

DoD Program *Idea Grant*

Professor Maria Hepel, Department of Chemistry at SUNY Potsdam, has been awarded \$549,713 from the U.S. Department of Defense for a project entitled "*Redox Abnormalities as a Vulnerability Phenotype for Autism and Related Alterations in CNS Development*", project duration: 2008-2011. This is a collaborative research project with the University of Rochester and the University of Arkansas.

A wide range of evidence demonstrates that children with autism or autism spectrum disorders (ASD), and also parents of these children, frequently have abnormalities in their redox status. Increased levels of oxidized glutathione, as well as other indications of a more oxidized state, have been observed in plasma, serum and urine samples from individuals diagnosed with ASD. Redox-related alterations associated with ASD also appear to be heritable. Recent studies have found that redox abnormalities indicative of an increased oxidative status are common in ASD for multiple genotypes. The evidence supporting an increased oxidative status in ASD children is found in the majority of cases examined. Moreover, such redox abnormalities may provide important clues as the reasons why only some children exposed to environmental factors develop ASD syndromes. In this project, the SUNY Potsdam research is focused on the design of

novel sensors for detecting oxidative stress and redox buffering capacities based on the main redox regulation system of glutathione, a small tripeptide biomolecule which protects cells against organic peroxides and radicals and also takes part in natural detoxification routes on heavy metal ion exposure. The development of biosensors and sensor arrays for this project is a continuation of earlier investigations on piezoimmunosensors for pesticides, herbicides and PCB. Several undergraduate students participate each year in research for this project. Students involved in the project include: Kaitlin Coopersmith, Amanda Prance, Robert Wallace, Janet Peachey, Zachary Reed, and Cortney Poiner, Jeffrey Deeb, Justin Barcombe, Veronica Landau, David Wickham and Amanda Dickson. A number of papers, co-authored with undergraduate students, reporting results obtained in this Project were presented at the regional, national and international conferences, including:

- [National Meeting of the American Chemical Society in Boston, MA, August 22-26, 2010.](#)
- [National Meeting of the American Chemical Society in Washington, DC, August 16-20, 2009.](#)
- [NERM-2010 North-East Regional Meeting of the American Chemical Society, Postdam, NY, June 2-5, 2010.](#)
- [PITTCON-2010 Conference and Exhibition, Orlando, FL, February 28 - March 5, 2010.](#)
- [4th International Conference on Oxidative/Nitrosative Stress and Disease, The New York Academy of Sciences, New York, NY, October 28-30, 2009.](#)
- [Materials Research Society Meeting, Boston, MA, November 30 - December 4, 2009.](#)
- 11th International Fischer Symposium on "Microscopy in Electrochemistry", Center for Environment and Culture, Benediktbeuern, Germany, July 26-31, 2009.
- ACS National Meeting, Salt Lake City, March 22-26, 2009.