

## 2009 ARVO Poster Presentation

### AmbioDry<sup>TM</sup> Amniotic Membrane Allografts

Program#/Poster#: 1946/D661

**Abstract Title:** Role of Amniotic Membrane Transplantation in the Recruitment of Immunological and Inflammatory Cells in Wound Healing After a Corneal Alkali Burn in Enhanced Green Fluorescent Proteins (EGFP) Chimeric Mice

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**Location:** Hall B/C

**Reviewing Code:** 169 corneal immunology - IM

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**Purpose:** To test the role of inflammatory cell recruitment regulated by Amniotic Membrane (AM) during the wound healing process after corneal alkali burn using Enhanced Green Fluorescent Protein (EGFP) chimeric mice.

**Methods:** 24 C57BL/6 EGFP chimeric mice received a central corneal alkali burn by placing a wet surgical sponge in sodium hydroxide 10mM on the cornea for 5 min. The epithelium was removed with a 30 Gauge needle. Animals were divided in 4 groups with 6 animals per group; as follows; corneal burn only, corneal burn with Fixed Human Amniotic Membrane (FHAM), corneal burn with Human Amniotic Membrane (HAM) (Ambio dry), and Corneal burn with Mice Amniotic Membrane (MAM) respectively. Cornea clarity and vascularity was scored and the recruitment of EGFP cells was quantified by *in vivo* fluorescent microscopy at postoperative day (POD) 1, 3, 7, 13, 17, 21, and 25. Two animals of each group were euthanized at POD 3 and the remaining at POD 25. Eyes were enucleated and immunohistochemistry to detect neutrophils (NIMP-R14), macrophages (CD11b), and CD4, CD8 and B cells (B220) was performed.

**Results:** HAM and MAM corneas were clearer and less vascularized than control and FHAM. HAM and MAM showed a uniform distribution of EGFP positive cells in the cornea. In contrast, control and FHAM treated groups had EGFP positive cells only at the periphery with no migration into the central cornea. Furthermore, this migration pattern correlated with the kinetics of corneal epithelium healing which was regenerated by POD 3 in HAM and MAM in contrast to none in control and FHAM. Immunohistochemical analysis of HAM and MAM demonstrated the presence of neutrophils, macrophages, T cells and B cells in higher quantities in HAM and MAM treated corneas in contrast to control and FHAM.

**Conclusions:** Amniotic membrane graft of the corneal surface appears to promote the regeneration of corneal epithelium during alkali burn. This effect could be regulated by the early recruitment of immunological cells to the site of injury.