

CURRICULUM VITA

Name: Brent D. Foy

Address: Department of Physics
Wright State University
Dayton, OH 45435

Phone: work: (937) 775-2571 home: (937) 436-4849

Email: brent.foy@wright.edu

Education:

- 1991 Ph.D. Medical Physics, Massachusetts Institute of Technology, Cambridge, MA
Thesis: NMR Characterization of Interstitial Myocardial Sodium
- 1985 B.S. Physics, Massachusetts Institute of Technology, Cambridge, MA

Professional Experience

- 2000- Associate Professor, Department of Physics, Wright State University, Dayton, OH
Developing biologically-based kinetic models of toxin disposition. Performing bioinformatic support and modeling for genomics/proteomics/metabolomics studies. Studying diffusion of proteins in cartilage as a possible sensitive indicator of early arthritic decay. Using ^{13}C NMR and mathematical models of biochemical reaction pathways to estimate metabolic fluxes.
- 1995- Director, Medical Physics Program, Department of Physics, Wright State University, Dayton, OH
- 1994 - 2000 Assistant Professor, Department of Physics, Wright State University, Dayton, OH
- 1991 - 1994 Research Fellow in Surgery, Department of Surgery, Dr. Martin Yarmush, Dr. Ron G. Tompkins, Massachusetts General Hospital, Harvard Medical School, Shriners Burns Institute, Boston, MA
Performed studies in perfused livers to determine the metabolic alterations of the hypermetabolic state induced by severe burn trauma. Studied oxygen uptake rates of cultured hepatocytes at various oxygen concentrations, and utilized this data in modeling oxygen transport in bioreactors.
- 1987 - 1991 Research Assistant, Department of Radiology, Dr. Deborah Burstein, Beth Israel Hospital, Boston, MA
- 1985 - 1986 Research Assistant, Physics Department, Dr. Toyochi Tanaka, Massachusetts Institute of Technology, Cambridge, MA

Original Reports

Karpinets TV, Foy BD. Model of the developing tumorigenic phenotype in mammalian cells and the role of sustained stress, *Journal of Theoretical Biology*, 227: 253-264, 2004.

Karpinets TV, Foy BD, Frazier JM. Tailored Gene Array Databases: Applications in Mechanistic Toxicology. *Bioinformatics*, 20: 507-517, 2004.

DelRaso NJ, Foy BD, Gearhart JM, Frazier JM. Cadmium Uptake Kinetics in Rat Hepatocytes: Correction for Albumin Binding, *Toxicological Sciences*, 72:19-30, 2003.

Foy BD, Frazier JM. Incorporation of Protein Binding Kinetics and Carrier-Mediated Membrane Transport into a Model of Chemical Kinetics in the Isolated Perfused Rat Liver., *Toxic. Mech. Meth.* 13: 53-75, 2003.

Soto A, Foy BD and Frazier JM. Effect Of Cadmium On Bromosulfophthalein Kinetics In The Isolated Perfused Rat Liver System, *Toxicological Sciences*, 69: 460-469, 2002.

Reo NV, Adinehzadeh M, Foy BD. Kinetic Analyses of Liver Phosphatidylcholine and Phosphatidylethanolamine Biosynthesis Using ¹³C NMR Spectroscopy. *Biochim Biophys Acta*, 1580: 171-188, 2002.

Foy, BD, Blake, J. Diffusion of Paramagnetically-Labeled Proteins in Cartilage: Enhancement of the 1-D NMR Imaging Technique. *Journal of Magnetic Resonance* **148**: 126-134, 2000.

Foy BD, Toxopeus C, Frazier JM. Kinetic Modeling of Slow Dissociation of Bromosulfophthalein from Albumin in Perfused Rat Liver: Toxicological Implications. *Toxic. Sci.* **50**: 20-29, 1999.

Yarmush DM, MacDonald AM, Foy BD, Berthiaume F, Tompkins RG, Yarmush ML. Cutaneous Burn Injury Alters Relative TCA Cycle Fluxes in Rat Liver *J Burn Care Rehab* **20**: 292-302, 1999.

Frazier JM, Pelekis M, Toxopeus C, Foy BD. Determination of Binding Constants of Water Soluble Chemicals for Biologically Based Kinetic Modeling. Technical Report for Air Force, 1998.

Bhatia SN, Toner M, Foy BD, Rotem A, O'Neil KM, Tompkins RG, Yarmush ML. Zonal liver cell heterogeneity: effects of oxygen on metabolic functions of hepatocytes. *Cellular Eng.* **1**: 125-135, 1996.

Zupke C, Foy BD. NMR analysis of cell metabolism. *Current Opinion in Biotech* **6**: 192-197, 1995.

Foy BD, Rotem A, Toner M, Tompkins RG, Yarmush ML. A device to measure oxygen uptake rate of cultured cells: importance in bioartificial organ design. Cell Transpl **3**: 515-527, 1994.

Rotem A, Toner M, Bhatia S, Foy BD, Tompkins RG, Yarmush ML. The effect of oxygen on attachment and spreading of cultured rat hepatocytes. Biotech Bioeng **43**: 654-660, 1994.

Foy BD, Toner M, Tompkins RG, Yarmush ML. Engineering organ perfusion protocols: NMR analysis of hepatocyte isolation from perfused rat liver. Biotech Bioeng **43**: 661-672, 1994.

Foy BD, Lee J, Morgan J, Toner M, Tompkins RG, Yarmush ML. Optimization of hepatocyte attachment to microcarriers: importance of oxygen. Biotech Bioeng **42**: 579-588, 1993.

Burstein D, Gray ML, Hartman AL, Gipe R, Foy BD. Self diffusion and diffusive permeability of small solutes in cartilage as measured by nuclear magnetic resonance (NMR) spectroscopy and imaging. J Orthop Res **11**: 465-478, 1993.

Foy BD, Burstein D. Characteristics of extracellular sodium relaxation in perfused hearts with pathologic interventions. Magn Reson Med **27**: 270-283, 1992.

Foy BD, Burstein D. Interstitial sodium nuclear magnetic resonance relaxation times in perfused hearts. Biophys J **58**: 127-134, 1990.

Peetermans JA, Foy BD, Tanaka T. Accumulation and diffusion of crystallin inside single fiber cells in intact chicken embryo lenses. Proc Natl Acad Sci **84**: 1727-1730, 1987.

Recent Presentations

Foy BD. Simulating the Interactions of Genes, Proteins, and Metabolites in Cell-like Entities, Review for AFOSR Bioinspired Concepts program, Annapolis, June 3, 2003.

Development and Application of a Biologically Based Mathematical Model of the Kinetics of Chrysotile Asbestos Fibers in Human Lung, Conference on Theories and Practices in Toxicology and Risk Assessment. Cincinnati, April 2002.

Recent Conference Abstracts and Posters

Foy BD, Implementation of Biochemical Complexes in Stochastic Simulations, Heidelberg, Germany, October, 2004.

Foy BD, Specification of Molecular Complexes in Cell Simulations, International Conference on Systems Biology, Stockholm, Sweden, December 11-15, 2002.

Foy BD, Gearhart J, Soto A, Frazier J. In-Vitro To Ex-Vivo Extrapolation Of Intracellular BSP Metabolism Parameters in Rat Liver, Society of Toxicology, Nashville, March 2002.

Foy, BD. Diffusion coefficients of proteins in cartilage. Whitaker Foundation Biomedical Engineering Research Conference. La Jolla, CA, August 2001.

Recent Funded Proposals

AFOSR Broad Agency Announcement, Bio-Inspired Concepts. Simulating the Interactions of Genes, Proteins and Metabolites in Cell-Like Entities. Principle investigator, Brent D. Foy. (\$375,000 for period from 9/1/01 to 1/31/05).

Dayton Area Graduate Studies Institute (DAGSI). Bioinformatic Support for Toxicogenomics. Principle investigator, Brent D. Foy. (\$400,000 for 2 year period from 7/1/01 to 7/1/04)

The Whitaker Foundation. Macromolecular Transport in Articular Cartilage during Cyclic Loading using Magnetic Resonance Imaging. Principle investigator, Brent D. Foy. (\$207,384 for 3 year period from 6/1/98 to 5/31/01)

Awards and Honors

1991-1994 John F. Burke Postdoctoral Fellowship, Massachusetts General Hospital
1985-1988 National Science Foundation Graduate Fellowship

Memberships

1989- International Society of Magnetic Resonance in Medicine
1985- Phi Beta Kappa
1985- Sigma Pi Sigma