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Improved culture of umbilical cord-derived stem/progenitor cells for neurological therapeutic purposes

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Human Mesenchymal Stem Cells (hMSC) have become one of the most promising candidates for tissue engineering and regenerative medicine applications. However our knowledge about general nature and biology of adult SC is still limited and needs further progression. Previously we have shown that human neural stem/progenitor cells derived from umbilical cord blood and transplanted to CNS under immunosuppressive regime can migrate toward brain injury and promote tissue regeneration. Our recent project is focused on a new culture system based on lowered oxygen tension and concomitant small molecule treatments, which would “rejuvenate” mesenchymal stem/progenitor cells and redirect them toward neural lineage differentiation. We hope that standardization of such new type of cell culture which mimics the stem cell niche-like environment, will enhance life-span, expansion and increase plasticity of MSCs expanded in vitro for improved therapy of injured brain.

Biography

Krystyna Domańska-Janik graduated at Warsaw Medical Academy and completed her MD and PhD in Medical Research Center (MRC) of Polish Academy of Sciences. At the beginning of this century, she was appointed as a Professor of Medicine to organize NeuroRepair Department in MRC and then have worked there as a group leader till now. At that time her research was focused mainly on functional neural stem cells which could be generated from umbilical cord blood and more recently from the other types of mesenchymal stem cell residing in different perinatal and adult tissue niches. She has published over 100 papers in indexed international journals (with >1400 citations, IH=20). Among them, there was a first in Poland report on successful, intraventricular, MRI-monitored transplantation of cord blood-derived neural progenitors into globally injured child brain. She is elected member of Neurobiological Committee and President of Cell Therapy Team of the Central Nervous System Diseases appointed by Committee of Neurology of Polish Academy of Sciences.

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