



MRI-guided, intrathecal delivery of hydrogel-embedded glial progenitors for treatment of amyotrophic lateral sclerosis

Acronym: NanoTech4ALS

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Amyotrophic lateral sclerosis (ALS) is a progressive neurodegenerative disorder with no cure. Recent progress in the field of stem cells and nanotechnology has raised hope for a treatment breakthrough. The significant role of glia for the proper function of motor neurons has been recently reported, and efficient methods to isolate glial restricted progenitors (GRPs) have been established. This project will use novel nanomedicine and imaging tools, to characterize cell delivery systems and monitor cell treatment progression. We will use human fetal GRPs and deliver them into the cerebrospinal fluid, targeting the cells primarily to the cervical spinal cord with the goal of rescuing respiratory function, which is a primary problem in ALS. To improve survival and differentiation of transplanted cells we will utilize growth factor-laden nanocarriers that will be embedded with cells into the hydrogel for slow release. Both cells and the gel will be labeled with MRI tracker for monitoring distribution, stability of the hydrogel and cell migration after transplantation in small and large animal models of ALS.

