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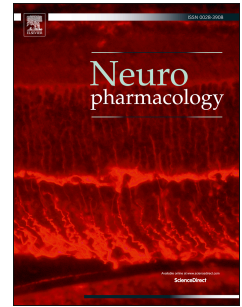
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Myelin plasticity in the central nervous system

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Abstract

Myelin sheaths, specialized segments of oligodendrocyte (OL) plasma membranes in the central nervous system (CNS), facilitate fast, saltatory conduction of action potentials down axons. Changes to the fine structure of myelin in a neural circuit, including sheath thickness and internode length (length of myelin segments between nodes of Ranvier), are expected to affect conduction velocity of action potentials. Myelination of the mammalian CNS occurs in a stereotyped, progressive pattern and continues well into adulthood in humans. Recent evidence from zebrafish, rodents, non-human primates, and humans suggests that myelination may be sensitive to experiences during development and adulthood, and that varying levels of neuronal activity may underlie these experience-dependent changes in myelin and myelin-forming cells. Several cellular, molecular, and epigenetic mechanisms have been investigated as contributors to myelin plasticity. A deeper understanding of myelin plasticity and its underlying mechanisms may provide insights into diseases involving myelin damage or dysregulation.

Keywords

Myelin, plasticity, oligodendrocyte, oligodendrocyte precursor, neuronal activity, experience

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