

# Automation and Microfluidic Tools for Q Bio

**Hang Lu**

*Georgia Institute of Technology*

*311 Ferst Dr. NW*

*Atlanta, GA 30332-0100*

**I**N this talk, I will focus on how my lab develops and uses a set of automation, microfluidics, and image-based data mining technologies to address questions in quantitative biology. In one example, I will show how we take advantage of simple hydrodynamics to design microfluidic systems for large throughput and spatially and temporally well-controlled experiments in embryonic development as well as in immunology. In another example, I will show how we combine the power of experimental tools and computational tools to study problems in development neurobiology and behavior in intact animals. The power of these engineered systems lies in that the throughput that can be achieved by using automation and microfluidics is 100-1,000 times that of conventional methods, and furthermore, we can obtain information unattainable or at least not easily attainable by conventional tools. For example, quantitative analysis and unbiased image data mining allowed the discovery of phenotypes (and subsequently genes) that are difficult for human users.