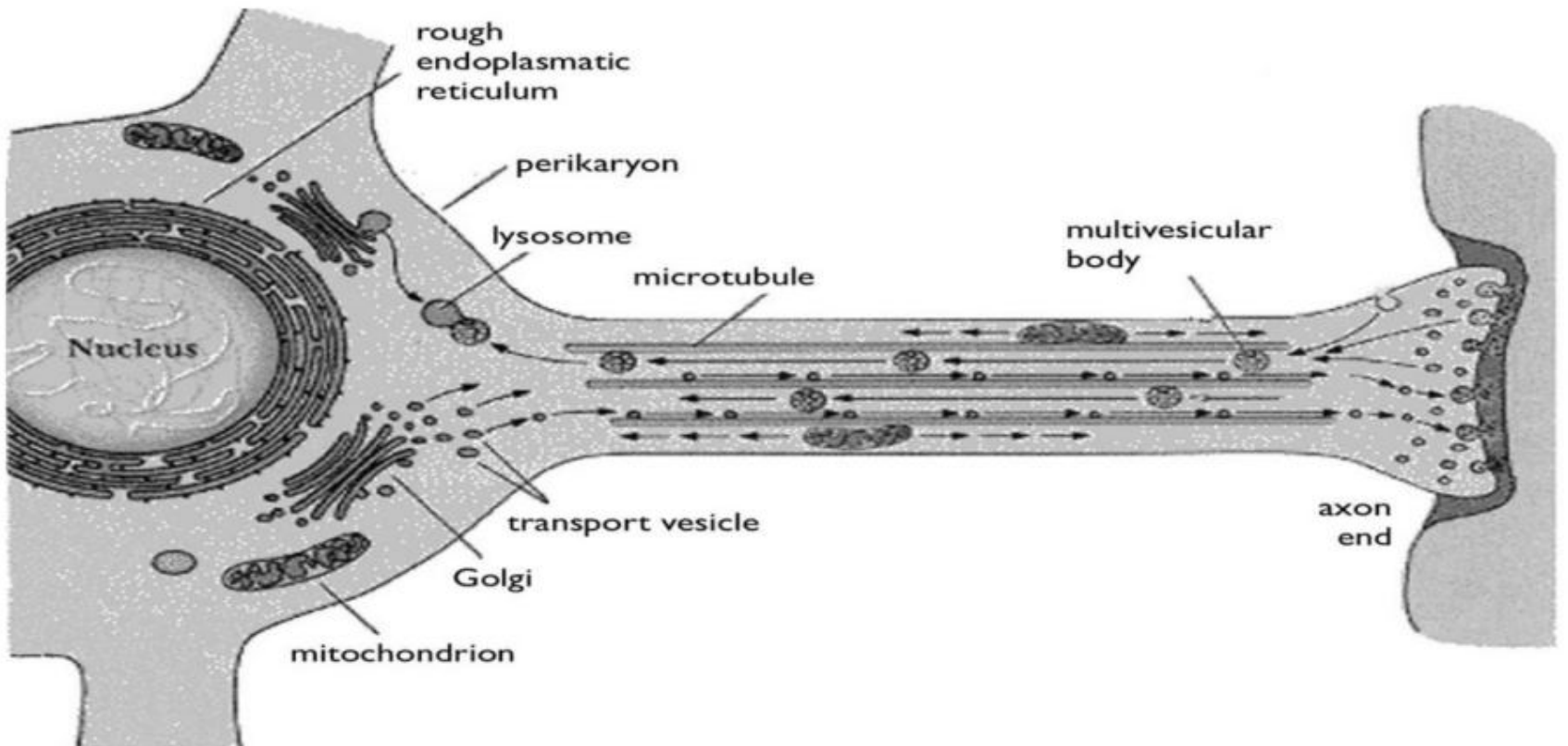
- Increases speed
- Reduces energy expenditure
- Provides protective covering to axon
- Responsible for color of white matter of brain and spinal cord

MULTIPLE SCLEROSIS



Axoplasmic Transport

- Transfer of substances cell body and axon between terminal

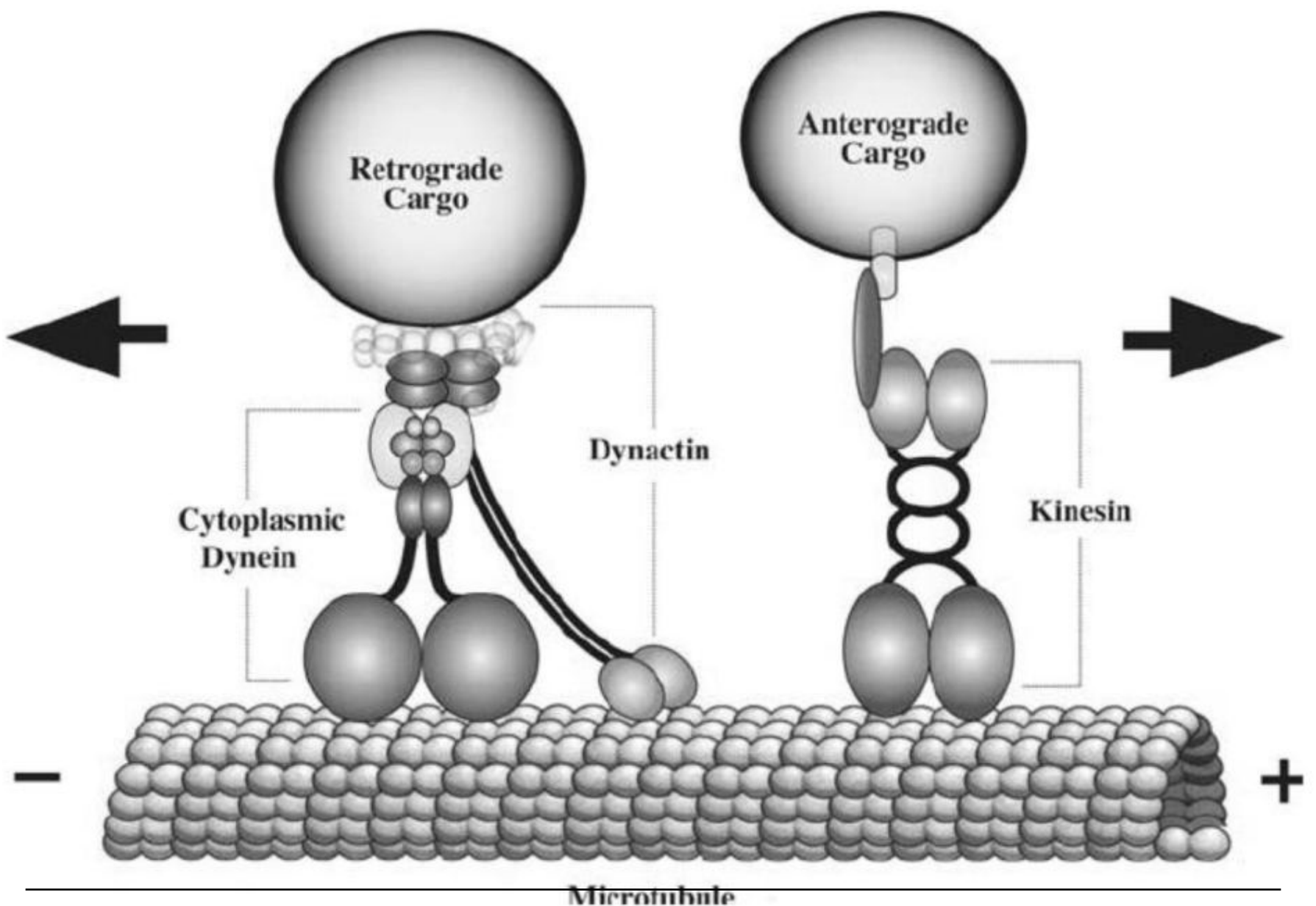
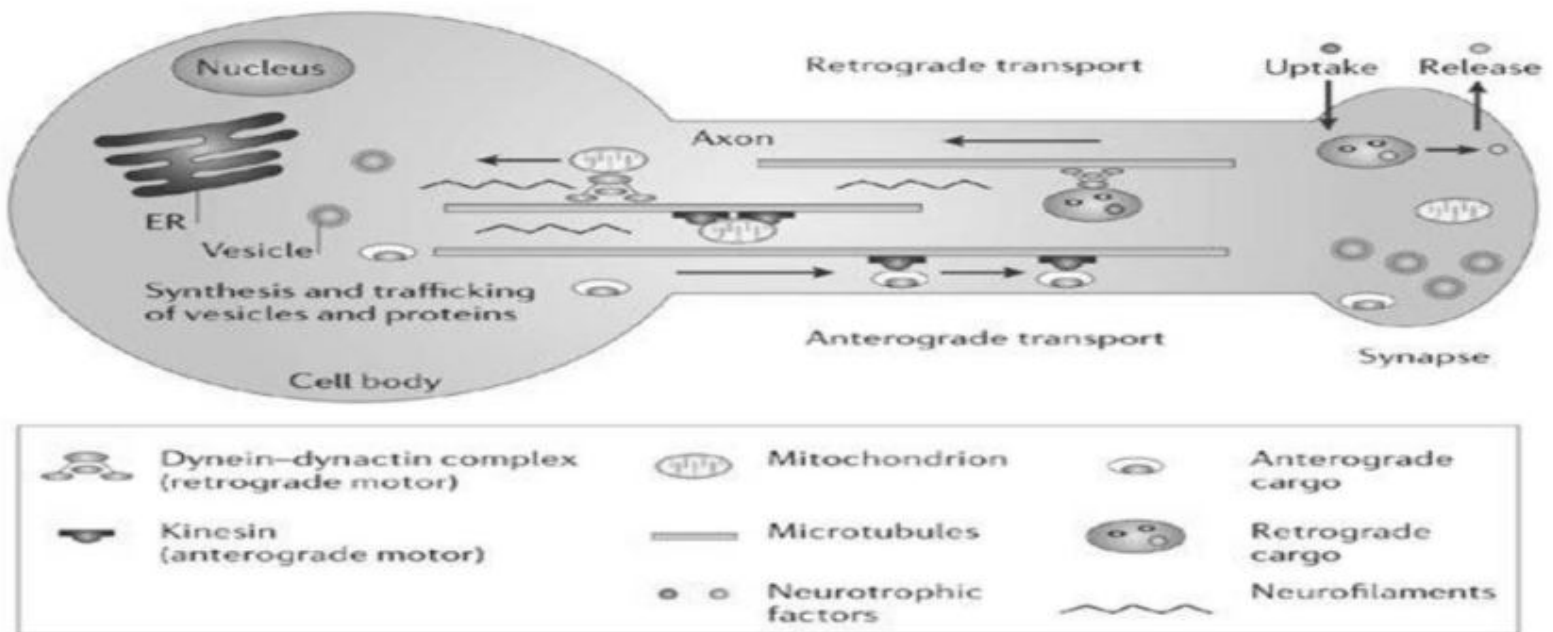


Axoplasmic Transport

- Proteins, Organelles, other cellular substances
- It can be abolished by colchicine, dinitrophenol, azide, cyanide, prolonged anoxia

Types of Axoplasmic transport

- Anterograde transport – Fast and Slow
- Retrograde transport



Based on size

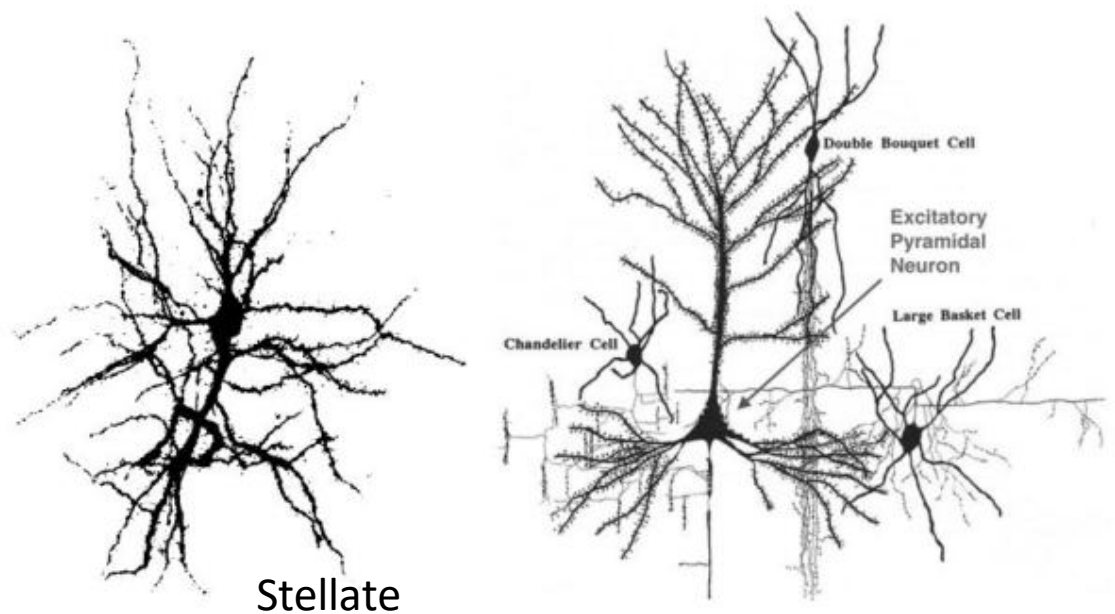
- Golgi Type I Neurons-
with long axons
- Golgi Type II Neurons-
with short axons

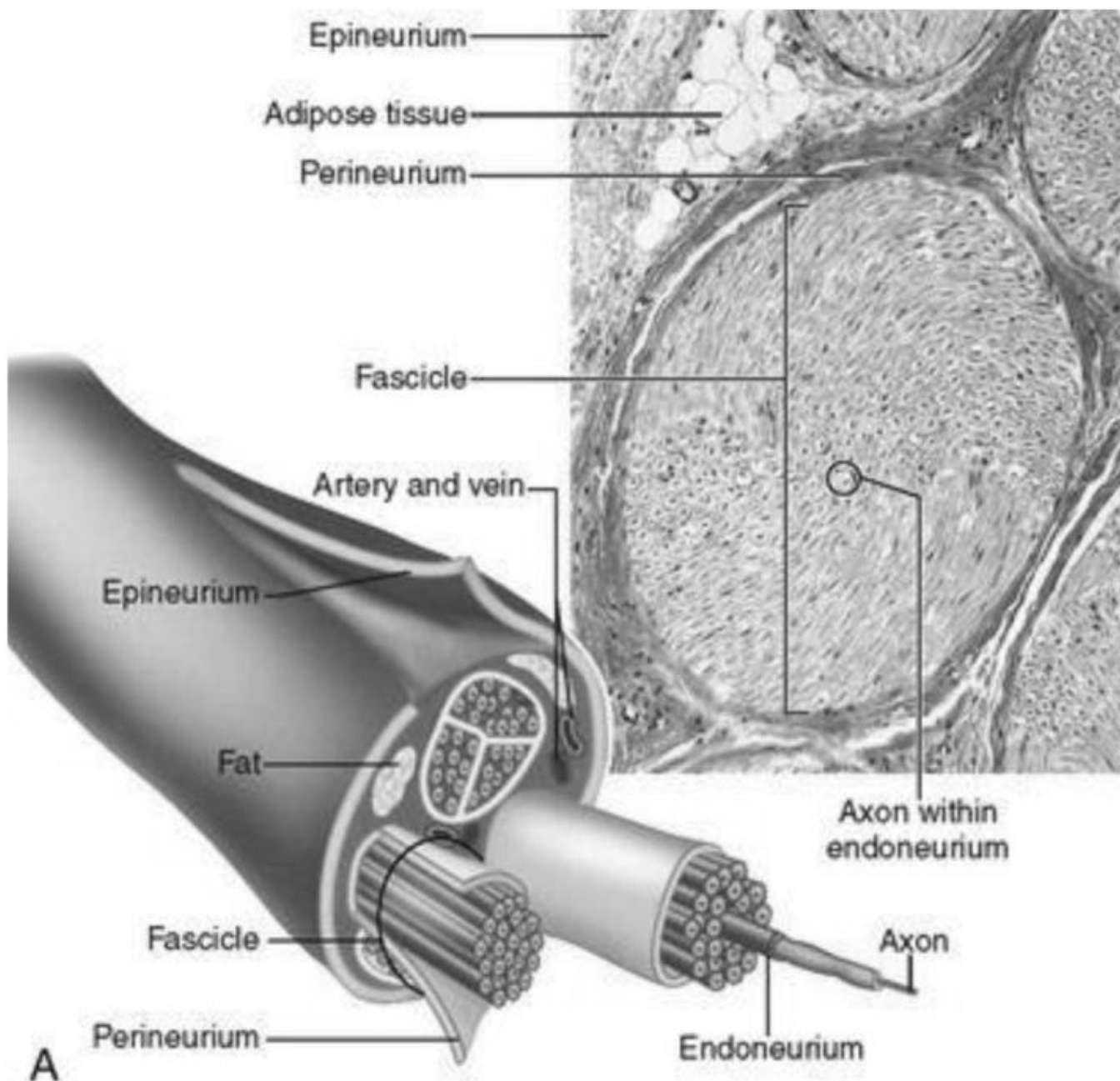
- Based on functions

Motor neurons

Sensory neurons

- Based on Dendritic
pattern





Growth of Neurons

- Neurotrophins-
 1. Nerve Growth factors
 2. Brain derived growth factors
 3. Neurotrophin -3
 4. Neurotrophin – 4 and 5