

**Harvard Medical School
Curriculum Vitae**

Date Prepared: 07/01/2023
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Place of Birth: Palo Alto, California

Education

1984	B.A. Departmental Honors	Human Biology and Humanities Honors Program	Stanford University
1994	Ph.D.	Neuroscience (Ph.D. Advisor: Len Kaczmarek)	Yale University Graduate School of Arts and Sciences
1994	M.D. cum laude	Medicine	Yale University School of Medicine

Postdoctoral Training

7/94-6/95	Intern	Internal Medicine	Massachusetts General Hospital
7/95-6/98	Resident	Psychiatry	McLean Hospital
7/98-6/2000	Fellow	Functional Neuroimaging	McLean Hospital
9/12-8/13	Visiting Scholar	Cognitive Neuroscience	University College of London

Faculty Academic Appointments

7/98-4/02	Instructor	Psychiatry	Harvard Medical School
5/07-4/14	Instructor, part-time	Psychiatry	Harvard Medical School
5/14-present	Lecturer, part-time	Psychiatry	Harvard Medical School

Appointments at Hospitals/Affiliated Institutions

7/98-3/02	Assistant Psychiatrist	Psychiatry	McLean Hospital,
7/98-3/02	Assistant Physiologist	Brain Imaging Center	McLean Hospital
5/07-present	Assistant Psychiatrist, part time	Psychiatry	McLean Hospital

Professional Societies

1996-	American Psychiatric Association	Member
1996-	Massachusetts Medical Society	Member

2001-	American Board of Psychiatry and Neurology	Diplomat
2010-	Organization for Human Brain Mapping	Member
2017-	International Society for the Study of Women's Sexual Health	Member
2023-	Yale Medical Alumni Association Board	Executive Board Member

Editorial Activities

1997-2002	Assistant Editor	<i>Harvard Review of Psychiatry</i>
2011	Ad hoc Reviewer	<i>Archives of General Psychiatry</i>
2013	Ad hoc Reviewer	<i>NeuroImage: Clinical</i>
2014	Ad hoc Reviewer	<i>Biological Psychiatry</i>
2015	Ad hoc Reviewer	<i>Autism Research</i>
2018	Ad hoc Reviewer	<i>Neuroscience and Biobehavioral Reviews</i>
2019	Ad hoc Reviewer	<i>Scientific Reports</i>

Honors and Prizes

1985	Departmental Honors	Humanities Honors Program	Stanford University
1985	Firestone Medal for Excellence in Research	College of Arts and Sciences	Stanford University
1987-1994	Medical Scientist Training Program Fellowship	School of Medicine	Yale University
1994	Janet M. Glasgow Memorial Achievement Citation	School of Medicine	Yale University
1996	Outstanding Resident Award	Psychiatry	National Institutes of Mental Health-UpJohn
1998	Dupont-Warren Fellowship	Psychiatry	Harvard Medical School
1998-2000	Young Investigators Award	Neuroimaging	NARSAD
2011	Nominated for the Best Poster Award	Functional Imaging	International Society for Magnetic Resonance in Medicine
2017	Best Poster in Psychiatry	MGH Research Day	Harvard University

Report of Funded and Unfunded Projects

Funding Information

Past

1998-2000	Dupont Warren Fellowship: Brain Imaging Center, McLean Hospital, Mentor: Debbye Yurgelun-Todd. (40,000).
1998-2000	Cognitive Effects of Cigarette Smoking: A functional MRI Study. NARSAD Young Investigators Award (60,000.00).

Current

2015-present	MR Methods Development at 3-Tesla 2008P002160; PI: Lukas; Role: Co-Investigator; Funding: Departmental Funds	
2015-present	MR Methods Development at 4-Tesla 2008P001842; PI: Olsen; Role: Co-Investigator; Funding: Departmental Funds	
2015-2018	Homeostatic and Hedonic Food Motivation Underlying Eating Disorder Trajectories 2014P000310; PI: Misra, Madhusmita; Role: Co-Investigator; Funding: NIH	

Laboratory and Other Research Supervisory and Training Responsibilities

2009-2014	Supervised senior research assistant	Training and supervision of all aspects of the research protocols, including data acquisition and analysis.
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Formal Teaching of Residents, Clinical Fellows and Research Fellows (post-docs):

2017-2019	Supervise Kendra Becker, post-doctoral fellow, 2hrs/wk	MGH/HMS
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Formal Teaching of Peers (e.g., CME and other continuing education courses)

1997	Smoking and Psychiatric Illness Harvard Medical School	Single presentation Boston, MA
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Local Invited Presentations

2008	Presentation to the Herbert Benson Institute, <i>fMRI based neurofeedback</i> Harvard Medical School
2013	Presentation to the Harvard Interdisciplinary Oxytocin Research initiation titled: <i>An ancient neuropeptide, active inference, and autism.</i>
2018	Presentation to the Center for Depression, Anxiety and Stress at McLean Hospital, <i>Predictive Coding and a Sense of Self</i>
2018	Presentation to the Harvard Brain Interdisciplinary Lecture Series, <i>Is Oxytocin a Coincidence Detector?</i>

Report of Regional, National and International Invited Teaching and Presentations

Invited Presentations and Courses

Regional and International

2007	Presentation to the annual meeting for the Fellows of McLean Hospital Belmont, MA, titled: <i>The future of fMRI based neurofeedback for psychiatric symptoms.</i>
2012	Presentation to the Theoretical Neurobiology meeting at the University College of London titled: <i>Group independent component analysis of emotional auditory stimuli</i>
2013	Course presentation to the graduate students at the Wellcome Trust Functional Imaging Laboratory Statistical Parametric Methods course at the University College of London titled: <i>Psychophysiological Interactions</i>
2013	Presentation to the Theoretical Neurobiology meeting at the University College of London titled: <i>An ancient neuropeptide, active inference, and autism.</i>

- 2014 Presentation to the Harvard Interdisciplinary Oxytocin Research Initiative meeting at Massachusetts General Hospital, Neuroendocrine Unit, Harvard Medical School, titled: *Oxytocin, interoception and autism.*
- 1/24/18 Discussant for the Harvard Brain Science Initiative on *Oxytocin and Neural Plasticity*
- 1/29/20 Yale SOM presenter for the *Women in Management and Health Care* and the *Life Sciences* organizations on *Defining Success.*
- 2/26/20 Panelist for the *Disparities in Women's Health Care Conference*, Yale SOM
- 6/11/23 Presentation to the International Psychoanalysis Society, Trieste Italy, *Interoception and a sense of self in Autism.*

Current Licensure and Certification

- 1994- Massachusetts Medical License
- 2001- Board certified, American Board of Psychiatry and Neurology
- 2011- Board recertification, American Board of Psychiatry and Neurology

Report of Technological and Other Scientific Innovations

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| Drug-Enhanced Neurofeedback Using Functional Magnetic Resonance Imaging | Inventor, U.S. Patent Application No. 61/111,147, filed November 4, 2008. Abandoned 2016. |
| Drug enhanced transcranial magnetic stimulation | Inventor; Co-inventors: Karl Friston and Hae-Jeong Park
Invention Disclosure Form on file with Partners. |
| Treating Sexual Dysfunction | Inventor, U.S. Patent No. 10,709,756. Issued July 14, 2020. |
| Treatment of Sexual Dysfunction, CIP | Inventor, U.S. Patent Application No. 15/969,471, filed May 2, 2018. |
| Treatment of Sexual Dysfunction | Inventor, U.S. Patent Application Nos. 62/443,731, filed January 8, 2017; 62/465,592, filed March 1, 2017; 62/467,328, filed March 6, 2017. |

Report of Board Activities

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| Stanford Alumni Outreach Leadership Board | London and New England (2012-2016) |
| Stanford Club of Boston | Board Member (2016-present) |
| Stanford Reunion Committee | Co-Chair, 35 th reunion |
| Yale School of Management Advisory Board | Board Member (2018-present) |
| Stanford Parents Advisory Board | Board Member (2018-present) |
| American Reparatory Theater (A.R.T.) | Advisory Board Member (2018-present) |
| Executive Board for the Association for Yale Alumni in Medicine | Executive Board Member (2023-present) |

Peer reviewed publications in print or other media

Research Investigations

- Fleming, J. E., **Quattrocki**, E., Latter, G., Miquel, J., Marcuson, R., Zuckerkandl, E., Bensch, K. G. "Age-dependent changes in protein of *Drosophila melanogaster*." *Science*, 1986.
- Knox, R. J., **Quattrocki**, E. A., Connor, J. A., Kaczmarek, L. K. "Recruitment of Ca²⁺ channels by protein kinase C during rapid formation of putative neuropeptide release sites in isolated *Aplysia* neurons." *Neuron*, 1992.
- Quattrocki**, E. A., Marshall, J., Kaczmarek, L. K. "A *Shab* potassium channel contributes to action potential broadening in peptidergic neurons." *Neuron*, 1994.
- Quattrocki**, E., Baird, A., Yurgelun-Todd, D., "The biological aspects of the link between smoking and depression." *Harvard Review of Psychiatry*, 2000.
- Quattrocki**, E. and Friston, K.J., "Autism, oxytocin, and interoception." *Neuroscience and Biobehavioral Reviews*, 2014.
- Jang, C., **Knight, E.Q.**, Pae, C., Park, B., Yoon, S.A., Park, H.J. "Individuality manifests in the dynamic reconfiguration of large-scale brain networks during movie viewing." *Scientific reports*, 2017.
- Cho, H., Kim, C.H., **Knight, E.Q.**, Oh, H.W., Park, B., Kim, D.G., Park, H.J. "Changes in brain metabolic connectivity underlie autistic-like social deficits in a rat model of autism spectrum disorder." *Scientific reports*, 2017.
- Lee D, **Quattrocki Knight E**, Song H, Lee S, Pae C, Yoo S, Park HJ. "Differential structure-function network coupling in the inattentive and combined types of attention deficit hyperactivity disorder." *PLoS One*, 16(12), Dec 1, 2021.

Thesis

- Quattrocki**, E.A. Leonardo da Vinci: The relationship between his anatomical studies and figurative art [Humanities Honors thesis]. Stanford, CA: Stanford University; 1985.
- Quattrocki**, E.A. The Molecular and Electrophysiological Characterization of an *Aplysia* Potassium Channel that Contributes to Action Potential Broadening in the Bag Cell Neurons [dissertation]. New Haven, CT: Yale University; 1994.

Abstracts, Poster Presentations and Exhibits Presented at Professional Meetings

- Quattrocki**, E.A., Baird, A.A., Hanson, R., Renshaw, P.F., Cohen, B.M., Yurgelun-Todd, D.A. "Effects of Smoking on Frontal Activation: An fMRI Study." *NeuroImage* 1998; 7:S111.
- Quattrocki Knight E**, Fan X, Frederick B, Kaufman M, Cohen B, "Self-organizing group level Independent Component Analysis reveals task-related activity as well as resting state networks during auditory stimulation." Presented at the 19th annual meeting of the International Society for Magnetic Resonance in Medicine in Montreal, Canada. May 12, 2011.
- Quattrocki**, E.A., Nickerson, L., Lowen, S., Fan, X., Frederick, B., Cohen, B., "Independent component analysis of passive listening reveals alterations in inter-network connectivity that correlate with emotional valence." Presented at the 4th annual Connectivity Conference, MIT, 2014.
- Kendra R Becker*, **Elizabeth Quattrocki Knight***, Franziska Plessow, Christopher J. Mancuso, Alyssa M. Izquierdo, Meghan Slattery, Kathryn A. Coniglio, Charu Baskaran, Elisa Asanza, Reitumetse L. Pulumo, Jennifer J. Thomas, Thilo Deckersbach, Madhusmita Misra, Elizabeth A. Lawson, Kamryn T.

Eddy, Ph.D. “Changes in Resting State Connectivity in Frontal Networks are Differentially Associated with Eating Pathology Before and After a Standardized Meal.” (* indicates co-first author). Presented to the Eating Disorders Research Society, Germany, 2017.

Narrative Report (limit to 500 words)

My background as a clinical psychiatrist and my training in both basic neuroscience and functional imaging allows me to integrate basic neuroscience with clinical research. My work targets two complementary areas.

The first explores the neuromodulation or effective connectivity between networks, both cognitive and emotional. Understanding the integration among exteroceptive and interoceptive networks could reveal the hierarchical and parallel processing underlying awareness of one’s own emotional state and the empathic ability to intuit the emotional state of others. Understanding the functional integration between exteroceptive and interoceptive processing relates to disease states that manifest when this type of processing fails such as anxiety disorders, autism, psychosis, dyslexia and mood disorders. Exploring the integration of cognitive networks, particularly the hemispheric divisions between the left and right auditory processing pathways could lead to more therapeutic interventions for developmental conditions such as dyslexia and autism.

The second focus of my research endeavors to harness the functional plasticity of the neuroendocrine system and how to understand neuropeptide influences on the integration between cognitive, interoceptive and exteroceptive processing networks. Analytic methods such as independent component analysis, psychophysiological interactions, and dynamic causal modeling are used to identify networks and explore the functional and effective connectivity between these networks and how neuropeptides such as oxytocin might modulate connectivity.

Collaborations include faculty in the Brain Imaging Center at McLean, the Neuroendocrine Unit at MGH and the Wellcome Trust Functional Imaging Laboratory at the University College of London. Over the years, I have developed an expertise in combining basic neuroscience, particularly neuropeptides, with translational applications of neuroimaging.

Currently, I am writing a nonfiction book on Theory of Mind.