



Center for Theoretical Biological Physics

SEMINAR

“Angiogenesis in the Eye: the Good and the Bad”



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Abstract: Angiogenesis, or blood vessel growth from existing ones, is an important physiological process that occur during development, wound healing, as well as diseases such as cancer and diabetes. I will report our recent progress in modeling angiogenesis in the eye in two scenarios. The good refers to healthy blood vessel growth in the retina in mouse embryos, which is a perfect experimental model for understanding the molecular mechanism of angiogenesis. The bad I the pathological blood vessel growth in age related macular degeneration, which is the leading cause of vision loss in the elderly and a looming epidemic in our aging society. We develop cell-based, multiscale models that include intracellular, cellular, and extracellular scale dynamics, and show that biomechanics of cell-cell and cell-matrix interactions play crucial roll in determining the dynamics of blood vessel growth initiation as well as vascular network formation. Such models show great potential as in silico Petri-dishes for predictive studies of mechanisms as well as therapies.