IPSC differentiation into ependymal progenitors to treat ventricular damage during hydrocephalus

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Introduction: During both obstructive congenital hydrocephalus and post-hemorrhagic hydrocephalus additional pathological events are intimately associated with their ethiology: a) a detrimental inflammatory response; b) severe damage of the underlying periventricular nervous tissue, including white matter, and c). Therapeutic approaches have been directed to overcome a) and b), however recovery of damaged neuroepithelium/ependyma is, in our present, an important therapeutic gap.
Methods: Human and mouse induced pluripotent stem cells (iPSC) have been artificially differented into ependymal progenitors. Intracerebroventricular (ICV) injections of iPCS are performed ex vivo and in vivo in the damaged ventricular wall. Their integration and differentiation has been studied by immunohistochemistry and histopathological analysis.
Results: Mice and human ependymal progenitors are able to integrate and differentiate into ependyma in damaged ventricular wall. Stage of ependymal differentiation by the time of the injection defined different degrees of integration.
Conclusions: IPSC appear to be a good ependymal progenitor source with no ethical controversy associated.

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