David G. Mummy, Ph.D.

Contact Information

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Research Interests and Activities

My research focuses on applications of hyperpolarized gas MRI and pulmonary CT to advance understanding of regional aspects of structure-function in lung disease. These advanced imaging techniques can also be used to derive biomarkers for the purposes of personalized therapy and evaluation of clinical outcomes.

I am a referee for *Radiology*.

Research Experience

Post-Doctoral Research Associate — Feb 2019 - Present
Department of Radiology and Center for In Vivo Microscopy
Duke University
Supervisor: Bastiaan Driehuys, Ph.D

Research Assistant — September 2013 - Jan 2019
Department of Medical Physics,
University of Wisconsin-Madison
Supervisor: Sean B. Fain, Ph.D

Education

University of Wisconsin, Madison, WI

Ph.D., Biomedical Engineering. December 2018.

- Thesis Topic: *Defining Asthma Phenotypes in Asthma Using CT and Hyperpolarized Gas MRI*
- Advisor: Sean B. Fain, Ph.D

M.S., Biomedical Engineering, January 2015

Seattle University, Seattle, WA

M.B.A., June 2011

Whitman College, Walla Walla, WA

B.A., Mathematics, Physics, May 2006

Previous Employment

Statistical Analyst Programmer — 2011 - 2013
Fred Hutchinson Cancer Research Center
Seattle, WA

Flight Test Software Analyst — 2008 - 2011
The Boeing Company
Seattle, WA

Publications

- Jessica M. Oakes, **David Mummy**, Kamran Poorbahrami, Wei Zha, and Sean B. Fain. "Patient-Specific Computational Simulations of Hyperpolarized 3He MRI Ventilation Defects in Healthy and Asthmatic Subjects". IEEE Transactions in Biomedical Engineering [in press].
- Zha, Wei, Stanley J. Kruger, Robert V. Cadman, **David G. Mummy**, Michael D. Evans, Scott K. Nagle, Loren C. Denlinger, Nizar N. Jarjour, Ronald L. Sorkness, and Sean B. Fain. "Regional Heterogeneity of Lobar Ventilation in Asthma Using Hyperpolarized Helium-3 MRI." Academic Radiology 25, no. 2 (2018): 169-178.

- **David G. Mummy**, Stanley J. Kruger, Wei Zha, Ronald L. Sorkness, Nizar N. Jarjour, Mark L. Scheibler, Loren C. Denlinger, Michael D. Evans, Sean B. Fain."Ventilation defect percent in helium-3 magnetic resonance imaging as a biomarker of severe outcomes in asthma." Journal of Allergy and Clinical Immunology 141.3 (2018).
- E. Adamson, K. Ludwig, **D. Mummy**, S.B. Fain. "Magnetic resonance imaging with hyperpolarized agents: methods and applications". Physics in Medicine and Biology (2017). doi: 10.1088/1361-6560/aa6be8.
- Wei Zha, David J. Niles, Stanley J. Kruger, Bernard J. Dardzinski, Robert V. Cadman, **David G. Mummy**, Scott K. Nagle, and Sean B. Fain. "Semiautomated Ventilation Defect Quantification in Exercise-induced Bronchoconstriction Using Hyperpolarized Helium-3 Magnetic Resonance Imaging: A Repeatability Study". Academic Radiology (2016).
- V. Shankaran, **D. Mummy**, L. Koepl, A. Bansal, D. Mirick, E. Yu, R. Morlock, S. Ogale, and S. Ramsey. "Survival and lifetime costs associated with first-line bevacizumab use in older patients with metastatic colorectal cancer". Oncologist 19:892-899, 2014
- V. Shankaran, **D. Mummy**, L. Koepl, D. Blough, Y. M. Yim, E. Yu, S. Ramsey. "Adverse events associated with Bevacizumab and chemotherapy in older patients with metastatic colorectal cancer". Clin Colorectal Cancer 2013; 12(3): 204–213
- B. Goulart, C. Reyes, C. Fedorenko, **D. Mummy**, S. Satram-Hoang, L. Koepl, D. Blough, S. Ramsey. "Referral and treatment patterns among patients with stages III and IV non-small cell lung cancer". Journal of Oncology Practice, 9, 42-50. doi:10.1200/JOP.2012.000640
- B. Goulart, M. Bensink, **D. Mummy**, S. Ramsey. "Lung cancer screening with low-dose computed tomography: costs, national expenditures, and cost-effectiveness". Journal of the National Comprehensive Cancer Network: JNCCN. 01/2012; 10(2): 267-275.

Book Chapters

- "Asthma." **David G. Mummy**, Wei Zha, Ronald L. Sorkness, Sean B. Fain. *MRI of the Lung*, Hans-Ulrich Kauczor and Mark Oliver Wielpütz, Eds. Springer, 2018.
- "Hyperpolarized Gas MRI of the Lung in Asthma." Sean B. Fain, **David G. Mummy**, Ronald L. Sorkness. *Hyperpolarized and Inert Gas MRI: From Technology to Application in Research and Medicine*, Mitchell S. Albert and Francis T. Hane, Eds. Academic Press, 2016.

Awards

Abstract Awards

- Summa cum laude abstract
  International Society for Magnetic Resonance Imaging, Honolulu, HI — April 2017
- Student Prize (North America)
  International Workshop on Pulmonary Functional Imaging, Edinburgh, Scotland — Sep 2015
- Abstract Scholarship
  American Thoracic Society International Conference, Denver, CO — Oct 2014

Presentations

- American Thoracic Society International Conference, San Diego, CA — May 2018
- International Society for Magnetic Resonance Imaging, Honolulu, HI — April 2017
- American Thoracic Society International Conference — May 2016

San Francisco, CA

- International Workshop on Pulmonary Functional Imaging — Sep 2015
  Edinburgh, Scotland