

Ke Cheng

DOCTOR OF PHILOSOPHY

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Education

City University of Hong Kong

PHD, CHEMICAL BIOLOGY

• Advisor: Prof. Hongyan Sun

Hong Kong

2018 - 2021

Jinan University

MS, MEDICINAL CHEMISTRY

• Advisor: Prof. Ke Ding

Guangzhou, China

2015 - 2018

Wuhan Institute of Technology

BS, PHARMACEUTICAL ENGINEERING

Wuhan, China

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

2021-2022 **Research Associate**, Department of Chemistry, City University of Hong Kong

2013-2014 **Intern**, WuXi AppTec (Wuhan)

Research Interests

Chemical Biology, Medicinal Chemistry, Cancer Theranostics, Nanomaterials

Skills & Expertise

Organic Chemistry; Analytical Chemistry; Small-Molecule Drug Development; Prodrug Design

Chemical Probe Development; Molecular Docking; Peptide Design/Synthesis; Gel Electrophoresis; Western Blotting

Cell Culture; Fluorescence Microscopy; Proteomics; Bioinformatics; Nanomaterials; Nanomedicine

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

ADVISORS: PROF. ADAM RENSLO & PROF. MICHAEL EVANS

• Project: "Trioxolane and disulfide probes for enhanced radioligand therapy"

San Francisco, CA

2024- Present

Sun Yat-sen University - School of Pharmaceutical Sciences (Shenzhen)

ADVISORS: PROF. WENBIN DENG & PROF. LIN MEI

• Project: "Self-assembled nanoprobe for targeted cancer therapy"

Shenzhen, China

2022 - 2023

City University of Hong Kong - Department of Chemistry

ADVISOR: PROF. HONGYAN SUN

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

Hong Kong

2018 - 2022

Jinan University - School of Pharmacy

ADVISORS: PROF. KE DING & PROF. ZHENGQIU LI

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

Guangzhou, China

2015-2018

Wuhan Institute of Technology - School of Chemical Engineering and Pharmacy

ADVISOR: PROF. SHUANGXI GU

- Dissertation: Synthesis of aryl sulfocyanic ester compounds

Wuhan, China

2013-2014

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

- 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.
- 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.
- 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.
- 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.
- 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.
- 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.
- 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.
- 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.
- 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.
- 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. Deng, W.; Xiong, Y.; Deng, G.; Qi, J.; **Cheng, K.**, New Application of Black Phosphorus Nano-Sheet in Tumor Treatment. *CN Patent*, 2024, **CN117924312A**
2. **Cheng, K.**; Zhang, J.; Wei, W.; Sun, H., Tumor-Targeting Self-Assembled Molecule Based on Methylene Blue: Preparation Method and Pharmaceutical Applications. *CN Patent*, 2022, **CN117924312A**
3. Wei W.; Zhang, J.; **Cheng, K.**; Meng, L.; Sun, H., Fluorescent Probe for Detecting Deacylation and/or Demethylase Activity: Preparation Method and Applications. *CN Patent*, 2022, **CN117903245A**
4. Ding, K; Li, Z; **Cheng, K.**, Tetrazole Molecular Probe Compound or Composition and its Application. *CN Patent*, 2017, **CN109593067B**