

Stem Cells Implantation: Is it the Way of the Future?

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Stem cells have been identified in vitro in the Ciliary Body (« ciliary margin ») of animals and in post mortem adult human eyes. To our knowledge, culture of Ciliary Body-derived Retinal Progenitors from the adult human eye in vivo has never been published.

We have very recently presented during 2008 ARVO meeting immunohistological arguments that the pathological condition of Retinal Detachment and Anterior Proliferative Vitreous Retinopathy in the adult human eye in vivo might be a potential donor source of Retinal Progenitor Cells for allogenic subretinal transplantation. Our observations suggest that this proliferation is limited, and oriented towards the neuronal differentiation, rather than the glial differentiation; this model might therefore present a spontaneous limitation of the risks of uncontrolled and aberrant proliferation (current obstacle to the use of embryonic/fetal sources), and of orientation towards glial/cicatricial tissue, which would impair functional success, i.e. restoration of vision.

From this pilot study in the adult human eye in vivo, we have developed an ambitious translational multicenter project to verify this hypothesis, to try to establish the conditions of amplification in culture, and the behavior of this potential donor cell source in vitro, and during transplantation in the subretinal space of the porcine eye (so far the closest animal model for transplantation in terms of retinal gene expression profile).