Ke Cheng

Doctor of Philosophy

Department of Pharmaceutical Chemistry, University of California, San Francisco, 600 16th Street, San Francisco, CA 94158

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Education

City University of Hong Kong *Hong Kong*
PhD, Chemistry *2018 - 2021*
- Advisor: Prof. Hongyan Sun

Jinan University *Guangzhou, China*
MS, Medicinal Chemistry *2015 - 2018*
- Advisor: Prof. Ke Ding

Wuhan Institute of Technology *Wuhan, China*
BS, Pharmaceutical Engineering *2010 - 2014*

Professional Experience

2024-Pres. **Postdoctoral Scholar**, Department of Pharmaceutical Chemistry, UCSF, Advisor: Prof. Adam Renslo
2022-2023 **Postdoctoral Researcher**, School of Pharmaceutical Sciences, Sun Yat-sen University, Advisor: Prof. Wenbin Deng
2021-2022 **Research Assistant**, Department of Chemistry, City University of Hong Kong, Advisor: Prof. Hongyan Sun

Research Interests

Chemical Biology, Medicinal Chemistry, Cancer Theranostics, Nanomaterials

Skills & Expertise

Organic Synthesis; Analytical Chemistry; Chemical Probe Development; Fluorescent Labeling/Imaging; Molecular Docking Drug Design/Optimization; Prodrug Development; Peptide Chemistry; Gel Electrophoresis; Western Blotting; Cell Culture Fluorescence Microscopy; Chemoproteomics; Bioinformatics; Nanomaterials Synthesis/Characterization

Awards & Fellowships

2018-2021 **Postgraduate Studentship**, City University of Hong Kong
2018 **Creative Research Award**, Jinan University
2015-2018 **Postgraduate Fellowship**, Jinan University

Research Experience

University of California, San Francisco - Department of Pharmaceutical Chemistry *San Francisco, CA*
Advisors: Prof. Adam Renslo and Prof. Michael Evans *2024- Present*
- Project: "Trioxolane and disulfide probes for enhanced radioligand therapy"

Sun Yat-sen University - School of Pharmaceutical Sciences (Shenzhen) *Shenzhen, China*
Advisors: Prof. Wenbin Deng and Prof. Lin Mei *2022 - 2023*
- Project: "Self-assembled nanoprobes for targeted anticancer therapy"

City University of Hong Kong - Department of Chemistry *Hong Kong*

Advisor: Prof. Hongyan Sun *2018 - 2022*

- Thesis: "Developing isoxazole as a novel photo-cross-linker for chemoproteomics"

Jinan University - School of Pharmacy *Guangzhou, China*

Advisors: Prof. Ke Ding and Prof. Zhengqiu Li *2015-2018*

- Thesis: "Tetrazole-based probes for integrated phenotypic screening, affinity-based proteome profiling, and sensitive detection of a cancer biomarker"

Wuhan Institute of Technology - School of Chemical Engineering and Pharmacy *Wuhan, China*

Advisor: Prof. Shuangxi Gu *2013-2014*

- Dissertation: Synthesis of aryl sulfocyanic ester derivatives

Presentations

Winter 2019, Conference Poster, Dutch Chemistry Conference CHAINS, The Netherlands

Summer 2017, Invited Speaker, Annual Conference of Guangdong Pharmaceutical Society, Guangzhou, China

Teaching Experience

2020 **Principles of Organic Chemistry**, Teaching Assistant *CityU, HK*

2018 **Chemistry**, Teaching Assistant *CityU, HK*

Publications

1. **Cheng, K.**; Lee, J. S.; Hao, P.; Yao, S. Q.; Ding, K.; Li, Z., Tetrazole-Based Probes for Integrated Phenotypic Screening, Affinity-Based Proteome Profiling, and Sensitive Detection of a Cancer Biomarker. ***Angew. Chem. Int. Ed.*** 2017, 56 (47), 15044-15048.
2. **Cheng, K.**; Qi, J.; Ren, X.; Zhang, J.; Li, H.; Xiao, H.; Wang, R.; Liu, Z.; Meng, L; Ma, N.; Sun, H., Developing Isoxazole as a Native Photo-Cross-Linker for Photoaffinity Labeling and Chemoproteomics. ***Angew. Chem. Int. Ed.*** 2022, 61 (47), e202209947.
3. **Cheng, K.**; Qi, J.; Zhang J.; Li H.; Ren X.; Wei W.; Meng L.; Jing L.; Li. Q.; Zhang H.; Deng W.; Sun H.; Mei L., Self-Assembled Nano-photosensitizer for Targeted, Activatable, and Biosafe Cancer Phototheranostics. ***Biomaterials*** 2022, 291, 121916.
4. Klope, M. T.; Tapia Cardona, J. A.; Chen, J.; Gonciarz, R. L.; **Cheng, K.**; Jaishankar, P.; Kim, J.; Legac, J.; Rosenthal, P. J.; Renslo, A. R., Synthesis and In Vivo Profiling of Desymmetrized Antimalarial Trioxolanes with Diverse Carbamate Side Chains. ***ACS Med. Chem. Lett.*** 2024, 4c00365.
5. Pezacki, A. T.; Gonciarz, R. L.; Okamura, T.; Matier, C. D.; Torrente, L.; **Cheng, K.**; Miller, S. G.; Ralle, M.; Ward, N. P.; DeNicola, G. M.; Renslo, A. R.; Chang, C. J., A tandem activity-based sensing and labeling strategy reveals antioxidant response element regulation of labile iron pools. ***PNAS*** 2024, 121 (28), e2401579121.
6. Ren, X.; Li, H.; Peng, H.; Yang, Y.; Su, H.; Huang, C.; Wang, X.; Zhang, J.; Liu, Z.; Wei, W.; **Cheng, K.**; Zhu, T.; Lu, Z.; Li, Z.; Zhao, Q.; Tang, B. Z.; Yao, S. Q.; Song, X.; Sun, H., Reactivity-Tunable Fluorescent Platform for Selective and Biocompatible Modification of Cysteine or Lysine. ***Adv. Sci.*** 2024, 11(31), 2402838.
7. Meng, L.; Chen, X.; **Cheng, K.**; Chen, N.; Zheng, Z.; Wang, F.; Sun, H.; Wong, K.-C., TransPTM: a transformer-based model for non-histone acetylation site prediction. ***Brief. Bioinform.*** 2024, 25(3), bbae219.
8. Xiong, Y.; He, C.; Lin, X.; **Cheng, K.**; He, F.; Zhao, J.; Yang, M.; Gao, H.; He, F.; Zhang, X.; Liu, Z.; Liu, G.; Deng, W., Black phosphorus nanosheets inhibit glioblastoma cell migration and invasion through modulation of WNT/β-catenin and NOTCH signaling pathways. ***Chem. Eng. J.*** 2024, 481, 148614.
9. Meng, L.; Lin, J.; **Cheng, K.**; Xu, K.; Sun, H.; Wong, K.-C., UniPTM: Multiple PTM site prediction on full-length protein sequence. ***bioRxiv*** 2024, 2024.08.03.606471.
10. Wu, P.; Qu, Z.; Zhang, J.; Ren, X.; Wang, D.; Huang, C.; **Cheng, K.**; Qi, J.; Shi, H.; Gan, S.; Wei, W.; Zhang, Y.; Lee, C.-S.; Wang, L.; Sun, H., A General Cyanine-Based Platform for Designing Robust Dual-Channel Near-Infrared Fluorescent and Photoacoustic Probes. ***Adv. Funct. Mater.*** 2024, 2400597.

11. Fan, Z.; Liu, Z.; Zhang, N.; Wei, W.; **Cheng, K.**; Sun, H.; Hao, Q., Identification of SIRT3 as an eraser of H4K16la. ***iScience*** 2023, 26(10), 107757.

12. He, F.; **Cheng, K.**; Qi J.; He F.; Chu C.; Xiong, Y.; Zhao, j.; Ding, J.; Kong, F.; Cao, Z.; Liu G.; Deng, W., Black Phosphorus Nanosheets Enhance Differentiation of Neural Progenitor Cells for Improved Treatment in Spinal Cord Injury. ***Chem. Eng. J.*** 2023, 472, 144977.

13. Zhang, J.; Shi, H.; Huang, C.; Mei, L.; Guo, Q.; **Cheng, K.**; Wu, P.; Su, D.; Chen, Q.; Gan, S.; Wing Chan, C. K.; Shi, J.; Chen, J. L.; Jonathan Choi, C. H.; Yao, S. Q.; Chen, X.-K.; Tang, B. Z.; He, J.; Sun, H., De Novo Designed Self-Assembling Rhodamine Probe for Real-Time, Long-Term and Quantitative Live-Cell Nanoscopy. ***ACS Nano*** 2023, 17(4), 3632–3644.

14. Wei, W.; Zhang, J.; Xu, Z.; Liu, Z.; Huang, C.; **Cheng, K.**; Meng, L.; Matsuda, Y.; Hao, Q.; Zhang, H; Sun, H., Universal Strategy to Develop Fluorogenic Probes for Lysine Deacylase/Demethylase Activity and Application in Discriminating Demethylation States. ***ACS Sens.*** 2023, 8(1), 28-39.

15. Li, H.; Guan, C.; Zhang, J.; **Cheng, K.**; Chen, Q.; He, L.; Ge, X.; Lai, Y.; Sun, H.; Zhang, Z., Robust Artificial Interphases Constructed by a Versatile Protein-Based Binder for High-Voltage Na-Ion Battery Cathodes. ***Adv. Mater.*** 2022, 34 (29), 2202624.

16. Li, H.; Guan, C.; Xu, M.; Guo, J.; Yuan, K.; **Cheng, K.**; Xie, Y.; Zhang, L.; Zheng, J.; Lai, Y., Organic/Inorganic Anions Coupling Enabled Reversible High-valent Redox in Vanadium-based Polyanionic Compound. ***Energy Storage Mater.*** 2022, 47, 526-533.

17. Meng, L.; Chan, W. S.; Huang, L.; Liu, L.; Chen, X.; Zhang, W.; Wang, F.; **Cheng, K.**; Sun, H.; Wong, K. C., Mini-review: Recent Advances in Post-translational Modification Site Prediction Based on Deep Learning. ***Comput. Struct. Biotechnol. J.*** 2022, 20, 3522-3532.

18. Li, H.; Zhang, W.; Han, Z.; Sun, K.; Gao, C.; **Cheng, K.**; Liu, Z.; Chen, Q.; Zhang, J.; Lai, Y., Pseudocapacitance Enhanced by N-defects in Na3MnTi(PO4)3/N-doped Carbon Composite for Symmetric Full Sodium-ion Batteries. ***Mater. Today Energy*** 2021, 21, 100754.

19. Qi, J.; Xiong, Y.; **Cheng, K.**.; Huang, Q.; Cao, J.; He, F.; Mei, L.; Liu, G.; Deng, W., Heterobifunctional PEG-grafted Black Phosphorus Quantum Dots: "Three-in-One" Nano-platforms for Mitochondria-targeted Photothermal Cancer Therapy. ***Asian J. Pharm. Sci.*** 2021, 16 (2), 222-235.

20. Chen, Q.; **Cheng, K.**; Wang, W.; Yang, L.; Xie, Y.; Feng, L.; Zhang, J.; Zhang, H.; Sun, H., A Pyrene-based Ratiometric Fluorescent Probe with a Large Stokes Shift for Selective Detection of Hydrogen Peroxide in Living Cells. ***J. Pharm. Anal.*** 2020, 10 (5), 490-497.

21. Zhang, J.; Wen, G.; Wang, W.; **Cheng, K.**; Guo, Q.; Tian, S.; Liu, C.; Hu, H.; Zhang, Y.; Zhang, H., Controllable Cleavage of C–N Bond-based Fluorescent and Photoacoustic Dual-modal Probes for the Detection of H2S in Living Mice. ***ACS Appl. Bio Mater.*** 2020, 4 (3), 2020-2025.

22. Zheng, G.; Li, Z.; Duan, Q.; **Cheng, K.**; He, Y.; Huang, S.; Zhang, H.; Jiang, Y.; Jia, Y.; Sun, H., Two Quenching Groups are Better Than One: a Robust Strategy for Constructing HOCl Fluorescent Probe with Minimized Background Fluorescence and Ultra-high Sensitivity and its Application of HOCl Imaging in Living Cells and Tissues. ***Sens. Actuators B Chem.*** 2020, 310, 127890.

23. Ma, N.; Zhang, Z.; Lee, J.-S.; **Cheng, K.**; Lin, L.; Zhang, D.; Hao, P.; Ding, K.; Ye, W.-C.; Li, Z., Affinity-based Protein Profiling Reveals Cellular Targets of Photoreactive Anticancer Inhibitors. ***ACS Chem. Biol.*** 2019, 14 (12), 2546-2552.

24. Duan, Q.; Zheng, G.; Li, Z.; **Cheng, K.**; Zhang, J.; Yang, L.; Jiang, Y.; Zhang, H.; He, J.; Sun, H., An Ultra-sensitive Ratiometric Fluorescent Probe for Hypochlorous Acid Detection by the Synergistic Effect of AIE and TBET and its Application of Detecting Exogenous/Endogenous HOCl in Living Cells. ***J. Mater. Chem. B*** 2019, 7 (33), 5125-5131.

Patents

1. **Cheng, K.**; Zhang, J.; Wei, W.; Sun, H.,The Preparation and Pharmaceutical Application of Methylene Blue-Based, Cancer-targeted, and Self-assembly Probes. ***CN Patent***, 2022, Priority No. 202211253483.7

2. Wei W.; Zhang, J.; **Cheng, K.**; Meng, L.; Sun, H., Fluorescent Probes for Detecting Deacylation and Demethylase Activities. ***CN Patent***, 2022, Priority No. 202211271510.3