Carl M Sheridan, J Clin Exp Ophthalmol 2018, Volume 9
DOI: 10.4172/2155-9570-C1-077

19th Global Ophthalmology Summit

February 26-27, 2018 | Berlin, Germany

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Seeing is believing in Tissue Engineering in Ophthalmology.

The eye is a significant focus for advancing regenerative medicine and translational research into human patients. The talk aims to highlight these by addressing tissue-engineering (TE) approaches for the cornea and retina. New cell-based therapies are emerging to repair or replace specific cells within the retina. These techniques are at the forefront of human stem cell research and gene therapy with several phase 1/2 clinical trials currently underway including the first use of iPS cells in human trials. They offer substantial hope for treating numerous retinal diseases such as Age-related Macular Degeneration. In addition corneal diseases have often been successfully treated by allogeneic corneal transplantation, yet supply shortage through human donor eye banks, optical clarity or graft rejection remains a major challenges. Corneal TE research is encompassing scaffolds for stromal and endothelial transplants, optical transparency or in vivo biocompatibility studies.

Recent Publications

KEARNS, V. R., TASKER, J., ZHUOLA, AKHTAR, R., BACHHUKA, A., VASILEV, K., SHERIDAN, C. M. & WILLIAMS, R. L. 2017. The formation of a functional retinal pigment epithelium occurs on porous polytetrafluoroethylene substrates independently of the surface chemistry. J Mater Sci Mater Med, 28, 124.

WILLOUGHBY, C.E., LESTER, K., WHYSALL, K., CHOUDHARY, A., HAMILL, K.J., SHERIDAN, C. (2017) Genome-wide transcriptome profiling of human trabecular meshwork cells treated with TGFβ-2. INVESTIGATIVE OPHTHALMOLOGY & VISUAL SCIENCE Vol. 58.

PAREKH, M., FERRARI, S., SHERIDAN, C., KAYE, S. & AHMAD, S. 2016. Concise Review: An Update on the Culture of Human Corneal Endothelial Cells for Transplantation. Stem Cells Translational

BRANCH, M. J., YU, W. Y., SHERIDAN, C. & HOPKINSON, A. 2015. Isolation of Adult Stem Cell Populations from the Human Cornea. In: RICH, I. N. (ed.) Stem Cell Protocols.

DOHERTY, K. G., OH, J. S., UNSWORTH, P., BOWFIELD, A., SHERIDAN, C. M., WEIGHTMAN, P., BRADLEY, J. W. & WILLIAMS, R. L. 2013. Polystyrene Surface Modification for Localized Cell Culture Using a Capillary Dielectric Barrier Discharge Atmospheric-Pressure Microplasma Jet. Plasma Processes and Polymers, 10, 978-989.

MASON, S. L., STEWART, R. M., KEARNS, V. R., WILLIAMS, R. L. & SHERIDAN, C. M. 2011. Ocular epithelial transplantation: current uses and future potential. Regen Med, 6, 767-82. Medicine, 5, 258-264.

Biography

Carl Sheridan is an internationally renowned cell biologist with research experience in ocular cell biology since 1991. His areas of focus have centered on ocular wound healing and cell transplantation research with published papers concerning the ocular surface, cornea, outflow pathway as well as retinal pathologies such as proliferative vitroretinopathy (PVR) and AMD. He has published and reviewed for almost all Ophthalmology scientific journals as well as chaired at international Ophthalmology conferences. He has a keen interest in both tissue engineering and regenerative medicine approaches to prevent and restore sight loss and is passionate that cross discipline research is key to achieving this goal.

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