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Use of Focal Adhesion Kinase Inhibitors To Reduce Scar Formation In Combination With Split Thickness Skin Grafts

Stanford inventors have discovered that applying a hydrogel containing an inhibitor of mechanotransduction pathways on top of a skin graft reduces scarring and promotes healing after repair of traumatic injuries like severe burn wounds.

Split thickness skin grafting (STSG) is the standard-of-care for repairing full thickness wounds, like severe burns. However, the repaired area after the graft exhibits fibrotic healing, which results in fragility, lack of flexibility, and scar contracture. Groups at Stanford and elsewhere have demonstrated that mechanotransduction pathways are involved in scarring and fibrosis and that Focal Adhesion Kinase (FAK) proteins are key signaling components in these pathways.

In this work, Stanford scientists test the principle that FAK inhibition is an effective strategy for reducing wound scarring and fibrosis using a previously validated and selective FAK inhibitor called VS-6062. They combine split thickness skin grafting with the application of collagen-pullulan hydrogels containing this FAK inhibitor and show in a porcine model that the addition of the inhibitor-containing hydrogel accelerates wound healing, reduces scarring, and blocks scar contracture as compared to hydrogels alone. The promising results of this straightforward method in a large animal model indicate a technology that is ripe for clinical trials and commercialization.

Applications

- Scar reduction, improved wound healing, and reduced wound contracture after skin graft repair of burn wounds or related soft-tissue defects

Advantages

- **Improved function**: Less wound contracture and greater flexibility of the skin around joints improves movement as compared to the standard-of-care skin graft alone
- **Improved appearance**: Less scarring than with grafting alone leads to improved aesthetic result for patients, increasing their quality of life
- **IND-stage therapy**: Promising results in porcine models and an Investigational New Drug (IND) application to the FDA in preparation indicate an advanced therapeutic product ready to move into patients soon

Publications

- In review

Patents

- Published Application: WO2023009439
- Published Application: 20240252494

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