

'ready-to-use' frozen cells. In this presentation, I will introduce the current status of our developments to provide a platform for discussing future therapies for treating corneal endothelial decompensation.

**P48-A109 OBSTACLES AND PERSPECTIVES IN TISSUE ENGINEERED ENDOTHELIAL KERATOPLASTY**

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Endothelial bioengineering is the simplest form of corneal bioengineering insofar as it consists of producing a large quantity of corneal endothelial cells and packaging them in a form that can be transplanted to the patient. It seems to be the most realistic solution to replace endothelial grafts made from donor corneas and thus allow, by domino effect, to reserve them for other indications of keratoplasty. Kyoto ophthalmologists (S Kinoshita, N Koizumi and N Okumura) were the pioneers of injection therapy by demonstrating its feasibility and safety, with an efficacy at 5 years comparable to that of conventional endothelial grafts. These pioneers, split into two distinct entities, are currently industrializing this therapy by injecting cells in suspension, in the USA (Aurion biotech) and in Asia (Actualeyes). In addition to injections, tissue engineered endothelial keratoplasty (TEEK) is a complementary research approach. They consist in reproducing in vitro grafts of the DMEK or DSAEK type by seeding the cultured cells on a 'corneo-compatible' support. Several have passed the pre-clinical stages and one is in clinical trial in Asia. Suspension cells and TEEK each have advantages and limitations that make them complementary in the management of corneal endothelial diseases.

We will analyze why there is not yet an alternative process for mass production of corneal endothelial cells or clinical grade TEEK, systematically detailing the various bottlenecks identified, from the source of cells and media, to regulatory and economic aspects.

**P49-A103 ALLOGENEIC LIMBO-DALK: A NOVEL SURGICAL TECHNIQUE FOR PATIENTS WITH CORNEAL STROMAL DISEASE AND LIMBAL STEM CELL DEFICIENCY**

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**Purpose** To describe a novel corneal surgical technique combining Deep Anterior Lamellar Keratoplasty (DALK) with grafting of allogeneic limbal stem cells (limbo-DALK) as treatment for eyes with corneal stromal pathology and limbal stem cell deficiency (LSCD).

**Methods** This is a series of six Limbo-DALKs in five eyes of five patients. One patient received a second limbo-DALK after graft failure following the first procedure. Two of the donor corneae were HLA matched. Clinical records of included patients were reviewed retrospectively. All patients had been diagnosed with LSCD due to various pathologies. Analysed data included demographic data, diagnoses and clinical history, graft visualization and thickness measurements by anterior segment OCT, visual acuity and epithelial status. Follow-up visits were 6 weeks and 3, 6, 9, 12 and 18 months postoperatively with final suture removal at 18 months and further follow-up examinations twice yearly thereafter.

**Results** Two grafts showed total epithelial closure after 2 days, two after 14 days. In one eye, full closure of corneal epithelium did not occur after the first limbo-DALK, but could be achieved one month after second limbo-DALK. No endothelial graft rejection was seen.

**Conclusion** Based on data from this pilot series, limbo-DALK seems to be a novel viable surgical approach for eyes with severe LSCD and stromal corneal pathology.