Kaiqi Long

CONTACT INFORMATION

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EDUCATION

9/2018-present PhD candidate in drug delivery, Department of Pharmocology and Pharmacy, Li Ka-Shing Falculty of Medicine, The University of Hong Kong, Hong Kong, China (Supervisor: Dr. Weiping Wang)

9/2014-8/2018 Bachelor of Science in Applied Chemistry, Sun Yat-Sen University, Guangzhou, China (GPA: 4.1/5, ranked 1st in 52)

RESEARCH EXPERIENCES

(Molecular Self-assembly; Light-responsive Drug Delivery; Photochemistry; Optical Devices)

- Developed **stimuli-responsive small molecule-assembled drug carriers** (Ph.D thesis)
  1. Developed a seires of clathrin-like, trigonal small molecules as building blocks of drug nanocarriers;
  2. Developed light-triggered drug release systems for intravenous chemotherapy of retinablastoma, constructed orthotopic retinablastoma mice model and evaluated theraputic efficacy *(Paper 2)*;
  3. Developed long-wavelength light-triggered drug release systems by investigating triplet-triplet energy transfer between cargos and building blocks *(Paper 3)*;
  4. Developed H_2S-triggered drug release system for therapy of endogenous H_2S-enriched tumors like colon tumors *(Paper 6)*;
- Developed **light-activable prodrugs** for precise drug delievry
  1. Developed *in-situ* monitorable drug delivery system for light-triggered drug release in colon tumor (*Paper 4*);
  2. Developed light-triggered multi-drug release system for cascade photodynamic-epigenetic-anti angiogenetic therapy for orthotopic esophageal tumor (*Ongoing*);
- Developed **light-responsive hydrogel** system for quantitative drug release, of which the light-triggered honokiol release was sucessfully utilized for insomnia treatment (*Paper 7*);
- Developed **NIR light-triggered upconversion-like photolysis strategy** and micellar system for light-triggered therapy *in vivo* (*Paper 1*);
- Developed **Type I PDT/PTT therapy** based on quinoidal semiconducting polymers (*Ongoing*);
- Designed and assembled **light delivery devices** (optical fiber and wiress LED implant) for phototherapy and drug delivery in deep tumors, such as primary breast tumor and esophageal tumor (*Ongoing*).

PUBLICATIONS

Peer-reviewed Articles: (Google Scholar: scholar.google.com/citations?user=IfMBx54AAAAJ)

1. **K Long**, W Lv, Z Wang, Y Zhang, K Chen, N Fan, Y Zhang, W Wang*, Near-infrared Light-Triggered Upconversion-like Prodrug Photolysis by One-step Energy Transfer, *Nature Communications*, 2023, DOI:10.1038/s41467-023-43805-y.
2. **K Long**[1], Y Yang[1], W Lv, K Jiang, Y Li, ACY Lo, WC Lam, C Zhan*, W Wang*, Green Light-triggered Intraocular Drug release for Intravenous Chemotherapy of Retinoblastoma, *Advanced Science*, 2021, 8, 2101754. (Highlighted on the journal cover)

3. **K Long**[1], H Han[1], W Kang, W Lv, L Wang, Y Wang, L Ge*, W Wang*, One-photon Red Light-triggered Disassembly of Small-molecule Nanoparticles for Drug Delivery, *Journal of Nanobiotechnology*, 2021, 19, 357.
4. **K Long**[1], Y Wang[1], W Lv, Y Yang, S Xu, C Zhan, W Wang*, Photoresponsive Prodrug-dye Nanoassembly for *in-situ* Monitorable Cancer Therapy, *Bioengineering & Translational Medicine*, 2022, e10311.
5. **K Long**[1], Y Liu[1], Y Li and W Wang*, Self-assembly of Trigonal Building Blocks into Nanostructures: Molecular Design and Biomedical Applications, *Journal of Materials Chemistry B*, 2020, 8, 6739-6752.
6. **K Long**, Y Yang, Z Du, W Kang, W Lv, Y Li, Y Xie, H Sung, C Zhan, W Wang*, H_2S-responsive Small-Molecule Nanocarrier for Drug Delivery to Colorectal Tumor, *Advanced Therapeutics*, 2022, 2200044. (Highlighted on the journal cover)
7. Y Yang[1], **K Long**[1], Y Wang[1], L Li, J Shi, J Liu, L Kong, Lin Yu, J Ding, Z Huang*, W Wang*, C Zhan*, NIR Light-triggered Quantitative Pulsed Drug Release, *Advanced Healthcare Materials*, 2022, 2102362.
8. Shuting Xu[1], Kaixuan Cui[1], **Kaiqi Long**, Jia Li, Wai-Ching Lam, Xiaoling Liang*, Weiping Wang*, Red light-triggered anti-angiogenic and photodynamic combination therapy of age-related macular degeneration, *Advanced Science*, 2023, Accepted.
9. Y Liu, **K Long**, T Wang, W Kang, W Wang*, Carrier-free Nanodrugs for Combination Therapy, 2022, *Aggregate*, e284.
10. W Lv, **K Long**, Y Yang, S Chen, C Zhan and W Wang*, A Red Light-Triggered Drug Release System based on One-Photon Upconversion-Like Photolysis, *Advanced Healthcare Materials*, 2020, 9, 2001118.
11. Y Li, Y Zhou, **K Long**, Y Zhang, T Wang, W Wang*, Photoenhanced Cytosolic Protein Delivery based on a Photocleavable Group-modified Dendrimer, *Nanoscale*, 2021, 13, 17784-17792.
12. Y Zhang, **K Long**, W Wang*, Facile Preparation and Photoactivation of Prodrug-dye Nanoassemblies, *Journal of Visualized Experiments*, 2023, 64677.
13. T Wang, **K Long**, Y Zhou, X Jiang, J Liu, JHC Fong, ASL Wong, WL Ng, W Wang*, Optochemical Control of mTOR Signaling and mTOR-dependent Autophagy, *ACS Pharmacology & Translational Science*, 2022, 5, 3, 149–155.
14. Y Liu, **K Long**, W Kang, T Wang, W Wang*, Optochemical Control of Immune Checkpoint Blockade via Light-triggered PD-L1 Dimerization, *Advanced NanoBiomed Research*, 2022, 2200017.
15. H Han, Y Li, Z Peng, **K Long**, C Zheng, W Wang*, TJ Webster*, L Ge*, A Soluplus/Poloxamer 407-based Self-nanoemulsifying Drug Delivery System for the Weakly Basic Drug Carvedilol to Improve its Bioavailability, *Nanomedicine: Nanotechnology, Biology and Medicine*, 2020, 27, 102199.

Patents:

1. W Wang, **K Long**, A Controlled Drug Release System of Photoresponsive Nanocarriers, Methods of Making and Using thereof, PCT Patent (No. PCT/CN2021/081262, 2021)
2. W Wang, T Wang, **K Long**, Compositions and Methods of Optochemical Control of mTOR Signaling and mTOR-dependent Autophagy, US Patent (No. 17/850,720, 2022)
3. W Wang, **K Long**, S Xu, Photoactivatable Prodrug Nanoparticles for Combined Anti-angiogenesis and Photodynamic Therapy, PCT Patent (No. PCT/CN2022/107621, 2022)
4. W Wang, Y Liu, **K Long**, Photoresponsive Prodrugs for Targeted Immunotherapy, US Provisional Patent (No. 63/203,87, 2021)
5. W Wang, **K Long**, Y Wang, Photocleavable Prodrug-based Nanomedicine for *in-situ* Monitorable Cancer Therapy, US Provisional Patent (No. 63/262,789, 2021)

6. W Wang, **K Long**, NIR Light-triggered Photolysis by One-step Energy Transfer, US Provisional Patent (No. 63/506,991, 2023)

Conference Presentations:

1. **K Long**, W Wang*, H_2S-responsive Nanocarrier for Drug Delivery, 10th International Conference on Materials for Advanced Technologies (ICMAT 2019), Singapore, 2019. (Oral presentation).
2. **K Long**, W Wang*, Long-wavelength Light-triggered Drug Delivery by Upconversion-like Photolysis, 13th International NanoMedicine Conference, Sydney, Autralia, 2023. (Oral presentation).
3. **K Long**, W Wang*, Long-wavelength Light-triggered Upconversion-like Prodrug Photolysis, 4th International Conference on Photopharmacology, Hong Kong, China, 2023. (Oral presentation).
4. **K Long**, Han Han, Weiping Wang*, One-photon Red Light-triggered Disassembly of Small-molecule Nanoparticles for Drug Delivery, Photopharmacology III Virtual Conference, 2021. (Poster presentation)
5. **K Long**, W Wang*, Green-light-triggered Intravenous Chemotherapy of Retinoblastoma, Postgraduate Symposium, The University of Hong Kong, 2021. (Poster presentation)

AWARDS & HONORS

2023	HKU Dissertation Year Fellowship
2022	Gold Medal, Special Edition 2022 Inventions Geneva Evaluation Days.
2018-2022	Hong Kong PhD Fellowship (HKPF)
2016-2017	First-class Scholarship, SYSU (ranked top 1%)
2015	Enterprise Scholarship of Amitabha
2015-2016	First-class Scholarship, SYSU (ranked top 1%)
2015-2016	China National Scholarship (ranked 1st)
2014-2015	First-class Scholarship, SYSU (ranked top 1%)

EXPERT SKILLS

- Organic synthesis of small molecules, such as drug derivatives, photocages and polymers.
- Column chromatography (HPLC, LC-MS and GPC); NMR, MALDI-TOF, DLS, UV-vis, fluorescence spectroscopy, SEM, TEM, etc.
- Software usage including Chemdraw, Gaussian 09W, Material studio 8.0, etc.
- Preparation and optimization of drug nanocarriers, drug encapsulation and release.
- Cell experiments. Cell culturing, toxicity evaluations by MTT and CCK8 assay, confocal imaging, flow cytometry, gene transfection, western blotting and qPCR.
- Animal experiments. Subcutaneous or orthotopic tumor model construction (retinoblastoma, breast tumor, colon tumor, esophageal tumor, etc.), *in vivo* efficacy and safety evaluation, pharmacokinetics study, H&E staining and immunohistochemistry staining.

PROFESSIONAL SKILLS

- Peer reviewer for *Redox Biology* and *Bioengineering & Translational Medicine*.
- Chaired Seminars in Li Dak-Sum Centre, The University of Hong Kong.
- Experienced in writing proposals for grant applications, such as National Natural Science Fund, Health and Medical Research Fund (HMRF), etc.
- Proficient in the use of Adobe series (Photoshop, Illustrator, After Effects, Premiere, Lightroom) for illustration design, video clip, etc.