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Modeling Angiogenesis in Cutaneous Wound Healing

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Modeling Angiogenesis in Cutaneous Wound Healing

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This paper is concerned with simulating angiogenesis, an essential component of the complicated process of cutaneous wound healing. By employing a variant of the Eden model for cluster aggregation, we recreate a healing process in which capillary blocks are laid behind moving capillary sprouts within the wound region. The regeneration process is orchestrated by planting seeds along the wound edge and allowing them to grow as sprouts into the wound space. Capillary blocks are formed when the tips of two sprouts converge. We present simulations illustrating different healing strategies, including bacterial infection for several wound geometries.