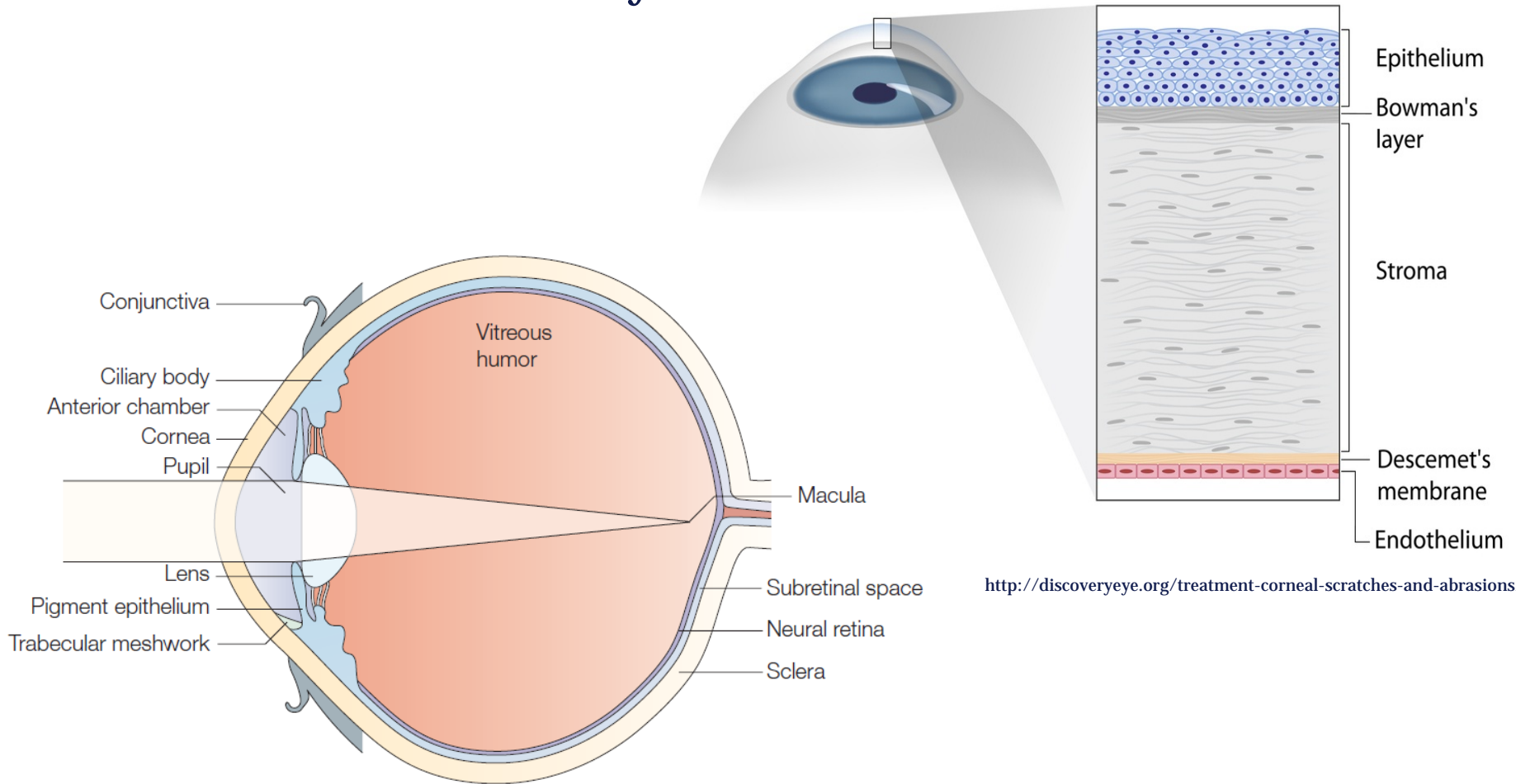


Cornea

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

Jun Yamada,<sup>1-3</sup> Morio Ueno,<sup>1</sup> Munetoyo Toda,<sup>1</sup> Katsuhiko Shinomiya,<sup>1</sup> Chie Sotozono,<sup>1</sup> Shigeru Kinoshita,<sup>4</sup> and Junji Hamuro<sup>1</sup>

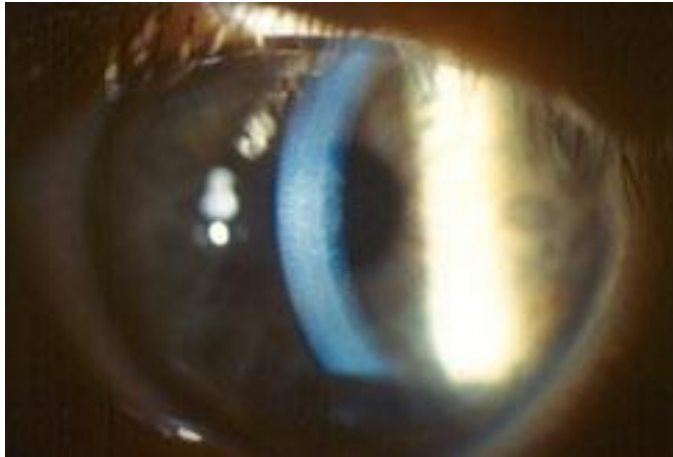
# Ocular & corneal anatomy



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

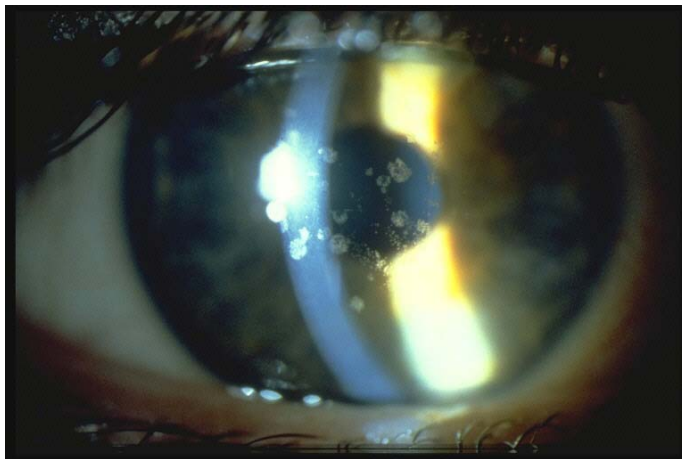
# Corneal endothelial pathology

## Fuch's Dystrophy



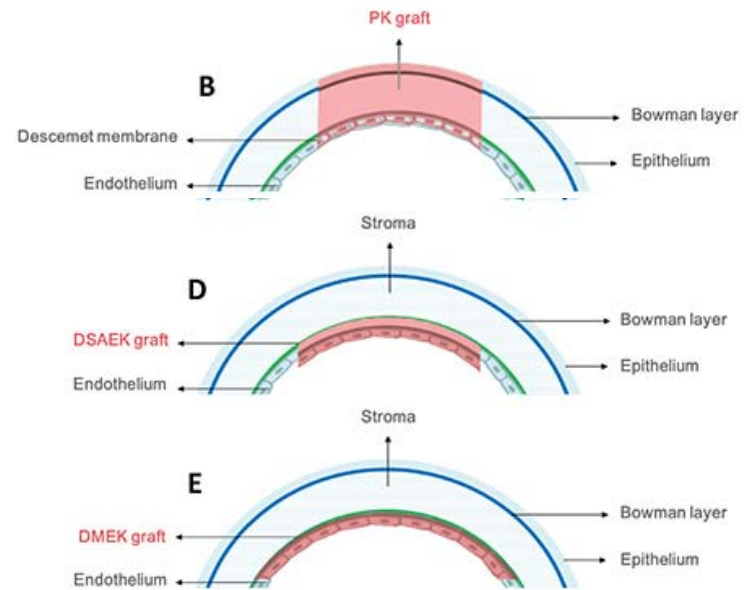
<http://dx.doi.org/10.1016/j.clae.2012.05.005>

## Bullous Keratopathy



<http://www.aaopt.org/eye-health/diseases/what-is-fuchs-dystrophy>

## surgical interventions

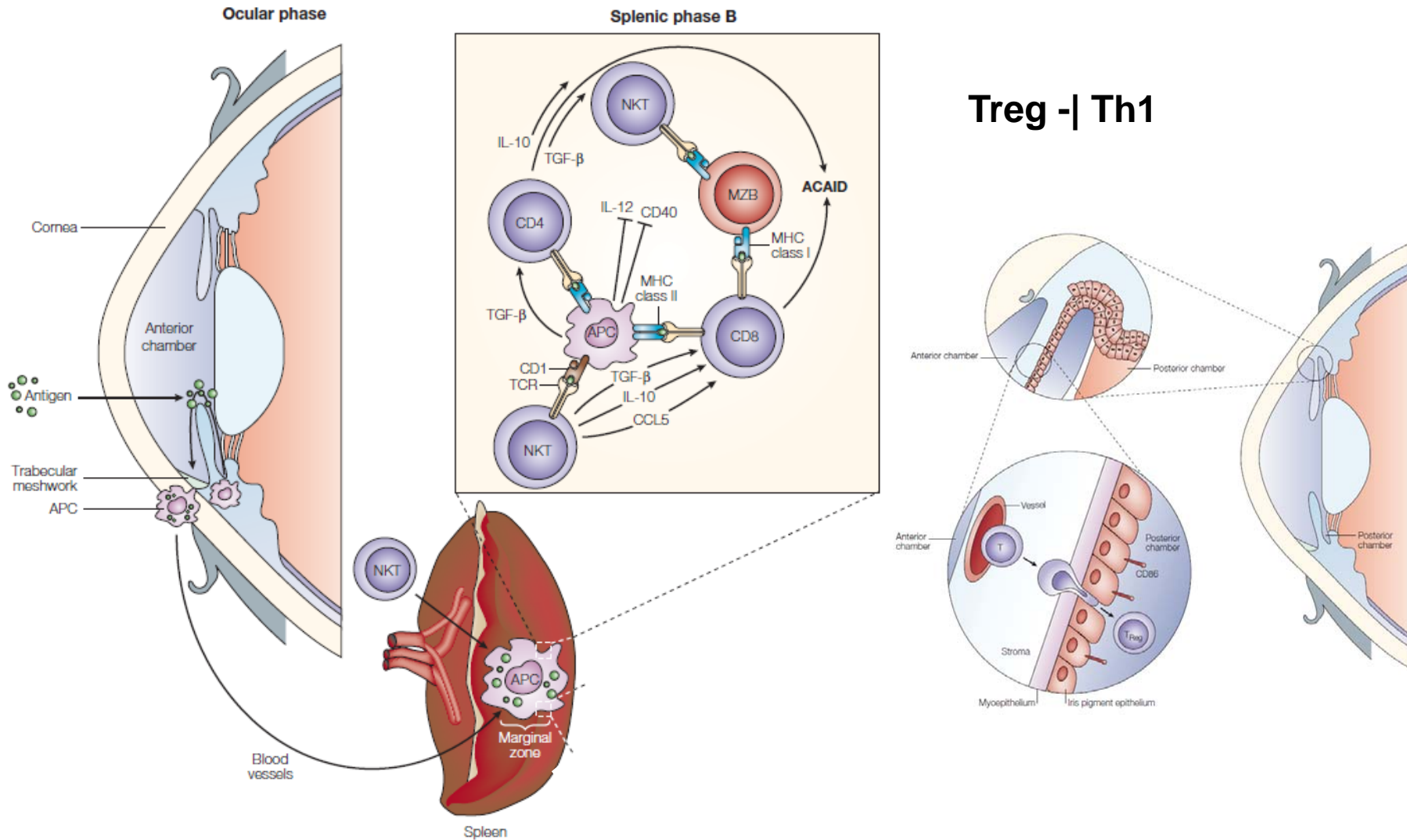


Korine van Dijk, BSc; Lamis Baydoun, MD; Ricarda M. Konder; & Gerrit R.J. Melles, MD, PhD; *Contact Lenses after Keratoplasty*; *Contact Lens Spectrum*, Volume: 29, Issue: August 2014, 36-38, 40, 42

## clinical trial

transplantation of cultivated  
corneal endothelial cell (CEC) sheets

# 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

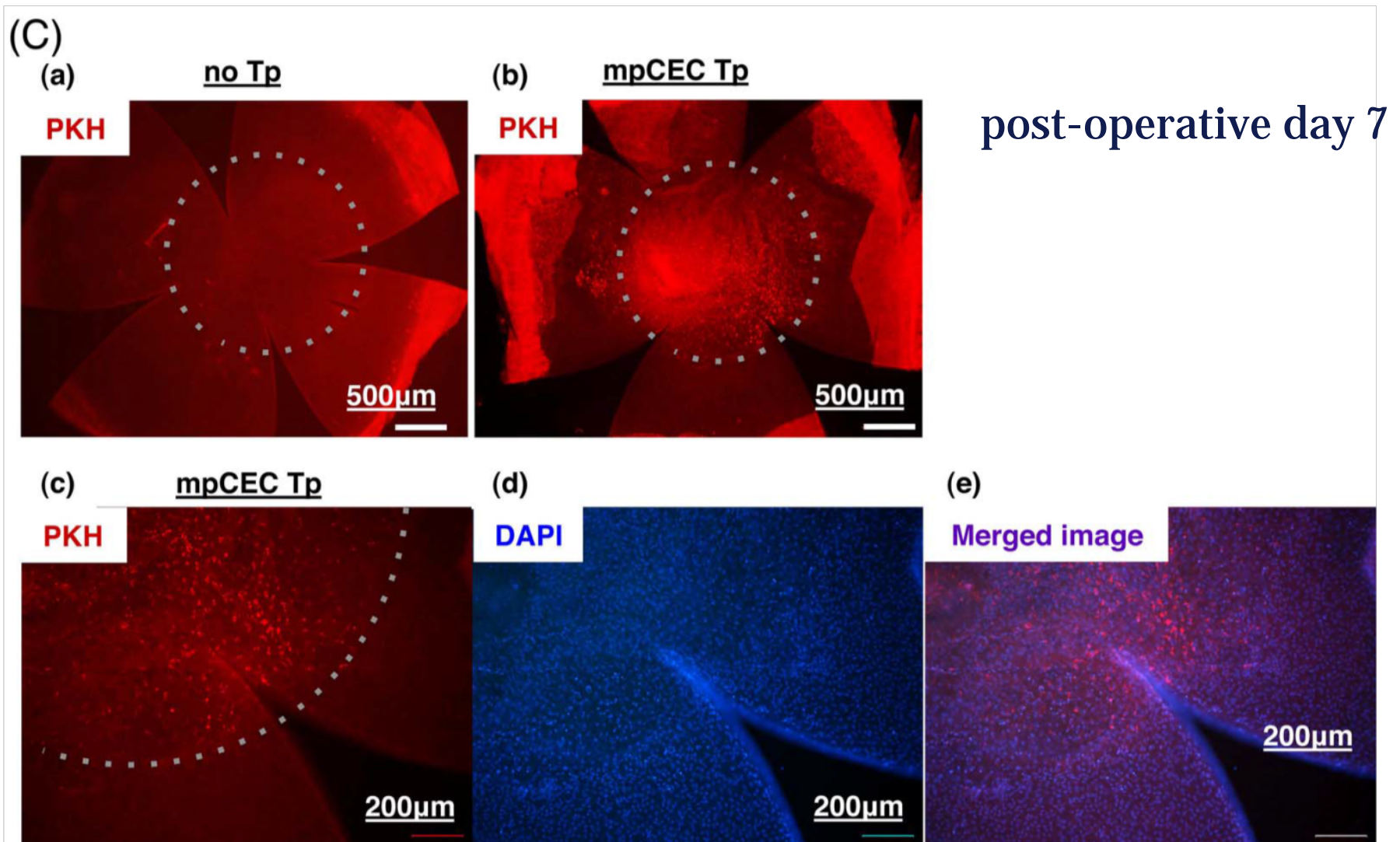
# Aims of this Study

- 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

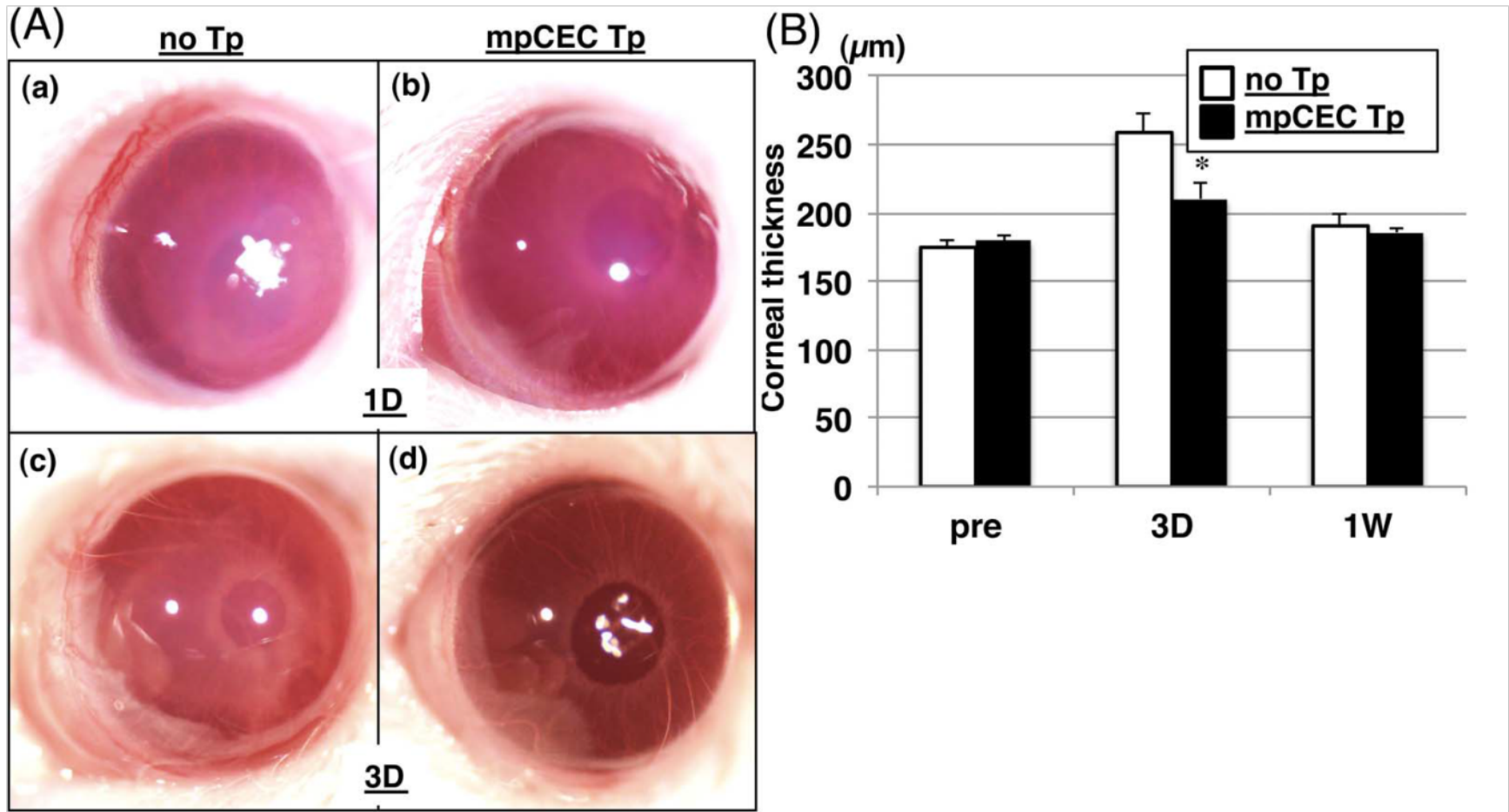
# Materials & Methods

- 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

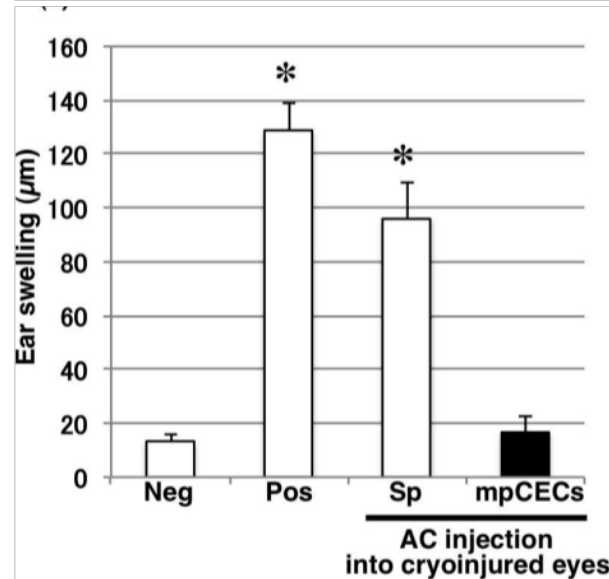
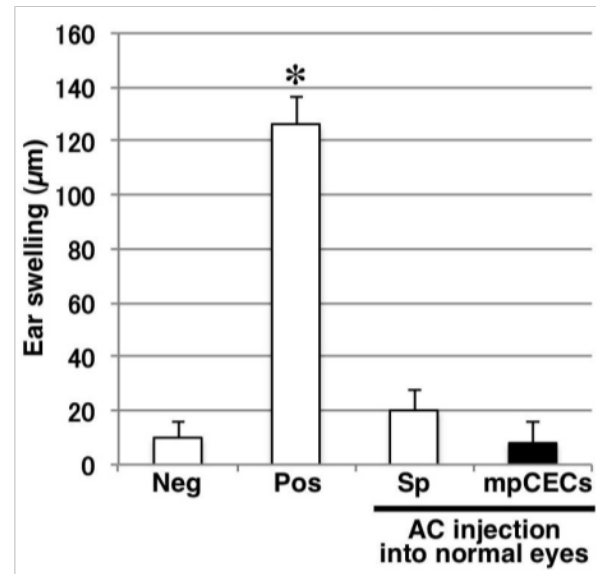
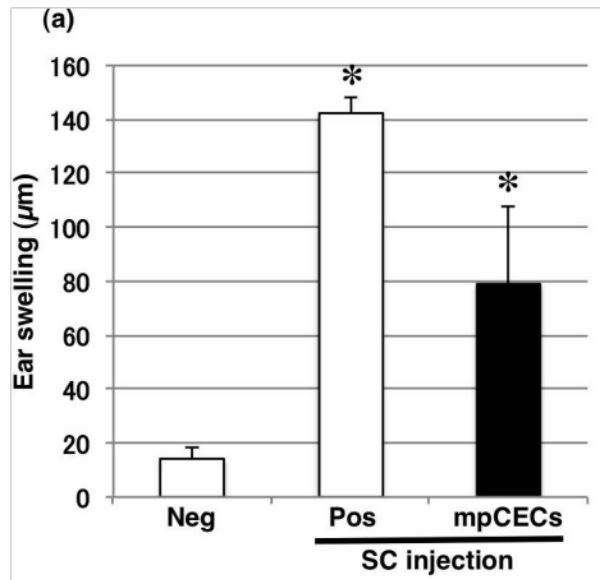


# Transplanted mpCEC do not induce allograft rejection

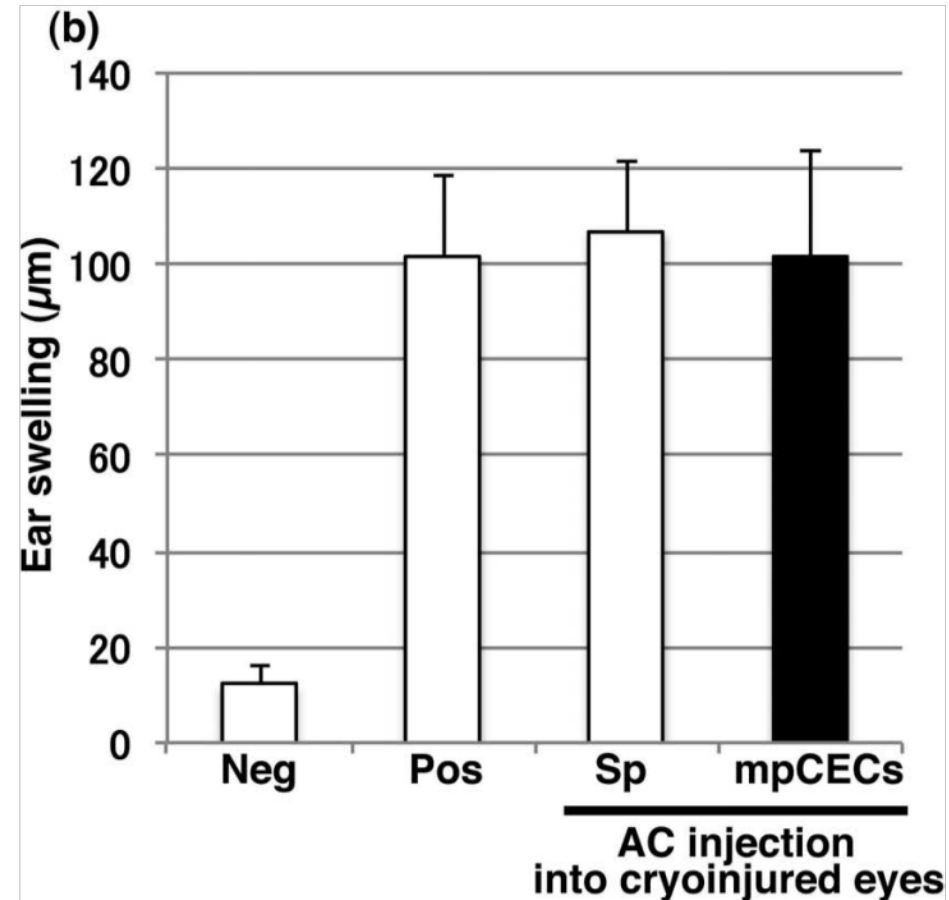
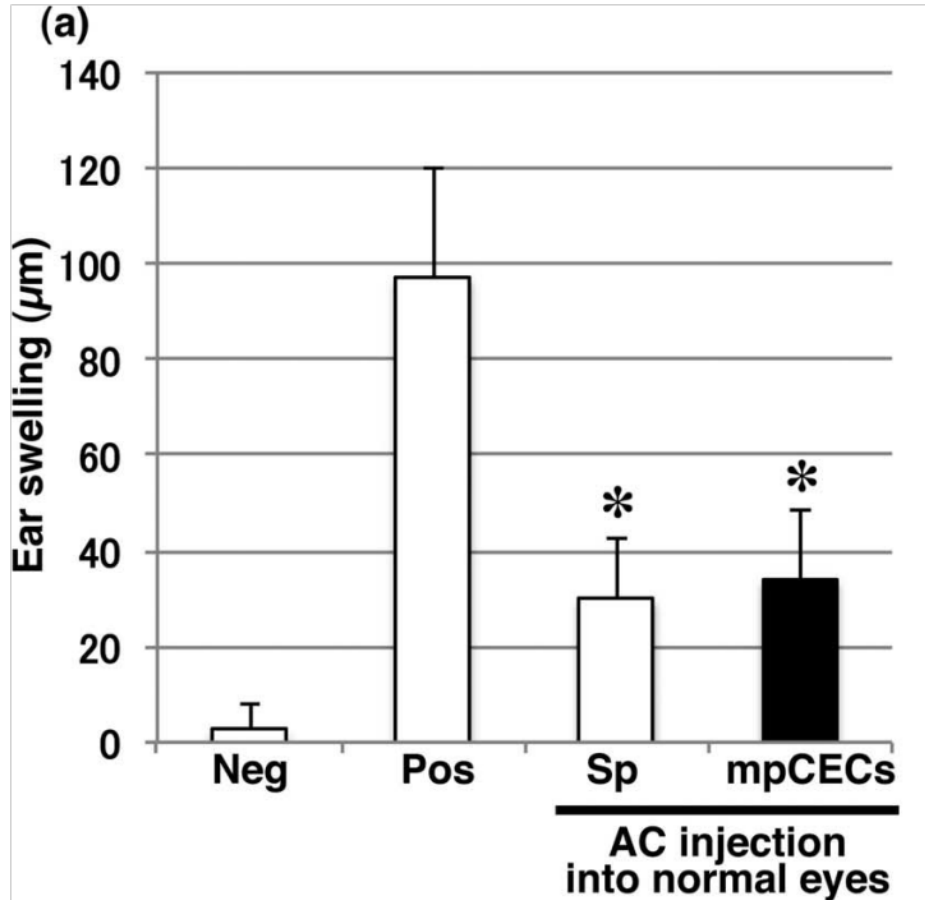




# DTH response: allogeneic mpCEC lose the capacity to induce DTH

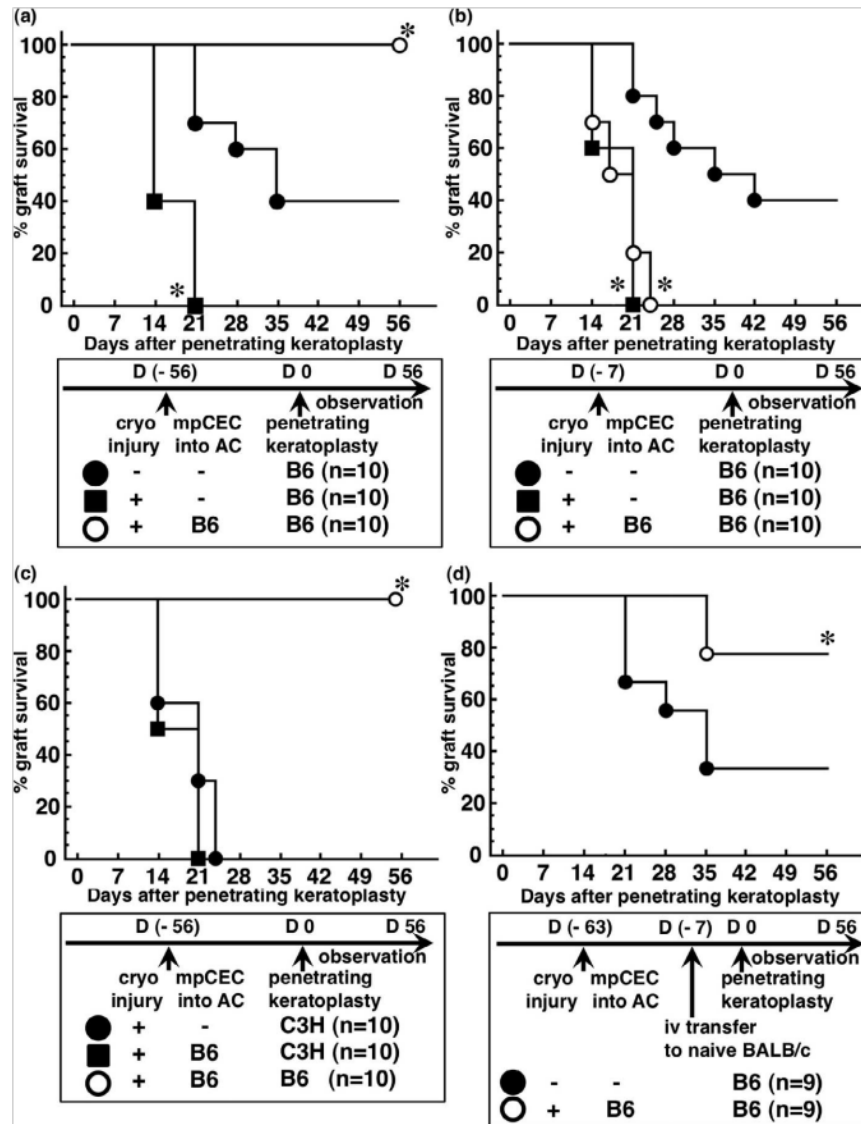


# ACAID induction: intracameral injection in non-inflamed eyes suppresses DTH response

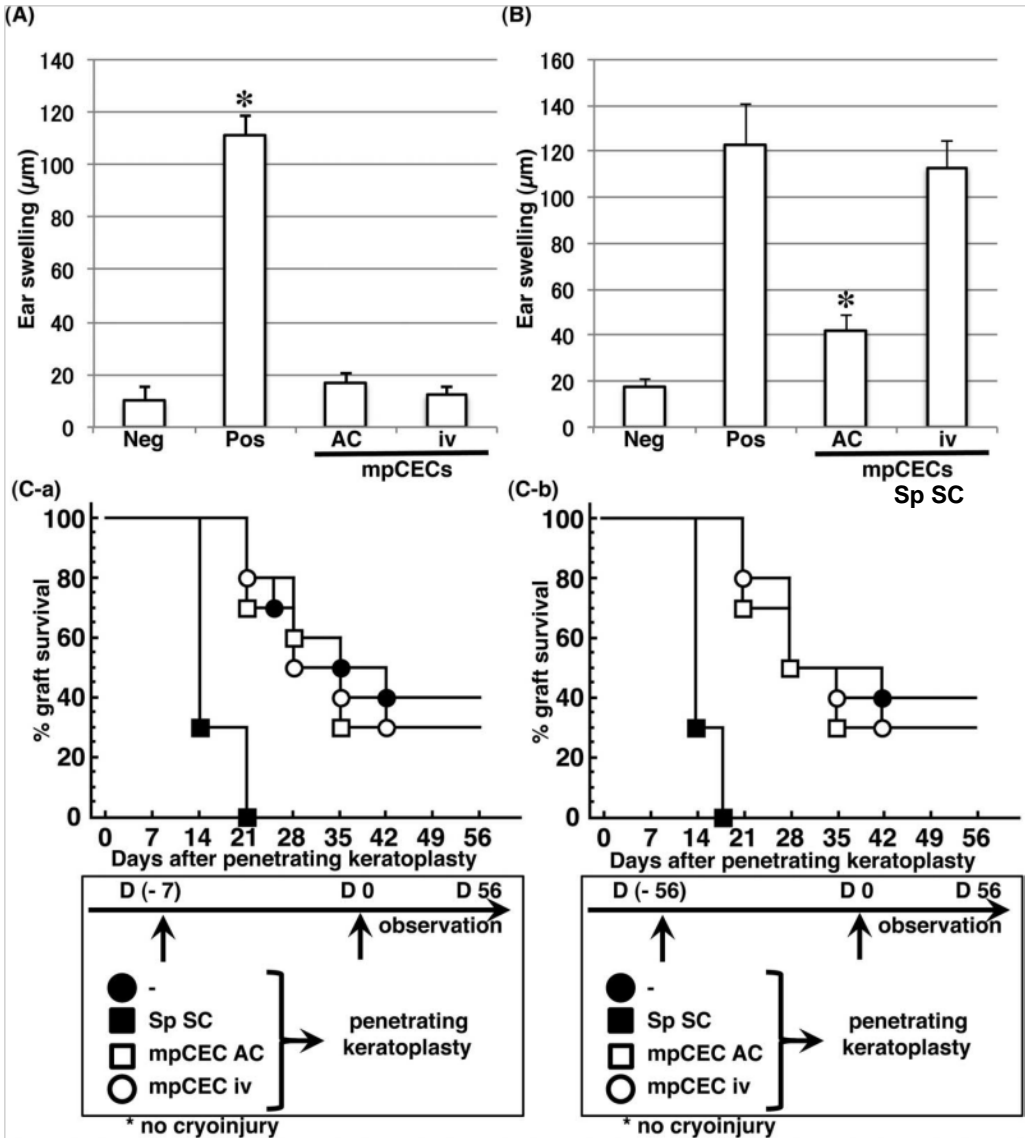


*mpCEC*  
*Sp* AC → *Sp SC*

# 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

