SEAN M. TOBYNE, M.A.   978-314-5729 ● stobyne@gmail.com

Experience neuroscientist nearing the completion of his PhD with 13 years of project management experience and 10 years of experience in behavioral, cognitive and computational neuroscience research including biomarker development, clinical trial outcomes and applied machine learning.

Education

Winter, 2018	Ph.D. (Computational Neuroscience), Boston University School of Med., Boston, MA

Dissertation Title: Mapping network organization of sensory-selective and sensory-independent working memory and attention in human frontal cortex with fMRI
Advisors: David Somers, Ph.D. and Robert Stern, Ph.D.

2011	M.A. (Psychology), Boston University, Boston, MA
2005	B.A. (Psychology), Saint Michael's College, Colchester, VT

Experience

2011 – Present   Project Manager/Senior Researcher – Dept. of Neurology & Martinos Center for Biomedical Imaging, Massachusetts General Hospital, Boston, MA

- Senior researcher for laboratory using advanced neuroimaging to investigate multiple sclerosis
- Manage team of 6 researchers, fellows and clinical research associates to successful study completion - including 5 peer reviewed publications and 20+ conference presentations
- Completed 2 applied machine learning studies to 1) classify patient and control groups and 2) conduct image segmentation using multimodal MRI-derived feature sets

2006 – 2011   Project Manager – Praxis, Inc., Waltham, MA

- Managed R&D/proof of concept component of software development projects at STTR funded boutique psycho-educational startup software company
- Delivered 5 successful field research projects to programming team
- Developed key field site research methodology for vetting research-based instructional design

Programming/Software Experience
Expert: MATLAB
Advanced: R, Python
Intermediate: C/C++, TensorFlow, SQL variants

Neuroimaging Software
FreeSurfer/FS-FAST, FSL, AFNI, Connectome Workbench, Brain Connectivity Toolbox, SPM, GIFTI/CIFTI image formats

Funding, Honors and Awards

2017 – Present   F31 National Research Service Award ($165,000; NINDS NIH F31-NS103306)
Project Title: *Predicting whole brain multisensory cognitive control networks: relationship with neuropsychological test performance and repetitive head impact*

2017   Boston University Data Science Day Award Winner

2016   ECTRIMS Educational Grant (€400)

2014 – 2016   Computational Neuroscience Training Fellowship ($65,000)
Project Title: *Graph theoretical analysis of attention and cognitive control networks: The Human Connectome Project and individualized traumatic brain injury assessment*

2016	GPN Best Poster Award – Systems Neuroscience
2015	CompNet Outreach and Meeting Initiative Funding
	Traumatic Brain Injury Workshop ($8,000)
	Network Science & Graph Theory Journal Club ($2,000)
2014	Center for Computation Neuroscience and Neural Technology Travel Award ($1,000)
2014	ACTRIMS-ECTRIMS Educational Grant ($500)
2005	Graduated Cum Laude
2002 – 2005	Dean's List, Saint Michael's College
2002 – 2005	Presidential Academic Scholarship, Saint Michael's College

In Prep Publications

Tobyne, S.M., Klawiter, E.C. (in prep). Automated multi-contrast classification of the corpus callosum in progressive multiple sclerosis

Tobyne, S.M., Brissenden, J.A., Noyce, A., Somers, D.C. (in prep). Mapping the topography of sensory-selective and multiple-demand brain structures in the individual through combined auditory-, visual- and tactile-selective fMRI.

Tobyne, S.M., Russo, A.W., Fox R.J., Klawiter, E.C. (in prep). Focal thalamic atrophy and clinical disability in progressive multiple sclerosis subgroups: baseline data from the SPRINT-MS clinical trial.

Peer-Reviewed Publications

Tobyne, S.M., Somers, D.C., Brissenden., J. A., Michalka, S.W., Noyce, A., and Osher D.E. (2018). Prediction of Individualized Task Activation in Sensory Modality-Selective Frontal Cortex with 'Connectome Fingerprinting.' NeuroImage 183:173-185. DOI: 10.1016/j.neuroimage.2018.08.007.

Brissendan, J.A., **Tobyne, S.M.**, Somers, D.C. (in press). Topographic Cortico-Cerebellar Networks Revealed by Visual Attention and Working Memory. Current Biology.

Chrastil, E.R.*, **Tobyne, S.M.*,** Nauer, R.K., Chang, A.E. and Stern, C.E. (in press). Unravelling retrosplenial cortex: Converging evidence for functional sub-division from meta-analysis and functional connectivity from the Human Connectome Project. Behavioral Neuroscience.
*these authors contributed equally to this work

Patel, K., **Tobyne S. M.,** Porter D., Bireley, J.D., Smith V., Klawiter E. (2017). Structural disconnection is responsible for increased functional connectivity in multiple sclerosis. Brain Structure and Function 223(5):2519-2526. DOI: 10.1007/s00429-018-1619-z

Tobyne, S.M., Osher, D.E., Michalka, S.M. and Somers, D.C. (2017). Sensory-biased attention networks in human lateral frontal cortex revealed by intrinsic functional connectivity. NeuroImage 162 :362-72. DOI: 10.1016/j.neuroimage.2017.08.020.

Tobyne, S.M., Ochoa W.B., Bireley, J.D., Smith, V.M.J., Geurts, J.J.G., Schmahmann, J.D. and Klawiter, E.C. (2017). Cognitive Impairment and the Regional Distribution of Cerebellar Lesions in Multiple Sclerosis. Multiple Sclerosis Journal. DOI: 10.1177/1352458517730132

Klawiter E.C., Bove R., Elsone, L., Alvarez, E., Borisow, N., Cortez, M., Mateen, F.J., Mealy, M.A., Sorum, J., Mutch, K., **Tobyne, S.M**., Ruprecht, K., Buckle, G.J., Levy, M., Wingerchuk, D., Paul, F., Cross, A., Jacobs, A., Chitnis, T., Weinshenker, B. (2017). High risk of postpartum relapses in neuromyelitis optica spectrum disorder. Neurology 89(22). DOI: 10.1212/WNL.0000000000004681.

Riley, B., Elsone, L., Alvarez, E., Borisow, N., Cortez, M.M., Mateen, F.J., Mealy, M.A., Mutch, K., **Tobyne, S.M.,** Ruprecht, K., Buckle, G.J., Levy, M., Wingerchuk, D.M., Paul, F., Cross A., Weinshenker, B., Jacob, A., Klawiter, E.C., Chitnis, T. (2017). Female hormonal exposures and neuromyelitis optica symptom onset in a multicenter study. Neurology: Neuroimmunology & Neuroinflammation 4(3). DOI: 10.1212/NXI.0000000000000339.

Tobyne, S.M, Boratyn, D., Johnson, J.A., Greve, D.N., Mainero, C and Klawiter, E.C. (2016). A Surface-based Technique for Mapping Homotopic Inter-hemispheric Connectivity: Development, Characterization and Clinical Application. Human Brain Mapping 37(8):2849-68. DOI: 10.1002/hbm.23214.

Huang, S., **Tobyne, S.M.,** Nummenmaa, A., Witzel, T., Wald, L., McNab, J., and Klawiter, E.C. (2016). Ultra-high Gradient Diffusion MR Imaging for Characterization of Axonal Pathology in Patients with Multiple Sclerosis. Radiology 280(1):2849-68. DOI: 10.1148/radiol.2016151582.

Brown, T.I., Ross, R.S., **Tobyne, S.M.** and Stern, C.E. (2011). Cooperative interactions between hippocampal and striatal systems support flexible navigation. NeuroImage, 60(2). DOI: 10.1016/j.neuroimage.2012.01.046

Invited Talks

Tobyne, S.M., Brissenden, J.A., Noyce, A.L., Somers, D.C. (2018). Combined visual, auditory and tactile working memory fMRI reveals the topography of human sensory-selective and sensory-independent cerebral cortex. 48th Annual Society for Neuroscience Conference, San Diego, CA.

Noyce, A.L., **Tobyne, S.M.,** Shinn-Cunningham, B., Somers, D.C. (2018). Sensory-selective and sensory-independent auditory and visual working memory in human cerebral cortex. 48th Annual Society for Neuroscience Conference, San Diego, CA.

Brissenden, J.A., **Tobyne, S.M.,** Halko, M.A., Somers, D.C. (2018). Stimulus-specific visual working memory representations in human cerebellum. 48th Annual Society for Neuroscience Conference, San Diego, CA.

Tobyne, S.M., Osher, D.E. Michalka, S.W., Noyce, A. and Somers, D.C. (2016). Functional connectivity predicts individual differences in sensory-biased caudolateral prefrontal cortex response to attention and working memory. 46th Annual Society for Neuroscience Conference, San Diego, CA.

Chrastil, E.R., **Tobyne, S.M.,** Nauer, R.K., Chang, A.E. and Stern, C.E. (2016). Unravelling retrosplenial cortex: Converging evidence for functional sub-division from meta-analysis and functional connectivity from the Human Connectome Project. 46th Annual Society for Neuroscience Conference, San Diego, CA.

Tobyne, S.M., Osher, D.E., Michalka, S.W., and Somers, D.C. (2014). Frontal networks for visual and auditory attention: Mining functional connectivity in the Human Connectome Project. 44th Annual Society for Neuroscience Conference, Washington D.C.

Osher, D.E., **Tobyne, S.M**., Michalka, S.W., and Somers, D.C. (2014). Frontal networks for visual and auditory attention: Mining structural connectivity in the Human Connectome Project. 44th Annual Society for Neuroscience Conference, Washington D.C.

Tobyne, S.M. (2011). An fMRI Investigation of Spatial Navigation (or Where am I going…And how did I get here?). PsiChi Honor Society Induction, Saint Michael's College, Colchester, Vermont.

Poster Presentations

Lefco, R.W., Michalka, S.W., **Tobyne, S.M.,** Brissenden, J.A., Noyce., A. L., Somers, D.C. (2018). 48th Annual Society for Neuroscience Conference, San Diego, CA.

Tobyne, S.M., Noyce, A.L., Brissenden, J.A., Somers, D.C. (2018). Mapping the topography of sensory-selective and multiple demand regions in lateral frontal cortex with combined visual, auditory and tactile fMRI. International Multisensory Research Forum.

Tobyne, S.M., Russo, A.W., Fox R.J., Klawiter, E.C. (2018). Focal thalamic atrophy and clinical disability in progressive multiple sclerosis subgroups. American Academy of Neurology Annual Meeting.

Tobyne, S.M., Noyce, A., Brissenden, J.A., Jones, S., Gomez-Ramirez, M., Moore, C., Somers, D. (2018). Working memory recruitment and network membership of visual, auditory, and tactile sensory-selective regions in frontal cortex. Cognitive Neuroscience Society Annual Meeting.

Tobyne, S.M., Noyce, A., Osher, D., Brissenen, J.A., Levin, E., Michalka, S., Somers, D. (2017). Mapping Task Response Profiles in Visual-biased Frontal Cortex. Vision Sciences Society Annual Meeting.

Tobyne, S.M, Osher, D.E., Congden K., Michalka, S.M, Somers D.C. (2015). The topography of sensory-biased lateral frontal attention regions in the Human Connectome Project. Neural Processing in Human, Animals and Machines Meeting.

Osher D.E., **Tobyne S.M.,** Congden K., Somers D.C. (2015). COMA: A registration approach specifically for subcortical structures. Organization for Human Brain Mapping Annual Meeting.

Osher D.E., **Tobyne S.M.,** Congden K., Michalka S.W., Somers D.C. (2015). Structural and functional connectivity of visual and auditory attentional networks: insights from the Human Connectome Project. Vision Science Society Annual Meeting.

Tobyne, S.M., Boratyn, D., Johnson, J.L., Greve, D.N., Klawiter, E.C. (2014). Surface-based homologous interhemispheric connectivity: reliability, validation and relationship with callosal atrophy in multiple sclerosis. 4th Biennial Conference on Resting State and Brain Connectivity, Cambridge, MA

Tobyne, S.M., Boratyn D., Klawiter, E.C. (2014). Impaired homologous interhemispheric connectivity is related to atrophy of the corpus callosum in multiple sclerosis. 30th Congress of the European Committee for Treatment and Research in Multiple Sclerosis, Boston, MA.

Tobyne, S.M., Boratyn, D., Sherman, J., Rosen, B., Mainero, C., Klawiter, E.C. (2014). Disrupted distant functional connectivity within the intraparietal junction is linked to impaired attention in multiple sclerosis. 30th Congress of the European Committee for Treatment and Research in Multiple Sclerosis, Boston, MA.

Boratyn, D.B., **Tobyne, S.M.,** Klawiter, E.C. (2014). Altered resting state homologous interhemispheric functional connectivity is related to clinical measures of disability in multiple sclerosis. 30th Congress of the European Committee for Treatment and Research in Multiple Sclerosis, Boston, MA.

Tobyne, S.M., Klawiter, E.C., Boratyn, D., Govindarajan, S.T., Sepulcre, J., Buckner, R., Kinkel, R.P., Rosen, B. and Mainero, C. (2013). Local and distant functional connectivity changes vary based on functional network in multiple sclerosis. 29th Congress of the European Committee for Treatment and Research in Multiple Sclerosis, Copenhagen, DE.

Louapre, C., Govindarajan, S.T., Gianni, C., Cohen-Adad, J., **Tobyne, S.M.,** Kinkel, R.P. and Mainero, C. Intracortical laminar pathology in the motor cortex is associated with proximal underlying white matter injury in multiple sclerosis: a multimodal 7T and 3T MRI study. 29th Congress of the European Committee for Treatment and Research in Multiple Sclerosis, Copenhagen, DE.

Klawiter E.C., **Tobyne, S.M.**, Huang, S., Witzel, T., Bhat, H., Heberlein, K., Feiweier, T., Liu, K., Wald, L. and McNab, J.A. (2013) Use of high gradient strength MR to determine corpus callosum axon diameter distributions in multiple sclerosis. ISMRM Workshop on Multiple Sclerosis as a Whole-Brain Disease, London, England, UK.

Klawiter, E.C., Alvarez, E., Elsone, L., Mateen, F., Borisow, N., Bove, R., Sorum, J., Mutch, K., **Tobyne, S.**, Musallam, A., Klemens, R., Buckle, G., Friedemann, P., Levy, M., Cross, A.H., Jacob, A., Chitnis, T. and Weinshenker, B. (2013). High Risk of Initial Symptom Onset Post-partum in Neuromyelitis Optica. American Academy of Neurology 65th Annual Meeting, San Diego, CA.

Wong, K., **Tobyne S.M.,** Govindarajan, S.T., Kinkel R.P., Rosen, B., Mainero, C. and Klawiter E.K. (2012). Default Mode Functional Connectivity is Modulated by Cingulum Integrity in Multiple Sclerosis. Massachusetts General Hospital Clinical Research Day, Boston, MA.

Klawiter, E.C., **Tobyne, S.M.,** Govindarajan, S.T., Sepulcre, J., Tinelli, E., Buckner, R., Kinkel, P., Rosen, B., and Mainero, C. (2012). Local functional connectivity is decreased across multiple cortical areas in multiple sclerosis. 28th Congress of the European Committee for Treatment in Research in Multiple Sclerosis, Lion, France.

Brown, T.I., Ross, R.S., **Tobyne, S.M**. and Stern, C.E. (2010). The functional connectivity of the hippocampus and caudate during successful disambiguation of well-learned spatial sequences. Society for Neuroscience 40th Annual Meeting, San Diego, CA.

Tobyne, S., Mahon, K.L., Warecki, E.A., Lockerbie, A.A., and Pasterchik, D.C. (2009). Picture Reader: Using Video Modeling, Picture Cues, and Matrix Training for Novel Task Instruction. 35th Annual Convention of the Association for Behavior Analysis, Phoenix, AZ.

Tobyne, S.M., Mahon, K.L., Warecki, E.A., Lockerbie, A.A., Hurlbut, D., and Pasterchik, D.C. (2009). Picture Reader: Combining video modeling and picture cues for novel task instruction. 39th Annual Gatlinburg Conference on Research & Theory in Intellectual and Developmental Disabilities, New Orleans, LA.

Tobyne, S.M. and Boynton, D.M. (2005). Computer modeling of human neural activity: Associative learning processes and retinal inhibition during edge enhancement. Saint Michael's College Psychology Senior Symposium, Colchester, VT.

Leadership and Mentoring

2018 – Present	Mentor – Undergraduate Research Opportunity Program
2012 – Present	Mentor – MGH Summer Research Trainee Program
2015 – 2017	Mentor – Undergraduate Computational Neuroscience Trainee Fellowship
2013 - 2014	Chair of Recruitment – Graduate Neuroscience Student Organization
2013 – 2014	Secretary – Computational Neuroscience Student Organization

Professional Affiliations

2017 – Present	Cognitive Neuroscience Society
2016 – Present	Vision Sciences Society
2010 – Present	Society for Neuroscience
2010 – Present	American Psychological Association
2005 – Present	Psi Chi

Referee/Reviewer

NeuroImage

NeuroImage: Clinical

Brain Imaging and Behavior

Teaching Experience
Perception and Behavior (teaching fellow; guest lecturer)

Introduction to Cognitive Neuroscience (teaching fellow)