Preservation of cone photoreceptors and visual function by retinal transplantation in animal models of retinitis pigmentosa"

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Retinal transplantation as a therapeutic strategy for inherited retinal degeneration has been historically envisaged to restore vision by replacing the lost retinal cells and attempting to reconstruct the neural circuitry with stem cells, progenitor cells and mature neural retinal cells. We present evidence for an alternative strategy aiming at preventing the secondary loss of cones, based on the paracrine effect of the transplanted rodswhich providecone survival signals. We carried out transplantation of photoreceptors or total neural retina in 3-month-old P23H rats, an animal model of dominant retinitis pigmentosa, and we have evaluated the function and host cone survival 6 months after surgery. The cone loss has been significantly reduced in the photoreceptor and retinal transplanted eyes, and morphologically their outer segments were found to be considerably longer than in non-transplanted group. This survival effect is correlated to functional preservation scored by photopic ERG recording. We demonstrate here that the transplantation of rod tissue reduces the secondary degeneration of host cone photoreceptors, thus preserves useful vision in retinitis pigmentosa.