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**Huijing Du\***, 203 Avery Hall, Lincoln, NE 68588. *Multiscale modeling of epidermal-dermal interactions during skin wound healing.*

Following injury, skin activates a complex wound healing programme. While cellular and signalling mechanisms of wound repair have been extensively studied, the principles of epidermal-dermal interactions and their effects on wound healing outcomes are only partially understood. To gain new insight into the effects of epidermal-dermal interactions, we developed a multiscale, hybrid mathematical model of skin wound healing. The model takes into consideration interactions between epidermis and dermis across the basement membrane via diffusible signals, defined as activator and inhibitor. Simulations revealed that epidermal-dermal interactions are critical for proper extracellular matrix deposition in the dermis, suggesting these signals may influence how wound scars form. Our model also makes several theoretical predictions. Taken together, our model predicts the important role of signalling across the dermal-epidermal interface and the effect of fibrin clot density and wound geometry on scar formation. This hybrid modelling approach may be also applicable to other complex tissue systems, enabling the simulation of dynamic processes, otherwise computationally prohibitive with fully discrete models due to a large number of variables. (Received September 05, 2019)