

Sean Cavanagh, MBBS PhD

I am a clinical academic psychiatrist specialising in computational psychiatry and translational neuroscience. My research aims to identify mechanistic and computational predictors of treatment response in obsessive-compulsive and related disorders. I combine behavioural modelling and clinical phenotyping to develop clinically actionable tools for early detection and personalised intervention. My doctoral work at UCL characterised neural computations underlying working memory and decision-making using single-neuron electrophysiology, pharmacological manipulations, and computational modelling.

Current Research Programme

- Developing behavioural paradigms to characterise mechanisms of CBT response in paediatric OCD.
- Applying reinforcement learning and decision models to predict treatment response and relapse.
- Functional neurosurgery research investigating cognitive effects of deep brain stimulation (DBS) and anterior cingulotomy.

Work

2024 – Present

Academic Clinical Fellow in Psychiatry: King's College London & South London and Maudsley NHS Foundation Trust

Research (Computational Psychiatry):

- Developing behavioural paradigms to characterise mechanisms of CBT response in paediatric OCD
- Applying reinforcement learning models to predict treatment response and relapse

Clinical Posts:

- National and Specialist CAMHS OCD and BDD Service
- Acute adult and older adult inpatient psychiatry

2022 – 2024

Academic Foundation Doctor, St George's University Hospital

Research post using computational psychiatry approaches in a functional neurosurgery patient population. Clinical posts included perinatal psychiatry, dermatology (with experience of psychodermatology), emergency medicine, general internal medicine, and trauma and orthopaedics.

Education

2015 - 2022

MBPhD Programme, University College London

Clinical Examination Results: First year (92%); Second year (81%); Final year (85%).

2015 - 2019

PhD in Neuroscience, University College London Queen Square Institute of Neurology

"Neural computations for working memory and decision making" supervised by Dr Steve Kennerley, Dr Simon Farmer and Dr Laurence Hunt.

2012 - 2015

BSc (Hons) Medical Sciences with Neuroscience, University College London - 1st Class

Dissertation: "Differential modulation of the excitability of inputs to corticospinal neurones during action preparation for choice reaction time" supervised by Professor John Rothwell.

Grants

- 2026: Royal College of Psychiatrists Academic Resident Doctor Grant (£4,650)
- 2026: European Association of Neurosurgical Societies (EANS) - Research Fund Seed Grant (€10,000, Co-PI)
- 2020: Foulkes Foundation Fellowship (£6,000).
- 2016: Brain travel award to attend Society for Neuroscience meeting, USA
- 2015: PhD studentship funding from Middlesex Hospital Medical School General Charitable Trust (£77,076)

Selected Awards and Media Coverage

2025: Contributor to Patient Resource on Body Dysmorphic Disorder ([Nip in the Bud](#))
2023: Merit Award for Leadership, London Foundation School (Health Education England)
2022: Betuel Prize (first prize for written examinations in MBBS finals)
2020: Media coverage of Cavanagh et al. 2020 (eLife) – including [Naked Scientists Podcast](#)
2019: Media coverage of Cavanagh et al. 2019 (PNAS) in [Medical Xpress](#)
2019: [Jon Driver Prize](#) (yearly award to outstanding young neuroscientist from UCL).
2017: Art of Neuroscience Competition Winner. Media coverage in [Scientific American](#) and [Atlas Obscura](#)

Clinical Innovation and Quality Improvement

- Automated pre-assessment report generation for National OCD/BDD service using Python (2026).
- Optimised St George's Hospital Emergency Department Cauda Equina pathway (2024).

Teaching and Academic Leadership

- Supervisor: MSc, MRes and BSc students (UCL & KCL), academic foundation doctor (SGUL).
- Research protocol marker, MSc Clinical Neuropsychiatry (KCL).
- Organiser, KCL IoPPN Journal Club.
- Peer reviewer: Science Advances, eLife, Quarterly Journal of Experimental Psychology.

Selected Presentations

2025: Maudsley Mental Health of Older Adult Academic Meeting – case presentation.
2025: Maudsley Hospital Journal Club - Non-invasive temporal interference electrical stimulation of the human hippocampus.
2024: Delusional infestation. St George's Hospital Dermatology Department.
2019: Jon Driver prize talk: The role of neuronal timescales in cognition. UCL Neuroscience Symposium ([Video](#)).
2019: Swartz program in theoretical neuroscience seminar. Yale University, USA.
2018: Circuit mechanisms of working memory and decision-making. Oxford Centre for Human Brain Activity, University of Oxford.
2018: Reconciling persistent and dynamic hypotheses of working memory coding in prefrontal cortex. Society for Neuroscience Meeting, San Diego, USA.
2018: Circuit mechanisms of working memory and decision-making. Max Planck UCL Centre for Computational Psychiatry and Ageing.

Publications

Gelfer, Y., **Cavanagh, S. E.**, Bridgens, A., Ashby, E., Bouchard, M., Leo, D. G. & Eastwood, D. M. (2024) Relapse, with poorer clinical and quality of life outcomes, affects 37% of idiopathic clubfoot patients: the Core outcome Clubfoot (CoCo) study - An International Multicentre Observational Study. *Bone & Joint*.

Hussain, S. A., Russell, A., **Cavanagh, S. E.**, Bridgens, A. & Gelfer, Y. (2023) "A 'Hub and Spoke' Shared Care initiative for CTEV Ponseti service." *Bone & Joint Open*, 4(11), pp. 865-872.

***Cavanagh, S.E.**, Hunt, L.T. & Kennerley, S.W. (2020) A Diversity of Intrinsic Timescales Underlie Neural Computations. *Front Neural Circuits*, **14**, 615626.

***Cavanagh, S.E.**, Lam, N.H., Murray, J.D., Hunt, L.T. & Kennerley, S.W. (2020) A circuit mechanism for decision-making biases and NMDA receptor hypofunction. *Elife*, 9.

***Cavanagh, S. E.**, Malalasekera, W. M. N., Miranda, B., Hunt, L. T., & Kennerley, S. W. (2019). Visual fixation patterns during economic choice reflect covert valuation processes that emerge with learning. *Proceedings of the National Academy of Sciences*, 201906662.

***Cavanagh, S. E.**, Towers, J. P., Wallis, J. D., Hunt, L. T., & Kennerley, S. W. (2018). Reconciling persistent and dynamic hypotheses of working memory coding in prefrontal cortex. *Nature Communications*, 9(1).

Hannah, R., **Cavanagh, S. E.**, Tremblay, S., Simeoni, S., & Rothwell, J. C. (2018). Selective suppression of local interneuron circuits in human motor cortex contributes to movement preparation. *Journal of Neuroscience*, 38(5), 1264–1276.

Hannah, R., Sommer, M., **Cavanagh, S.**, Jerjian, S., & Rothwell, J. C. (2017). Motor outcomes of repetitive transcranial magnetic stimulation are dependent on the specific interneuron circuit targeted. In *Biosystems and Biorobotics* (Vol. 15, pp. 3–7).

***Cavanagh, S. E.**, Wallis, J. D., Kennerley, S. W., & Hunt, L. T. (2016). Autocorrelation structure at rest predicts value correlates of single neurons during reward-guided choice. *ELife*.

Cavanagh, S., Malalasekera, N., & Kennerley, S. (2015). In the blink of an eye: Value and novelty drive saccades. *Annals of Medicine and Surgery*, 4(3), 319–320.