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Oral Communication

## KERATINOCYTE & SKIN PHYSIOLOGY

**S. Keswani**, Cincinnati Children's Hopsital, USA

# Recapitulating Fetal “Scarless” Healing In Postnatal Wounds: Are We There Yet?

Purpose Mid-gestation fetal skin heals wounds without scar. We have identified an essential role of IL-10 in the fetus’ ability to heal regeneratively and have demonstrated that viral mediated IL-10 overexpression results in regenerative wound healing in postnatal wounds. Given the inherent translational issues with viral-mediated gene therapy, we aim to validate a clinically translatable hydrogel delivery system of IL-10, which will result in fetal-type regenerative healing. Methods We first determined the optimal hydrogel composition for sustained IL-10 release kinetics. The composition of thiol-modified hyaluronan with thiol-modified heparin (HA), thiol-modified gelatin and a thiol-reactive crosslinker (polyethylene glycol diacrylate, PEGDA) were tested. The following ratios of HA:Gelatin:PEGDA were loaded with IL-10 (800 ng/25 ul) and evaluated: 1) Gel A (2:2:1), 2) Gel B (2:1:1), 3) Gel C (0:1:0) (thiol-modified gelatin only), 4) Gel D (0:0:1) (PEGDA only). Daily release of IL-10 was evaluated for seven days (ELISA). Identifying the hydrogels capable of sustained release, we then evaluated 4-mm excisional wounds in vivo. Wounds were treated with the hydrogel+IL-10, hydrogel control or recombinant IL-10 control and evaluated at 28 days (H&E). Results In vitro, all four hydrogel demonstrated release of IL-10 for three days. While hydrogels containing HA (Gel A and Gel B) continued sustained release of IL-10 for seven days, Gel C and Gel D release decreases at day 4

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