

Two graduate research positions (RA) are available immediate in the following area

1. Study of genetic networks. Research include both the theoretical issues such as the role network structure in function and robustness, the definition of network topological measures that capture the network structure; and applications that include algorithm development for network modeling from high-throughput genetic data, the genetic complexity in higher organisms, the genetic basis for phenotypes and signature perturbations during disease process.
2. Study of the multi-scale complex system that regulates glucose tolerance, a basic physiological process that provides energy to all cells in human body. The research involves the development and application of mathematical and computational methods for the study of the biological systems across different spatial and temporal scales. For insulin release from pancreatic islets, both ODE and PDE systems will be used to study the synchronization, pattern formation, wave front propagation and noise-induced orders in the islet, which can be modeled as a network of coupled non-linear oscillators (the beta cells, as well as other islet cells). From the results derive the emergent properties and the mathematical models of beta-cell function. Higher levels will include the investigation of autocrine and paracrine regulation, the communication and signaling between multiple organs (pancreas, liver, muscle, brain, etc), and the dynamics of glucose/insulin in blood circulation.

In either area of research, there will be ample opportunity to interact with a team of interdisciplinary investigators that includes mathematical biologist, theoretical physicist, applied mathematician, as well as biologists and clinicians. Such training and experience in a multi-disciplinary research environment will be valuable for future career development. More information of our research can be found at <http://www.phy.uab.edu/~xwang/>. Students interested to apply fundamental physical principles to biological problems are encouraged to apply.