Chapter 3

Structure and Function of Cells

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ABSTRACT

Neurons are the elementary structures that process information in the CNS. They are electrically excitable cells that process and transmit information around the nervous system. Neurons communicate information either by electrical or by chemical signaling that occurs through synapses. Neurons are the main part of nervous system consisting of a number of specialised types. Neuronal structure is similar to other body cells, having common features: Neurons are enclosed in a cell membrane known as a plasma membrane. The nucleus of a neuron compromises of chromosomes and genetic information. Neurons comprise of cytoplasm, mitochondria, and other organelles. The cellular processes take place in a neuron. Ribosomes are used for production of proteins, and mitochondria are for metabolic action acting as powerhouse of cell. Neurons comprise a Golgi complex that has a system of vesicles that secretes hormones and other products. The difference in neurons or nerve cells from other body cells is that extensions originate from the central body of the neuron.
NEURONS

Neurons are the elementary structures which process information in the Central Nerves System (CNS). They are electrically excitable cells that can receive and transmit chemical or electrical signals rapidly through synapses around the nervous system. Neurons are the main part of nervous system consisting of number of specialised type and function. Neuronal structure is similar to other body cells, having similar features, yet there is complexities vary throughout animal kingdom. It change from nerve nets (neurons) in lower organism to centralized structure consisting central nervous system (CNS) made of brain, spinal cord and a peripheral nervous system (PNS) made up of peripheral sensory and motor nerves. One major difference between invertebrates and vertebrates nervous systems is that nerve cords in various invertebrates are ventrally placed where dorsally vertebrate. They are enclosed in a cell membrane known as a plasma membrane. The nucleus of a neuron compromises of chromosomes that possess genetic information. Neurons comprises of cytoplasm, mitochondria and other organelles. Basic cellular processes take place in a neuron. Ribosomes are involved in protein production, while mitochondria act as power house of cell by metabolic action. Neurons comprise a Golgi complex which has a system of vesicles that secretes hormones and other products the difference in neurons or nerve cells from other body cells is the extensions originate from the central body of the neuron. These are termed as dendrites and axons. Dendrites pass information to the cell body while axons communicate information away from the cell body. An electrochemical mechanism occurs transmitting and receiving information from neurons There are distinct and specialised structures, synapse (the junction between one neuron and the next) which are compromised by neurons. Neurotransmitters and neuro modulators are chemicals synthesized by neurons.

NEURON STRUCTURE

A distinctive neuron possesses a cell body (soma), dendrites and axon. Dendrites are filaments in nature, originate from the cell body, they branch several times forming a complex dendritic tree. Small protrusions present in dendrites called dendritic spines, which further increase the surface area require for synaptic connection. An axon is like rob in an electrical cable. The axon mound is the site where cell body starts and explorations to the site in the nervous system connecting with another nerve cell or different type of cell, such as muscle (Fig. 1).

The cell body possess cytoplasm as like other cells with granules called as Nissl’s granules. It frequently gives rise to several dendrites but only to one axon formation. A layer of fatty cells called the myelin sheath segmentally encloses the fibres of
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