

Chan Kiat Hwa

Senior Lecturer

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Professional Experience

2023 – present Senior Lecturer, NUS College, National University of Singapore
2016 – 2023 Assistant Professor of Science (Chemistry), Yale-NUS College
2010 – 2016 Postdoctoral Fellow, Institute of Bioengineering and Nanotechnology, Singapore

Education

2006/07 – 2009/10 Doctor of Philosophy, Princeton University, USA
2004/05 – 2005/06 Master of Arts, Princeton University, USA
2003/04 Master of Science, National University of Singapore
2000/01 – 2002/03 Bachelor of Science (Hons), National University of Singapore

Awards/Honours Received

2022/23 Finalist for Yale-NUS Early Career Teaching Award
2009/10 Dean's Fund for Scholarly Travel
2004/05 – 2007/08 Hugh Stott Taylor Merit Prize
2004/05 – 2008/09 A*STAR National Science Scholarship (PhD)
2003/04 President Graduate Fellowship
2003/04 Kiang Aik Kim Scholarship

Publications

- [Chan, K. H.](#); Gowidjaja, J.; Urera, M. Q.; Wainwright, B. "Analysis of toxic metals found in shark fins collected from a global trade hub" *Environmental Science & Technology* **2023** (<https://doi.org/10.1021/acs.est.3c02585>).
- Dediu, V.; Ghitman, J.; Pircalabioru, G. G.; [Chan, K. H.](#); Iliescu, F. S.; Iliescu, C. "Trends in photothermal nanostructures for antimicrobial applications" *International Journal of Molecular Sciences* **2023**, *24*, 9375.
- Tay, J. J. J.; Karve, N. R. O.; [Chan, K. H.](#)* "Design, synthesis, and stability of (1-amino-4-(3-bromopropoxy)anthracene-9,10-dione)pentacarbonylrhenium(I) triflate: first X-ray crystallographic structure of a Re(CO)₅(N-donor)" *Journal of Organometallic Chemistry* **2023**, 122632.
- Bae, K. H.; Lai, F.; Mong, J.; Nambu, A.; [Chan, K. H.](#); Her, Z.; Osato, M.; Tan, M. H.; Chen, Q.; Kurisawa, M. "Bone Marrow-Targetable Green Tea Catechin-Based Micellar Nanocomplex for Synergistic Therapy of Acute Myeloid Leukemia" *Journal of Nanobiotechnology* **2022**, *20*, 481.
- Bae, K. H.; [Chan, K. H.](#); Kurisawa, M. "Autoxidation-resistant, ROS-scavenging and Anti-inflammatory Micellar Nanoparticles Self-assembled from Poly(acrylic acid)-Green Tea Catechin Conjugates" *ACS Macro Letters* **2022**, *11*, 835-840.
- [Chan, K. H.](#); Groves, J. T. "Concise Modular Synthesis and NMR Structural Determination of Gallium Mycobactin T" *Journal of Organic Chemistry* **2021**, *86*, 15453-15468.

- Kong, J. W.; Lam, Z.; Chan, K. H.; Ganguly, R.; Lee, J. -Y. J.; Loo, L. -H.; Webster, R. D.; Wong, Z. X.; Leong, W. K. "Group VIII metal carbonyl cluster-boronic acid conjugates: cytotoxicity and mode of action studies" *ACS Omega* **2021**, *6*, 29045-29053.
- Chan, K. H.*; Lim, J.; Jee, J. E.; Aw, J. H.; Lee, S. S. "Peptide-Peptide Co-Assembly: A Design Strategy for Functional Detection of C-peptide, A Biomarker of Diabetic Neuropathy" *International Journal of Molecular Sciences* **2020**, *21*, 9671.
- Chan, K. H.*; Tay, J. J. J. "Advancement of Peptide Nanobiotechnology via Emerging Microfluidics Technology" *Micromachines* **2019**, *10*, 627, doi:10.3390/mi10100627.
- Iliescu, F. S.; Poenar, D. P.; Yu, F.; Ni, M.; Chan, K. H.; Cima, I.; Taylor, H. K.; Cima, I.; Iliescu, C. "Recent advances in microfluidic methods in cancer liquid biopsy" *Biomicrofluidics* **2019**, *13*, 041503. (Featured article)
- Chan, K. H.*; Lee, W. H.; Ni, M.; Loo, Y.; Hauser, C. A. E. "C-Terminal residue of ultrashort peptides impacts on molecular self-assembly, hydrogelation, and interaction with small-molecule drugs" *Scientific Reports* **2018**, *8*, 17127 doi: 10.1038/s41598-018-35431-2 (1-14).
- Chan, K. H.*; Xue, B.; Robinson, R. C.; Hauser, C. A. E. "Systematic single moiety variations of ultrashort peptides produce profound effects on self-assembly, nanostructure formation, hydrogelation, and phase transition" *Scientific Reports* **2017**, *7*, 12897 doi:10.1038/s41598-017-12694-9 (1-11).
- Chan, K. H.; Lee, W. H.; Zhuo, S.; Ni, M. "Harnessing supramolecular peptide nanotechnology in biomedical applications" *International Journal of Nanomedicine* **2017**, *12*, 1171-1182.
- Ren, C.; Ng, G. H. B.; Wu, H.; Chan, K. H.; Shen, J.; Teh, C.; Ying, J. Y.; Zeng, H. "Instant room-temperature gelation of crude oil by chiral organogelators" *Chemistry of Materials* **2016**, *28*, 4001-4008.
- Chan, K. H.; Zhuo, S.; Ni, M. "Priming the surface of orthopedic implants for osteoblast attachment in bone tissue engineering" *International Journal of Medical Science* **2015**, *12*, 701-707.
- Smadbeck, J.**; Chan, K. H.**; Khoury, G. A.**; Xue, B.; Robinson, R. C.; Hauser, C. A. E.; Floudas, C. A. "De novo design and characterization of ultrashort self-associating peptides" *PLoS Computational Biology* **2014**, *10*, e1003718 (1-17). (** Co-first author)
- Reithofer, M. R.; Chan, K. H.; Lakshmanan, A.; Lam, D. H.; Mishra, A.; Gopalan, B.; Joshi, M.; Wang, S.; Hauser, C. A. E. "Ligation of anti-cancer drugs to self-assembling ultrashort peptides by click chemistry for localized therapy" *Chemical Science* **2014**, *5*, 625-630.
- Mishra, A.**; Chan, K. H.**; Reithofer, M. R.; Hauser, C. A. E. "Influence of metal salts on the hydrogelation properties of ultrashort aliphatic peptides" *RSC Advances* **2013**, *3*, 9985-9993. (** Co-first author)
- Zhang, S.; Chan, K. H.; Prud'homme, R. K.; Link, A. J. "Synthesis and evaluation of clickable block copolymers for targeted nanoparticle drug delivery" *Molecular Pharmaceutics* **2012**, *9*, 2228-2236.
- Chan, K. H.; Leong, W. K.; Jaouen, G.; Leclercq, L.; Top, S.; Vessieres, A. "Organometallic cluster analogues of tamoxifen: Synthesis and biochemical assay" *Journal of Organometallic Chemistry* **2006**, *691*, 9-19.
- Chan, K. H.; Leong, W. K.; Mak, K. H. G. "Thermolysis of the osmium-antimony clusters Os₃(CO)₁₁(SbMe₂Ar): Higher nuclearity clusters and arrested orthometalation" *Organometallics* **2006**, *25*, 250-259.

Expositions

- Chan, K. H.; Leong, W. K. “Bonding and reactivity of arene-trinuclear ruthenium/osmium clusters” In: Reedijk, J. (Ed.) *Elsevier Reference Module in Chemistry, Molecular Sciences and Chemical Engineering*. Waltham, MA: Elsevier. 29 October 2015 doi: 10.1016/B978-0-12-409547-2.11708-1 (1-10).
- Chan, K. H.; Jaspreet; Hauser, C. A. E. “The wonder stuff – How peptide hydrogels could change the face of biomedicine” *Laboratory News* 2015, Jan 20.
- Chan, K. H.; Hauser, C. A. E. “P-Glycoprotein-dependent trafficking of nanoparticle-drug conjugates” *MaterialsViews* 2014, Jun 12.
- Chan, K. H.; Zhuo, S.; Ni, M. “Natural and synthetic peptide-based biomaterials for bone tissue engineering” *OA Tissue Engineering* 2013, 1, 6 (1-5).

Patent

- Reithofer, M. R.; Hauser, C. A. E.; Chan, K. H.; Mishra, A. “Self-assembling ultrashort peptides modified with bioactive agents by click chemistry” Singapore Provisional Application (PCT/SG2013/000549) filed on 24 December 2013.

Progress: Licensing revenue has been received for the licensing of this patent to a European MNC (for the development of ultrashort peptide hydrogels for cosmetic applications).

Public Presentations

- Chan, K. H. “Peptide-peptide co-assembly: a design strategy for functional detection of C-peptide, a biomarker of diabetic neuropathy” Department of Chemistry, Colby College, Maine, USA, Sep 17, 2021. (Invited talk)
- Chan, K. H. “Mediation of co-assembly of peptides with different functionalities via a common peptide backbone” ACS (American Chemical Society) Spring 2021 National Meeting & Exposition, Virtual, Apr 5-16, 2021. (Oral presentation)
- Chan, K. H. “Capitalization on self-assembly for the preparation of rhenium carbonyl-based nanoparticles for theranostic applications” 258th American Chemical Society (ACS) National Meeting & Exposition, San Diego, California, USA, Aug 25-29, 2019. (Oral presentation)
- Chan, K. H. “Development of rhenium carbonyl-drug-peptide nanoparticles for theranostic applications” 9th Asian Biological Inorganic Chemistry Conference (AsBIC9), National University of Singapore, Singapore, Dec 9-14, 2018. (Invited talk)
- Chan, K. H. “Complexity in the relationship between peptide structure and their self-assembling tendencies” *International Conference on Nanotechnology: Ideas, Innovations & Initiatives-2017 (ICN:3I-2017)*, Indian Institute of Technology (IIT) Roorkee, Uttarakhand, India, Dec 6-8, 2017. (Plenary lecture)
- Chan, K. H. “Developing peptide hydrogels for biomedical applications: From practice to theory” Centre for Clean Environment and Energy, Griffith University, Gold Coast, Queensland, Australia, Jul 28, 2017. (Invited talk)
- Chan, K. H. “R&D landscape in Singapore related to economic development” MIT Sloan School of Management Southeast Asia Study Tour, Skype, Singapore, Feb 22, 2017. (Invited talk)
- Chan, K. H.; Zeng, H. “Synthetic water channel-based biomimetic hybrid membranes for water desalination” *Presentation to Environment & Water Industry (EWI) Project Evaluation Panel*, Environment Building, Singapore, Jun 18, 2015. (Oral presentation)

- Chan, K. H.; Mishra, A.; Reithofer, M. R.; Hauser, C. A. E. “Influence of metal salts on the hydrogelation properties of ultrashort aliphatic peptides” *3rd Nano Today Conference*, Biopolis, Singapore, Dec 8-11, 2013. (Poster presentation)
- Chan, K. H.; Groves, J. T. “Exploring the intracellular partitioning of mycobactin T in human macrophages” *239th American Chemical Society (ACS) National Meeting & Exposition*, San Francisco, California, USA, Mar 21-25, 2010. (Oral presentation)
- Chan, K. H.; Groves, J. T. “Development of “turn-on” fluorophores for iron detection” *13th International Conference of Bioinorganic Chemistry (ICBIC)*, University of Vienna, Austria, Jul 15-20, 2007. (Poster presentation)
- Chan, K. H.; Groves, J. T. “Illuminating the roles of siderophores in host-pathogen interactions” *Center of Environmental Bioinorganic Chemistry (CEBIC) Summer Workshop*, Princeton University, New Jersey, USA, Jun 10-13, 2007. (Oral presentation)
- Chan, K. H.; Leong, W. K.; Top, S.; Vessières, A.; Jaouen, G. “Investigations into carbonyl cluster derivatives of tamoxifen” *2nd International Symposium on Bioorganometallic Chemistry (ISBOMC)*, University of Zurich, Switzerland, Jul 14-17, 2004. (Poster presentation)

Lecture

- Chan, K. H. “How much science does a Martian need to know in order to survive?” Yale-NUS Open Day, Yale-NUS College, Singapore, Mar 10, 2018.

Media Mentions

- Highlight on Environmental Chemistry: Latest@Yale-NUS (27 July 2021). Environmental Chemistry course highlights the interdisciplinary nature of the Yale-NUS curriculum: <https://www.yale-nus.edu.sg/newsroom/environmental-chemistry-course-highlights-the-interdisciplinary-nature-of-the-yale-nus-curriculum/>
- Highlight on my teaching: <https://teaching.yale-nus.edu.sg/news-media/teaching-at-yale-nus/chan-kiat-hwa/>
- Reflection of my teaching: Yale-NUS Centre for Teaching & Learning – Reflections on Teaching

Professional Activities

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| 2021 | Presider, Self-Assembly in Polymer Systems (COLL001F), ACS (American Chemical Society) Spring 2021 National Meeting & Exposition, Virtual (5-16 April 2021) |
| 2017 – 2018 | Organizing Committee for 9 th Asian Biological Inorganic Chemistry (AsBIC9) Conference (9–14 December 2018) |
| 2017 | Organizing Committee for STEM Singapore Innovations Symposium (27–28 April 2017) |
| 2014 – present | Interviewer for undergraduate admission, Alumni Schools Committee, Princeton Alumni Association of Singapore |
| 2006 – present | Member, American Chemical Society, USA |

Common Curriculum Courses Taught

- Foundations of Science–Water (YCC2135; include laboratory sessions)*
- Scientific Inquiry 1 (YCC1131)

- Scientific Inquiry 2 (YCC2137; includes laboratory sessions)**
- Quantitative Reasoning with Data (GEA1000N)
- Science and Society (NSS2001)

Physical Sciences Major Courses Taught

- General Chemistry (YSC1207; includes laboratory sessions)
- Physical Chemistry (YSC2225; includes laboratory sessions)*
- Biochemistry (YSC3214)
- Inorganic Chemistry (YSC3228; includes laboratory sessions)*
- Environmental Chemistry: How The Science Informs Our Policy (YSC3259; includes laboratory sessions)*
- Organometallic Chemistry (YSC4205)*

* Wholly designed by me

** Partially designed by me