

Yadava Laboratory

Research Interests: *Mitochondrial biogenesis, Mitochondrial dysfunction & disease, Aging*

The long-term objectives of my group are to understand (i) how mitochondrial dysfunction leads to neurodegeneration and other age-associated diseases such as diabetes and cancer, and (ii) the molecular, biochemical and physiological causes of mitochondrial dysfunction. Our studies involve functional imaging, molecular biological, biochemical and physiological approaches to probe mitochondrial function and biogenesis. A special emphasis is given to studying mitochondrial function in intact cells.

Mitochondrial dysfunction is very often associated with a variety of human diseases starting in early childhood to late in life. Although neuromuscular degenerative diseases are more frequent, almost every tissue is associated with pathological conditions due to mitochondrial dysfunction. This is not surprising considering the key role mitochondria play in cellular bioenergetics, and in making life and death decisions. It has become clear that mitochondrial dysfunction should be considered in investigating all those diseases for which molecular and biochemical explanations are lacking. Most often mitochondrial dysfunction is due to partial deficiencies of the respiratory chain complexes with Complex I (NADH-ubiquinone oxidoreductase) being the leading cause. Thus, Complex I is the main focus of our studies to elucidate (1) the role of mitochondrial dysfunction in disease, and (2) the process of mitochondrial biogenesis.

Selected Publications: The Role of Mitochondrial Dysfunction in Disease

Yadava N, Nicholls DG. (2007) Spare respiratory capacity rather than oxidative stress regulates glutamate excitotoxicity following partial respiratory inhibition of mitochondrial complex I with rotenone. **J Neurosci.**, 27(27): 7310-7317

Nicholls DG, Johnson-Cadwell L, Vesce S, Jekabsons M, **Yadava N**. (2007) Bioenergetics of mitochondria in cultured neurons and their role in glutamate excitotoxicity. **J Neurosci. Res.**, 85(15): 3206-3212

Ricci J.E., Munoz-Pinedo C., Fitzgerald P., Bailly-Maitre B., Perkins G.A., **Yadava N.**, Scheffler I.E., Ellisman M.H., Green D.R. (2004) Disruption of mitochondrial function during apoptosis is mediated by caspase cleavage of the p75 subunit (NDUFS1) of complex I of the electron transport chain. **Cell**, 117: 773-786

Selected Publications: The Process of Mitochondrial Biogenesis

Yadava N., Potluri P., Scheffler I.E. (2008). Investigations of the potential effects of phosphorylation of the MWFE and ESSS subunits on complex I activity and assembly. **Int. J. Biochem. Cell Biol.**, 40(3): 447-460

Yadava N., Houchens T., Potluri P., Scheffler I.E. (2004) Development and characterization of a conditional mitochondrial complex I assembly system. **J. Biol. Chem.**, 279(13): 12406-12413

Yadava N., Potluri P., Smith E., Bisevac A., Scheffler I. E. (2002) Species-specific and mutant MWFE proteins: their effect on the assembly of the mammalian mitochondrial complex I. **J. Biol. Chem.**, 277(24): 21221-30; 277(45): 21221-21230

Scheffler I.E., **Yadava N.**, Potluri P. (2004) Molecular genetics of complex I-deficient Chinese hamster cell lines. **Biochim. Biophys. Acta**, 1659:160-171

Professional Societies:

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| 2005-present | Member of the Society for Neuroscience (SFN) |
| 2001-present | Member of the American Society for Biochemistry and Molecular Biology (ASBMB) |



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Education

B.S., Biology, Banaras Hindu University, India

M.S., Biotechnology, M.S. University of Baroda, India

Ph.D., Life Sciences, Jawaharlal Nehru University, India

Postdoctoral

Parasitic invasion: The Chicago Medical School 1997-1998:

Mitochondrial Biogenesis: University of California San Diego 1998-2005

Mitochondrial dysfunction & disease: Buck Institute for Age Research 2005-2008

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