

John D. Murray

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Department of Psychological and Brain Sciences

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Academic Positions

- 2023–Present: DARTMOUTH COLLEGE. Gregg L. Engles Associate Professor of Psychological and Brain Sciences. ‘Breaking the Neural Code’ Academic Cluster.
- 2015–Present: YALE UNIVERSITY. Assistant (2015–21), Associate (2021–23), and Adjunct (2023–present) Professor of Psychiatry. Secondary appointments in Physics and Neuroscience.
- 2013–15: NEW YORK UNIVERSITY. Postdoctoral Researcher, Center for Neural Science

Education

- 2007–13: YALE UNIVERSITY. Ph.D. in Physics (Advisor: Xiao-Jing Wang)
- 2009: MARINE BIOLOGICAL LABORATORY. Methods in Computational Neuroscience course.
- 2006–07: ÉCOLE NORMALE SUPÉRIEURE DE CACHAN, France. Fulbright Scholar
- 2002–06: YALE UNIVERSITY. B.S. in Physics (Intensive) and Mathematics (double major), *cum laude*

Selected Awards & Honors

- 2023: Gregg L. Engles endowed professorship, Dartmouth College
- 2022: Blavatnik Fund for Innovation at Yale Award
- 2016: Scholar Award. Yale Center for Clinical Investigation.
- 2012: 30 under 30: Science & Healthcare, *Forbes*.
- 2006: Fulbright Scholarship. U.S. DEPARTMENT OF STATE.
- 2006: Howard L. Schultz Prize in Physics; Anthony D. Stanley Memorial Prize in Mathematics; DeForest Prize in Mathematics. YALE COLLEGE.

Selected Publications

[[Google Scholar Profile](#)] (H-index: 36; >7,500 citations)

* denotes equal contribution; † denotes co-corresponding

- Ito T, Murray JD (In Review) **Large-scale signal and noise correlations configure multi-task coding in human brain networks.** *bioRxiv* 10.1101/2022.11.23.517699
- Helmer M, Warrington S, Mohammadi-Nejad A, Ji JL, Howell A, Rosand B, Anticevic A, Sotiropoulos SN[†], Murray JD[†] (In Review) **On stability of Canonical Correlation Analysis and Partial Least Squares with application to brain-behavior associations.** *bioRxiv* 10.1101/2020.08.25.265546
- Gu QL, Lam NH, Wimmer RD, Halassa MM, Murray JD (In Review) **Computational circuit mechanisms underlying thalamic control of attention.** *bioRxiv* 10.1101/2020.09.16.300749
- Shinn M, Hu A, Turner L, Noble S, Preller KH, Ji JL, Moujaes F, Achard S, Scheinost D, Constable RT, Krystal JH, Vollenweider FX, Lee D, Anticevic A, Bullmore ET*, Murray JD* (2023) **Functional brain networks reflect spatial and temporal autocorrelation.** *Nature Neuroscience* 26:867
- Pettine WW, Raman DV, Redish AD, Murray JD (2023) **Human generalization of internal representations through prototype learning with goal-directed attention.** *Nature Human Behavior* 7:442
- Ito T, Murray JD (2023) **Multitask representations in human cortex transform along a sensory-to-motor hierarchy.** *Nature Neuroscience* 26:306
- Ehrlich DB, Murray JD (2022) **Geometry of neural computation unifies working memory and planning.** *Proceedings of the National Academy of Sciences* 119:e2115610119

- Lam NH, Borduqui T, Hallak J, Roque AC, Anticevic A, Krystal JH, Wang X-J, [Murray JD](#) (2022) **Effects of altered excitation-inhibition balance on decision making in a cortical circuit model.** *Journal of Neuroscience* 42:1035
- Shinn M, Lee D, [Murray JD](#)[†], Seo H[†] (2022) **Transient neuronal suppression for exploitation of new sensory evidence.** *Nature Communications* 13:23
- Li D, Constantinidis C, Murray JD (2021) **Trial-to-trial variability of spiking delay activity in prefrontal cortex constrains burst-coding models of working memory.** *Journal of Neuroscience* 41:8928
- Burt JB, Preller KH, Demirtas M, Ji JL, Krystal JH, Vollenweider FX, Anticevic A, [Murray JD](#) (2021) **Transcriptomics-informed large-scale cortical model captures topography of pharmacological neuroimaging effects of LSD.** *eLife* 10:e69320
- Ehrlich DB*, Stone JT*, Brandfonbrener D, Atanasov A, [Murray JD](#) (2021) **PsychRNN: An accessible yet flexible Python package for training recurrent neural network models on cognitive tasks.** *eNeuro* 0427-20.2020
- Cavanagh SE*, Lam NH*, [Murray JD](#)[†], Hunt LT[†], Kennerley SW[†] (2020) **A circuit mechanism for decision-making biases and NMDA receptor hypofunction.** *eLife* 9:e53664
- Shinn M, Ehrlich DB, Lee D, [Murray JD](#)[†], Seo H[†] (2020) **Confluence of timing and reward biases in perceptual decision-making dynamics.** *Journal of Neuroscience* 40:7326
- Shinn M*, Lam NH*, [Murray JD](#) (2020) **A flexible framework for simulating and fitting generalized drift-diffusion models.** *eLife* 9:e56938
- Burt JB, Helmer M, Shinn M, Anticevic A, [Murray JD](#) (2020) **Generative modeling of brain maps with spatial autocorrelation.** *NeuroImage* 221:117141
- Demirtaş M, Burt JB*, Helmer M*, Ji JL, Adkinson BD, Glasser MF, Van Essen DC, Sotiropoulos S, Anticevic A, [Murray JD](#) (2019) **Hierarchical heterogeneity across human cortex shapes large-scale neural dynamics.** *Neuron* 101:1181
- Burt JB, Demirtaş M, Eckner WJ, Navejar N, Ji JL, Martin WJ, Bernacchia A, Anticevic A, [Murray JD](#) (2018) **Hierarchy of transcriptomic specialization across human cortex captured by structural neuroimaging topography.** *Nature Neuroscience* 21:1251
- [Murray JD](#)*, Jaramillo J*, Wang X-J (2017) **Working memory and decision-making in a fronto-parietal circuit model.** *Journal of Neuroscience* 37:12167
- [Murray JD](#), Bernacchia A, Roy NA, Constantinidis C, Romo R, Wang X-J (2017) **Stable population coding for working memory coexists with heterogeneous neural dynamics in prefrontal cortex.** *Proceedings of the National Academy of Sciences* 114:394
- [Murray JD](#), Bernacchia A, Freedman DJ, Romo R, Wallis JD, Cai X, Padoa-Schioppa C, Pasternak T, Seo H, Lee D, Wang X-J (2014) **A hierarchy of intrinsic timescales across primate cortex.** *Nature Neuroscience* 17:1661
- [Murray JD](#), Anticevic A, Gancsos M, Ichinose M, Corlett PR, Krystal JH, Wang X-J (2014) **Linking microcircuit dysfunction to cognitive impairment: effects of disinhibition associated with schizophrenia in a cortical working memory model.** *Cerebral Cortex* 24:859

Trainees

- **Ph.D. Students:** Joshua B. Burt (2020); Norman Lam (2020); Daniel B. Ehrlich (2021); Maxwell Shinn (2021); Daming Li (2022); Rachel A. Cooper; Amber M. Howell; Frederick Berl; Lianghui Peng; Heraclitos Lefcochilos-Fogelquist; Harper Cho
- **Postdoctoral Researchers:** Murat Demirtas; Julie Goulet; Markus Helmer; Qinglong Gu; Takuya Ito; Warren W. Pettine; Jacob A. Miller
- **Postgraduate Researchers:** Sam Zheng; Cove Geary