
BIOGRAPHICAL SKETCH

NAME James Dennis Quirk	POSITION TITLE Assistant Professor in Radiology		
eRA COMMONS USER NAME JDQUIRK			
EDUCATION/TRAINING <i>(Begin with baccalaureate or other initial professional education, such as nursing, and include postdoctoral training.)</i>			
INSTITUTION AND LOCATION	DEGREE <i>(if applicable)</i>	YEAR(s)	FIELD OF STUDY
Massachusetts Institute of Technology, Cambridge, MA	B.S.	1994	Chemistry
Washington University, St. Louis, MO	M.A.	1998	Chemistry
Washington University, St. Louis, MO	Ph.D.	2001	Chemistry

A. Personal Statement.

Our main research focus is the use of hyperpolarized noble gas MRI as a biomarker for the detection and characterization of pulmonary diseases as part of a multi-disciplinary imaging team across the Departments of Radiology, Physics, and Internal Medicine. Recent projects include measuring pulmonary ventilation and acinar microstructure in healthy controls and subjects with COPD, asthma, post-pneumonectomy, and post-lung transplantation.

We also utilize MRI to non-invasively study animal models of musculoskeletal disorders as part of an ongoing collaboration with the Washington University Musculoskeletal Research Core. Recent projects include characterizing the onset and progression of arthritic changes in the mouse knee, phenotyping fat deposition patterns in transgenic mouse models, and measuring angiogenic changes in the rat forelimb following bone microfracture.

B. Positions and Honors.

Positions and Employment

1994-1996 Research Associate, Glycan/Repligen Pharmaceuticals, Cambridge, MA
2001-2004 Senior Scientist, Pfizer Inc./Pharmacia, St. Louis, MO
2004-2006 Principal Scientist, Pfizer Inc., St. Louis, MO
2006-2012 Research Instructor, Radiology, Washington University School of Medicine, St. Louis, MO
2013-present Assistant Professor, Radiology, Washington University School of Medicine, St. Louis, MO

Other Experience and Professional Memberships

1996-2002, 2010-present Member, American Chemical Society
1997-1998 Member, 10th Annual Marcus Memorial Lecture Committee, Washington University
1997-1998 Member, Title IX Grievance Committee, Washington University
1999-present Member, International Society for Magnetic Resonance in Medicine (ISMRM)
2003-2005 Member, Academy of Molecular Imaging
2006-2009 Chair-Elect/Chair/Chair-Emeritus, MR in Drug Discovery Study Group, ISMRM
2007-2008 Member, Workshop & Study Group Review Committee, ISMRM
2010-present Member, American Thoracic Society

Peer Review Experience

Journal of Magnetic Resonance
Magnetic Resonance in Medicine

C. Selected peer-reviewed publications

J. D. Quirk, Y. V. Chang, D. A. Yablonskiy, “In Vivo Lung Morphometry with Hyperpolarized ^3He Diffusion MRI: Reproducibility and the Role of Diffusion-Sensitizing Gradient Direction.”, *Magnetic Resonance in Medicine*, 2014, DOI: 10.1002/mrm.25241.

Y. V. Chang, **J. D. Quirk**, D. A. Yablonskiy, “In Vivo Lung Morphometry with Accelerated Hyperpolarized ^3He Diffusion MRI: A Preliminary Study.”, *Magnetic Resonance in Medicine*, DOI: 10.1002/mrm.25284.

F. Pennati, **J. D. Quirk**, D. A. Yablonskiy, M. Castro, A. Aliverti, J. C. Woods. “Assessment of Regional Lung Function by Multi-Volume 1H-MRI in Health and Obstructive Lung Disease: Comparison with ^3He -MRI. *Radiology* 2014. Accepted.

R. E. Tomlinson, A. H. Schmieder, **J. D. Quirk**, G. M. Lanza, M. J. Silva. “Antagonizing the alpha beta Integrin Inhibits Angiogenesis and Impairs Woven but Not Lamellar Bone Formation Induced by Mechanical Loading.” *Journal of Bone and Mineral Research* (2014), DOI 10.1002/jbmr.2223.

D. A. Yablonskiy, A. L. Sukstanskii, **J.D. Quirk**, J. C. Woods, M. S. Conradi, “Probing Lung Microstructure with Hyperpolarized Noble Gas Diffusion MRI: Theoretical Models and Experimental Results.”, *Magnetic Resonance in Medicine*, 71 (2014), p.486-505.

Y.V. Chang, **J.D. Quirk**, I.C. Ruset, J.J. Atkinson, F.W. Hersman, J.C. Woods, “Quantification of human lung structure and physiology using hyperpolarized Xe.” *Magnetic Resonance in Medicine* 71 (2014), p. 339-344.

A. J. Hajari, D. A. Yablonskiy, A. L. Sukstanskii, **J. D. Quirk**, M. S. Conradi, J. C. Woods, “Morphometric Changes in the Human Pulmonary Acinus During Inflation.”, *J Appl Physiol.*, 112 (2012), p. 937-43.

J. D. Quirk, B. A. Lutey, D. S. Gierada, J. C. Woods, R. M. Senior, S. S. Lefrak, A. L. Sukstanskii, M. S. Conradi, and D. A. Yablonskiy, “In Vivo Detection of Acinar Microstructural Changes in Early Emphysema with ^3He Lung Morphometry.”, *Radiology*, 260 (2011), p. 866-874.

A. J. Hajari, D. A. Yablonskiy, **J. D. Quirk**, A. L. Sukstanskii, R. A. Pierce, G. Deslee, M. S. Conradi, and J. C. Woods, “Imaging alveolar-duct geometry during expiration via ^3He lung morphometry.” *J Appl Physiol*, 110 (2011), p. 1448-54.

E. Osmanagic, A. L. Sukstanskii, **J. D. Quirk**, J. C. Woods, R. A. Pierce, M. S. Conradi, E. R. Weibel, and D. A. Yablonskiy, “Quantitative assessment of lung microstructure in healthy mice using an MR-based ^3He lung morphometry technique.” *J Appl Physiol.*, 109 (2010), p. 1592-9.

T. K. Pilgram, **J. D. Quirk**, A. J. Bierhals, R. D. Yusen, S. S. Lefrak, J. D. Cooper, D. S. Gierada, “Accuracy of Emphysema Quantification Performed with Reduced Numbers of CT Sections.”, *American Journal of Roentgenology*, 194 (2010), p. 585-591.

D. A. Yablonskiy, A. L. Sukstanskii, J. C. Woods, D. S. Gierada, **J. D. Quirk**, J. C. Hogg, J. D. Cooper, M. S. Conradi, “Quantification of Lung Microstructure with Hyperpolarized ^3He Diffusion MRI.”, *Journal of Applied Physiology*, 107 (2009), p.1258-1265.

J. D. Quirk, A. L. Sukstanskii, G. L. Bretthorst, D. A. Yablonskiy, "Optimal Decay Rate Constant Estimates From Phased Array Data Utilizing Joint Bayesian Analysis.", *Journal of Magnetic Resonance*, 198 (2009), p. 49-56.

A. Bashir, M. S. Conradi, J. C. Woods, **J. D. Quirk**, D. A. Yablonskiy, "Calibration of RF Transmitter Voltages for Hyperpolarized Gas MRI.", *Magnetic Resonance in Medicine*, 61 (2009), p. 239-243.

B. A. Lutey, S. S. Lefrak, J. C. Woods, T. Tanoli, **J. D. Quirk**, A. Bashir, D. A. Yablonskiy, M. S. Conradi, S. T. Bartel, T. K. Pilgram, J. D. Cooper, and D. S. Gierada, "Hyperpolarized ³He MR Imaging: Physiologic Monitoring Observations and Safety Considerations in 100 Consecutive Subjects.", *Radiology*, 248 (2008), p. 655-661.

J. D. Quirk, A. L. Sukstanskii, D. S. Gierada, J. C. Woods, M. S. Conradi, and D. A. Yablonskiy. "Models and Applications of in vivo Lung Morphometry with Hyperpolarized ³He MRI in a Mild COPD Population". In: Hurlimann MD, Song YQ, Fantazzini P, Bortolotti V, editors. *AIP Conference Proceedings*; 2008; Cambridge, MA. American Institute of Physics. p 29-31. (AIP Conference Proceedings).

M. W. Tengowski, J. M. Lapointe, **J. D. Quirk**, J. Z. Long, D. T. Stephenson, M. E. Elwell, R. A. Valdez, C. M. Matherne, J. J. Kotyk. "Early Changes In Renal Blood Flow As Detected With DCE MRI Predict Imminent Pathology In A Rat Model Of Renal Papillary Necrosis: Developing A Drug Safety Biomarker." *Mol Imaging Biol* 7(2):119 (2005) , A146.

J. D. Quirk, S. J. Baldwin, M. P. Harms, F. Eckstein, M. Hudelmaier, S. Wrubel, E. C. Arner, J. J. Kotyk, "Validation of MRI Cartilage Biomarkers in Rat Knee Osteoarthritis." *Osteoarthritis and Cartilage* 12(Sup. 2) (2004), pp. S32-33.

J. D. Quirk, S. H. Kim, J. M. Thompson, S. J. Baldwin, K. S. Chinn, K. M. Shevlin, J. R. Hartke, E. C. Arner, J. J. Kotyk, "Monitoring Disease Progression in Rat Models of Arthritis Using Magnetic Resonance Imaging". *Mol Imaging Biol* 6(2) (2004), pp. 90-91.

J. D. Quirk, G. L. Bretthorst, T. Q. Duong, A. Z. Snyder, C. S. Springer, J. J. H. Ackerman, J. J. Neil, "Equilibrium Water Exchange Between the Intra- and Extracellular Spaces of Mammalian Brain". *Magnetic Resonance in Medicine*. 50 (2003), pp. 493-9.