

**Title** **Enhanced wound healing of tissue-engineered human corneas through altered phosphorylation of CREB and AKT signal transduction pathways**



**Activity sector** Ocular diseases and wound healing

**Inventor(s)** Sylvain Guérin *et al.*, CUO-Recherche, Centre de recherche du CHU de Québec-Université Laval



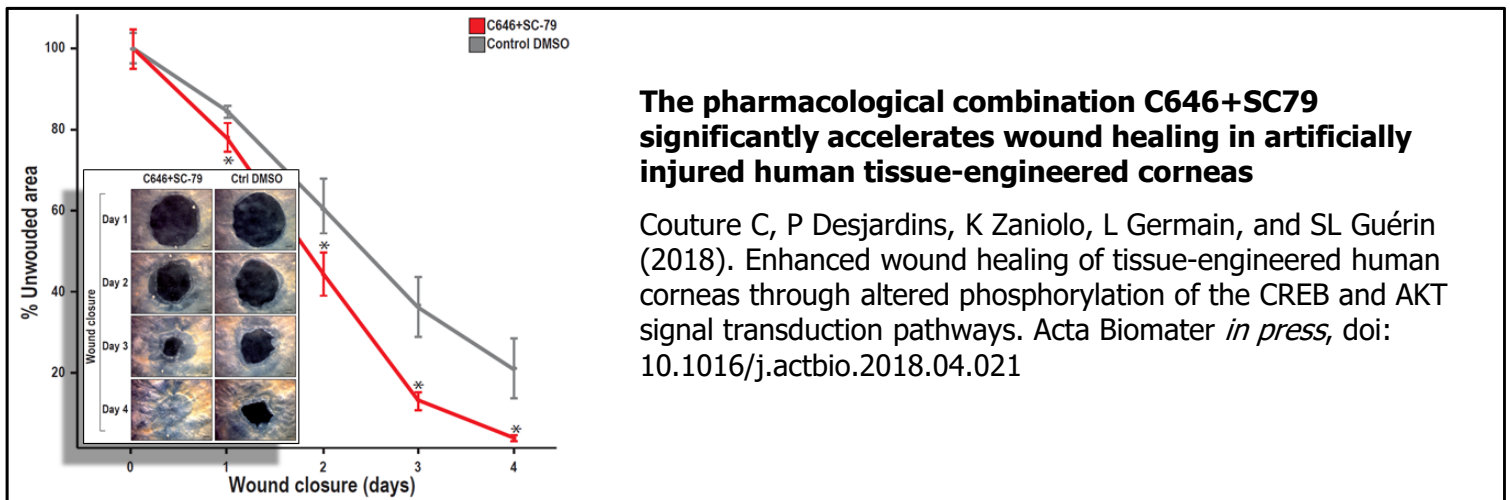
**Markets** Ophthalmology - Wound healing after eye surgery

**Unmet need(s)** Acceleration of (cornea) wound healing to decrease the risk of infection

**Solutions** A synergistic pharmacological combination composed of an inhibitor of CREB (C646) and an agonist of AKT (SC79) signalling pathways

**Description** The healing of corneal injuries and cataract surgeries generally requires 5-6 days, a period during which the risk of infection increases. Prof Guérin and colleagues have demonstrated that the modulation of CREB (inhibition by C646) and AKT (induction by SC79) signalling pathways can reduce the healing time to 4-5 days (rather than 6-7 days for DMSO-treated controls) using a human tissue-engineered cornea *in vitro* model (Couture *et al.*, 2018). This effect was reproduced *in vivo* in a rabbit ophthalmologic injury disease model (unpublished).

This invention could have broad applications in wound healing.



**Strengths** C646+SC79 is a synergistic pharmacological combination that decreases the time required for corneal wound healing from 6-7 days to 4-5 days

**Opportunities** SOVAR and Université Laval seek a partner for co-development or commercialization of this technology, in the form of more potent derivatives and/or formulation to increase the corneal residence time

Possibilities of collaborative research and development in other areas of wound healing

**Intellectual property** Guérin S, L Germain, K Zaniolo, C Couture, and P Desjardins (2017). Compositions favoring wound repair. WO2017075715A1. Assignee: Université Laval.