

Kaho Leung, Ph.D.

Department of Chemistry and Biochemistry, University of South Carolina
GSRC, 631 Sumter Street • Columbia • SC 29208
kaho@mailbox.sc.edu

Professional Experience

Assistant Professor, Department of Chemistry and Biochemistry, University of South Carolina, US	2025 – present
Assistant Professor, Department of Chemistry and Biochemistry, Clarkson University, US	2021 – 2025
Postdoctoral Fellow, The University of Chicago, US <i>with Professor Yamuna Krishnan, Department of Chemistry, Grossman Institute of Neuroscience, Quantitative Biology and Human Behavior</i>	2016 – 2021
Graduate Research, Hong Kong Baptist University, HK <i>with Professor Dik-Lung Ma, Department of Chemistry</i>	2011 – 2015
Ph.D. Exchange Research, European Institute of Chemistry and Biology, France <i>with Professor Jean-Louis Mergny</i>	2012, 2014
Undergraduate Research, Hong Kong Baptist University, HK <i>with Professor Suk-Yin Lai, Department of Chemistry</i>	2010 – 2011

Education

Ph.D. in Chemistry, Hong Kong Baptist University, HK	2015
B.S. in Chemistry, Hong Kong Baptist University, HK	2011

Scholar profile (Aug 16, 2025)

Total citation	3665
h-index	29
Verified review	77
Google scholar	Kaho Leung (link)
Web of Science ResearcherID	AAB-9337-2019 (link)
ORCID iD	0000-0002-2998-669X

Honors and Awards

2025	Sensors & Diagnostics Emerging Investigators
2024	Member of million-dollar club, Clarkson University
2022	MIRA Maximizing Investigators' Research Award, NIH
2021 – present	Reviewer panel member of <i>RSC Advances</i> (RSC Publishing)
2013	Dr. Wu Yee Sun Memorial Scholarship Fund, Hong Kong Baptist University, HK
2012	Dr. Wu Yee Sun Memorial Scholarship Fund, Hong Kong Baptist University, HK

Research support

Current support

Title: R35 GM147112 Development and Application of Organelle Chemotype Fingerprinting for the Functional Investigation of Organellar Chloride

Role: Principal Investigator

Sponsor: NIH-NIGMS

Dates: 08/01/2022 – 5/31/2027

Amount: \$1,810,547

Title: R35GM147112-02S2 Prospective Evaluation of Chloride Channel-Targeted Therapy for Alzheimer's disease

Role: Principal Investigator

Sponsor: NIH-NIGMS, NIA

Dates: 06/01/2023 – 5/31/2027

Amount: \$290,681

Completed support

Title: R35GM147112-02S1 Undergraduate Summer Research in Chemical Biology

Role: Principal Investigator

Sponsor: NIH-NIGMS

Dates: 06/01/2023 – 5/31/2024

Amount: \$10,121

Patent

Y. Krishnan, K. Chakraborty, **K. Leung**, A. Saminathan, "METHODS OF DETERMINING PH AND CALCIUM OR CHLORIDE CONCENTRATION IN SAMPLES" US Patent App. 17/295,704

Publications

(*undergraduates are underlined*)

Since 2021

1. J. Morse, M. R. Nadiveedhi, M. Schmidt, F. Tang, C. Hladun, P. Ganesh, Z. Qiu, **K. Leung*** "Tunable Cytosolic Chloride Indicators for Real-Time Chloride Imaging in Live Cells." *BioRxiv*, 2024, DOI:10.1101/2024.08.08.606814
2. J. Morse, D. Wang, S. Mei, D. Whitham, C. Hladun, C. C. Darie, H. O Sintim*, M. Wang*, **K. Leung*** "Chloride Homeostasis Regulates cGAS-STING Signaling." *BioRxiv*, 2024, DOI:10.1101/2024.04.08.588475
3. F. Tang, L. Tucker, M.R. Nadiveedhi, C. Hladun, J. Morse, M. Ali, N. Payne, M. Schmidt, **K. Leung*** "Leveraging Chlorination-Based Mechanism for Resolving Subcellular Hypochlorous Acid." *BioRxiv*, 2024, DOI: 10.1101/2024.08.22.609247
4. J. Morse†, N. Ofodum†, F.K. Tang†, M. Schmidt, X. Lu*, **K. Leung*** "Leveraging Metal Complexes for Microsecond Lifetime-Based Chloride Sensing." *ACS Sensors*, 2025, 10, 2, 657
5. J. Morse, **K. Leung*** "FRET-based reporter assesses lysosomal DNA-degradation ability in live cells" 2025. *Sensors and Actuators Reports*, 2025, 9, 100259
6. A. S. Deshpande, T. Bechard, E. DeVoe, J. Morse, R. Khan, **K. Leung**, S. Andreescu* "Real-time monitoring of cellular superoxide anion release in THP-1 cells using a catalytically amplified

superoxide dismutase–based microbiosensor" *Analytical and Bioanalytical Chemistry*, 2024, 416, 4727

7. P. Gupta, K. Chaudagar, S. Sharma-Saha, K. Bynoe, L. Maillat, B. Heiss, **K. Leung**, Y. Krishnan, W. Stadler, A. Patnaik*, "PARP/PI3K inhibitor combination therapy eradicates c-MYC-driven murine prostate cancers via cGAS/STING pathway activation within tumor-associated macrophages." *Cancer Res.*, 2021, 81, 1685.
8. J. Osei-Owusu, J. Yang, **K. Leung**, Z. Ruan, W. Lu, Y. Krishnan and Z. Qiu* "Proton-activated chloride channel PAC regulates endosomal acidification and transferrin receptor-mediated endocytosis." *Cell Reports*, 2021, 34, 108683.

2016–2021

9. **K. Leung**, K. Chakraborty, A. Saminathan, Y. Krishnan*, "A DNA Nanomachine chemically resolves lysosomes in live cells." *Nature Nanotechnology*, 2019, 14, 176.
Highlighted in:
 - C.-M. Horejs (Associate Editor of *Nature Reviews Materials*), "Lysosomes uncovered" *Nature Reviews Materials*, 2019, 4, 2.
 - Editorial, "DNA nanostructures fingerprint cellular organelles" *Nature Nanotechnology*, 2019, 14, 99.
 - "Researchers use DNA nanomachines to discover subgroups of lysosomes" Phys.org <https://phys.org/news/2018-12-dna-nanomachines-subgroups-lysosomes.html>
10. N. Narayanaswamy, K. Chakraborty, A. Saminathan, E. Zeichner, **K. Leung**, J. Devany, Y. Krishnan* "A pH-correctable, DNA-based fluorescent reporter for organellar Calcium." *Nature Methods*, 2019, 16, 95.
Highlighted in:
 - Editorial, "DNA nanostructures fingerprint cellular organelles" *Nature Nanotechnology*. 2019, 14, 99.
11. **K. Leung**, Y. Krishnan*, "Dynamic RNA Nanotechnology Enters the CRISPR Toolbox." *ACS Central Science*, 2019, 5, 1111.
12. K. Chakraborty, **K. Leung**, Y. Krishnan*, "High luminal chloride in the lysosome is critical for lysosome function" *eLIFE*, 2017, 6, e28862.
13. X. Lin, **K. Leung (Co-first author)**, L. Lin, L. Lin, S. Lin, C.-H. Leung, D.-L. Ma*, J.-M. Lin*. "Determination of cell metabolite VEGF₁₆₅ and dynamic analysis of protein-DNA interactions by combination of microfluidic technique and luminescent switch-on probe" *Biosens. Bioelectron.*, 2016, 79, 25.
14. C.-H. Leung*, L.-J. Liu, **K. Leung**, D.-L. Ma*. "Epigenetic modulation by inorganic metal complexes" *Coord. Chem. Rev.*, 2016, 319, 25.

2011–2015

15. **K.-H. Leung**, H.-Z. He, B. He, H.-J. Zhong, S. Lin, Y.-T Wang, D.-L. Ma*, C.-H. Leung*. "Label-free luminescence switch-on detection of hepatitis C virus NS3 helicase activity using a G-quadruplex-selective probe" *Chem. Sci.*, 2015, 6, 2166
16. **K.-H. Leung**, B. He, C. Yang, C.-H. Leung*, H.-M. D. Wang*, D.-L. Ma*. "Development of an aptamer-based sensing platform for metal ions, proteins and small molecules through terminal deoxynucleotidyl transferase-induced G-quadruplex formation" *ACS Appl. Mater. Interfaces*, 2015, 7, 24046
17. **K.-H. Leung**, H.-Z. He, V. P.-Y. Ma, H.-J. Zhong, D. S.-H. Chan, J. Zhou, J.-L. Mergny, C.-H. Leung*, D.-L. Ma*. "Detection of base excision repair enzyme activity using a luminescent G-

quadruplex selective switch-on probe" *Chem. Commun.*, 2013, 49, 5630.

18. **K.-H. Leung**, H.-Z. He, V. P.-Y. Ma, D. S.-H. Chan, C.-H. Leung*, D.-L. Ma*. "A luminescent G-quadruplex switch-on probe for the highly selective and tunable detection of cysteine and glutathione" *Chem. Commun.*, 2013, 49, 771.
19. **K.-H. Leung**, H.-Z. He, W. Wang, H.-J. Zhong, D. S.-H. Chan, C.-H. Leung*, D.-L. Ma*. "Label-free luminescent switch-on detection of endonuclease IV activity using a G-quadruplex-selective iridium(III) complex" *ACS Appl. Mater. Interfaces*, 2013, 23, 12249.
20. H.-J. Zhong, L. Lu, **K.-H. Leung**, C. C. L. Wong, C. Peng, S.-C. Yan, D.-L. Ma, * Z. Cai*, H.-M. D.Wang*, C. H. Leung* "An iridium(III) based irreversible protein–protein interaction inhibitor of BRD4 as a potent anticancer agent" *Chem. Sci.*, 2015, 6, 5400
21. **K.-H. Leung**, L.-J. Liu, S. Lin, L. Lu, H.-J. Zhong, D. Susanti, W. Rao, M. Wang, W.-I. Che, D. S.-H. Chan, C.-H. Leung*, P. W.-H. Chan*, D.-L. Ma*. "Discovery of a Small-Molecule Inhibitor of STAT3 by Ligand-Based Pharmacophore Screening" *Methods*, 2015, 71, 38.
22. H.-J. Zhong, **K.-H. Leung (Co-first author)**, S. Lin, D. S.-H. Chan, Q.-B. Han, S. L.-F. Chan, D.-L. Ma*, C.-H. Leung*. "Discovery of Deoxyvasicinone Derivatives as Inhibitors of NEDD8-Activating Enzyme" *Methods*, 2015, 71, 71.
23. L.-J. Liu, **K.-H. Leung**, S. Lin, D. S.-H. Chan, D. Susanti, W. Rao, P. W. H. Chan, D.-L. Ma*, C.-H. Leung*. "Pharmacophore modeling for the identification of small-molecule inhibitors of TACE" *Methods*, 2015, 71, 92.
24. D.-L. Ma*, L.-J. Liu, **K.-H. Leung**, Y.-T. Chen, H.-J. Zhong, D. S.-H. Chan, H.-M. D. Wang*, C.-H. Leung*. "Antagonising STAT3 dimerization by a rhodium(III) complex" *Angew. Chem. Int. Ed.*, 2014, 53, 9178.
25. H.-Z. He, **K.-H. Leung**, W. Wang, D. S.-H. Chan, C.-H. Leung, D.-L. Ma*. "Label-free luminescence switch-on detection of T4 polynucleotide kinase activity using a G-quadruplex-selective probe" *Chem. Commun.*, 2014, 50, 5313.
26. D.-L. Ma*, S. Lin, **K.-H. Leung**, H.-J. Zhong, L.-J. Liu, D. S.-H. Chan, A. Bourdoncle, J.-L. Mergny, H.-M. D. Wang*, C.-H. Leung*. "An oligonucleotide-based label-free luminescent switch-on probe for RNA detection utilizing a G-quadruplex-selective iridium(III) complex" *Nanoscale*, 2014, 6, 8489.
27. L.-J. Liu, **K.-H. Leung (Co-first author)**, D. S.-H. Chan, D.-L. Ma*, C.-H. Leung*. "Identification of a natural product-like STAT3 dimerization inhibitor by structure-based virtual screening" *Cell Death Dis.*, 2014, 5, e1293.
28. M. Wang, **K.-H. Leung (Co-first author)**, S. Lin, D. S.-H. Chan, D.W.J. Kwong*, C.-H. Leung*, D.-L. Ma* "A colorimetric chemosensor for Cu²⁺ ion detection based on an iridium(III) complex" *Sci. Rep.*, 2014, 4, 6794.
29. M. Wang, **K.-H. Leung (Co-first author)**, S. Lin, D. S.-H. Chan, C.-H. Leung, D.-L. Ma*. "A G-quadruplex-based, label-free, switch-on luminescent detection assay for Ag⁺ ions based on the exonuclease III-mediated digestion of C-Ag⁺-C DNA" *J. Mater. Chem. B*, 2014, 2, 6467.
30. H.-J. Zhong, **K.-H. Leung (Co-first author)**, L.-J. Liu, L. Lu, D. S.-H. Chan, C.-H. Leung*, D.-L. Ma*. "Antagonism of mTOR Activity by a kinetically inert rhodium(III) complex" *ChemPlusChem*, 2014, 79, 508.

31. **K.-H. Leung**, H.-Z. He, H. Yang, D. S.-H. Chan, C.-H. Leung*, D.-L. Ma*. "A G-quadruplex-selective luminescent switch-on probe for the detection of sub-nanomolar human neutrophil elastase" *RSC Adv.*, 2013, 3, 1656.
32. **K.-H. Leung**, H.-Z. He, D. S.-H. Chan, W.-C. Fu, C.-H. Leung, D.-L. Ma*. "An oligonucleotide-based switch-on luminescent probe for the detection of kanamycin in aqueous solution" *Sensor Actuat. B-Chem.*, 2013, 177, 487.
33. **K.-H. Leung**, H.-Z. He, H.-J. Zhong, L. Lu, D. S.-H. Chan, D.-L. Ma*, C.-H. Leung*. "A highly sensitive G-quadruplex-based luminescent switch-on probe for the detection of polymerase 3' to 5' proofreading activity" *Methods*, 2013, 64, 224.
34. H.-Z. He, **K.-H. Leung**, H. Yang, D. S.-H. Chan, C.-H. Leung, J. Zhou, A. Bourdoncle, J.-L. Mergny, D.-L. Ma*. "Label-free detection of sub-nanomolar lead(II) ions in aqueous solution using a metal-based luminescent switch-on probe." *Biosens. Bioelectron.*, 2013, 41, 871.
35. **K.-H. Leung**, L. Lu, M. Wang, T.-Y. Mak, D. S.-H. Chan, F.-K. Tang, C.-H. Leung, H.-Y. Kwan, Z. Yu, D.-L. Ma*. "A label-free luminescent switch-on assay for ATP using a G-quadruplex-selective iridium(III) complex" *PLoS ONE*, 2013, 10, e77921.
36. H. Yang, H.-J. Zhong, **K.-H. Leung (Co-first author)**, D. S.-H. Chan, V. P.-Y. Ma, R. Nanjunda, W. D. Wilson, D.-L. Ma*, C.-H. Leung*. "Structure-Based Design of Flavone Derivatives as *c-myc* Oncogene Down-Regulators" *Eur. J. Pharm. Sci.*, 2013, 48, 130.
37. D.-L. Ma*, H.-Z. He, **K.-H. Leung**, H.-J. Zhong, D. S.-H. Chan, C.-H. Leung*. "Label-free luminescent DNA oligonucleotide-based probes" *Chem. Soc. Rev.*, 2013, 42, 3427.
38. D.-L. Ma*, V. P.-Y. Ma, D. S.-H. Chan, **K.-H. Leung**, H.-Z. He, C.-H. Leung*. "Bioactive luminescent transition-metal complexes for biomedical applications" *Angew. Chem., Int. Ed.*, 2013, 52, 7666.
39. **K.-H. Leung**, V. P.-Y. Ma, H.-Z. He, D. S.-H. Chan, C.-H. Leung, D.-L. Ma*. "A highly selective G-quadruplex-based luminescent switch-on probe for the detection of nanomolar strontium(II) ion in sea water" *RSC Adv.*, 2012, 2, 8273.
40. H.-Z. He, **K.-H. Leung (Co-first author)**, W.-C. Fu, D. S.-H. Chan, C.-H. Leung, D.-L. Ma*. "Application of a DNA-based luminescence switch-on method for the detection of mercury(II) ions in water samples of Hong Kong" *Environ. Res. Lett.*, 2012, 7, 044032.
Highlighted in
 - Environmental research web - Insight: mercury sensing by a label-free DNA-based biosensor, Feb 11, 2013
41. H.-Z. He, V. P.-Y. Ma, **K.-H. Leung (Co-first author)**, D. S.-H. Chan, H. Yang, Z. Cheng, C.-H. Leung, D.-L. Ma*. "A label-free G-quadruplex-based switch-on fluorescence assay for the selective detection of ATP" *Analyst*, 2012, 137, 1538.
Highlighted in
 - Vibhuti Patel, Deputy Editor of *Analyst*
42. D.-L. Ma*, H.-Z. He, V. P.-Y. Ma, D. S.-H. Chan, **K.-H. Leung**, H.-J. Zhong, L.-H. Lu, J.-L. Mergny, C.-H. Leung. "Label-free sensing of pH and silver nanoparticles using an "OR" logic gate" *Anal. Chim. Acta*, 2012, 733, 78.
43. H.-J. Zhong, V. P.-Y. Ma, Z. Cheng, D. S.-H. Chan, H.-Z. He, **K.-H. Leung**, D.-L. Ma*, C.-H. Leung*. "Discovery of a Natural Product Inhibitor Targeting Protein Neddylation by Structure-Based Virtual Screening" *Biochimie*, 2012, 94, 2457.

44. D.-L. Ma*, D. S.-H. Chan, V. P.-Y. Ma, **K.-H. Leung**, H.-J. Zhong, C.-H. Leung*. "Current advancements in Ab luminescent probes and inhibitors of Ab aggregation" *Curr. Alzheimer Res.*, 2012, 9, 830.
45. D.-L. Ma*, V. P.-Y. Ma, D. S.-H. Chan, **K.-H. Leung**, H.-J. Zhong, C.-H. Leung*. "In silico screening of quadruplex-binding ligands" *Methods*, 2012, 57, 106.
46. D.-L. Ma*, V. P.-Y. Ma, D. S.-H. Chan, H.-Z. He, **K.-H. Leung**, C.-H. Leung*. "Recent advances in luminescent metal complexes for sensing" *Coord. Chem. Rev.*, 2012, 256, 3087.

Book Chapters

1. D.-L. Ma, V. P.-Y. Ma, D. S.-H. Chan, **K.-H. Leung**, H.-J. Zhong, C.-H. Leung. "Natural products as inhibitors of the ubiquitin-/ubiquitin-like protein-proteasome pathway" *Book Chapter: Natural Products: Structure, Bioactivity and Applications*, Nova Science Publishers, Inc., 2012, ISBN: 978-1-62081-728-5.
2. D.-L. Ma, V. P.-Y. Ma, **K.-H. Leung**, H.-J. Zhong, H.-Z. He, D. S.-H. Chan, C.-H. Leung. "Structure-based approaches targeting oncogene promoter G-quadruplexes" *Book Chapter: Oncogene*, Intech, 2012, ISBN 980-953-307-364-9.

Manuscript Referee

(Publons, Web of Science Researcher ID: AAB-9337-2019)

	Verified reviews: 77
eLIFE – eLife Sciences Publications Ltd.	4
ACS sensors - ACS Publications	4
ACS Chemical Biology	1
ACS Nano - ACS Publications	1
The Journal of Physiology – American Physiological Society	1
Review Commons – EMBO Press	1
Life Science Alliance – EMBO Press	1
Nucleic Acids Research – Oxford University Press	2
Frontiers in Microbiology – Frontiers Media	1
Chemical Communications – RSC Publishing	31
Nanoscale – RSC Publishing	14
Bioconjugate Chemistry - ACS Publications	1
RSC advances – RSC Publishing	2
International Journal of Molecular Sciences – MDPI	2
Biosensors – MDPI	1
Molecules – MDPI	8
Nanomaterials – MDPI	1

Team

Graduate Students

Gabriella Ballestas	Aug 2024 – present
Colby Hladun	Aug 2023 – present
Jared Morse	Aug 2021 – present
Prasanna Ganesh	Jan 2024 – Aug 2025
Lawrence Tucker	Aug 2023 – Aug 2025
Rezaur Rahim, M.S.	Aug 2021 – May 2023

Undergraduate Students

1. Aashna Karavadia	Aug 2025 – present	AS Biological Sciences '2027	
2. Carolyn Colosi	Sept 2024 – Aug 2025	Chemistry '2027	
3. Kathrine Cowart	May 2024 – Aug 2025	McNair scholar Widener University	
4. Citlaly Hernandez	May 2024 – Aug 2025	McNair scholar Montclair State University	
5. Kirby Davidson	Sept 2023 – Aug 2025	Biomolecular Science, Chemistry '2027	
6. Matthias Schmidt	Jan 2022 – Aug 2025	McNair scholar, Chemistry '2025	Northwestern University, PhD
		• Undergraduate poster presentation award - 13th NNY-ACS Local Section • Undergraduate poster presentation award, Research and Projects Showcase Summer 2023 • Egon Matijevic Endowed Chemistry Scholarship 2022 • Department of Chem and Biomolecular Sci Freshman Award 2022 • Presidential Scholar Spring-Fall 2022	
7. Alayna Appolon	May 2023 – Aug 2024	McNair scholar Chemical Engineering '2024	
8. Christopher Brandon	Sept 2022 – May 2024	Biomolecular Science, Chemistry '2024	
9. Noah Payne	Jan 2023 – May 2024	Chemistry '2024	
10. Mahnoor Ali	Jan 2023 – May 2024	Biomolecular Science '2024	
		• Egon Matijevic Endowed Chemistry Scholarship 2023	Florida International University, PhD
11. Serena Mei	Aug 2021 – May 2023	Chemistry '2023	
		• Walsh Summer Research Fellowship 2022	Northeastern University, PharmD
12. John Carlson	Jan 2023 – May 2023	Biomolecular Science '2024	
13. Dean Buttaci	Sept 2022 – Dec 2022	Biology '2023	
14. Mary Donnelly	Sept 2022 – Dec 2022	McNair scholar, Biomolecular Science '2022	Research Specialist, University of Pennsylvania Tufts University, DMD
15. Isabella DeSena	May 2022 – Dec 2022	Biology '2022	
16. Michael Spizuoco	Jan 2022 – May 2022	Chemical Engineering '2022	
17. Danna Wang	June 2021 – Aug 2022	McNair scholar, Biomolecular Science '2022	Northeastern University, PharmD

Post Baccalaureate Lab Assistant

1. Halyna Smutok	Aug 2023 – Mar 2024
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Postdoctoral Scholars

• Dr. Maheshwara Nadiveedhi Reddy	May 2023 – present
• Dr. Fung Kit Tang May	May 2023 – Dec 2024
• Dr. Attunuri Nagireddy	Jan 2024 – Nov 2024
• Dr. Bishnu Das	Jan 2024 – July 2024