Allogeneic Sensitization and Tolerance Induction After Corneal Endothelial Cell Transplantation in Mice

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Ocular & corneal anatomy

Streilein JW, Ocular Immune Privilege: Therapeutic Opportunities from an Experiment of Nature; Nature Reviews Immunology, Vol 3:879-889

http://discoveryeye.org/treatment-corneal-scratches-and-abrasions/
Corneal endothelial pathology

Fuch’s Dystrophy

http://dx.doi.org/10.1016/j.clae.2012.05.005

Bullous Keratopathy

surgical interventions

clinical trial

transplantation of cultivated corneal endothelial cell (CEC) sheets

http://www.aao.org/eye-health/diseases/what-is-fuchs-dystrophy
Anterior chamber-associated immune deviation (ACAID)

Streilein JW, Ocular Immune Privilege: Therapeutic Opportunities from an Experiment of Nature; Nature Reviews Immunology, Vol 3:879-889
Aims of this Study

- examine the alloimmunogenicity of CEC injected into the AC
- investigate the tendency to development DTH
- assess the ability of transplanted CEC to induce ACAID & the induction of immune tolerance
Materials & Methods

- mpCEC from donor C5BL/6 mice & intracameral injection
- transcorneal freezing (cryoinjury): cryoprobe 10”
- slit-lamp biomicroscopy & pachymetry
- ACAID induction: SC immunization w/ splenocytes
- ear thickness to assess DTH response
Transplanted mpCEC adhere to endothelial cell defect areas

post-operative day 7
Transplanted mpCEC do not induce allograft rejection
DTH response: allogeneic mpCEC lose the capacity to induce DTH
ACAID induction: intracameral injection in non-inflamed eyes suppresses DTH response

\[ \text{mpCEC} \quad \text{Sp} \quad \text{AC} \rightarrow \text{Sp SC} \]
Immune tolerance is antigen-specific & dependent on splenocytes
survival of allogeneic mpCEC is necessary to induce delayed type tolerance
Conclusions

• mpCEC injected into the AC do not induce allogeneic DTH
• cryoinjury abolished ACAID induction
• delayed tolerance rather than mpCEC-induced ACAID promotes allograft survival
Thank you for your attention