

Elke Schoffers, Ph.D.

Synthesis of Bioactive Molecules,
Asymmetric Catalysis

E-mail: Elke.Schoffers@wmich.edu

Office phone: 269-387-2265

Lab phone: 269-387-2246

1989: B.S. Johannes Gutenberg
University

1991: M.S. State University of New York
at Stony Brook

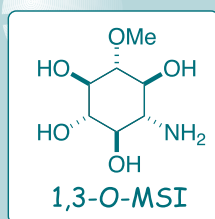
1996: Ph.D. Wayne State University

Research Interests

Dr. Schoffers started her academic career at the Johannes Gutenberg University in Mainz, Germany, and continued graduate studies in the United States under the supervision of Professors I. Ojima (SUNY Stony Brook, M.S., 1991), C.R. Johnson (WSU, Ph.D., 1996), and A.J. Pearson (CWRU, postdoc, 1996-98). In 1998 she joined the Department of Chemistry at Western Michigan University where she is pursuing research opportunities with graduate and undergraduate students. Her long-term goal is to study and apply stereoselective synthesis. All research projects involve organic synthesis and offer her students an opportunity to explore fundamental synthetic methods.

1. Synthesis of Inosamines

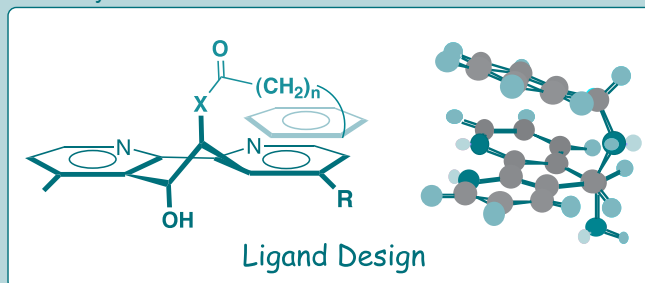
The challenging structure of 3-O-methylscyllo-inosamine displays dense functionality and stereochemistry. The carbohydrate-like target molecule attracted Dr. Schoffers' attention due to the potential involvement in plant signal-transduction. Because the target is available in only minute amounts in legume plants, she is not only interested in the preparation of larger quantities but also in the use of synthetic intermediates for antibiotics.



2. New Ligands for Asymmetric Catalysis

It has been recognized that catalysis will play a crucial role in the 21st century in the environmentally benign synthesis of new and existing chemicals. Our research program is concerned with the application of asymmetric catalysis for the preparation of enantiomerically pure chemicals, an important aspect for the synthesis of pharmaceuticals, agrochemicals, and food ingredients.

Currently, we are investigating the synthesis of novel bridged bipyridyl ligands that can be applied as optically active metal ligands in asymmetric catalysis. This project applies synthesis to organometallic chemistry and employs computational methods for conformational analysis of new ligands that complement laboratory methods.



3. Arylamine Nucleoside Adducts (collaboration Prof. J. Means, Analytical Chemistry/Toxicology)

Arylamines are metabolically activated in organisms to form powerful electrophiles that can covalently bond to DNA and RNA to form adducts. If these adducts are not repaired they can cause mutations that ultimately may lead to cancer. These compounds are difficult to study because their traditional syntheses are low yielding. We have developed a facile, high yielding synthesis for several adducts by coupling a protected derivative of 8-bromoadenosine directly with the desired amine using palladium catalysis.

Selected Publications

- Olsen, P.; Schoffers, E.; Means, J. "Development of an Isotope Dilution Liquid Chromatography/Tandem Mass Spectrometry Detection Method for DNA Adducts of Selected Aromatic Amines," *J. Am. Soc. Mass Spectrom.* **2003**, *14*, 1057-1066.
- Schoffers, E. "Reinventing Phenanthroline Ligands" *European Journal of Organic Chemistry* **2003**, 1145-1152
- Schoffers, E.; Tran, S. D.; Mace, K. "Preparation of Chiral 5,6-Dihydrophenanthrolines From Phenanthroline-5,6-epoxide" *Heterocycles* **2003**, *60*, 769-772
- Schoffers, E.; Olsen, P.; Means, J. "Synthesis of C8-Adenosine Adducts of Arylamines Using Palladium Catalysis" *Organic Letters* **2001**, *3*, 4221-4223
- Pearson, A. J.; Schoffers, E. "Tricarbonyltris(pyridine)-molybdenum. A Convenient Reagent for the Preparation of *p*-Allylmolybdenum Complexes" *Organometallics* **1997**, *16*, 5365-5367.