

**The Faculty of Medicine of Harvard University
Curriculum Vitae**

Date Prepared: December 18th, 2020
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Home Address:
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Place of Birth: Baltimore, Maryland USA

Education:

05/2003	BA (Magna Cum Laude)	Biology and Biomedical Physics	Washington University in St. Louis
06/2011	PhD	Biology and Biomedical Sciences – Neurosciences (PI: Steven Petersen, PhD)	Washington University in St. Louis School of Medicine
06/2011	MD	Medicine	Washington University in St. Louis School of Medicine

Postdoctoral Training:

07/11-06/13	Resident	Pediatric and Adolescent Medicine	Mayo Clinic – Rochester
07/13-06/16	Resident	Child and Adolescent Neurology	Mayo Clinic – Rochester
07/16-06/18	Clinical Fellow	Pediatric Behavioral Neurology	Boston Children’s Hospital
07/17-06/19	Postdoctoral Fellow	T32 Translational Postdoctoral Training in Neurodevelopment (PI: Michael Fox, MD, PhD)	Boston Children’s Hospital and Beth Israel Deaconess Medical Center

Faculty Academic Appointments:

07/15-06/16	Instructor	Neurology	Mayo Clinic – Rochester
07/18-	Instructor	Neurology	Harvard Medical School

Appointments at Hospitals/Affiliated Institutions:

07/18- Assistant Neurology Boston Children’s Hospital

Committee Service:

Local

2012-2013	Pediatrics Inpatient RN/MD Communication Committee	Mayo Clinic – Rochester
	2012-2013	Physician Member
2018-	IRB Scientific Review – Neurology	Boston Children’s Hospital – Neurology
	2018-	Scientific Reviewer
2019-	Research Imaging Advisory Committee	Boston Children’s Hospital
	2019-	Member, Neurology Representative
2019-	Brookline Place Transformer Teams	Boston Children’s Hospital
	2019-	Member, Autism Spectrum Center Team
	2019-	Member, Behavioral Neurology Team
	2019-	Member, Research MRI Team

Professional Societies:

2000-2016	Sigma Xi Scientific Research Society	Member
2003-	American Medical Association	Member
2004-2011	Society for Neuroscience	Member
2011-2013	American Academy of Pediatrics	Member
2013-	American Academy of Neurology	Member, Child Neurology Section Member, Neuroimaging Section
2013-	Child Neurology Society	Member
	2016-2018, 2019-2021	Member, Scientific Selection & Program Planning Committee
2016-	American Society of Neuroimaging	Member
2017-	Organization for Human Brain Mapping	Member
2019-	International Child Neurology Association	Member
2019-	American Neurological Association	Member
2020-	Flux: The Society for Developmental Cognitive Neuroscience	Member
2020-	International Society for Autism Research	Member

Editorial Activities:

- **Ad hoc Reviewer**

Cerebral Cortex
Child Neurology Open
Developmental Science
Human Brain Mapping
IEEE Journal of Biomedical and Health Informatics
Journal of Child Neurology
Journal of Neuroscience Methods
NeuroImage
Neuropediatrics
PLoS ONE
PLoS Computational Biology
Proceedings of the National Academy of Sciences

Honors and Prizes:

2000, 2001, 2002	Dean's List	Washington University in St. Louis	Academic Achievement
2001	Summer Research Fellowship	Howard Hughes Medical Institute	Research
2003	Magna Cum Laude	Washington University in St. Louis	Academic Achievement
2006-2008	Integrative Graduate Education and Research Training (IGERT) Program Fellowship	Washington University in St. Louis (Sponsored by NSF 0548890)	Research
2007	Travel Award for Conference on Image Processing for Random Shapes, Applications to Brain Mapping, Geophysics, and Astrophysics	NSF – Institute for Pure and Applied Mathematics (IPAM)	Research
2008, 2009	Graduate Student Finalist, James L. O'Leary Prize Competition for Outstanding Research in Neuroscience	Washington University in St. Louis School of Medicine	Research
2009	Winner of the Pittsburgh Brain Connectivity Competition	Organization for Human Brain Mapping	Research
2016	Chief Resident Award	Mayo Clinic – Rochester	Teaching

2017-2019	Translational Post-doctoral Training in Neurodevelopment (T32) Fellowship	Boston Children's Hospital	Research
2019	Workshop on Autism Spectrum Disorders	Cold Spring Harbor Laboratory	Research
2020	HMS/HSDM Leadership Development Course for Physicians and Scientists	Harvard Medical School	Leadership
2020	Harvard Grant Review and Support Program	Harvard Catalyst The Harvard Clinical and Translational Science Center	Research

Report of Funded and Unfunded Projects

Past

2008-2011 Defining Human Cortical Functional Areas Using Resting Functional Connectivity NINDS F30 NS062489 (Ruth L. Kirschstein NRSA Individual Fellowship)
PI/Trainee
This goal of the study was to identify the possibility of using resting state functional connectivity MRI to define distinct regions/functional areas across the brain.

Current

01/2020-12/2021 Using clinical cohorts and functional connectivity to identify the neuroanatomical basis of atypical face processing in autism spectrum disorders
Child Neurology Society/Foundation PERF Shields Research Grant
PI (\$100,000 – Total Direct Costs)
The goal of this project is to determine whether the pattern of cortical tubers in children with Tuberous Sclerosis Complex and/or a specific predicted network abnormality predicts their face processing ability.

07/2020-06/2023 Identifying the common neural substrate critical for face processing deficits.
NIH (Parent Grant: K12 NS098482) Child Neurology Career Development Program
PI (Funding declined upon receiving K23 grant noted below)
The goal of this project is to determine whether 1) the pattern of cortical tubers in children with Tuberous Sclerosis Complex, and 2) functional connectivity abnormalities in adolescents with idiopathic Autism Spectrum Disorder converge on common network alterations that predict their face processing ability.

04/2020-03/2024 The neuroanatomical basis for face processing deficits in autism spectrum disorder.
NIH K23 MH120510
PI (\$722,238 – Total Direct Costs)
This proposal investigates the cause of face processing difficulties in ASD by leveraging information from patients with acquired prosopagnosia and prospective collection of MRI and behavioral data in adolescent subjects across a range of face-processing abilities.

Projects Submitted for Funding

Pending; Identifying fMRI/EEG Neurofeedback Targets for Critical Symptoms of Autism Spectrum
Submitted- Disorder
9/2020 Burroughs Wellcome Fund/Career Awards for Medical Scientists (CAMS)
PI (\$700,000 – Total Direct Costs)
The goal of this proposal is to identify treatment targets for two important symptoms in Autism Spectrum Disorders – impairment of social skills and persistent agitation/irritability, and to test whether these targets can be influenced by real-time-fMRI neurofeedback.

Training Grants and Mentored Trainee Grants

Unfunded Current Projects

- 2016- Assessing the utility of clinical MRI in newly diagnosed ASD patients.
Co-PI (with Simon Warfield, PhD)
We are retrospectively studying the cohort of Autism patients seen at BCH over the past 16 years to determine clinical efficacy trends and creating a large-scale imaging database of clinical structural MRIs in ASD.
- 2017- Improvement of motion correction strategies for functional neuroimaging in pediatric clinical populations.
Collaborator
Working with research fellows in the Computational Radiology Laboratory, this project seeks to expand on a novel method, Dynamic Missing Data Completion (DMC), to reduce motion-related artifacts compared to current best practice, and others, for MRI acquisition in developmental populations with high motion.
- 2018- Creating a Developmental Atlas of Brain Connectivity
PI
This proposal aims to generate a Developmental Atlas of Brain Connectivity that combines all publicly available brain connectivity data, currently from more than 15,000 children and adolescents, into a single consistently processed and quality-controlled dataset that can be used by medical researchers as a ‘gold-standard’ reference of typical development.
- 2019- Lesion network mapping of Autism-related Symptoms
PI
This project seeks to understand whether there is a particular network of regions impacted by lesions that are associated with social network impoverishment/loss of social skills and/or agitation/irritability, beyond that which can be explained by post-stroke depression and other independent risk factors
- 2020- Predicting infantile spasms after perinatal stroke using lesion network imaging/damage assessment
Co-PI (with Jurriaan Peters, MD)
This project six to determine if the development of infantile spasms after pre- or perinatal stroke is related to lesion location/network involvement and can be predicted from such.

Report of Local Teaching and Training

Teaching of Students in Courses:

2018-2019	Practice of Medicine (POM) – Interviewing and Communication Skills (ICS) 1 st year medical students	HMS 3-hr sessions every other week (13 sessions)
2019-2020	Practice of Medicine (POM) – Interviewing and Communication Skills (ICS) 1 st year medical students	HMS 3-hr sessions every other week (13 sessions)
2020-2021	Practice of Medicine (POM) – Interviewing and Communication Skills (ICS) 1 st year medical students	HMS 3-hr sessions every other week (13 sessions)

Formal Teaching of Residents, Clinical Fellows and Research Fellows (post-docs):

2017-2018	Pediatric Neurology NP Lecture Series – Clinical Neuroimaging Curriculum Pediatric Neurology Nurse Practitioners	Boston Children’s Hospital 3x 1-hr lectures
2017-2018	Child Neurology Residency Core Curriculum – Clinical Neuroimaging Child and Adult Neurology Residents	Boston Children’s Hospital 4x 1-hr lectures
2018-2019	Child Neurology Residency Core Curriculum – Clinical Neuroimaging Child and Adult Neurology Residents	Boston Children’s Hospital 5x 1-hr lectures
05/2019	Child Neurology Residency Academic Retreat – Faculty Instructor	Boston Children’s Hospital 4-hr workshop
2019-2020	Child Neurology Residency Core Curriculum – Clinical Neuroimaging Child and Adult Neurology Residents	Boston Children’s Hospital 5x 1-hr lectures
09/2019	Child Neurology Residency Core Curriculum – Personal Finance Bootcamp Child and Adult Neurology Residents	Boston Children’s Hospital 1-hr lecture
11/2019	Child Neurology Residency Academic Retreat – CV and Biosketch Preparation and Launching a Research Career	Boston Children’s Hospital 2x 1-hr workshops
2020-2021	Child Neurology Residency Academic Retreats – Faculty Instructor/Panelist	Boston Children’s Hospital 3x 1-hr workshops
2020-2021	Child Neurology Residency Core Curriculum – Clinical Neuroimaging Child and Adult Neurology Residents	Boston Children’s Hospital 5x 1-hr lectures

Clinical Supervisory and Training Responsibilities:

Research Supervisory and Training Responsibilities:

2017-2020	Supervision of research assistants, post-doctoral fellows, and biostatistician	Beth Israel Deaconess Medical Center – Laboratory for Brain Network Imaging and Modulation 1-hr lab meeting per week and 1:1 supervision 1-2 hrs per week per fellow/RA
2017-	Supervision of rotating medical students and research fellows (1-2 fellows per year)	Boston Children’s Hospital – Laboratory of Computational Radiology 1:1 supervision 1-2 hrs per week per fellow
2020-	Supervision of research assistants and post-doctoral fellows	Brigham and Women’s Hospital – Center for Circuit Therapeutics 1-hr lab meeting per week and 1:1 supervision 1-2 hrs per week per fellow/RA

Formally Mentored Harvard Medical, Dental and Graduate Students:

2018-2019 Ivry Zagury-Orly, HMS MD/MMSc in Medical Education, Class of 2020
Currently finishing his medical degree at University of Montreal. Completed a project titled “Performance on the Benton Face Recognition Task demonstrates a persistent correlation with ADOS Social Affect across age, sex, and IQ in multiple NDAR datasets”. Submitted for presentation at 2020 International Society for Autism Research meeting and publication in the Journal of Autism and Developmental Disorders.

Other Mentored Trainees and Faculty:

2017-2019 Louis Soussand, MS / Senior Data Scientist, French Assistance Publique - Hopitaux de Paris.
Career stage: senior research assistant/biostatistician. Mentoring role: research advisor.
Accomplishments: authorship of multiple neuroimaging projects as well as creation of computing infrastructure to allow advanced statistical analysis of large neuroimaging datasets through a web-based interface.

2018- Tamar Caceres, MD / Pediatric Neurology and Neurodevelopmental Disabilities Resident – Boston Children’s Hospital.
Career stage: resident. Mentoring role: research and career development mentor as part of the BCH Neuro RAMP (Neurology Resident Advisor and Mentor Program).

2020- Ayesha Imran / Senior Undergraduate Student, Emmanuel College
Career stage: undergraduate student. Mentoring role: senior research project internship project advisor.

Formal Teaching of Peers (e.g., CME and other continuing education courses):

- No presentations below were sponsored by 3rd parties/outside entities
- Those presentations below sponsored by outside entities are so noted and the sponsor(s) is (are) identified.

2020 Neuroimaging Essentials for the Neurologist Single presentation
 Michael J. Bresnan Child Neurology Course Boston

Local Invited Presentations:

- No presentations below were sponsored by 3rd parties/outside entities*
 Those presentations below sponsored by outside entities are so noted and the sponsor(s) is (are) identified.

2020 Using other clinical cohorts to understand ASD (and maybe generate new treatment targets)
 / Glahn Laboratory Invited Speaker Series
 Department of Psychiatry, BCH

2020 Bedside to Bedside Translational Neuroimaging: Asking causal questions about ASD
 symptoms using *other* clinical cohorts / Brainstorming for 2 Brookline Place Talk Series
 Departments of Neurology, Psychiatry, and Developmental and Behavioral Pediatrics, BCH

2020 Using other clinical cohorts to understand ASD (and maybe generate new treatment targets)
 / Fetal-Neonatal Neuroimaging and Developmental Science Center (FNNDSC) Invited
 Speaker Series
 Department of Radiology, BCH

2020 Bedside to Bedside Translational Neuroimaging: Asking causal questions about ASD
 symptoms using *other* clinical cohorts / Meet the Clinical Researcher Series
 F.M. Kirby Neurobiology Center, BCH

Report of Regional, National and International Invited Teaching and Presentations

- No presentations below were sponsored by 3rd parties/outside entities*
 Those presentations below sponsored by outside entities are so noted and the sponsor(s) is (are) identified.

Regional

11/2019 Tubers associated with infantile spasms impact a common brain network in TSC
 Young Investigator Presentation at the Meeting of the Greater Boston Epilepsy Society
 Boston, MA

National

2016 Junior Member Seminar 2: Residents: Finding a Fellowship / Invited Co-chair
 45th Annual Meeting of the Child Neurology Society
 Vancouver, BC

2016 Platform Session I / Moderator
 45th Annual Meeting of the Child Neurology Society
 Vancouver, BC

2017 Mortality and comorbidities in narcolepsy - an Olmsted County, Minnesota community-
 based study (selected oral abstract)

- 69th Annual Meeting of the American Academy of Neurology
Boston, MA
- 2017 Junior Member Seminar 2: Residents: Finding a Fellowship / Invited Co-chair
46th Annual Meeting of the Child Neurology Society
Kansas City, KS
- 2017 Platform Session I / Moderator
46th Annual Meeting of the Child Neurology Society
Kansas City, KS
- 2018 Platform Session I / Moderator
47th Annual Meeting of the Child Neurology Society
Chicago, IL
- 2019 Platform Session II: Epilepsy and Mitochondrial Disease / Moderator
48th Annual Meeting of the Child Neurology Society
Charlotte, NC
- 2020 A pathway to identifying neuromodulation targets in non-lesional neurodevelopmental disorders / invited presentation
NYC Neuromodulation 2020
New York, NY
- 2020 Junior Member Session 2: Nurturing the Global Pipeline of Academic Child Neurologists / Organizer and Moderator (selected seminar proposal)
Joint 16th International Child Neurology Congress / 49th Annual Meeting of the Child Neurology Society
San Diego, CA
- 2020 Early-Stage Investigator Special Interest Group / Organizer and Moderator
Joint 16th International Child Neurology Congress / 49th Annual Meeting of the Child Neurology Society
San Diego, CA

International

- 2009 Finding putative functional areas using rs-fcMRI and DTI by computing gradients along the cortical surface. (Oral presentation of winning entry)
15th Annual Meeting of the Organization for Human Brain Mapping
San Francisco, CA
- 2019 Tubers associated with infantile spasms impact a common brain network in tuberous sclerosis complex. Oral Presentation - Co-Author
2019 International TSC Research Conference
Toronto, Ontario, Canada
- 2020 Junior Member Session 2: Nurturing the Global Pipeline of Academic Child Neurologists / Organizer and Moderator (selected seminar proposal)
Joint 16th International Child Neurology Congress / 49th Annual Meeting of the Child Neurology Society
San Diego, CA
- 2020 Early-Stage Investigator Special Interest Group / Organizer and Moderator
Joint 16th International Child Neurology Congress / 49th Annual Meeting of the Child Neurology Society
San Diego, CA

Report of Clinical Activities and Innovations

Current Licensure and Certification:

2016	Initial Certification, Neurology with Special Qualification in Child Neurology, American Board of Psychiatry and Neurology
2012-2016	Minnesota Medical License
2016-	Massachusetts Medical License

Practice Activities:

2016-	Ambulatory Care	Behavioral Neurology Division and Autism Spectrum Center Boston Children's Hospital	Nine half-day sessions per month
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Clinical Innovations:

Report of Teaching and Education Innovations

Report of Technological and Other Scientific Innovations

Use of Functional Connectivity to define human cortical and subcortical functional areas. (2008-2012)	As part of a team led by Steven Petersen and Bradley Schlaggar at Washington University in St. Louis, I developed methods using non-invasive functional MRI data to describe functional areas and networks across the brain. Specifically, I created a method to divide the brain into functional areas using transitions in functional connectivity, i.e., correlations in the spontaneous activity of the brain that appear to reflect functional relationships between regions. Since publication in 2008 (PMID: 18367410), this technique has been cited over 500 times and is one of the defining methods of the Human Connectome Project (NIH U54 MH091657). This method has proven to be applicable to subcortical structures, such as the basal ganglia, and provides robust findings in adults as well as in children.
Application of Graph Theory techniques to understand the development of functional networks	As part of a team led by Steven Petersen and Bradley Schlaggar at Washington University in St. Louis, my colleagues and I also pioneered the use of Graph Theory to help understand the relationships between regions in the brain revealed using functional connectivity MRI. Our initial analyses of the default and executive control networks of the brain and their development from childhood

(2007-2011)	into adolescence have been cited over 8000 times across the neuroscience literature. We also applied this technique to adolescents with Tourette syndrome as an example of the clinical applicability of these techniques gaining unique insights into this disorder.
Standardization and Portability of Neuroimaging Analyses (2017-2020)	While a clinical resident at the Mayo Clinic up through the present, I have led efforts towards the standardization and incorporation of research tools into graduate medical education through presentations and publications that demonstrate the utility of rapidly deployable software, e.g., “NeuroDebian” virtual machines, and now continue to engage in collaborative work with other research centers to generate accessible and reproducible research packages such as the Brain Imaging Data Structure Applications (BIDS Apps). I rewrote the software used by Dr. Michael Fox’s Laboratory for Brain Network Imaging and Modulation – Beth Israel Deaconess Medical Center to perform Lesion Network Mapping in a highly portable and open-source fashion and continue to contribute to efforts to close the gap between novel neuroimaging discoveries and clinical tools that will improve patient care.
Creation and release of the open-source publicly available “GSP1000 Preprocessed Connectome” (2020)	Functional connectivity analysis (the understanding and analysis of correlated spontaneous activity seen in related brain regions) requires data from hundreds if not thousands of participants to generate a stable population estimate. I led a team that carefully pre-processed and packaged a ‘publicly available’ version of the MGH Genomics Superstruct Project, i.e., generated completely from publicly available data, using publicly available open-source tools, to help standardize functional connectivity analyses. Unlike existing similar datasets, the GSP1000 contains data for all ‘voxels’ in the brain, both grey and white matter, which uniquely suits it for lesion network mapping.

Report of Education of Patients and Service to the Community

- No presentations below were sponsored by 3rd parties/outside entities*
- Those presentations below sponsored by outside entities are so noted and the sponsor(s) is (are) identified.*

Activities

2017 Device Squad Podcast on Digital Tools for Autism Spectrum Disorder & Asperger’s Syndrome/Panelist (Propelics)
 Participated in a recorded panel discussion on digital tools for Autism Spectrum Disorder & Asperger’s Syndrome with Steven Brykman, Digital Strategist and UX Architect for Propelics, (myself), Michael McWatters, UX Architect at TED Conferences, and Cathy Farmer, Board of Directors Member for the Organization for Autism Research.
<https://soundcloud.com/propelics/digital-tools-for-autism>

Educational Material for Patients and the Lay Community:

Books, monographs, articles and presentations in other media

Educational material or curricula developed for non-professional students

Patient educational material

Recognition:

Report of Scholarship (ORCID 0000-0001-6557-5866)

Peer-Reviewed Scholarship in print or other media:

Research Investigations

1. Grady RM, Akaaboune M, **Cohen AL**, Maimone MM, Lichtman JW, Sanes JR. Tyrosine-phosphorylated and nonphosphorylated isoforms of alpha-dystrobrevin: roles in skeletal muscle and its neuromuscular and myotendinous junctions. *J Cell Biol.* 2003 Mar 3;160(5):741-52. Epub 2003 Feb 25. PubMed PMID: 12604589; PubMed Central PMCID: PMC2173352.
2. Fair DA, Schlaggar BL, **Cohen AL**, Miezin FM, Dosenbach NU, Wenger KK, Fox MD, Snyder AZ, Raichle ME, Petersen SE. A method for using blocked and event-related fMRI data to study "resting state" functional connectivity. *Neuroimage.* 2007 Mar;35(1):396-405. Epub 2007 Jan 18. PubMed PMID: 17239622; PubMed Central PMCID: PMC2563954.
3. Dosenbach NU, Fair DA, Miezin FM, **Cohen AL**, Wenger KK, Dosenbach RA, Fox MD, Snyder AZ, Vincent JL, Raichle ME, Schlaggar BL, Petersen SE. Distinct brain networks for adaptive and stable task control in humans. *Proc Natl Acad Sci U S A.* 2007 Jun 26;104(26):11073-8. Epub 2007 Jun 18. PubMed PMID: 17576922; PubMed Central PMCID: PMC1904171.
4. Fair DA, Dosenbach NU, Church JA, **Cohen AL**, Brahmabhatt S, Miezin FM, Barch DM, Raichle ME, Petersen SE, Schlaggar BL. Development of distinct control networks through segregation and integration. *Proc Natl Acad Sci U S A.* 2007 Aug 14;104(33):13507-12. Epub 2007 Aug 6. PubMed PMID: 17679691; PubMed Central PMCID: PMC1940033.
5. Dosenbach NU, Fair DA, **Cohen AL**, Schlaggar BL, Petersen SE. A dual-networks architecture of top-down control. *Trends Cogn Sci.* 2008 Mar;12(3):99-105. doi: 10.1016/j.tics.2008.01.001. Epub 2008 Feb 11. Review. PubMed PMID: 18262825; PubMed Central PMCID: PMC3632449.
6. Fair DA, **Cohen AL**, Dosenbach NU, Church JA, Miezin FM, Barch DM, Raichle ME, Petersen SE, Schlaggar BL. The maturing architecture of the brain's default network. *Proc Natl Acad Sci U S A.* 2008 Mar 11;105(10):4028-32. doi: 10.1073/pnas.0800376105. Epub 2008 Mar 5. PubMed PMID: 18322013; PubMed Central PMCID: PMC2268790.
 - Preview: In This Issue. *Proc Natl Acad Sci U S A.* 2008 2008 Mar 11;105(10):3659-3660. doi:10.1073/iti1008105
7. **Cohen AL**, Fair DA, Dosenbach NU, Miezin FM, Dierker D, Van Essen DC, Schlaggar BL, Petersen

- SE. Defining functional areas in individual human brains using resting functional connectivity MRI. *Neuroimage*. 2008 May 15;41(1):45-57. doi: 10.1016/j.neuroimage.2008.01.066. Epub 2008 Mar 25. PubMed PMID: 18367410; PubMed Central PMCID: PMC2705206.
8. Church JA, Fair DA, Dosenbach NU, **Cohen AL**, Miezin FM, Petersen SE, Schlaggar BL. Control networks in paediatric Tourette syndrome show immature and anomalous patterns of functional connectivity. *Brain*. 2009 Jan;132(Pt 1):225-38. doi: 10.1093/brain/awn223. Epub 2008 Oct 24. PubMed PMID: 18952678; PubMed Central PMCID: PMC2638693.
 9. Fair DA and **Cohen AL***, Power JD, Dosenbach NU, Church JA, Miezin FM, Schlaggar BL, Petersen SE. Functional brain networks develop from a "local to distributed" organization. *PLoS Comput Biol*. 2009 May;5(5):e1000381. doi: 10.1371/journal.pcbi.1000381. Epub 2009 May 1. PubMed PMID: 19412534; PubMed Central PMCID: PMC2671306.
 10. White BR, Snyder AZ, **Cohen AL**, Petersen SE, Raichle ME, Schlaggar BL, Culver JP. Resting-state functional connectivity in the human brain revealed with diffuse optical tomography. *Neuroimage*. 2009 Aug 1;47(1):148-56. doi: 10.1016/j.neuroimage.2009.03.058. Epub 2009 Apr 1. PubMed PMID: 19344773; PubMed Central PMCID: PMC2699418.
 11. Barnes KA, **Cohen AL**, Power JD, Nelson SM, Dosenbach YB, Miezin FM, Petersen SE, Schlaggar BL. Identifying Basal Ganglia divisions in individuals using resting-state functional connectivity MRI. *Front Syst Neurosci*. 2010 Jun 10;4:18. doi: 10.3389/fnsys.2010.00018. eCollection 2010. PubMed PMID: 20589235; PubMed Central PMCID: PMC2892946.
 12. Nelson SM, Dosenbach NU, **Cohen AL**, Wheeler ME, Schlaggar BL, Petersen SE. Role of the anterior insula in task-level control and focal attention. *Brain Struct Funct*. 2010 Jun;214(5-6):669-80. doi: 10.1007/s00429-010-0260-2. Epub 2010 May 29. Review. PubMed PMID: 20512372; PubMed Central PMCID: PMC2886908.
 - Editorial Preview: Craig, AD Once an island, now the focus of attention. *Brain Struct Funct*. 2010 Jun;214(5-6):214: 395. doi:10.1007/s00429-010-0270-0
 13. Nelson SM, **Cohen AL**, Power JD, Wig GS, Miezin FM, Wheeler ME, Velanova K, Donaldson DI, Phillips JS, Schlaggar BL, Petersen SE. A parcellation scheme for human left lateral parietal cortex. *Neuron*. 2010 Jul 15;67(1):156-70. doi: 10.1016/j.neuron.2010.05.025. PubMed PMID: 20624599; PubMed Central PMCID: PMC2913443.
 - Preview: Uncapher MR, Hutchinson JB, Wagner AD. A roadmap to brain mapping: toward a functional map of human parietal cortex. *Neuron*. 2010 Jul 15;67(1):5-8. doi: 10.1016/j.neuron.2010.06.025. PubMed PMID: 20624586.
 14. Dosenbach NU, Nardos B, **Cohen AL**, Fair DA, Power JD, Church JA, Nelson SM, Wig GS, Vogel AC, Lessov-Schlaggar CN, Barnes KA, Dubis JW, Feczko E, Coalson RS, Pruett JR Jr, Barch DM, Petersen SE, Schlaggar BL. Prediction of individual brain maturity using fMRI. *Science*. 2010 Sep 10;329(5997):1358-61. doi: 10.1126/science.1194144. Erratum in: *Science*. 2010 Nov 5;330(6005):756. PubMed PMID: 20829489; PubMed Central PMCID: PMC3135376.
 - Letter to the Editor: Brandeis D, Koenig T, Wackermann J. Individual brain maturity: from electrophysiology to FMRI. *Brain Topogr*. 2011 Oct;24(3-4):187-8. doi: 10.1007/s10548-011-0184-z. Epub 2011 Apr 24. PubMed PMID: 21516489.
 - Author Response: Dosenbach, NUF, Petersen, SE, Schlaggar, BL. *Brain Topogr*. 2011 Oct;24(3-4):189-91. doi:10.1007/s10548-011-0185-y
 15. Power JD, **Cohen AL**, Nelson SM, Wig GS, Barnes KA, Church JA, Vogel AC, Laumann TO, Miezin FM, Schlaggar BL, Petersen SE. Functional network organization of the human brain. *Neuron*. 2011 Nov 17;72(4):665-78. doi: 10.1016/j.neuron.2011.09.006. PubMed PMID: 22099467; PubMed Central PMCID: PMC3222858.

16. Barnes KA, Nelson SM, **Cohen AL**, Power JD, Coalson RS, Miezin FM, Vogel AC, Dubis JW, Church JA, Petersen SE, Schlaggar BL. Parcellation in left lateral parietal cortex is similar in adults and children. *Cereb Cortex*. 2012 May;22(5):1148-58. doi: 10.1093/cercor/bhr189. Epub 2011 Aug 1. PubMed PMID: 21810781; PubMed Central PMCID: PMC3328346.
17. Wig GS, Laumann TO, **Cohen AL**, Power JD, Nelson SM, Glasser MF, Miezin FM, Snyder AZ, Schlaggar BL, Petersen SE. Parcellating an individual subject's cortical and subcortical brain structures using snowball sampling of resting-state correlations. *Cereb Cortex*. 2014 Aug;24(8):2036-54. doi: 10.1093/cercor/bht056. Epub 2013 Mar 8. PubMed PMID: 23476025; PubMed Central PMCID: PMC4089380.
18. **Cohen AL**, Kenney-Jung D, Botha H, Tillema JM. NeuroDebian Virtual Machine Deployment Facilitates Trainee-Driven Bedside Neuroimaging Research. *J Child Neurol*. 2017 Jan;32(1):29-34. doi: 10.1177/0883073816668113. Epub 2016 Sep 29. PubMed PMID: 27655470.
19. Gorgolewski KJ, Alfaro-Almagro F, Auer T, Bellec P, Capotă M, Chakravarty MM, Churchill NW, **Cohen AL**, Craddock RC, Devenyi GA, Eklund A, Esteban O, Flandin G, Ghosh SS, Guntupalli JS, Jenkinson M, Keshavan A, Kiar G, Liem F, Raamana PR, Raffelt D, Steele CJ, Quirion PO, Smith RE, Strother SC, Varoquaux G, Wang Y, Yarkoni T, Poldrack RA. BIDS apps: Improving ease of use, accessibility, and reproducibility of neuroimaging data analysis methods. *PLoS Comput Biol*. 2017 Mar 9;13(3):e1005209. doi: 10.1371/journal.pcbi.1005209. eCollection 2017 Mar. PubMed PMID: 28278228; PubMed Central PMCID: PMC5363996.
20. **Cohen AL**, Mandrekar J, St. Louis EK, Silber MH, Kotagal S. Comorbidities in a community sample of narcolepsy. *Sleep Medicine*. 2018 March;43:14-18. doi: 10.1016/j.sleep.2017.11.1125. PubMed PMID: 29482805; PubMed Central PMCID: PMC5931205.
 - Letter to the Editor: Cremaschi, R, Hirotsu C, Tufik S, Coelho FM. High fatigue frequency in narcolepsy type 1 and type 2 in a Brazilian Sleep Center. *Sleep Med*. 2018 Dec;52:236. doi: 10.1016/j.sleep.2018.08.012. Epub 2018 Sep 5. PubMed PMID: 30274905
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Narrative Report

I am a pediatric neurologist and physician-scientist specializing in using translational neuroimaging to understand and develop treatments for autism spectrum disorders and other neurodevelopmental conditions. I earned my baccalaureate, medical, and graduate doctoral degrees at Washington University in St. Louis, where I gained a particular expertise in functional connectivity neuroimaging. During my Pediatrics and Child Neurology residency at Mayo Clinic, I became interested in childhood conditions affecting cognition including neurodevelopmental disorders and went on to complete a Behavioral Neurology fellowship at Boston Children's Hospital and a post-doctoral (T32) research fellowship focusing on localizing the neuroanatomic basis of specific symptoms seen across neurodevelopmental disorders. My long-term goal is to generate treatment targets that could eventually be used for clinical trials, while I also continue to care for patients in the Autism Spectrum Center and the Behavioral Neurology Clinic at BCH.

Area of Excellence: Investigation

My research interests and expertise include constructing and applying novel neuroimaging methods to understand brain development, with a focus on neuropsychiatric and neurodevelopmental disorders, i.e., disorders that affect wide-ranging networks in the brain, and I am known nationally and internationally for several of my contributions. During my graduate years, I created a method to non-invasively divide the brain into functional areas using the brain's spontaneous fMRI activity; a technique which has been cited over 500 times and is one of the defining methods of the Human Connectome Project. This method has been widely adopted and provides robust findings in children as well as in adults. My colleagues and I also pioneered the use of Graph Theory to understand the development of the network architecture of the brain from childhood into adulthood; work that has been cited over 10,000 times across the neuroscience literature.

During my residency training, I became deeply interested in translating technology to directly impact clinical care. I encouraged standardization and incorporation of research tools into graduate medical education through presentations and publications that demonstrate the utility of rapidly deployable software within the clinical setting and continue to be a part of international efforts to generate accessible and reproducible research software "containers" such as the Brain Imaging Data Structure Applications.

Now, my growing research program focuses on identifying the neuroanatomical substrate for symptoms common in autism and other neurodevelopmental conditions with the goal of generating targets for noninvasive treatment modalities, e.g., TMS and/or real-time fMRI-based neurofeedback, by: 1) Generation of circuit-based hypotheses for specific symptoms from cohorts with lesions, tubers, tumor resections, epilepsy foci, etc... 2) Validation of these localizations through prospective neuroimaging study

of patients with neurodevelopmental disorders affected by those symptoms, and 3) Testing whether modulating this circuit through non-invasive therapy affects each symptom, e.g., through behavioral and fMRI-based neurofeedback, or TMS/TCDS-based interventions. I collaborate closely with both the Computational Radiology Laboratory at BCH and the Center for Brain Circuit Therapeutics at Brigham and Women's Hospital. I am also working towards generating a large-scale database of connectivity neuroimaging data across typical development for rapid hypothesis testing.

Teaching and Education

As a clinical fellow and post-doctoral researcher, my teaching activities focused on mentoring and teaching post-doctoral research fellows and research assistants. As an Instructor in Neurology, I have also developed a growing Clinical Neuroimaging curriculum for the Boston Children's Neurology Residency Program and Neurology Nurse Practitioners and also teach the HMS 1st year medical students within their Interviewing and Communication Skills (ICS) / Practice of Medicine (POM) course. I also help train and mentor post-doctoral fellows, research assistants, and rotating students in my own laboratory and in the Center for Brain Circuit Therapeutics at Brigham and Women's Hospital with my close collaborator Dr. Michael Fox.

Summary

My passion and diligence have established my reputation as a self-motivated investigator, clinician, and educator known for my collegiality, professionalism, and empathy with patients and their families. Because of my experiences in basic neuroscience research and my clinical training in Child Neurology, I am acutely aware of the need for "closing the gap" with bench-to-bedside translational research in neurodevelopmental disorders and have made this a focus of my career.