

10<sup>th</sup> International Conference on

# Clinical & Experimental Ophthalmology

November 21-23, 2016 Dubai, UAE



## Felipe Soria

*Instituto de la Visión, Mexico & Vissum Corporacion Alicante, Spain*

### Mesothelial cells: A cellular surrogate for tissue engineering of corneal endothelium

**Purpose:** To evaluate whether mouse adipose tissue mesothelial cells (ATMCs) share morphologic and biochemical characteristics with mouse corneal endothelial cells (CECs) and to evaluate their capacity to adhere to the decellularized basal membrane of human anterior lens capsules (HALCs) as a potential tissue-engineered surrogate for corneal endothelium replacement.

**Methods:** Adipose tissue mesothelial cells were isolated from the visceral adipose tissue of adult mice and their expression of several corneal endothelium markers was determined with quantitative RT-PCR, immunofluorescence and Western blotting. Adipose tissue mesothelial cells were cultured in a mesothelial retaining phenotype medium (MRPM) and further seeded and cultured on top of the decellularized basal membrane of HALCs. ATMC-HALC composites were evaluated by optical microscopy, immunofluorescence, and transmission electron microscopy.

**Results:** Mesothelial retaining phenotype medium-cultured ATMCs express the corneal endothelium markers COL4A2, COL8A2, SLC4A4, CAR2, sodium- and potassium-dependent adenosine triphosphatase (Na./K.-ATPase), b-catenin, zona occludens-1 and N-cadherin in a pattern similar to that in mouse CECs. Furthermore, ATMCs displayed strong adhesion capacity onto the basal membrane of HALCs and formed a confluent monolayer within 72 hours of culture in MRPM. Ultra-structural morphologic and marker characteristics displayed by ATMC monolayer on HALCs clearly indicated that ATMCs retained their original phenotype of squamous epithelial-like cells.

**Conclusions:** Corneal epithelial cells and ATMCs share morphologic (structural) and marker (functional) similarities. The ATMCs adhered and formed structures mimicking focal adhesion complexes with the HALC basal membrane. Monolayer structure and achieved density of ATMCs support the proposal to use adult human mesothelial cells (MCs) as a possible surrogate for damaged corneal endothelium.

### Biography

Felipe A Soria studied Medicine in the Adventist University in Argentina and did Specialty in Ophthalmology in the Vision Institute of Montemorelos University in Mexico. He made the Subspecialties of Cornea, Refractive and Cataract Surgery in Vissum Corporation with Dr. Jorge Alio for a period of two years. He has written more than 30 scientific articles and book chapters, being Editor of the book *Femtosecond Laser Assisted Keratoplasty*. He has participated with 40 communications in different international congress across the world. He owns the patent: Use of Mesothelial cells in Tissue Bioengineering and Artificial Tissues.

[soriafelipe.md@gmail.com](mailto:soriafelipe.md@gmail.com)

### Notes: