

Neuroengineering

In-Hong Yang's research over the past six years has focused on understanding mechanisms of neurodegeneration associated with injury and disease as well as developing strategies to promote cell differentiation and/or regeneration. During his graduate studies in Biomedical Engineering at Texas A&M, his work focused on developing an *in vitro* model of neuron injury appropriate for the study of head injury and using proteomic approaches to examine protein expression and phosphorylation associated with both injury and recovery from injury. This work contributed to the understanding of both mechanisms of neuron injury and recovery. During his postdoctoral training in the University of Cincinnati, he conducted research on nerve cell micropatterning on various materials, and the effect of material microstructure on neuron differentiation, migration and survival. He developed methods for 2 and 3 dimensional co-culture of micropatterned cells, appropriate for studying the interaction of different cell populations within the central nervous system. In his current work, he is examining changes in neuron response to pathological insult throughout differential and development, from stem cells to adult neuronal cells. His future research plans are to combine his expertise in areas of proteomics, cell micropatterning and cell response to material structure, as well as cell response to both mechanical and chemical stimuli from the environment to effectively use stem cells and engineered tissues in a variety of applications associated with neuroregeneration after injury or disease, and to develop therapeutics that specifically promote or protect neurons from injury or disease.