

KARLA L MILLER

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APPOINTMENTS

- 2016–2021 Wellcome Trust Senior Research Fellow
WIN, University of Oxford
- 2015–Present Associate Director
WIN (formerly FMRIB), University of Oxford
- 2014–Present Professor of Biomedical Engineering
Nuffield Department of Clinical Neurosciences, University of Oxford
- 2011–2016 Wellcome Trust Career Development Fellow
FMRIB Centre, University of Oxford
- 2007–2014 University Research Lecturer
Nuffield Department of Clinical Neurosciences, University of Oxford
- 2006–2011 Royal Academy of Engineering / EPSRC Research Fellow
FMRIB Centre, University of Oxford
- 2004–2006 Post-doctoral Researcher
FMRIB Centre, University of Oxford
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EDUCATION

- 2004 Doctor of Philosophy (PhD)
Electrical Engineering, Stanford University
Thesis: Novel methods for steady-state neuroimaging
Advisor: Prof. John M. Pauly
- 2000 Master of Science
Electrical Engineering, Stanford University
- 1998 Bachelor of Science (with highest honors)
Computer Science, University of Illinois Urbana-Champaign

RESEARCH INTERESTS

I develop novel methods for acquiring, reconstructing and analyzing MRI scans of the brain. My group is developing novel measurements and biophysical models for *tissue microstructure* based on diffusion and magnetic susceptibility of tissue. We further aim to improve our understanding of MRI data in living subjects by comparing *scans of post-mortem brains* with microscopic imaging in the same tissue. Finally, using ultra-high-field MRI scanners and sophisticated signal processing methods, we are developing *advanced fMRI and diffusion imaging acquisitions*, primarily aimed at measures of brain connectivity.

AWARDS AND PROFESSIONAL ACTIVITIES

I have held various service positions in the MRI community, primarily at the Wellcome Centre for Integrative Neuroimaging (WIN) and the International Society for Magnetic Resonance in Medicine (ISMRM). WIN (formerly known as FMRI) is a research centre dedicated to MR neuroimaging, including large research groups focusing on both technology and neuroscience. The ISMRM is the leading society for developing MRI technology and furthering its application in clinical and biological science.

Professional Appointments

- Diversity Champion: *Oxford Neuroscience Strategy Board*, 2020–Present
- Chair: *WIN Equality Diversity & Inclusion Committee*, 2019–Present
- Associate (Senior) Editor: *Magnetic Resonance in Medicine*, 2019–Present
- Chair: *ISMRM Public Engagement Ad-Hoc Committee*, 2019–2020
- Vice Chair: *ISMRM Equity Diversity and Inclusivity Task Force*, 2019–2020
- Member: *Oxford Recognition of Distinction Committee (awards Professor titles)*, 2019–2020
- Member: *Harvard Connectome 2.0 Advisory Board*, 2019–Present
- Member: *Donders Institute Peer Review Committee*, 2019
- Member: *MRM Editor-in-Chief Selection Committee*, 2018–2019
- Member: *Oxford Associate Professor & Research Lecturer Committee (awards titles)*, 2018–2020
- Member: *NeuroSpin Scientific Advisory Board*, 2017–Present
- Member: *EPSRC Healthcare Technologies Grant Panel*, 2017
- Member: *ISMRM Executive Board*, 2017–2018
- Chair: *ISMRM Annual Meeting Program Committee*, 2018
- Educational Chair: *ISMRM Annual Meeting Program Committee*, 2017
- Panel Member: *International Research Scholars Fellowship Committee (Wellcome/HHMI)*, 2017
- Member: *ISMRM Board of Trustees*, 2016–2018
- Member: *FMRI/WIN Directorate*, 2014–Present
- Member: *NDCN Graduate Studies Committee*, 2014–2015
- Panel Member: *Vienna Science and Technology Fund (WWTF)*, 2014
- Deputy (Handling) Editor: *Magnetic Resonance in Medicine*, 2013–2020
- Editorial Board: *NMR in Biomedicine*, 2013–2015
- Editorial Board: *Magnetic Resonance in Medicine*, 2012–Present
- Editorial Board: *NeuroImage*, 2011–2015
- Member: *ISMRM Board of Trustees*, 2011–2013
- Vice-Chair/Chair: *ISMRM Young Investigator Award Sub-committee*, 2011–2014
- Member: *FMRI Strategy Committee*, 2010–2014
- Member: *ISMRM Annual Meeting Program Committee*, 2010–2012 (*fMRI Chair*, 2011–2012)
- Secretary: *ISMRM Current Issues in Brain Function Study Group*, 2009–2010
- Secretary: *ISMRM Diffusion-Perfusion Study Group*, 2008–2009

Conference & Workshop Activities

- Program Chair: *ISMRM-ESMRMB Joint Annual Meeting*, 2018
- Organizing Committee: *British Chapter of the ISMRM*, 2018
- Education Chair: *ISMRM Annual Meeting*, 2017
- Organizing Committee: *Biomedical and Astronomical Signal Processing (BASP) Workshop*, 2017
- Organizing Committee: *Whistler Workshop on Brain Function*, Whistler, 2016
- Organizing Committee: *Whistler Workshop on Brain Function*, Whistler, 2014
- Invited Participant: *MRC Brain Donation Workshop*, 2013
- Invited Participant: *EPSRC Dementia Scoping Workshop*, 2013
- Co-Organizer: *ISMRM Educational Courses (2 courses)*, Salt Lake City, 2013
- Co-Organizer: *ISMRM-OHBM Joint Virtual Workshop*, 2012
- Co-Organizer: *ISMRM Educational Courses (2 courses)*, Melbourne, 2012
- Organizer: *OHBM Morning Workshop: Susceptibility Imaging*, Quebec City, 2011
- Co-Organizer: *ISMRM Educational Courses (3 courses)*, Montreal, 2011
- Organizer: *ESMRMB Lectures on MRI: Diffusion Imaging (3-day course)*, Oxford, 2010
- Organizer: *UK Diffusion MRI Interest Group (day workshop)*, Oxford, 2007
- Member: *Grand Engineering Challenges Working Group*, Royal Academy of Engineering, 2007

Awards, Recognition and Keynotes

- Shortlist, Vice-Chancellor's Diversity Awards, University of Oxford 2020
- Web of Science Highly-Cited Researchers 2019
- Plenary Speaker, *ESMRMB* 2017
- Keynote Speaker, *OHBM* 2017
- Fellow, *ISMRM* 2016
- NIBIB New Horizons Lecture, *ISMRM*, 2014
- Outstanding Teacher Award, *ISMRM*, 2014
- Plenary Speaker, *ENC* 2012
- Teaching Excellence Award, University of Oxford, 2012
- Outstanding Teacher Award, *ISMRM*, 2012
- Research Fellowship (Non-Stipendiary), Worcester College, University of Oxford, 2006–2010
- Departmental Merit Award, Clinical Neurology, University of Oxford, 2007
- PEO Scholar Award (Visiting Research Assistant at Oxford), 2001–2002
- Stanford Graduate Fellowship (Full Scholarship), 1998–2002
- Computing Research Association Outstanding Undergraduate Award (1 of 2 nationally), 1998
- Hohn-Nash Award for Scientific Computing, Dept. of Computer Science, UIUC, 1998
- Spyglass Award for Academic Achievement, Dept. of Computer Science, UIUC, 1997

MENTORSHIP

Sponsored fellows

- *Wenchuan Wu*, Royal Academy of Engineering Fellow, University of Oxford, 2019–2024.
- *Mark Chiew*, Royal Academy of Engineering Fellow, University of Oxford, 2017–2022.
- *Johanna Vannesjo*, Marie Curie Fellow, University of Oxford, 2015–2017.
- *Lior Weizman*, Coleman-Cohen Fellow, University of Oxford, 2015–2016.
- *Peter Koopmans*, Sir Henry Wellcome Fellow, University of Oxford, 2013–2016.

Post-doctoral researchers

- *Aurea Bach-Martins*, University of Oxford, 2019–Present.
- *Benjamin Tendler*, University of Oxford, 2017–Present.
- *Jeroen Mollink*, University of Oxford and Radboud University, 2018–2020.
- *Wenchuan Wu*, University of Oxford, 2017–2019.
- *Nadine Graedel*, University of Oxford, 2016–2017.
- *Johanna Vannesjo*, University of Oxford, 2014–2015; 2017–2018.
- *Michiel Kleinnijenhuis*, University of Oxford, 2013–2018.
- *Mark Chiew*, University of Oxford, 2012–2017.
- *Sean Foxley*, University of Oxford, 2011–2016.
- *Jennifer McNab*, University of Oxford, 2008–2009.
- *Daniel Gallichan*, University of Oxford, 2007–2008.

Doctoral students

- *Daniel Kor*, University of Oxford, 2019–Present.
- *Cristiana Tisca*, University of Oxford, 2019–Present.
- *Amy Howard*, University of Oxford, 2017–Present.
- *Istvan Huszar*, University of Oxford, 2017–Present.
- *Chaoyue Wang*, University of Oxford, 2017–Present.
- *Harry Mason*, University of Oxford, 2016–2020.
- *Feng Qi*, University of Oxford, 2015–2019.
- *Jeroen Mollink*, Radboud University and University of Oxford, 2014–2018.
- *Yuhang Shi*, University of Oxford, 2013–2017.
- *Wenchuan Wu*, University of Oxford, 2013–2017.
- *Tianyou Xu*, University of Oxford, 2013–2017.
- *Nadine Graedel*, University of Oxford, 2012–2016.
- *Wilfred Lam*, University of Oxford, 2010–2014.
- *Way Cherng Chen*, University of Oxford and A*STAR Singapore, 2009–2013.
- *Robert Frost*, University of Oxford, 2008–2012.
- *Rob (HN) Tijssen*, University of Oxford, 2007–2011.
- *Jennifer McNab*, University of Oxford, 2005–2008.

EDUCATIONAL ACTIVITIES

Lecturing

- *Oxford-Nottingham Biomedical Imaging CDT*, Module Director, 2014–2019.
- *FMRIB Graduate Program: Physics Course*, Director & Principal Lecturer, 2006–2014.
- *ISMRM Educational Courses: Various Topics*, 2008–2014, 2016.
- *FSL Course: Physics of MRI, FMRI and Diffusion MRI*, 2008–2016.
- *OHBM Educational Courses: Various Topics*, 2014–2015.
- *ESMRMB Diffusion Course*, University of Oxford, 2010.
- *Institute of Biomedical Engineering Doctoral Training Centre*, University of Oxford, 2010–2011.
- *EPIC (GE) Sequence Programing*, Designed/Taught Course, Stanford University, 2004.
- *Medical Imaging II: Electrical Engineering*, Teaching Assistant, Stanford University, 2001.

Students Examined

- *Sophie Schauman*, DPhil, University of Oxford, 2020.
- *Hossein Rafiipoor*, DPhil Transfer, University of Oxford, 2020.
- *Daniel West*, PhD, Kings College London, 2020.
- *Emil Ljungberg*, PhD, Kings College London, 2020.
- *Daniel Gomes*, PhD, Radboud University, Nijmegen, 2019.
- *Ferenc Mozes*, DPhil, University of Oxford, 2019.
- *Sophie Schauman*, DPhil Transfer, University of Oxford, 2018.
- *Sven Jaeschke*, DPhil Transfer, University of Oxford, 2017.
- *Emmanuel Vallee*, DPhil Transfer, University of Oxford, 2015.
- *Olivia Viessmann*, DPhil Transfer, University of Oxford, 2014.
- *Sezgi Goksan*, DPhil Transfer, University of Oxford, 2014.
- *Steve Patterson*, PhD, Dalhousie University, 2013.
- *Eleanor Berry*, DPhil Transfer, University of Oxford, 2013.
- *Anna Blazejewska*, PhD, University of Nottingham, 2013.
- *James Kolasinski*, DPhil Transfer, University of Oxford, 2012.
- *Pieter Buur*, PhD, Radboud University, Nijmegen, 2011.
- *Tom Okell*, DPhil Transfer, University of Oxford, 2009.
- *Kyle Pattinson*, DPhil, University of Oxford, 2008.
- *Julien Cohen-Adad*, PhD, University of Montreal and Ecole Centrale Paris, 2008.

Public Engagement, Media and Outreach

- *SHElock (day event with girls aged 11-14)*, Oxford 2019.
- *My Love Affair with the Brain (public panel)*, Brain Awareness Week 2018.
- *Curiosity Carnival (science festival)*, Oxford 2017.
- *Massive U.K. Brain-Mapping Project Releases First Results*, Scientific American 2016.
- *All In the Mind*, BBC Radio 4 2015.
- *How the smallest atoms revolutionized neuroscience*, St Anne's College, Oxford 2013.
- *Physics on the brain*, Chippewa Falls PEO 2011.
- *My career in brain imaging*, Chippewa Falls High School 2011.
- *The importance of brain donation*, Autism Speaks, Oxford 2011.
- *Diffusion imaging of post-mortem human brains*, Brain Bank for Autism, Oxford 2010.
- *Wonderful protons: Revealing the brain's secrets with MRI*, Royal Academy of Engineering 2009.
- *MRI: A window into the working brain*, Royal Academy of Engineering 2007.

MAJOR PROJECTS

Grants and Research Contracts

- 12/2019–11/2024 *Integrative imaging of brain structure and function in populations and individuals*
Wellcome Trust Collaborative Award, £4,106,203
Investigators: Smith (PI), Jbabdi, Miller, Woolrich, Jenkinson, Beckmann, Robinson.
- 04/2017–04/2022 *Wellcome Trust Centre for Integrative Neuroimaging*
Wellcome Trust Centre Grant, £11,463,085
Investigators: Johansen-Berg (PI), Behrens, Harrison, Husain, Jenkinson, Jezzard, Mackay, Miller, Nichols, Nobre, Rushworth, Smith, Tracey, Turner, Woolrich
- 10/2016–09/2021 *Linking MRI and microscopy for multi-scale neuroscience: Mechanisms, diagnostics and anatomy*
Wellcome Trust Senior Research Fellowship, £1,793,980
Investigators: Miller
- 1/2016–12/2018 *The UK7T Network: developing ultra-high field MRI for biomedical research*
MRC Partnership Grant, £1,309,733
Investigators: Bowtell (PI), Miller (Oxford PI), Carpenter, Rowe, Williams, Wise, Jones, Linden, Muir, Goense, Muckli, Francis, Glover, Gowland, Morris, Bajaj, Clare, Jezzard, Mackay
- 10/2015–9/2017 *Improving ultra-high field MRI using parallel transmit technology*
Wellcome Trust Multi-user Equipment Grant, £147,000
Investigators: Clare (PI), Miller, Jezzard, Tracey, Johansen-Berg, Stagg, Smith, Emir, Behrens, Nobre
- 06/2015–05/2020 *National Facility for In Vivo MR Imaging of Human Tissue Microstructure*
EPSRC Strategic Equipment Award, £2,944,960
Investigators: Jones (PI), Parker, Cercignani, Alexander, DellAcqua, Bowtell, Wise, Thomas, Singh, Miller
- 2/2014–2/2016 *Investigating and validating MRI-based markers of white matter microstructure*
Wellcome Trust Fellowship Enhancement (joint award), £161,955
Investigators: Miller (PI), Johansen-Berg
- 2/2014–2/2016 *The role of myelin in experience-dependent white matter plasticity* Wellcome Trust Fellowship Enhancement (joint award), £187,532
Investigators: Johansen-Berg (PI), Miller
- 6/2013–3/2017 *Novel MRI techniques for brain banking and motor neuron disease research*
MRC, £594,000
Investigators: Miller (PI), Ansoorge, Turner
- 2/2012–8/2016 *Advanced fMRI acquisition, reconstruction and signal processing for dynamic brain network imaging*
EPSRC, £556,000
Investigators: Miller (PI), Smith, Blumensath
- 3/2011–2/2017 *New methods for interrogating white matter microstructure with MRI*
Wellcome Trust Career Development Fellowship, £686,000
Investigators: Miller (PI)
- 3/2011–2/2014 *Investigating cortical pathways with diffusion-tensor imaging (DTI), manganese-enhanced MRI and modern histological techniques in monkeys and humans*
BBSRC, £1,000,000
Investigators: Krug (PI), Bridge, Miller

- 7/2008–7/2011 *New tools for understanding white matter disease using diffusion MRI*
EPSRC, £550,000
Investigators: Smith (PI), Behrens, Miller
- 4/2006–3/2011 *Improved imaging of brain function and connectivity*
Royal Acad Eng/EPSRC Post-Doctoral Fellowship, £240,000
Investigators: Miller
- 1/2008–8/2010 *Studentship in FMRI of the Brainstem*
GlaxoSmithKline, £30,000
Investigators: Miller
- 8/2008–8/2009 *Feasibility study for MRI and neuropathological investigations of the role of anatomical connections in determining patterns of neurodegeneration in MS*
MS Society, £136,000
Investigators: Johansen-Berg (PI), Miller, Palace
- 4/2006–4/2008 *Integrated Structural and Diffusion Imaging for AD*
GlaxoSmithKline, £200,000
Investigators: Miller (PI), Smith, Johansen-Berg
- 10/2005–6/2008 *Diffusion imaging of post-mortem brain tissue*
Charles Wolfson Charitable Trust Studentship, £130,000
Investigators: Aziz (PI), Miller
- 4/2004–4/2006 *Methodology development of steady-state diffusion and functional brain imaging*
GlaxoSmithKline, £140,000
Investigators: Jezzard (PI), Miller
- 1/2004–1/2006 *Imaging brain activation with steady-state MRI*
NIH R21 EB002969, \$300,000
Investigators: Pauly (PI), Miller

Research Consortia

- Consultant: *Integrated Neural Networks in the Primate Brain (WT Strategic Award)*, 2014–2019
- Collaborator: *Developing Human Connectome Project (ERC-Funded Consortium)*, 2013–2018
- Consultant: *FAST INdICATE (NIHR/MRC-Funded Trial)*, 2012–2015
- Member: *Biobank Imaging Enhancement Working Group*, UK Biobank, 2011–2018
- Consultant: *Human Connectome Project (NIH-Funded Consortium)*, 2010–2014

PUBLICATIONS AND PRESENTATIONS

Journal Articles (Original Research)

† Equal contribution (indicated for KL Miller only).

- Wang C, Foxley S, Ansorge O, Bangerter-Christensen S, Chiew M, Leonte A, Menke RAL, Mollink J, Palbage-Gamarallage M, Turner MR, **Miller KL**[†], Tendler BC[†] (2020). Methods for quantitative susceptibility and R2* mapping in whole post-mortem brains at 7T applied to amyotrophic lateral sclerosis. *NeuroImage*, in press.
- Roumazeilles L, Eichert N, Bryant KL, Folloni D, Sallet J, Vijayakumar S, Foxley S, Tendler BC, Jbabdi S, Reveley C, Verhagen L, Dershowitz LB, Guthrie M, Flach E, **Miller KL**, Mars RB (2020). Longitudinal connections and the organization of the temporal cortex in macaques, great apes, and humans. *PLoS Biology*, in press.

- Tendler BC, Foxley S, Hernandez-Fernandez M, Cottaar M, Scott C, Ansorge O, **Miller KL**[†], Jbabdi S[†] (2020). Use of multi-flip angle measurements to account for transmit inhomogeneity and non-Gaussian diffusion in DW-SSFP. *NeuroImage*, in press.
- Alfaro-Almagro F, McCarthy P, Ayouni S, Andersson JLR, Bastiani M, **Miller KL**, Nichols TE, Smith SM (2020). Confound modelling in UK Biobank brain imaging. *NeuroImage*, in press.
- Littlejohns T, Holliday J, Gibson L, Garratt S, Oesingmann N, Alfaro-Almagro F, Bell J, Boulwood C, Collins R, Conroy M, Crabtree N, Doherty N, Frangi A, Harvey N, Leeson P, **Miller K**, Neubauer S, Petersen S, Sellors J, Sheard S, Smith S, Sudlow C, Matthews P, Allen N (2020). The UK Biobank imaging enhancement of 100,000 participants: rationale, data collection, management and future directions. *Nature Communications*, in press.
- Smith SM, Elliott LT, Alfaro-Almagro F, McCarthy P, Nichols TE, Douaud G, **Miller KL** (2020). Brain aging comprises many modes of structural and functional change with distinct genetic and biophysical associations. *eLife*, 9.
- Tendler BC, Foxley S, Cottaar M, Jbabdi S[†], **Miller KL**[†] (2020). Modelling an equivalent b-value in diffusion-weighted steady-state free precession. *Magnetic Resonance in Medicine*, 84:873-884.
- Sampaio-Baptista C, Valles A, Khrapitchev AA, Akkermans G, Winkler A, Foxley S, Sibson NR, **Miller KL**, Diamond ME, Martens GJM, De Weerd P, Johansen-Berg H (2020). White matter structure and myelin-related gene expression alterations with experience in adult rats. *Progress in Neurobiology*, 187:101770.
- Chiew M, **Miller KL** (2019). Improved statistical efficiency of simultaneous multi-slice fMRI by reconstruction with spatially adaptive temporal smoothing. *NeuroImage*, 203: 116165.
- Howard AFD, Mollink J, Kleinnijenhuis M, Pallebage-Gamarallage M, Bastiani M, Cottaar M, **Miller KL**[†], Jbabdi S[†] (2019). Joint modelling of diffusion MRI and microscopy. *NeuroImage*, 201: 116014.
- Mollink J, Hiemstra M, **Miller KL**, Huszar IN, Jenkinson M, Raaphorst J, Wiesmann M, Ansorge O, Pallebage-Gamarallage M, van Capellen van Walsum AM (2019). White matter changes in the perforant path area in patients with amyotrophic lateral sclerosis. *Neuropathology and Applied Neurobiology*, 45: 570–585.
- McKavanagh R, Torso M, Jenkinson M, Kolasinski J, Staggs CJ, Esiri MM, McNab JA, Johansen-Berg H, **Miller KL**, Chance SA. Relating diffusion tensor imaging measurements to microstructural quantities in the cerebral cortex in multiple sclerosis. *Human Brain Mapping*, 40: 4417–4431.
- Smith SM, Viduarre D, Alfaro-Almagro F, Nichols TE, **Miller KL** (2019). Estimation of brain age delta from brain imaging. *NeuroImage*, 200: 528–539.
- Mollink J, Smith SM, Elliott LT, Kleinnijenhuis M, Hiemstra M, Alfaro-Almagro F, Marchini J, van Capellen van Walsum AM, Jbabdi S[†], **Miller KL**[†] (2019). The spatial correspondence and genetic influence of inter-hemispheric connectivity with white matter microstructure. *Nature Neuroscience*, 22: 809–819.
- Wu W, Koopmans PJ, Andersson JLR, **Miller KL** (2019). Diffusion Acceleration with Gaussian process Estimated Reconstruction (DAGER). *Magnetic Resonance in Medicine*, 82: 107–125.
- Bridge H, Bell A, Ainsworth M, Sallet J, Premereur E, Ahmed B, Mitchell A, Schuffelgen U, Buckley M, Tendler B, **Miller KL**, Mars R, Parker AJ, Krug K (2019). Preserved extrastriate visual network in a monkey with substantial, naturally occurring damage to primary visual cortex. *eLife*, 8.
- Dai E, Wu Y, Wu W, Guo R, **Miller KL**, Zhang Z, Guo H (2019). A 3D k-Space Fourier encoding and reconstruction framework for simultaneous multi-slab (SMSlab) acquisition. *Magnetic Resonance in Medicine*, 82: 1012–1024.

- Vannesjo SJ, Clare S, Kasper L, Tracey I, **Miller KL** (2019). A method for Magnetic Resonance in Medicine.correcting breathing-induced field fluctuations in T2*-weighted spinal cord imaging using a respiratory trace. *Magnetic Resonance in Medicine*, 81: 3745–3753.
- Elliott LT, Sharp K, Alfaro-Almagro F, Shi S, **Miller KL**, Douaud G, Marchini J, Smith SM (2018). Genome-wide association studies of brain imaging phenotypes in UK Biobank. *Nature*, 562: 210–216.
- Chiew M, Graedel NN, **Miller KL** (2018). Recovering task fMRI signals from highly under-sampled data with low-rank and temporal subspace constraints. *NeuroImage*, 174: 97–110.
- Pallegage-Gamarallage M, Foxley ES, Menke RAL, Huszar IN, Jenkinson M, Tendler BC, Wang C, Jbabdi S, Turner MR, **Miller KL**, Ansorge O (2018). Dissecting the pathobiology of altered MRI signal in amyotrophic lateral sclerosis: A post mortem whole brain sampling strategy for the integration of ultra-high-field MRI and quantitative neuropathology. *BMC Neuroscience*, 19: 11.
- Vannesjo SJ, **Miller KL**, Clare S, Tracey I (2018). Spatiotemporal characterization of breathing-induced B0 field fluctuations in the cervical spinal cord at 7T. *NeuroImage*, 167: 191–202.
- Shi Y, Vannesjo J, **Miller KL**, Clare S (2018). Template-based field map prediction for rapid whole brain B0 shimming. *Magnetic Resonance in Medicine*, 80: 171–180.
- Alfaro-Almagro F, Jenkinson M, Bangerter NK, Andersson JLR, Griffanti L, Douaud G, Sotiropoulos SN, Jbabdi S, Hernandez-Fernandez M, Valleee E, Vidaurre D, Webster M, McCarthy P, Rorden C, Daducci A, Alexander DC, Zhang H, Dragonu I, Matthews PM, **Miller KL**, Smith SM (2018). UK Biobank Brain Imaging: Automated Processing Pipeline and Quality Control for 100,000 subjects. *NeuroImage*, 166: 400–424.
- Kleinnijenhuis M, Mollink J, Lam WL, Kinchesh P, Khrapitchev AA, Smart SC, Jbabdi S[†], **Miller KL**[†] (2018). Choice of reference measurements affects quantification of long diffusion time behaviour using stimulated echoes. *Magnetic Resonance in Medicine*, 79: 952–959.
- Xu T, Foxley S, Kleinnijenhuis M, Chen WC, **Miller KL** (2018). The effect of realistic geometries on the susceptibility-weighted MR signal in white matter. *Magnetic Resonance in Medicine*, 79: 498–500.
- Mollink J, Kleinnijenhuis M, van Cappellen van Walsum AM, Sotiropoulos SN, Cottaar M, Mirfin C, Heinrich MP, Jenkinson M, Pallegage-Gamarallage M, Ansorge O, Jbabdi S[†], **Miller KL**[†] (2017). Evaluating fibre orientation dispersion in white matter: Comparison of diffusion MRI, histology and polarized light imaging. *NeuroImage*, 157: 561–574.
- Weizman L, **Miller KL**, Eldar YC, Chiew M (2017). PEAR: Periodic And fixed rank separation for fast fMRI. *Medical Physics*, 44: 6166–6182.
- Graedel NN, McNab JA, Chiew M[†], **Miller KL**[†] (2017). Motion correction for functional MRI with three-dimensional hybrid radial-Cartesian EPI. *Magnetic Resonance in Medicine*, 78: 527–540.
- Cardenas AM, Sarlls JE, Kwan JY, Bageac D, Gala ZS, Danielian LE, Ray-Chadhury A, Wang HW, **Miller KL**, Foxley S, Jbabdi S, Welsh RC, Floeter MK (2017). Pathology of callosal damage in ALS: an ex-vivo, 7T diffusion tensor MRI study. *NeuroImage Clinical*, 15: 200–208.
- Chiew M, Graedel NN, McNab JA, Smith SM, **Miller KL** (2016). Accelerating functional MRI using fixed-rank approximations and radial-cartesian sampling. *Magnetic Resonance in Medicine*, 76: 1825–1836.
- **Miller KL**, Alfaro-Almagro F, Bangerter NK, Thomas DL, Yacoub E, Xu J, Bartsch AJ, Jbabdi S, Sotiropoulos SN, Andersson JLR, Griffanti L, Douaud G, Okell TW, Weale P, Dragonu I, Garratt S, Hudson S, Collins R, Jenkinson M, Matthews PM, Smith SM (2016). Multimodal population brain imaging in the UK Biobank prospective epidemiological study. *Nature Neuroscience*, 19: 1523–1536.

- Wu W, Poser BA, Douaud G, Frost R, In MH, Speck O, Koopmans PJ[†], **Miller KL**[†] (2016). High-resolution diffusion MRI at 7T using a three-dimensional multi-slab acquisition. *NeuroImage*, 143: 1-14.
- Large I, Bridge H, Ahmed B, Clare S, Kolasinski J, Lam W, **Miller KL**, Glasser M, Van Essen D, Dyrby T, Parker AJ, Smith JET, Daubney G, Sallet J, Bell A, Krug K (2016). Individual differences in the alignment of structural and functional markers of the V5/MT complex in primates. *Cerebral Cortex*, 26: 3928-3944.
- Okell TW, Schmitt P, Bi X, Chappell MA, Tijssen RHN, **Miller KM**, Jezzard P (2016). Optimization of 4D Vessel-Selective Arterial Spin Labeling Angiography using Balanced Steady-State Free Precession and Vessel-Encoding. *NMR in Biomedicine*, 29: 776-786.
- Wu W, Koopmans PJ, Frost R, **Miller KL** (2016). Reducing slab boundary artefacts in 3D multi-slab diffusion MRI using nonlinear inversion for slab profile encoding (NPEN). *Magnetic Resonance in Medicine*, 76: 1183-1195.
- Mars RB, Foxley S, Jbabdi S, Salet J, Noonan MP, Neubert FX, Verhagen L, Dunbar RIM, Khrapichev A, **Miller KL**, Rushworth MFS (2016). The extreme capsule fiber complex in humans and macaque monkeys: A comparative diffusion MRI tractography study. *Brain Structure and Function*, 221: 4059-4071.
- Mollink J, van Baarsen K, Dederen PJWC, Foxley S, **Miller KL**, Slump C, Grotenhuis JA, Kleinnijenhuis M, van Cappellen van Walsum AM (2016). Dentatorubrothalamic tract localization with post mortem MR diffusion tractography compared to histological 3D reconstruction. *Brain Structure and Function*, 221: 3487-3501.
- Smith SM, Nichols TE, Vidaurre D, Winkler A, Behrens TEJ, Glasser MF, Ugurbil K, Barch DM, Van Essen D, **Miller KL** (2015). A positive-negative mode of population co-variation links brain connectivity, demographics and behavior. *Nature Neuroscience*, 18: 1565-1567.
- Berns GS, Cook PF, Foxley S, Jbabdi S, **Miller KL**, Marino L (2015). Diffusion tensor imaging of dolphin brains reveals direct auditory pathway to temporal lobe. *Proc Royal Society B*, 282: 20151203.
- Chiew M, Smith SM, Koopmans PJ, Graedel NN, Blumensath T, **Miller KL** (2015). k-t FASTER: Acceleration of fMRI data acquisition using low rank constraints. *Magnetic Resonance in Medicine*, 74: 353-364.
- Frost R, Jezzard P, Douaud G, Clare S, Porter DA, **Miller KL** (2015). Scan time reduction for readout-segmented EPI using simultaneous multislice acceleration: Diffusion-weighted imaging at 3 and 7 Tesla. *Magnetic Resonance in Medicine*, 74: 136-149.
- Lam W, Jbabdi S[†], **Miller KL**[†] (2015). A model for the diffusion spectrum of extra-axonal water. *Magnetic Resonance in Medicine*, 73: 2306-2320.
- Smith SM, Hyvarinen A, Varoquaux G, **Miller KL**, Beckmann CF (2014). Group-PCA for very large fMRI datasets. *NeuroImage*, 101: 738-749.
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Invited Reviews, Book Chapters and Commentaries

- Warnert EAH, Nayak K, Menon R, Rice C, Port J, Morris EA, Sodickson, DK, Sundgren P, **Miller KL**, Anazodo UC (2019). Resonate: Reflections and recommendations on implicit biases within the ISMRM. *J Magn Reson Im*, in press.
- Roebroek A, **Miller KL**, Aggarwal M (2019). Ex vivo diffusion MRI of the human brain: Technical challenges and recent advances. *NMR in Biomedicine*, 32: e3941.
- Jones DK, Alexander DC, Bowtell R, Cercignani M, dell'Acqua F, McHugh DM, **Miller KL**, Palombo M, Parker GJ, Rudrapatna U, Tax C (2018). Microstructural Imaging of the Human Brain with A 'Super-Scanner': 10 Key Advantages of Ultra-Strong Gradients for Diffusion MRI. *NeuroImage*, 182: 8-38.
- Wu W, **Miller KL** (2017). Image formation in diffusion MRI: A review of recent technical developments. *Journal of Magnetic Resonance Imaging*, 46: 646-662.
- Lerch JP, van der Kouwe AJW, Raznahan A, Paus T, Johansen-Berg H, **Miller KL**, Smith SM, Fischl B, Sotiropoulos SN (2017). Studying neuroanatomy using MRI. *Nature Neuroscience*, 20: 314-326.
- **Miller KL**, Bartsch AJ, Smith SM (2015). Simultaneous multi-slice imaging for resting-state fMRI. *MAGNETOM Flash*, in press.
- Okell T, Hattingen E, Klein JC, **Miller KL** (2015). Magnetic resonance imaging (MRI) methods. *Diseases of the spinal cord (Springer, 1st ed)*, in press.
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- Frost R, Koopmans PJ, Harston GW, Kennedy J, Jezzard P, **Miller KL**, Porter DA (2015). High-resolution diffusion-weighted neuroimaging at 3T and 7T with SMS RESOLVE. *MAGNETOM Flash*, in press.
- Mars RB, Neubert FX, Verhagen L, Sallet J, **Miller KL**, Dunbar RIM, Barton RA (2014). Primate comparative neuroscience using magnetic resonance imaging: Promises and challenges. *Frontiers in Neuroscience*, 8: 298.
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- **Miller KL** (2013). Diffusion acquisition: Pushing the boundaries. *Diffusion MRI: From quantitative measurement to in-vivo neuroanatomy (Academic Press, 2nd ed)*, in press.
- **Miller KL** (2011). Functional MRI using steady-state free precession (SSFP). *NeuroImage*, 62: 713-719.
- Niazy RK, Xie J, **Miller KL**, Beckmann CF, Smith SM (2011). Spectral characteristics of resting-state networks. *Progress in Brain Research (v193): Slow Brain Oscillations of Sleep, Resting State and Vigilance*, Ch 17.

- **Miller KL**, Tijssen RH, Stikov N, Okell T (2011). Steady-state MRI: Methods for neuroimaging. *Imaging in Medicine*, 3:93–105.
- McNab JA, **Miller KL** (2010). Steady-state diffusion-weighted imaging: Theory, acquisition and analysis. *NMR in Biomedicine, Special Issue on Diffusion Imaging of the Brain*, 23:781–793.
- Lee J, Kim TS, Lee JH, **Miller KL** (2008). Steady-state free precession (SSFP) techniques for functional MRI. *Brain Mapping Research Trends (ISBN 978-1-60456-001-5)*, Ch 3.

Intellectual Property

- Chance S, McKavannagh R, Jenkinson M, **Miller KL**. Microstructural brain changes for diagnosis of cognitive disorders. Filed (UK).
- Porter DP, Jezzard P, Frost R, **Miller KL**. Diffusion-weighted magnetic resonance imaging using 3D mosaic segmentation and 3D navigator phase correction. US Patent 2012/0,286,777.
- **Miller KL** and Pauly JM. Functional magnetic resonance imaging using steady state free precession. US Patent 7,096,056.
- **Miller KL** and Pauly JM. Method for removing dynamic nonlinear phase errors from MRI data. US Patent 6,853,191.

Invited Lectures

- Invited Talk: *Brain Imaging in UK Biobank*, OHBM Australia Chapter Meeting 2020
- Invited Talk: *Brain Imaging in UK Biobank*, UK Biobank Scientific Conference 2020
- Seminar: *MRI Methods for Crossing Scales in Neuroscience*, Kings College London 2020
- Seminar: *MRI Methods for Crossing Scales in Neuroscience*, Institut du Cerveau Paris 2020
- Seminar: *Neuroimaging in the UK Biobank*, University of Manchester 2019
- Invited Talk: *Linking MRI to microscopy in ALS*, NeuroImaging in ALS Society 2019
- Seminar: *Imaging in UK Biobank*, Oxford Big Data Institute 2019
- Invited Talk: *Linking MRI to microscopy to investigate brain microstructure*, MR Balkans 2019
- Invited Talk: *A Tale of Two Hemispheres: Crossing scales with MRI*, OHBM Symposium 2019
- Invited Talk: *Bridging scales with neuroimaging*, McGill 7T Launch 2019
- Invited Talk: *Open Questions for Diffusion and Relaxometry MRI*, ISMRM Symposium 2019
- Seminar: *Population neuroimaging: UK Biobank*, Champalimaud, Lisbon 2019
- Seminar: *Accelerating MRI with statistical machine learning*, Universidad Catolica, Santiago 2019
- Seminar: *A tale of two hemispheres*, London (WCHN-ION) Brain Meeting 2018
- Webinar: *The Effect of Geometry on Susceptibility Weighted MRI*, ISMRM Journal Club 2018.
- Invited Talk: *Neuroscience in the era of population neuroimaging*, Gordon Conf In Vivo MR 2018.
- Invited Talk: *MRI as a tool for spanning scales in neuroscience*, Wellcome Trust Symposium 2018.
- Invited Talk: *MRI in an era of multi-scale neuroscience*, Oxford Neuroscience Symposium 2018.
- Keynote: *Neuroscience in the era of population imaging*, Cambridge Imaging Festival 2018.
- Invited Talk: *Challenges of scale in neuroimaging*, NeuroSpin 10th Anniversary 2018.
- Chaucer Lecture: *Challenges of scale in neuroimaging*, University of Cambridge 2018.
- Sylvius Lecture: *Challenges of scale in neuroimaging*, University of Leiden 2017.
- Plenary: *The physicist's goal: Bridging temporal and spatial scales*, ESMRMB 2017.
- Invited Talk: *Big data meets brain imaging: UK Biobank*, Big Data in Health 2017.
- Online Seminar: *Big data meets brain imaging: UK Biobank*, Stanford 2017.
- Keynote: *Bridging scales with neuroimaging: challenges and opportunities*, OHBM 2017.
- Seminar: *Linking MRI to microscopy in the human brain*, UCL 2017.
- Invited Talk: *The Challenges and Importance of Scale in Neuroscience*, BASP Workshop 2017.

- Invited Talk: *Human brain imaging*, Coordinating Global Brain Projects (NSF), NYC 2016.
- Invited Talk: *What's your (diffusion) sequence?*, ISMRM Diffusion Workshop, Lisbon 2016.
- Invited Talk: *Challenges of scale in neuroimaging*, British Chapter of the ISMRM, Leeds 2016.
- Invited Talk: *Innovations in human brain imaging*, Siemens Symposium, ISMRM 2016.
- Seminar: *Adventures in post-mortem imaging*, Cuban Neuroscience Institute 2016.
- Invited Talk: *Probing brain microstructure with MRI*, Wellcome Trust Symposium 2015.
- Invited Talk: *Spatio-temporal acceleration of FMRI*, Minnesota High-Field Workshop 2015.
- Invited Talk: *Trends in human brain mapping research*, Siemens Symposium, OHBM 2015.
- Invited Talk: *Probing brain microstructure with MRI*, Morning Symposium, OHBM 2015.
- Educational Lecture: *Diffusion MRI: Getting Your Measures Right*, OHBM 2015.
- Invited Talk: *Improving FMRI with non-GRE methods*, British Neuroscience Assoc 2015.
- Seminar: *Novel microstructure measures with MRI*, Warwick University 2015.
- Seminar: *Adventures in post-mortem imaging*, Donders Centre 2015.
- Seminar: *Adventures in post-mortem imaging*, Maastricht University 2015.
- Invited Talk: *Function, connectivity and microstructure using MRI*, GE Whitney Symposium 2014.
- NIBIB New Horizons Keynote Lecture: *MRI in an era of multi-scale neuroscience*, ISMRM 2014.
- Educational Lecture: *Spoiled & Balanced Gradient-Echo Sequences*, ISMRM 2014.
- Educational Lecture: *Advances in Functional MRI Acquisition*, OHBM 2014.
- Educational Lecture: *Diffusion MRI: Getting Your Measures Right*, OHBM 2014.
- Seminar: *MRI in an era of multi-scale neuroscience*, Siemens Molecular 2014.
- Invited Talk: *Fundamentals of Neuroimaging*, NC3Rs Workshop 2013.
- Seminar: *Novel microstructural measures with MRI*, Max Planck Tuebingen 2013.
- Educational Lecture: *Physics of diffusion MRI*, Simons Foundation Colloquium, NYU 2013.
- Invited Talk: *Novel microstructural measures with MRI*, Oxford Imaging Festival 2013.
- Seminar: *Novel microstructural measures with MRI*, University of Pennsylvania 2013.
- Educational Lecture: *Practical FMRI*, ISMRM 2013.
- Seminar: *Novel microstructural measures with MRI*, King's College London 2013.
- Seminar: *Novel microstructural measures with MRI*, ETH Zurich 2013.
- Invited Talk: *Post-mortem diffusion imaging*, Nijmegen Symposium on MR NeuroImaging 2013.
- Invited Talk: *Detecting brain microstructure with MRI*, Wellcome Trust 2013.
- Seminar: *Novel microstructural measures with MRI*, CMIC, University College London 2012.
- Invited Talk: *SSFP diffusion imaging*, Irish Diffusion Imaging Group (IDIG) Workshop 2012.
- Educational Lecture: *Balanced SSFP and Unique Contrast Mechanisms*, ISMRM 2012.
- Seminar: *Magnetic susceptibility contrast in the brain*, CIRC, Singapore 2012.
- Plenary: *Studying magnetic susceptibility of brain tissues with SSFP*, ENC 2012.
- Seminar: *MRI in basic neuroscience*, Siemens Magnet Technology 2012.
- Invited Talk: *Beyond phase: Mining the riches of magnetic susceptibility*, OHBM Workshop 2011.
- Invited Talk: *Susceptibility measures with SSFP*, School on MR and Brain Function, Erice 2011.
- Educational Lecture: *Steady-state sequences: Spoiled and balanced methods*, ISMRM 2011.
- Educational Lecture: *FMRI for Clinicians*, ISMRM 2011.
- Seminar: *Developments in steady-state neuroimaging*, BIMG, Birmingham 2011.
- Seminar: *Diffusion-Weighted SSFP*, Max Planck Institute, Leipzig 2011.
- Seminar: *Developments in steady-state neuroimaging*, Hammersmith, Imperial College 2011.
- Seminar: *Diffusion-Weighted SSFP*, CRMBM, Marseilles 2011.
- Invited Talk: *Diffusion imaging of post-mortem human brains*, NISALS Workshop, Oxford 2010.
- Seminar: *SSFP brain imaging: The weird and the wonderful*, MGH, Boston 2010.

- Seminar: *SSFP-based measures of susceptibility in white matter*, SPMMRC, Nottingham 2010.
- Educational Lecture: *Steady-state sequences: Spoiled and balanced methods*, ISMRM 2010.
- Educational Lecture: *FMRI for Clinicians*, ISMRM 2010.
- Seminar: *Steady-state diffusion imaging techniques*, ICH, University College London 2010.
- Seminar: *Detecting susceptibility using SSFP profile asymmetries*, NIH 2010.
- Seminar: *Novel neuroimaging techniques using SSFP*, Johns Hopkins University 2010.
- Educational Lecture: *FMRI for Clinicians*, ISMRM 2009.
- Hot Topic: *Tissue-dependent asymmetries in the SSFP profile*, Gordon Conf on In Vivo MR 2008.
- Seminar: *Arcane or amazing? The SSFP signal profile*, MRSRL, Stanford University 2008.
- Seminar: *Functional MRI with SSFP*, UCSD Center for FMRI, San Diego 2008.
- Seminar: *Functional MRI with SSFP: Theory and practice*, CISC, Brighton 2008.
- Educational Lecture: *Sequences for diffusion-weighted MRI*, ISMRM 2008.
- Seminar: *Probing brain function and connectivity with SSFP*, FC Donders Centre, Nijmegen 2008.
- Seminar: *Advances in SSFP for functional MRI*, GlaxoSmithKline CIC, London 2007.
- Invited Talk: *SSFP and other 3D methods for high-resolution FMRI*, OHBM Workshop 2007.
- Invited Talk: *Vascular contribution to diffusion FMRI*, UK Diffusion Interest Group 2006.
- Invited Talk: *Neuroimaging applications of steady-state free precession*, BC-ISMRM 2005.
- Seminar: *Motion-correction methods for diffusion imaging*, Engineering Sciences, Oxford 2004.
- Seminar: *Improved diffusion and functional imaging with SSFP*, Wurzburg 2004.
- Seminar: *Novel brain imaging methods using SSFP*, Siemens Medical Systems, Erlangen 2004.