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# Use of biomaterials for delivery of chemotrophic proteins in the central nervous system

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During regeneration of Central Nervous System (CNS) or after cell transplantation therapies, an important aspect to consider is the projection of neurons to their correct targets. Chemotropic factors are proteins that exert an attractive or repulsive effect over neuronal projections, act through concentration gradients and influence elongation and direction of neurites. The use of chemotropic proteins (CP) to direct axons or to improve the elongation of neurites of implanted or regenerating neurons has been recently proposed; however the delivery of the proteins in the CNS is a challenging enterprise due to the low accessibility of the tissue. In the case of CP, site-specific delivery is important to avoid pleiotropic effects, protein degradation, and to promote protein diffusion from a defined area to form concentration gradients. Among strategies for Intracerebral delivery of proteins, the use of injectable polymeric biomaterials is a low invasive alternative, advantageous for applications that require a well defined physical space. Using in vitro assays we analyzed the rate of protein delivery, the formation of concentration gradients and the biological activity of encapsulated proteins in thixotropic nanocomposites and termoreversible hydrogels. Our results demonstrate that it is feasible to form functional concentration gradients of the recombinant CP semaphorin, and to exert attractive or repulsive effects in dorsal root ganglion and in dopaminergic neurons; however it was also important to perform in vivo evaluation of the compatibility of biomaterials using several techniques like immunohistochemistry, and behavioral and motor skills evaluations to analyze the impact of proposed polymers inside the brain.

## Biography

Elisa Tamariz completed her Ph. D. in Cell Biology at the Center for Research and Advanced Studies (CINVESTAV), México. She stayed as postdoctoral researcher at Cell Biology Department of the UT Southwestern Medical Center, Dallas, TX. USA, and at Neurobiology Institute of the National University of Mexico. At present she is the head of the laboratory of neuronal projection and neuroregeneration at Universidad Veracruzana, México. She has published 11 papers in reputed journals; her work has been distinguished in national and international forums, and has been highlighted at the cover page of the important neurobiology publication Journal of Neuroscience Research.

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