

Postdoctoral Positions – *Redox Regulation in Treatment of Parkinson's Disease* [Available July 2010]

Thiol Homeostasis and Cardiovascular Risk: Role in Aging [Available Dec. 2010]

The laboratory of John Mieyal is recognized internationally for advancing knowledge of redox regulation and signal transduction in health and disease, especially involving the glutaredoxin and thioredoxin enzyme systems. Professor Mieyal has been a featured speaker at ASBMB, International Redox Network, and Gordon Conferences on *Redox Regulation and Thiol Homeostasis* in recent years. Two current research areas of emphasis for the laboratory are mechanisms of alterations in redox regulation in Parkinson's disease and cardiovascular thiol homeostasis with aging, and one or more post-doctoral positions are available in each case for individuals who focused their Ph.D. training on neurodegenerative or cardiovascular diseases and/ or areas related to redox regulation and thiol homeostasis. *For the Parkinson's disease focus, successful candidates must be United States citizens.*

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Joint Appointments: Chemistry, Environmental Health Sciences, Cancer Center

RESEARCH INTERESTS - Modulation of thiol-disulfide status of critical cysteine residues on proteins is recognized as an important mechanism of oxidative signal transduction and enzyme regulation, as well as an important consequence of oxidative stress associated with aging and cardiovascular, inflammatory, and neurodegenerative diseases, diabetes, AIDS, and cancer. Within these contexts reversible formation of protein mixed disulfides (protein-SSG) with intracellular glutathione (GSH) is a prevalent form of cysteine modification.

Our laboratory is focused on the molecular mechanisms and physiological implications of thiol-disulfide oxidoreductase enzymes that catalyze formation and breakdown of protein intermediates with modified cysteine residues. In particular, we found glutaredoxin displays unique specificity and catalytic efficiency for reduction of protein-SSG substrates, and it also displays a unique ability to sequester and transfer the glutathione thiyl radical. *Thus, glutaredoxin is expected to play a central role in cellular regulation.* We employ many techniques to study the roles of glutaredoxin and related enzymes in redox signal transduction, and in response to oxidative stress associated with various diseases.

SELECTED CITATIONS

Website: <http://pharmacology.case.edu/department/Faculty/Primary/Pages/mieyal.aspx>

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