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Connexin mimetic peptide Gap27 accelerates wound healing in ex-vivo wound healing models, enhances the proliferation and migration of human fibroblasts and keratinocytes but has no effect on the migration of human keratinocytes from diabetic origin

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Connexins are transmembrane proteins that form Gap Junctions (GJ), communicating channels that allow the exchange of small molecules between adjacent cells. GJ are important for migration, differentiation and proliferation of cells. Connexin 43 (Cx43) has been shown to be ubiquitously expressed in human epidermis and to be down-regulated during early wound healing at the wound margins and in regenerating epidermis. **The fact that** Cx43 is still present at the margins of chronic wounds implicates that the down regulation is important for an effective wound closure. Phoshorylation of Cx43 on serine368 (S368) has been shown to decrease gap junctional intercellular communication (GJIC). **We could observe** an even distribution of pS368 throughout the epidermal layers of native porcine skin. After wounding, pS368 was down regulated in parallel to Cx43. To further elucidate the role of Cx43 we investigated the influence of a Cx43 mimetic peptide (Gap27) which results in a disruption of GJIC. Treatment of porcine ex-vivo wound healing models with Gap27 resulted in a significantly accelerated wound healing compared to the controls. **The treated models** showed a higher number of proliferative keratinocytes in the regenerating epidermis and at the wound margins. No difference concerning Cx43 phosphorylation (pS368) was observed. Confluent keratinocyte and fibroblast cultures that were treated with Gap27 prior to a scratch wound assay showed an enhanced migration that resulted in a faster wound closure. Interestingly, Gap27 treatment had no effect on the migration of human keratinocytes from diabetic origin. **This data suggests** a different influence of Gap27 on wound healing in diabetic and non-diabetic keratinocytes.