



Diana Cash



BIOMARKER RESEARCH AND
IMAGING FOR NEUROSCIENCE

Senior Lecturer & BRAIN Centre Director

Biomarker Research and Imaging for Neuroscience ([The BRAIN Centre](#))

Institute of Psychology, Psychiatry and Neuroscience (IOPPN)

King's College London

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Personal statement

I am a neuroscientist with over 20 years' experience with preclinical experimental models of neuropsychiatric disorders. During my PhD, I became intrigued by the ability of imaging to bridge the gap between molecular and behavioural sciences, and clinical research into human disorders. My work combines imaging and neurobiology with the aim of improving disease diagnosis, characterisation, and treatments.

My passion for imaging was bolstered by an opportunity to set up a new facility at the IOPPN, The BRAIN Centre. Since its inception in 2017, The BRAIN Centre has matured into a busy laboratory with preclinical research projects combining imaging with numerous other methods including EEG, behavioural testing, autoradiography and histology. We collaborate with investigators from academia and the pharmaceutical industry, in support of early, proof of concept studies, as well as the later stage research toward drug discovery, experimental medicine and clinical trials.

Professional Experience and Responsibilities

Senior Lecturer (Associate Professor eqv)

May 2020 – present

IOPPN, KCL

- Supervising postdoctoral research associates and research students
- Leading on neuroimaging research projects: data analysis & interpretation, manuscript writing
- Planning projects and applying for research funding, as a PI or Co-investigator/collaborator
- Various academic duties as required, in teaching, research and administration

Director of The BRAIN Centre

Jan 2017 – present

IOPPN, KCL

- Day-to-day running of The BRAIN Centre, a research facility for preclinical neuroimaging
- Managing a team of three senior staff scientists and two research assistants
- Overseeing timetabling, project management, finances and budgeting for the facility
- Planning the scientific portfolio for the facility; liaising with stakeholders
- Providing the first point of call to prospective clients and collaborators; advising on project planning and funding applications
- Preparing written reports for industry clients
- Overall responsibility for laboratory animals' management as a Home Office licence holder

Research Scientist

Jan 2001 – Dec 2016

Including Edmond and Lily Safrá (ELS) Research Fellow (2010-2014)

IOPPN, KCL

- Conducted preclinical research projects using neuroimaging and spectroscopy to develop a portfolio of imaging biomarkers for neuroscience
- Managed multiple pharmaceutical industry-funded drug discovery projects, including "fee for service" consultancy-based projects
- ELS Fellowship (held between 2010-2014) involved neuroimaging focusing on neurodegeneration inducing Parkinson's disease

Research Assistant (PT)

Sept 1997 – Aug 1998

Pharmacology, Royal Free Hospital, London

- Performed pharmacological and biochemical experiments investigating nitric oxide-mediated vasomotor responses in blood vessels.

Education

PhD in Clinical Neuroscience

Oct 1998 – Dec 2003

IOP, KCL (Part-time from 2001)

- Thesis: *Structural and functional imaging of experimental Parkinsonism*

MSc in Neuroscience (Distinction)

Oct 1997 – Sept 1998

IOP, KCL

- Research project thesis: *The effect of aminoguanidine on transient focal ischaemia in the rat brain*

BSc in Molecular Biology (First Class)

Oct 1993 – Sept 1997

Birkbeck College, London

- Research project thesis: *Nitric oxide synthase in the trout brain*
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Teaching, Supervision and Academic Citizenship

- **Postgraduate Supervision and Teaching:** supervisor to seven PhD students, previously supervised eight PhD students to completion; routinely supervising several MSc student research projects per year; lecturing and examining on topics in preclinical neuroimaging at MSc level; co-lead on “Translational Neuroscience and Drug Development” module on the Neuroscience and Psychology BSc course at KCL
 - **Postgraduate management:** shortlisting & interviewing for KCL-based PhD programmes; PGR sub-committee member at School of Neuroscience (IOPPN)
 - **Past External Examiner** for UCL MSc in Advanced Biomedical Imaging
 - **Involvement with funding agencies:** NC3R Internal Grants Assessments Panel member; External grants reviewer for MRC, BBSRC and BHF
 - **Peer reviewer** for multiple journals including Neuroimage, Nature Communications and Brain, Behaviour and Immunity
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Technical skills & laboratory experience

Imaging: experienced in a range of *in vivo* imaging & spectroscopic applications for structural and functional brain mapping, including MRI and PET, and image analysis. **Laboratory animals:** UK Home office personal (PIL) and Project licence (PPL) holder; surgery and behavioural experiments; *in vivo* recording techniques (EEG, biosensors, Laser Doppler). **Laboratory techniques:** autoradiography & histology; biochemical & molecular techniques.

Research funding: recent and active

- MRC: “Multi-modal dissection of neural circuits in health and disease” 2023-24. £533K (Co-Investigator)
 - Sir Jules Thorn Award for Biomedical Research: *Novel Diagnostic and Therapeutic Insights For Fibromyalgia*. 2023-28. £1.4M (Co-Investigator)
 - MRC: *Complement C3aR in adolescent synaptic pruning and risk for anxiety*. 2021-23. £195K (Named Sponsor)
 - Wellcome Trust: *Excitation/Inhibition Balance & Cognition in Schizophrenia: Building A Multi-Scale Understanding* 2022-26. £846K (Named collaborator)
 - Alzheimer's Research UK King's College London Network Centre Grant. 2021-22. £38K (Co-Investigator)
 - Alzheimer's Society: *Imaging and monitoring treatment of amyloid pathology by MRI*. 2019-23. £91K (Co-Investigator)
 - ERUK: *Predicting which brain region to treat: Multimodal Ictogenic Network Mapping*. 2019-22. £29K (Principal Investigator)
 - Wellcome Trust: *Dissecting neural networks with optogenetic functional MRI (opto-fMRI)*. 2018-23. £287K (Co-Investigator)
 - ARUK: *Investigating the role of N-terminal tau splice variants and inhibitory synapses in brain structural and functional deficits of a TDP-43 knock-in mouse model of ALS-FTD*. 2018-22. £350K (Co-Investigator)
 - Wellcome Trust: *Consortium for Neuroimmunology of Mood Disorders and Alzheimer's disease*. 2015-24. £1.25M (Co-Investigator)
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Industrial funding

- **Received >£2M since 2020 as a Principal Investigator** from companies including GlaxoSmithKline, Jocasta/Unity Biotechnology, Jazz Pharma and Syndesi (now AbbVie) for several collaborative research or fee-for-service projects that **aim to utilise neuroimaging for drug discovery in neuroscience**
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Selected publications (full list @ [google scholar](#)) [*significant author; #Q1 journal]

- *Vrooman RM et al. (2025) *fMRI data acquisition and analysis for task-free, anesthetized rats*. *Nature Protocols* 10.1038/s41596-024-01110-y
- *Monnot C et al. (2025) *Early alterations of functional connectivity, regional brain volumes and astrocyte markers in the beta-sitosterol beta-d-glucoside (BSSG) rat model of parkinsonism*. *Experimental Neurology* 385, 115118 <https://doi.org/10.1016/j.expneurol.2024.115118>
- *Mantas I et al. (2025) *A molecular mechanism mediating clozapine-enhanced sensorimotor gating*. *Neuropsychopharmacology* 10.1038/s41386-025-02060-z
- *Kim E et al. (2023) *Mapping neuroinflammation in vivo with diffusion-MRI in rats given a systemic lipopolysaccharide challenge*. *Brain Behav Immun*. 113, 289.
- *Turkheimer FE et al. (2023) *Sickness Behaviour and Depression: An Updated Model of Peripheral-Central Immunity Interactions*. *Brain Behav Immun* doi:10.1016/j.bbi.2023.03.031.
- *Vicente-Rodríguez M et al. (2023) *Pharmacological modulation of TSPO in microglia/macrophages and neurons in a chronic neurodegenerative model of prion disease*. *J Neuroinflamm* 20, 92.
- *Grandjean J et al. (2023) *A consensus protocol for functional connectivity analysis in the rat brain*. *Nat Neurosci* 26(4):673-681. doi:10.1038/s41593-023-01286-8
- *Singh N et al. (2023) *The effects of acute Methylene Blue administration on cerebral blood flow and metabolism in humans and rats*. *J of Cerebral Blood Flow and Metabolism* doi:10.1177/0271678X231157958
- *Kiemes A et al. (2022) *ErbB4 deletion from fast-spiking interneurons causes psychosis-relevant neuroimaging phenotypes*. *Schizophrenia Bull* doi:10.1093/schbul/sbac192.
- *Gelegen C et al. (2022) *Relevance of sleep and associated structural changes in GBA1 mouse to human rapid eye movement behavior disorder*. *Sci Rep*.12(1):7973. <https://doi.org/10.1038/s41598-022-11516-x>
- *Wood TC et al. (2021) *Non-Invasive measurement of the cerebral metabolic rate of oxygen using MRI in rodents*. *Wellcome Open Res* 2022, 6:109. <https://doi.org/10.12688/wellcomeopenres.16734.4>
- *Serrano ME et al. (2022) *Imaging Synaptic Density: The Next Holy Grail of Neuroscience?* *Front Neurosci* 16, 796129.
- *Brusini I et al. (2022) *MRI-derived brain age as a biomarker of ageing in rats: validation using a healthy lifestyle intervention*. *Neurobiology of Ageing* 109: 204-2015. DOI: 10.1016/j.neurobiolaging.2021.10.004
- *Kiemes A et al. (2021) *Gestational methylazoxymethanol acetate administration alters α 5GABA A and NMDA receptor density: An integrated neuroimaging, behavioural and pharmacological study*. *Neuropsychopharmacology*, <https://doi.org/10.1038/s41386-021-01213-0>.
- *Kim E et al. (2021) *In vivo multi-parametric manganese-enhanced MRI for detecting senile plaques in rodent models of Alzheimer's disease*. *Sci Reports*, 11, 12419. <https://doi.org/10.1038/s41598-021-91899-5>
- *Vicente-Rodríguez M et al. (2021) *Resolving the cellular specificity of TSPO imaging in a rat model of peripherally-induced neuroinflammation*. *Brain Behav Immun*. <https://doi.org/10.1016/j.bbi.2021.05.025>
- *Lin Z et al. (2021) *MRI-guided histology of TDP-43 knock-in mice implicates parvalbumin interneuron loss, impaired neurogenesis and aberrant neurodevelopment in ALS-FTD*. *Brain Communications*, 3(2), <https://doi.org/10.1093/braincomms/fcab114>.
- Basalay MV et al. (2020) *Neuroprotection by remote ischemic conditioning in the setting of acute ischemic stroke: a preclinical two-centre study*. *Scientific Reports*, 10, e46-10. <https://doi.org/10.1038/s41598-020-74046-4>
- Polsek D et al. (2020) *The innate immune toll-like-receptor-2 modulates the depressogenic and anorexiolytic neuroinflammatory response in obstructive sleep apnoea*. *Scientific Reports*, 10, 404-413.
- *Morgan C et al. (2020) *Late changes in blood-brain barrier permeability in a rat tMCAO model of stroke detected by gadolinium-enhanced MRI*. *Neurological Research* doi: 10.1080/01616412.2020.1786637.
- Mota F et al. (2020) *Investigating the effects of ebselen, a potential new lithium mimetic, on glutamate transmission*. *Synapse* 47:698. <https://doi.org/10.1002/syn.22151>
- *Mancuso R et al. (2019) *CSF1R inhibitor JNJ-40346527 attenuates microglial proliferation and neurodegeneration in P301S mice*. *Brain* 21:383. <https://doi.org/10.1093/brain/awz241>
- *Duricki DA et al. (2019) *Stroke recovery in rats after 24h-delayed, intramuscular neurotrophin-3 infusion*. *Ann Neurol* 85(1):32. DOI: 10.1002/ana.25386
- Singh N et al. (2018) *Assessing the feasibility of intranasal radiotracer administration for in brain PET imaging*. *Nuclear Med and Biol*, 66:32. doi: 10.1016/j.nucmedbio.2018.08.005
- Walker SE et al. (2018) *Alterations in brain microstructure in rats that develop abnormal aggression following peripubertal stress*. *Eur J Neurosci* 1. <https://onlinelibrary.wiley.com/doi/10.1111/ejn.14061>
- *Horder J et al. (2018) *GABAA Receptor Availability Is Not Altered In Adults With Autism Spectrum Disorder (ASD) Or In ASD Mouse Models*. *Science Translational Medicine* 10(461) eaam8434. DOI: 10.1126/scitranslmed.aam8434
- *Westphal R et al. (2017) *Characterization of the resting-state brain network topology in the 6-hydroxydopamine rat model of Parkinson's disease*. *PLOS One* (12:e0172394-18). <https://doi.org/10.1371/journal.pone.0172394>
- *Wood T et al. (2016) *Whole-brain ex-vivo quantitative MRI of the cuprizone mouse model*. *PeerJ* 4, e2632, 10.7717/peerj.2632. doi: 10.7717/peerj.2632
- Tomimatsu Y et al. (2016) *TAK-063, a phosphodiesterase 10A inhibitor, modulates neuronal activity in various brain regions in pHMRI and EEG studies with and without ketamine challenge*. *Neuroscience* 339,180.
- *Westphal R et al. (2016) *Characterization of grey matter atrophy following 6-hydroxydopamine lesion of the nigrostriatal system*. *Neuroscience* 334, 166. DOI: 10.1016/j.neuroscience.2016.07.046
- *Alfieri A et al. (2013) *Sulforaphane preconditioning of the Nrf2/HO-1 defense pathway protects the cerebral vasculature against blood-brain barrier disruption and neurological deficits in stroke*. *Free Rad Biol Med* 65, 1012-1022.