

Curriculum Vitae

Date Prepared: November 18, 2009. Last modified May, 2024
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Place of Birth: New York City

Education

1972	B.F.A.	Design and Social Theory	California Institute of the Arts, Los Angeles
1981	Ph.D.	Board of Studies in History of Consciousness	University of California, Santa Cruz
1983-1985		Science courses	City College of New York and University of California, Santa Cruz
1991	M.D.		Columbia University College of Physicians and Surgeons, New York City

Postdoctoral Training

7/1991-6/1992	Intern	Pediatrics	New York Hospital-Cornell University Medical Center
7/1992-6/1993	Junior Resident in Pediatrics	Pediatrics	New York Hospital-Cornell University Medical Center
7/1993-6/1994	Resident	Neurology	Massachusetts General Hospital
7/1994-6/1996	Fellow	Pediatric Neurology	Massachusetts General Hospital
7/1996-6/1998	Clinical/Research Fellow	Neurology	Massachusetts General Hospital

Faculty Academic Appointments

1975-1981	Graduate Teaching Assistant	Political Theory, Environmental Studies, Anthropology	University of California, Santa Cruz
1982-1986	Lecturer		College of New Rochelle
1982-1984	Lecturer		Empire State College, State University of New York
1982-1984	Lecturer	Division of Degree Studies	New York University

1986-1988	Lecturer		Iona College
1988-1989	Lecturer	New School for Social Research	Eugene Lang College
1998-2003	Instructor	Neurology	Massachusetts General Hospital Harvard Medical School
2004-2017	Assistant Professor	Neurology	Harvard Medical School

Appointments at Hospitals/Affiliated Institutions

7/1996-6/1998	Fellow	Clinical and Research	Massachusetts General Hospital
7/1996-6/2003	Clinical Associate	Neurology	Massachusetts General Hospital
7/1996-6/2005	Assistant(position)	Neurology (Pediatrics)	McLean Hospital, Belmont, Massachusetts
7/2003-3/2012	Assistant Neurologist	Neurology	Massachusetts General Hospital
9/2005-5/2007	Active Associate	Pediatrics and Medicine	Cambridge Health Alliance
9/2005-5/2007	Consulting Neurologist	Neurology	Center for Child and Adolescent Development, Cambridge Health Alliance
4/2012-2017	Assistant Neuroscientist	Neurology	Massachusetts General hospital

Other Professional Positions

1981-1982	Research Associate, Center for the Philosophy and History of Science		Boston University
1985	Visiting Scientist, Animal Behavior Division of the Department of Mammalogy		American Museum of Natural History
1995	Laboratory Instructor; Human Neural Science and Behavior Course		Harvard Medical School
2011-2017	President		Higher Synthesis Foundation
2011-	Director		Higher Synthesis Health
2017-	Secretary		Higher Synthesis Foundation
2018-	Executive Director		Higher Synthesis Foundation

Major Administrative Leadership Positions

Local

2006-2017	Director, TRANSCEND Research Program (Treatment Research And NeuroScience Evaluation of Neurodevelopmental Disorders)		Massachusetts General Hospital
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Local

1998-2001	Brain Development Working Group		Coordinator, Harvard University Mind-
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2003-2004	Subcommittee on research planning. Initiated monthly research planning meetings involving journal club and exploration of potential themes for collaborative research projects.	Brain-Behavior Initiative Autism Research Center Planning group, Massachusetts General Hospital Co-chair
2005	Steering committee, Autism seminar planning	Massachusetts General Hospital
2006-2007	Research committee, Autism Center planning committee	Massachusetts General Hospital

National and International

2003	Planning Committee, Exploring Opportunities for Interdisciplinary Linkages in Neurodevelopment and Environmental Health Sciences. Multiple meetings over several months to plan agenda and choose attendees for this conference with approximately 25 attendees held at the Harvard Club in Boston, November 2003. Additionally, post-conference evaluation.	The John Merck Fund invitational conference
2004-2007	Brain Development Initiative	Cure Autism Now Foundation Director
2004-2009	Scientific Advisory Board	AGRE (Autism Genetic Resource Exchange)
2004-2005	Planning committee, White Matter Think Tank, Feb 4-6, 2005, Malibu, CA Planning process fall and winter 2004-2005	Cure Autism Now Foundation Chair
2005-2006	Organizing committee, CME course, "Clinical implications of environmental neurotoxicants for neurodevelopmental disabilities" November 2-3	UC Davis MIND Institute Co-chair, Chair of planning Robert Hendren, former Executive Director of the MIND Institute, UC Davis Medical School, then Vice Chair Psychiatry, UCSF
2006	Co-organizer of invitational conference: New Paradigms in Autism Research and Treatment November 3-5, 2006	Commonweal Institute Co-organizer
2006-2009	Autism Coalition for Treatment	Board of Directors
2006-2010	Environmental Health Advisory Board	Autism Society of America and John Merck Fund

		Co-Chair
2007-2010	Organizing committee for CME courses to follow up initial CME described above	UC Davis MIND Institute
		Co-chair
2007	Reviewer of John Merck Fund's Developmental Disabilities Program	John Merck Fund
2007-2010	Treatment Guided Research Initiative	Autism Society of America
2007-		Director
2007	Autism and Environment Committee	Autism Speaks
2008	Biology Group	NIH Inter-Agency Coordinating Committee (IACC) Autism Strategy Process
2008	Strategic Planning Workgroup (SPWG)	NIH Interagency Autism Coordinating Committee (IACC)
2008-2014	Scientific Advisory Committee	Autism Speaks
2011-2015	Consultant on neurodevelopmental and medical research and on development of Brain Research and Intervention program	The Center for Discovery, Sullivan County, New York State (largest residential facility in NY State for children and adults with special needs)
2013-	Co-Director of Medical Advisory Board for Research and Clinical Planning	Epidemic Answers Foundation, Canary Kids Movie Project
2013-2015	Consultant	Open Medicine Institute, Mountainview, CA
2013-2015	Board Member	Sherkow Foundation, New York City
2013-2023	Board Member	Zebrin Foundation, Cambridge, MA
2014-	Director of Medical and Scientific Advisory Board (and Principal Investigator)	Epidemic Answers Foundation, Documenting Hope Project
2014	Consultant hired by Bob Wright, founder of Autism Speaks, to analyze the merits and weaknesses of the organization's program on environment	Autism Speaks
2019-2023	President	Zebrin Foundation

Professional Societies

1986-1991	American Medical Student Association	President, Columbia University College of Physicians and Surgeons Chapter
	1987-1988	
1990-2001	American Neuropsychiatric Association	
1991-2004	American Academy of Pediatrics	
1991-2002	American Anthropological Association	
1993-2004	American Academy of Neurology	

1994-2005	Child Neurology Society	
	1996-2003	Electronic Communications Committee
1994-2003	Council for Responsible Genetics	
	1994-2003	Board of Directors
	1997-2003	Vice-Chair
1995-2000	International Society for Research on Emotion	Member
1996-1999	Society for Research in Child Development	Member
1996-1999	International Society on Infant Studies	Member
1998-2001	Brain Development Working Group, Harvard University Mind-Brain-Behavior Initiative	Member
1999	International Neuropsychological Society	Member
1999-present	Society for Neuroscience	Member

Grant Review Activities

2002	NIH Study Section, STAART (Studies to Advance Autism Research and Treatment) Centers Programs	NIH
2004	Grants Review	NAAR (National Alliance for Autism Research)
	2004	Reviewer
2006	Grants Review	Cure Autism Now
	2006	Reviewer
2007	Communications Program	Nancy Lurie Marks Family Foundation
	2007	Reviewer
2007-2011	Child Pathology and Developmental Disabilities Study Section	NIH
		Ad Hoc Reviewer
2008	Missouri Life Sciences Research Board	American Association for the Advancement of Science (AAAS) Research Competitiveness Program
	2008	Remote reviewer
2008-2009	Special Emphasis Panel/Scientific Review Group 2008-2009/2009/10 ZRG1 BBBP-C (02)	NIH
2012	Child Pathology and Developmental Disabilities Study Section	NIH
		Ad Hoc Reviewer
2015	Developmental Brain Disorders	NIH Ad Hoc Reviewer

Editorial Activities

American Journal of Biochemistry and Biotechnology
American Journal of Medical Genetics
American Journal of Psychiatry
Annals of Neurology
Archives of General Psychiatry
Biological Psychiatry
Brain
Brain Research
Cerebral Cortex

Clinical Evidence
 Developmental Neuroscience
 Developmental Science
 Environmental Health Perspectives
 Journal of Autism and Developmental Disorders
 Neuroimage
 Neurology
 Neuropediatrics
 Neuropsychology
 Neuroscience and Biobehavioral Reviews
 Neurotoxicology
 New England Journal of Medicine
 Progress in Neuropsychopharmacology and Biological Psychiatry
 New England Journal of Medicine
 Trends in Cognitive Science

Other Editorial Roles

2006	Editorial advisor	Special issue of Autism Society of America magazine The Advocate, "Environmental Health and Autism," release date December 7, 2006.
2006-2007	Guest Editorial Board	American Journal of Biochemistry and Biotechnology, Special issue on Autism Spectrum Disorders
2008	Guest Editor	Autism Advocate, Special issue on Treatment Guided Research Initiative, Autism Society of America

Honors and Prizes

1968	National Merit Scholar	
1969	Richard F. Scholz Memorial Scholarship	Reed College
1985	T.C. Schneirla Award in Comparative Psychology	
1987-1991	Rhodebeck Scholarship	Columbia University College of Physicians and Surgeons
1998-1999	Warren-Whitman-Richardson Fellowship	Harvard Medical School
1998-2000	Research Scholar	Cure Autism Now
2004-2007	Innovator Award	Cure Autism Now
2007	Princeton Lecture Series Fellowship	Eden Institute Foundation
2009	Visiting Professor	Southwest Autism Research and Resource Center, Phoenix, AZ
2011	Most Inspirational Teacher	AutismOne
2013	Canary Award	Epidemic Answers Foundation, Documenting Hope Project

Report of Funded and Unfunded Projects

Funding Information

Past

- 1998-1999 Autism: Brain Morphometry and Cognitive Neuroscience
Warren-Whitman-Richardson Fellowship
PI: Martha Herbert *total grant \$30,000.*
Analysis of brain morphometry volumetric data from a dataset containing 93 MRI scans of children with autism, language impairment, low IQ and typical development.
- 1998-2000 Autism: Brain Morphometry and Cognitive Neuroscience
Cure Autism Now Young Investigator Award
PI: Martha Herbert (indirect cost \$7,272)
Analysis of brain morphometry volumetric data from a dataset containing 93 MRI scans of children with autism, language impairment, low IQ and typical development.
- 1999-2004 Autism: Brain Morphometry and Cognitive Neuroscience
NINDS K23 Mentored Clinical Scientist Development Award
PI: Martha Herbert (\$48,529 indirect costs)
Analysis of brain morphometry volumetric data from a dataset containing 93 MRI scans of children with autism, language impairment, low IQ and typical development.
- 2002-2007 Neuroimaging of Young Children at High Risk for Autism (funding reallocated to allow pursuit of EEG in younger siblings at risk for autism)
NAAR (Nat'l Alliance for Autism Research) (indirect cost: \$10,864)
PI: Martha Herbert
MRI scanning of infants at risk for autism, converted to EEG study.
- 2004-2007 Brain Development and White Matter Initiative
Innovator Award, CAN (Cure Autism Now Foundation)
PI; Martha Herbert (Indirect costs: 0)
Grant awarded to support innovate multidisciplinary research following the PI's contributions to autism with her white matter and her asymmetry findings.
- 2005-2006 Electrophysiological Indicators of Gating and Timing Abnormalities in Autism
Commonwealth Fund, Massachusetts
Co-PIs: Jerome Kagan, Martha Herbert
EEG studies of children with autism and typical controls focusing on early sensory processing (\$100,000)
- 2005-2007 Unrestricted funds for autism research.
Bernard Fund for Autism Research, Harvard University
Co-PIs: Jerome Kagan and Martha Herbert (funds based with Dr. Kagan at Harvard FAS) (\$250,000)
This funding was used to support the development of the TRANCEND Research Program's EEG research and the framing of its biomarker approach
- 2006-2008 Electrophysiological Indicators of Gating and Timing Abnormalities in Autism
Cure Autism Now Foundation
PI: Katherine Martien, Role on project: Co-Investigator

EEG studies of children with autism and typical controls focusing on early sensory processing

- 2006-2009 Gating, timing and Connectivity in Autism
Nancy Lurie Marks Family Foundation
Equipment grant: High Density 128 Lead Array EEG Machine, photogrammetry machine, eye-tracking machine, shielded room
PI: Martha Herbert (\$188,500) equipment grant; 0 indirects)
This grant supported the purchase of a high density array 128 lead geodesic EEG, a photogrammetry machine, and an acoustic and electromagnetically shielded room, all of which are now housed at the MGH-Lurie Family Center for Autism in Lexington.
- 2007-2010 Treatment-Guided Research Initiative
Autism Society of America
Grant to plan information capture and dissemination related to individualized treatment of heterogeneous medical and behavioral issues in autism.
- 2006-2011 Multispectral MRI Imaging of White Matter in Autism
NINDS R01 NS 048455
PI: Martha Herbert (\$2,539,706)(indirects: \$1,479,807)
MRI imaging to assess tissue properties of white matter in autism and neurocognitive correlates related to simple and complex processing, utilizing volumetrics, diffusion tensor imaging and magnetic resonance spectroscopy along with neurocognitive assessment.
- 2007-2012 Coherence and Sensory Perception Deficits in Children with Autism – a Study of the 'Noisy Cortex' Hypothesis
Nancy Lurie Marks Family Foundation
PI: Tal Kenet, PhD; Role on Project: Co-Investigator
MEG study with MRI to study cortical noise, its impact on sensory processing, source localization via MRI, and structure-function correlation.
- 2007-2009 Coherence and Temporal Dynamics in Auditory Cortex of children with Autism
NIH R03
PI: Tal Kenet, PhD
Role on Project: Co-Investigator
Magneto encephalography study of auditory cortex.
- 2009-2011 Creating a Pediatric Imaging-Genomics Data Resource
NIH RC2
PI: Anders Dale, Terry Jernigan. Site PI: Bruce Rosen.
Role on Project: Investigator.
9-center study to build a database of ~1400 typically developing children ages 3-20, involving MRI, online neurocognitive assessment and salivary samples for genetics.
- 2011-2013 Retrospective Autism Recovery Documentation
Jane Botsford Johnson Foundation
PI (\$98,1750)
To critically review and document detailed case reports of autism recovery and publish the findings in a peer-reviewed journal.

- 2010-2011 In vivo glutathione imaging: Spectral edited sequence development
Autism Research Institute
PI (\$18,000)
To hire a programmer to develop a spectral edited sequence to perform in vivo magnetic resonance spectroscopy measures of glutathione in the brain
- 2011-2012 NIRS Imaging and its Utility and Importance in Infants
Nancy Lurie Marks Family Foundation
Equipment grant paying for purchase of Oxiplex frequency domain Near Infrared Spectroscopy machine
PI (\$59,340)
- 2011-2013 Brain correlates of mitochondrial dysfunction in autism
Jane Botsford Johnson Foundation
PI (\$154,238)
To perform multimodal analyses of existing clinical data comprised of EEG, MRI and laboratory data from children with autism with epilepsy and/or mitochondrial dysfunction
- 2011-2012 31Phosphorus Spectroscopy Imaging of lipid and bioenergetics metabolites: coil construction
Autism Research Institute and Parent's Collaborative
PI (\$22,000)
To build a dual-tuned coil for the 3T Siemens magnet to allow in vivo measurement of phospholipids, ATP, phosphocreatine and other metabolites and to attempt to replicate the 1993 study showing positive findings with this method
- 2014 Autism and EMF: an EEG study: Silicon Valley Fund-Sullivan Fund. (\$85,000)
- 2014-5 Magnetic Resonance Study of Brain Pathophysiology and Perfusion in Autism
Nancy Lurie Marks Family Foundation (\$128,000 NCE)
- 2014-5 Data Collection and Outcomes: Infrastructure for Systems Medicine
Wallace Research Foundation (\$100,000)
- 2015-2016 Data Capture and Data Pooling in Functional and Systems Medicine
Wallace Research Foundation (\$100,000)
- 2016-2017 Customizing Practice-Based Research Network and Registry Design for Pooling Clinical Outcomes Data Across Diverse Functional and Systems Medicine Practices
(\$130,000)

Current

- 2008-2013 A prospective multi-system evaluation of infants at risk for autism.
Department of Defense Congressionally Directed Medical Research Program, Autism Spectrum Disorder Research Program, AS073092
PI: Martha Herbert, MD, PhD(\$656,250; total project \$1,148,100) Partnering PI: Margaret Bauman, MD
A pilot study to develop infrastructure for prospective evaluation of medical/physiological (including metabolic, immune, neuromotor) and electrophysiological (EEG, ERP, autonomies) as well as behavioral and language dimensions of development in infants at high risk for autism, hypothesizing that systemic physiological deficits will precede

behavioral symptoms, and that proinflammatory immune and oxidative stress will correlate with EEG spikes, increased amplitude and reduced coherence.

- 2014-2023 Principal Investigator, Documenting Hope Project (This is a virtual project in terms of management. Funding and in-kind corporate donations go through Epidemic Answers Foundation).
- 2016-2018 Autism, Environment, Brain, Biomarkers: Deterioration and Amelioration (\$180,000 to Higher Synthesis Foundation), Donor: Clear Light Ventures
- 2017-2018 Implementing a Data Capture Platform for Practice-Based Research About Integrative, Functional and Systems Approaches to Healthcare. Wallace Research Foundation (\$100,000)
- 2019-2021 Pilot School Study of ABMNM Impacts During the LCSD ABClassroom Program Improvement Project. Higher Synthesis Foundation, \$20,000.
- 2020-2022 & 2024- EMIT Study (EMF Mitigation Impact Tracking), \$60,000, Clear Light Ventures

Unfunded Projects

- 2013-2017 Data analysis from DoD funded study that ended in 2013 – A multisystem assessment of Infants at High Risk for autism.
- 2013-2019 Practice-based research data capture consortium. Building consensus on practice data capture instruments to facilitate pooling data
- 2017-2017 Building a business plan for device development, and designing a replication study, following upon the based upon an EEG signature in 2-week-old infants who were studied in my DoD high Risk infant sibling study, that predicts autism outcome and severity at 30 months.

Patents applied for

2016: Systems and Methods for Early Diagnosis of Autism Spectrum Disorders (Partners/now Mass General Brigham Innovation and Ventures)

Report of Local Teaching and Training

Teaching of Students in Courses

1995:	Introduction to Neuroanatomy, section leader with 10 students. 2nd year medical students	Harvard Medical School Substantial weekly preparation for ten weeks.
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Formal Teaching of Residents, Clinical Fellows and Research Fellows (post-docs)

1996-2003:	Institute of Health Professionals, Physical Therapy Lecture: Introduction to Pediatric Neurology Physical therapy students	Massachusetts General Hospital 2 two-hour lectures annually, approximately 50 students. Initial preparation was very extensive, over two months. Updates annually took one day each.
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1996-2002	Annual lecture on Review of Pediatric Neurology.	McLean Hospital Review of Psychiatry and Neurology Substantial preparation 1996, 1997; course cancelled 2001. Course redesigned and lecture revised 2002; one day preparation. Approximately 60-70 students.
1997-2002:	Introduction to the Neurological Examination Harvard medical students	Harvard Medical School Participation in one-time bedside session with medical students. No preparation.
2002-2009	Summer Stock: Introductory lectures for new neurology residents	MGH: 1.5 hours per year introduction to autism clinical and research
2000-2004:	Predoctoral seminar in neuroscience Predoctoral neuropsychologists	Massachusetts Mental Health Two annual 1 ½ hour lectures: a) Introduction to Brain Development, b) Introduction to the Neurological Examination for Neuropsychologists. Substantial preparation for first two years. Lecture updated 2004, 2 hours, on basis of Learning and the Brain presentation, November 2003.
2003	“Autism Neuroimaging: A Review and Commentary.” Continuing Medical Education Course in Pediatric Neurology.	Harvard Medical School
2003	“Autism: Do neurology, neuroscience and medicine implicate the environment?” Post-graduate seminar in child psychiatry	200+ attendees. One day preparation. Judge Baker Center, Boston, Massachusetts
2004	“Disorders of Cerebral Development,” Bresnan Child Neurology Course	25 attendees Children’s Hospital of Boston
2005	"Autism." Bresnan Child Neurology Course	200 attendees Royal Sonesta Hotel (Massachusetts General Hospital organizer)
2008-2009	Neurodevelopmental disabilities as part of Pediatric Resident Ambulatory Care Rotation MGH Pediatric residents of all levels	200 attendees Massachusetts General Hospital
2007	“Autism: A brain disorder or a disorder that affects the brain?” Bresnan Child Neurology Course	Monthly lecture Royal Sonesta Hotel (Massachusetts General Hospital organizer)
2009	“Autism: Research Update” Bresnan Child Neurology Course	200 attendees Royal Sonesta Hotel (Massachusetts General Hospital organizer)
2011	“Autism: Research Update” Bresnan Child Neurology Course	200 attendees Royal Sonesta Hotel (Massachusetts General Hospital organizer)
2013	“Autism: Research Update” Bresnan Child Neurology Course	200 attendees Royal Sonesta Hotel (Massachusetts General Hospital organizer); 200 attendees

2015	“Autism: Research Update” Bresnan Child Neurology Course	Royal Sonesta Hotel (Massachusetts General Hospital organizer); 200 attendees
2016	“Whole Body Approaches to Understanding and Addressing Autism Spectrum Disorders”, Autism Spectrum Disorders 2016, Harvard Medical School CME Course	Royal Sonesta Hotel (Massachusetts General Hospital organizer); 600 attendees

Laboratory and Other Research Supervisory and Training Responsibilities

2005-22017	Director of TRANSCEND Research Program, involving setting up the program; hiring, training and supervising staff; developing and documenting laboratory procedures	TRANSCEND has been a full-time effort with the supervisory and training aspects being a significant part of the work. Supervision of infrastructure (e.g. IRBs, database management), data collection, data analysis.
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Formally Supervised Trainees

1999-2001	Shelly Steele (degree)	Graduate student, UIC-Chicago She was exposed to whole brain volumetric analysis and contributed strongly to my lab organization.
1999-2000	Girim Sung B.S.	VP Finance company, applying for PhD She was MIT student who was exposed to multidisciplinary medical features contextualizing her neuroscience and molecular biology training.
2000-2002	Karen Bos M.D.	Harvard Medical School and Harvard School of Public Health She was a Radcliffe student fellow who gained experience with medical research, database organization and clinical resource development.
2001-2004	David A Ziegler PhD.	He was hired after two years of graduate school in psychology, neuroanatomy and statistics. He worked for three years and prepared several papers and many presentations. He then obtained a PhD 2004-2011 at MIT Brain & Cog Science, and is now a post-doctoral brain imaging fellow at UCSF He spent three years with me producing papers on the MRI morphometric data I had accumulated; he learned writing, presenting, grant preparation, bibliographic database management, data management and related skills.
2002-2004	Kathryn Devaney M.A.	School Counselor She served as a research assistant in my MRI infant siblings study.
2005-	Tal Kenet, PhD	Assistant Professor, Neurology, MGH She joined me direct from her postdoctoral fellowship with Dr. Michael Merzenich at UCSF, and has been instrumental in co-leading the

2005-2006	Lisa McCoy Cremer B.A.	TRANSCEND Research Program development effort. MSW and MPH She worked as a research assistant in our EEG program, gained valuable clinical experience, and moved on to social work school.
2006-2007	Suzanne Maness, M.S.	School psychologist, Riverside CA She was an outstanding contributor to the early development of our laboratory and served as a research coordinator, gaining experience with research management and neuroscience.
2006-2011 2016-	Nandita Shetty, MS	Neuroimaging MRI biomedical engineer, still in employ She was a biomedical engineer at the inception of my R01, ran the imaging acquisition and analysis, and was greatly proactive in the overall development of the research program, serving her ambition to go to business school in a joint imaging-business program. She returned to work with me remotely in the summer-fall of 2016 in building integrated clinical-research care services infrastructure.
2006-2008	Avi Ringer, BS	Graduate school molecular epidemiology He spent two years developing skills in biomarker research pertinent to neurodevelopmental disorders and contributed greatly to the design and grant proposal for our funded high-risk infant sibling study.
2006-2009	Emily Mott, BA	Infant research-normal development She served as recruiter, research coordinator and psychometrician and imaging acquisition assistant.
2007-2009	Alyssa Orinstein, BA	clinical psychology at the University of Connecticut. In the TRANSCEND Research program she moved from recruiter to perform as a psychometrician and research coordinator, gaining great hands-on experience in a start-up research program that propelled her to admission to a highly competitive clinical neuropsychology PhD program.
2007-2008	Nikki Meribella, BA	Masters program in counseling She came to us with undergraduate research experience in EEG and worked in the earlier stages of our EEG research in data collection and analysis.
2009-	Jamie Fanelli, M.Ed.	Education background, psychometrician and research coordinator
2008-	Hari Bharadwaj, MS	Biomedical engineer and signal processing analyst He is collecting EEG data in our infant siblings study and analyzing the data, as well as contributing strongly to the development of our planned near infrared spectroscopy program.
2009-	Gillian V. Chapman PhD	Year training in autism research prior to her Clinical Psychology internship

2009-	Kanwaljit Singh MD, MPH	<p>She has outstanding testing and interpersonal skills and came to our program to gain a year's experience with autism and imaging research. Research Fellow with TRANSCEND for both infant research program and school-aged research program</p> <p>He is a pediatrician aiming for a career in pediatric neurology who sought out a position in TRANSCEND due to its multidisciplinary approach to development, and has been doing outstanding work in biomaterials collection standard operating procedure development and statistical analysis of imaging and EEG data, as well as database development and maintenance.</p>
2010-	Mark Westaway, MD	<p>Non-Clinical Research Fellow, now physician. He is an experienced Australian physician who came to TRANSCEND to learn research techniques. He had a special interest in electrophysiological measures sensitive to change, which is consistent with the mission of the TRANSCEND Research Program. He left due to medical illness.</p>
2010-	Nitzah Gebhard, BA	<p>Research Coordinator and psychometrist with two years prior experience</p> <p>Her goal is doctoral training in clinical psychology focusing on autism.</p>
2010-2016	Sara Bersche Golas, MA, MA	<p>Research coordinator for the DoD-funded High-Risk Infant prospective multisystem study</p> <p>She has masters level training in experimental psychology and Arabic studies. She wishes to make a career in research. She was advanced to her present position after having joined the program as a temp coordinating the autonomic data collection. She has demonstrated remarkable abilities in coordinating data sets and human subjects. She moved on to a database management position but continued to work with us post-study funding until spring of 2016.</p>
2010-2011	Molly Galdston, BA	<p>Preparing for nurse practitioner training</p> <p>She worked as a research coordinator and psychometrist on both the infant and school-age children studies. Her experience in our infant sibling research study contributed to her deciding to become a nurse practitioner rather than a clinical psychologist.</p>
2011	William LeBec	<p>Was masters electrical engineering student at Ecole Polytechnique in France.</p> <p>Summer intern from Ecole Polytechnique in France who did a 90 day internship as part of his masters level electrical engineering training and worked on analyzing EEG data from the DoD At Risk Infant</p>

2011	Lia Harrington	Sibling study. She was an undergraduate at Dartmouth University. Undergraduate summer intern with strong background in statistics who worked intensively in biomaterials acquisition and brain imaging statistical analysis.
2011	Meenakshi Mal, MD	Physician trained in India seeking further training in US. She is an Indian-trained physician who volunteered for three months to get experience in research to support her goal of doing a pediatrics residency program in the U.S.
2011-2012	Kaustubh Limaye, MD	Neurology Resident at University of Arkansas in Little Rock. He was a volunteer research fellow gaining experience in EEG and imaging research as he applied for neurology residency programs with the goal of being an epileptologist.
2011-2013	Robert Yuen, BS	Research assistant in the DoD High Risk Infant Siblings study. He joined TRANSCEND initially as a volunteer and then after outstanding performance in biomaterials sample processing, EEG and NIRS machine operation and data entry was hired in the DoD Infant Siblings study.
2012-2014	Shantanu Ghosh, Ph.D.	Signal processing engineering and brain imaging analysis with PhD in linguistics and strong interest in brain pathophysiology. Dr. Ghosh joined TRANSCEND to perform multimodal imaging analysis and plan future research studies
2013-2016	Mohamad Alshikho, MD, MA	Dr. Alshikho joined our lab to learn about neurological and neurodevelopmental research. He is an internist trained in Syria who wishes to retrain as a neurologist and has joined my research program to learn how to perform interdisciplinary neuroscience research with a clinical orientation.
2011	Louisa Harrington	She is an undergraduate student from Dartmouth interested in autism and psychology.
2013 Summer	Lauren Purdom	Lauren worked in our laboratory during the summer between her sophomore and junior years at Lehigh University. Her job was to analyze magnetic resonance spectroscopy data.
2013-	Ann Z. Bauer	Ann wrote a public health/epidemiology dissertation on autism and acetaminophen at U Mass Lowell, and I was on her dissertation committee. I continue to mentor her in her research.
2013-2015	Margaret Ptak	Margaret is a graduate student at BU who will do her thesis using our infant siblings data and a

2013-	Ya Wen, Ph.D.	practicum in bioinformatics building an autism research database as part of a lab collaboration. Dr. Ya Wen has a PhD in Molecular Neuroscience from Hong Kong and two years' postdoc at Baylor. She is joining Dr. Herbert to work on meta-analyses related to metabolism, diet, genetics and brain relationships.
2014	Andrew Luo	Andrew is a high school student who interned in our lab and learned bibliographic searching and organizing tools.
2014-present	Jenny Foster, MS, BCBA	Psychologist at Center for Discovery Clinic within major residential facility in New York State, supervising her development of brain program
2015	Christine Lung	Medical student and student body president, did summer internship in Higher Synthesis Health Clinic
2015	Gillian Orlando	High school graduate taking year off before college, interested in special education, did fall internship in clinic
2015-	Donna Messinger, MS	Donna is a NeuroMovement practitioner who works in my clinic as well as in her own private practice. Her daughter was my patient in the Vincent Burnham Neurology Clinic. I am mentoring her in integrating her work into a broader neurology workflow.
2015-2016	Elizabeth DeBruin	Respiratory therapist taking bachelor's degree in psychology did internship in clinic
2016	Luisa Masclans	Harvard undergrad entering fourth year, as pre-med, did summer internship in clinic
2016-2018	Datis Kharrazian, DHSc	Researcher and educator, and functional neurology clinician, taking two-year MMSCI (Masters in Medical Science) whom I am mentoring and helping with research and IRB preparation as well as data preparation and presentation
2016-2018	Nandita Shetty, MS	Nandita, a biomedical engineer who worked in TTRANSCEND for 4 ½ years, left to pursue other interests including business graduate training in a Stanford run program in India, and then she built and sold a startup. She contacted me because she wanted to work in the health sector and she is now both helping and being mentored by me.

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

2006	Co-organizer of CME course at UC Davis-MIND Institute: Clinical Implications of Environmental Toxicology for Children's Neurodevelopment in Autism	November 2-3, 2006.
2007	Co-organizer of CME courses based at UC Davis-MIND Institute: Clinical Implications of Environmental Toxicology for Children's Neurodevelopment in Autism	July 2007Phoenix;, February 2008 UCSF.
2007	Connectivity in Autism, Kennedy Krieger Institute's	October 22, 2007

	Center for Autism and Related Disorders Annual CME Course	
2007	"Understanding the Science of Autism Disorders," in "Autism Spectrum Disorders: From Childhood to Adulthood," Department of Psychiatry at Cambridge Health Alliance and Harvard Medical School	November 2, 2007.
2008	Co-organizer, CME course on Autism, Autism Society of America national conference	July 2008
2009	Co-organizer and presenter, CME course, "Autism as a Complex Crisis and Points of Intervention," Autism Society of America National Conference	July 2009
2009	"Autism Research Update," MGH Child Neurology CME course	September 29, 2009
	Massachusetts General Hospital	Boston
2009	"Imaging autism tissue and function," Martinos Center for Biomedical Imaging Advanced Neuroimaging course, Martinos Center for Biomedical Imaging	October 21, 2009
2010	Convener and chair of Think Tank, Linking Brain Research to Clinical Applications, Autism One	May 2010 Chicago
2011	Autism and the Brain	April, 2011, Newark, NJ
	UMDNJ Pediatric Neurology Grand Rounds	
2011	Autism as a Whole-Body Systems Condition, Autism Research Institute Conference CME course	April, 2010 Atlanta
2011	Underlying pathophysiological processes in Autism Spectrum Disorders	May 2011 Chicago
2009	"Autism Research Update," MGH Child Neurology CME course	September 29, 2009, Boston
	Massachusetts General Hospital	
2011	Autism as a Whole-Body Systems Condition, Autism Research Institute Conference CME course	October 2011, Las Vegas
2011	Autism Research Update, MGH Pediatric Neurology CME course	September 20, 2011, Boston
2011	Overview of Physiological issues Underlying Autism Spectrum Disorders, CME Course	November 2011, Barbados
2011	Autism and the Brain	Neurology, UMDNJ, Newark, NJ, April 2011
2012	Shifting models: Integrative systems approach to Autism.	MAPS CME, 3/2/2012
2012	Autism as a Whole-Body Systems Condition, Autism Research Institute Conference CME course	April 2012, Newark, New Jersey
2012	A pathophysiological approach to brain issues in Autism: More than development. CME course at AutismOne	May, 2012 Chicago IL
2012	Autism as a Whole-Body Systems Condition, Medical Academy of Pediatric Special Needs	September, 2012, Orlando, Florida
2012	Glial Cells, Advanced CME, Autism Research Institute	October, 2012, Anaheim, California
2012	Autism: From a Static Brain Defect to a Chronic Systemic Dynamic Encephalopathy	May 8, 2012. Neurology Grand Rounds, Tufts-NEMC, Boston 2012
2012	The Autism Revolution: From Broken Brain to Chronic Treatable Systemic Condition	Marshall University Medical School, Huntington, W VA,

2013	Autism Research Update	Sept 21, 2012 October, 2013, MGH Pedi Neuro CME course
2015	Autism Research Update	October, 2015, MGH Pedi Neuro CME course
2016	Whole Body Approaches to Understanding and Addressing Autism Spectrum Disorders	November 18-19, 2016 Harvard CME Course

Local Invited Presentations

2005	"Neurobiology of Autism: A Systems Approach." Massachusetts General Hospital seminar series: Autism: Genes, Brains, Babies and Beyond, November 2005.	
2009	Autism: A Whole Body Systems Approach. Tufts-New England Medical Center, Pediatric Grand Rounds, April 2009.	
2011	"Autism: Developmental, Chronic or Both?" Mass General Hospital-Charlestown, Pediatrics, February 2011	
2011	"Autism and Environmental Vulnerability: Whole Brain, Whole Body, Whole Planet", Groden Center Annual Conference, Providence, RI, March 2011.	
2012	Commentator, Autism Speaks Symposium, Boston Public Library, May 15, 2012	
2012	Autism: From a Static Brain Defect to a Chronic Dynamic Systems Encephalopathy, Neuroscience Grand Rounds, Tufts-New England Medical Center, May 31, 2012	
2012	Autism: From a Static Brain Defect to a Chronic Dynamic Systems Encephalopathy, Neuroscience Grand Rounds, Asian Medical Association, McLean Hospital, Belmont MA, August 26, 2012	
2012	Autism Whole Body Strategies, Newton Partnership, May, 2012	
2012	Keynote: Autism Chronic Treatable Features, American Chinese Medical Exchange, McLean Hospital, August 26, 2012	
2012	Autism Revolution, Autism Chinese Medical Exchange, Hyatt Hotel Cambridge, November 3, 2012	
2013	Radio interview for Patricia Raskin show on Providence RI radio station about whole-body approach to autism spectrum disorders	
2013-5	American-Chinese Medical Exchange Society – keynoting their tri-annual conferences	
2014-0228	Autism and Brain Health? The clinical utility of framing autism behaviors as emergent properties of disordered brain cellular and tissue health	Pediatric Neurology Noon Conference, MGH, Elizabeth Thiele Clinic-Lab
2014-0321	A Whole-Body Approach to Brain Health	MIT Media Lab
2015-0428	Reverse-Engineering Mechanisms of Recovery in Chronic Illness	World Medical Innovation Forum, Westin Copley Place, Partners Health Care

Report of Regional, National and International Invited Teaching and Presentations

Invited Presentations and Courses

Regional

1999	"The Large Brain in autism," Developmental Disorders Section,	American Psychological Association ,Boston
2003	"Gene and Environment: The Case of Autism." Cambridge Forum lecture and radio broadcast.	

2003	"Inside the Child's brain: Images of typical brain Development and Developmental /Learning Disorders.". Learning and the Brain Conference.	Cambridge, Massachusetts.
2003	"Autism and Environment: Exploring the Connections." Alliance for a Healthy Tomorrow	Massachusetts
April, 2004	"Neuroimaging of Children at Risk for Autism." Learning and the Brain conference, ,	Cambridge Massachusetts
May, 2004	"Neuroimaging and Disorders of Child Mental Development (especially autism): Considerations on Methodology and Pathogenesis."	Lecture series on imaging and environmental health, Harvard School of Public Health, Massachusetts
October, 2004	Localization of white matter enlargement in autism and its implications." Boston Club Meeting on White Matter Imaging.	Nancy Lurie Marks Foundation. Boston, Massachusetts
November, 2004	"Autism: Brain, body, gene and environment."	Autism Society of America, Massachusetts Chapter Massachusetts
November, 2004	White matter as a nexus, an entry into the complex web of autism."	Wellesley College Wellesley, Massachusetts
December, 2004	Autism: Gene but also Environment; Brain but also Body; Epidemic?"	University of Massachusetts, Lowell, School of Health and Environment Environmental Health Seminar Series fall Massachusetts
February, 2005	"Autism: Clinical Implications of New Developments in Autism." .	North Shore Children's Hospital Massachusetts
April, 2005	"Treatable features of autism: Implications of new findings in autism biochemistry and immunology." Opening talk in seminar, " Treatable features of autism: Implications of new findings in autism biochemistry and immunology."	Quincy, Massachusetts Bridge Meeting
May, 2005	Discussant, Autism as a Movement disorder?	Boston Club, Nancy Lurie Marks Foundation, Massachusetts
October, 2005	"Autism: From specific behaviors to systemic findings." ,	Pediatric Grand Rounds, Massachusetts General Hospital Massachusetts
June, 2005	"Brain similarities in autism and developmental language disorder."	Boston University Department of Anatomy and Neurobiology, Massachusetts

September, 2005	"Toward a framework for understanding autism," Keynote, Autism.com	New Hampshire, Massachusetts
December, 2005,	"Connectivity in Context: Physical and Systems Considerations in the Development of Gating, Timing, Asymmetry and Connectivity Challenges in Autism," "Gamma oscillations as a unifying theme in autism research	Nancy Lurie Marks Boston Club meeting Massachusetts
December, 2005	"Autism: Could the Brain be Downstream?"	MIT Brain and Developmental Disorders Seminar Series, Massachusetts
July, 2006	"Where the rubber hits the road: How environmental factors can lead to some of what we call autism." Environment and Neurodevelopmental Disabilities panel.	Autism Society of America National Convention Providence Rhode Island
September 26, 2006	Connectivity in Context: Physical and Systems Considerations in the Development of Gating, Timing, Asymmetry and Connectivity Challenges in Autism.	Nancy Lurie Marks Autism Research Lecture, Brandeis University, Waltham MA
March 16, 2007	Autism and Biomarkers.	Nancy Lurie Marks Family Foundation Boston Club, Massachusetts
April, 2007	Autism: A Brain Disorder or a Disorder that Affects the Brain?	University of Connecticut, Storrs, Psychology Department Connecticut
June, 2007	Expanding the Spectrum of Autism Models: From Fixed Developmental Defects to Reversible Functional Impairments. Groden Center/Brown University conference, Autism Spectrum Disorder: Recent Advances in Infantile Origins, Early Childhood Detection, and Intervention, sponsored by the American Psychological Association, Autism Speaks and the Autism Consortium	American Psychological Association, Providence, RI
November, 2007	"Understanding the Science of Autism Disorders," in "Autism Spectrum Disorders: From Childhood to Adulthood",	Department of Psychiatry at Cambridge Health Alliance and Harvard Medical School Massachusetts, Boston, MA
September, 2008	Autism: Introduction to a whole-body systems approach.	Brandeis University, Waltham, MA: Nancy Lurie Marks Family Foundation Autism Lecture Series Massachusetts
2008	Autism: Introduction to a whole-body systems approach. MIT Brain and Cognitive Sciences course guest lecture	MIT Cambridge, Massachusetts

April 6, 2009	Brain, Body and Planet in Common Crisis: Autism as a Hologram, a Challenge and an Opportunity. Autism and Technology course,.	MIT Cambridge, Massachusetts
April 15, 2009.	Rethinking Autism Research: From Whole Body to Molecular Pathways and Back. Grand Rounds,	Tufts-New England Medical Center, Pediatrics, Autism Awareness Day. Massachusetts
May 12, 2009	Genes and Environment, Developmental and Chronic: An inclusive approach to Autism Science. Autism: Bridging the Gap Between Knowledge and Practice for Clinicians.	CDC conference on Autism, Augusta, Maine.
April, 2010	Autism and Environmental Vulnerability: Whole Brain, Whole Planet.	Western New York Autism Society New York
2010	TRANSCEND Research Program: Autism and Environmental Vulnerability: Whole Brain, Whole Planet.	Western New York Autism Society New York
March 9, 2010	Transforming the Future of Autism Research From Research to Treatment. Webinar	Magellan Insurance southeastern Pennsylvania cachement area
2014-1204	Autism: Whole-Body Strategies	When the Belly is the Beast, New England Organic Farming Association (NOFA)
2015-1004	Autism Spectrum Disorders: Chronic, Dynamic, Treatable	75th Northeast Congress of Optometry
2016-1216	Whole Body Approaches to Understanding and Addressing Autism Spectrum Disorders: The Interplay of Biophysical, Metabolic and Electrophysiological Parameters	Center for Discovery (residential facility and research center, Harris NY)
2017-0418		
National		
1998	Plenary speaker, "The Large Brain in Autism: Explorations in Volumetric Measurement"	Plenary at International Congress of Schizophrenia Research, Santa Fe, NM.
2000	"Public Health Monitoring and Genetically Engineered Foods,"	National Academy of Sciences Standing Committee on Biotechnology, Food and Fiber Production,

2000	Plenary speaker, Biotechnology: "The Medical and Social Issues," "Technology, the Market and Responsible Citizenry," "Ethical, Philosophical and Spiritual Issues"	and the Environment." State of the World Forum, New York
10/2002	"Autism, Brain Morphometry and Cognitive Neuroscience."	NIH K-awardee annual conference, New York City, Interdisciplinary Council on Developmental and Learning Disorders." Tyson's Corner, Virginia
11/2002	"Neuroimaging of Autism."	
03/2003	"Science as domination or partnership with nature."	Medicine and the Planet: the coming age of ecological medicine. Seattle, Washington
2003	"Anatomical Neuroimaging: Methodological Considerations for Insights into Pathogenesis." The John Merck Fund invitational conference: Exploring Opportunities for Interdisciplinary Linkages in Neurodevelopment and Environmental Health Sciences.	The John Merck Fund invitational conference, Boston, MA
2004	"The Brain in Autism: Implications of the Biomedical Perspective." Defeat Autism Now General session plenary.	Washington DC and Los Angeles, California, Wheaton College
04/2004	"Autism in Images: The Brain and Beyond." .	Learning and Developmental Disorders Initiative, Collaborative on Health and the Environment, at NIH
05/2004	"The Science of Autism: Why we'll never understand autism if we don't consider the environment" , plenary.	
07/2004	"Autism Do Neurology, Neuroscience and Medicine Implicate the Environment?" Platform.	Autism Society of America, Seattle, Washington
09/2004	"Radiate white matter enlargement and abnormal asymmetry as autism endophenotypes." .	Autism Genetic Resource Exchange Board Meeting, Los Angeles, California
11/2004	"Gene-environment interactions and biological heterogeneity in learning and developmental disorders: A complex systems approach." , Platform presentation.	American Public Health Association Annual Meeting, on theme of "Health and the Environment, Washington, D.C., Cornell University
11/2004	"An integrative approach to the autism phenotype: exposition and reflections." lecture to course on the history of autism research.	Department of History of Science
2004	"Localization of White Matter Enlargement in Autism and its Implications.". Keynote speaker in six-hour symposium.	Autism Symposium, Cody Autism Center, Brookhaven National Laboratories in conjunction with SUNY Stonybrook and Cold Spring

01/2005	"Gene-Environment Interactions and Behavior, Including Brain and Chemical Abnormalities - an Integrative Model" – Invited webcast lecture inaugurating new webcast series.	Harbor Laboratories, , American Association on Mental Retardation,
02/2005	"The Autism Phenotype: Brain and Beyond." Opening talk at the Cure Autism Now foundation White Matter Think Tank.	Malibu, CA
03/2005	"Autism: Upstream, midstream and downstream" Cure Autism Now Dinner and fundraiser,	Beverly Hills, CA,
03/2005	"Localization of white matter enlargement in autism: White matter, inflammation and connectivity."	University of California, Los Angeles
03/2005	"Localization of white matter enlargement in autism: Thinking about the implications" Cure Autism Now chapter meeting,	Santa Monica College, Los Angeles,
04/2005	"Is the brain "downstream"? Implications of biomedical findings in autism. Defeat Autism Now.	Quincy, MA
05/2005	Brain changing for people with autism and their researchers: Putting recovery on the horizon." Autism One.	Autism One, Chicago
06/2005	"Models of autism and their implications for treatment."	MIND Institute, UC Davis Medical Center, Sacramento California,
09/2005	"Environment and Children's Disorders" and "Autism, Genes and Environment" – two talks at NIEHS public forum, Theme: Environment and Neurodevelopmental Disorders,	Twenty-Second International Neurotoxicology Conference (NTX XXII), Research Triangle Park, NC,
10/2005	"The Scientific Plausibility of Autism Recovery."	Autism Recovery Consortium, UCSF
10/2005	"From Specific Behaviors to Systemic Findings in Autism: White Matter and Beyond." Cure Autism Now Chapter meeting,	Boston, Westin Copley Plaza Hotel
04/2006	Autism, Biology and the Environment.	University of Rochester Department of Environmental Studies,
06/2006	"Autism: Parsing heterogeneity of causes and features."	Neurobehavioral Teratology Society, Tucson Arizona
09/2006	Autism: A Brain disorder or a disorder that affects the brain?" Plenary,	Neurotoxicology XXXIII, Durham, NC
06/2006	"Autism: A Brain Disorder or a Disorder that Affects the Brain" Keynote speaker,	Autism Society of America National Convention, Providence Rhode Island
2006	Widespread Changes in Autism: Tracking Brain and Body Implications.	Atlanta, GA, Society for Neuroscience Meet the Experts brunch,
10/25/2006	Autism as a case study of neuroimmunotoxicological injury: Levels of Evidence and their Implications. Claire Farr Memorial Lecture.	American Academy of Environmental Medicine
11/02/2006	"Could the brain be downstream? A whole body- systems approach to autism." CME course, "Clinical implications of Environmental Toxicology for	UC Davis-MIND Institute

01/17/2007	Children's Neurodevelopment in Autism. The Biology of Autism.	American Psychoanalytic Association, New York
04/18/2007	Autism and Biomarkers: What do we know and what do we need to know?	Institute of Medicine Autism and Environment Workshop
05/04/2007	Autism: A brain disorder or a disorder that affects the brain?	Minnesota Autism Society of America
05/05/2007	Disorders of cerebral white matter during development. In Structure-Function Correlations in Behavioral Neurology. Half-day course at American Academy of Neurology	American Academy of Neurology
06/2007	2007 Princeton Lecture Series Fellowship,	Eden Institute Foundation Princeton Lecture Series,
09/2007	The Emerging Whole-Body, Gene-Environment-Epigenetics Approach in Autism Research and Treatment, at "Priming for Prevention: An Ecological Approach to Research, Education and Policy,"	the second national conference of the Collaborative on Health and the Environment's Learning and Developmental Disabilities Initiative (LDDI), Harris, NY
2007	Center for Discovery, Harris NY, "Responding to Autism" Conference: "Autism – The Big Picture: Defining the Condition"	Harris, NY
2007	Center for Discovery, Harris NY, "Responding to Autism" Conference: "Autism – The Current State of Diagnostic Assessment"	Harris, NY
10/22/2007	Connectivity in Autism, Kennedy	Krieger Institute's Center for Autism and Related Disorders,
10/22/2007	Medical Evaluations in Autism, Kennedy Krieger Institute	Krieger Institute's Center for Autism and Related Disorders,
01/16/2008	American Psychoanalytic Association, Dialog between Psychoanalysis and Neurobiology, Approaches to Change in Autism.	American Psychoanalytic Association
02/2008	NPART (New Paradigms in Autism Research and Treatment) Symposium, Introduction to Medical and Systemic Features in Autism	University of California San Francisco
2008	Grand Rounds, New Approaches in Autism	Children's Hospital of Oakland, California,
03/2008	Autism—brain and body: From metabolism to function to structure	American Society for Neurochemistry, San Antonio TX,
04/18/2008	Wisconsin Symposium on Emotion: Framing autism as a systemic disorder that affects the brain: implications for body, emotion and consciousness.	Madison, Wisconsin
05/09/2008	National Association of State Directors of Developmental Disability Services (NASDDDS), plenary: New Medical & Biomedical Research and Implications for Services and Supports.	National Association of State Directors of Developmental Disability Services (NASDDDS Nashville, TN
05/23/2008	AutismOne: Treatment-Guided Research: Learning While Helping in a Complex Health Crisis.	Autism One Chicago

05/24/2008	AutismOne Law Day: Autism: A brain disorder or a disorder that affects the brain	Autism One Chicago
06/16/2008	Institute on Autism, Florida State University, Autism as a Whole-Body, Systemic Disorder with multileveled treatment targets (4 90 minute lectures: overview, environment, medical, integration)	Florida State University
2008	A model for integrating biomedical and behavioral approaches: Implications and applications (with Edward Carr, PhD)	Autism Society of America Conference,
2008	Autism: Introduction to a Whole-body systems approach.	Omega Institute Autism Symposium
11/14/2008	Autism: Brain, body and planet in common crisis. Keynote address, ,	Pangea Conference on Integrative Pediatrics, New York City,
02/2009	A whole-body approach to studying infants who may develop autism. .	. Institute for Science and Health, Florida,
2009	Carr E , & Herbert MR. (2009, March). A model for integrating biomedical and behavioral approaches to autism spectrum disorder.	Featured presentation at the annual meeting of the Association for Positive Behavior Support, Jacksonville, FL.
04/07/2009	“Environment” as an ongoing chronic active disruptor in autism: Evidence and Implications.	. Heinz Endowments Think Tank on Environment and Autism, Pittsburgh, PA, Atlanta, GA
04/18/2009	Progress in the whole-body model in autism: Strengthening impacts and results. Defeat Autism Now	
04/22/2009	Emerging Science and Rising Numbers in Autism: Implications and Opportunities to Help. 2009 Glenwood Lecture,	University of Alabama School of Public Health and Glenwood Inc Birmingham Alabama
05/06/2009	Can children with autism recover? Keynote,	YAI/National Institute for People with Disabilities Network, New York
05/22/2009	More than Developmental: Environmental Impacts as Chronic and What This Means for Treatment, Research and Policy.	Chicago, AutismOne conference,
05/22/2009	Overview of Autism Science. AutismOne Legal.	Autism One Chicago
05/28/2009	Linking Body, Brain and Planet: Systems Lessons from Autism. Keynote, .	16th International Symposium on Functional Medicine: Assessment and Treatment of Mood Disorders from a Functional Medicine Perspective,
07/2009	Brain, Body and Environment in Autism: Effective Responses to Unprecedented Challenges to Human Development. Opening talk in CME course	Autism Society of America national conference Chicago,
07/2009	What is treatment-guided research? Science that Makes a Difference Symposium,	Autism Society of America national conference, Chicago,
09/24/2009	Visiting Professor at Southwest Autism Research	Southwest Autism Research

	and Resource Center. Two talks: “Is autism potentially curable?” (for parents), and “ Towards a unifying approach to autism” (for physicians),	and Resource Center
10/2009	New developments in autism.	Defeat Autism Now Science Track, Dallas,
10/17/2009	Challenges in framing medical dimensions of autism.	American Academy of Pediatrics section on integrative medicine, Washington DC,
10/2009	Autism multidimensional findings and frontiers in multimodal pediatric imaging.	Symposium on Pediatric Neuroimaging, Society for Neuroscience, Chicago,
12/2009	Whole Brain and whole Systems in Autism.	Children’s Hospital of Atlanta
02/2010	Active Ongoing Processes Underlying Autism Spectrum Disorders. Grand Rounds,	Department of Psychiatry, University of Alabama, Birmingham AL,
2010	Autism in Infancy: Predetermined? or Produced by Active Treatable Processes? <i>Questions for Reflection</i> . Autism One Prediction and Prevention Symposium.	Chicago, IL
5/1/2010	How much of autism can be explained by active pathophysiological processes? Talk About Curing Autism annual conference keynote, May 1, 2010	Irvine, California
2010	Autism: Whole Body Medical Condition in a Troubled Planet. Training for HealthNet, the primary insurer for federal employees and the military, preparatory to their starting an autism program.	
2011	Autism and the Brain, Grand Rounds,	UMDNJ, Newark, NJ
2011	MISSING 2011 SOME PRESENTATIONS	
5/11/2012	Reframing Autism: From a lifelong brain defect to a chronic dynamic systemic condition. Weill-Cornell medical School, Pediatric Neurology annual autism conference: Growing Up with Autism: Life Transitions An Autism Symposium for Families and Professionals	Weill-Cornell Medical College, New York, NY
06/24/2011	How environment makes sense of whole body, whole lifespan, treatable features of neurodevelopmental disorders: the case of autism. Conference: Environmental Toxicity and Neurodevelopmental Disorders, Needs updating.	The Children’s Institute of Pittsburgh and Duquesne University
2012	Kiwi College – webinar – The Autism Revolution: Ten Tips Similar presentations during book tour	
4/6/2013	From Grasping Multi-Scale Transduction to Crowd-Sourcing Recovery	Thought Leaders Consortium, Personalized

2014-0123	Neurology Grand Rounds	Lifestyle Medicine Institute, Seattle, Washington Neurology Department, Baylor University School of Medicine, Houston TX
2014-0124	Pediatric Grand Rounds	U Texas San Antonio Autism Research Institute
2014-0304	Everyday Epigenetics Autism A Brain Disorder Or A Disorder That Affects The Brain? An Actionable Approach to Autism Based Upon Things We Already Know	weekly CME webinar
2014-0306	Transforming Autism Science and Standards of Care Through Crowd-Sourcing Community Practices	National Webinar, Integrative Psychiatry Symposium
2014-0413	Panel Co-Chair, Recent Advances in Translational Research in Autism	Science for the People: the 1970s and Today, University of Massachusetts, Amherst
2014-0428	The Neurological Incoherence of Biomedical Approaches to Autism	American Academy of Neurology, Annual Meeting, Philadelphia PA
2014-0524	Transcending Autism	Autism One conference, Chicago IL
2014-0630	Autism: Chronic Features and Dynamic Mechanisms	iCare4Autism, Conference, NYC
2014-0701	Autism is Actionable: Integrated, effective approaches can make a huge difference now	iCare4Autism, Conference, NYC
2014-0906	Lessons from Autism about Whole Body-Brain Health	US Autism and Aspergers Association, Springfield MO
2014-0920	Lessons from Autism about Whole Body-Brain Health	Brain Health Symposium, Fort Lauderdale, FL
2014-1014	Autism and EMF? Plausibility of a Pathophysiological Link	IAFNR conference, Las Vegas, NV
2014-1023	Whole Body Approach to Brain Health	American Academy of Environmental Medicine, Albuquerque NM
2014-1024	Polling Outcome Data to Assess Efficacy and Upgrade Treatment	American Academy of Environmental Medicine, Albuquerque NM
2014-1026	Symposium Chair, Nutrition for the Developing Brain	ACIM Conference, Orlando Florida
2015-1112	What is it about the brain that can be optimized through preconceptional, pregnancy and infancy strategies?	American College of Nutrition, Annual Conference, Orlando FL
2015-1114	Preconception, Pregnancy and Infancy Influences on Brain and Immune Outcomes: Autism and Beyond	American College of Nutrition, Annual Conference, Orlando FL
2016-0206	Wetlands of the Brain: Corruption and Redemption of Biophysical Systems Integrity	American College for the Advancement of Medicine, Las Vegas NV, Annual Meeting
2016-0503	Rationale for Research and Precautionary Intervention Regarding Potential Autism-EMF Link	Zen Brain Retreat #9, Upaya Zen Center, Santa Fe, NM Wi-Fi Panel, Pediatric Academic Societies,

2016-0607	Multifactorial approaches to autism causes, contributors and mechanisms	Baltimore MD Collaborative on Health and Environment, Panel on Autism and Acetaminophen (phone with slides)
2016-0721	Autism Pathways Analysis: A Functional Framework and Clues for Further Investigation	Collaborative on Health and Environment, Presentation by first and senior authors on recent paper in PLOS ONE by Y Wen and MR Herbert
2017-0418	Diagnostic and Classification Systems in Autism: Context and its influence on Methods and Objectives	New Jersey Autism Centers of Excellence. Conference held in Princeton, NJ
2018-0727	Movement Research with Fidelity to Practice-Driven Transformation	Movement IS Conference, Harvard Medical School
2020-0122	A Clinical and Public Health Perspective on the Microbiome: Gut and Beyond	MIT Enterprise Forum Cambridge Innovation Series Event: Going Beyond the Gut: The Future of Microbiome Therapeutics
2023-0213	Brain Health as a Multi-layered Ecosystem Issue: A Body-Brain-World Approach	Epidemic Answers Fundraiser, Vanderbilt Mansion, Fisher Island, Florida

International

01/2004	“Complexity in Neurobiology: Autism as a Case Study.”	2nd Biennial International Seminar on the Philosophical, Epistemological and Methodological Implications of Complexity Theory, Parallel Session on Complexity in Biological Systems, Havana, Cuba,
03/2004	“Asymmetry in the Autistic Brain.”	Fourth Neurology Conference, Santiago de Cuba
09/15/2006	Imaging and autism.	Second International Symposium on Schizophrenia: Göttingen, Germany
09/2007 2008 2008	Autism: Neurology and More, Connectivity and Pathophysiology in Autism Bridging Physiology, Function and Structure in Autism	Autism Asia, Hong Kong, Maastricht, Holland 8th National Autism Congress Rotterdam, Holland, (University of Utrecht
2008	Autism: Introduction to a whole-body systems approach.	Fudan University and Children’s Hospital, Shanghai,

2008	Autism: Environmental contributors.	People's Republic of China Fudan University and Children's Hospital, Shanghai,
2008	Autism: Medical considerations.	People's Republic of China Fudan University and Children's Hospital, Shanghai,
10/24/2008	Environmental contributors to autism. Keynote address, 2400 attendees	Geneva Institute Autism conference, Toronto, Canada,
03/17/2009	Autism as a neurological disorder. Keynote at Toronto Autism Treatment Network conference,	Toronto Autism Treatment Network conference
10/16/2009	Autism frontiers. AutismOne and Autism Canada conference,.	Autism Canada conference Toronto,.
03/17/2010	Active Ongoing Pathophysiological Processes in Autism Spectrum Disorder. "Nature and Nurture in Brain Development" Symposium,	Norwegian Consortium on Brain Development, Domus Medica, Institute of Basic Medical Sciences, University of Oslo
2010	Transcending the Gaps in Autism Research: Measuring and Promoting Brain Change.	Webinar for Children's Neurodevelopmental Fund, Brisbane Australia
2010	Autism and the Brain	MINDD Foundation, Sydney, Australia
2011 October	Autism: Complex, Chronic, treatable	Bioregulatory Medicine ThinkTank, Baden Baden, Gerany, Heel Corporation
2012 October	Autism: Complex, Chronic, Treatable	Autism Canada, Moncton, New Brunswick
2013 May	Brain health talk series	MINDD Foundation, Sydney, Australia
2013 June	Autism: Complex, Chronic, Treatable	Autism Treatment Trust, Edinburgh, Scotland, UK
2013 June	Autism is Actionable	Autism public meeting, House of Commons, Parliament, London, UK
2013 October	Autism: from static genetic brain defect to dynamic gene-environment modulated pathophysiology	European Congress of Neuropsychopharmacology, Barcelona, Spain
2013 December	Autism and EMF: Plausibility of a Pathophysiological Link	Collaborative on Health and Environment web interview
2014 January	Taking a Fresh Look at Autism: from static genetic brain defect to dynamic gene-environment modulated pathophysiology	Pediatric Neurology Grand Rounds. Baylor University, Houston, Texas
2014 January	Taking a Fresh Look at Autism: from static genetic brain defect to dynamic gene-environment modulated pathophysiology	Pediatric Grand Rounds, University of Texas San Antonio Health Center
2014 January	Autism is Actionable	Family Medicine and Ethics Grand Rounds, University of Texas San Antonio Health Center
2015-0428	EMF Degrades Aspects of Core Physiology	Canadian House of Commons,

	Already Disturbed by Other Environmental Impacts: The Case of Autism	Ottawa, Standing Committee on Health, Submission and Presentation
2015-0715	Reexaminando el autismo: De “cerebro roto” a enfermedad crónica tratable	Primer Congreso Médico Científico Centroamericano de Autismo - “El Autismo de Hoy”; San Jose, Costa Rica Medical Society
2015-0716	Un abordaje completo del cuerpo hacia la salud del cerebro	Primer Congreso Médico Científico Centroamericano de Autismo - “El Autismo de Hoy”; San Jose, Costa Rica Medical Society
2015-0717	El autismo y la vulnerabilidad ambiental: Cuerpo entero, cerebro entero, alimentos enteros, planeta entero	Primer Congreso Médico Científico Centroamericano de Autismo - “El Autismo de Hoy”; San Jose, Costa Rica Medical Society
2015-0717	El autismo es procesable: enfoques efectivos, integrativos, pueden hacer una gran diferencia	Primer Congreso Médico Científico Centroamericano de Autismo - “El Autismo de Hoy”; San Jose, Costa Rica Medical Society
2015-0802	Autism is Actionable: Integrated, effective approaches can make a huge difference now	Keynote, Shenzhen Convention Center, Autism Conference
2015-0811	Non-invasive in vivo Brain Biomarkers: Utility in Assessments of Gut-Brain Axis problems and interventions in Neurodevelopmental Disorders with special reference to Autism	Nanjing University Medical School Psychiatry/Neurology joint presentation with Liping Zhao, PhD
2016-0426	How environmental toxins can alter brain development and degrade ongoing brain function	Toxic Contamination of Children, Conference at United Nations in honor of the 30th Anniversary of the Chernobyl Nuclear Meltdown
2017-0603	Missing in Plain View: Ongoing Progress and Recovery in Stroke with NeuroMovement (talk co-delivered with Anat Baniel, MS)	Institute for Functional Medicine Annual International Conference Topic: The Dynamic Brain. Los Angeles, CA
2023-0727	Documenting Improvement from Reducing Exposures: Evolution of the Idea, Draft Study Design and Illustrative Method for Complex Data	International Commission for Biological Effects of EMF, Virtual Meeting

[Report of Clinical Activities and Innovations](#)

Current Licensure and Certification

1993-1996	MGH - Limited Licensure
1996-	Commonwealth of Massachusetts Board of Registration in Medicine Registration

1997- Board Certified in Neurology, with Special Competence in Child Neurology
Recertified 2007 and 2018
2004 American Board of Psychiatry and Neurology, Subspecialty Certified in
Neurodevelopmental Disabilities

Practice Activities

7/1996-7/2005	Major focus: neuropsychiatric disorders, neurodevelopmental disorders, epilepsy, headache. Complex consultations	Pediatric Neurology Clinic, McLean Hospital Department of Neurology	12hrs/week
7/1999-7/2006, 2006	Major focus: neuropsychiatric disorders, neurodevelopmental disorders, epilepsy, headache. Complex consultations	Pediatric Neurology Clinic, Massachusetts General Hospital	6hrs/week
9/2000-4/2006	Pediatric Neurology Attending Physician, Management of pediatric neurology inpatient service	Massachusetts General Hospital	15hrs/week
9/2005—12/2006	Pediatric Neurologist in Child Development Center, neurodevelopmental disorders, epilepsy, headache. Complex consultations	Cambridge Health Alliance, Cambridge Hospital, Harvard Medical School	12hrs/week
2014-15	Small pediatric neurology private practice	Higher Synthesis Health, Cambridge MA	4-8 hrs/week
2015-17	Expanded practice to include additional services and practitioners	Higher Synthesis Health, Cambridge MA	12-24 hours per week plus admin and research
2017-2022	Small pediatric neurology private part-time practice	Higher Synthesis Health, Cambridge MA	4-8 hrs/week

Report of Education of Patients and Service to the Community

Activities

2005-2008 Executive Committee, NPART (New Paradigms in Autism Research and Treatment), Commonwealth Institute, Bolinas, CA
2007-2009 Coordinator, Autism Recovery Documentation Project
2001-present Frequent lectures to parent groups listed under invited lectures.

Educational Material for Patients and the Lay Community

(selection of media appearances)
2006- Personal website containing publications and links: www.marthahebert.org

2011	Interviewed by Robert MacNeil on PBS in Part 3 of six part series on autism, http://www.pbs.org/newshour/bb/health/jan-june11/autism3causes_04-20.html , http://www.pbs.org/newshour/bb/health/jan-june11/herbertext_04-20.html	
July 8,2011	Interviewed by Bruce Gellerman on NPR "Living on Earth" show about recent paper on autism having stronger environmental than genetic influences	
2012	www.AutismRevolution.org , website for book, <i>The Autism Revolution</i> (Harvard Health Publications, 2012; see below under books)	
2012	Website, www.autismWHYandHOW , a site for understanding the rationale and support for multiple points of view about the nature, causes and ways to help autism, a framework for civil discourse amongst these points of view, and a pertinent repository of scientific literature.	
2012-	Blogs on above websites: WHY AREN'T WE THERE YET? Valuable but incomplete measures of brain changes in babies with autism HOUSEKEEPING AND HIGHER FUNCTIONS ARE MARRIED AND INSEPARABLE IN THE BRAIN Risk vs Cause: What's the difference between something causing autism versus increasing risk for autism? Obesity, Diabetes, and Autism Risk: Much That You Can Do Bigger than autism, Bigger than genes: A whole body approach to autism and what you can do Autism: 1 in 88 and what we can do New view of autism: Not locked in to genes, brain	
2016	Interview on Morning Edition, WBUR, to discuss new findings reported in just published PLOS ONE paper on Pathway Networks in autism	
2014-02	Full Potential Parenting	Summit
2014-05	Healthy Gut - interview	Healthy Gut Summit
2015-0110	Autism Intensive Summit	recorded in January for later broadcast
2015-0114	Autism Recovery Summit	recorded in January for later broadcast
2014-0804	Toxicity, Brain and Behavior: What should the Average Person Know	Web Summit by Deanna Minich
2015-0317	Whole Body Approach to Brain Health	Healing Our Children - Web Summit
2019-0311	NeuroMovement and the Brain	Podcast interview
2019-0325	WiFi in Schools: Biological Hazards	Shrewsbury Public Library, Massachusetts
2020-0821	Synergistic Body-Brain Upgrade	Future Life Now Summit, online

Books, monographs, articles and presentations in other media

2006	Time to Get a Grip: Autism and Environment	Author and guest editor	Autism Advocate (magazine of Autism Society of America), December 2006
2008	Treatment Guided Research: Helping people now with humility, respect and boldness	Author and editorial advisor	Autism Advocate (magazine of Autism Society of America), April, 2008
2012	The Autism Revolution: Whole-Body Strategies for	Book Author (with Karen Weintraub, writer)	Harvard Health Publications, and Random House – Ballantine Books, publication date 3/27/2012 (book

Making Life All It
Can Be

completed April, 2012; peer review
completed and book approved by
Harvard Health Publications July 2011)

Interviewed for a
variety of films
during past 15
years

Autism Now: Dr.
Martha Herbert
Extended Interview

PBS News Hour, Robin
McNeil, April 2011

http://www.pbs.org/newshour/bb/health-jan-june11-herbertext_04-20/

Report of Scholarship

Publications

Peer reviewed publications in print or other media

Research Investigations

1. Cher LM, Hochberg F, Teruya J, Nitschke M, Valenzuela R, Schmahmann J, **Herbert MR**, Rosas H, Stowell C. Therapy for paraneoplastic neurologic syndromes in six patients with protein A column immunoabsorption. *Cancer* 1995;75(7):1678-1683.
2. So GM, **Herbert MR**, Dooling EC, Buonanno F, Kosofsky BE, Ebb D. Multifocal embolic strokes following cardiac surgery in a protein C-deficient child. *Journal of Child Neurology* 1998; 13(Dec):629-31.
3. **Herbert MR**, Harris GJ, Ziegler DA, Adrien KT, Makris N, Kennedy D, Lange NT, Chabris CF, Bakardjiev A, Hodgson J, Takeoka M, Harris GJ, Tager-Flusberg H, Caviness VS. Abnormal asymmetry in language association cortex in autism. *Annals of Neurology* 2002;52(Nov):588-96.
4. **Herbert MR**, Makris N, Lange NT, Ziegler DA, Bakardjiev A, Hodgson J, Adrien KT, Steele S, Kennedy D, Harris GJ, Caviness VS. Dissociations of cerebral white matter, cerebral cortex, and subcortical volumes in autistic boys. *Brain* 2003;126 (pt 5):1182-92.
5. **Herbert MR**, Makris N, Lange NT, Ziegler DA, Bakardjiev A, Hodgson J, Adrien KT, Kennedy D, Filipek PA, Caviness VS. Large brain and white matter volumes in Children with developmental language disorder. *Developmental Science* 6(4), 2003; F11-F22.
6. **Herbert MR**, Ziegler DA, Makris N, Kennedy D, Filipek PA, Kemper T, Caviness VS. Localization of white matter increase in autism and developmental language disorder. *Annals of Neurology* 2004; 55(4):530-40.
7. Moore CM; Frazier JA; Seifert K.; Ahn MS; Venter JJ; **Herbert MR**, and Renshaw PF. Increased GABA in the anterior cingulate cortex of children and adolescents with bipolar affective disorder: a 4.0 T MRS Study. *Psychiatry*. 2004 Apr 15; 55:109S
8. Frazier JA, Chiu S, Breeze JL, Kennedy DN, Makris N, **Herbert MR**, Bent EK, Koneru VK, Dieterich M, Garroway J, Rauch SL, Melrose R, Stein N, Grant E, Sohma M, Klaveness S, Cohen BM, Seidman L, Caviness VS, Biederman, J. Structural brain magnetic resonance imaging of limbic structures in pediatric bipolar disorder. *American Journal of Psychiatry*, in press.
9. De Fosse L, Hodge SM, Makris N, Kennedy DN, Caviness VS, McGrath L, Steele S, Ziegler D, **Herbert MR**, Frazier J, Tager-Flusberg H, Harris GJ. Language-Association Cortex Asymmetry in Autism and Specific Language Impairment. *Annals of Neurology*, 2004 Oct 11; 56(6):757-766.
10. **Herbert MR**, Ziegler DA, Deutsch D, O'Brien L, Kennedy D, Filipek PA, Makris N, Caviness VS. Asymmetries in Autism and Developmental Language Disorder: A nested whole-brain analysis. *Brain*, 2005 Jan; 128(Pt 1):213-26..
11. Frazier JA, Breeze JL, Makris N, Giuliano AS, **Herbert MR**, Seidman L, Biederman J, Hodge SM, Dieterich ME, Gerstein E, Kennedy DN, Rauch SL, Cohen B, Caviness VS. Cortical Gray Matter

- Differences Identified by Structural Magnetic Resonance Imaging in Pediatric Bipolar Disorder. *Bipolar Disord* 7, 555-69.
12. Frazier J.A., Chiu S., Breeze J.L., Makris N., Lange N., Kennedy D.N., **Herbert M.R.**, Bent E.K., Koneru V.K., Dieterich M.E., Hodge S.M., Rauch S.L., Grant P.E., Cohen B.M., Seidman L.J., Caviness V.S. and Biederman J. Structural brain magnetic resonance imaging of limbic and thalamic volumes in pediatric bipolar disorder. *Am J Psychiatry* 2005 162, 1256-65.
 13. O'Brien L, Ziegler D, Deutsch C, Kennedy DN, Goldstein J, Seidman L, Hodge S, Makris N, Caviness VS, Frazier J, **Herbert MR.** 2006. Adjustment for whole brain and cranial size in volumetric brain studies: a review of common adjustment factors and statistical methods.. *Harv Rev Psychiatry*, 2006 May-Jun 30;14(3):141-51
 14. Szatmari, Peter: Autism Genome Project Consortium (**Herbert MR** is author #29 of 67), Mapping autism risk loci using genetic linkage and chromosomal rearrangements, *Nature Genetics*, 18 February 2007 (advance electronic publication).
 15. Anatomic brain magnetic resonance imaging of the basal ganglia in pediatric bipolar disorder. Ahn MS, Breeze JL, Makris N, Kennedy DN, Hodge SM, **Herbert MR**, Seidman LJ, Biederman J, Caviness VS, Frazier JA. *J Affect Disord*. 2007 Dec;104(1-3):147-54. PMID: 17532475
 16. Granpeesheh D, Tarbox J, Dixon DR, Carr E, **Herbert MR.** Retrospective analysis of clinical records in 28 cases of recovery from autism. *Annals Clinical Psychiatry*, 2009 21:195-204. This paper won the **American Academy of Clinical Psychiatrists 2011 George Winokur Research Award.**
 17. Isler JR, Martien KM, Grieve PG, Stark RI, **Herbert MR.** Reduced functional connectivity in visual evoked potentials in children with autism spectrum disorder. *Clin Neurophysiol*. Epub 2010 June PMID: 20605520
 18. **Herbert MR.** Environment and vulnerable physiology in autism. Supplement to European Neuropsychopharmacology (ENP), S.09.02, p. S177.
 19. O'Brien LM, Ziegler DA, Deutsch CK, Frazier JA, **Herbert MR**, Locascio JJ. Statistical adjustments for brain size in volumetric neuroimaging studies: Some practical implications in methods. *Psychiatry Research: Neuroimaging*: 193 (2011) 113–122.
 20. Goldman S, O'Brien LM, Filipek PA, Rapin I, **Herbert MR.** Motor stereotypies and volumetric brain alterations in children with Autistic Disorder. [Research in Autism Spectrum Disorders 7 \(2013\) 82–92](#)
 21. Khan S, Gramfort A, Shetty NR, Kitzbichler MG, Ganesan S, Moran JM, Lee SM, Gabrieli JD, Tager-Flusberg HB, Joseph RM, **Herbert MR**, Hamalainen MS, Kenet T (2013) Local and long-range functional connectivity is reduced in concert in autism spectrum disorders. *Proc Natl Acad Sci U S A*. 2013 Feb 19;110(8):3107-12. PMID: 23319621
 22. Kitzbichler, MG, S Khan, S Ganesan, MG Vangel, **MR Herbert**, MS Hamalainen and T. Kenet. "Altered Development and Multifaceted Band-Specific Abnormalities of Resting State Networks in Autism." *Biol Psychiatry* 77, no. 9 (2015): 794-804.
 23. Khan, S., K. Michmizos, M. Tommerdahl, S. Ganesan, M. G. Kitzbichler, M. Zetino, K. L. Garel, **M. R. Herbert**, M. S. Hamalainen and T. Kenet. "Somatosensory Cortex Functional Connectivity Abnormalities in Autism Show Opposite Trends, Depending on Direction and Spatial Scale." *Brain* 138, no. Pt 5 (2015): 1394-409.
 24. Goldman AW, Burmeister Y, Cesnulevicius K, **Herbert M**, Kane M, Lescheid D, McCaffrey T, Schultz M, Seilheimer B, Smit A, St. Laurent G III and Berman B (2015) Bioregulatory systems medicine: an innovative approach to integrating the science of molecular networks, inflammation, and systems biology with the patient's autoregulatory capacity? *Front. Physiol.* 6:225. doi: 10.3389/fphys.2015.00225
 25. Correlation of Fractional Anisotropy With Motor Recovery in Patients With Stroke After Postacute Rehabilitation. Wen H, Alshikho MJ, Wang Y, Luo X, Zafonte R, **Herbert MR**, Wang QM. *Arch Phys Med Rehabil*. 2016 Sep;97(9):1487-95. PMID: 27178097.
 26. Wen Y, Alshikho MJ, **Herbert MR.** Pathway Network Analyses for Autism Reveal Multisystem

- Involvement, Major Overlaps with Other Diseases and Convergence upon MAPK and Calcium Signaling, *PLOS ONE* 7 April 2016. PMID: 27055244
27. Mamashli F, Khan S, Bharadwaj H, Michmizos K, Ganesan S, Garel KA, Ali Hashmi J, **Herbert MR**, Hämäläinen M, Kenet T. *Autism Res.* 2016 Dec 2. PMID: 27910247. Auditory processing in noise is associated with complex patterns of disrupted functional connectivity in autism spectrum disorder.
 28. Parker W, Hornik CD, Bilbo S, Holzknecht ZE, Gentry L, Rao R, Lin SS, **Herbert MR**, Nevison CD. The role of oxidative stress, inflammation and acetaminophen exposure from birth to early childhood in the induction of autism. *J Int Med Res.* 2017 Apr;45(2):407-438. doi: 10.1177/0300060517693423. Epub 2017 Mar 16. Review. PMID: 28415925
 29. Wen Y, **Herbert MR**. [Connecting the dots: Overlaps between autism and cancer suggest possible common mechanisms regarding signaling pathways related to metabolic alterations.](#) *Med Hypotheses.* 2017 Jun;103:118-123. doi: 10.1016/j.mehy.2017.05.004. Epub 2017 May 5. PMID: 28571796

Peer-reviewed non-data presentations

1. **Herbert, MR**. Autism: a brain disorder or a disorder that affects the brain? *Clinical Neuropsychiatry* 2005 (special issue on autism models and their implications for treatment). 2:354-79.
2. **Herbert, MR**, Russo, JP, Yang, S, Roohi, J, Blaxill, M, Kahler, SG, McCoy, L, Ziegler, DA, Hatchwell, E. Autism and Environmental Genomics. *Neurotoxicology.* 2006:27, 671-84.
3. Anderson M, Hooker B, **Herbert M**. Bridging from Cells to Cognition in Autism Pathophysiology: Biological Pathways to Defective Brain Function and Plasticity. *American Journal of Biochemistry and Biotechnology* 2008 4 (2): 167-176.
4. Offering to share: how to put heads together in autism neuroimaging. Belmonte MK, Mazziotta JC, Minshew NJ, Evans AC, Courchesne E, Dager SR, Bookheimer SY, Aylward EH, Amaral DG, Cantor RM, Chugani DC, Dale AM, Davatzikos C, Gerig G, **Herbert MR**, Lainhart JE, Murphy DG, Piven J, Reiss AL, Schultz RT, Zeffiro TA, Levi-Pearl S, Lajonchere C, Colamarino SA. *J Autism Dev Disord.* 2008 Jan;38(1):2-13. PMID: 17347882
5. **Herbert MR**, SHANK3, the synapse, and autism. *N Engl J Med.* 2011 Jul 14;365(2):173-5. PMID: 21751912.
4. **Herbert MR**, Buckley JA. Autism and Dietary Therapy: Case Report and Review of the Literature. *Journal of Child Neurology* 2013 Aug;28(8):975-82. PMID: 23666039
5. **Herbert MR**. Everyday Epigenetics: From molecular intervention to public health and lifestyle medicine. *North American Journal of Medicine and Science.* 2013 6(3): 167-170.
6. **Herbert MR**, Sage S. Autism and EMF? Plausibility of a Pathophysiological Link. Part I *Pathophysiology.* 2013 Jun;20(3): 191-209; PMID 24095003.
7. **Herbert MR**, Sage S. Autism and EMF? Plausibility of a Pathophysiological Link. Part II 211-234. *Pathophysiology.* 2013 Jun;20(3):211-234. PMID 24113318.

Non-peer reviewed scientific or medical publications/materials in print or other media

1. **Herbert MR**. Women, the Family and Convivial Society. *CIDOC Cuaderno.* Cuernavaca, Mexico, 1972 (reprinted in *Zona carga y descarga.* Puerto Rico, 1973).
2. **Herbert, MR**. Women and Industrialism. *Esprit* 1973 Jul-Aug; 21:85-94. (Paris), translated from English publication in Cuernavaca, Mexico; subsequently reprinted in Holland, India and Japan.

3. **Herbert MR.** Evolutionary theory in ferment. *Telos* 1983;57:107-28.
4. Caviness VS, Lange NT, Makris N, Herbert MR, Kennedy D. MRI-based volumetrics: emergence of a developmental brain science. *Brain and Development* 1999;21: 289-95.
5. **Herbert MR.** Sophistry or Sensitive Science? *Wild Duck Review*, 2000.
6. Caviness VS, Makris N, Lange NT, **Herbert MR**, Kennedy D. Advanced applications of MRI in human brain sciences. *Keio Journal of Medicine* 2000;47(2):67-73.
7. **Herbert MR.** Genetics finding its place in larger living schemes. *Critical Public Health* 2002;12(3):221-36.
8. Kennedy D, Makris N, **Herbert MR**, Takahashi T, Caviness VS. Basic principles of MRI and morphometry studies of human brain development. *Developmental Science* 2002;5(3):268-78.
9. **Herbert MR**, Ziegler DA, Kennedy D, Filipek PA, Makris N, Caviness VS. MRI Structural Neuroimaging of Autism and Developmental Language Disorder: A Review and Commentary. *Advances in Clinical Neurosciences 2003*, Singh K.K. & Chandra P., eds. Association of Neuroscientists of Eastern India, Ranchi 2003.
10. **Herbert MR**, Ziegler DA. Response to Letter, White Matter Volume Increase and Minicolumns in Autism - Reply. *Annals of Neurology*, 2004 Sep; 56(3):454.
11. **Herbert MR.** Neuroimaging in disorders of social and emotional functioning: what is the question? *J Child Neurol* 2004 Oct;19(10):772-84.
12. **Herbert MR.** Autistic spectrum disorders in children (book review). *Annals of Neurology*, *Ann Neurol.* 2004 Dec; 56(6).
13. **Herbert MR.** More than Code: From genetic reductionism to complex biological systems. *Genetics and Governance*. Alan Peterson and Robin Bunton, eds. London, Routledge, 2005.
14. **Herbert MR.** Food free of genetic engineering: More than a Right. *Rights and Liberties in the Biotech Age*. Sheldon Krinsky and Peter Shorett, eds. Rowman & Littlefield, , 2005.
15. **Herbert MR**, Ziegler DA. Volumetric Neuroimaging and Low-Dose Early-Life Exposures: Loose coupling of pathogenesis-brain-behavior links. *Neurotoxicology*, 2005; 26(4):565-72.
16. **Herbert MR.** Large Brains in Autism: The Challenge of Pervasive Abnormality. *The Neuroscientist*, 2005 Oct; 11(5): 417-40.
17. **Herbert, MR.** Autism Biology and the Environment. *San Francisco Medicine* 2005 Nov-Dec., 78(8), 13-16.
18. **Herbert MR**, Caviness, VS, Neuroanatomical and Imaging Studies. Chapter 8 in Isabelle Rapin and Roberto Tuchman, eds. *Autism: A neurobiological disorder of early brain development*. London, Mac Keith Press, 2006, pp 115-140.
19. **Herbert MR.** Autism. Chapter for *Neurobiology of Disease*, Sid Gilman, editor. Elsevier Press, 2006.
20. **Herbert MR**, Clinical Implications of environmental toxicology for children's neurodevelopment in autism. *Future Neurology*, March 2007 2(2): 167-171(5).
21. **Herbert MR.** and Kenet T. Brain Abnormalities in Language Disorders and in Autism. *Pediatr Clin North Am* 2007; 54:563-583.
22. **Herbert MR**, Anderson M. An Expanding Spectrum of Autism Models: From Fixed Developmental Defects to Reversible Functional Impairments. Zimmerman A ed. *Autism: Current Theories and Evidence*. Humana Press, 2008, Chapter 18 of 18.
23. **Herbert MR.** Treatment-Guided Research: Helping people now with Humility, Respect and Boldness. *Autism Advocate*, 2008 50(1) 8-15.
24. **Herbert MR**, Kelley E, Kinsbourne M, Pandey J, Boorstein H, **Herbert MR**, Fein D. Can children with autism recover? If so, how? *Neuropsychol Rev.* 2008 Dec; 18(4): 339-66.
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27. **Herbert, MR.** Environment and vulnerable physiology in autism. *European Neuropsychopharmacology*, 2010 20(August), pp. S177-S177. doi:10.1016/S0924-977X(10)70159-0
28. **Herbert MR.** Neuroanatomy in Autism. *The Neuropsychology of Autism*. Fein D., ed. Oxford University Press, chapter 3, 2011, pp 47-76
29. **Herbert MR.** A Whole-Body Systems Approach to Autism. *The Neuropsychology of Autism*. Fein D., ed. Oxford University Press, Chapter 25, 2011, pp. 499-510.
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34. **Herbert, MR.** Translational implications of a whole-body approach to brain health in autism: How Transduction Between Metabolism and Electrophysiology Points to Mechanisms for Neuroplasticity. In Hu, Valerie, ed., *Frontiers in Autism Research, Diagnosis and Treatment*. 2014.
35. **Herbert, MR,** Submission to Canadian House of Commons Standing Committee on Health, April 28, 2015. Evidence Indicates Plausible Link between Autism and RF Radiation Exposure, reviewed in RADIOFREQUENCY ELECTROMAGNETIC RADIATION AND THE HEALTH OF CANADIANS, Report of the Standing Committee on Health, June, 2015, Ben Lobb, Chair.

Thesis

Herbert MR. The idea of evolution as a learning process in Marx, Piaget, and Habermas [dissertation]. Santa Cruz (CA): University of California; 1981.

Abstracts, Poster Presentations and Exhibits Presented at Professional Meetings

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- Conference, 9th Annual Symposium of the Child Neurology Section, International School of Neurological Sciences. Rome, Italy; 1999 Jun.
4. **Herbert MR**, Steele S, Makris N, Kennedy D, Lange NT, Bakardjiev A, Hodgson J, Takeoka M, Lee CJ, Caviness VS. Topological warping in autistic and normal children's brains. Society for Neuroscience Annual Meeting, 31.8, 2000.
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 8. **Herbert MR**, Ziegler DA, Adrien KT, Makris N, Kennedy D, Bakardjiev A, Hodgson J, Takeoka M, Harris GJ, Caviness VS. Asymmetries in language-related cortical regions in girls and boys with specific language impairment. Cognitive Neuroscience Society Annual Meeting, Session #D26; 2002.
 9. Ziegler DA, **Herbert MR**, Adrien KT, Makris N, Kennedy D, Bakardjiev A, Hodgson J, Takeoka M, Harris GJ, Caviness VS. Cortical asymmetries and language ability in boys with autism or specific language impairment. Cognitive Neuroscience Society Annual Meeting, Session #D26; 2002.
 10. Ziegler DA, **Herbert MR**, Hodge S, Deutsch C, Steele S, McGrath L, Kennedy D, Harris GJ, Tager-Flusberg H, Caviness VS. Disproportionate linear scaling of cerebral white to gray matter in boys with autism and developmental language disorder [platform presentation]. Society for Neuroscience Annual Meeting, Session #124.7; 2002.
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 12. **Herbert MR**, Ziegler DA, Makris N, Normandin JJ, Sanders HA, Kennedy DN, Caviness VS. Relationships between brain volume, corpus callosum area and volumetric asymmetries. Society for Neuroscience Annual Meeting, Session #647.2, 2003.
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 14. Bentwich J, Benveniste H, Ziegler DA, Maletic-Savatic M, Filipek PA, Kennedy D, Makris N, Caviness VS, **Herbert MR**. Rightward volume asymmetry in mentalizing networks in autistic cerebral cortex. IMFAR (Intl Meeting for Autism Research), Boston, May 2005, poster P1A.2.2.
 15. Ziegler DA, Makris N, Kennedy DN, Caviness VS, Filipek PA, **Herbert MR**. Corpus callosum volume is reduced relative to overall white matter volume in autism and developmental language disorder. IMFAR, Montreal, June 2006, Oral session 01.2.
 16. Deutsch CK, Ziegler DA, Braun N, Hodge S, Makris N, **Herbert MR**. Increased white matter volume is correlated with greater postcentral sulcal complexity in children with autism, DLD and controls. IMFAR, Montreal, June 2006, PS4.37
 17. Martien K, Grieve PG, Snidman N, Kagan J, Kenet T, **Herbert MR**. EEG coherence in autism: preliminary evidence for sensory processing effects on functional connectivity. Society for Neuroscience, November 2007.
 18. **Herbert MR**, Ringer A, Corrales M. Linking Toxicology literature to autism research: A bibliometric contribution to a translational research challenge. IMFAR 2008 London, Poster 110.
 19. Corrales M, Ringer A, **Herbert MR**. Potential autism research gaps suggested by analysis of

- literature and comorbidities. IMFAR 2008, London, Poster 109.
20. Martien K et al., EEG Coherence Abnormalities in Autistic Children Triggered by the Processing of Complex Visual Stimuli in Motion. IMFAR 2008, London, Poster 106.
 21. Granpeesheh D. et al, Retrospective Analysis of Clinical Records in 34 Cases of Recovery from Autism, IMFAR 2008, London, Poster 17.
 22. Kenet T, Orekhova E, Shetty N, Lee AKC, Vangel M, **Herbert MR**, Manoach D. MEG study of cortical coherence in autism. IMFAR 2008, London.
 23. Isler J, Grieve P, Martien KM, Stark RI, Snidman N, Kagan J, **Herbert MR**. Irregularities in event-related synchrony in autistic children. Society for Neuroscience. Abstract/Poster presentation November 2008.
 24. Martien KM, Grieve J, Isler, Snidman N, Kagan J, **Herbert MR**. Developmental changes in EEG coherence abnormalities in autistic children across visual stimulus conditions. Abstract/Poster Presentation, Society for Neuroscience, November 2008.
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 27. Ratai E, Shetty N, Ringer AP, **Herbert MR**. Single voxel magnetic resonance spectroscopy in high-functioning school-aged boys with autism spectrum disorder and typical development. IMFAR 2009, Chicago.
 28. Shetty N, Ratai E, Ringer AP, **Herbert MR**. Magnetic resonance spectroscopy in ASD: Review of regions investigated, findings, potential influence of methodology and directions for future research. IMFAR 2009, Chicago.
 29. Shetty N, **Herbert MR**. White matter integrity and volumetrics in the investigation of structural connectivity in school-aged high functioning boys with ASD. IMFAR 2009, Chicago.
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Narrative Report)

My path into child neurology and neurodevelopmental disorders began before my decision to go to medical school as a second career. A fascination with brain function and potential and its evolution and development, piqued in part by an extracurricular practice that I experienced as upgrading brain processing, had led me to write a doctoral dissertation on the evolution and development of learning processes, based in the later works of the great Swiss developmental psychologist Jean Piaget placed in their philosophical, systems and social theoretical contexts. Then, after my PhD, I continued for a while to work in history of science, and comparative (evolutionary) psychology as a postdoctoral colleague of several senior mentors at Harvard and the American Museum of Natural History in New York. This combination of areas of work stimulated an intense interest in neuroanatomy that led me to medical school as preparation for neurology, and the ensemble of these interest sharpened my focus into child neurology at MGH, where my systems orientation was found by the residency director interviewing me to be particularly interesting and of potential value to the field.

My initial clinical research at the MGH/Martinos Center for Morphometric Analysis sought answers to neurodevelopmental disorders in brain structure as probed through anatomical magnetic resonance neuroimaging, seeking cortical correlates of neurofunctional differences. Surprisingly, my strongest findings were not cortical but rather in the outer parts of white matter, and they were met by my mentor's initial but not sustained consternation (he was a cortical development expert), due to the seeming irrelevance of white matter to neurodevelopmental disorders defined by behavior (which to my mentor "had to be" cortical). The unexpectedness of these findings, combined with my clinical observations of the very common presence of somatic and systemic problems in these populations, led me to reflect carefully upon everything I thought I knew about brain dysfunction (as well as about autism). When I came upon a poster at the 2002 Child Neurology meeting identifying microglial and astroglial activation in post-mortem brain samples from individuals with autism, I couldn't help but think that this finding might be related to my finding of 37% increase in prefrontal white matter volume in high-functioning autistic children (this finding by the way made it onto the front page of the New York Times Science Times section). I published my first paper using a connectivity network abnormalities framework to interpret anatomical brain data in 2002, two years before Marcel Just's pathbreaking fMRI autism "underconnectivity" paper. In 2005 I co-organized a White Matter Summit sponsored by the Cure Autism Now Foundation (which had given me their first Innovator Award) alongside of Marcel Just, and also Carlos Pardo who had just published neuropathology findings of innate immune activation in autism brains, the findings from his 2002 poster mentioned above, with further replication. The core question we addressed was how these findings might be related to each other and how that might focus further efforts.

Further complicating my reflections and my growing restlessness with anatomical neuroimaging was reading the growing literature on brain impacts of even low-dose toxic exposures, concerns about environmental contributors to the at least apparent rise in numbers diagnosed with autism, and concerns about environmental deterioration more generally and how environmental factors might be contributing to brain and body illness in the broader population. I published a series of papers including "Autism and Environmental Genomics" which was the most highly cited paper in *Neurotoxicology* for two years (and have continued on this topic, including coauthoring the Environmental Genomics chapter in the authoritative Oxford University Press *Autism* textbook in 2011, publishing on environmentally vulnerable physiology and the coupling between metabolism and electrophysiology, and most recently a paper in PLOS ONE on pathway network interactions in autism that was viewed over 8,000 times in its first 8 months).

By 2005 I had arrived at a model of autism described in the title of a paper I published in that year titled “Autism: A Brain Disorder or a Disorder that Affects the Brain?”, which marked my move from an anatomical to a functional-centered approach. On this basis I started the TRANSCEND Research Program (MGH/Martinos/Neurology) where three similarly oriented PIs could efficiently share a phenotyping infrastructure to perform coordinated MRI, MEG and EEG work. The research work that followed from this approach included a) correlating EEG and/or MEG data with MRI diffusion tensor imaging and magnetic resonance spectroscopy, and b) conducting an intensive longitudinal multivariate study of development of infants at high risk for autism to test the model that autism develops over time from physiological deterioration rather than being genetically hardwired into the brain from the start, by tracking trajectories of development across brain and autonomic electrophysiology, metabolic biomarkers, microbiome, and neurofunctional assessments; this work, which required 60% effort but only 5% effort pay for several years (a local foundation promised us extra support on the basis of which I accepted the funding; but they then changed their minds), going down to 1% effort in the final year and now to no funding. Even with this abusively low level of pay, this work led to a patent filed by MGH due to our being able to predict autism outcome at 30 months by an EEG signature at 2-4 week of age (we were probably the first to move beyond a behavioral model – where infant studies began assessments at 4-6 months – to a physiological model where we began prenatally and then in earliest possible infancy).

In the 2006-7 funding resources for more exploratory physiological, electrophysiological and multidisciplinary research in autism started drying up. The pharmaceutical-funded Boston Autism Consortium’s founder expressed confidence that his group would discover all the genes within 18 months (which of course did not happen since the concept that it was just “the genes” was primitive though useful if you were looking to build lucrative companies around gene patents), and his people would not support medical or physiological research even though I had put together a 40-member group of faculty members at Boston’s major medical centers, including epileptologists, rheumatologists, gastroenterologists and other clinical care providers, to work together in a “Clinical Pathophysiology Working Group” on physiological underpinnings and medical care for autism’s medical comorbidities – they argued that their molecular, brain and behavior working groups, plus genetics, covered the waterfront. More recently such medical comorbidities have been more broadly acceptable to research and discuss, particularly with the recognition of the importance of neuroinflammation including by such leaders at MGH as Christopher McDougle, as well as Alessio Fasano with his pathbreaking work on celiac, gluten and microbiome.

A further wrinkle that entered my perspective on autism and on brain disorders more generally was becoming aware of the phenomenon of recovery from autism. These recoveries were being generated by “warrior parents” outside of medical institutions. I saw video evidence, and was part of the (to my knowledge) first documentary about this phenomenon (called “Finding the Words”), but since the ostensible recoveries did not occur based on single treatment agents but on dynamic complex multitarget sequenced interventions, no one had figured out how to conduct rigorous research on this phenomenon itself using standard clinical trial models (which are designed to assess shorter term impact of single interventions, but not to investigate strategies leading to a trajectory toward recovery over time). Even so, the presence of recoveries seemed to force a choice between on the one hand “seeing what you believe” which would mean denying that this could possibly occur and getting on with the clinical and research agendas as usual that the NIH would fund – and on the other hand “believing what you see” which would mean a) trying to figure out what the underlying mechanisms of autism might be that would allow “recovery” from this previously presumed “hardwired” disorder to happen, b) searching for appropriate research designs, and c) aiming to reverse engineer the processes seeming to lead to recoveries, looking for mechanisms suggesting avenues of intervention. As I further articulated these thoughts, I came to realize that I needed to move from doing studies describing the problems and deficits to studies tracking how they change with intervention.

My acceptance, after considerable hesitation, of an invitation from an editor at Harvard Health Publications to write a public-facing autism book under their label, had a major impact on my life and work. On the one hand, it gave me a chance to explain a systems biological approach to autism in language that the general public could understand as well as find practically useful – and it also gave me a chance to elaborate the public health implications of a physiologically grounded “autism as something that develops physiologically” approach and practical, safe lifestyle changes that might reduce severity of behaviors and somatic/brain complications—what I’ve been calling “everyday epigenetics.” On the other hand, it took time away from my research as well as pushed me to deeply rethink what I was trying to do with my time, energy, technologies and experiments.

A further piece of my reflections in that period related to the difficulties in implementing my funded brain imaging research agenda, due to a number of factors. I had thought that the Martinos Center would be the ideal place to study the interrelationship between electromagnetic brain signaling (using MEG) and metabolic brain processes (using two specialized magnetic resonance spectroscopy techniques – a spectral-edited glutathione spectroscopy technique, and a 31-Phosphorus coil to measure bioenergetic metabolites that I had had custom built). This project looked like it could be the culmination of our intentions in setting up the TRANSCEND Research program in taking a multidisciplinary rigorous approach to correlations across different levels of brain functioning). However, in implementing this project, I experienced major logistical delays outside of my control, including extended lateness in production of my 31-Phosphorus coil (having to wait over 6 extra months beyond targeted finish date for a relatively small job), several 6+ months shutdowns for upgrades of the only Martinos scanner that could implement our work, followed by months of further wait while our particular custom protocols were re-initiated (with some critical ones not re-initiated after a wait approaching a year and with one that was taken down and inadvertently not restarted for a few months without our being informed, so that when we turned it on with a valuable subject in the scanner it didn’t work). After the upgrades, our protocol, which could previously all be done on one scanner, needed to be implemented not on one but on two or three scanners at different times, making scheduling for special needs children just about impossible. An additional challenge is that the Clinical Research Center at the Martinos Center has never provided nursing support for pediatric research since they close at 3:30 pm — before school children can get to Martinos; and institutional efforts to change this have not succeeded. These obstacles to the kinds of clinical support for pediatric research that were readily available to research involving adults forced me to wonder whether my imaging research agenda, at least as it was formulated in my last grant proposal for this work, was feasible at the Martinos Center or at Mass General (which is an adult-centered hospital with a relatively small pediatric service), where there were reducing physical infrastructure needed to conduct biosample research. Their more recent decision to get rid of the mock scanner used to behaviorally prepare children for staying still in a scanner sealed my sense that trying to do root-cause-oriented pediatric (and especially pediatric special needs) neuroimaging at the Martinos Center was too fraught with logistical risks to be feasible.

Meanwhile, my interests in autism were becoming progressively more subsumed to concerns more broadly about the relationships between human chronic illness (with autism being but one of many examples) and environmental degradation. When I was in this frame of mind, on a more global level, early in 2016, when several papers from top-tier scientific journals shocked me by extrapolating present environmental trends to horrific outcomes sooner and more severe than I had ever imagined, I felt forced to reflect on global scale challenges and their implications for my own and everyone’s lives and choices. The top two predictions (ranked by the extent to which they shocked me) were that there would be no more skeletal fish in the oceans by 2048, and that severe oxygen depletion in the oceans would compromise marine life by 2030. Such extremely dire predictions were not entirely new to me, as I had read the 2005-6 UN Millennium Ecosystem Assessment report—in which 1355 scientists stated that conditions allowing continuation of life on earth could not be guaranteed for more than two generations. Back in 2006, when this report was released, the contrast between press coverage abroad (e.g., the two

leading British newspapers each put up whole websites around the report) and in the US (where the New York Times gave it two paragraphs and it otherwise went basically unnoticed) disturbed me greatly. At least now, a decade later, there is more widespread awareness of our ecological plight and less turning away from those who bring these issues up. But the extrapolation that the skeletal fish population would soon decline to zero was hard to take. I had never imagined “zero fish” in the oceanic vastness; and the idea/prediction that the oceans were so close to a major tipping point shook me up existentially and decisively, at a time when my questioning had become much deeper than a decade earlier. These horrific changes might well come in my own lifetime and that of many or most human beings on earth.

As a neurologist, I can't help but reflect upon the contribution of the human brain to our present planetary crises. As someone trained in systems thinking, I see a distressing tendency for us, at least in some cultures, to be much more comfortable looking at little pieces that we can control and specify rather than influences that propagate in not fully predictable ways through larger interconnected dynamical systems. At the same time, I see enormous hope in our neuroplasticity, provided we overcome what is in the way of our harnessing it. Based on the institutional obstacles to interdisciplinary and pediatric research at Mass General, alongside of my great respect for successful community-based regenerative biocultural practices including “bodywork” and regenerative/biodynamic farming, I chose to shift my center of gravity to work in the latter context. This was consistent with the mission of the Higher Synthesis Foundation, which I had founded in 2011.

In practical regard to neuroplasticity, I served as research adviser to the ABM@NeuroMovement@neuroplasticity project (which evolved out of the work of Moshe Feldenkrais) whose core advisers were Michael Merzenich, a Kavli Prize winner and one of the founders of the field of neuroplasticity and a now world-famous neuroanatomist, Jill Bolte Taylor, who had been at McLean Hospital (Harvard's flagship psychiatric Hospital, where I'd had a part time clinical practice for 11 years, who had a hemorrhagic stroke in 1996 treated at MGH, and fully recovered from its sequelae over 8 years using methods similar to “NeuroMovement” (as related in her best-selling book and very popular TED talk *My Stroke of Insight*). I became fascinated with this practice's non-linear systems dynamical brain-oriented approach to rehab, and the unexpectedly large amount of change it induces in children and adults with brain damage or malformation, concerns central to me as a child neurologist. I chose to study it directly by taking the training, and as a researcher saw that it posed many of the same research challenges I'd already addressed. It required a combination of my research design, anthropological and philosophical approaches to help bring this approach to the level where its methods and pedagogy could contribute to upgrading outcomes and cutting costs in these conditions. It was also gratifying to me in that it connected a decades-long hobby of training in movement practices with my profession as a child neurologist and neuroscientist. I wrote an IRB protocol for implementation of two aspects of this training in a Canadian school district whose leadership had become very impressed with ABMNeuroMovement's model and impacts. The study had two arms – a school-wide training for aides and teachers, and a small hands-on pilot project for children with autism. This project started in the fall of 2019, was interrupted in March of 2020 by the pandemic which proscribed hands-on body practices. It is reestablishing itself now with the addition of the brilliant neurocognitive mathematical psychologist Rutgers-based Elizabeth Torres and the mathematical analysis of movement sensor data in correlation with video and functional tracking, whom I'd identified in 2016 as having a mathematical approach that was perfect for tracking the types of intervention-driven changes achieved by the ABMNeuroMovement practice and framework. Early in the period when no hands-on work could be done I and a colleague played an instrumental role in designing online questionnaires for a web-based parent/caregiver training program based on these principles, that is now ongoing.

With further regard to finding appropriate research methods for documenting and assessing multitargeted treatment strategies, I served for 6 years as PI and chair of the Medical and Scientific Advisory Board of the Documenting Hope project, which wanted to bring attention toward what it considers to be more

effective approaches to address the chronic disease diagnoses that 1 in 2 American children now have. I see what is happening to our children as a facet of what is happening to our planet. This project's study design, for which I wrote the IRB protocol, involved prospective longitudinal multivariate data collection and analyses and documentary film to provide initial data for designing a larger, community-based test of the hypothesis that environmentally informed interventions will produce better outcomes than targeting symptoms without addressing underlying lifestyle and environmental contributors. So, my research attention turned to how to generate, measure, explain and increase the likelihood of outcomes that go against the declining trends in the systemic and brain health of human beings on our wounded planet. Such measures included some I had already deployed, but now wish to utilize in a more engaged context

The pandemic altered my priorities profoundly. I avidly followed science and the context of science as it unfolded. I realized that something was going on at a scale and of a kind different from what I had been attending to. These concerns augmented the shock I described above about threats to life in the oceans. I became increasingly restless regarding my circumstances and current choices. In the middle of 2022, I got an opportunity to leave the Boston area and work on a project unifying health promotion with ecosystem regeneration in a context of regenerative agriculture in the setting of a traditional community in rural Central Tennessee where the children were in unusually good shape cognitively and motorically, something that meant a lot to me as a child neurologist. This picked up a thread that had been present but not acted upon throughout my entire medical career regarding farming, as my father had bought a farm in Northern New York State 50 years ago, right around the time I started graduate school, and I inherited it when he died – and this plus early exposure to a newly launched biodynamic farming training program where I was in graduate school at UC Santa Cruz piqued a lifelong but until recently unfulfilled interest. The opportunity to pursue this work in a more temperate climate, in collaboration with a scientist colleague from the Documenting Hope Project who was an evolutionary biologist and naturalist with extensive farming skills, led me to shift to new priorities where research and health promotion are grounded directly in earth-related endeavors. The project we are developing is under the Higher Synthesis Foundation. In my time in this beautiful place with its vibrant, cohesive community, in the setting of great unrest and instability more broadly, I am reevaluating the role of science in my overall endeavors. I am finding company and collaboration in other researchers who have been engaging in similar reevaluations.

In summary, I have outlined a career trajectory from an interdisciplinary humanities and social science PhD at UC Santa Cruz centering around development and evolution, to becoming a child neurologist and engaging in neurodevelopmental neuroimaging, to systems approaches to an expansion into autism pathophysiology and environmental genomics that were applicable to chronic illness more generally, to my present orientation more community-facing regenerative research which, while still addressing similar underlying themes, more explicitly links strategies to address physiological problems in neurodevelopmental disorders and pediatric chronic illness to our present health and environmental challenges, which I am now addressing in a rural rather than an urban environment including connecting with both local traditional farmers and various groups and leaders in sophisticated strategies to recover ecological and nutrient rich growing of food in healthy cultural contexts. The times at present are truly novel, full of instabilities and unpredictable. I look forward to a pooling of efforts in fresh, creative ways to rise to the evolutionarily unprecedented challenges and dangers we face, which I believe mandates us to upgrade our awareness and coherence so we can become part of truly regenerative solutions.