Fluid-structure modeling for simulating embryonic development

The work in the Doubrovinski laboratory is focused on uncovering the physical aspects of animal development. Using fruit fly (Drosophila melanogaster) embryo as an experimental model, we have developed a tool box of experimental techniques that allow measuring rheological properties of embryonic tissues directly in a living developing fly embryo. Our work has revealed that the embryonic cell consists of viscous interior (cytoplasm) enclosed by a highly elastic cell surface (cellular cortex). Careful quantitative measurements have allowed us to determine material parameters characterizing those cellular compartments. Currently, our research is focused on utilizing the information acquired in quantitative in vivo measurements of tissue rheology to understand endogenous tissue movements that shape an embryo during development.

We are looking for an expert in computational fluid dynamics to model tissue dynamics during embryonic development. The project will involve developing simulations of embryonic tissue dynamics occurring during the development of a fruit fly embryo. The models developed will be rigorously tested using a variety of biological experiments (fly genetics, microscopy, laser ablation, etc.) so we are looking for someone who is eager to collaborate with experimentalists in the lab. This project is a continuation of an ongoing collaboration with the Mandadapu group at UC Berkeley, and the work will be co-advised by Kranthi Mandadapu.

Information on our postdoctoral training program and benefits can be found in our Postdoc Handbook or at http://www.utsouthwestern.edu/postdocs. Interested individuals should send a CV, statement of interests, and a list of three references to:

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