

Research Interest:

- **Signal Transduction Pathways**

Delineating signaling pathways that protect against neuronal cell loss mediated by harmful insults would be beneficial for developing strategies to delay or halt the neurodegenerative process. The overall goal of our current research is to delineate the signaling pathways that the growth factor, vascular endothelial growth factor (VEGF), regulates to promote survival in neuronal cells subjected to harmful stimuli. VEGF is a well established angiogenic factor that also exhibits neuroprotective properties. Our research focuses specifically on identifying the signaling intermediates underlying the neuroprotection that VEGF mediates through activation of its cognate receptor VEGFR-2 in both in vitro and in vivo model systems of neuronal cell stress. We have identified signaling pathways that VEGF modulates to promote cell survival and those that VEGF suppresses to prevent cell death. The rationale for these studies is to determine whether VEGF would serve as a useful therapeutic to prevent the neuronal cell damage associated with neurodegenerative disorders.

My teaching responsibilities involve overseeing a BA/MA program in Biology with Specialization in Biotechnology. This program involves a Biotechnology Seminar and a Biotechnology Workshop that is designed to teach graduating seniors and Masters Students in the Biological Sciences state-of-the-art laboratory procedures in recombinant DNA techniques and the basic scientific principles underlying each technique. Students who successfully complete the Workshop are entitled to internships with local biotechnology or biomedical research laboratories. The curriculum for this program is based on my previous work in cancer therapeutics in industry. This work focused on the development of drugs that target signaling by specific tyrosine kinase receptors to prevent tumor growth or angiogenesis.