Translational Neuroimaging of Neurogenetic Disorders DPhil (PhD)

Department of Psychiatry, University of Oxford

Start: October 2026

Neurogenetic disorders, including aneuploidies and recurrent copy number variations, are major risk factors for adverse mental health outcomes. Beyond their clinical importance, they provide powerful human models for uncovering multiscale genetic mechanisms in psychiatry. This studentship will leverage several globally unique neuroimaging datasets to (i) elucidate how neurogenetic disorders alter human brain organization, and (ii) translate these insights toward clinical stratification. The research environment is highly collaborative and supportive, with opportunities to work closely with leading UK- and US-based experts in imaging genomics.

About the research group, supervision and training environment

This position will be based in the research group of Prof. Armin Raznahan (W.A. Handley Professor in Psychiatry, Oxford Department of Psychiatry) which recently relocated to the UK from the U.S. NIMH Intramural Program Section on Developmental Neurogenomics. This group uses clinical[1–3], neuroimaging[4–6] and genomic[7–10] research methods to advance understanding and care for pediatric-onset neuropsychiatric disorders[11]. There is a major emphasis on mentorship / career development.

Focus of the DPhil

The DPhil project will involve use of already acquired multimodal neuroimaging data in neurogenetic syndromes (including sex chromosome aneuploidies) to map effects of altered gene dosage on human brain organization. There will be a special emphasis on: use and construction of brain charts for normative modeling of these data; integration of research and clinically acquired scans; linkage of neuroimaging findings to genetic and genomic data.

Supervision and training

The primary supervisor will be Prof. Raznahan with additional supervision and mentorship through close collaboration with Prof. Aaron Alexander-Bloch at the University of Pennsylvania, USA. There will also be a secondary Oxford co-supervisor based on the trainee's needs and preferences. You will receive expert training and extensive networking / career development opportunities in : multimodal neuroimaging; creation and use of brain growth charts; AI-driven image analysis of clinically acquired scans; integration of neuroimaging and genomic data.

Candidate Profile

We welcome ambitious applicants with at least an upper second-class honours degree (or equivalent) in neuroscience, computer science, engineering, bioinformatics or related fields.

Strong Python and/or R skills and clear communication are essential; experience in neuroimaging, applied data science and/or machine learning are desirable.

Funding & how to apply

The scholarship will fund course fees up to the value of home fees*, a tax-free stipend in line with UKRI standard rate (not less than £20,780 per annum), plus additional support for research expenses, conference attendance, and consumables.

*Applications from overseas students are encouraged with several options available for coverage of fees above home-student rates (additional funded or competitive scholarships; self-funding)

You will need to apply for this studentship via the main University online graduate application form, and pay an application fee of £20. The application form, all supporting materials required for the programme (including references) and payment must be submitted by the appropriate studentship deadline. To access the application form and application guide please visit our website at https://www.ox.ac.uk/admissions/graduate/application-guide

For Informal enquiries please contact: raznahana@mail.nih.gov

Deadline for submission of applications: 12:00 noon (UK time) on 6th February 2026

Interview date: W/C 16th February 2026

Studentship code to be entered on application: 26PSYCH04WEB

References

1. Larsen, I. G. *et al.* Novel tools for comparing the architecture of psychopathology between neurogenetic disorders: An application to X- versus Y-chromosome aneuploidy effects in males. *Psychol. Med.* **55**, e166 (2025).
2. Vaez, M. *et al.* Population-Based Risk of Psychiatric Disorders Associated With Recurrent Copy Number Variants. *JAMA Psychiatry* **81**, 957–966 (2024).
3. Sánchez, X. C. *et al.* Associations of psychiatric disorders with sex chromosome aneuploidies in the Danish iPSYCH2015 dataset: a case-cohort study. *Lancet Psychiatry* **10**, 129–138 (2023).
4. Levitis, E. *et al.* The variegation of human brain vulnerability to rare genetic disorders and convergence with behaviorally defined disorders. *Biol. Psychiatry* (2023) doi:10.1016/j.biopsych.2023.07.008.
5. Mallard, T. T. *et al.* X-chromosome influences on neuroanatomical variation in humans. *Nat. Neurosci.* **24**, 1216–1224 (2021).

6. Guma, E. *et al*. A Cross-Species Neuroimaging Study of Sex Chromosome Dosage Effects on Human and Mouse Brain Anatomy. *J. Neurosci*. **43**, 1321–1333 (2023).
7. Wagstyl, K. *et al*. Transcriptional cartography integrates multiscale biology of the human cortex. *Elife* **12**, (2024).
8. Seidlitz, J. *et al*. Transcriptomic and cellular decoding of regional brain vulnerability to neurogenetic disorders. *Nat. Commun*. **11**, 3358 (2020).
9. Legue, M. *et al*. Sex chromosome aneuploidy impacts on human gene expression and regulation: a systematic review. *Mol. Med*. (2025) doi:10.1186/s10020-025-01404-1.
10. Liu, S. *et al*. Aneuploidy effects on human gene expression across three cell types. *Proc. Natl. Acad. Sci. U. S. A*. **120**, e2218478120 (2023).
11. Raznahan, A., Won, H., Glahn, D. C. & Jacquemont, S. Convergence and Divergence of Rare Genetic Disorders on Brain Phenotypes: A Review. *JAMA Psychiatry* **79**, 818–828 (2022).