

## Erin L. Rich, MD, PhD

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**Professional 2017 – present** Assistant Professor (Tenure-track), Department of Neuroscience and Friedman Brain Institute, Icahn School of Medicine at Mount Sinai

**Date of appointment: April 1, 2017**

**2015 – 2017** Assistant Project Scientist, Helen Wills Neuroscience Institute, University of California, Berkeley

**2014 – 2017** Affiliate Researcher, Department of Neurological Surgery, University of California, San Francisco

**2010 – 2015** Post-doctoral Fellow, University of California, Berkeley  
Mentor: Joni Wallis, PhD

2014 – 2017 Co-mentor: Edward Chang, MD, UC San Francisco

**Education MD 2010, Mount Sinai School of Medicine, New York, NY**  
Medical Scientist Training Program (MSTP), 2002 – 2010

**PhD 2008, Mount Sinai School of Medicine, New York, NY**  
Department of Neuroscience

**BS 2002, Tufts University, Medford, MA**  
Majors in Biology and Classical Studies

**Awards & Research Support 2019 – 2021 Brain and Behavior Research Foundation NARSAD Young Investigator Grant** *The Neural Basis of Expectation and Bias in Large-scale Brain Networks*

**2018 – 2021 Whitehall Foundation Research Grant** *Neural mechanisms of self-generated mnemonic strategies*

**2018 – 2022 Pew Scholars Program in Biomedical Sciences,** *The neural basis of expectation and bias in large-scale orbitofrontal networks*

**2018** Schneider-Lesser Foundation Junior Faculty Fellowship

**2015 – 2020 K08 Mentored Clinical Scientist Research Development Award,** NIH/NIDA, *Multi-Scale Orbitofrontal Networks Underlying Reward Processing*

**2012 – 2015 Hilda and Preston Davis Foundation Postdoctoral Fellowship in Eating Disorders Research,** *The Role of Limbic and Prefrontal Cortex in Coding Food and Non-food Values*

**2010** Basic Science Best Achievement Award for Paper Published in 2009

**2006** Mount Sinai Graduate School Teaching Award

**2005 – 2008 Kirschstein NRSA Predoctoral Fellowship** NIH/NIMH, *Prefrontal Cortex Contributions to Behavior Organization*

**2002** Audrey Butvay Gruss Science Award

**2002** Benjamin Brown Scholarship

**2001** Poskitt Scholarship for Biology Undergraduate

**1999, 2000 Howard Hughes Undergraduate Research Grant**

**Teaching 2017 – present** Icahn School of Medicine at Mount Sinai, Graduate School  
Selected Topics in Neuroscience, Course co-director

**2014** Adjunct Instructor, California State University East Bay

Course: Psychopharmacology, Department of Psychology  
**2007 – 2008** Adjunct Instructor, Stern College for Women of Yeshiva University  
Course: Introduction to Statistics  
**2005 – 2007** Lab Instructor/TA, Mount Sinai Graduate School  
Course: Biostatistical Concepts and Methods  
**2003 – 2010** CPR Instructor/ 2004-2006 Course Coordinator  
Course: AHA Basic Care Life Support, Mount Sinai School of Medicine

### **Memberships and Committees**

#### **Society for Neuroscience**

**2005 – 2007** Mount Sinai MSTP Admissions Committee  
**2006 – 2008** Mount Sinai Graduate School Steering Committee

### **Ad Hoc Work, Professional Service and Outreach**

Center for Excellence in Youth Education, Day-with-a-Scientist Series  
Society for Neuroscience 2016 Minisymposium Co-chair, *Neural Mechanisms of Economic Choice*  
Ad-hoc reviewer for *Nature Neuroscience*, *Current Biology*, *Nature Communications*, *Journal of Neuroscience*, *PNAS*, *eLife*, *Current Opinion in Behavioral Sciences*, *Cerebral Cortex*, *European Journal of Neuroscience*, *Brain and Neuroscience Advances*, *Psychiatry Research*

### **Bibliography**

#### **Publications in progress**

**Rich, E.L.**, Chang, E.F. Task specific value encoding in the human orbitofrontal cortex. *In preparation*

#### **Publications**

- Rudebeck, P.H., **Rich, E.L.** Orbitofrontal cortex. *Curr Biol.* 2018 Sep 24;28(18):R1083-R1088. doi: 10.1016/j.cub.2018.07.018
- Rich, E.L.**, Stoll, F.M., Rudebeck, P.H. Linking dynamic patterns of neural activity in orbitofrontal cortex with decision making. *Curr Opin Neurobiol.* 2017 Nov 20;49:24-32. doi: 10.1016/j.conb.2017.11.002.
- Santacruz, S.R., **Rich, E.L.**, Wallis, J.D., Carmena, J.M. Caudate microstimulation increases value of specific choices. *Curr Biol.* 2017 Nov 6;27(21):3375-3383.e3.
- Rich, E.L.**, Wallis, J.D. Spatiotemporal dynamics of information encoding revealed in orbitofrontal high-gamma. *Nat Commun.* 2017 Oct 26;8(1):1139. doi: 10.1038/s41467-017-01253-5.
- Rich, E.L.**, Wallis, J.D. Decoding Subjective Decisions from Orbitofrontal Cortex. *Nat Neurosci.* 2016 Jul;19(7):973-80.
- Rich, E.L.**, Wallis, J.D. What stays the same in orbitofrontal cortex. *Nat Neurosci.* 2016 May 26;19(6):768-70.  
*Commentary for Xie and Padoa-Schioppa, 2016.*
- Rich, E.L.**, Wallis, J.D. Medial-lateral organization of the orbitofrontal cortex. *J Cogn Neurosci.* 2014 Jul; 26(7):1347-62.

- Rich E.L.**, Wallis, J.D. Prefrontal-Amygdala Interactions Underlying Value Coding. *Neuron*. 2013 Dec; 80(6):1344-1346.  
*Commentary for Rudebeck and Murray, 2013.*
- Perez-Rodriguez, M.M., Hazlett, E.A., **Rich, E.L.**, Ripoll, L.H., Weiner, D.M., Spence, N., Goodman, M., Koenigsberg, H.W., Siever, L.J., New, A.S. Striatal activity in borderline personality disorder with comorbid intermittent explosive disorder: sex differences. *J Psychiatr Res*. 2012 Jun;46(6):797-804.
- Wallis, J.D., **Rich, E.L.** Challenges of Interpreting Frontal Neurons during Value-Based Decision-Making. *Front Neurosci*. 2011;5:124.
- Rich, E.L.**, Shapiro, M.L. Rat prefrontal cortical neurons selectively code strategy switches. *J Neurosci*. 2009 Jun;29(22):7208-19.
- Bozdagi O, **Rich E**, Tronel S, Sadahiro M, Patterson K, Shapiro ML, Alberini CM, Huntley GW, Salton SR. The neurotrophin-inducible gene *Vgf* regulates hippocampal function and behavior through a brain-derived neurotrophic factor-dependent mechanism. *J Neurosci*. 2008 Sept;28(39):9857-69.
- Romero, L.M., **Rich, E.L.** Photoperiodically-induced changes in hypothalamic-pituitary-adrenal axis sensitivity in captive house sparrows (*Passer domesticus*). *Comp Biochem Physiol A Mol Integr Physiol*. 2007 Jun; 147(2):562-8.
- Rich, E.L.**, Shapiro, M.L. Prelimbic/Infralimbic inactivation impairs memory for multiple task switches, but not flexible selection of familiar tasks. *J Neurosci*. 2007 Apr; 27(17):4747-4755.
- Rich, E.L.**, Romero, L.M. Exposure to chronic stress downregulates corticosterone responses to acute stressors. *Am J Physiol Regul Integr Comp Physiol*. 2005 Jun; 288(6):R1628-36.
- Rich, E.L.**, Romero, L.M. Daily and photoperiod variations of basal and stress-induced corticosterone concentrations in house sparrows (*Passer domesticus*). *J Comp Physiol [B]*. 2001 Oct; 11(7):543-7.

### **Talks and Presentations**

- Rich, E.L.** Dynamic value representations underlying decision-making. Neurobiology of Cognition 2018, Gordon Research Conferences. Newry, ME.
- Rich, E. L.** Reward and decision-making in the orbitofrontal cortex. Columbia University Emerging Addiction Science Workshop 2018. New York, NY.
- Rich, E.L.**, Chang, E.F. Task specific value encoding in the human orbitofrontal cortex. Society for Neuroscience 2017. Washington, DC.
- Rich, E.L.**, Dynamic encoding of choice in the orbitofrontal cortex. SUNY Downstate, Neuroscience Research Seminar 2017, New York, NY
- Rich, E.L.** Dynamic Neural Signatures of Subjectivity in Choice. Columbia University Workshop on Information Processing and Behavioral Variability 2017. New York, NY.
- Rich, E.L.**, Wallis, J.D. Dynamic encoding of choice in the orbitofrontal cortex. Cognitive Neuroscience Society (CNS) 2017. San Francisco, CA.
- Rich, E.L.**, Wallis, J.D. Dynamic encoding of choice in the orbitofrontal cortex. Computational and Systems Neuroscience (COSYNE) Workshops, 2017. Snowbird, UT.
- Rich, E.L.**, Wallis, J.D. Dynamic encoding of choice in the orbitofrontal cortex. Society for Neuroscience 2016. San Diego, CA.

- Rich, E.L.**, Wallis, J.D. Competing neural representations of choice alternatives in orbitofrontal cortex during value-based decisions. Society for Neuroscience 2015. Chicago, IL.
- Rich, E.L.**, Wallis, J.D. Evidence for directionality in orbitofrontal local field potentials. Society for Neuroscience 2014. Washington, DC.
- Rich, E.L.**, Wallis, J.D. Spatiotemporal dynamics of value coding in the orbitofrontal cortex. Computational Properties of Prefrontal Cortex Conference 2014. Whistler, Canada.
- Rich, E.L.**, Wallis, J.D. Functional organization of the orbitofrontal cortex. San Francisco VA Medical Center Substance Abuse Seminar 2013. San Francisco, CA.
- Rich, E.L.**, Shapiro, M.L. Prefrontal cortical activity in place and response task switching. Neurobiology of Learning and Memory Winter Conference 2008. Park City, UT.
- Rich, E.L.**, Shapiro, M.L. Prefrontal cortical contributions to behavior organization. Mount Sinai Annual Graduate School Retreat 2008. New York, NY.
- Rich, E.L.**, Shapiro, M.L. Prelimbic/infralimbic inactivation impairs memory for multiple task switches. Mount Sinai Meet the Authors Lecture Series 2007. New York, NY.

### **Abstracts**

- Gillis, Z.S., **Rich, E.L.** The role of the orbitofrontal cortex in expectation and motivation. Society for Neuroscience 2018.
- Chiang, F.K., Wallis, J.D., **Rich, E.L.** Ensemble decoding of spatial and mnemonic information in lateral prefrontal cortex. Society for Neuroscience 2018.
- Enel, P., Wallis, J.D. **Rich, E.L.** Representations and dynamics in OFC and ACC in a value based decision making task. Society for Neuroscience 2018.
- Enel, P., Wallis, J.D. **Rich, E.L.** Representations and dynamics in OFC and ACC in a value based decision making task. Computational Properties of Prefrontal Cortex 2018.
- Chiang, F.K., **Rich, E.L.** Prefrontal tuning in mnemonic strategies in a spatial self-ordered search task. Computational Properties of Prefrontal Cortex 2018.
- Chiang, F.K., **Rich, E.L.** Prefrontal tuning in mnemonic strategies in a spatial self-ordered search task. Friedman Brain Institute Annual Retreat 2018.
- Santacruz, S.R., **Rich, E.L.**, Wallis, J.D., Carmena, J.M. Stimulation in primate caudate nucleus mediates decision-making behavior in free-choice task. Society for Neuroscience 2016.
- Rich, E.L.**, Wallis, J.D. Decoding subjective decisions from the orbitofrontal cortex. AREADNE Conference on Encoding and Decoding of Neural Ensembles 2016.
- Rich, E.L.**, Wallis, J.D., Dawes, H., Chang, E.F. Encoding of stimulus value estimates in high-frequency epicortical signals in human OFC. Quadriennial Meeting on OFC Function 2015
- Chang, E.F., Case, J, Wallis, J.D., **Rich, E.L.** Learned representations of sensory stimulus value in large-scale brain networks. Society for Neuroscience 2015.
- Rich, E.L.**, Wallis, J.D. Evidence for directionality in orbitofrontal local field potentials. Computational and Systems Neuroscience (COSYNE) 2015.
- Rich, E.L.**, Wallis, J.D. Representation of primary and secondary rewards in orbitofrontal cortex. Society for Neuroscience 2013.
- Rich, E.L.**, Wallis, J.D. Prefrontal cortex differentially encodes stimuli and actions associated with rewards or punishment. Society for Neuroscience 2012.
- Rich, E.L.**, Wallis, J.D. Differential effects of positive and negative reinforcement on behavior. Society for Neuroscience 2011.
- Rich, E.L.**, Shapiro, M.L. Strategy switching correlates in rat prelimbic/infralimbic neurons. Society for Neuroscience 2007.

- Rich, E.L.**, Shapiro, M.L. Rat prelimbic/infralimbic areas contribute to multiple strategy switches. Society for Neuroscience 2006.
- Rich, E.L.**, Romero, L.M. Corticosterone response to variable doses of dexamethasone, CRF and ACTH in the European Starling (*Sturnus vulgaris*). Society for Integrative and Comparative Biology 2002.
- Romero, L.M., **Rich, E.L.**, Tran, K.D., Nephew, B.C. Regulation of corticosterone release in captive house sparrows. Society for Integrative and Comparative Biology 2002.
- Rich, E.L.**, Romero, L.M. Daily and seasonal variation in basal and stress-induced levels of corticosterone in house sparrows. N.E.U.R.O.N. 2000.