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EDUCATION

2011 Doctor of Philosophy, University of Oxford (NIH-Oxford Scholar)

Oxford Centre for Functional Magnetic Resonance Imaging of the Brain (FMRIB)
Advanced MRI group, Laboratory for Functional and Molecular Imaging, NINDS, NIH

2006 Bachelor of Science in Physics, Massachusetts Institute of Technology

ACADEMIC POSITIONS

Faculty

2018-current **Assistant Professor**

Physical Therapy and Human Movement Sciences
Feinberg School of Medicine
Northwestern University

2018-current **Assistant Professor**

Biomedical Engineering
McCormick School of Engineering and Applied Sciences
Northwestern University

2018-current **Preceptor**

Northwestern University Interdepartmental Neuroscience (NUIN) Program

Fellowship

2014-2017 **Anne McLaren Fellow**

Sir Peter Mansfield Imaging Centre
Division of Clinical Neuroscience, School of Medicine
University of Nottingham

2013-2014 **Wellcome Trust ISSF Fellow**

Cardiff University Brain Research Imaging Centre (CUBRIC)

Post-doctorate

2011-2013 **Postdoctoral Research Associate**
Cardiff University Brain Research Imaging Centre (CUBRIC)

Doctorate

2006-2011 **NIH-Oxford Scholar**
Collaboration between NIH and University of Oxford

PUBLICATIONS

Whittaker JR, Driver ID, Venzi M, **Bright MG**, Murphy K (2019) Cerebral Autoregulation Evidenced by Synchronized Low Frequency Oscillations in Blood Pressure and Resting-State fMRI. *Front. Neurosci.* 13:433

Dury RJ, Falah Y, Gowland PA, Evangelou N, **Bright MG**, Francis ST (2019) Ultra-high-field Arterial Spin Labeling MRI for non-contrast assessment of cortical lesion perfusion in Multiple Sclerosis. *European Radiology* 29(4):2027-2033.

Bright MG, Croal PL, Blockley NP, Bulte DP (2019) Multiparametric measurement of cerebral physiology using calibrated fMRI. *Neuroimage* 187:128-144.

Whittaker J, **Bright MG**, Driver I, Babic A, Murphy K (2019) Changes in cerebral arterial blood volume during lower body negative pressure measured with MRI. *Neuroimage* 187:166-175.

Bright MG, Whittaker JR, Driver ID, Murphy K. 2018. Vascular physiology drives functional neural networks. *bioRxiv* doi: <https://doi.org/10.1101/475491>

Bright MG, Tench CR, Murphy K (2017) Potential pitfalls in denoising resting state fMRI data using General Linear Models. *Neuroimage* 154:159-168.

Driver I, Whittaker J, **Bright MG**, Muthukumaraswamy, S, Murphy K (2016) Arterial CO₂ fluctuations modulate neuronal rhythmicity; implications for MEG and fMRI studies of resting state. *J Neurosci* 36(33):8541-50.

Tewarie P, **Bright MG**, Hillebrand A, Robson SE, Gascoyne LE, Morris PG, Meier J, Van Mieghem P, Brookes MJ (2016) Predicting haemodynamic networks using electrophysiology: the role of non-linear and cross-frequency interactions. *NeuroImage* 230:273-292.

Bright MG, Murphy K (2015) Is fMRI "noise" really noise? Resting state nuisance regressors remove variance with network structure. *Neuroimage* 114:158-169.

Whittaker J, Driver I, **Bright MG**, Murphy K (2015) The absolute CBF response to activation is preserved during elevated perfusion: implications for neurovascular coupling measures. *Neuroimage* 125:198-207.

Bright MG, Bianciardi M, de Zwart JA, Murphy K, Duyn JH (2014) Early anti-correlated BOLD signal changes of physiologic origin. *Neuroimage* 87:287-296.

Bright MG, Murphy K (2013) Reliable quantification of BOLD fMRI cerebrovascular reactivity despite poor breath-hold performance. *Neuroimage* 83:559-568.

Bright MG, Murphy K (2013) Removing motion and physiological artifacts from intrinsic BOLD fluctuations using short echo data. *Neuroimage* 64(1):526-537.

Bulte DP, Kelly M, Germuska M, Xie J, Chappell MA, Okell TW, **Bright MG**, Jezzard P (2012) Quantitative measurement of cerebral physiology using respiratory-calibrated MRI. *Neuroimage* 60:582-591.

Bright MG, Donahue MJ, Duyn JH, Jezzard P, Bulte DP (2011) The effect of basal vasodilation on hypercapnic and hypocapnic reactivity measured using magnetic resonance imaging. *J Cereb Blood Flow Metab* 31(2):426-38.

Bright MG, Bulte DP, Jezzard P, Duyn J (2009) Characterization of regional heterogeneity in cerebrovascular reactivity dynamics using novel hypocapnia task and BOLD fMRI. *Neuroimage* 48(1):166-75.

Book chapters

Bulte DP, **Bright MG**, Howe F, Corfield D (2016) Vascular Response to Hypoxia and Hypercapnia. In: Bammer R ed. *MR & CT Perfusion Imaging: Clinical Applications and Theoretical Principles*. Wolters Kluwer. ISBN/ISSN: 9781451147155.

Editorials and Commentaries

Bright MG (2018) MRI of induced blood pressure fluctuations can improve validity and extend clinical impact of CA measurements. Comment on *CrossTalk* debate. *J Physiol* 596:3-13.

Bright MG, Murphy K (2017) Cleaning up the fMRI time series: mitigating noise with advanced acquisition and correction strategies. *Neuroimage* 154:1-3.

FUNDING

Grants

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| 2019-2021 | Craig H. Neilson Foundation Spinal Cord Injury Research on the Translational Spectrum (SCIRTS) Pilot Research Grant (\$300k)
“Neurovascular mechanisms of intermittent hypoxia induced neural plasticity.”
PI: Molly Bright |
| 2019-2020 | Interdisciplinary Rehabilitative Engineering K12 Career Development Award (\$125k)
“Optimized fMRI to develop neurorehabilitative therapies in pediatric-onset hemiplegia”
PI: Julius Dewald |

2016-2018 Medical Research Council Confidence in Concept Grant (£64 k)
 “Validation of MRI protocol for monitoring neuroinflammation in Multiple Sclerosis”
 PI: Molly Bright

2016-2017 Mason Medical Research Trust (£9 k)
 “Perfusion MRI in Reversible Cerebral Vasoconstriction Syndrome.”
 PI: Yasser Falah

Fellowships

2014-2017 Anne McLaren Fellowship
 2013-2014 Wellcome Trust ISSF Fellowship
 2006-2011 NIH-Oxford Scholar, doctoral training fellowship
 2005 International Research Fellowship in Optics and Photonics
 2004 U.S. Department of Energy National Undergraduate Research Fellowship

INVITED TALKS

2019 Multimodal Neuroimaging and Neuroscience Workshop, NIMH, NIH, Bethesda, MD, USA
 “Adding vascular insight to the MRI experiment”

2019 Imaging Cerebral Physiology Network Symposium on Physiological and Functional MRI of the Brain, Johns Hopkins University, Baltimore, MD, USA
 “Isolating the signal and noise in fMRI data”

2019 Movement and Rehabilitation Sciences Training Day, Northwestern University, Chicago, IL USA
 “Imaging neural and vascular plasticity in rehabilitation”

2019 Neurology First Fridays Seminar Series, Northwestern University, Chicago, IL, USA
 “Cerebrovascular reactivity; mapping CVR using MRI”

2018 University of Nebraska, Lincoln, NE, USA
 “To Err is Human; the signal and the noise in functional neuroimaging”

2018 Biostatistics Masters Program, Northwestern University, Chicago, IL, USA
 “Isolating the signal and noise in fMRI data”

2017 European Society for Magnetic Resonance in Medicine, Annual Meeting, Barcelona, Spain
 “Vasoactive challenges for imaging Cerebrovascular Reactivity”

2017 International Society for Magnetic Resonance in Medicine, Annual Meeting, Honolulu, HI, USA
 “BOLD signal physiology”

2017 Neurology Grand Rounds, UC Davis, Davis, CA, USA
 “Mapping Cerebrovascular Reactivity using MRI”

2017 Northwestern University, Chicago, IL, USA
 “To Err is Human; the signal and the noise in functional neuroimaging”

2015 Institute of Psychiatry, Psychology, and Neuroscience, King’s College, London, UK
 The signal and the noise in resting state fMRI

2013 University of Nottingham, Nottingham, UK
 “fMRI measures of vascular physiology”

2012 Vanderbilt University, Nashville, TN, USA
 “Characterizing BOLD response dynamics using physiological challenges”

TEACHING AND SUPERVISION

Postdoctoral supervision

2019-current Rachael Stickland
 2019-current Mark Hoggarth
 2019 Rangaprakesh Deshpande

Doctoral supervision

2019-current Kimberley Hemmerling (Biomedical Engineering, Northwestern University)
 2019-current Neha Reddy (Medical Scientist Training Program, Northwestern University)
 2018-current Jasmine Vu (Biomedical Engineering, Northwestern University)
 2018-current Kristina Zvolanek (Biomedical Engineering, Northwestern University)
 2015-2019 Yasser Falah (Division of Clinical Neuroscience, University of Nottingham)

Masters supervision

2018-current Apoorva Ayyagari (Biomedical Engineering, Northwestern University)
 2018-2019 Vineet Sharma (Biomedical Engineering, Northwestern University)

Undergraduate supervision

2019 Ana Cornell (Biomedical Engineering, Northwestern University)
 2018-2019 Aaron Shoemaker (Biomedical Engineering, Northwestern University)
 2015-2016 Navdeep Jabble, BMed Sci completed (1st class honours)

Teaching

Northwestern University - McCormick School of Engineering

2019 MRI Modeling of Brain Physiology (Graduate course in Biomedical Engineering)
 2019 Design, Thinking, Communication (Freshman engineering design project course)

Northwestern University - Feinberg School of Medicine

2019 NeuroControl Summer School (international researchers hosted at Northwestern University)
 2019 Neuroscience II (Second-year course in Doctor of Physical Therapy program)
 2018-2019 PT Residency Program

External Teaching

2017 International Society for Magnetic Resonance in Medicine educational course
 2017 Organization for Human Brain Mapping educational symposium (course organizer, faculty)
 2017 European Society for Magnetic Resonance in Medicine and Biology educational session
 2015 Bristol MR Summer School

Pedagogical Training

2018-2019 Searle Fellows Program (as faculty fellow)
 2009 University of Oxford Medical Sciences Division Teaching Skills Course, Stages I and II

AWARDS

- ISMRM “Magna Cum Laude” Award, 2015
- Guarantors of Brain Travel Grant, 2013
- ISMRM “Summa Cum Laude” Award, 2012
- ISMRM Educational Stipend, 2010, 2009, 2008
- University of Oxford, Department of Neurology Cairns Fund Travel Grant, 2009
- University of Oxford, Green Templeton College Travel Grant, 2009
- NIH Graduate Student Symposium Poster Award Winner and Travel Award Recipient, 2007

PROFESSIONAL ACTIVITIES

2019-present Elected Committee Member of the Current Issues in Brain Function Study Group of the International Society for Magnetic Resonance in Medicine

2014-present Founding co-chair of Imaging Cerebral Physiology Network

2017-present Editorial Board for NeuroImage

2016-2017 Handling guest-editor for special issue of NeuroImage

Volume 154 "Cleaning up the fMRI time-series: mitigating noise with advanced acquisition and correction strategies"

Reviewer for NeuroImage, JCBFM, PLoS ONE, Human Brain Mapping, J Neuroscience

Member of the International Society for Magnetic Resonance in Medicine

Session moderator at annual meeting (2013, 2014, 2016, 2017, 2018)

Member of the Organization for Human Brain Mapping