Glial-based therapies in the treatment of inherited demyelinating diseases

Stanaszek L.

NeuroRepair Department, Mossakowski Medical Research Institute, Polish Academy of Sciences, Warsaw, Poland

Glia plays a crucial role in the proper function of the central nervous system (CNS). In turn, glia failure may lead to the progression of demyelinating and neurodegenerative processes. Considering the role of glia in the pathogenesis of demyelinating diseases, the idea of malfunctioning glia replacement with healthy cells seems tempting. The overall goal of this study is to test the efficacy of glial restricted precursors (GRPs) transplantation in demyelinating and neurodegenerative diseases. In this project, GRPs were transplanted intraventricularly into 2 day-old shi/rag2-/- mice. The myelination process was analyzed with magnetic resonance imaging (MRI), electron microscopy and immunohistochemistry 18, 31 weeks after transplantation. The length of life of transplanted mice has been recorded in order to evaluate the influence of cGRPs in lifespan prolongation. Transplanted Shi/rag2-/- mice survived longer compared to non-transplant controls. Furthermore, GRP transplantation resulted in enhanced myelin production. The positive results were dependent on the transplantation site. Encouraged by the results we have performed multisite transplantation with better result in terms of lifespan prolongation and myelination. Our results confirm the therapeutic potential of GRPs.nFunding: National Center for Research and Development (STRATEGMED I project “GRP&ALS”, STRATEGMED1/233209/12/NCBR/2015), the National Science Centre (SONATA project 2017/26/D/NZ3/00721), and the European Social Fund (project POWR.03.02.00-00-I028/17-00).

This research was carried out with the use of CePT infrastructure financed by the European Regional Development Fund in the Operational Program “Innovative Economy” for 2007–2013.