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RETINAL PHOTORECEPTORS AND PIGMENT EPITHELIUM TRANSPLANTED AS A COHERENT SHEET IN RATS.

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Purpose To develop a method for co-transplantation of retinal photoreceptors and pigment epithelium
Methods Eyes from 8-14 days old pigmented rats were incubated in enzyme solution and the retina with adhering pigment epithelium was dissected. The tissue was embedded in gelatin and the inner retina was removed by sectioning. Small square pieces of the remaining gelatin embedded tissue were cut out and inserted into a flattened plastic tube. Using a transcorneal approach, the transplant was placed in the subretinal space. After one week, the transplanted eyes were examined in histological sections.
Results In some cases, the transplanted retinal pigment epithelium had separated from the transplanted photoreceptors. In transplants where the photoreceptors and pigment epithelium were attached, proper layering was achieved. In these transplants, all three different types of photoreceptor cells were found.
Conclusions We have shown that it is possible to transplant a coherent sheet of retinal photoreceptor cells and pigment epithelium to a rat host eye.

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TITLE: HUMAN FETAL NEURAL RETINAL CELL TRANSPLANTATION IN RETINITIS PIGMENTOSA.

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Purpose: Continuous work in the field of Retinal Transplantation has now been carried out for more than a decade. We are at the stage where clinical studies are underway. With this work, we plan on investigating the clinical and functional outcomes of fetal neural retinal cells transplanted to patients with Retinitis Pigmentosa (RP).

Methods: Dissociated neural retinal cells from 14 to 16 week old human fetuses were injected into the subretinal space of three patients with RP. Prior to surgery, the visual acuity was limited to light perception, and the ERGs were subnormal in both eyes of all patients. This work was carried out in strict accordance with Federal and Institutional guidelines.

Results: At three months post-transplantation, there was no rejection clinically, and no complications had occurred. The grafts appeared clinically to be stable with no sign of inflammation or infection. Up to this point, there was no subjective visual improvement. The patients are being followed closely via many parameters including ERGs.

Conclusions: This initial clinical series shows that no undesirable side effects occurred in retinis pigmentosa patients as a result of subretinal grafting, even in the absence of systemic immunosupression. At this phase, it appears that the transplantation has no deleterious effects. Ongoing studies will indicate if, and under what circumstances, visual recovery may take place.

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BIOCHEMICAL CONSIDERATIONS ON THE USE OF ANTIOXIDANTS IN THE TREATMENT OF RETINAL PIGMENTARY DEGENERATIONS.

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It has been demonstrated that a congenital or acquired defect at retinal pigment epithelium (RPE) level is responsible for pigmentary retinal degeneration in RCS rats. It is thought that the defect is due to a reduced phagocytic capacity of these cells in regards of photoreceptor outer segments.

In this paper the biological peculiarities of RPE cells are discussed, as well as the demonstration that in certain retinal pigmentary degenerations (as in Leber's congenital amaurosis) a primitive lesion is at the level of peroxisomes. This alteration will determine an accumulation of free radicals in these cells, with damage of photoreceptor phospholipid membranes and impairment of shedding mechanisms.

These considerations justify theoretically the use of antioxidants in the treatment of retinal pigmentary degenerations.