Department of Mathematics and Statistics Colloquium

Differential Equations Heal All Wounds

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Abstract: Wound healing and tissue repair is a complex, multi-scale problem. Even in healthy individuals, it is difficult to quantify the different processes involved in the successful healing of a wound. When a patient is suffering for multiple injuries or diseases, the normal healing processes can be impaired. Mathematical modeling is currently being used to help identify why the healing process breaks down and what can be done to improve long term patient outcomes. Wound healing is achieved through the production of collagen by fibroblast cells. We use ordinary and partial differential equation models to investigate the competing actions of fibroblast cells and inflammatory cells on collagen accumulation. The model predictions are confirmed with experimental data. To connect the model to individual patients, we investigate the impact of circulating systemic hormones such as cortisol and estrogen on wound healing and patient outcomes.

Monday, January 23 at 3:45 in Roop 103

refreshments at 3:30