CURRICULUM VITA

Name: Brent D. Foy

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Wright State University
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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
Modeling biomolecular networks using stochastic and non-stochastic methods. Modeling of asbestos kinetics in human lung, ribosome binding sites, and watershed travel times.

1995 - 2005 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. Toyoichi Tanaka, Massachusetts Institute of Technology, Cambridge, MA

Original Reports

Romer SH, Metzger S, Peraza K, Wright M, Jobe DS, Song LS, Rich MM, Foy BD, Talmadge RJ, Voss AA. A mouse model of Huntington's disease shows altered ultrastructure of transverse tubules in skeletal muscle fibers. J Gen. Physiol. 153 (4): e202012637, 2021.

Paliy O, Foy BD. Mathematical Modeling of 16S Ribosomal DNA Amplification Reveals Optimal Conditions for the Interrogation of Complex Microbial Communities with Phylogenetic Microarrays. Bioinformatics, 27:2134-2140, 2011.

Rigsbee L, Agans R, Foy BD, and Paliy O. Optimizing the Analysis of Human Intestinal Microbiota with Phylogenetic Microarray. FEMS Microbiol. Ecol, 75:332-42, 2011

Frazier JM, Chusak Y, Foy BD. Stochastic Simulation and Analysis of Biomolecular Reaction Networks BMC Systems Biology, 3:64, 2009.

Kleismit RA, Kozlowski G, Foy BD, Hull BE and Kazimierczuk M. Local complex permittivity measurements of porcine skin tissue in the frequency range from 1 GHz to 15 GHz by evanescent microscopy. Physics in Medicine and Biology, 54: 699-713, 2009.

Karpinets TV, Foy BD. Tumorigenesis: the adaptation of mammalian cells to sustained stress environment by epigenetic alterations and succeeding matched mutations, Carcinogenesis, 26(8): 1323-1334, 2005.

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 ^{13}C 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.

Funded Proposals

AFOSR, STTR phase II AF14-AT-21, Terahertz Spectroscopic Chemical Sensor for Analysis of Fatigued Human Breath. PI: Ivan Medvedev. My role: Senior Personnel. (Total funding to WSU: $286,066 for period from 11/1/2015 to 10/31/2017)

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 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 period from 6/1/98 to 5/31/01)

Contracts

National Institute for Occupational Safety and Health, procurement for preparation of a manuscript describing previous work. (2014)

National Institute for Occupational Safety and Health. "Follow-on Analyses for Revisions to a Biomathematical Model for Deposition and Clearance of Chrysotile Asbestos Fibers in Human Lungs" (Contract from July 2006 to June 2008.)

National Institute of Occupational Safety and Health. "Develop a biologically-based model describing the deposition and clearance of chrysotile asbestos fibers in the human lung." (Contract from September 2000 to August 2005)

Thesis Advisor and Postdoctoral Scholar Sponsor

Postdoctoral sponsor and supervisor for Tatiana Karpinets, Ph.D. Now at Oak Ridge National Laboratories.

Ph.D. Thesis Committee for Mehdi Adinezedah, Fine Wu, Sabrina Metzger (ongoing).

Thesis supervisor for 13 Master's students in the Physics Department at Wright State.