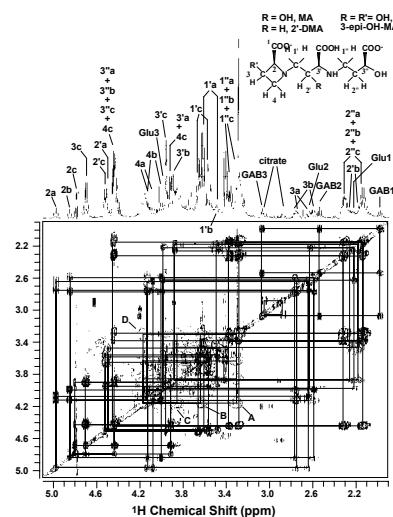


AREAS OF RESEARCH INTEREST

- Stress metabolism and contaminant biotransformation by organisms in response to natural stresses and anthropogenic pollution
- Use of metabolomics and proteomics for probing environmental stress metabolism and adaptation
- Roles of primary producers metabolism in biogeochemical cycling, ecotoxicology, and *in situ* bioremediation
- Functions of natural organic matters in contaminant bioavailability, transport, and remediation

In collaboration with Dr. Andrew Lane (the Brown Cancer Center, University of Louisville) and Dr. Richard Higashi at the University of California, Davis, our research is in the area of environmental biochemistry with emphasis on pollutant transformations, molecular toxic mechanism(s), and bioremediation. We apply a variety of bioanalytical approaches, including metabolomics by NMR, GC-MS, and FTIR as well as proteomics by 2-D gel electrophoresis and LC-tandem MS to investigate the following problems: 1) Selenium biotransformations and selenoprotein regulation in relation to toxicity in embryonic development and carcinogenesis. 2) Induction and structure characterization of biogenic chelators, their interaction with heavy metals, and application to metal bioavailability and *in situ* bioremediation.



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