

1173-92-235

Daniel Alejandro Cruz* (dcruz@gatech.edu), 686 Cherry St, Skiles 019, Atlanta, GA 30318, and **Elena Dimitrova, Melissa Kemp, Eunbi Park and Jack Toppen.** *Boolean Network Modeling of FGF Signaling Within Pluripotent Stem Cell Colonies.*

The differentiation of stem cell colonies into specified tissue types is possible through local and long-distance intercellular communication; however, it is unclear which mechanisms take priority in context-specific situations. Here we consider human induced pluripotent stem cells (hiPSCs) whose therapeutic potential arises from their ability to differentiate into all germ layers: endoderm (lungs, gastrointestinal tract, etc.), mesoderm (bone, muscle, blood vessels, etc.), and ectoderm (skin, hair, nervous tissue, etc.). Informed by experimental data, we develop a collection of Boolean network models for the FGF/ERK pathway which serves as a means for intercellular communication. The purpose of these models is (i) to study the role of FGF signaling in the context of hiPSC differentiation and (ii) to inform a type of multi-scale model called an agent-based model (ABM) that incorporates additional biological details like cell location. Thus, we study both the local dynamics of intercellular communication and the emergent behaviors of our ABM to ascertain which mechanisms determine cell fate in this context. (Received September 21, 2021)