

Eilidh MacNicol, PhD

Brain Networks, Healthy Ageing, MRI, Data Processing and Analysis

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📍 London, United Kingdom

Research Experience

Postdoctoral Research Associate, Neuroimaging, King's College London, UK 2021–Present

Generating and curating rodent-specific resources for MRI preprocessing and analysis

Creating and applying pipelines for fMRI/phMRI, autoradiography, histology, and HPLC studies

Applying advanced mathematical and statistical analyses to processed datasets

Interpreting and disseminating findings for pharmaceutical companies, peers, and lay audiences

Visiting Student Researcher, Dep. of Psychology, Stanford University, CA, USA 2020

Providing expertise to improve the compatibility of **NiPreps** software with rodent data

Doctoral Researcher, Neuroimaging, King's College London, UK 2016–2021

Acquiring, curating, processing, and analysing a multimodal longitudinal study of healthy ageing in rats

Miscellaneous experience: acquiring and analysing fMRI and diffusion MRI from humans, behaviour testing in rats, conscious and unconscious autoradiography, and examination of antibody binding to lipid complexes across ELISA, glycoarray, and tissue samples.

Teaching Experience

Instructor, NiPraxis, **Online** Autumn 2022

Proof-reading course resources, assisting students to work through exercises, and reviewing code pull-requests on end-of-course projects.

Speaker and co-organiser, **Quality Control** Educational session, **ISMRM, London** May 2022

Creating online textbook and tutorials, and demonstrating data quality control to mixed ability audience.

Speaker and co-organiser: **Voxelwise Preclinical Neuroimaging Analysis Workshop** 2019

Running a “hands-on” tutorial for fMRI analysis and data visualisation.

Graduate Teaching Assistant, King's College London, UK 2018

Facilitating the undergraduate workshop series “Imaging the Brain, Reading the Mind” (Module 6BYN3010) which introduces fMRI data analysis with SPM

Teaching experience also includes informal one-to-one coaching and small seminars for PhD and MSc students on data curation, processing, analysis, and visualisation.

Education

Doctor of Philosophy in Neuroimaging Research 2016–2021

Dep. of Neuroimaging, King's College London, UK

Master of Science (Distinction) in Neuroimaging 2014–2015

Institute of Psychiatry, Psychology, and Neuroscience, King's College London, UK

Bachelor of Science (upper second-class honours) in Neuroscience 2009–2013

Faculty of Life Sciences and Medicine, University of Glasgow, UK

Awards

Exceptional Training Opportunity at Stanford University 2020

£4989, MRC Flexible Supplement

Best Verbal Poster Presentation 2017

1st annual King's College London MRC doctoral training partnership symposium

Stipend and Bench Fees 2016–2020

King's College London's MRC doctoral training partnership

Best Research Project 2015

MSc neuroimaging 2014/15

Projects

nMRIPrep Developer 2024–Present

Developing and optimizing [an open-source Python package](#) to transparently process and analyse non-MRI data generated at the BRAIN centre, including autoradiography, HPLC, and histology.

Collaborators: Dr Katarina Ilic and Dr Eugene Kim

NiPreps Maintainer 2020–Present

Maintenance and contribution to various open-source Python packages, including:

[NiRodents](#) - modifies human-specific workflows for non-human data

[fMRIPrep-rodents](#) - rodent fMRI preprocessing package with minimal user intervention

Supervision: Dr Oscar Esteban

Longitudinal Characterisation of Healthy Ageing in Rats using Multimodal MRI 2016–2021

The [RESILIENT](#) study examined lifestyle modifications in a rat model of healthy ageing. Rats were given behavioural tests and non-invasive MRI imaging at up to four sessions across adulthood.

Supervision: Dr Diana Cash and Prof Federico Turkheimer

Public Engagement

Demo guide: King's College London dementia research open day 2019

Conducting tours of the preclinical MRI facility providing tailored answers for a non-specialist audience, promoting the necessity of preclinical imaging, highlighting the importance of researching healthy ageing in addition to ageing in the presence of disease.

Committees

Postdoctoral representative: Dep. Neuroimaging 2022–Present

Representing the interests of postdoctoral researchers and teaching fellows across departmental and institute-wide leadership committees.

Organising Committee Member: Dep. Neuroimaging, Diversity and Inclusion 2020–2022

Organisation and chairing the departmental book club with a focus on highlighting various diversity and inclusion themes. Notably, book choices have reflected the local communities in South London, diversity and inclusion in research and data analysis, and mental health.

Taught Postgraduate Co-Chair: IoPPN Student Forum 2014–2015

Engaged with several academic committees to provide a better student experience Solely responsible for disseminating details of events and news via social media channels Promoted inter-departmental networking and collaboration opportunities

Committee Member: University of Glasgow Neuroscience Society 2011–2013

President (2012-13); secretary (2011-12)

Extending membership to non-honours students and improving visibility on campus by employing creative solutions to recruitment obstacles

Reviewer: [NeuroImage](#)

Reviewer: [Frontiers in Neuroscience](#)

Publications

Journal articles

1. **Early alterations of functional connectivity, regional brain volumes and astrocyte markers in the beta-sitosterol beta-d-glucoside (BSSG) rat model of parkinsonism**
Monnot*, C., Kalomoiri*, M., MacNicol*, E., Kim, E., Mesquita, M., Damberg, P., Van Kampen, J., Kay, D., Turkheimer, F., Robertson, H., *et al.*, 2024, *Experimental Neurology*, 115118, doi:[10.1016/j.expneurol.2024.115118](https://doi.org/10.1016/j.expneurol.2024.115118)
2. **EIDA: A lossless approach for dynamic functional connectivity; application to fMRI data of a model of ageing**
De Alteriis*, G., MacNicol*, E., Hancock, F., Ciaramella, A., Cash, D., Expert, P. & Turkheimer, F. E., 2024, *Imaging Neuroscience* **2**, 1–22, doi:[10.1162/imag_a_00113](https://doi.org/10.1162/imag_a_00113)
3. **A consensus protocol for functional connectivity analysis in the rat brain**
Grandjean, J. *et al.*, 2023, *Nature Neuroscience*, 1–9, doi:[10.1038/s41593-023-01286-8](https://doi.org/10.1038/s41593-023-01286-8)
4. **The effects of acute Methylene Blue administration on cerebral blood flow and metabolism in humans and rats**
Singh, N., MacNicol, E., DiPasquale, O., Randall, K., Lythgoe, D., Mazibuko, N., Simmons, C., Selvaggi, P., Stephenson, S., Turkheimer, F. E., Cash, D., Zelaya, F. & Colasanti, A., 2023, *Journal of Cerebral Blood Flow & Metabolism*, 0271678X231157958, doi:[10.1177/0271678X231157958](https://doi.org/10.1177/0271678X231157958)
5. **Quality control in functional MRI studies with MRIQC and fMRIPrep**
Provins, C., MacNicol, E., Seeley, S. H., Hagmann, P. & Esteban, O., 2023, *Frontiers in Neuroimaging* **1**, doi:[10.3389/fnimg.2022.1073734](https://doi.org/10.3389/fnimg.2022.1073734)
6. **TemplateFlow: FAIR-sharing of multi-scale, multi-species brain models**
Ciric, R., Thompson, W. H., Lorenz, R., Goncalves, M., MacNicol, E., Markiewicz, C. J., Halchenko, Y. O., Ghosh, S. S., Gorgolewski, K. J., Poldrack, R. A., *et al.*, 2022, *Nature Methods* **19**, 1568–1571, doi:[10.1038/s41592-022-01681-2](https://doi.org/10.1038/s41592-022-01681-2)
7. **Non-Invasive measurement of the cerebral metabolic rate of oxygen using MRI in rodents**
Wood, T. C., Cash, D., MacNicol, E., Simmons, C., Kim, E., Lythgoe, D. J., Zelaya, F. & Turkheimer, F., 2022, *Wellcome Open Research* **6**, 109, doi:[10.12688/wellcomeopenres.16734.4](https://doi.org/10.12688/wellcomeopenres.16734.4)
8. **Age-specific adult rat brain MRI templates and tissue probability maps**
MacNicol, E., Wright, P., Kim, E., Brusini, I., Esteban, O., Simmons, C., Turkheimer, F. E. & Cash, D., 2022, *Frontiers in Neuroinformatics* **15**, 74, doi:[10.3389/fninf.2021.669049](https://doi.org/10.3389/fninf.2021.669049)
9. **MRI-derived brain age as a biomarker of ageing in rats: validation using a healthy lifestyle intervention**
Brusini, I., MacNicol, E., Kim, E., Smedby, Ö., Wang, C., Westman, E., Veronese, M., Turkheimer, F. & Cash, D., 2021, *Neurobiology of Aging*, S019745802100316X, doi:[10.1016/j.neurobiolaging.2021.10.004](https://doi.org/10.1016/j.neurobiolaging.2021.10.004)

Submitted articles

1. **Acute Cannabidiol (CBD), Tetrahydrocannabinol (THC) and their mixture (THC:CBD) exert differential effects on brain activity and blood flow in rats: A Translational Neuroimaging Study**
MacNicol*, E., Kokkinou*, M., Serrano Navacerrada, M. E., Smith, D.-M., Li, J., Simmons, C., Kim, E., Mesquita, M., Rojo Gonzalez, L., Andrews, T., *et al.*, 2024, *In submission*, doi:.
2. **Quality assessment and control of unprocessed anatomical, functional, and diffusion MRI of the human brain using MRIQC**
Hagen, M. P., Provins, C., MacNicol, E., Li, J. K., Gomez, T., Garcia, M., Seeley, S. H., Legarreta, J. H., Norgaard, M., Bissett, P. G., *et al.*, 2024, *bioRxiv*, doi:[10.1101/2024.10.21.619532](https://doi.org/10.1101/2024.10.21.619532)
3. **Activation mapping in multi-center rat sensory-evoked functional MRI datasets using a unified pipeline.**
Galteau, M. E. *et al.*, 2024, *bioRxiv*, doi:[10.1101/2024.09.27.615384](https://doi.org/10.1101/2024.09.27.615384)

Peer-reviewed conference proceedings

1. **Atlas-Based Brain Extraction Is Robust Across Rat MRI Studies**

MacNicol, E., Ciric, R., Kim, E., Censo, D. D., Cash, D., Poldrack, R. A. & Esteban, O. 2021 *IEEE 18th International Symposium on Biomedical Imaging (ISBI)* 2021, doi:[10.1109/ISBI48211.2021.9433884](https://doi.org/10.1109/ISBI48211.2021.9433884)

Presentations

Selected talks

1. **Statistical power in preclinical neuroimaging**

Joint MRC DTP symposium, University College London, London, UK (July, 2023)

2. **Species agnostic tools for translational MRI processing**

RIOT Science Club (June, 2022); <https://youtu.be/8n0kOctrjN0>

3. **Quality Control in Preclinical MRI: Where Do Artifacts Come From & How to Fix Them**

Joint Annual Meeting ISMRM-ESMRMB, London (May, 2022); <https://www.nipreps.org/qc-book>

4. **The future of open tools/technologies**

Organization of Human Brain Mapping Open Science Room (June, 2021); <https://youtu.be/kJi6QF46szw>

5. **RESILIENT: a longitudinal MRI study of healthy ageing in rats**

Center for Alzheimer's Research, Karolinska Institutet, Stockholm, Sweden (Mar., 2021)

6. **Data visualisation in preclinical MRI**

The Francis Crick Institute, London (Sept., 2019)

Poster presentations

1. **Adapting fMRIPrep for Rodent MRI**

King's College London (Apr., 2020)