

Letters

Lens Regeneration: Some Caveats

EyeNet's recent write-up on lens regeneration (News in Review, June) fascinated me. As a former embryologist using lens development as a model system, please allow me to offer some caveats.

Lens epithelial cells (I prefer that over “lens stem cells”) love to proliferate. Various structures encountered after cataract surgery such as opacified posterior capsules, Elschnig pearls, and bladder cells testify to that. Thus, the trick is not simply to grow lens cells, but rather to grow them in an organized fashion so that the internal architecture of the lens is as normal as possible and therefore optically clear. In a chick embryo, it is possible to take a lens out, reverse it with the epithelium in the back, or even put 2 lenses in the capsular bag next to each other, and the epithelial cells will reverse their growth direction and normalize the external lens structure; but the internal lens is disorganized and, therefore, never entirely clear. The lens fibers are laid down around the lens center, which forces them into the fiber shape. Without that, they will turn into bladder cells.

The lenses that were pictured in the *EyeNet* News in Review article appear less than clear to me, and I suggest that there is enough irregularity present to interfere with visual development.

Johan T. Zwaan, MD, PhD
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Authors' Response to “Lens Regeneration: Some Caveats”

We welcome the comments by Dr. Zwaan. In our *Nature* article, we do not claim that a completely normal lens was regenerated—nor would it be reasonable to expect this. Instead, we hypothesized that the current surgical procedure for pediatric cataracts may impair lens regeneration in several ways. By destroying the integrity of the lens capsule and subcapsular lens epithelial cells (LECs), the commonly used anterior continuous curvilinear capsulorrhexis procedure greatly diminishes the possibility of lens regeneration. Regenerated lenses are mostly clear, especially in the central area aligned with the visual axis.

The imperfections noted, which we acknowledged in the article, mainly reflect the loss of LECs and small amounts of peripheral scarring at the capsulorrhexis site, and anterior-posterior capsule adhesions, which in most cases are out of the visual axis and do not affect vision or interfere with visual development.

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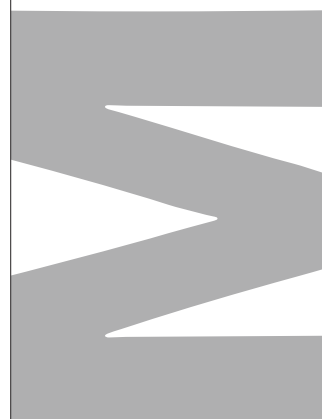
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