Zou Peng

CMI-P-37

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Research Keywords

Proximity labeling, Voltage imaging, Neuroscience, Membraneless organelles

Academic Career

B.S., 2007, PKU (Chemistry and Physics); Ph.D., 2013, MIT (Biological Chemistry, advisor: Alice Ting); Postdoctoral Training, 2013-2015, Harvard University (advisor: Adam Cohen); Assistant Professor, 2015-2021, Peking University; Associate Professor (Tenured), 2021-present, Peking University.

Selected Publications

Wang, P.#, Tang, W.#, Li, Z.#, Zou, Z., Zhou, Y., Li, R., Xiong, T., Wang, J.* and Zou, P.* (2019). Mapping spatial transcriptome with light-activated proximity-dependent RNA labeling. Nat. Chem. Biol. 15, 1110-1119.

Ding, T.#, Zhu, L.#, Fang, Y., Liu, Y., Tang, W. and Zou, P.* (2020). Chromophore-assisted proximity labeling of DNA reveals chromosomal organization in living cells. Angew. Chem. Int. Ed. Engl. 59, 22933-22937. (Selected as Hot Paper)

Zheng, F., Yu, C., Zhou, X. and Zou, P.* (2023). Genetically encoded photocatalytic protein labeling enables spatially-resolved profiling of intracellular proteome. Nat. Commun. 14, 2978.

Ren, Z.#, Tang, W.#, Peng, L. and Zou, P.* (2023). Profiling stress-triggered RNA condensation with photocatalytic proximity labeling. Nat. Commun. 14, 7390.

Zhang, W., Fu, Y., Peng, L., Ogawa, Y., Ding, X., Rasband, A., Zhou, X., Shelly, M., Rasband M. N.* and Zou, P.* (2023). Immunoproximity biotinylation reveals the axon initial segment proteome. Nat. Commun. 14, 8201.

Wang, R.#, Fang, Y.#, Hu, Y., Liu, Y.*, Chen, P. R.* and Zou, P.* (2025). Bioluminescence-activated proximity labeling for spatial multi-omics. Chem 11, 102595.

Liu, S.#, Lin, C.#, Xu, Y.#, Luo, H., Peng, L., Zeng, X., Zheng, H., Chen, P. R.* and Zou, P.* (2021). A far-red hybrid voltage indicator enabled by bioorthogonal engineering of rhodopsin on live neurons. Nat. Chem. 13, 472-479.

Liu, S.#, Ling, J.#, Xie, B.#, Zhang, Y., Peng, L., Yang, L., Yu, L., Lin, J., Tang, C.*, Chen, Z.* and Zou, P.* (2025). Positive-going hybrid indicators for voltage imaging in excitable cells and tissues. Sci. Adv. 11, eads1807.

Why My Lab?

My lab can offer...

Welcome to our lab at College of Chemistry and Molecular Engineering, Peking University! We aim to invent chemical and biophysical tools to map neuronal activities at high spatiotemporal resolution. We apply these tools to investigate the underlying biological macromolecules, physical forces, and chemical signaling that give rise to neuronal functions. Examples are engineered enzymes, fluorescent indicators, custom-built microscopes and software, etc. Our methods are drawing from a wide range of techniques, including protein engineering,

chemical synthesis, molecular and cellular biology, fluorescence microscopy, high-throughput sequencing, mass spectrometry-based proteomics, and quantitative modeling. Current research projects include: 1) optical mapping of action potential waveforms with genetically-encoded voltage indicators; 2) free radical-based chemical probes for spatiotemporally resolved mapping of proteins and RNAs in neurons; and 3) directed evolution platforms that drive technological advancements in the above two fronts.