
BIOGRAPHICAL SKETCH

Provide the following information for the key personnel and other significant contributors in the order listed on Form Page 2.

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NAME J. Michael O'Donnell, PhD		POSITION TITLE	
eRA COMMONS USER NAME ODONNELL		Assistant Professor	
EDUCATION/TRAINING <i>(Begin with baccalaureate or other initial professional education, such as nursing,</i>			
INSTITUTION AND LOCATION	DEGREE <i>(if applicable)</i>	YEAR(s)	FIELD OF STUDY
The University of Dayton	BS	1981-86	Electrical Engineering
The Ohio State University	PhD	1989-95	Biophysics
Harvard Medical School, Massachusetts General Hospital	Postdoctoral	1995-1998	Biochemistry
University of Maryland School of Medicine	Postdoctoral	1999-2000	Molecular Biology & Biochemistry

Research and Professional Experience:

- 1987-88 Electrical Engineer, Defense Electronics Supply Center, Dayton, Ohio.
- 1988-91 Research/Project Engineer. International Applied Physics, Dayton, Ohio. Supervisor; David Bauer.
- 1991-92 Graduate Teaching Assistant. Biology Department. Laboratory Instructor. The Ohio State University, Columbus, Ohio.
- 1992-95 Graduate Research Associate. Department of Radiology, The Ohio State University Medical Center. NMR Center. Supervisor; Dr. Pierre Robitaille.
- 1995-98 Postdoctoral Fellow. Department of Radiology. Harvard Medical School, The Massachusetts General Hospital, Boston, MA. NMR Center. Supervisor; Dr. E. Douglas Lewandowski.
- 1999-00 Postdoctoral Fellow. University of Maryland School of Medicine, Department of Molecular Biology and Biochemistry. Baltimore, Maryland. Supervisor; Dr. G. Inesi.
- 2000-00 Research Assistant Professor. University of Maryland School of Medicine, Department of Molecular Biology and Biochemistry. Baltimore, Maryland.
- 2000-05 Research Assistant Professor. University of Illinois at Chicago, College of Medicine. Program in Integrative Cardiac Metabolism. Department of Physiology and Biophysics. Chicago, Illinois.
- 2005-present Assistant Professor. University of Illinois at Chicago, College of Medicine. Program in Integrative Cardiac Metabolism. Department of Physiology and Biophysics. Chicago, Illinois.

Fellowships and Awards

NIH National Research Service Award
American Heart Association, Mid-Atlantic Affiliate Scientist Development Grant
American Heart Association, National Foundation Scientist Development Grant
Student/Young Investigator Travel Award, AHA (1999, 2003) and ISMRM (1994).

Committees / Memberships

- 2005- Center for Cardiovascular Research (CCVR) member, University of Illinois at Chicago
2006- American Heart Association, Peer Review Study Group (Lipids). National and Greater Midwest.
2007- Director, PICM Animal Surgical Laboratory, Program in Integrative Cardiac Metabolism.
University of Illinois at Chicago.
2007- University Animal Care Committee (ACC) member, University of Illinois at Chicago.

Professional Societies

AHA, American Heart Association, Basic Science Council.
Biophysical Society.
ISHR, International Society of Heart Research

Representative Publications

- Robitaille PM, DP Rath, AM Abduljalil, **JM O'Donnell**, Z Jiang, H Zhang, and R Hamlin. Dynamic ¹³C NMR Analysis of Oxidative Metabolism in the in Vivo Canine Myocardium. *J. Biol. Chem.* 268; 26296-26301, 1993. PMID: 8253751
- O'Donnell JM**, ME Durand, PM Robitaille, SW Fisher, and PC Stromberg. ³¹P-NMR Analysis of Lethal and Sublethal Lesions Produced by KCl-Intoxication in the Zebra Mussel, *Dreissena Polymorpha*. *J. Exper. Zool.*: 276; 53-62, 1996.
- O'Donnell JM**, M Akino, H Zhu, and BT Stokes. Phosphorus-31 Nuclear Magnetic Resonance Spectroscopy of the Spinal Cord in the Pig, Rat, and Rabbit. *J. Invest. Rad.*: 31(3);121-125, 1996. PMID: 8675418
- Akino M, **JM O'Donnell**, PM Robitaille, and BT Stokes. Phosphorus-31 Magnetic Resonance Spectroscopy Studies of Pig Spinal Cord Injury: Myelin Changes, Intracellular pH, and Bioenergetics. *J. Invest. Rad.* 32(7);382-388, 1997. PMID: 9228603
- Lewandowski ED, X Yu, KF LaNoue, LT White, C Doumen, and **JM O'Donnell**. Altered Metabolite Exchange Between Subcellular Compartments in Intact Postischemic Rabbit Hearts. *Circ. Res.* 81;165-175, 1997. PMID: 9242177
- O'Donnell JM**, C Doumen, KF LaNoue, LT White, X Yu, NM Alpert, and ED Lewandowski. Dehydrogenase Regulation of Metabolite Oxidation and Efflux From Mitochondria in Intact Hearts. *Amer. J. Physiol.* 43:H467-H476, 1998. PMID: 9486249
- O'Donnell JM**, P Narayan, MQ Bailey, AM Abduljalil, S McCune, R Altschuld, and PM Robitaille. ³¹P-NMR Analysis of Congestive Heart Failure in the SHHR/Mcc-*fa*^{cp} Rat Heart. *J. Mol. Cell. Cardiol.* 30(2):235-241, 1998. PMID: 9515000
- O'Donnell JM**, LT White, and ED Lewandowski. Mitochondrial Transporter Responsiveness and Metabolic Flux Homeostasis in Postischemic Hearts. *Amer. J. Physiol.* 277;H866-H873, 1999. PMID: 10484405
- White LT, **JM O'Donnell**, J Griffin, and ED Lewandowski. Cytosolic Redox State Mediates Postischemic Response to Pyruvate Dehydrogenase Stimulation. *Amer. J. Physiol.* 277; H626-H634, 1999. PMID: 10444488
- Griffin JL, **JM O'Donnell**, LT White, RJ Hajjar, and ED Lewandowski. Postnatal Expression and Activity of the Mitochondrial 2-Oxoglutarate Malate Carriers in Intact Hearts. *Am J Physiol* 279: C1704-C1709, 2000. PMID: 11078684
- Inesi G, Cavagna M, **O'Donnell JM**, Sumbilla C, Zhong L, Ma H, and Klein MG. Adenovirus Mediated Gene Transfer of SERCA Isoforms. In, Molecular Approaches to the Therapy of Heart Failure. Hasenfuss, G. and Marban E., (eds). Springer-Steinkopff. Darmstadt, Germany. P 76-88. 2000.
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Cavagna M, **JM O'Donnell**, C Sumbilla, G Inesi, and MG Klein. Exogenous Ca²⁺-ATPase Isoform Effects on Ca²⁺ Transients of Embryonic Chicken and Neonatal Rat Cardiac Myocytes. *J of Physiol*. 528(1):53-63, 2000. PMCID: PMC2270107

O'Donnell JM, C Sumbilla, M Hailun, I Farrance, M Cavagna, M Klein, and G Inesi. Tight Control of Exogenous SERCA Expression is Required to Obtain Acceleration of Calcium Transients with Minimal Cytotoxic Effect in Cardiac Myocytes. *Circ Res*. 88:415-421, 2001. PMID: 11230109

O'Donnell JM, LT White, NM Alpert, JL Griffin, and ED Lewandowski. Coupling of Mitochondrial Fatty Acid Uptake to Oxidative Flux in the Intact Heart. *Biophys J*. 2002 Jan;82(1):11-18. PMCID: PMC1302444

Lewandowski ED, RK Kudej, LT White, **JM O'Donnell**, and SF Vatner. Mitochondrial Preference for Short Chain Fatty Acid Oxidation During Coronary Artery Constriction. *Circulation*. 2002 Jan 22; 105(3) 367-72. PMID: 11804994

O'Donnell JM, RK Kudej, LT White, KF LaNoue, SF Vatner, and ED Lewandowski. Limited Transfer of Cytosolic NADH into Mitochondria at High Cardiac Workload. *Amer J Physiol (Heart Circ Physiol)* Jun; 286(6): H2237-H2242, 2004. PMID: 14751856

O'Donnell JM, and ED Lewandowski. Efficient, Cardiac-Specific Adenoviral Gene Transfer by Isolated Retrograde Perfusion *In Vivo*. *Gene Therapy* 12, 958-964, 2005. PMID: 15789062

O'Donnell JM, Zampino M, Alpert NM, Fasano MJ, Geenen DL, and Lewandowski ED. Accelerated Triacylglycerol Turnover Kinetics in Hearts of Diabetic Rats Include Evidence for Compartmented Lipid Storage. *Amer J Physiol (Endocrin and Metab)* Mar; 290(3): E448-55, 2006. PMID: 16234271

O'Donnell JM and ED Lewandowski. Controlling Specificity and Efficiency of Adenoviral Gene Transfer in Heart by Catheter Based Coronary Perfusion. In: *Gene Therapy - Prospective assessment in its societal context*. Niewohner J & Tannert C (Eds), Elsevier (pub), Amsterdam, Netherlands. p.33-46, 2006.

Lewandowski ED, **JM O'Donnell**, TD Scholz, N Sorokina, and PM Buttrick. Recruitment of NADH Shuttling in Pressure Overloaded and Hypertrophic Rat Hearts. *Amer J Physiol (Cell Physiology)*, 292(5): C1880-6, 2007. PMCID: PMC1868664

Sorokina N, **O'Donnell JM**, McKinney RD, Pound KM, Woldegiorgis G, LaNoue KF, Ballal K, Taegtmeyer H, Buttrick PM, Lewandowski ED. Recruitment of compensatory pathways to sustain oxidative flux with reduced carnitine palmitoyltransferase I activity characterizes inefficiency in energy metabolism in hypertrophied hearts. *Circulation*. 155(15): 2033-41, 2007. PMID: 17404155

O'Donnell JM, A Fields, N Sorokina, and ED Lewandowski. The absence of endogenous lipid oxidation in early stage heart failure exposes limits in lipid storage and turnover. *J Mol Cell Physiol* 44(2):315-322, 2008. PMCID: PMC2276319

O'Donnell JM, Fields AD, Xu X, Chowdhury SA, Geenen DL, and Bi J. Limited functional and metabolic improvements in hypertrophic and healthy hearts expressing the skeletal muscle isoform of SERCA1 by adenoviral gene transfer in vivo. *Amer J Physiol (Heart and Circ.)* 295(6):H2483-94, 2008. PMCID: PMC2614552

Pound KM, N Sorokina, M Fasano, DA Berkich, KF LaNoue, **JM O'Donnell**, and ED Lewandowski. Enzyme substrate competition effectively attenuates upregulated anaplerotic flux through malic enzyme in hypertrophied hearts and restores triacylglyceride. *Circulation Research*. 2009;104(6):805-12.

O'Donnell JM, Pound K., Xu X, and Lewandowski ED. SERCA1 Expression enhances the metabolic efficiency of improved contractility in post ischemic hearts. *Submitted for review*.

Grant Support

ACTIVE

RO1 HL079415-04 (PI: O'Donnell)

Title: Metabolism of Hypertrophic Hearts Overexpressing SERCA

Goal: The goal of this study is to determine how changes in calcium handling influence cardiac metabolism in hypertrophic heart following adenoviral gene transfer of SERCA in vivo.

4 R37 HL049244-15 (MERIT Award) Co-investigator (PI: Lewandowski)

Magnetic Resonance of Cardiac C-13 Flux and Metabolic Rate

Goal: The overall goal is to determine relationship between development of cardiomyopathy and lipid dynamics in hearts of diabetic mice (db/db), and transgenic models of PGC-1a deficiency, PPAR α overexpression, acylcarnitine synthase overexpression, and fatty acid transporter protein overexpression. There is no overlap.

5 RO1 HL62702-08 Co-investigator (PI: Lewandowski)

Title: NMR of mitochondrial transporters in cardiac hypertrophy

Goal: This project pursues novel application of NMR to monitor transport rates of intermediary metabolites for energy production in hypertrophied and failing hearts.

There is no overlap.
