The Department of Bioengineering announces the following PhD defense:

**Capillary Microfluidics for Viscoelastic Characterization of Biopolymers**

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1PM  
5048 NI

Numerous applications in biomedical engineering from tissue engineered constructs to biosensors and diagnostic tools call for a better understanding of the relationship between the biochemical constituents of a structure and their viscoelastic properties. The aim of the proposed studies is to develop a simple technique based on capillary microfluidics to study the viscoelasticity of biopolymers. An experimental system based on capillary microfluidics will be fabricated to analyze the viscoelasticity of biopolymers and a mathematical model will be developed that will relate the capillary flow behavior of biopolymers to their viscoelastic properties. In the next step, a systematic study of the viscoelasticity of different biopolymers, that constitute the extracellular matrix of tissues, like glycosaminoglycan and collagen, will be performed in aqueous solutions. This will be followed by a viscoelastic analysis of how the different biopolymers interact when present together. For this, multicomponent aqueous solutions will be prepared that will have more than one biopolymer in the same aqueous solution. Finally, the results will be compared to existing molecular models of viscoelasticity.