Expression of GAP-43 by neurons cultured in the presence of CNS myelin fragments.

Parker L. Andersen and David J. Schreyer. Cameco MS neuroscience research Center and the Dept of Anatomy and Cell Biology, Saskatoon, Canada.

Central nervous system (CNS) myelin has been shown to inhibit axon growth from neurons in vivo and in vitro. An inverse pattern of myelin concentration and immunoreactivity for the growth associated protein GAP-43 has been noted in the CNS, and this has led to the suggestion that CNS myelin repressed GAP-43 expression. However dorsal root ganglia (DRG) neurons can regenerate their axons in the peripheral nervous system (PNS) (or within intraspinal PNS grafts) and display elevated expression of GAP-43 despite maintaining substantial contact with CNS myelin. We examined levels of GAP-43 expression in cultured adult DRG neurons using quantitative ELISA for GAP-43. Cultured neurons underwent chronic exposure to CNS myelin membrane fragments (a gift from Dr. L. McKerracher), applied either as a surface coating or as a particle suspension. GAP-43 expression in adult DRG neurons remained unchanged in these experiments. MAP-2 immunoreactivity showed that neuron survival was also unchanged by CNS myelin exposure. The growth inhibition effect of CNS myelin may be due solely to local effects on growth cone motility.