Research Description: Professor George W. Kabalka

Dr. Kabalka's research is focused on the creation of new synthetic pathways (molecular architecture) that can be utilized for the preparation of agents of use in Nuclear medicine imaging. A primary goals center on the design and synthesis of pharmaceuticals labeled with radioisotopes for use in the Positron Emission Tomographic (PET) evaluation of neurodegenerative diseases such as Alzheimer's and Parkinson's, as well as, neurological disorders involving seizure activity and tumor growth. The detection of cancers such as metastatic malignant melanomas and glioblastomas is also an important component of the research program. Current projects involve the synthesis of radiolabeled celecoxib (a COX-2 inhibitor) for detection of early onset of Alzheimer's disease, the preparation of radiofluorinated boronated unnatural amino acids for the detection of brain tumors, and radiolabeled anabaseine derivatives for use in the early detection of lung cancer.

For an overview of our current research efforts, please review the following:

Kabalka, G. W.; Venkataiah, B.; Dong, G. "Organic Synthesis in Ionic Liquids Utilizing Organometallic Reagents", In: *Ionic Liquids in Organic Synthesis*; S. V. Malhotra, (Ed.) American Chemical Society Symposium Series, **2007**, 72–82.

Kabalka, G W.; Zhou, L.-L.; Wang, L.; Pagni, R. M. "A Microwave Enhanced, Solventless Mannich Condensation of Terminal Alkynes and Secondary Amines with *para*-Formaldehyde on Cuprous Iodide Doped Alumina," *Tetrahedron* **2006**, *62*, 857–867.

Schuller, H. M.; Kabalka, G. W.; Smith, G.; Mereddy, A.; Murthy, A.; Cekanova, M. "Detection of Overexpressed Cox-2 in Precancerous Lesions of Hamster Pancreas and Lungs by Molecular Imaging: Implications for Early Diagnosis and Prevention." *Chem. Med. Chem.* **2006**, *1*, 603–610.

Kabalka, G. W.; Al-Masum, M.; Mereddy, A. R.; Dadush, E. "Microwave Enhanced Cross-Coupling Reactions Involving Alkenyl- and Alkynyltrifluoroborates." *Tetrahedron Lett.* **2006**, *47*, 1133–1136.

Kabalka, G. W.; Yao, M.-L. "The Synthesis and Use of Boronated Amino Acids for Boron Neutron Capture Therapy." *Anti-Cancer Agents in Medicinal Chemistry* **2006**, *6*, 111–125.

Kabalka, G. W.; Mereddy, A. R.; Green, J. F. "The No-Carrier-Added Synthesis of Bromine-76 Labeled Alkenyl and Alkynyl Bromides Using Organotrifluoroborates," *J. Labeled Compds. Radiopharm.* **2006**, *49*, 11–15.