

Novel Methods to Cultivate Human Limbal Epithelial Stem Cells

Tech ID: 24365 / UC Case 2012-743-0

SUMMARY

UCLA researchers in the Jules Stein Eye Institute have developed novel methods for cultivating stem cells using human feeder cells. This technology enables a more efficient system of producing pure stem cell populations for therapeutic development.

BACKGROUND

Limbal stem cell (LSC) deficiency is a disease with severe visual impairment and marked morbidity. This disease can be caused by an inherited stem cell disorder or contact lens wear. LSC therapy, using grafts of autologous limbal tissue cultivated *in vitro*, is an attractive strategy for long-term corneal regeneration. However, this approach has not been widely accepted, because current methods often lead to contamination by other cell types. Novel culture methods overcoming this barrier are critical in enabling this strategy to be used as treatment options.

INNOVATION

UCLA researchers have developed novel methods for cultivating human LSCs. These methods maintain ideal spacing between stem and feeder cells, preventing physical competition for growth surface. This allows for higher proliferation rates and better-maintained stem cell phenotypes. In addition, due to the physical separation of the LSCs and feeder cells, isolating pure populations of LSCs is possible. These unique advantages enable culture systems to efficiently expand human LSCs for therapeutic use.

APPLICATIONS

- ▶ Treating limbal stem cell deficiency
- ▶ Culturing cells whose growth require the co-culture of feeder cells

ADVANTAGES

- ▶ Higher stem cell growth rate
- ▶ Better maintained stem cell phenotype
- ▶ Enables the isolation of pure stem cell populations

STATE OF DEVELOPMENT

UCLA researchers have successfully demonstrated the advantages of this technology in both the culture and isolation of human LSCs. Studies to examine the therapeutic potential of the cultivated LSCs and their ability to reconstruct a healthy corneal surface are underway in animal models.

PATENT STATUS

Country	Type	Number	Dated	Case
United States Of America	Published Application	20160376555	12/29/2016	2012-743

ADDITIONAL TECHNOLOGIES BY THESE INVENTORS

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OTHER INFORMATION

KEYWORDS

feeder cells, corneal stem cells, tissue culture, membrane, limbal stem cell deficiency, limbal stem cells, progenitor cells, tissue culture

CATEGORIZED AS

- ▶ **Biotechnology**
 - ▶ Health
- ▶ **Medical**
 - ▶ Disease: Ophthalmology and Optometry
 - ▶ Research Tools
 - ▶ Stem Cell
- ▶ **Research Tools**
 - ▶ Cell Lines
 - ▶ Other

RELATED CASES

2012-743-0

- ▶ [Stem Cell-Derived Exosomes for the Treatment of Corneal Scarring](#)
- ▶ [Xenobiotic-Free Culture System To Expand Human Limbal Stem Cells](#)

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