Neurilemmal Sheath Encyclopedia Article

Neurilemmal Sheath

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Neurilemmal Sheath

Nerve fibers (axons) are often covered by a special insulating layer called the myelin sheath. This covering is composed of the membranes of specialized cells called oligodendrocytes (in the brain and spinal cord, or central nervous system) and Schwann cells (throughout the rest of the body). In axons throughout the body, the outermost sheath formed by the presence of Schwann cells wrapping around the axon is called the neurilemmal sheath. This neurilemmal sheath is composed of the nucleus and cytoplasm of the Schwann cells. It is thus also called the sheath of Schwann. Because axons in the central nervous system are not insulated by Schwann cells, they have no neurilemmal sheath.

The neurilemmal sheath plays an important role in the potential regeneration of injured axons throughout the body. When an axon is cut or seriously damaged, causing it to be detached from its nucleus or soma, the axon will degenerate. Specialized immune system cells will clean up the resulting debris. The neurilemmal sheath, now an empty tube, is left behind. If the soma is uninjured, it may be able to begin to sprout a new axon. This new sprout will find its way into the empty neurilemmal sheath. When full recovery is possible, Schwann cells will myelinate the new axon within the old neurilemmal sheath.