

Agent-based Modeling of Wound Healing

Qi Mi, Ph.D

Department of Sports Medicine and Nutrition, University of Pittsburgh, PA, 15260

Agent-based modeling (ABM) has recently emerged as an innovative computational approach to the simulation of complex biological systems and an alternative to traditional ODE or PDE based methodology. The entities (agents) in the ABMs can represent molecules, cells, or higher order cellular structures. It is relatively easy to transfer biological interactions into rules that define the explicit actions of the agents. The ABMs are especially useful for generating hypotheses and investigating spatially and temporally heterogeneous patterns of the biological system. In my talk, I will present my studies of using agent-based approach to model the wound healing in the settings of diabetic foot ulcer and epithelial cell layer migration. A multi-scale ABM framework-SPARK which has been recently developed in our group will also be discussed.