Fangming Xie

Ph.D. student in Physics
Computational Neural DNA Dynamics Lab (Mukamel Lab)
University of California, San Diego
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Education

2016 - Ph.D. in Physics
University of California, San Diego, CA

2012 - 2016 B.S. in Physics
University of Science and Technology of China, Hefei, China

Research Experience

2017 - **Ph.D. research in epigenetics and neuroscience**
Physics department, University of California, San Diego, CA
Thesis: Integrative analysis of brain cell type transcriptomes and epigenomes.
Advisor: Prof. Eran A. Mukamel

2014 - 2016 **Research assistant in condensed matter physics and materials science**
Hefei National Laboratory for Physical Sciences at the Microscale, University of Science and Technology of China, Hefei, China
First principles numerical analysis of two-dimensional van der Waals materials.
Advisors: Prof. Wenguang Zhu, Prof. Jie Zeng

2015 **Research assistant in biophysics**
Physics department, University of California, Los Angeles, CA
Computational modeling of melting transition in viral capsid assembly.
Advisors: Prof. William S. Klug, Prof. Robijn F. Bruinsma

2014 **Research assistant in condensed matter physics**
Physics department, University of Michigan, Ann Arbor, MI
Computational modeling of opto-mechanical properties of a photonic crystal membrane.
Advisor: Prof. Hui Deng

Teaching Experience

2020 Tutor, “AP Calculus”, San Diego Tutor Tree (remote tutoring during COVID)

2019 Instructor, the Young Scientist Club (preschool outreach)

2016 - 2019 Teaching assistant, “Modeling & Data Analysis”, “Neural Signal Processing”, “General Physics (Mechanics)”, “Physics Lab (Mechanics)” “Physics Lab (Wave, Optical, and Modern Physics)”, University of California, San Diego

Professional Associations

2017 - 2019 Member, *Society for Neuroscience*

2018 - Member, *BRAIN Initiative Cell Census Network*

Publications

Research papers (in preparation)

Xie*, F., Armand*, E. A., … Mukamel, E. A. (2021). Enhancer-gene link identification using single neuron transcriptomes and epigenomes with stringent statistical criteria and multi-modal data integration. *In preparation*
(*These authors contributed equally to this work.)

Research papers (accepted by journals or in revision; preprints available)

Yao*, Z., Liu*, H., **Xie*, F.**, Fischer*, S., Adkins, R. S., Aldrige, A. I., Ament, S. A., Bartlett, A., Margarita Behrens, M., Van den Berge, K., Bertagnolli, D., Biancalani, T., Sina Booeshaghi, A., Bravo, H. C., Casper, T., Colantuoni, C., Crabtree, J., Creasy, H., Crichton, K., … Mukamel, E. A. (2020). An integrated transcriptomic and epigenomic atlas of mouse primary motor cortex cell types. In bioRxiv (p. 2020.02.29.970558). *Accepted by Nature*
(*These authors contributed equally to this work.)

Luo*, C., Liu*, H., **Xie*, F.**, Armand, E. J., Siletti, K., Bakken, T., Fang, R., Doyle, W. I., Hodge, R. D., Hu, L., Wang, B.-A., Zhang, Z., Preissl, S., Lee, D.-S., Zhou, J., Niu, S.-Y., Castanon, R., Bartlett, A., Rivkin, A., … Ecker, J. R. (2019). Single nucleus multi-omics links human cortical cell regulatory genome diversity to disease risk variants. In bioRxiv (p. 2019.12.11.873398). *Under review*
(*These authors contributed equally to this work.)

BRAIN Initiative Cell Census Network (BICCN), Adkins, R. S., Aldridge, A. I., Allen, S., Ament, S. A., An, X., Armand, E., Ascoli, G. A., Bakken, T. E., Bandrowski, A., Banerjee, S., Barkas, N., Bartlett, A., Bateup, H. S., Margarita Behrens, M., Berens, P., Berg, J., Bernabucci, M., Bernaerts, Y., …, **Xie, F.**, …, Zingg, B. (2020). A multimodal cell census and atlas of the mammalian primary motor cortex. In bioRxiv (p. 2020.10.19.343129). *Under review*

Bakken, T. E., Jorstad, N. L., Hu, Q., Lake, B. B., Tian, W., Kalmbach, B. E., Crow, M., Hodge, R. D., Krienen, F. M., Sorensen, S. A., Eggermont, J., Yao, Z., Aevermann, B. D., Aldridge, A. I., Bartlett, A., Bertagnolli, D., Casper, T., Castanon, R. G., Crichton, K., …, **Xie, F.**, …, Lein, E. S. (2020). Evolution of cellular diversity in primary motor cortex of human, marmoset monkey, and mouse. In bioRxiv (p. 2020.03.31.016972). *Accepted by Nature*

Research papers (published in peer-reviewed journals)

Fang, R., Preissl, S., Li, Y., Hou, X., Lucero, J., Wang, X., Motamedi, A., Shiau, A. K., Zhou, X., **Xie, F.**, Mukamel, E. A., Zhang, K., Zhang, Y., Behrens, M. M., Ecker, J. R., & Ren, B. (2021). Comprehensive analysis of single cell ATAC-seq data with SnapATAC. Nature Communications, 12(1), 1337.

Dharmavaram, S., **Xie, F.**, Klug, W., Rudnick, J., & Bruinsma, R. (2016). Landau theory and the emergence of chirality in viral capsids. EPL, 116(2), 26002.

Dharmavaram, S., **Xie, F.**, Klug, W., Rudnick, J., & Bruinsma, R. (2017). Orientational phase transitions and the assembly of viral capsids. Physical Review. E, 95(6-1), 062402.

Nan, F., **Xie, F.-M.**, Liang, S., Ma, L., Yang, D.-J., Liu, X.-L., Wang, J.-H., Cheng, Z.-Q., Yu, X.-F., Zhou, L., Wang, Q.-Q., & Zeng, J. (2016). Growth of metal-semiconductor core-multishell nanorods with optimized field confinement and nonlinear enhancement. Nanoscale, 8(23), 11969–11975.

Review papers

Armand*, E. J., Li*, J., **Xie*, F.**, Luo, C., & Mukamel, E. A. (2021). Single-Cell Sequencing of Brain Cell Transcriptomes and Epigenomes. Neuron, 109(1), 11–26.
(*These authors contributed equally to this work.)

Software

SingleCellFusion: https://github.com/mukamel-lab/SingleCellFusion
A computational tool that integrates disparate single-cell transcriptome and epigenome datasets.
