Curriculum Vitae (7.12.25.)

Jinwoo Shin, Ph.D.

The Kool Laboratory, Stanford University, United States of America

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Professional and Academic Positions

- ***Post-Doctoral Fellow*** (Jan. 2023 – Present)
  Department of Chemistry, Stanford University (Advisor: Prof. Eric T. Kool)

- ***Post-Doctoral Fellow and Research Professor*** (Sep. 2021 – Dec. 2022)
  The Institute of Basic Science, Korea University (Advisor: Prof. Jong Seung Kim)
  Technical Research Personnel, Military Service of the Republic of Korea Army

Education and Training

- ***Ph.D. in Organic Chemistry*** (Sep. 2015 – Aug. 2021, GPA: 4.34/4.5)
  Department of Chemistry, Korea University, Seoul, Republic of Korea (Advisor: Prof. Jong Seung Kim)
  Ph.D. Thesis: Design, Synthesis, and Characterization of Advanced Fluorescent Probes and Multi-functional Photo-therapeutics

- ***B.S. in Chemistry*** (Mar. 2012 – Aug. 2015, GPA: 4.44/4.5)
  Department of Chemistry, Hallym University, Chuncheon, Republic of Korea
  Summa cum laude *(Graduated with first class honor in Collage of Science)*

Research Interests

- ***Organic Chemistry/Chemical Biology/Medicinal Chemistry/Theoretical Chemistry***
  - ✓ Development of chemical tools for DNA and RNA
    - *Enhancing fluorogenic chemosensors for DNA repair systems by expanding to multi-color labeling*
    - *Developing novel fluorogenic chemosensors for RNA labeling*
    - *Chemistry on AP (abasic, DNA) and 2′-OH (RNA) site for versatile modification of nucleic acids*
  - ✓ Chemical modification on RNA to regulate translational processes
    - *Optimizing the effectiveness of mRNA therapeutics through regulation of its translation*
  - ✓ Risk Assessment of novel genotoxic mechanism from the consumption of heat-damaged DNA in food
    - *Heat-damaged DNA: Quali-/quantification and its implication in uncovering a novel genotoxic pathway*
    - *Developing an advanced bio-platform for genetic risk assessment*
    - *Investigating the feasibility of genotoxicity, neurodegeneration, carcinogenesis, and mutagenesis*
  - ✓ Development of advanced fluorescent probes and multi-functional phototherapeutics for various disease
    - *Advancing theranostics and elucidating the principles behind the ambiguous etiology of pathogens*
  - ✓ Derivation of the optimal structure through DFT-based calculation and docking study
    - Developing biochemical agents aimed at facilitating early diagnosis and treatment of various diseases

Books/Chapters

1. **J. Shin**, J. An, J. Kim, Y. Noh, P. Jangili,* J. S. Kim,* Ratiometric Fluorescent Chemosensors: Photo-physical/chemical Mechanism Principles and Design Strategies. in *Fluorescent Chemosensors*. eds. L. Wu, A.C. Sedgwick, X.-P. He & T.D. James. (124–159). *The Royal Society of Chemistry*, **2023**. (DOI: 10.1039/9781839167324-00124, April 2023)

List of Publications

23 publications (11 as a 1st author and 12 as a co-author), 3,283 citations (Google Scholar)

Google Scholar link: https://scholar.google.com/citations?user=XLit1nwAAAAJ&hl=ko

†Both authors equally contributed to the work, *Corresponding author

[1st author, published]

11. **J. Shin**,† N. Kang,† B. Kim,† H. Hong, L. Yu, J. Kim, H. Kang,* J. S. Kim,* One-dimensional nanomaterials for cancer therapy and diagnosis. *Chem. Soc. Rev.* **2023**, *52*, 4488–4514 (DOI: 10.1039/d2cs00840h).

10. **J. Shin**,† D. W. Kang,† J. H. Lim,† J. M. An,† Y. Kim, J. H. Kim, M. S. Ji, S. Park,* D. Kim,* J. Y. Lee,* J. S. Kim,* C. S. Hong,* Wavelength engineerable porous organic polymer photosensitizers with protonation triggered ROS generation. *Nat. Commun.* **2023**, *14*, 1498 (DOI: 10.1038/s41467-023-37156-x).

9. **J. Shin**,† Y. Xu,† S. Koo,† J. H. Lim,† J. Y. Lee,* A. Sharma,* Y. Sun,* J. S. Kim,* Mitochondria-targeted Nanotheranostic: Harnessing Single Laser Activated Dual Photo-therapeutic Processing for Hypoxic Tumor Treatment. *Matter* **2021**, *4*, 2508–2521 (DOI: 10.1016/j.matt.2021.05.022).

8. **J. Shin**,† P. Verwilst,† H. Choi,† S. Kang, J. Han, N. H. Kim, J. G. Choi, M. S. Oh, J. S. Hwang, D. Kim,* I. M.-Jung,* J. S. Kim,* Harnessing Intramolecular Rotation to Enhance Two-photon Imaging of Aβ Plaques Through Minimizing Background Fluorescence. *Angew. Chem. Int. Ed.* **2019**, *58*, 5648–5652 (DOI: 10.1002/anie.201900549).

7. L. Tu,† Q. Li,† S. Qiu,† M. Li,† **J. Shin**,† P. Wu,† N. Singh, J. Li, Q. Ding, C. Hu, X. Xiong,* Y. Sun,* J. S. Kim,* Recent developments in carbon dots: a biomedical application perspective. *J. Mat. Chem. B* **2023**, *11*, 3038–3053 (DOI: 10.1039/d2tb02794a).

6. H. Kim,† **J. Shin**,† D. W. Kang,† Y. Kim,† J. H. Kim, M. Kang, J. H. Choe, S. Park,* J. S. Kim,* C. S. Hong,* Photocatalytic detoxification of a sulfur mustard simulant under realistic conditions by imidazoline-based porous organic polymer composites. *Cell Rep. Phys. Sci.* **2022**, *3*, 100888 (DOI:10.1016/j.xcrp.2022.100888).

5. J. An,† P. Verwilst,† H. Aziz,† **J. Shin**,† S. Lim, I. Kim, Y. K. Kim,* J. S. Kim,* Picomolar-Sensitive β-Amyloid Fibril Fluorophores by Tailoring the Hydrophobicity of Biannulated π-Elongated Dioxaborine-Dyes. *Bioact. Mater.* **2022**, *13*, 239–248 (DOI: 10.1016/j.bioactmat.2021.10.047).

4. J. Cho,† **J. Shin**,† M. Kang,† P. Verwilst, C. Lim, H. Yoo, J. G. Kim, X. Zhang, C. S. Hong,* J. S. Kim,* S. Kim,* Calix[n]triazolium based Turn-On Fluorescent Sensing Ensemble for Selective Adenosine Monophosphate (AMP) Detection. *Chem. Commun.* **2021**, *57*, 12139 (DOI: 10.1039/d1cc04950j).

3. C. Liu,† **J. Shin**,† S. Son,† Y. Choe,† N. Farokhzad, Z. Tang, Y. Xiao, N. Kong,* T. Xie,* J. S. Kim,* W. Tao,* Pnictogens in medicinal chemistry: evolution from erstwhile drugs to emerging layered photonic nanomedicine. *Chem. Soc. Rev.* **2021**, *50*, 2260–2279 (DOI: 10.1039/d0cs01175d).

2. S. Son,† J. H. Kim,† X. Wang,† C. Zhang,† S. A. Yoon,† **J. Shin**,† A. Sharma,* M. H. Lee,* L. Cheng,* J. Wu,* J. S. Kim,* Multifunctional sonosensitizers in sonodynamic cancer therapy. *Chem. Soc. Rev.* **2020**, *49*, 3244–3261 (DOI: 10.1039/c9cs00648f).

1. Z. Yang,† D. H. Kang,† H. Lee,† **J. Shin**,† W. Yan, B. Rathore, H.-R. Kim, S. J. Kim, H. Singh, L. Liu, J. Qu,* C. Kang,* J. S. Kim,* A Fluorescent Probe for Stimulated Emission Depletion Super-Resolution Imaging of Vicinal-Dithiol-Proteins on Mitochondrial Membrane. *Bioconj. Chem.* **2018**, *29*, 1446–1453 (DOI: 10.1021/acs.bioconjchem.8b00128).

[1st author, Manuscript in preparation or submitted]

2. **J. Shin**,† M. J. Kim,† E. T. Kool,* Wavelength-engineered Fluorogenic Multicolor Labeling of RNA via Selective 2′-OH Covalent Acylation. **2025**, (Manuscript in preparation).

1. **. Shin**,† P. Jaruga, M. Dizdaroglu, E. T. Kool,* DNA Content and DNA Damage in Raw and Heat-processed Foods. **2025**, (Submitted).

[Co-author, published]

12. J. An,† K. Kim, H. J. Lim, H. Y. Kim, **J. Shin**, I. Park, I. Cho, H. Y. Kim, S. Kim, C. McLean, K. Y. Choi, Y. Kim*, K. H. Lee*, J. S. Kim,* Early onset diagnosis in Alzheimer's disease patients via amyloid-β oligomers-sensing probe in cerebrospinal fluid. *Nat. Commun.* **2024**, *15*, 1004 (DOI: 10.1038/s41467-024-44818-x).

11. Z. Zunbul,† J. An,† H. Aziz,† **J. Shin**, S. Lim, L. Yu, Y. K. Kim,* J. S. Kim,* Tailoring Hydrophobicity of Thioflavin T to Optimize Aβ Fibril Bioimaging. *Adv. NanoBiomed Res.* **2023**, *3*, 2200161 (DOI: 10.1002/anbr.202200161).

10. J. H. Kim,† S. Park,† E. Jung, **J. Shin**, Y-J. Kim,* J. Y. Kim,* J. L. Sessler,* J. H. Seo,* J. S. Kim,* A dual-action niclosamide-based prodrug that targets cancer stem cells and inhibits TNBC metastasis. *Proc. Natl. Acad. Sci. U.S.A.* **2023**, *120*, e2304091120 (DOI: 10.1073/pnas.2304081120).

9. D. W. Kang,† J. H. Kim,† J. H. Lim,† Y. Kim, M. Kang, **J. Shin**, S. Son, H. Yun, H. Kim, S. Park, J. S. Kim,* C. S. Hong,* Promoted type I and II ROS generation by a covalent-organic framework though sonosensitization and PMS activation. *ACS Catal.* **2022**, *12*, 9621 (DOI: 10.1021/acscatal.2c02414,).

8. J. H. Kim,† H. Yun,† D. W. Kang,† **J. Shin**, M. Kang, N. Singh, J.-E. Jeong, C. S. Hong,* J. S. Kim,* S. Kim,* Isomeric sp2-Carbon Porous Organic Polymer-mediated Photo- and Sono-catalytic Detoxification of Sulfur Mustard under Ambient Conditions. *Matter* **2021**, *4*, 3774 (DOI: 10.1016/j.matt.2021.10.005).

7. J. M. An,† H. Moon,† P. Verwilst,† **J. Shin**, B. M. Park, C. Park, J. S. Kim, S. G. Yeo,* H. Y. Kim,* D. Kim* Human Glioblastoma Visualization: Triple Receptor-targeting Fluorescent Complex of Dye, SIWV Tetra-peptide, and Serum Albumin Protein. *ACS Sens.* **2021**, *6*, 2270–2280 (DOI: 10.1021/acssensors.1c00320).

6. B. Chen,† W. Gong,† Z. Yang,* W. Pan, P. Verwilst, **J. Shin**, W. Yan, L. Liu, J. Qu,* J. S. Kim,* STORM imaging of mitochondrial dynamics using a vicinal-dithiol-proteins-targeted probe. *Biomaterials* **2020**, *243*, 119938 (DOI: 10.1016/j.biomaterials.2020.119938).

5. P. Liu,† W. Fu,† P. Verwilst, M. Won, **J. Shin**, Z. Cai,* B. Tong, J. Shi, Y. Dong,* J. S. Kim,* MDM2-Associated Clusterization-Triggered Emission and Apoptosis Induction Effectuated by a Theranostic Spiropolymer. *Angew. Chem. Int. Ed.* **2020**, *132*, 1–6 (DOI: 10.1002/anie.201916524).

4. Y. He,† **J. Shin**, W. Gong, P. Das, J. Qu, Z. Yang,* W. Liu, C. Kang, J. Qu,* J. S. Kim,* Dual-functional fluorescent molecular rotor for endoplasmic reticulum microviscosity imaging during reticulophagy. *Chem. Commun.* **2019**, *55*, 2453–2456 (DOI: 10.1039/C9CC00300B).

3. Y. Zhou,† M. Maiti,† A. Sharma,† M. Won, L. Yu, L. X. Miao, **J. Shin**, A. Podder, K. N. Bobba, J. Han,* S. Bhuniya,* J. S. Kim,* Azo-based small molecular hypoxia responsive theranostic for tumor-specific imaging and therapy. *J. Control Rel.* **2018**, *288*, 14–22 (DOI: 10.1016/j.jconrel.2018.08.036,).

2. H. S. Jung,† P. Verwilst,† A. Sharma,† **J. Shin**, J. L. Sessler,* J. S. Kim,* Organic molecule-based photothermal agents: an expanding photothermal universe. *Chem. Soc. Rev.* **2018**, *47*, 2280–2297 (DOI: 10.1039/C7CS00522A).

1. J.-H. Zhu,† C. Yu,† Y. Chen, **J. Shin**, Q.-Y. Cao,* J. S. Kim,* A self-assembled amphiphilic imidazole-based ATP probe. *Chem. Commun.* **2017**, *53*, 4342–4345 (DOI: 10.1039/c7cc01346a).

Patent Applications/Registrations

[Applications]

9. Imidazoline-based porous organic polymers and method of preparing the same, KR 10-2022-0111859 (05 September 2022)
8. Two-photon fluorescent probe compound selective for amyloid beta plaques and method for imaging amyloid beta plaques using same, U.S.A. 17/802,233 (25 August 2022)
7. Nano-theranostics for single-laser-activated phototherapy having mitochondria specificity, KR 10-2022-0075972 (22 June 2022)
6. Imidazoline-based porous organic polymers and method of preparing the same, KR 10-2021-0120637 (09 September 2021)
5. Amyloid-β-specific two-photon fluorescent probe, and method for imaging amyloid-β plaque using the same, PCT/KR2021/001002 (26 January 2021)
4. Anti-cancer prodrug for overcoming multidrug resistance, PCT/KR2020/018292 (14 December 2020)
3. Amyloid-β-specific two-photon fluorescent probe, and method for imaging amyloid-β plaque using the same, KR 10-2020-0023888 (26 February 2020)
2. Anti-cancer prodrug for overcoming multidrug resistance, KR 10-2019-0165660 (12 December 2019)
1. Anticancer theranostic compound having colorectal cancer specificity, KR 10-2019-0032285 (21 March 2019)

[Registrations]

3. Amyloid-β-specific two-photon fluorescent probe, and method for imaging amyloid-β plaque using the same, KR 10-2344437 (23 December 2021)
2. Anti-cancer prodrug for overcoming multidrug resistance, KR 10-2326738 (10 November 2021)
1. Anticancer theranostic compound having colorectal cancer specificity, KR 10-2258299 (25 May 2021)

Professional Honors, Scholarships, and Fellowships

- ***Beneficiary of Post-Doctoral Overseas Training Fellowship 2024***
  National Research Foundation of Korea
- ***Beneficiary of 13th S-Oil Dissertation of the Year Awards 2023***
  Chemistry, The Korean Academy of Science and Technology and S-Oil
  Profile featured (Link: S-OIL NEWS, Maeil Business News Korea, Smartfn News, Sisaon News, and Newsprime)
- ***Beneficiary of CAS Future Leaders 2022***
  A division of the American Chemical Society
  Profile featured in C&EN (Link: 2022 article)
- ***Selected as a Scientist registered more than 3 times in the past 3 years***
  The people who made Korea shine, BRIC, 6 high-impact journal papers

- ***Outstanding Poster Award, The 128th General Meeting of the Korean Chemical Society*** (April 2022)
  ICC JEJU, Republic of Korea
  Utilizing Maximal Photon Usage of Single-laser-activated Dual Photoactivable Organic Nanotheranostic: Mitochondria-targeted Phototherapeutic Processing for Hypoxic Tumor Treatment
- ***Outstanding Poster Award, The 11th Chemosensor Symposium*** (January 2019)
  Korea University, Republic of Korea
  An Imino-coumarin Scaffold for Two-Photon β-Amyloid Fluorescence Probe with Minimal Auto-fluorescence
- ***Outstanding Poster Award, The 10th Singapore International Chemistry Conference, SICC10*** (December 2018)
  National University of Singapore University, Singapore
  Next-Generation Two-Photon β-Amyloid Dyes: Minimizing Background Fluorescence
- ***2021 Winner of the Chemistry Learning Group, Brain Korea 21 plus*** (Spring semester, 2021)
  Department of Chemistry, Korea University, Republic of Korea
- ***2020 Excellent paper award, Brain Korea 21 plus*** (Spring semester, 2020)
  Department of Chemistry, Korea University, Republic of Korea
- ***2019 Excellent paper award, Brain Korea 21 plus*** (Spring semester, 2019)
  Department of Chemistry, Korea University, Republic of Korea
- ***2018 Excellent presentation of conference award, Brain Korea 21 plus*** (Fall semester, 2018)
  Department of Chemistry, Korea University, Republic of Korea
- ***2018 Participation paper award, Brain Korea 21 plus*** (Spring semester, 2018)
  Department of Chemistry, Korea University, Republic of Korea
- ***2017 Excellent paper award, Brain Korea 21 plus*** (Spring semester, 2017)
  Department of Chemistry, Korea University, Republic of Korea
- ***Summa cum laude, Department of Chemistry, Hallym University***
  Department of Chemistry, Hallym University, Republic of Korea
- ***S&T Foundation Scholarship Program Beneficiary*** (2013-2014)
  S&T Foundation, Republic of Korea
- ***Best academic achievement*** (2012-2015)
  Department of Chemistry, Hallym University, Republic of Korea

Poster Presentation

12 **J. Shin**, Y. Xu, S. Koo, J. H. Lim, J. Y. Lee, A. Sharma, Y. Sun, J. S. Kim, Harnessing a Single-laser-activated Dual Photoactivable Organic Nanotheranostic for Maximal Photon Usage, ACS Fall 2022, Chicago Illinois, United States of America (International conference, August 2022).

11 **J. Shin**, S. Son, J. H. Kim, J. An, J. Kim, B. Kim, M. Choi, H. Rha, Z. Zunbul, J. Lee, E. J. Kim, J. S. Kim, Single-laser-activatable Dual Phototherapeutic Nanotheranostic, The 20th Annual Congress of the Korean Photodynamic Association, National Cancer Center, Republic of Korea (August 2022).

10 **J. Shin**, Y. Xu, S. Son, J. Kim, J. An, J. Y. Lee, A. Sharma, Y. Sun, J. S. Kim, Utilizing Maximal Photon Usage of Single-laser-activated Dual Photoactivable Organic Nanotheranostic: Mitochondria-targeted Phototherapeutic Processing for

Hypoxic Tumor Treatment, The 129th General Meeting of the Korean Chemical Society, ICC JEJU, Republic of Korea (Outstanding poster award, April 2022).

9. **J. Shin**, J. Ahn, J. H. Kim, S. Son, W. Choi, Y. Choe, J. S. Kim, A MDM2-Associated Spiropolymer Theranostic: Clusterization-Triggered Emission and Effectuating Apoptosis, The 125th General Meeting of the Korean Chemical Society, Online Meeting (July 2020).

8. **J. Shin**, J. Ahn, H. S. Kim, J. H. Kim, S. Son, M. S. Ji, W. Choi, E. Jung, J. S. Kim, Harnessing Bifunctional Fluorescent Molecular Rotor for Endoplasmic Reticulum Microviscosity Lifetime Imaging during Reticulophagy, The 12th Chemosensor Symposium, Ewha Womans University, Republic of Korea (January 2020).

7. **J. Shin**, J. Kim, J. Ahn, H. S. Kim, J. H. Kim, S. Son, M. S. Ji, W. Choi, J. S. Kim, Minimizing Background Fluorescence in Brightly Emissive Two-Photon β-Amyloid Dyes, The 124th General Meeting of the Korean Chemical Society, Changwon Convention Center, Republic of Korea (October 2019).

6. **J. Shin**, J. Kim, J. Ahn, H. S. Kim, J. H. Kim, S. Son, M. S. Ji, W. Choi, J. S. Kim, A Molecular Rotor Probe for Endoplasmic Reticulum Local Viscosity Fluorescence Lifetime Imaging of Reticulophagy, The 123th General Meeting of the Korean Chemical Society, Suwon, Republic of Korea (April 2019).

5. **J. Shin**, J. Kim, K. Sunwoo, H. S. Kim, J. H. Kim, S. Son, M. S. Ji, S. Koo, J. S. Kim, An Imino-coumarin Scaffold for Two-Photon *β*-Amyloid Fluorescence Probe with Minimal Auto-fluorescence, The 11th Chemosensor Symposium, Korea University, Republic of Korea (Outstanding poster award, January 2019).

4. **J. Shin**, S. Kim, J. Kim, K. Sunwoo, H. S. Kim, G. Y. Park, S. Son, T. Jeong, M. S. Ji, S. Koo, J. S. Kim, Next-Generation Two-Photon β-Amyloid Dyes: Minimizing Background Fluorescence, The 10th Singapore International Chemistry Conference (SICC10), National University of Singapore, Singapore (International conference, Outstanding poster award, December 2018).

3. **J. Shin**, H. S. Kim, J. Kim, G. Y. Park, S. Son, A. Sharma, W. Y. Kim, S. Koo, K. Sunwoo, T. Jeong, J. S. Kim, A non-Enzymatic Based Fluorogenic Probe for Sensing Uric Acid in Blood Serum, The 2nd Asian Conference on Chemosensors & Imaging Probes, Beijing, China (International conference, October 2017).

2. **J. Shin**, T. H. Jeong, W. Y. Kim, G. Y. Park, S. Son, K. Sunwoo, J. S. Kim, A non-enzymatic approach to sensing uric acid in blood serum: complementary H-Bonding on a BODIPY scaffold, The 119th General Meeting of the Korean Chemical Society, KINTEX, Republic of Korea (April 2017).

1. **J. Shin**, Y. H. Lee, C. H. Kim, I. S. Shim, J. S. Kim, A non-enzymatic BODIPY based fluorogenic probe for uric acid in blood serum, The 117th General Meeting of the Korean Chemical Society, Convention center, KINTEX, Republic of Korea (April 2016).

Membership and Activities in Professional Associations

- ***American Chemical Society (ACS)*** (2022 – Present)
  Annual membership, United States of America
- ***Chemical Abstract Service (CAS) Future Leaders Alumni Community*** (2022 – Present)
  Lifetime membership, United States of America
- ***Korean-American Scientists and Engineers Association (KSEA),*** (2024 – Present)
  Annual membership, United States of America and Republic of Korea
- ***The Korean Chemical Society (KCS),*** (2016 – 2020)
  Annual membership, Republic of Korea

Professional Experiences

- ***Journal Peer Reviewer*** (November 2023–Present)
  ACS Applied Bio Materials, American Chemical Society, United States of America
  Aggregate, Wiley, United States of America
- ***Post-Doctoral Scholar*** (January 2023–Present)
  Department of Chemistry, Sarafan ChEM-H, Stanford Cancer Institute, Stanford University, Stanford, U.S.A.
- ***Technical Research Personnel*** (September 2020–September 2023)
  Military Service of the Republic of Korea Army, The Institute of Basic Science, Korea University
- ***General Chemistry Laboratory* I *English Class*** (Spring semester, 2019)
  Department of Chemistry, Korea University, Seoul, Republic of Korea
  As a teaching assistant (Prof. Sang Won Lee)
- ***General Chemistry Laboratory* I *English Class*** (Spring semester, 2019)
  Department of Chemistry, Korea University, Seoul, Republic of Korea
  As a teaching assistant (Prof. Hugh I. Kim)
- ***History of Civilization: Modern Science and Technology*** (Fall semester, 2018)
  Department of Chemistry, Korea University, Seoul, Republic of Korea
  As a teaching assistant (Prof. Seung Joon Jeon)
- ***General Chemistry Laboratory*** (Fall semester, 2018)
  Department of Chemistry, Korea University, Seoul, Republic of Korea
  As a teaching assistant (Prof. Suk Joong Lee)
- ***General Chemistry Laboratory*** (Spring semester, 2018)
  Department of Chemistry, Korea University, Seoul, Republic of Korea
  As a teaching assistant (Prof. Suk Joong Lee)
- ***General Chemistry Laboratory* I *English Class*** (Spring semester, 2018)
  Department of Chemistry, Korea University, Seoul, Republic of Korea
  As a teaching assistant (Prof. Hyo Jae Yoon)
- ***History of Civilization: Modern Science and Technology*** (Fall semester, 2017)
  Department of Chemistry, Korea University, Seoul, Republic of Korea
  As a teaching assistant (Prof. Seung Joon Jeon)
- ***General Chemistry* II** (Fall semester, 2016)
  Department of Chemistry, Korea University, Seoul, Republic of Korea
  As a teaching assistant (Prof. Cheol-Hong Cheon)
- ***General Chemistry* I *English Class*** (Spring semester, 2016)
  Department of Chemistry, Korea University, Seoul, Republic of Korea
  As a teaching assistant (Prof. Sang-Hee Shim)

Academic References

- ***Prof. Eric T. Kool*** *at Department of Chemistry, Stanford University, U. S. A. (Postdoc. Advisor)*
  kool@stanford.edu, +1-650-724-4741
- ***Prof. Jong Seung Kim*** *at the Department of Chemistry, Korea University, South Korea (Ph.D. Advisor)*

jongkim@korea.ac.kr, +82-2-3290-3143

- ***Prof. Hak Joong Kim*** *at the Department of Chemistry, Korea University, South Korea (Thesis Supervisor)*
  hakkim@korea.ac.kr, +82-2-3290-3148
- ***Prof. Chang Seop Hong*** *at the Department of Chemistry, Korea University, South Korea (Thesis Supervisor, Co-worker)*
  cshong@korea.ac.kr, +82-2-3290-3138
- ***Prof. Dokyoung Kim*** *at the Department of Biomedical Science, Kyung Hee University, South Korea (Thesis Supervisor & Co-worker)*
  dkim@khu.ac.kr, +82-2-961-0297
- ***Prof. Peter Verwilst*** *at Medicinal Chemistry (Rega Institute), KU Leuven, Belgium (Lab. Senior & Co-worker)*
  peter.verwilst@kuleuven.be, +32-16-32-31-86
- ***Prof. Hyo Sung Jung*** *at the Department of Biological Sciences, Hyupsung University, South Korea (Lab. Senior & Co-worker)*
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- ***Prof. Jiyou Han*** *at the Department of Biological Sciences, Hyupsung University, South Korea (Lab. Senior & Co-worker)*
  hanjiyou12@hanmail.net, +82-31-299-0759
- ***Prof. Jeong Tae Lee*** *at the Department of Chemistry, Hallym University, South Korea (Undergraduate Advisor)*
  jtshl@hallym.ac.kr, +82-33-248-2071

Experimental Capabilities

- ***Molecular Synthetic Techniques***

  Organic synthesis

  - ✓ *Conventional multi-step organic synthesis*
  - ✓ *Carbon-Carbon coupling reactions*
  - ✓ *Organometallic coupling reactions (e.g., Organometal coupling, etc.)*
  - ✓ *Fluorophore synthesis (e.g., Coumarin, Rhodamine, BODIPY, Nile Red, etc.)*
  - ✓ *Photo-/Sono-sensitizer synthesis*
  - ✓ *Conventional polymerization (e.g., porous organic polymer, etc.)*

- ***Characterization Techniques***

  Photophysical property analysis

  - ✓ *UV-Vis spectrophotometer (RF-5301 – Shimadzu, FP-8500 spectrofluorometer/-Zasco)*
  - ✓ *Fluorophotometer (V-750 spectrophotometer-Zasco)*
  - ✓ *Various laser devices (LED lamps, LED diodes, etc.)*

  Molecular structure/Physical property analysis

  - ✓ *ESI-MS (Shimadzu)*

- ✓ *Nuclear magnetic resonance (1D NMR & 2D NMR analysis, 300/ 400 MHz - Varian and 500 MHz - Bruker)*
- ✓ *Brunauer-Emmett-Teller (BET) surface area analysis*
- ✓ *Powder XRD (Ultima III diffractometer - Rigaku)*
- ✓ *Infrared spectroscopy (Nicolet iS10 FT-IR spectrometer - Thermo fisher scientific)*
- ✓ *Thermogravimetric analysis (N-1000, N-1500 - Sinco)*

Others

- ✓ *Protein sample preparation (e.g., Amyloid-beta fibrils)*
- ✓ *High-performance liquid chromatography (HPLC)*
- ✓ *Dissolved oxygen level measurement*
- ✓ *Tip-sonicator*

- ***Theoretical Calculations on Molecular Docking Assay and*** **Density Functional Theory**
  - ✓ *Gaussian 09, Gaussian View (Quantum mechanical calculator)*
  - ✓ *Gabedit (Molecular modeling program)*
  - ✓ *Chimera (Molecular modeling program)*
  - ✓ *AutoDock 4 (Molecular docking program)*
  - ✓ *AutoDock Vina (Molecular docking program)*
  - ✓ *Schrödinger (Molecular docking program)*
  - ✓ *Flare (Molecular docking program)*

  Conventional programs
  - ✓ *Origin*
  - ✓ *Chemdraw*
  - ✓ *MestReNova*
  - ✓ *Spinworks*

- ***Biological Experience***

  Cellular based assays
  - ✓ *Confocal and fluorescence microscopic imaging*
  - ✓ *Cytotoxicity/cell viability assay*
  - ✓ *gDNA extraction and measurement*
  - ✓ *Protein quantification*

  Animal based assays
  - ✓ *Mouse oral gavage*
  - ✓ *Mouse anatomy*
  - ✓ *Mouse gDNA extraction and measurement*

  Food based assays
  - ✓ *gDNA extraction and measurement*