

Myelin contributes to the parallel orientation of axonal growth on white matter in vitro

ABSTRACT

According to the current research, certain relevant factors that restrict axonal growth on white matter are not haptotactic and may involve myelin-related "inhibitors", which could be involved in any way.

INTRODUCTION

Myelin is a protein that forms a network of axons in living tissues. Myelin is believed to be required for normal cognitive function and a variety of neurological conditions. Myelin is also thought to play a role in the formation of synapses between neurons; an important step in the process of synapse formation.

Myelin is produced in the synapses of nerve cells as electrical charges are exchanged between the axon terminals. Myelin is also required for axonal growth in the adult brain. Myelin also plays a role in the production of synapses. Myelin can be produced in several ways; in the form of protein or in the form of a complex of proteins that are part of a synapse.

Myelin is a protein that forms a network of axons in living tissues. Myelin is It was previously held that growth of axons within white matter could not occur, but this view changed over time due to the well documented failure of injured axons to regenerate in the CNS; further work revealed that neurons apparently attach poorly to their own white matter, and further investigations found myelin-associated molecules such as Nogo (formerly NI-35/250), myelin-associated glycoprotein (MAG) and chondroitin sulfate proteoglycans inhibit neurite growth. Early research on how transplanted embryonic neurons could have extended in parallel, but this theory appeared to be inconsistent with previous studies that suggested successful growth of which was due to the fact it could not express receptors for a myelin-associated inhibitors (although these earlier findings were supported by recent evidence showing that white matter may be able to support large scale parallel axial growth from transplantation of adult neurons, and also confirmed through experiments in tissue section culture). Given that white matter has the potential to support axonal growth, we searched for the properties that facilitate its parallel orientation. Physical edges and contours arranged in parallel within white matter, such as axons, cones or bellies, could theoretically guide parallel growth. Further experiments were conducted to determine the role of myelin in parallel orientation of neurites, including orientation on (or before) a myelin-like substrate, and whether neurons cultured with cAMP analogs or preincubated with nerve growth factor (NGF) attenuated the overall inhibitory effects of both myelin and neurites; further investigations revealed that myelin activity was found to be significantly less parallel on white matter, which may be more homologous

CONCLUSION

Remarkable conclusions The findings indicate that myelin may have an inhibitory effect on neurite growth, as indicated by the orienting influence of white matter.