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**Stem Cells and Regeneration: Feedback, Niche, and Epigenetic Regulation**

In developing and renewing tissues, terminally differentiated cell types are typically specified through the actions of multistage cell lineages. Such lineages commonly include a stem cell and multiple progenitor cell stages, which ultimately give rise to terminally differentiated cells. In this talk, I will present several modeling frameworks with different complexity on multistage cell lineages driven by stem cells, which account for diffusive signaling molecules, regulatory networks, cellular shapes, mechanics, and evolution. Questions of our interest include role of feedbacks in regeneration, stem cell niche for tissue spatial organization, crosstalk between epigenetic and genetic regulations. In several cases, we will also present direct comparisons between our modeling outputs and some existing and new in-vivo and in-vitro data.