The effect of PLX5622 on the oligo-lineage

Makhliyo Normatova

mnormat1209@mail.ru

The Republican Research Centre for Organ and Tissue Transplantation, Dushanbe, Tajikistan

Wolfson Institute for Biomedical Research, University College London, London, UK

Abstract

Background: The colony-stimulating factor1 receptor (CSF1R) found to be responsible for the development of the microglia (Erblich et al., 2011, Elmore et al., 2014). It was shown that blocking CSF1R signalling impeded the adequate microglia population of the brain. Thus, application of high doses of CSFR1 tyrosine kinase activity inhibitor PLX5622 led to elimination of microglia from the brain (Dagher et al., 2015). In the current study we aimed to explore the effect of PLX5622 on the oligo-lineage progenitors and oligodendrocytes.

Methods: Throughout the current research the frozen mouse brain blocks of 1) wild-type two month old mice, 2) two month old mice treated with EdU within 14 and 21 days, 3) two month old mice treated with PLX5622 within 14 and 21 days and 4) mice of age 43 days both wild-type and treated with PLX5622 were used. Immunohistochemistry was intensively applied in this study.

Results: To study the expression profile of oligo-lineage following antibodies such as PDGFRα-marker for oligodendrocyte precursors, CC1-marker for mature oligodendrocytes, and OLIG2-marker for oligodendrocyte differentiation were applied. Confocal images of the ventral and dorsal funiculus as well as ventral horn of the spinal cord were taken with a 10× objective. PLX5622 treatment showed no significant difference in OLIG2 and CC1 expression levels, while a notable reduction of oligodendrocyte precursors labelled by PDGFRα was observed.

Conclusion: Our preliminary data demonstrated that application of selective microglia inhibitor PLX5622 caused elimination of the oligodendrocyte precursors. Our data additionally showed that the restoration period of 14 and 21 days do not lead to the full recovery of oligodendrocyte precursors.