

## Sean Froudish-Walsh CV

### Academic Work Experience

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University of Bristol (UK) 01/02/2025 -  
Senior Lecturer in Computational Neuroscience  
Head of Cognition, Anatomy and Neural Networks (CANN) group  
Faculty Student Access & Inclusion Officer, Faculty of Engineering & Science

University of Bristol (UK) 01/08/2022 - 31/01/2025  
Lecturer in Computational Neuroscience  
Head of Cognition, Anatomy and Neural Networks (CANN) group

New York University (USA) 01/09/2017 – 30/6/2022  
Postdoctoral associate  
Xiao-Jing Wang lab  
Main project: “Anatomically-constrained large-scale neural network modelling of cognition in primates”

Icahn School of Medicine at Mount Sinai (USA) 01/09/2015 – 31/08/2017  
Postdoctoral fellow  
Paula Croxson lab  
Main project: “Distributed plasticity following focal hippocampal lesions in the monkey”

Institute of Psychiatry, King’s College London (UK) 10/10/2011 – 20/04/2015  
Research Worker  
Chiara Nosarti and Oliver Howes labs  
Main project: “The long-term effects of brain injury following very preterm birth on dopamine and memory function”

University of Barcelona (Spain) 01/03/2011 – 31/09/2011  
MRI Analyst  
Antoni Rodríguez-Fornells lab  
Main project: “Diffusion MRI tractography investigation of language and motor recovery following stroke”

University of Málaga (Spain) 01/12/2010 – 31/09/2011  
Specialist MR Technician  
Marcelo Berthier lab  
Main project: “Multimodal MRI investigation of recovery following aphasia and related disorders”

Trinity College Dublin (Ireland) 01/06/2009 – 01/09/2009  
Research Assistant  
Conor Houghton lab  
Main project: “Bayesian fitting methods for analysing spike train data”

### Education

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Institute of Psychiatry, King’s College London (UK) 01/01/2012 – 01/07/2015  
**PhD in Neuroimaging** (Defence date: 20/April/2015)  
Advisors: Chiara Nosarti, Oliver Howes  
Thesis: “Very early brain damage leads to dopamine dysregulation in adulthood”

Institute of Psychiatry, King’s College London (UK) 01/09/2009 – 08/09/2010  
**MSc in Neuroscience** (graduated with Distinction)  
Thesis: “Disruption to the corpus callosum in adults with autism spectrum disorder”

Trinity College Dublin (Ireland) 01/10/2005 – 25/06/2009  
**BA (Hons) in Pure and Applied Mathematics** (graduated with First Class Honours)

### Peer-reviewed publications

For full list of publications (excluding articles in press), see my Google Scholar page:

[https://scholar.google.com/citations?user=1n\\_2bLsAAAAJ&hl=en](https://scholar.google.com/citations?user=1n_2bLsAAAAJ&hl=en)

### 1st author peer-reviewed papers (\* = co-first authors, + = co-last authors)

- 1) Klatzmann\* U, **S Froudish-Walsh\***, D Bliss, P Theodoni, M Niu, L Rapan, N Palomero-Gallagher, C Sergent, S Dehaene, XJ Wang. "A connectome-based model of conscious access in monkey cortex". *Cell Reports*, (In press, 2025).
- 2) Ding\* X, **S Froudish-Walsh\***, J Jaramillo\*, J Jiang, XJ Wang. "Cell type-specific connectome predicts distributed working memory activity in the mouse brain", *eLife* (2024).
- 3) **Froudish-Walsh S**; T Xu; M Niu; L Rapan; D Margulies; K Zilles; XJ Wang<sup>+</sup> N Palomero-Gallagher<sup>+</sup>. "Gradients of receptor expression in the macaque neocortex". *Nature Neuroscience* (2023): <https://doi.org/10.1038/s41593-023-01351-2>
- 4) **Froudish-Walsh S**; DP Bliss; X Ding; L Rapan; M Niu; K Knoblauch; K Zilles; H Kennedy<sup>+</sup>; N Palomero-Gallagher<sup>+</sup>; XJ Wang<sup>+</sup>. "A dopamine gradient controls access to distributed working memory in the large-scale monkey cortex". *Neuron* (2021): 109(21) 3500-3520
- 5) **Froudish-Walsh, S**; PGF Browning; JJ Young; KL Murphy; RB Mars; L Fleyscher; PL Croxson. "Macro-connectomics and microstructure predict dynamic plasticity patterns in the non-human primate brain". *eLife* (2018): 7:e34354
- 6) **Froudish-Walsh, S**; PGF Browning; PL Croxson; KL Murphy; JL Shamy; TL Veuthey; CRE Wilson; MG Baxter. "The rhesus monkey hippocampus contributes to scene memory retrieval, but not new learning". *Journal of Neuroscience* (2018): 38(36):7800 –7808
- 7) **Froudish-Walsh, S**; MP Bloomfield; J Kroll; V Karolis; Sameer Jauhar; Ilaria Bonoldi; PK McGuire; RM Murray; S Kapur; C Nosarti; O Howes. "Presynaptic striatal dopamine dysfunction in people who experienced neonatal brain injury". *eLife* (2017): 6: e29088.
- 8) Kroll, J\*; **S Froudish-Walsh\***; PJ Brittain; CEJ Tseng; V Karolis; R M. Murray; C Nosarti. "A dimensional approach to assessing psychiatric risk in adults born very preterm." *Psych. Med* (2017): 48 (10) 738-1744
- 9) **Froudish-Walsh, S**; D López-Barroso; MJ Torres-Prioris; PL Croxson; ML Berthier. "Plasticity in the Working Memory System: Life Span Changes and Response to Injury." *The Neuroscientist* (2017): 1073858417717210.
- 10) **Froudish-Walsh, S**; V Karolis; C Caldinelli; PJ Brittain; J Kroll; E Rodríguez-Toscano; M Tesse; M Colquhoun; O Howes; F Dell'Acqua; M Thiebaut de Schotten; RM Murray; SCR Williams; C Nosarti. "Very Early Brain Damage Leads to Remodeling of the Working Memory System in Adulthood: A Combined fMRI/Tractography Study." *The Journal of Neuroscience* 35, no. 48 (2015): 15787-15799.
- 11) Salvan, P\*; **S Froudish-Walsh\***; MPG Allin; M Walshe; RM Murray; S Bhattacharyya; PK McGuire; SCR Williams; C Nosarti. "Road work on memory lane—Functional and structural alterations to the learning and memory circuit in adults born very preterm." *NeuroImage*. 102 (2014): 152-161.
- 12) Lawrence, EJ\*; **S Froudish-Walsh\***; R Neilan; KW Nam; V Giampietro; PK McGuire; RM Murray; and C Nosarti. "Motor fMRI and Cortical Grey Matter Volume in Adult Born Very Preterm." *Developmental Cognitive Neuroscience* 10 (2014): 1-9.

### 2<sup>nd</sup> author peer-reviewed papers:

- 13) Rapan, L, **S Froudish-Walsh**, M Niu, T Xu, L Zhao, T Funck, XJ Wang, K Amunts, N Palomero-Gallagher. "Cytoarchitectonic, receptor distribution and functional connectivity analyses of the macaque frontal lobe." *eLife* (2023).
- 14) Rapan, L; **S Froudish-Walsh**, M Niu, T Xu, T Funck, K Zilles, N Palomero-Gallagher. "Multimodal 3D atlas of the macaque monkey motor and premotor cortex". *NeuroImage* (2020) 117574.

- 15) Tseng, CEJ; **S Froudish-Walsh**; J Kroll; V Karolis; PJ Brittain; N Palamin; H Clifton; S Counsell; SCR Williams; RM Murray; C Nosarti. "Verbal fluency is affected by altered brain lateralization in adults who were born very preterm". *eNeuro* (2019): 6(2) 1-16.
- 16) Velthorst, E; **S Froudish-Walsh** et al., "Genetic risk for schizophrenia and autism, social impairment and developmental pathways to psychosis". *Translational Psych.* (2018): 8:204.
- 17) Karolis, V; **S Froudish-Walsh**; J Kroll; PJ Brittain; CEJ Tseng; KW Nam; A Reinders; RM Murray; SCR Williams; PM Thompson; C Nosarti; "Volumetric grey matter alterations in adolescents and adults born very preterm suggest accelerated brain maturation". *NeuroImage*, 163, (2017): 379-389.
- 18) Caldinelli, C; **S Froudish-Walsh**; V Karolis; CEJ Tseng; MP Allin; M Cuddy; RM Murray; C Nosarti. "White matter alterations to the cingulum and fornix following very preterm birth and their relationship with cognitive functions". *NeuroImage*. 150, (2017): 373-382.
- 19) Karolis, V; **S Froudish-Walsh**; PJ Brittain; J Kroll; G Ball; AD Edwards; F Dell'Acqua; SCR Williams; RM Murray; C Nosarti. "Reinforcement of the Brain's Rich-Club Architecture Following Early Neurodevelopmental Disruption Caused by Very Preterm Birth." *Cerebral Cortex* 26; 3 (2016): 1322-1335.
- 20) Nosarti, C; **S Froudish-Walsh**. "Alterations in development of hippocampal and cortical memory mechanisms following very preterm birth." *Developmental Medicine and Child Neurology* 58; S4 (2016): 35-45.
- 21) Tseng, CEJ, **S Froudish-Walsh**, PJ Brittain, V Karolis, C Caldinelli, J Kroll, SJ Counsell, SCR Williams, RM Murray; C Nosarti. "A multimodal imaging study of recognition memory in very preterm born adults." *Human Brain Mapping* 38, no. 2 (2017): 644-655.
- 22) Brittain, PJ; **S Froudish-Walsh**; KW Nam; V Giampietro; V Karolis; RM Murray; S Bhattacharyya; A Kalpakidou; and C Nosarti. "Neural compensation in adulthood following very preterm birth demonstrated during a visual paired associates learning task." *NeuroImage: Clinical* 6 (2014): 54-63.
- 23) Berthier, ML; **S Froudish-Walsh**; Guadalupe Dávila; and Alejandro Nabrozidis. "Dissociated repetition deficits in aphasia can reflect flexible interactions between left dorsal and ventral streams and gender-dimorphic architecture of the right dorsal stream." *Frontiers in human neuroscience* 7 (2013).

#### Middle author peer-reviewed papers:

- 24) Luppi, Andrea I., Zhen-Qi Liu, Justine Y. Hansen, Rodrigo Cofre, Elena Kuzmin, **Seán Froudish-Walsh**, Nicola Palomero-Gallagher, and Bratislav Misic. "Benchmarking macaque brain gene expression for horizontal and vertical translation." *Science Advances* (2025) In press.
- 25) Niu M, L Rapan, **S Froudish-Walsh**, L Zhao, T Funck, K Amunts, N Palomero-Gallagher. 2024. Multimodal mapping of macaque monkey somatosensory cortex. *Progress in Neurobiology* (in press).
- 26) Magrou\* L, MK Joyce\*, **S Froudish-Walsh**, D Datta, XJ Wang, J Martínez-Trujillo, AFT Arnsten. 2024. The meso-connectomes of mouse, marmoset and macaque: Density, modularity and the emergence of higher cognition. *Cerebral Cortex* (2024).
- 27) D'Ambrosio, E., Pergola, G., Pardiñas, A.F., Dahoun, T., Veronese, M., Sportelli, L., Taurisano, P., Griffiths, K., Jauhar, S., Rogdaki, M., Bloomfield, M.A., **Froudish-Walsh, S.**, et al., 2022. A polygenic score indexing a DRD2-related co-expression network is associated with striatal dopamine function. *Scientific reports*, 12(1), pp.1-9.
- 28) Milham, M., Petkov, C., Belin, P., Hamed, S.B., Evrard, H., Fair, D., Fox, A., **Froudish-Walsh, S.**, Hayashi, T., Kastner, S. Klink, C., et al. "Toward next-generation primate neuroscience: A collaboration-based strategic plan for integrative neuroimaging." *Neuron* (2022)
- 29) Gao\* Z; H Wang\*; C Lu; **S Froudish-Walsh**, M Chen; XJ Wang\*; J Hu\*; W Sun\*. "The neural basis of delayed gratification." *Science Advances* (2021).
- 30) Klink PC, JF Aubry, V Ferrera, AS Fox, **S Froudish-Walsh** et al. "Combined brain perturbation and neuroimaging in non-human primates". *NeuroImage* (2021)
- 31) Niu, M; L Rapan; T Funck; **S Froudish-Walsh**, L Zhao, K Zilles, N Palomero-Gallagher. "Organization of the macaque monkey inferior parietal lobule based on multimodal receptor architectonics." *NeuroImage* (2021): 117843.

- 32) Milham, M et al., "Accelerating the evolution of non-human primate imaging". *Neuron* (2020). 105, 600-603.
- 33) Papini, C; L Palaniyappan; J Kroll; **S Froudist-Walsh**; RM Murray; C Nosarti. "Altered cortical gyrification in adults who were born very preterm and its associations with cognition and mental health." *Biological Psychiatry: CNNI* (2020): 5(7) 640-650
- 34) Kroll, J; V Karolis; PJ Brittain; CEJ Tseng; **S Froudist-Walsh**; R M. Murray; C Nosarti. "Systematic assessment of perinatal and socio-demographic factors associated with IQ from childhood to adult life following very preterm birth." *Intelligence*. (2019) 77, 101401.
- 35) D'Ambrosio, E; T Dahoun; AF Pardiñas; M Veronese; MAP Bloomfield; S Jauhar; I Bonoldi; M Rogdaki, **S Froudist-Walsh**; JTR Walters; O Howes. "The effect of a genetic variant at the schizophrenia associated AS3MT/BORCS7 locus on striatal dopamine function: a PET imaging study." *Psychiatry Research: Neuroimaging* (2019): 291: 34-41.
- 36) Xu, T; D Sturgeon; JSB Ramirez; **S Froudist-Walsh**; DS Margulies, CE Schroeder; DA Fair; M Milham. "Inter-individual variability of functional connectivity in awake and anesthetized rhesus monkeys". *Biological Psychiatry: CNNI* (2019): 4(6), 543-553.
- 37) Milham, M et al. "An open resource for non-human primate imaging". *Neuron* (2018) 100(1) 61-74.
- 38) Dahoun, T; AF Pardiñas; M Veronese; MAP Bloomfield; S Jauhar; I Bonoldi; **S Froudist-Walsh**; C Nosarti; C Korth; W Hennah; J Walters; D Prata; O D Howes; "The effect of the DISC1 Ser704Cys polymorphism on striatal dopamine synthesis capacity an [<sup>18</sup>F]-DOPA PET study ". *Human Molecular Genetics* (2018): 27(20) 3498-3506.
- 39) Parvaz, MA; K Kim; **S Froudist-Walsh**, JH Newcorn, I Ivanov; "Reward-based learning as a function of severity of substance abuse risk in Drug-Naïve Youth with ADHD". *Journal of Child and Adolescent Psychopharmacology* (2018): 28(8) 547-553.
- 40) Kroll, J; PJ Brittain; V Karolis; Jane Tseng; **S Froudist-Walsh**; R M Murray; C Nosarti. "Real-life impact of executive function impairments in adults who were born very preterm." *JINS*, 23, 5 (2017): 381-389.
- 41) Catani , M; F Dell'Acqua; H Howells; S Budisavljevic; M Thiebaut de Schotten; **S Froudist-Walsh**; L D'Anna; ET Bullmore; J Suckling; S Baron-Cohen; MV. Lombardo; A Leemans; MC Craig; DGM Murphy. "Frontal networks in adults with autism spectrum disorder." *Brain* 139; no. 2 (2016): 616-630.
- 42) Papini, C; TP White; A Montagna; PJ Brittain; **S Froudist-Walsh**; J Kroll; V Karolis; A Simonelli; Steven C Williams; R M Murray; C Nosarti. "Altered resting state functional connectivity in emotion processing brain regions in adults who were born very preterm." *Psychological Medicine* (2016): 46(14) 3025-3039.
- 43) Sarkar, S; F Dell'Acqua; **S Froudist Walsh**; N Blackwood; S Scott; MC Craig; Q Deeley; DGM Murphy. "A Whole-Brain Investigation of White Matter Microstructure in Adolescents with Conduct Disorder." *PloS one* 11; no. 6 (2016): e0155475.
- 44) Nam, KW; N Castellanos; **S Froudist-Walsh**; A Simmons; MP Allin; M Walshe; RM Murray; A Evans; JS Muehlboeck; C Nosarti. "Alterations in cortical thickness development in preterm-born individuals: implications for high-order cognitive processing." *NeuroImage* 115 (2015); 64-75
- 45) White, TP; I Symington; NP Castellanos; PJ Brittain; **S Froudist-Walsh**; KW Nam; JR Sato et al. "Dysconnectivity of neurocognitive networks at rest in very-preterm born adults." *NeuroImage: Clinical* 4 (2014): 352-365.
- 46) Tuomiranta, LM.; E Càmarà; **S Froudist-Walsh**; P Ripolles; JP Saunavaara; R Parkkola; N Martin; A Rodríguez-Fornells; M Laine. "Hidden word learning capacity through orthography in aphasia." *Cortex* 50 (2014): 174- 191.
- 47) De-Torres, I; G Dávila; ML Berthier; **S Froudist-Walsh**; I Moreno-Torres; R Ruiz-Cruces. "Repeating with the right hemisphere: reduced interactions between phonological and lexical-semantic systems in crossed aphasia?." *Frontiers in human neuroscience* 7 (2013).
- 48) Moreno-Torres, I; ML Berthier; M del Mar Cid; C Green; A Gutiérrez; N García-Casares; **S Froudist-Walsh** et al. "Foreign accent syndrome: a multimodal evaluation in the search of neuroscience-driven treatments." *Neuropsychologia* 51; no. 3 (2013): 520-537.
- 49) García-Casares, N; ML Berthier Torres; **S Froudist-Walsh**; P Gonzalez-Santos. "A model of musical cognition and amusia." *Neurología* 28; no. 3 (2013): 179-186.
- 50) Amengual, JL; A Valero-Cabré; MV de las Heras; N Rojo; **S Froudist-Walsh**; P Ripollés; N Bodammer et al. "Prognostic value of cortically induced motor evoked activity by TMS in chronic

stroke: Caveats from a revealing single clinical case." *BMC neurology* 12; no. 1 (2012).

- 51) Berthier, ML; N Garcia-Casares; **S Froudish-Walsh**; A Nabrozidis; MRJ Ruiz; et al. "Recovery from post-stroke aphasia: lessons from brain imaging and implications for rehabilitation and biological treatments." *Discovery medicine* 12; no. 65 (2011): 275-289.

### Preprints - \* signifies co-first authors, + signifies co-last/corresponding authors

- 1) Joyce\*, M. K. P., Ivanov\*, T. G., Krienen, F., Mitchell, J., Ma, S., Inoue, W.,..., **Froudish-Walsh**\*, S., Arnsten\*, A. F. (2024). Dopamine D1 receptor expression in prefrontal parvalbumin neurons influences distractibility across species. *bioRxiv*, 2024-06. (under revision at *Communications Biology*)
- 2) Alldritt, S., Ramirez, J. S., de Wael, R. V., Bethlehem, R., Seidlitz, J., Wang, Z., ... & Sharma, K. K. (2024). Brain Charts for the Rhesus Macaque Lifespan. *BioRxiv*. (under revision at *Nature Neuroscience*)
- 3) Hong SJ, Oh Y, Ann Y, Lee JJ, Ito T, **Froudish-Walsh S**, Paquola C, Milham M, Spreng RN, Margulies D, Bernhardt B. (2024). In vivo cartography of state-dependent signal flow hierarchy in the human cerebral cortex. *ResearchSquare*, (under revision at *Nature Neuroscience*).
- 4) Purple, R. J., Gupta, R., Thomas, C. W., Golden, C. T., Froudish-Walsh, S., & Jones, M. W. (2024). Short- and long-term reconfiguration of rat prefrontal cortical networks following single doses of psilocybin. *bioRxiv*, (under review at *Molecular Psychiatry*).
- 5) Pereira-Obilinovic\*, U., **Froudish-Walsh**\*, S., & Wang\*, X. J. (2024). Cognitive network interactions through communication subspaces in large-scale models of the neocortex. *bioRxiv* (under review at *Neuron*).

### Open data

EBRAINS - (<https://search.kg.ebrains.eu/instances/e39a0407-a98a-480e-9c63-4a2225ddfbe4>)

Example datasets (from 59)

1. **Froudish-Walsh, S.**, Niu, M., Rapan, L., & Palomero-Gallagher, N. (2023). Neurotransmitter receptor densities per neuron across macaque cortex (v1.0) [Data set]. EBRAINS. <https://doi.org/10.25493/5HK3-S8M>
2. Rapan, L., Niu, M., Zhao, L., Funck, T., **Froudish-Walsh, S.**, Zhu, Q., & Palomero-Gallagher, N. (2023). 3D cyto- and receptor architectonic map of macaque prefrontal area p46vf (v1.0) [Data set]. EBRAINS. <https://doi.org/10.25493/Z0XP-EC3>
3. Niu, M., Rapan, L., Funck, T., **Froudish-Walsh, S.**, Zhao, L., Zilles, K., & Palomero-Gallagher, N. (2021). 3D cyto- and receptor architectonic map of macaque area PGop of the inferior parietal lobe [Data set]. EBRAINS. <https://doi.org/10.25493/MJN4-SY2>

### BALSA neuroimaging repositories

1. Rapan, L, **S Froudish-Walsh**, M Niu, T Xu, L Zhao, T Funck, XJ Wang, K Amunts, N Palomero-Gallagher. "Cytoarchitectonic, receptor distribution and functional connectivity analyses of the macaque frontal lobe" (2023) - <https://balsa.wustl.edu/study/7xGrm>
2. **Froudish-Walsh S**; T Xu; M Niu; L Rapan; D Margulies; K Zilles; XJ Wang+ N Palomero-Gallagher+. "Gradients of neurotransmitter receptor expression in the macaque cortex" (2023) - <https://balsa.wustl.edu/study/P2Nql>
3. **Froudish-Walsh S**; DP Bliss; X Ding; L Rapan; M Niu; K Knoblauch; K Zilles; H Kennedy+; N Palomero-Gallagher+; XJ Wang+. "A dopamine gradient controls access to distributed working memory in the large-scale monkey cortex". (2021) - <https://balsa.wustl.edu/study/7qKNZ>
4. Niu, M; L Rapan; T Funck; **S Froudish-Walsh**, L Zhao, K Zilles, N Palomero-Gallagher. "Receptor architecture of macaque inferior parietal lobe" (2021) - <https://balsa.wustl.edu/study/7qgpZ>
5. Rapan, L; **S Froudish-Walsh**, M Niu, T Xu, T Funck, K Zilles, N Palomero-Gallagher. "Multimodal 3D atlas of the macaque monkey motor and premotor cortex". (2020) <https://balsa.wustl.edu/study/g7qwN>

### INDI Primate Data Exchange

- 1) Open macaque multimodal MRI dataset. Identifier: Mount Sinai School of Medicine. [https://fcon\\_1000.projects.nitrc.org/indi/indiPRIME.html](https://fcon_1000.projects.nitrc.org/indi/indiPRIME.html)

## Open code

**Github** repositories at [github.com/seanfw/](https://github.com/seanfw/) and [github.com/cannngroup](https://github.com/cannngroup)

Example repository names and functions

- 1) **surface-activity-vis** - Visualising simulated activity, or real data on the cortical surface
- 2) **macaque\_hierarchy** - Calculating and analysing the cortical hierarchy
- 3) **genemapper** - Analysing human gene expression on the cortical surface
- 4) **dopamine-dist-wm** - Simulating the large-scale monkey cortex (DOI: 10.5281/zenodo.5507279)
- 5) **macaque-pfc-func-conn** - Analysing prefrontal functional connectivity
- 6) **Rapan\_et\_al\_Neurolmage\_2020**- functional connectivity of premotor cortex -
- 7) **froudish-walsh-et-al-elife-2018** - Connectomics analysis of the lesioned monkey brain

## Grants, Awards and Fellowships

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- 1) Innovative and Inspiring Teaching Award, Bristol Teaching Awards – Nominated 2025
- 2) Fellowship of the Higher Education Academy. AdvanceHE, UK. 2024
- 3) Postgraduate Certificate in Academic Practice. University of Bristol. 2024
- 4) BBSRC Supporting Research in Cognitive Computational Neuroscience grant (**Role: PI**, co-I Matt Jones, collaborators Robin Carhart-Harris, Nicola Palomero-Gallagher). "Revealing the circuit mechanisms of altered conscious perception with neuropixels recordings and biophysically-inspired neural networks." Value: £200,000 (\$246,000). 2023-2024
- 5) BN Neuroscience of Mental Health grant – Scobie Foundation (**Role: PI**, collaborators Anissa Abi-Dargham, Mark Slifstein, Jared van Snellenberg, co-I Matt Jones). Identifying network and neurochemical mechanisms for hallucinations and working memory deficits in schizophrenia using neural network modelling and neuroimaging. Value: £100,000 (\$123,000). 2023-2027
- 6) Liverpool Victoria (LV) Challenge Seedcorn Funding. (**Role: Co-I**, PI: Conor Houghton). "Hierarchical Bayes for imbalanced or insufficient data". Value £30,000 (\$37,000). 2023-2024
- 7) CRCNS, NIH R01MH122024 (Role: Key Personnel. PI: XJ Wang, co-PI N Palomero-Gallagher). Gradients of receptors underlying distributed cognitive functions. (*Co-written with Dr. Palomero-Gallagher & Prof. Wang*). 2019-2022
- 8) NIMH/Kavli/Wellcome Travel Grant. PRIME-DE Conference, London, UK. 2019
- 9) Trinity Visiting Academic Programme, Trinity College Dublin, Ireland. 2019
- 10) International Postdoc Fellowship, Paris Brain Institute (ICM), Paris, France (Declined). 2017
- 11) Young Investigator Award. Persistent Maladaptive Beh. Conf. Rochester, NY, USA. 2016
- 12) Future Leaders in Science Education and Communication Scholar. Mount Sinai, USA. 2015-2016
- 13) Brain Travel Grant, Pediatric Academic Societies Meeting. Washington DC, USA. 2013
- 14) MSc Neuroscience Bursary. King's College London, UK. 2009-2010

## Invited talks

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- 1) University of Oxford, UK. (Upcoming) 2025
- 2) Computational Neuroscience (CNS\*2025), Florence, Italy. (Upcoming) 2025
- 3) BBSRC @ British Neuroscience Association 2025, Liverpool, UK. (Upcoming) 2025
- 4) Fudan University, Shanghai, China 2025
- 5) Pompeu Fabra University, Barcelona, Spain. 2025
- 6) University of Nottingham, UK. 2024
- 7) Kavli Institute, Norwegian University of Science & Technology, Norway. 2024
- 8) Nonlinear Sciences & Applications Conference, Shanghai, China. 2024
- 9) Korea Institute of Science & Technology, Korea. 2024
- 10) University of Cambridge, UK. 2024
- 11) CoSyNe Conference Workshop. Cascais, Portugal. 2024
- 12) Bristol Neuroscience Research Showcase. University of Bristol, UK 2024
- 13) Human Brain Project EBRAINS Bernstein Conference meeting. Berlin, Germany. 2023
- 14) BBSRC Cognitive Computational Neuroscience meeting. University of Oxford, UK. 2023

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| 15) International Workshop on Soft Matter and Biophysics Theories. Institute of Theoretical Physics, Chinese Academy of Sciences, China. | 2023 |
| 16) Sungkyunkwan University, Seoul, South Korea.   | 2023 |
| 17) IDIBAPS, Hospital Clinic, Barcelona, Spain.  | 2023 |
| 18) Ulster University, Northern Ireland.   | 2023 |
| 19) University of Bristol, UK.   | 2022 |
| 20) NeuroNex Working Memory Symposium. San Diego, California, USA.   | 2022 |
| 21) Xi'an Jiaotong University, China.  | 2022 |
| 22) Montreal Neurological Institute, Canada.   | 2021 |
| 23) Neuroscience Ireland Conference, Ireland.  | 2021 |
| 24) Gradients of Brain Organization Workshop, pre-OHBM satellite meeting.  | 2021 |
| 25) NeuroNex consortium meeting. International consortium meeting, led by Yale University, USA, and Western University, Canada.          | 2021 |
| 26) Imperial College London, UK  | 2020 |
| 27) American Psychological Association (APA), USA. Session cancelled due to pandemic.  | 2020 |
| 28) Stony Brook University, New York, USA.   | 2019 |
| 29) Flux Congress on Neurodevelopment, New York, USA.  | 2019 |
| 30) Trinity College Dublin, Ireland.   | 2019 |
| 31) Brain & Spine Institute, Hôpital Pitié Salpêtrière, Paris, France.   | 2019 |
| 32) Nathan Kline Institute, New York, USA.   | 2018 |
| 33) Max Planck Institute for Human Cognitive and Brain Sciences, Leipzig, Germany.   | 2017 |
| 34) University of Barcelona, Spain.  | 2015 |
| 35) King's College London, UK.   | 2015 |
| 36) Icahn School of Medicine at Mount Sinai; New York; USA.  | 2014 |

#### Main collaborators

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Nicola Palomero-Gallagher (Jülich, Germany)  
Amy Arnsten (Yale University, USA)  
Anissa Abi-Dargham (Stony Brook University, USA)  
Fenna Krienen (Princeton University, USA).  
Ulises Pereira Obilinovic (Allen Institute, USA)  
Julio Martínez-Trujillo (Western University, Canada)  
Marieke Schölvink & Martha Havenith (Max Planck Institute, Germany)  
Igor Kagan (German Primate Institute, Germany)  
Stanislas Dehaene (Collège de France, France)  
Daniel Margulies (Université Paris Cité, France/University of Oxford, UK)  
Claire Sergent (Université Paris Cité, France)  
Wim Vanduffel (KU Leuven, Belgium/Harvard University, USA)  
Matt Jones (University of Bristol, UK)  
Paul Anastasiades (University of Bristol, UK)  
Edwin Simpson (University of Bristol, UK)  
Rui Ponte Costa (University of Oxford, UK)  
Seok-Jun Hong (Sungkyunkwan University, South Korea).  
Jianfeng Feng (Fudan University, China).

#### Industry partners

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Boehringer Ingelheim  
Compass Pathways

#### Teaching

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- 1) **Cognitive Artificial Intelligence.** Senior Year, BSc/MEng Engineering Mathematics, University of Bristol. (Unit Director. Designed & teaching 100% of module). **Nominated for Innovative and Inspiring Teaching Award, Bristol Teaching Awards.** 2024
- 2) Neural Systems and Computation. Senior Year, MSci Psychology & Neuroscience, University of Bristol. Lecturer (10%). 2024,2025

- 3) Introduction to Artificial Intelligence. Guest lecture. MSc Comp. Sci. University of Bristol. 2024
- 4) Information Processing & the Brain. Senior Year, BSc/MEng Computer Science, University of Bristol. (Unit Director. Designed & taught entire course). 2023
- 5) Learning, Computation & the Brain. MSc Computer Science, University of Bristol. (Designed & taught 40% of course) 2022
- 6) Information Processing & the Brain. Guest Lecture. Senior Year, BSc Computer Science, University of Bristol. 2022
- 7) Introduction to the neuroscience of memory. Oral History, Freshman Course, New York University. 2020
- 8) Neuroconnect Course. Diffusion MRI course at Mount Sinai. Developed and taught a class on 'Promises and Pitfalls of Tractography' and a practical on 'Manual dissection of white matter tracts'. Audience: Postdocs – Associate Professors. 2016
- 9) Sinai Methods Bootcamp. Taught introduction to fMRI, diffusion MRI and structural MRI. Audience: new PhD students. 2015
- 10) King's College London. Neuroanatomy lecturer. Audience: MSc in Mental Health students. 2012

#### Anonymous Feedback on Cognitive Artificial Intelligence Unit:

How motivated have you been to engage with the content of this unit? 100% Positive.

How often have you found this unit intellectually stimulating? 100% Positive.

How well organised is this unit? 100% Positive.

Overall, how satisfied have you been with the quality of this unit? 100% Positive.

*"Really engaging teaching, good breadth of content. Fascinating Subject"*

*"Sean has been such a good unit director. The content has been really interesting and delivered really well"*

*"This course covers a wide range of topics in artificial intelligence and neuroscience. It is highly challenging but also incredibly rewarding."*

*"I like the different forms of engagement and links to further reading or applications help it feel very relevant and interesting. Also very well structured and organised makes the learning and assessment expectations very clear."*

*"The videos we had to watch every week were very informative and engaging. Sean is a great lecturer! He's very well spoken, knows how to break down concepts and is very friendly and helpful to everyone. I have particularly enjoyed how he makes a few students engage in the lecture by asking a few questions and having people go up to the board. These unit's classes have been encouraging and friendly teaching environments."*

*"The content has been very interesting and I have felt motivated to actually learn the content. It has been really interesting to learn about the brain and AI from a different perspective and the ideas we have covered have been fascinating. I also really enjoyed the debate, I've never been a part of something like that at uni."*

*"This is an extremely well-run unit, arguably the best learning experience I've had at university thus far."*

*"Honestly one of the most interesting and engaging units out there!"*

*"It honestly been one of the most enjoyable modules I have studied at university"*

#### Outreach, Equality, Diversity & Inclusion

- 1) Lead on Faculty of Science & Engineering Access & Participation Strategy. 2025
- 2) Access to Bristol (Computer Science). Widening Participation @ Uni. Bristol. "Using computer science and engineering mathematics to understand the brain and cure disorders" (ages 16-18) 2024
- 3) Brain Awareness Week. "Bridging across scales of neuroscience." Bristol. (Public talk) 2024
- 4) Access to Bristol. Widening Participation @ Uni. Bristol. Lecture on "Cognitive AI" (ages 16-18) 2023
- 5) Bristol Multi-Faith Forum. "Your brain on stress & how to deal with it better". Bristol. (Ages 5-16) 2023
- 6) Widening participation work experience. Classes on "Engineering in Neuroscience". Bristol. (Ages 15-17) 2023
- 7) Best of Bristol talk at the Bristol Neuroscience Festival on "The neuroscience of normal and abnormal conscious experiences" (sold out, 120 people, Adult audience). 2023
- 8) Bristol Neuroscience Festival – lead organiser of "Neural Networks" exhibit. Explaining activity across



- scales of neuroscience through computational simulations. Educated and entertained hundreds of students from primary and secondary school and adults over 3 full days. (Ages -all) 2023
- 9) Talk on "Stress & the Brain" to Empire Fighting Chance charity (working with 3,500-5,000 young people per year) to counter deprivation 2023
  - 10) Growing Up In Science. Organiser & Interviewer for Dr. Sindy Joyce. Rebroadcast on "This Irish American Life" radio show on WNYE 91.5 FM and www.irishradio.com 2021
  - 11) Bellwether Hub podcast. Host: Jim Frawley. Interviewed about learning and memory. 2020
  - 12) Tourist Information podcast (by The Ring Magazine). Host: Brin-Jonathan Butler. Interviewed about dopamine, brain injury and learning. 2020
  - 13) Mandatory Responsible Conduct in Research Course (Racism in Science). New York University. Co-organiser. Audience – graduate students – Faculty. 2020
  - 14) Center of Excellence in Youth Education, Mount Sinai, New York. Co-organised and co-taught the neuroscience engagement day for 45 local students. Audience: 16-17 year olds. 2016
  - 15) Boys and Girls Harbor School (East Harlem, New York). Taught neural connectivity class to 5<sup>th</sup> grade children. Audience: 10-11 year olds. 2016
  - 16) Curriculum Design Team; Centre for Excellence in Youth Education; Icahn School of Medicine at Mount Sinai. Planned and taught range of classes and activities. Audience: adolescents in New York schools. 2015-2016
  - 17) Eagle Academy for Young Men (Bronx; New York). Taught three classes on brain disorders to 9<sup>th</sup> and 10<sup>th</sup> grade adolescents. Audience: 16-17 year olds. 2015
  - 18) Eagle Academy for Young Men (Queens; New York). Taught a class on brain disorders to 9<sup>th</sup> and 10<sup>th</sup> grade adolescents. Audience: 16-17 year olds. 2015

#### Seminars/Workshops organised

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|---|-------|
| Neuroanatomy and Computation across Species (NACAS) Co-founder. Erice, Sicily. (Planned)                                | 2026- |
| Brains, AI & Data Workshop (sold out, 100 people). Lead organiser. Watershed, Bristol, UK.                              | 2025  |
| Bristol Neuroscience Seminars (Major series – 80-120 audience). Co-founder/co-lead organiser                            | 2023- |
| Bristol Neuroscience Trainee Journal Club & Lunch with speaker. Founder/organiser                                       | 2023- |
| Bristol Neural Computation Seminar. Co-lead organiser   | 2023- |
| PRIME-DRE Global Collaboration Workshop. Co-lead of Modeling, Analysis and Informatics Section. Online (International). | 2021  |
| Large-scale gradients in cortical organisation. Collège de France (Paris, France).                                      | 2019  |
| Mechanisms of dopamine ramping. New York University (USA).  | 2018  |

#### Mentoring experience

##### CANN Research Group Members

###### *Postdoc:*

- |   |           |
|---|-----------|
| <i>Dabal Pedamonti</i>  | 2024-     |
| <i>Rahul Gupta</i> (postdoc, now Assistant Professor @ UPES, India) | 2023-2024 |

###### *PhD students*

- |                     |       |
|---------------------|-------|
| Xiaohe Yu           | 2025- |
| Aswathi Thirukraman | 2023- |
| Eva Sevenster       | 2023- |
| Tsvetoslav Ivanov   | 2023- |
| George Sains        | 2023- |
| Ulysse Klatzmann    | 2022- |

###### *Masters students/PhD rotation students etc.*

21 students mentored at King's College London, New York University, University of Bristol.

#### Further education

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|---|-----------|
| Higher Education Curriculum Development and Learning Design. University of Bristol.   | 2023-2024 |
| Project Management Tools for Managing your Research Project. University of Bristol.   | 2024      |
| Healthy and Sustainable Productivity for Assistant Professors. University of Bristol. | 2022-2023 |

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|---|---------------------------|
| Deep Learning Specialization. deeplearning.ai/Coursera.                             | January 2020              |
| Neuronal Networks. Courant Institute of Mathematical Sciences, New York University. | Fall 2017                 |
| Science Education and Communication. Mount Sinai.                                   | October 2015- June 2016   |
| Python data structures. University of Michigan/Coursera.                            | March 2016                |
| Python for everybody. University of Michigan/Coursera.                              | March 2016                |
| Dynamical Modeling Methods for Systems Biology. Mount Sinai/Coursera.               | January – March, 2016     |
| Machine Learning. Stanford University/Coursera.                                     | July – September 2015     |
| Computational Neuroscience. University of Washington/Coursera.                      | May-June 2015             |
| Live Science Communication Training. Science Museum, London.                        | September 2014            |
| Advanced Neuroimaging Summer Program. UCLA.   | July 2013                 |
| Open Collaboration & Innovation Programme. University of London.                    | December 2011 - June 2012 |
| FSL course. University of Oxford (online).  | October 2010              |
| Neuroanatomy and Tractography Workshop. King's College London.                      | March 2010                |

#### Further skills

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Programming languages: Python, Matlab, R, shell scripting  
Machine learning platforms/software: Pytorch  
Neuroimaging software packages: FSL, SPM, ExploreDTI, FreeSurfer; ANTs, Connectome Workbench  
Statistical analysis programs: R; SPSS  
Task presentation programs: PsychToolbox; MonkeyLogic  
Languages: English (native); Spanish (C1); Italian (B2); French (B2); Irish Gaelic (B2), Catalan (B1).

#### Reviewer for academic journals

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Nature (declined due to conflict of interest), Nature Neuroscience, Biological Psychiatry, Nature Communications, Cerebral Cortex, Science Advances, Communications Biology, Journal of Neuroscience, Lancet Child & Adolescent Health, NeuroImage, Human Brain Mapping, Neuropsychopharmacology, Cortex, Brain Structure & Function, PLoS Biology, PLoS Computational Biology, PLoS One.

#### Reviewer for grant applications

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Medical Research Council; Biotechnology and Biological Sciences Research Council (UK).

#### Reviewer for conferences

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CoSyNe (Computational and Systems Neuroscience).

#### PhD Committee/viva examiner

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External: Max Planck Institute, Leipzig, Germany; Universidad de Málaga, Spain.  
Internal: University of Bristol, UK

#### Academic society memberships

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NYU Neuroscience Postdoc Organisation (Co-founder), Society for Neuroscience, Federation of European Neuroscience Societies, Neuroscience Ireland, Organization for Human Brain Mapping

#### Consortium member

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PRIMatE Data & Resource Exchange (PRIME-DRE). International consortium for the advancement of non-human primate imaging. Co-lead of Analysis, Modeling and Informatics for the 2021 Global meeting.

NeuroNex Consortium. International consortium devoted to understanding working memory, from transcriptomics to single neurons and neuronal networks.