

## **Associate Professor of Neuroscience and Psychology**

Center for Molecular & Behavioral Neuroscience and Department of Psychology  
Rutgers University-Newark

## **Education**

- 2009      **University of Pittsburgh**  
**Ph.D. in Neuroscience** and affiliated with the Center for the Neural Basis of Cognition and Carnegie Mellon University
- 2003      **University of California, Berkeley**  
**B.A. in Cognitive Science** (Highest Honors)

## **Research and Work Experience**

- 2021 – Present      Affiliate Faculty of the Department of Psychology at Rutgers University-Newark
- 2019 – Present      Associate Professor at the Center for Molecular & Behavioral Neuroscience (CMBN), Rutgers University-Newark. Director of the Cole Neurocognition Laboratory
- 2014 – 2019      Assistant Professor at the Center for Molecular & Behavioral Neuroscience (CMBN), Rutgers University-Newark. Director of the Cole Neurocognition Laboratory
- 2012 – 2013      Post-doctoral research with Steven Petersen (Neuroscience, Radiology, & Psychology, Washington University in St. Louis)  
*Investigations of brain network organization and cognitive control*
- 2009 – 2013      Post-doctoral research with Todd Braver & Deanna Barch  
(Department of Psychology, Washington University in St. Louis)  
*Investigations of prefrontal cortex, cognitive control, learning, schizophrenia, & intelligence*
- 2004 – 2009      Ph.D. research with Walter Schneider (Department of Psychology, University of Pittsburgh)  
*Investigations of prefrontal cortex, cognitive control, & learning/memory*
- 2001 – 2004      Undergraduate and post-baccalaureate research with Mark D'Esposito (Neuroscience and Psychology, UC Berkeley)  
*Investigations of prefrontal cortex and cognitive control*
- 2003      Undergraduate research with William DeBello (Neuroscience, UC Davis)  
*Investigations of the genetic basis of learning and memory*
- 2001 – 2003      Software engineering and web development for Apple, Inc.

## **Honors and Awards**

- 2019      Cognitive Neuroscience Society's Young Investigator Award  
"Recognizes outstanding contributions by scientists early in their career"
- 2018      Center for the Neural Basis of Cognition (CNBC) Alumni Lecture (Pittsburgh, PA)
- 2015      Elected to be member of the Cognitive Neuroscience Society's Symposium Committee
- 2011      Fellow at the Summer Institute in Cognitive Neuroscience, Santa Barbara, CA
- 2010      NeuroImage Editor's Choice Award  
For Cole et al. 2010, "Identifying the brain's most globally connected regions"

*Awarded by the editors in acknowledgment of a study's importance and high impact*

- 2007 National Science Foundation Integrative Graduate Education and Research Traineeship (IGERT) Fellowship
- 2005-2008 National Science Foundation Graduate Research Fellowship
- 2003 Highest Honors in Cognitive Science at UC Berkeley

## **Organizational Leadership and Professional Memberships**

- 2018 – Present Associate Member of the Institute for Brain and Neuroscience Research (New Jersey Institute of Technology)
- 2016 – Present Founder and organizer (along with Drew Headley) of the Integrative Neuroscience Discussion Group (INDG) at the Center for Molecular & Behavioral Neuroscience. This is a group that seeks to develop unified understandings between human and non-human (animal and computational models) neuroscience and psychology.
- 2015 – Present Member and co-organizer of Newark Brain Connectivity meetings. These meetings bring together scientists interested in brain connectivity research from Newark, NJ and the surrounding region (such as neuroscientists and psychologists from Rutgers University and New Jersey Institute of Technology).
- 2004 – Present Society for Neuroscience  
Cognitive Neuroscience Society
- 2010 – Present Psychonomic Society
- 2009 – Present Neuroethics Society
- 2006 – Present Organization for Human Brain Mapping
- 2004 – 2009 Center for the Neural Basis of Cognition, Carnegie Mellon & University of Pittsburgh  
Center for Neuroscience, University of Pittsburgh  
Learning Research and Development Center
- 2006 – 2007 President of the Department of Neuroscience Graduate Student Organization, University of Pittsburgh
- 2002 – 2003 President of the Cognitive Science Student Association, UC Berkeley

## **Research Grants and Fellowships**

- Co-Principal Investigator: "MRI: Acquisition of a High-Performance Computing Cluster for Research and Teaching at Rutgers University-Newark", National Science Foundation – Office of Advanced Cyberinfrastructure (OAC) 2117429, PI: Michele Pavanello, Total cost: \$559,288 2021-2024
- Participating faculty: "Graduate Research Training Initiative for Student Enhancement (G-RISE) (T32) at Rutgers University-Newark", National Institutes of Health, PI: Barry Komisaruk, Total cost: \$2,353,390 2021-2026
- Co-Principal Investigator: "Major Research Instrumentation: Acquisition of a 3T SIEMENS PRISMA at RUBIC: The Evolution to a Regional Center", National Science Foundation – Division of Behavioral & Cognitive Sciences (BCS) 1919873, PI: Stephen Hanson, Total cost: \$1,484,000 2019-2021

<u>Co-Principal Investigator</u> : "Negative Affect Mechanisms Underlying Opioid Use in Lab and Daily Life", Rutgers University-Newark Initiative for Multidisciplinary Research Teams Award, PI: Mauricio Delgado.	2019-2021
<u>Co-Principal Investigator</u> : "Major Research Instrumentation: Acquisition of a GPU cluster to support interdisciplinary research in human learning, machine learning, and data science", National Science Foundation – Division of Behavioral & Cognitive Sciences (BCS) 1828528, PI: Patrick Shafto, Total cost: \$99,999	2018-2021
<u>Co-Investigator</u> : "Imaging the effects of psychosocial stress on cognitive performance", National Science Foundation – Division of Behavioral & Cognitive Sciences (BCS) 1756065, PI: Elizabeth Tricomi, Total cost: \$408,699	2018-2021
<u>Co-Investigator</u> : "Prescription opiate, drug-cue processing network, and neural connectivity", National Institutes of Health – National Institute on Drug Abuse (I/START R03 DA044496), PI: Suchismita Ray, Total direct cost: \$161,644. <u>Status</u> : Completed.	2017-2018
<u>Principal Investigator</u> : "Brain Network Mechanisms of Aging-Related Cognitive Decline", National Institutes of Health – National Institute on Aging (R01 AG055556), Total direct cost: \$250,000/year The goal of this research is to identify network mechanisms that can account for the alterations in both intrinsic brain connectivity and cognitive task activations that occur with aging-related decline of cognitive control abilities among healthy older adults.	2017-2022
<u>Principal Investigator</u> : "Brain Network Mechanisms of Instructed Learning", National Institutes of Health – National Institute of Mental Health (R01 MH109520), Total direct cost: \$250,000/year The goal of this research is to utilize the tools of network neuroscience to improve understanding of how instructed learning is implemented in the human brain, from initial learning to expertise.	2016-2021
<u>Co-Principal Investigator</u> : "Integrated Framework for Studying Proactive Control in Rapid Instructed Task Learning", United States – Israel Binational Science Foundation (BSF 2015186), Total cost: \$200,000	2016-2020
<u>Collaborator</u> : "Neuropsychiatric Classification via Connectivity and Machine Learning", National Institutes of Health (NIH) – National Institute of Mental Health (R03 MH105765), PI: Alan Anticevic, Total cost: \$74,000/year. <u>Status</u> : Completed.	2014-2016
<u>Principal Investigator</u> : "Network Mechanisms of Flexible Cognitive Control", National Institutes of Health – National Institute of Mental Health (K99-R00 MH096801), Total direct cost: \$157,000/year. <u>Status</u> : Completed. This project investigates the hypothesis that flexible cognition and behavior is supported by flexible hubs – frontoparietal brain regions with extensive global brain connectivity that flexibly updates according to task demands.	2012-2017
<u>Principal Investigator (fellowship)</u> : "Beyond Localization of Memory Functions: Learning Statistical Methods for Estimating Directed Connectivity among Cortical Regions Using Multiple Neuroimaging Technologies", National Science Foundation (IGERT Fellowship), Funded amount: \$30,000. <u>Status</u> : Completed. The goal of this research is to learn methodological techniques for estimating directed functional (effective) connectivity and empirically test the efficacy of those techniques using functional MRI and magnetoencephalography.	2007
<u>Principal Investigator (fellowship)</u> : "Dissociating the Network Components Underlying Cognitive Control", National Science Foundation (Graduate Research Fellowship), Funded amount: \$90,000. <u>Status</u> : Completed. The goal of this project is to utilize experimental manipulations of cognitive control processes with functional MRI to identify the shared and specialized roles of cognitive control network brain regions.	2005-2008

## Preprint Scientific Publications

1. Mill RD, Hamilton JL, Winfield EC, Lalta N, Chen RH, Cole MW (Preprint). "Emergence of task information from dynamic network interactions in the human brain" *bioRxiv*. doi:10.1101/2021.01.26.428276
2. Sanchez-Romero R, Ito T, Mill RD, Hanson SJ, Cole MW (Preprint). "[Causally informed activity flow models provide mechanistic insight into the emergence of cognitive processes from brain network interactions](#)". *bioRxiv*. doi:10.1101/2021.04.16.440226
3. Singh MF, Wang C, Cole MW, Ching S (Preprint). "[Efficient state and parameter estimation for high-dimensional nonlinear system identification with application to MEG brain network modeling](#)". *arXiv*. arXiv:2104.02827
4. McCormick EM\*, Arnemann KL\*, Ito T, Hanson SJ, Cole MW (Preprint). "[Latent functional connectivity underlying multiple brain states](#)". *bioRxiv*. doi:10.1101/2021.04.05.438534 [\* = equal contribution]

## Peer-reviewed Scientific Publications

### **Citation statistics:**

**h-index** (as of 2021-10-15): 40

**Citations** (as of 2021-10-15): 10336

### **Full publication lists:**

Google Scholar profile: <https://scholar.google.com/citations?user=8FK99kkAAAAJ&hl=en>

PubMed/NCBI Bibliography: <https://www.ncbi.nlm.nih.gov/myncbi/michael.cole.1/bibliography/public/>

ORCID ID: <https://orcid.org/0000-0003-4329-438X>

Lab website publication list: <https://www.colelab.org/#publications>

### **List of publications:**

1. Ito T, Yang GB, Laurent P, Schultz DH, Cole MW (In Press). "Constructing neural network models from brain data reveals representational transformations linked to adaptive behavior". *Nature Communications*.
2. Schultz DH, Ito T, Cole MW (In Press). "Global connectivity fingerprints predict the domain generality of multiple-demand regions". *Cerebral Cortex*.
3. Cocuzza C, Sanchez-Romero R, Cole MW (In Press). "Protocol for activity flow mapping of neurocognitive computations using the Brain Activity Flow Toolbox". *STAR Protocols*.
4. Singh MF, Wang A, Cole MW, Ching S, Braver TS (Preprint). "[Enhancing Task fMRI Preprocessing via Individualized Model-Based Filtering of Intrinsic Activity Dynamics](#)". *NeuroImage*.
5. Hearne LJ, Mill RD, Keane BP, Repovs G, Anticevic A, **Cole MW** (2021). "[Activity flow underlying abnormalities in brain activations and cognition in schizophrenia](#)". *Science Advances*. 7(9) doi:10.1126/sciadv.abf2513
6. Keane BP, Barch DM, Mill R, Silverstein SM, Krekelberg B, **Cole MW** (2021). "[Brain network mechanisms of visual shape completion](#)". *NeuroImage*. 236. doi:10.1101/2020.08.03.233403
7. **Cole MW**, Ito T, Cocuzza C, Sanchez-Romero R (2021). "[The functional relevance of task-state functional connectivity](#)". *Journal of Neuroscience*. 41(12):2684-2702. doi:10.1523/JNEUROSCI.1713-20.2021
8. Sanchez-Romero R, **Cole MW** (2021). "[Combining multiple functional connectivity methods to improve casual inferences](#)". *Journal of Cognitive Neuroscience*. 33(2):180–194. doi:10.1162/jocn\_a\_01580
9. Spronk M, Keane BP, Ito T, Kulkarni K, Ji JL, Anticevic A, **Cole MW** (2021). "[A whole-brain and cross-diagnostic perspective on functional brain network dysfunction](#)". *Cerebral Cortex*. 31(1):547-561. doi:10.1093/cercor/bhaa242
10. Singh MF, Braver TS, **Cole MW**, Ching S (2020). "[Estimation and validation of individualized dynamic brain models with resting state fMRI](#)". *NeuroImage*. 221. doi:10.1016/j.neuroimage.2020.117046

11. Mill RD, Gordon BA, Balota DA, **Cole MW** (In Press). "[Predicting dysfunctional age-related task activations from resting-state network iterations](https://doi.org/10.1016/j.neuroimage.2020.117167)". *NeuroImage*. doi:10.1016/j.neuroimage.2020.117167
12. Ito T, Hearne LJ, **Cole MW** (2020). "[A cortical hierarchy of localized and distributed processes revealed via dissociation of task activations, connectivity changes, and intrinsic timescales](https://doi.org/10.1016/j.neuroimage.2020.117141)". *NeuroImage*. 221. doi:10.1016/j.neuroimage.2020.117141
13. Ito T, Brincat SL, Siegel M, Mill RD, He BJ, Miller EK, Rotstein HG, **Cole MW** (2020). "Task-Evoked Activity Quenches Neural Correlations and Variability in Large-Scale Brain Systems". *PLOS Computational Biology*. 16(8): e1007983. doi:10.1371/journal.pcbi.1007983
14. Cocuzza CV, Ito T, Schultz D, Bassett DS, **Cole MW** (2020). "Flexible coordinator and switcher hubs for adaptive task control". *Journal of Neuroscience*. 40(36):6949–6968. doi:10.1523/JNEUROSCI.2559-19.2020
15. Lamichhane B, Westbrook A, **Cole MW**, Braver T (2020). "Exploring brain-behavior relationships in the N-back task". *NeuroImage*. 212:1-11. doi:10.1016/j.neuroimage.2020.116683
16. Ito T, Hearne L, Mill R, Cocuzza C, **Cole MW** (2020). "Discovering the Computational Relevance of Brain Network Organization". *Trends in Cognitive Sciences*. 24, 25–38. doi.org/10.1016/j.tics.2019.10.005
17. Kar K, Ito T, **Cole MW**, and Krekelberg B (2020). "[Transcranial Alternating Current Stimulation Attenuates BOLD Adaptation and Increases Functional Connectivity](https://doi.org/10.1152/jn.00376.2019)". *Journal of Neurophysiology*. 123: 428–438. doi:10.1152/jn.00376.2019
18. Reid AT, Headley DB, Mill RD, Sanchez-Romero R, Uddin LQ, Marinazzo D, Lurie DJ, Valdés-Sosa PA, Hanson SJ, Biswal BB, Calhoun V, Poldrack RA, **Cole MW** (2019). "Advancing functional connectivity research from association to causation". *Nature Neuroscience*. <https://doi.org/10.1038/S41593-019-0510-4>
19. Yang GR, **Cole MW**, Rajan K (2019) "How to study the neural mechanisms of multiple tasks". *Current Opinion in Behavioral Sciences*. 29:134–143. <https://doi.org/10.1016/j.cobeha.2019.07.001>
20. Bolt T, Nomi JS, Bainter S, **Cole MW**, Uddin LQ (2019). "The Situation or the Person? Individual and Task-Evoked Differences in BOLD Activity". *Human Brain Mapping*. 40, 2943– 2954 <https://doi.org/10.1002/hbm.24570>
21. **Cole MW**, Ito T, Schultz D, Mill R, Chen R, Cocuzza C (2019). "Task activations produce spurious but systematic inflation of task functional connectivity estimates". *NeuroImage*. 189, 1–18. <https://doi.org/10.1016/j.neuroimage.2018.12.054>
22. Ji JL\*, Spronk M\*, Kulkarni K, Repovš G, Anticevic A\*\*, **Cole MW\*\*** (2019) "Mapping the human brain's cortical-subcortical functional network organization". *NeuroImage*. 185, 35–57. <https://doi.org/10.1016/j.neuroimage.2018.10.006> [\*=equal contribution; \*\*=senior authors]
23. Schultz, DH, Ito, T, Solomyak, LI, Chen, RH, Mill, RD, Anticevic, A, & **Cole, MW** (2019). "Global connectivity of the fronto-parietal cognitive control network is related to depression symptoms in the general population". *Network Neuroscience*, 3(1), 107–123. [https://doi.org/10.1162/netn\\_a\\_00056](https://doi.org/10.1162/netn_a_00056)
24. Chen RH, Ito T, Kulkarni KR, **Cole MW** (2018). "The human brain traverses a common activation-pattern state space across task and rest". *Brain Connectivity*, 8(7), 429–443. <https://doi.org/10.1089/brain.2018.0586>
25. Dixon ML, De La Vega A, Mills C, Andrews-Hanna J, Spreng RN, **Cole MW**, Christoff K (2018) "Heterogeneity within the frontoparietal control network and its relationship to the default and dorsal attention networks". *Proceedings of the National Academy of Sciences*. 115(7):E1598-E1607. PMID: PMC5816169 <https://doi.org/10.1073/pnas.1715766115>
26. **Cole MW**, Patrick LM, Meiran N, Braver TS (2018) "A role for proactive control in rapid instructed task learning.". *Acta psychologica*. 184:20–30. PMID: PMC5742075 <http://doi.org/10.1016/j.actpsy.2017.06.004>
27. Ito T, Kulkarni KR, Schultz DH, Mill RD, Chen RH, Solomyak LI, **Cole MW** (2017) "Cognitive task information is transferred between brain regions via resting-state network topology". *Nature Communications*. 8:1027. PMID: PMC5715061 <http://doi.org/10.1038/s41467-017-01000-w>

28. Li Q, Yang G, Li Z, Qi Y, **Cole MW**, Liu X (2017) “Conflict detection and resolution rely on a combination of common and distinct cognitive control networks.”. *Neuroscience and Biobehavioral Reviews*. 83:123–131. PMID: 29017916 <http://doi.org/10.1016/j.neubiorev.2017.09.032>
29. **Cole MW**, Braver TS, Meiran N (2017) “The task novelty paradox: Flexible control of inflexible neural pathways during rapid instructed task learning.”. *Neuroscience and Biobehavioral Reviews*. 81:4–15. PMCID: PMC5705534 <http://doi.org/10.1016/j.neubiorev.2017.02.009>
30. Mill RD, Ito T, **Cole MW** (2017) “From connectome to cognition: The search for mechanism in human functional brain networks.”. *NeuroImage*. 160:124–139. PMCID: PMC5529276 <http://doi.org/10.1016/j.neuroimage.2017.01.060>
31. Mill RD, Bagic A, Bostan A, Schneider W, **Cole MW** (2017) “Empirical validation of directed functional connectivity.”. *NeuroImage*. 146:275–287. PMID: 27856312 <http://dx.doi.org/10.1016/j.neuroimage.2016.11.037>
32. **Cole MW**, Ito T, Bassett DS, Schultz DH (2016) “Activity flow over resting-state networks shapes cognitive task activations”. *Nature Neuroscience*. 19(12):1718–26. PMID: 27723746 <http://dx.doi.org/10.1038/nn.4406>
33. Schultz DH, **Cole MW** (2016) “Integrated Brain Network Architecture Supports Cognitive Task Performance”. *Neuron*. 92:278–279. <http://doi.org/10.1016/j.neuron.2016.10.004>
34. Schultz DH, **Cole MW** (2016) “Higher intelligence is associated with less task-related brain network reconfiguration”. *Journal of Neuroscience*. 36(33):8551–8561. <http://doi.org/10.1523/JNEUROSCI.0358-16.2016>
35. **Cole MW**, Yang GJ, Murray JD, Repovs G, Anticevic A (2016) “Functional connectivity change as shared signal dynamics”. *Journal of Neuroscience Methods*. 259:22–39. PMCID: PMC4715953 <http://doi.org/10.1016/j.jneumeth.2015.11.011>
36. **Cole MW**, Ito T, Braver TS (2016) “The Behavioral Relevance of Task Information in Human Prefrontal Cortex.”. *Cerebral Cortex*. 26:2497–2505. PMCID: PMC4869805 <http://doi.org/10.1093/cercor/bhv072>
37. Etzel JA, **Cole MW**, Zacks JM, Kay KN, Braver TS (2016) “Reward Motivation Enhances Task Coding in Frontoparietal Cortex.”. *Cerebral Cortex*. 26:1647–1659. PMCID: PMC4785950 <http://doi.org/10.1093/cercor/bhu327>
38. Mattar MG, **Cole MW**, Thompson-Schill SL, Bassett DS (2015) “A Functional Cartography of Cognitive Systems.”. *PLoS Computational Biology*. 11:e1004533. PMCID: PMC4668064 <http://doi.org/10.1371/journal.pcbi.1004533>
39. **Cole MW**, Ito T, Braver TS (2015) “Lateral Prefrontal Cortex Contributes to Fluid Intelligence Through Multinetwork Connectivity.”. *Brain Connectivity*. 5:497–504. PMCID: PMC4601676 <http://doi.org/10.1089/brain.2015.0357>
40. Anticevic A, Hu X, Xiao Y, Hu J, Li F, Bi F, **Cole MW**, Savic A, Yang GJ, Repovs G, Murray JD, Wang X-J, Huang X, Lui S, Krystal JH, Gong Q (2015) “Early-course unmedicated schizophrenia patients exhibit elevated prefrontal connectivity associated with longitudinal change.”. *Journal of Neuroscience*. 35:267–286. PMCID: PMC4287147 <http://doi.org/10.1523/JNEUROSCI.2310-14.2015>
41. Meiran N, Pereg M, Kessler Y, **Cole MW**, Braver TS (2015) “Reflexive activation of newly instructed stimulus-response rules: evidence from lateralized readiness potentials in no-go trials.”. *Cogn Affect Behav Neurosci*. 15:365–373. PMID: 25216992 <http://doi.org/10.3758/s13415-014-0321-8>
42. Meiran N, Pereg M, Kessler Y, **Cole MW**, Braver TS (2015) “The power of instructions: Proactive configuration of stimulus-response translation.”. *Journal of Experimental Psychology: Learning, Memory, and Cognition*. 41:768–786. PMID: 25329082 <http://doi.org/10.1037/xlm0000063>
43. **Cole MW**, Bassett DS, Power JD, Braver TS, Petersen SE (2014) “Intrinsic and task-evoked network architectures of the human brain.”. *Neuron*. 83:238–251. PMCID: PMC4082806 <http://doi.org/10.1016/j.neuron.2014.05.014>
44. **Cole MW**, Repovs G, Anticevic A (2014) “The frontoparietal control system: a central role in mental health.”. *The Neuroscientist*. 20:652–664. PMCID: PMC4162869 <http://doi.org/10.1177/1073858414525995>

45. Yang GJ, Murray JD, Repovs G, **Cole MW**, Savic A, Glasser MF, Pittenger C, Krystal JH, Wang X-J, Pearlson GD, Glahn DC, Anticevic A (2014) "Altered global brain signal in schizophrenia.". *Proceedings of the National Academy of Sciences*. 111:7438–7443. PMCID: PMC4034208  
<http://doi.org/10.1073/pnas.1405289111>
46. Anticevic A, Hu S, Zhang S, Savic A, Billingslea E, Wasylink S, Repovs G, **Cole MW**, Bednarski S, Krystal JH, Bloch MH, Li C-SR, Pittenger C (2014) "Global resting-state functional magnetic resonance imaging analysis identifies frontal cortex, striatal, and cerebellar dysconnectivity in obsessive-compulsive disorder.". *Biol Psychiatry*. 75:595–605. PMCID: PMC3969771  
<http://doi.org/10.1016/j.biopsych.2013.10.021>
47. Anticevic A, Tang Y, Cho YT, Repovs G, **Cole MW**, Savic A, Wang F, Krystal JH, Xu K (2014) "Amygdala connectivity differs among chronic, early course, and individuals at risk for developing schizophrenia.". *Schizophr Bull*. 40:1105–1116. PMCID: PMC4133672  
<http://doi.org/10.1093/schbul/sbt165>
48. Anticevic A, **Cole MW**, Repovs G, Murray JD, Brumbaugh MS, Winkler AM, Savic A, Krystal JH, Pearlson GD, Glahn DC (2014) "Characterizing thalamo-cortical disturbances in schizophrenia and bipolar illness.". *Cerebral Cortex*. 24:3116–3130. PMCID: PMC4224238  
<http://doi.org/10.1093/cercor/bht165>
49. **Cole MW**, Reynolds JR, Power JD, Repovs G, Anticevic A, Braver TS (2013) "Multi-task connectivity reveals flexible hubs for adaptive task control.". *Nature Neuroscience* 16:1348–1355. PMCID: PMC3758404 <http://doi.org/10.1038/nn.3470>
50. Anticevic A, **Cole MW**, Repovs G, Savic A, Driesen NR, Yang G, Cho YT, Murray JD, Glahn DC, Wang X-J, Krystal JH (2013) "Connectivity, pharmacology, and computation: toward a mechanistic understanding of neural system dysfunction in schizophrenia.". *Front Psychiatry*. 4:169. PMCID: PMC3871997 <http://doi.org/10.3389/fpsy.2013.00169>
51. Anticevic A, Brumbaugh MS, Winkler AM, Lombardo LE, Barrett J, Corlett PR, Kober H, Gruber J, Repovs G, **Cole MW**, Krystal JH, Pearlson GD, Glahn DC (2013) "Global prefrontal and fronto-amygdala dysconnectivity in bipolar I disorder with psychosis history.". *Biol Psychiatry*. 73:565–573. PMCID: PMC3549314 <http://doi.org/10.1016/j.biopsych.2012.07.031>
52. **Cole MW**, Laurent P, Stocco A (2013) "Rapid instructed task learning: a new window into the human brain's unique capacity for flexible cognitive control.". *Cogn Affect Behav Neurosci*. 13:1–22. PMCID: PMC3557598 <http://doi.org/10.3758/s13415-012-0125-7>
53. Anticevic A, **Cole MW**, Murray JD, Corlett PR, Wang X-J, Krystal JH (2012) "The role of default network deactivation in cognition and disease.". *Trends Cogn Sci (Regul Ed)*. 16:584–592. PMCID: PMC3501603 <http://doi.org/10.1016/j.tics.2012.10.008>
54. **Cole MW**, Yarkoni T, Repovs G, Anticevic A, Braver TS (2012) "Global connectivity of prefrontal cortex predicts cognitive control and intelligence.". *Journal of Neuroscience*. 32:8988–8999. PMCID: PMC3392686 <http://doi.org/10.1523/JNEUROSCI.0536-12.2012>
55. Meiran N, **Cole MW**, Braver TS (2012) "When planning results in loss of control: intention-based reflexivity and working-memory.". *Front Hum Neurosci*. 6:104. PMCID: PMC3347625  
<http://doi.org/10.3389/fnhum.2012.00104>
56. **Cole MW**, Etzel JA, Zacks JM, Schneider W, Braver TS (2011) "Rapid transfer of abstract rules to novel contexts in human lateral prefrontal cortex.". *Front Hum Neurosci*. 5:142. PMCID: PMC3221399  
<http://doi.org/10.3389/fnhum.2011.00142>
57. **Cole MW**, Anticevic A, Repovs G, Barch D (2011) "Variable global dysconnectivity and individual differences in schizophrenia.". *Biol Psychiatry*. 70:43–50. PMCID: PMC3204885  
<http://doi.org/10.1016/j.biopsych.2011.02.010>
58. **Cole MW**, Bagic A, Kass R, Schneider W (2010) "Prefrontal dynamics underlying rapid instructed task learning reverse with practice.". *Journal of Neuroscience*. 30:14245–14254. PMCID: PMC3128837  
<http://doi.org/10.1523/JNEUROSCI.1662-10.2010>

59. **Cole MW**, Yeung N, Freiwald WA, Botvinick M (2010) "Conflict over cingulate cortex: Between-species differences in cingulate may support enhanced cognitive flexibility in humans.". *Brain Behav Evol.* 75:239–240. PMID: 20693782 <http://doi.org/10.1159/000313860>
60. Braver TS, **Cole MW**, Yarkoni T (2010) "Vive les differences! Individual variation in neural mechanisms of executive control.". *Curr Opin Neurobiol.* 20:242–250. PMCID: PMC2904672 <http://doi.org/10.1016/j.conb.2010.03.002>
61. **Cole MW**, Pathak S, Schneider W (2010) "Identifying the brain's most globally connected regions.". *NeuroImage.* 49:3132–3148. PMID: 19909818 <http://doi.org/10.1016/j.neuroimage.2009.11.001>
62. **Cole MW**, Yeung N, Freiwald WA, Botvinick M (2009) "Cingulate cortex: diverging data from humans and monkeys.". *Trends Neurosci.* 32:566–574. PMID: 19781794 <http://doi.org/10.1016/j.tins.2009.07.001>
63. **Cole MW**, Schneider W (2007) "The cognitive control network: Integrated cortical regions with dissociable functions.". *NeuroImage.* 37:343–360. PMID: 17553704 <http://doi.org/10.1016/j.neuroimage.2007.03.071>
64. Schumacher EH, **Cole MW**, D'Esposito M (2007) "Selection and maintenance of stimulus-response rules during preparation and performance of a spatial choice-reaction task.". *Brain Research.* 1136:77–87. PMCID: PMC1892617 <http://doi.org/10.1016/j.brainres.2006.11.081>
65. Hester R, D'Esposito M, **Cole MW**, Garavan H (2007) "Neural mechanisms for response selection: comparing selection of responses and items from working memory.". *NeuroImage.* 34:446–454. PMID: 17071112 <http://doi.org/10.1016/j.neuroimage.2006.08.001>
66. Curtis CE, **Cole MW**, Rao VY, D'Esposito M (2005) "Canceling planned action: an fMRI study of countermanding saccades.". *Cereb Cortex.* 15:1281–1289. PMID: 15616130 <http://doi.org/10.1093/cercor/bhi011>

## Book Chapters and Conference Proceedings Publications

1. Singh MF, **Cole MW**, Braver TS, Ching S (2022). "Developing control-theoretic objectives for large-scale brain dynamics and cognitive enhancement". *Annual Reviews in Control.*
2. Singh MF, Wang C, **Cole MW**, Ching S (2022). "Efficient state and parameter estimation for high-dimensional nonlinear system identification with application to MEG brain network modeling". *Proceedings from the American Control Conference.*
3. **Cole M.W.** (2017). "Control and Connectivity: Dynamic Networks in the Human Brain". Book chapter in: Egnor T. *Wiley Handbook of Cognitive Control.* John Wiley & Sons, Ltd.
4. Meiran N., **Cole M.W.**, and Braver T.S. (2013). "When Planning Results in Loss of Control: Intention-Based Reflexivity and Proactive Control". Book chapter in: Seebass, G., Schmitz, M., & Gollwitzer, P. M. *Acting intentionally and its limits: Individuals, groups, institutions.* Berlin: De Gruyter.
5. Etzel, J.A., **Cole M.W.**, Braver T.S. (2012). "Looking Outside the Searchlight". In G. Langs, I. Rish, M. Grosse-Wentrup, & B. Murphy (Eds.), *Machine Learning and Interpretation in Neuroimaging. Lecture Notes in Computer Science.* (vol. 7263, pp. 26–33). Springer Berlin / Heidelberg. doi:10.1007/978-3-642-34713-9\_4
6. Schneider W., Pathak S., Phillips J.S., **Cole M.W.** (2009). "High Definition Fiber Tracking Exposes Circuit Diagram for Brain Showing Triarchic Representation, Domain General Control, and Metacognitive Subsystems". *AAAI Fall Symposium: Biologically Inspired Cognitive Architectures*
7. Schneider W., **Cole M.W.**, Pathak S. (2008). "Reverse Engineering the Brain with a Circuit Diagram Based on a Segmented Connectome and System Dynamics". *AAAI Fall Symposium: Biologically Inspired Cognitive Architectures*

## Invited Talks and Symposia



1. The cognitive and aging-related clinical relevance of brain network organization. Growing Up In Aging Neuroscience, Providence, RI. (May 2022)
2. The cognitive and clinical relevance of brain network organization. Department of Psychiatry, Columbia University, New York, NY. (August 2021)
3. The cognitive and clinical relevance of brain network organization. Center for Neuromodulation in Depression and Stress, University of Pennsylvania, Philadelphia, PA. (July 2021)
4. Brain network organization as the computational architecture of cognition. Invited talk presented at the Montreal Neurological Institute-Hospital (MNI), Montreal, Quebec, Canada. (November 2019)
5. Brain network organization as the computational architecture of cognition: Implications for mental health. Invited talk presented at the Rutgers-Princeton Center for Computational Cognitive Neuro-Psychiatry, Piscataway, NJ. (November 2019)
6. Brain network organization as the computational architecture of cognition: Implications for emotion regulation and mental health. Invited virtual talk presented at the Sapiens Labs' Inter and Intra Person Variability Symposium. (November 2019)
7. Brain network organization as the computational architecture of cognition: Implications for emotion regulation and mental health. Invited talk presented at the Social & Affective Neuroscience Society conference, Miami, FL. (May 2019)
8. Brain network organization as the computational architecture of cognition. Invited talk presented at the Cognitive Neuroscience Society conference, San Francisco, CA. (March 2019)
9. Brain network organization as the computational architecture of cognition. Invited talk presented at Georgia Institute of Technology, Atlanta, GA. (March 2019)
10. The Cognitive and Computational Relevance of Functional Brain Networks. Invited talk presented at New York University (NYU) School of Medicine, New York, NY. (April 2018)
11. The Cognitive and Computational Relevance of Functional Brain Networks. Invited CNBC Alumni Talk presented at the Center for the Neural Basis of Cognition (CNBC), University of Pittsburgh and Carnegie Mellon University, Pittsburgh, PA. (April 2018)
12. Neural and cognitive bases of rational and critical thinking. Invited talk presented at Columbia University, New York, NY. (November 2017)
13. The Cognitive Relevance of Functional Brain Networks. Invited talk presented at Carnegie Mellon University, Pittsburgh, PA. (March 2017)
14. Stable and Dynamic Functional Brain Network Architectures Underlying Flexible Cognition. Invited talk presented at Vanderbilt University, Nashville, TN. (February 2017)
15. Functional Brain Network Mechanisms Underlying Flexible Cognitive Control. Invited talk presented at the Control Processes Conference in San Diego, CA. (November 2016)
16. Stable and Dynamic Functional Brain Network Architectures Underlying Flexible Cognition. Invited talk presented at the Cognitive Neuroscience Seminar Series at Taub Institute, Columbia Medical School, New York, NY. (October 2016)
17. Brain network mechanisms of rapid instructed task learning. Invited talk presented at the Attention & Performance Conference, Turnhout, Belgium. (June 2016)
18. Brain Network Mechanisms of Flexible Cognitive Control. Invited talk presented at Humbolt University, Berlin, Germany. (May 2016)
19. Brain Network Mechanisms of Flexible Cognitive Control. Invited talk presented at the Dresden Symposium on Volition and Cognitive Control, Dresden, Germany. (July 2015)
20. Brain network mechanisms of flexible cognitive control in health and disease. Talk presented at Weil Cornell, New York, NY. (April 2015)
21. Flexible Learning: Understanding Cognitive Control and Intelligence in the Brain. Talk presented at Rutgers Research Day, Newark, NJ. (April 2015)
22. Human brain network dynamics and goal-directed cognition. Talk presented at Newark NeuroTalks, Newark, NJ. (March 2015)

23. Functional connectivity differences in brain networks: contributions of shared and unshared variance. Invited talk presented at the Asilomar conference, Pacific Grove, CA. (November 2014)
24. Multi-task functional connectivity and flexible hubs. Invited talk presented at the International Conference on Cognitive Neuroscience (ICON), Brisbane, Australia. (August 2014)
25. Intrinsic and dynamic brain network architectures underlying adaptive behavior in humans. Invited talk presented at the Princeton Neuroscience Institute, Princeton, NJ. (June 2014)
26. Intrinsic and task-evoked network architectures of the human brain. Invited talk presented at the Nathan S. Kline Institute (NKI), Orangeburg, NY. (May 2014)
27. Flexible Thinking: Understanding Cognitive Control and Intelligence in the Brain. Invited talk presented at the Learning and the Brain conference, New York, NY. (May 2014)
28. Intrinsic and Dynamic Network Architectures of the Human Brain. Invited talk presented at the Psychology Department, UC Berkeley, Berkeley, CA. (November 2013)
29. Brain Network Mechanisms of Flexible Cognitive Control in Health and Disease. Invited talk presented at the Department of Psychiatry, Yale, New Haven, CT. (April 2013)
30. Brain Network Mechanisms of Flexible Cognitive Control. Invited talk presented at the McGovern Institute for Brain Research, MIT, Cambridge, MA. (January 2013)
31. A role for the brain network mechanisms of flexible cognitive control in human intelligence. Invited talk presented at the International Society for Intelligence Research, San Antonio, TX. (December 2012)
32. Global Brain Connectivity and Other Graph Theoretical Approaches: Methods and Findings. Invited talk/workshop presented at the MRI Users' Meeting Group, The Ohio State University, Columbus, OH. (November 2012)
33. Brain Network Mechanisms of Flexible Cognitive Control. Invited talk presented at the Center for Molecular and Behavioral Neuroscience, Rutgers, Newark, NJ. (November 2012)
34. Investigating Global Brain Connectivity: Methods, Software, and Findings. Talk presented at the Neuroimaging Informatics and Analysis Center seminar series, Washington University, St. Louis, MO. (March 2011)
35. Multiple Network Mechanisms Underlying Flexibility in Prefrontal Cortex. Talk presented at the Brain, Behavior, and Cognition seminar series, Washington University, St. Louis, MO. (March 2010)
36. Network Mechanisms Underlying Flexibility in Prefrontal Cortex. Invited talk presented as part of the Center for Mind and Brain seminar series, UC Davis, Davis, CA. (January 2010)
37. Source Localization with MEG: An MNE Software Overview. Talk presented for the University of Pittsburgh MEG center, Pittsburgh, PA. (May 2008)
38. Connectomics of the Human Cognitive Control Network. Invited talk presented for Beatriz Luna's lab, Pittsburgh, PA. (January 2008)
39. Using Functional MRI to Inform Neural Models of Decision Making. Talk presented at the annual CNBC retreat, Pittsburgh, PA. (October 2006)
40. Specialization and integration within a cortical cognitive control network. Talk presented at the CNBC 'Brain Bag', Pittsburgh, PA. (October 2006)
41. Innate functional connectivity from resting state linear correlations. Invited talk presented at the Clinical Cognitive Neuroscience Lab's Methods Monday forum, Pittsburgh, PA. (March 2006)
42. Dissociations in Cognitive Control: The Specialized Roles of Lateral and Medial Prefrontal Cortex. Talk presented at the Cognitive Psychology 'Brown Bag', Pittsburgh, PA. (November 2005)
43. Results and statistics in fMRI. Talk presented at the 2005 CNBC fMRI Workshop, Pittsburgh, PA. (October 2005)

## Conference Presentations

For a list of conference presentations, see: <https://www.colelab.org/#presentations>

## Service to Peer-reviewed Scientific Journals

### Member of editorial boards

Associate Editor for journal *Network Neuroscience* (2016-Present)  
Member of the Advisory Board for *Brain Structure and Function* (2015-Present)  
Member of the Editorial Board at *Brain Research* (2021-Present)  
Review editor at *Frontiers in Human Neuroscience* (2014-Present)

### Ad Hoc Reviewer for Journals

*Acta Psychologica*  
*Biological Psychiatry* (3x)  
*BioSystems* (2x)  
*Brain*  
*Brain and Language*  
*Brain Communications*  
*Brain Connectivity* (2x)  
*Brain Research*  
*Brain Sciences*  
*Brain Structure and Function* (8x)  
*Cerebral Cortex* (29x)  
*Cognition* (7x)  
*Cognitive, Affective & Behav. Neuroscience* (2x)  
*Current Directions in Psychological Science*  
*eLife* (2x)  
*European Journal of Neuroscience*  
*Frontiers in Human Neuroscience* (3x)  
*Human Brain Mapping* (13x)  
*Journal of Cognition* (2x)  
*Journal of Cognitive Neuroscience* (12x)  
*Journal of Experimental Psychology: General* (3x)  
*Journal of Experimental Psychology: HPP*  
*Journal of Neuroscience* (25x)  
*Journal of Neuroscience Methods*  
*Journal of Neurophysiology*  
*Molecular Psychiatry* (2x)  
*Nature Communications* (8x)  
*Nature Neuroscience* (6x)  
*Nature Reviews Neuroscience*  
*Network Neuroscience* (5x)  
*NeuroImage* (51x)  
*NeuroImage: Clinical* (2x)  
*Neuron* (13x)  
*Neuropsychologia* (5x)  
*Neuroscience & Biobehavioral Reviews* (3x)  
*Personality Neuroscience*  
*Perspectives on Psychological Science*  
*Philosophical Transactions B*  
*PLOS Biology* (2x)  
*PLOS Computational Biology* (6x)  
*PNAS* (9x)  
*Psychological Medicine* (2x)  
*Psychonomic Bulletin & Review*  
*Quarterly Journal of Experimental Psychology*  
*Royal Society Open Science*  
*Schizophrenia Bulletin*  
*Science Advances*  
*Scientific Reports*  
*The American Journal of Psychiatry*  
*Trends in Cognitive Sciences* (3x)

## Service to Grant-issuing Institutions

### Grant Review Panel Member

The US National Institutes of Health (NIH), ad hoc member of Cognition & Perception (CP) study section, 2020  
The US National Institutes of Health (NIH), Biobehavioral Processes of Cognition and Stress special emphasis panel, 2020  
The US National Science Foundation (NSF), Integrative Strategies for Understanding Neural and Cognitive Systems (NCS) panel, 2018  
The US National Institutes of Health (NIH), ad hoc member of Cognition & Perception (CP) study section, 2018 (2x)  
The US National Science Foundation (NSF), special BRAIN Initiative panel, 2017  
The Busch Biomedical Grant Program, 2016

## Ad Hoc Reviewer for Grants

The Wellcome Trust, 2017

The Netherlands Organization for Scientific Research, 2015

The United Kingdom Medical Research Council, 2015

## Mentoring

### *Faculty:*

Brian Keane (mentor on NIH K01) 2016-2020  
Ravi Mill (research associate faculty) 2019-

### *Postdoctoral fellows:*

Douglas Schultz (*moved on to assistant professor at University of Nebraska*) 2014-2018  
Ravi Mill (*moved on to research associate faculty*) Spring 2015-Fall 2019  
Marjolein Spronk (*moved on to becoming a data scientist at Rancho BioSciences*) 2015-2017  
Katelyn Arneemann (*moved on to becoming a data scientist at Data Cubed Health*) Summer 2018-Fall 2019  
Luke Hearne Summer 2018-  
Ruben Sanchez-Romero Fall 2018-  
Ethan McCormick (*moved on to postdoc at Radboud University Medical Center*) Spring 2020-Spring 2021  
Matthew Singh Spring 2021-

### *PhD students:*

Richard Chen Fall 2014-Spring 2021  
Pinelopi Kyriazi Fall 2014 (rotation)  
Takuya Ito (*moved on to postdoc at Yale University*) Fall 2015-Fall 2020  
Carrisa Cocuzza Fall 2016-  
Katherine Wolfert Fall 2017 (rotation)  
Ian Kim Fall 2018 (rotation)  
Micah Ketola Fall 2020-  
Kirsten Petersen Spring 2021-

### *Full-time research assistants at Rutgers University-Newark:*

Levi Solomyak 2014-2016  
Takuya Ito (*moved on to PhD in the lab*) 2014-2015  
Kaustubh Kulkarni (*moved on to MD-PhD at Icahn School of Medicine at Mount Sinai*) Fall 2015-Summer 2017  
Julia Hamilton (*moved on to MD at Washington University*) 2017- 2019  
Emily Winfield (*moved on to a data science position in industry (at Aquant)*) Spring 2018-Spring 2021  
Nicole Lalta Summer 2020-

### *Undergraduate research assistants at Rutgers University-Newark:*

Sara Horton (Summer 2015, Summer 2016), Brayan Zambrano (2016; received NSF LSAMP fellowship), Miguel Vivar Lazo (2016-2017; received McNair Scholar award, NSF LSAMP fellowship, and Aresty Fellowship), Ryan Welch (2015-2017; high school student), Nicole Lalta (2017-2020; NSF LSAMP fellowship), Yanira Sanchez (2018; NSF LSAMP fellowship), Catalina Guzman (2018-2019; NSF LSAMP fellowship), Aisha Assaf (2017-2019), Diana Rodas (2018-2020; NSF LSAMP

fellowship), Kirsten Petersen (2018-2020), Jada White (2021; NSF LSAMP fellowship), Willio Jeanvilma (2021; NSF LSAMP fellowship), Avi Shah (2020-2021), Akshay Warriar (2021-2022), Aditya Rao (2021-), Edwin Lotero (2021-; NSF LSAMP fellowship)

*Member of Ph.D. thesis committee for:*

Dana Mastrovito (2016-2018), Kainan Sally Wang (2017-2019), Hillary Levinson (2018-2020), Shira Lupkin (2021-)

*Outside member of Ph.D. thesis committee for:*

Azeezat Azeez (NJIT, 2018-2019); Luke Hearne (The University of Queensland, 2017); Alisha Janssen (The Ohio State University, 2014-2016)

*Visiting scholars mentored:*

Guochun Yang, Senne Braem, Mia Tharp, Hannah Bohle

*Research assistants at Washington University (2009-2013):*

Lauren Patrick, Nicholas Fazzio, Jordan Livingston, Takuya Ito, Lauren Ness, Maria Chushak, Cameron Smith

*Research assistants at the University of Pittsburgh (2004-2009):*

Eliezer Kanal, Sudhir Pathak, Amber Kunkel, Anderson Tesfazion

## Teaching Experience

- |             |  |
|-------------|--|
| Spring 2022 | Course developer and instructor for <i>Network &amp; Complexity Neuroscience</i> , a graduate-level course at Rutgers University-Newark  |
| Fall 2021   | Co-instructor for <i>Foundations in Neuroscience III</i> , a graduate-level course at Rutgers University-Newark providing an introduction to cognitive neuroscience                        |
| Spring 2020 | Lead instructor for <i>Foundations in Neuroscience III</i> , a graduate-level course at Rutgers University-Newark providing an introduction to cognitive neuroscience                      |
| Fall 2018   | Co-instructor for <i>Introduction to Neuroscience</i> , an undergraduate-level course at Rutgers University-Newark providing an introduction to neuroscience                               |
| Spring 2018 | Co-instructor for <i>Foundations in Neuroscience III</i> , a graduate-level course at Rutgers University-Newark providing an introduction to cognitive neuroscience                        |
| Spring 2016 | Course developer and instructor for <i>Network &amp; Complexity Neuroscience</i> , a graduate-level course at Rutgers University-Newark  |
| Fall 2015   | Course developer and lead instructor for <i>Foundations in Neuroscience III</i> , a graduate-level course at Rutgers University-Newark providing an introduction to cognitive neuroscience |
| Spring 2015 | Co-instructor for Critical Thinking in Neuroscience course, Rutgers University-Newark  |
| Spring 2012 | Co-instructor (with Todd Braver) for <i>Functional Neuroimaging</i> , Washington University in St. Louis   |
| 2011        | Guest lecturer for <i>Cognitive Neuroscience</i> (Instructor: Todd Braver), Washington University in St. Louis   |

- 2010 Guest lecturer for *Cognitive Neuroscience* (Instructor: Todd Braver), Washington University in St. Louis
- Fall 2006 Teaching assistant for *Introduction to Neuroscience* (Instructor: David Wood), University of Pittsburgh
- Spring 2006 Guest lecturer for *Laboratory on fMRI Data Acquisition and Analysis* (Instructor: Walter Schneider), University of Pittsburgh
- Spring 2003 Teaching assistant for *The Neural Basis of Language and Thought* (Instructors: Jerome Feldman and George Lakoff), UC Berkeley