

Difference Between Schwann Cell and Myelin Sheath

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Key Difference – Schwann Cell vs Myelin Sheath

Neurons (nerve cells) are the main cells of the [nervous system](#). A neuron has three major components: [dendrites](#), cell body, and [axon](#). Dendrites receive impulses and pass to the axon and then transmit to dendrites of the next neuron. Axon is the thin long section of the neuron which takes the information away from the neuron. It is formed by a single extension of the nerve cell [cytoplasm](#). Axons are wrapped in special cells called Schwann cells for the effective and speedy action of signal transmission. Schwann cells are located around the axon, and there are small gaps between each cell. Schwann cells form a sheath around the axon, which is known as the myelin sheath. Thus, the key difference between Schwann cells and myelin sheath is that **Schwann cells are the peripheral nervous system cells which form the myelin sheath around the axon while myelin sheath is an electrically insulating layer wrapped around the axon, which increases the speed of electric conduction.**

What is Schwann Cell?

Schwann cell (also called **neurilemma cell**) is a cell in the [peripheral nervous system](#) that forms the myelin sheath around the neuron axon. Schwann cells were discovered by German physiologist Theodor Schwann in the 19th century; hence, they are named as Schwann cells. Schwann cells wrap the axon while keeping gaps between each cell. These cells do not cover the entire axon. Unmyelinated spaces remain in the axon between cells. These gaps are known as nodes of Ranvier.

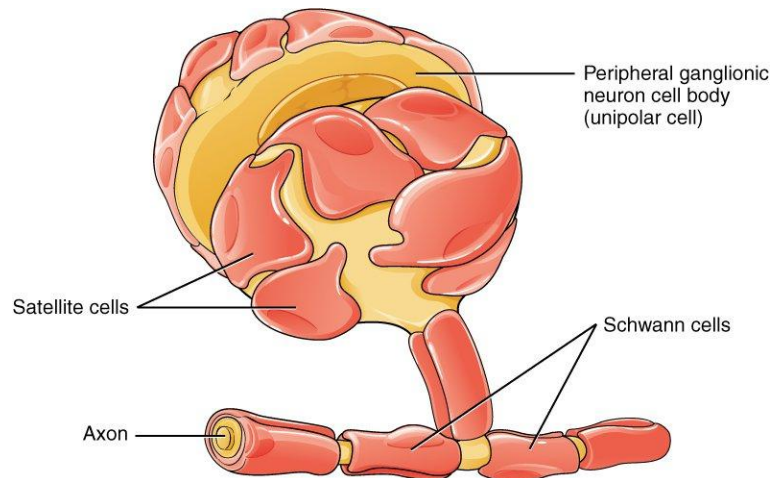


Figure 01: Schwann cells

Not all neuron axons are wrapped with Schwann cells. Axons are wrapped with Schwann cells and insulated with myelin sheaths only when the speed of the electrical signal that travels along the neurons needs to increase. Neurons with Schwann cells are known as myelinated neurons, and others are known as unmyelinated neurons. Schwann cells play a major role in increasing the speed of signal transmission through neurons. Hence, Schwann cells are considered as principal support of the neurons.

What is Myelin Sheath?

Myelin sheath is an electrically insulating layer wrapped around the axon which increases the speed of electric conduction. Myelin sheath is made up of from a material called myelin. The production of the myelin sheath is called myelination or myelinogenesis. Myelin is produced by special cells called Schwann cells of the peripheral nervous system. Not all axons have a myelinated sheath around the axon.

Myelin sheath is formed around the axon in a spiral fashion. Myelin generating Schwann cells keeps gaps when furnishing myelin around the axon. They are the nodes of Ranvier and they are important for the functioning of the myelin sheath. Myelin sheath forms a protective cover around the nerve cell axon and prevents the loss of electrical signals. It also increases the speed of transmission of the nerve signal.

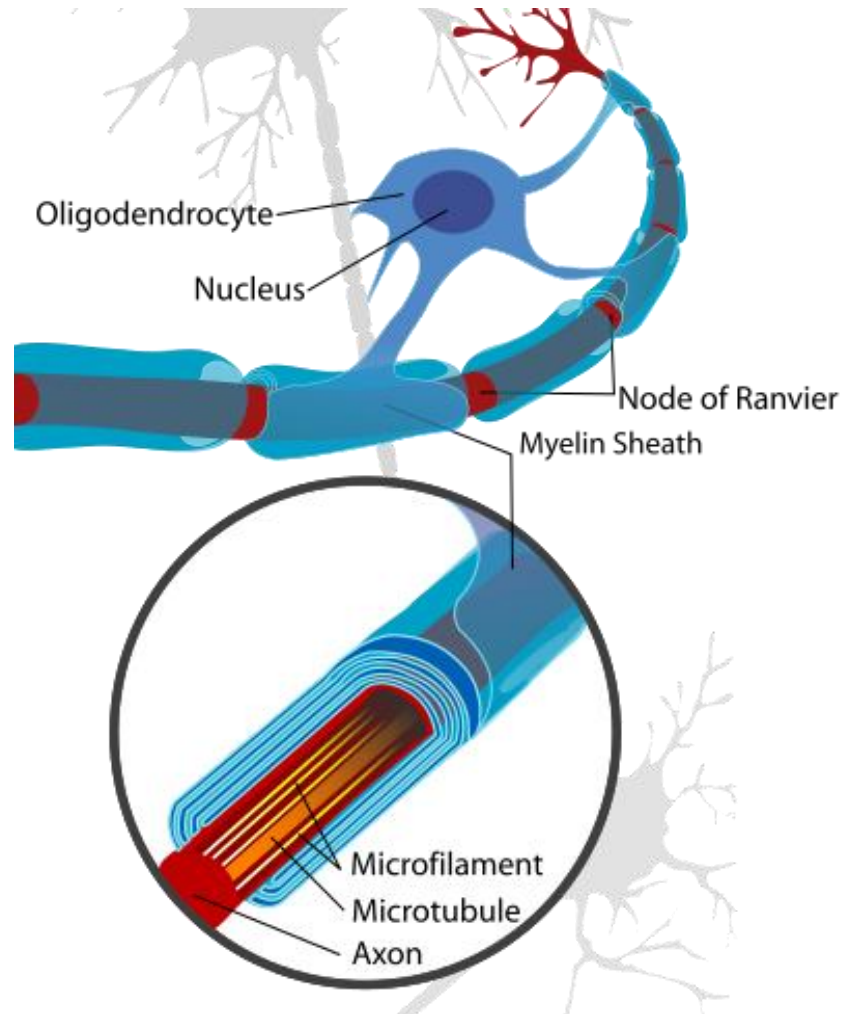


Figure 02: Myelin sheath around an axon

What is the relationship between Schwann Cell and Myelin Sheath?

- Myelin sheath originates from and is a part of the Schwann cells of the peripheral nervous system.

What is the difference between Schwann Cell and Myelin Sheath?

Schwann Cell vs Myelin Sheath

Schwann cell is a special cell of the peripheral nervous system which forms the myelin sheath around the axon of the neuron cell.

Myelin Sheath is an insulating cover that surrounds an axon to increase the speed of nerve impulses that travel along the axons.

Relationship

Schwann cells are a variety of glial cells.

Myelin sheath is formed from a material called myelin.

Summary – Schwann Cell vs Myelin Sheath

Axon is the thin and long section of the nerve cell, which takes the electrical signal away from the neuron cell body. It is a main component of the nerve cell. The speed of the nerve impulse traveling through neurons is increased by forming an insulating layer around the axon. This is known as the myelin sheath. Myelin sheath is formed by special cells called Schwann cells. Schwann cells wrap around the axon and form the myelin to form the myelin sheath. This is the difference between Schwann cell and myelin sheath. Schwann cells and myelin sheaths are important for the effective and efficient transmission of nerve impulses through neurons.

References:

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2. "Schwann Cells." Schwann Cells – an overview | ScienceDirect Topics. N.p., n.d. Web. [Available here](#). 19 July 2017.

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