

Curriculum vitae

Date Prepared: Jul 10, 2025

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Education

Year	Degree (Honors)	Field of Study (Thesis advisor for PhDs)	Institution
2003	B.Sc.	Chemistry, Botany, Zoology	SGB Amravati University, India
2005	M.Sc.	Biotechnology	RTM Nagpur University, India
2011	M.S.	Molecular and Cell Biology	University of Texas at Dallas, USA
2015	Ph.D.	Computational Biology, Molecular and Cell Biology (Prof. Michael Q. Zhang)	University of Texas at Dallas, USA

Postdoctoral Training

Year(s)	Titles	Specialty/Discipline (Lab PI for postdoc research)	Institution
2016-2022	Research Scientist	Neuroscience, Computational Biology, Transcriptomics (Prof. Genevieve Konopka)	University of Texas Southwestern Medical Center, USA

Faculty Academic Appointments

Year(s)	Titles	Department	Institution
2025-present	Director of Neuroinformatics, Assistant Professor	Peter O'Donnell Jr. Brain Institute	University of Texas Southwestern Medical Center, USA
2022-present	Assistant Professor	Neuroscience	University of Texas Southwestern Medical Center, USA

Other Professional Positions

Year(s)	Position Title	Institution
2006-2008	Research Associate Supervisor: Mr. Jagdish Nagdev	Genecity Laboratories Pvt. Ltd., Pune, India
2008-2009	Bioinformatics Research Trainee Mentor: Dr. USN Murthy (Chemical Biology)	Indian Institute of Chemical Technology, Hyderabad, India
2009	Research and Development Executive Mentor: Dr. Sanjeev Kumar Gupta (R&D)	Yashraj Biotechnology Pvt. Ltd., Mumbai, India
2010-2011	Research Technician II Mentor: Prof. Melanie Cobb (Pharmacology)	University of Texas Southwestern Medical Center, USA

Honors and Awards

Year	Name of Honor/Award	Awarding Organization
2011-2015	Graduate Tuition Award	Department of Biological Sciences, School of Natural Sciences and Mathematics, University of Texas at Dallas, USA

Professional Societies

Dates	Society Name, member
2019	Society for Neuroscience

Editorial Activities

Year(s)	Journal Name
<u>Editor/Associate Editor</u>	
2022-2023	Frontiers in Molecular Neuroscience

Ad Hoc Reviewer

2020-2025	Briefings in Bioinformatics, Oxford University Press
2020-2025	Journal of Bioinformatics and Computational Biology
2022-2025	Frontiers in Neuroscience
2022-2025	Nature Reviews Neurology
2022-2025	STAR Protocols, Cell Press

Teaching Activities

Year(s)	Activity
<u>Medical and graduate school didactic and small group teaching</u>	
2010	Graduate Teaching Assistant for Biochemistry laboratory Instructor: Prof. Mehmat Candas, University of Texas at Dallas, USA
2011	Graduate Teaching Assistant for Biochemistry laboratory Instructor: Prof. Scott Rippel, University of Texas at Dallas, USA
2012	Graduate Teaching Assistant for course Computational Biology Instructor: Prof. Michael Zhang, University of Texas at Dallas, USA
2022	Faculty Instructor for Single Cell Genomics Nano-course, July 2022 Lyda Hill Department of Bioinformatics, UT Southwestern Medical Center. https://www.nanocourses.net/spring-summer-2022
2023	Faculty Instructor for Single Cell Genomics Nano-course, Feb 2023 Lyda Hill Department of Bioinformatics, UT Southwestern Medical Center. https://www.nanocourses.net/spring-2023
2024	Faculty Instructor for Single Cell Genomics Nano-course, Jan 2024 Lyda Hill Department of Bioinformatics, UT Southwestern Medical Center. https://www.nanocourses.net/spring-2024
2024	Instructor for Experimental Design Section of Neuroscience Core Course, Dec 2024 Department of Neuroscience, UT Southwestern Medical Center

Service to the Community

Year(s)	Role	Organization or institution
2012	Guest speaker for Introduction to Bioengineering course “Computational biology of transcription factors”	University of Texas at Dallas, USA
2013	Guest speaker for Introduction to Bioengineering course “Differential isoform recruitment analysis using next-generation transcriptomic sequencing data”	University of Texas at Dallas, USA
2021	Judge for Science Fair	Uplift Education District, Dallas, USA
2022	Judge for Science Fair	Uplift Education District, Dallas, USA
2022	Judge for Science and Engineering Fair	Dallas ISD, USA

Peer-Reviewed Publications

Original Research Articles

1. **Kulkarni, A.**, Naveen Kumar, B. S. C., Ravi, V., & Murthy, U. S. (2011). Colon cancer prediction with genetics profiles using evolutionary techniques. *Expert Systems with Applications*, 38(3), 2752-2757. doi:10.1016/j.eswa.2010.08.065.
2. Ma, X., **Kulkarni, A.**, Zhang, Z., Xuan, Z., Serfling, R., & Zhang, M. Q. (2012). A highly efficient and effective motif discovery method for ChIP-seq/ChIP-chip data using positional information. *Nucleic Acids Res*, 40(7), e50. doi:10.1093/nar/gkr1135.
3. Osborne J. K., Larsen J. E., Shields M. D., Gonzales J. X., Shames D. S., Sato M., **Kulkarni A.**, Wistuba I. I., Girard L., Minna J. D., Cobb M. H. (2013). NeuroD1 regulates survival and migration of neuroendocrine lung carcinomas via signaling molecules TrkB and NCAM. *Proc Natl Acad Sci USA*, 110(16), 6524-6529. doi:10.1073/pnas.1303932110.
4. Xie W., Schultz M. D., Lister R., Hou Z., Rajagopal N., Ray P., Whitaker J. W., Tian S., Hawkins R. D., Leung D., Yang H., Wang T., Lee A. Y., Swanson S. A., Zhang J., Zhu Y., Kim A., Nery J. R., Urich M. A., Kuan S., Yen C. A., Klugman S., Yu P., Suknuntha K., Propson N. E., Chen H., Edsall L. E., Wagner U., Li Y., Ye Z., **Kulkarni A.**, Xuan Z., Chung W. Y., Chi N. C., Antosiewicz-Bourget J. E., Slukvin I., Stewart R., Zhang M. Q., Wang W., Thomson J. A., Ecker J. R., Ren B. (2013). Epigenomic analysis of multilineage differentiation of human embryonic stem cells. *Cell*, 153(5), 1134-1148. doi:10.1016/j.cell.2013.04.022.
5. Sephton, C. F., Tang, A. A., **Kulkarni, A.**, West, J., Brooks, M., Stubblefield, J. J., Liu Y., Zhang M. Q., Green C. B., Huber K. M., Huang E. J., Herz J., Yu G. (2014). Activity-dependent FUS dysregulation disrupts synaptic homeostasis. *Proc Natl Acad Sci USA*, 111(44), E4769-4778. doi:10.1073/pnas.1406162111.
6. Roadmap Epigenomics Consortium (2015). Integrative analysis of 111 reference human epigenomes. *Nature*, 518(7539), 317-330. doi:10.1038/nature14248.
7. Araujo, D. J., Toriumi, K., Escamilla, C. O., **Kulkarni, A.**, Anderson, A. G., Harper, M., Usui N., Ellegood J., Lerch J. P., Birnbaum S. G., Tucker H. O., Powell C. M., Konopka, G. (2017). Foxp1 in Forebrain Pyramidal Neurons Controls Gene Expression Required for Spatial Learning and Synaptic Plasticity. *J Neurosci*, 37(45), 10917-10931. doi:10.1523/JNEUROSCI.1005-17.2017.
8. Usui, N., Araujo, D. J., **Kulkarni, A.**, Co, M., Ellegood, J., Harper, M., Toriumi K., Lerch J. P., Konopka, G. (2017). Foxp1 regulation of neonatal vocalizations via cortical development. *Genes Dev*, 31(20), 2039-2055. doi:10.1101/gad.305037.117
9. Anderson, A. G., **Kulkarni, A.**, Harper, M., & Konopka, G. (2020). Single-Cell Analysis of Foxp1-Driven Mechanisms Essential for Striatal Development. *Cell Rep*, 30(9), 3051-3066 e3057. doi:10.1016/j.celrep.2020.02.030
10. Bjorness, T. E.*, **Kulkarni, A.***, Rybalchenko, V.*, Suzuki, A., Bridges, C., Harrington, A. J., Cowan C. W., Takahashi J. S., Konopka G., Greene, R. W. (2020). An essential role for MEF2C in the cortical response to loss of sleep in mice. *Elife*, 9. doi:10.7554/eLife.58331. *Equal contribution.

11. Co, M., Hickey, S. L., **Kulkarni, A.**, Harper, M., & Konopka, G. (2020). Cortical Foxp2 Supports Behavioral Flexibility and Developmental Dopamine D1 Receptor Expression. *Cereb Cortex*, 30(3), 1855-1870. doi:10.1093/cercor/bhz209.
12. Ayhan, F., **Kulkarni, A.**, Berto, S., Sivaprakasam, K., Douglas, C., Lega, B. C., & Konopka, G. (2021). Resolving cellular and molecular diversity along the hippocampal anterior-to-posterior axis in humans. *Neuron*, 109(13), 2091-2105 e2096. doi:10.1016/j.neuron.2021.05.003.
13. Berto, S., Fontenot, M. R., Seger, S., Ayhan, F., Caglayan, E., **Kulkarni, A.**, Douglas C., Tamminga C. A., Lega B. C., Konopka, G. (2021). Gene-expression correlates of the oscillatory signatures supporting human episodic memory encoding. *Nat Neurosci*, 24(4), 554-564. doi:10.1038/s41593-021-00803-x.
14. Khandelwal, N., Cavalier, S., Rybalchenko, V., **Kulkarni, A.**, Anderson, A. G., Konopka, G., & Gibson, J. R. (2021). FOXP1 negatively regulates intrinsic excitability in D2 striatal projection neurons by promoting inwardly rectifying and leak potassium currents. *Mol Psychiatry*, 26(6), 1761-1774. doi:10.1038/s41380-020-00995-x.
15. Xiao, L., Merullo, D. P., Koch, T. M. I., Cao, M., Co, M., **Kulkarni, A.**, Konopka G., Roberts, T. F. (2021). Expression of FoxP2 in the basal ganglia regulates vocal motor sequences in the adult songbird. *Nat Commun*, 12(1), 2617. doi:10.1038/s41467-021-22918-2.
16. Xu, P., Berto, S., **Kulkarni, A.**, Jeong, B., Joseph, C., Cox, K. H., Greenberg M. E., Kim T. K., Konopka G., Takahashi, J. S. (2021). NPAS4 regulates the transcriptional response of the suprachiasmatic nucleus to light and circadian behavior. *Neuron*, 109(20), 3268-3282 e3266. doi:10.1016/j.neuron.2021.07.026.
17. Anderson A.G.*, **Kulkarni A.*** & Konopka G. (2023) A single-cell trajectory atlas of striatal development. *Sci Rep* **13**, 9031. doi.org: 10.1038/s41598-023-36255-5.
*Equal contribution.
18. Park SHE., **Kulkarni A.**, Konopka G (2023) FOXP1 orchestrates neurogenesis in human cortical basal radial glial cells. *PLOS Biology* 21(8): e3001852. doi: 10.1371/journal.pbio.3001852.
19. Khandelwal N., **Kulkarni A.**, Ahmed N. I., Harper M., Konopka G. (2024) FOXP1 regulates the development of excitatory synaptic inputs onto striatal neurons and induces phenotypic reversal with reinstatement. *Sci. Adv.* **10**, eadm7039 (2024); doi: 10.1126/sciadv.adm7039.
20. Ahmed N. I., Khandelwal N., Anderson A.G., **Kulkarni A.**, Gibson J., Konopka G. (2024) Compensation between FOXP transcription factors maintains proper striatal function. *Cell Reports*, Volume 43, Issue 5, 114257; doi: 10.1016/j.celrep.2024.114257.
21. Putman J.N., Watson S.D., Zhang Z., Khandelwal N., **Kulkarni A.**, Gibson J.R., Huber K.M. (2024) Pre- and postsynaptic MEF2C promote experience-dependent, input-specific development of cortical Layer 4 to Layer 2/3 excitatory synapses and regulate activity-dependent expression of synaptic cell adhesion molecules. *JNeurosci* e0098242024; doi: 10.1523/JNEUROSCI.0098-24.2024.
22. Moore H., Dehnad M., Freelin A., Granger B., Subramanian S., **Kulkarni A.**, Berto S., Lega B. C., Konopka G. (2025) Stimulation modulates cell assemblies linked with gene networks in the human temporal cortex *ex vivo*. bioRxiv 2025.06.25.661589; doi: 10.1101/2025.06.25.661589

23. Huang H., Charron T.L., Fu M., Dunn M., Jones D.M., Kumar P., **Kulkarni A.**, Konopka G., Shakkottai V.G. (2025) Resilience to Endoplasmic Reticulum Stress Mitigates Calcium-Dependent Membrane Hyperexcitability Underlying Late Disease Onset in SCA6. *bioRxiv*; 10.1101/2025.01.27.635103.
24. Vogt K., **Kulkarni A.**, Pandey R., Dehnad M., Konopka G., Greene R. (2025) Sleep need driven oscillation of glutamatergic synaptic phenotype. *eLife* 13:RP98280; doi: 10.7554/eLife.98280.4.
25. Liu Y., Fontenot M.R., **Kulkarni A.**, Khandelwal N., Park S.H., Criswell C., Harper M., Xu P., Gupta N., Gibson J., Takahashi J.S., Konopka G. (2025) Human CLOCK enhances neocortical function. *Nat Neurosci*; doi: 10.1038/s41593-025-01993-4.

Reviews, Chapters, Monographs and Editorials

1. **Kulkarni, A.**, Anderson, A. G., Merullo, D. P., & Konopka, G. (2019). Beyond bulk: a review of single cell transcriptomics methodologies and applications. *Curr Opin Biotechnol*, 58, 129-136. doi:10.1016/j.copbio.2019.03.001

Proceedings of Meetings

1. **Kulkarni A.**, Ma X., Zhang M. Q., (2010) Transcription factor binding sites motif discovery using ChIP data. Presented at UT Metroplex Day 2010, University of Texas Southwestern Medical Center, USA.
2. **Kulkarni A.**, Sephton C., Zhang M. Q., Yu G. (2015) Broken Heart: Cardiac muscle remodeling by FUS. Presented at SY-BIO 2015 IEEE Life Sciences, University of Texas at Dallas, USA.
3. Co, M., **Kulkarni, A.**, Usui, N., Harper, M., Konopka, G. (2017) Identifying FOXP2-driven gene networks in cortical cell types vulnerable to autism: Presented at the Keystone Symposia meeting on Synapses and Circuits: Formation, Function and Dysfunction, Santa Fe, NM, USA.
4. Konopka, G., Berto, S., Fetahi, Y., **Kulkarni, A.**, Gandal, M.J., and Montillo, A. (2017) Altered human brain gene expression correspondence with resting state brain activity in autism: Abstracts of the Annual Society for Neuroscience Meeting, Session 196, Washington, DC, USA.
5. Co, M., **Kulkarni, A.**, Usui N., Harper, M., Konopka, G. (2018) Genetic dissection of dopaminergic cortical neurons expressing language-related transcription factors: Presented at Keystone Symposia State of the Brain: Genetic dissection of brain circuits and behavior in health and disease, Keystone, CO, USA.
6. Anderson, A.G., **Kulkarni, A.**, Konopka, G. (2018) Foxp1 regulates distinct features of striatal development and ASD-relevant behaviors through cell-type specific molecular pathways: Presented at the Basal Ganglia Gordon Conference, Ventura, CA, USA.
7. Co, M., **Kulkarni, A.**, Usui, N., Harper, M., Konopka, G. (2018) Investigation of Foxp2 function in layer 6 corticothalamic neurons: Abstracts of the Annual Society for Neuroscience Meeting, Session 369.04/C26, San Diego, CA, USA.

8. Anderson, A.G. **Kulkarni A.**, Harper M., Konopka, G. (2018) Foxp1 regulates cell-type specific molecular pathways and function within striatal projection neurons. Abstracts of the Annual Society for Neuroscience Meeting, Session 369.10/C32, San Diego, CA, USA.
9. Ayhan F.*, **Kulkarni A.***, Douglas C., Lega B. C., Konopka G. (2018) Resolving cellular and molecular diversity along the hippocampal anterior-to-posterior axis in humans. Presented at Chan Zuckerberg Initiative East Coast Retreat, Woods Hole, MA, USA.
*Equal contribution.
10. Berto, S., Fontenot, M., Seger, S., Ayhan, F., **Kulkarni, A.**, Douglas, C., Lega, B., and Konopka, G. (2019) The genomic underpinnings of oscillatory biomarkers supports successful memory encoding in humans: Presented at the EMBO Workshop on Network Inference in Biology and Disease, Naples, Italy.
11. Merullo D. P., **Kulkarni A.**, Co M., Konopka G., Roberts T. F. (2019) Characterizing distinct cell types in HVC of male zebra finches using single-cell RNA sequencing. Abstracts of the Annual Society for Neuroscience Meeting, Session 232.20/P23, Chicago, IL, USA.
12. **Kulkarni, A.**, Bjorness, T., Suzuki, A., Konopka, G., and Greene, R. (2019) Transcriptomic analysis of sleep states. Abstracts of the Annual Society for Neuroscience Meeting, Session 503.10/V31, Chicago, IL, USA.
13. Ayhan, F., **Kulkarni, A.**, Douglas, C., Lega, B.C., Konopka, G. (2019) Resolving cellular and molecular diversity along the hippocampal anterior-to-posterior axis in humans. Abstracts of the Annual Society for Neuroscience Meeting, Session 250.17/AA42, Chicago, IL, USA.
14. Zhang Y., **Kulkarni A.**, Konopka G. (2024) Cellular resolution multi-omics of white matter tracts in autism spectrum disorder. Abstracts of the Annual Society for Neuroscience Meeting, PST309.05/W31, Chicago, IL, USA.