

Wrapped to Adapt: Experience-Dependent Myelination.

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Public Summary:

Activity of the nervous system has long been recognized as a critical modulator of brain structure and function. Influences of experience on the cytoarchitecture and functional connectivity of neurons have been appreciated since the classic work of Hubel and Wiesel (1963; Wiesel and Hubel, 1963a, 1963b). In recent years, a similar structural plasticity has come to light for the myelinated infrastructure of the nervous system. While an innate program of myelin development proceeds independently of nervous system activity, increasing evidence supports a role for activity-dependent, plastic changes in myelin-forming cells that influence myelin structure and neurological function. Accumulating evidence of complementary and likely temporally overlapping activity-independent and activity-dependent modes of myelination are beginning to crystallize in a model of myelin plasticity, with broad implications for neurological function in health and disease.

Scientific Abstract:

Activity of the nervous system has long been recognized as a critical modulator of brain structure and function. Influences of experience on the cytoarchitecture and functional connectivity of neurons have been appreciated since the classic work of Hubel and Wiesel (1963; Wiesel and Hubel, 1963a, 1963b). In recent years, a similar structural plasticity has come to light for the myelinated infrastructure of the nervous system. While an innate program of myelin development proceeds independently of nervous system activity, increasing evidence supports a role for activity-dependent, plastic changes in myelin-forming cells that influence myelin structure and neurological function. Accumulating evidence of complementary and likely temporally overlapping activity-independent and activity-dependent modes of myelination are beginning to crystallize in a model of myelin plasticity, with broad implications for neurological function in health and disease.

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