

CURRICULUM VITAE
Christopher Lee Keown, Ph.D.

3232 Old Heather Road
San Diego, CA 92111

(415) 515-9942
christopher.keown@gmail.com

EDUCATION

Doctor of Philosophy in Cognitive Science, University of California, San Diego (2013 – 2018)

Dissertation: “Genome-Scale Studies of Dynamic DNA Methylation in Mammalian Brain Cells”

Advisor: Eran A. Mukamel

Committee: Paula A. Desplats, Joseph R. Ecker, Fred H. Gage, Lara M. Rangel, Terrence J. Sejnowski

Master in Computational Science, San Diego State University (2009 – 2013)

Bachelor of Science in Computer Science, Indiana University (1999 – 2003)

RESEARCH EXPERIENCE

Computational Neural Data and Dynamics Laboratory, UCSD, Eran Mukamel, PhD (2013 – 2018)

- Developed pipeline for the unsupervised clustering of neurons into neuron types using molecular markers, thereby identifying a novel neuron type in work funded by Obama’s BRAIN Initiative.
- Applied advanced data analysis techniques to large-scale genomics datasets in order to elucidate the molecular mechanisms for how genomic modifications lead to sex differences and can also mediate environmental changes in cognition.

Brain Development and Imaging Laboratory, San Diego State University, Ralph-Axel Müller, PhD, (2010 – 2013)

- Applied advanced computational methods, including support vector machines and graph theory, to examine brain connectivity patterns in Autism Spectrum Disorder.

PUBLICATIONS (*authors contributed equally)

- Zhang, Tie-Yuan*, **Christopher L. Keown***, Xianglan Wen, Junhao Li, Dulcie A. Vousden, Christoph Anacker, Urvashi Bhattacharyya, et al. 2018. “Environmental Enrichment Increases Transcriptional and Epigenetic Differentiation between Mouse Dorsal and Ventral Dentate Gyrus.” *Nature Communications* 9 (1):298.
- Luo, Chongyuan*, **Christopher L. Keown***, Laurie Kurihara, Jingtian Zhou, Yupeng He, Junhao Li, Rosa Castanon, et al. 2017. “Single-Cell Methylomes Identify Neuronal Subtypes and Regulatory Elements in Mammalian Cortex.” *Science* 357 (6351): 600–604.
- **Keown, Christopher L.**, Joel B. Berletch, Rosa Castanon, Joseph R. Nery, Christine M. Disteché, Joseph R. Ecker, and Eran A. Mukamel. 2017. “Allele-Specific Non-CG DNA Methylation Marks Domains of Active Chromatin in Female Mouse Brain.” *Proceedings of the National Academy of Sciences of the United States of America*, March. doi:10.1073/pnas.1611905114.
- Abbott, Angela E., Annika Linke, Aarti Nair, Afroz Jahedi, Laura A. Alba, **Christopher L. Keown**, Inna Fishman, and Ralph-Axel Müller. 2017. “Repetitive Behaviors in Autism Are Linked to Imbalance of Corticostriatal connectivity: A Functional Connectivity MRI Study.” *Social Cognitive and Affective Neuroscience*, November. <https://doi.org/10.1093/scan/nsx129>.
- **Keown, Christopher L.**, Michael C. Datko, Colleen P. Chen, Jose Omar Maximo, Afroz Jahedi, and Ralph-Axel Müller. 2017. “Network Organization Is Globally Atypical in Autism: A Graph Theory Study of Intrinsic Functional Connectivity.” *Biological Psychiatry: Cognitive Neuroscience and Neuroimaging* 2 (1). Elsevier: 66–75.
- Shen, Mark D., Deana D. Li, **Christopher L. Keown**, Aaron Lee, Ryan T. Johnson, Kathleen Angkustsiri, Sally J. Rogers, Ralph-Axel Müller, David G. Amaral, and Christine Wu Nordahl. 2016. “Functional Connectivity of the Amygdala Is Disrupted in Preschool-Aged Children With Autism Spectrum Disorder.” *Journal of the American Academy of Child and Adolescent Psychiatry* 55 (9): 817–24.
- Chen, Colleen P., **Christopher L. Keown**, Afroz Jahedi, Aarti Nair, Mark E. Pflieger, Barbara A. Bailey, and Ralph-Axel Müller. 2015. “Diagnostic Classification of Intrinsic Functional Connectivity Highlights Somatosensory, Default Mode, and Visual Regions in Autism.” *NeuroImage. Clinical* 8 (April): 238–45.
- Khan, Amanda J., Aarti Nair, **Christopher L. Keown**, Michael C. Datko, Alan J. Lincoln, and Ralph-Axel Müller. 2015. “Cerebro-Cerebellar Resting-State Functional Connectivity in Children and Adolescents with Autism Spectrum Disorder.” *Biological Psychiatry* 78 (9): 625–34.

- Abbott, Angela E., Aarti Nair, **Christopher L. Keown**, Michael Datko, Afrooz Jahedi, Inna Fishman, and Ralph-Axel Müller. 2016. "Patterns of Atypical Functional Connectivity and Behavioral Links in Autism Differ Between Default, Salience, and Executive Networks." *Cerebral Cortex* 26 (10): 4034–45.
- So, Alex Yick-Lun, Reeshelle Sookram, Aadel A. Chaudhuri, Aarathi Minisandram, David Cheng, Catherine Xie, Ee Lyn Lim, ..., **Christopher L. Keown**, et al. 2014. "Dual Mechanisms by Which miR-125b Represses IRF4 to Induce Myeloid and B-Cell Leukemias." *Blood* 124 (9): 1502–12.
- Fishman, Inna, **Christopher L. Keown**, Alan J. Lincoln, Jaime A. Pineda, and Ralph-Axel Müller. 2014. "Atypical Cross Talk between Mentalizing and Mirror Neuron Networks in Autism Spectrum Disorder." *JAMA Psychiatry* 71 (7): 751–60.
- Nair, Aarti*, **Christopher L. Keown***, Michael Datko, Patricia Shih, Brandon Keehn, and Ralph-Axel Müller. 2014. "Impact of Methodological Variables on Functional Connectivity Findings in Autism Spectrum Disorders." *Human Brain Mapping* 35 (8): 4035–48.
- **Keown, Christopher Lee**, Patricia Shih, Aarti Nair, Nick Peterson, Mark Edward Mulvey, and Ralph-Axel Müller. 2013. "Local Functional Overconnectivity in Posterior Brain Regions Is Associated with Symptom Severity in Autism Spectrum Disorders." *Cell Reports* 5 (3): 567–72.
- Maximo, Jose O., **Christopher L. Keown**, Aarti Nair, and Ralph-Axel Müller. 2013. "Approaches to Local Connectivity in Autism Using Resting State Functional Connectivity MRI." *Frontiers in Human Neuroscience* 7 (October): 605.
- Chen, Colleen Pam, **Christopher L. Keown**, and Ralph-Axel Müller. 2013. "Towards Understanding Autism Risk Factors: a Classification of Brain Images with Support Vector Machines" *International Journal of Semantic Computing* 07 (02): 205–13.
- Di Martino, A., C-G Yan, Q. Li, E. Denio, F. X. Castellanos, K. Alaerts, J. S. Anderson, ..., **Christopher L. Keown** et al. 2014. "The Autism Brain Imaging Data Exchange: Towards a Large-Scale Evaluation of the Intrinsic Brain Architecture in Autism." *Molecular Psychiatry* 19 (6): 659–67.
- Shih, Patricia, Brandon Keehn, Jessica K. Oram, Kelly M. Leyden, **Christopher L. Keown**, and Ralph-Axel Müller. 2011. "Functional Differentiation of Posterior Superior Temporal Sulcus in Autism: A Functional Connectivity Magnetic Resonance Imaging Study." *Biological Psychiatry* 70 (3): 270–77.

ORAL PRESENTATIONS

- Luo, C., **Keown, C.L.**, Castanon, R., Lucero, J., Li, J., Nery, J.R., Kurihara, L., Schumacher, C., Harkins, T., Mukamel, E.A., Behrens, M. and Ecker, J.R. *Single-neuron methylomes reveal epigenomic diversity in the brain*. Third Annual BRAIN Initiative Investigators Meeting, Washington, D.C., 2016.
- Zhang, Z., Luo, C., **Keown, C.L.**, Castanon, R., Lucero, J., Li, J., Nery, J.R., Kurihara, L., Schumacher, C., Harkins, T., Mukamel, E.A., Behrens, M. and Ecker, J.R. *Single-cell methylome sequencing of identified cortical projection cell types*. Third Annual BRAIN Initiative Investigators Meeting, Washington, D.C., 2016.
- **Keown, C.L.**, Berletch, C.B., Disteché, C.M., Ecker, J.R., Mukamel, E.A. Brain-Specific DNA Methylation Signatures of Escape from X Chromosome Inactivation in the Mouse Frontal Cortex, Chicago, IL., October 2015.
- **Keown, C.L.**, Shih, P., Keehn, B. & Müller, R.-A. *Investigation of functional systems with independent component analysis in Autism Spectrum Disorder*. Oral presentation at the 40th annual meeting of the Society for Neuroscience, San Diego, CA, 2010.

CONFERENCE POSTERS

- **Keown, C.L.**, Zhang, T.-Y., Li, J, Wen, X., O'Toole, N., Anacker C., Diorio, J., Mukamel, E.A., Meaney, M.J. *Environmental enrichment increases transcriptional and epigenetic differentiation between mouse dorsal and ventral dentate gyrus neurons*. Poster presentation at the 47th annual meeting of the Society for Neuroscience, Washington, D.C., 2017.
- **Keown, C.L.**, Luo, C., Castanon, R, Lucero, J., Li, J., Nery, J.R., Kurihara, L., Schumacher, C., Harkins, T., Mukamel, E.A., Behrens, M. Ecker, J.R. *Single-neuron methylomes reveal epigenomic diversity in the brain*. Single Cell Analysis meeting at Cold Spring Harbor Institute, Cold Spring Harbor, NY, 2017.
- Nair, A., **Keown, C. L.**, Datko, M., Khan, A. & R.-A. Müller. *Aberrant right temporo-thalamic connectivity in ASD: an fcMRI and graph theory study*. Abstract submitted for poster presentation at the 13th annual meeting of the International Meeting for Autism Research, San Sebastián, Spain, 2013.

- **Keown, C. L.**, Shih, P., Peterson, N., Nair, A., Datko, M. & R.-A Müller. *Aberrant short and long-distance functional connectivity MRI patterns in autism spectrum disorder*. Poster Presentation at the Inaugural Symposium of the San Diego Consortium for Developmental Cognitive Neuroscience, San Diego, CA, 2012.
- **Keown, C. L.**, Shih, P., Peterson, N., Nair, A., Datko, M. & R.-A Müller. *Atypical local and long-distance functional connectivity in autism spectrum disorder: An fMRI study*. Poster presentation at the 42th annual meeting of the Society for Neuroscience, San Diego, CA, 2012.
- Abbott, A., Nair, A., **Keown, C. L.**, Datko, M & R.-A. Müller. *Neural correlates of repetitive behavior in autism spectrum disorders*. Poster presentation at the 42th annual meeting of the Society for Neuroscience, San Diego, CA, 2012.
- **Keown, C. L.**, Nair, A., Datko, M. C., Keehn, B., Shih, P., & R.-A. Müller. *Effects of methodological variables on resting state functional connectivity findings in autism spectrum disorders*. Poster presentation for the 2012 Third Biennial Conference on Resting State Brain Connectivity, Madgeburg, Germany, 2012.
- Nair, A., **Keown, C.L.**, Datko, M., Keehn, B., Shih, P., & Müller, R.-A. *Comparison of methodological variables in functional connectivity MRI analyses of Autism Spectrum Disorders*. Poster presentation for the 2012 International Meeting for Autism Research, Toronto, Canada, 2012.

AWARDS

- NIMH Predoctoral Fellowship, Institute for Neural Computation, July 2016.
- Department of Cognitive Science Teaching Award, 2015.
- Kavli Institute of Brain and Mind Fellowship, April 2014.

INVITED TALKS

Broad Institute Online Journal Club, Harvard University, October 2017

WORKSHOPS

Neuromorphic Cognition Engineering Workshop in Telluride, CO, June 2017

- Three-week workshop training in brain-inspired hardware and software
- Built laser-tracking iRobot using retina-based vision processor

BUSINESS EXPERIENCE

AxeVentures, Founder and Owner, (2018 – present)

- Axe throwing entertainment and team building company in North Park in San Diego

Escape Game SD, Founder and Owner, (2014 – present)

- Designed, built and managed escape room chain.

WORK EXPERIENCE

Developer & Analyst, Ozone Online, Online Marketing Agency, San Francisco (2003 – 2013)

- Designed, built and managed web-based solutions for clients to manage their marketing database and marketing campaigns.
- Quantified and analyzed the performance of marketing campaigns in order to improve client's marketing strategy.
- Created and lead training seminars to train new employees and bridge the communication gap between the less-technical management team with the technically savvy development team.
- Managed development team through the process of website development.