PROGRAM BOOKLET

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대한화학회 유기화학분과회
제25회 하계 워크숍 및
제10회 튜토리얼 강좌

2025년 8월 25일 - 27일
델피노 리조트, 고성(속초)

KCS Korean Chemical Society
Division of Organic Chemistry

공식후원사 | TCI · SEJIN CI

후원 | GWTO 강원관광재단 Gangwon Tourism Organization · 2025-2026 강원 방문의 해 · POLYPHENOL FACTORY

공동주최 | AI-CRED INSTITUTE · KAIST InnoCORE AI-혁신신약연구단

ACDC Asymmetric Catalysis Design Center · 성균관대학교 비대칭 촉매반응 디자인 센터

G-LAMP KANGWON NATIONAL UNIVERSITY · 강원대학교 G-LAMP사업단

DEL 기술연구단 Department of DEL Technology · 한국화학연구원 DEL기술연구단

부산대학교 전기화학 분자변환 연구센터

유기화학분과회 회원 여러분께,

제25회 유기화학분과회 하계 워크숍에 참석해 주신 여러분을 진심으로 환영합니다.

올해 워크숍은 설악 델피노 리조트에서 2박 3일간 개최되며, 튜토리얼과 기조강연을 비롯해 구두·포스터 발표, 젊은 유기화학자상 시상 등 다양한 프로그램으로 구성하였습니다. 특히 전공 분야별 연구자 간 교류를 더욱 밀도 있게 이어갈 수 있도록 대학원생 및 박사후연구원 구두 발표 세션을 확대하였으며, 기업체 발표와 학생 포스터 세션 등도 내실 있게 마련하였습니다.

튜토리얼 세션은 김동석 박사님(AI브랜딩연구소)과 이홍근 교수님(서울대)의 실용적인 강연으로 시작되며, 이어지는 기조강연에서는 Shu-Li You 교수님(SIOC)의 세계적인 연구 성과를 직접 들을 수 있는 소중한 기회를 마련하였습니다. 둘째 날에는 연구책임자 여러분의 발표 기회를 확대하였으며, 제18회 젊은 유기화학자상 수상자인 김현진 박사님(KRICT), 한서정 교수님(서강대)의 수상 강연도 준비되어 있습니다. 두 분 수상자께 진심으로 축하의 말씀을 전합니다.

하계 워크숍은 무엇보다 젊은 연구자들을 위한 자리입니다. 대학원생과 박사후연구원 여러분이 직접 연구 결과를 발표하고 활발히 토론하는 과정 속에서, 미래 유기화학의 주역으로 성장하는 소중한 계기가 되기를 바랍니다. 우수 발표자에게는 Junior ACP 학회 참가 자격과 함께 부상이 수여됩니다.

이번 워크숍의 성공적인 개최를 위해 애써 주신 운영진 여러분께 깊이 감사드립니다. 강은주 총무부회장, 정원진 학술부회장, 김 민 기획부회장, 황종연 산학연부회장을 비롯해 이준석, 김주현, 최이삭, 유성현, 박윤수, 전홍준 운영위원 등 각 실무를 맡아 주신 모든 위원들께 감사의 마음을 전합니다. 아울러 재정적 후원과 행정적 지원을 아끼지 않으신 분과 회원님들과 기업체 관계자 여러분, 그리고 행정을 총괄해 주신 김은경 실장님과 도우미 학생들, 델피노 리조트 관계자 여러분께도 진심으로 감사드립니다. 유기화학은 시대가 요구하는 창의적이며 지속 가능한 해법을 제시할 수 있는 학문입니다. 이번 워크숍이 학문적 소통의 장이자 새로운 협력의 출발점이 되기를 바라며, 참석하신 모든 분들께 뜻깊고 유익한 시간이 되시기를 기원합니다.

감사합니다.

2025년 8월 25일

대한화학회 유기화학분과회 회장 **이 희 승**

■ 2025년 8월 25일 (월)

Opening — **소노캄B 지하2층 그랜드볼룸**

14:00 – 14:20 등록

14:20 – 14:30 개회사 및 인사말씀 (제44대 유기화학분과회 회장 이희승)

14:30 – 14:40 축사 (제54대 대한화학회 회장 이필호)

Tutorial Session — **소노캄B 지하2층 그랜드볼룸**

좌장: 신광민 (성균관대)

14:40 – 15:40 **튜토리얼 강연 I (김동석, AI브랜딩연구소)**
생성형 AI 실전 마스터클래스: 연구 생산성 2.5배 향상!
연구자를 위한 스마트 R&D 혁신 전략

15:40 – 16:40 **튜토리얼 강연 II (이홍근, 서울대)**
How to Turn a Lab Notebook into Publication

16:40 – 17:00 휴식 및 기념촬영

Plenary Lecture — **소노캄B 지하2층 그랜드볼룸**

좌장: 정원진 (GIST)

17:00 – 18:00 **기조 강연 (Shu-Li You, SIOC, CAS, China)**
Developing New Synthetic Methodologies of Dearomatization Reactions

■ 2025년 8월 26일 (화)

08:30 – 09:10 등록 및 인사 (학생 포스터 부착)

Session I **소노캄B 지하2층 그랜드볼룸**

09:10 – 10:10 **구두발표 1** 좌장: 최이삭 (충북대)

- **신광민 (성균관대):** Electrooxidative Pd-Catalyzed Remote Hydrofunctionalization of Alkenes via Carbocationic Intermediates
- **이은성 (서울대):** Radical Innovations: Carbene-Derived Stable Organic Radicals and Their Application
- **허정녕 (KRICT):** One-Pot Synthetic Strategies for the Rapid Construction of Polycyclic Heterocycles

10:10 – 10:30 휴식 (학생 포스터 부착)

10:30 – 11:30 **구두발표 2** 좌장: 김주현 (동국대)

- **이해신 (KAIST):** Polyphenolic Adhesion and Coatings
- **김지민 (전남대):** Regio- and Stereoselective Aryne Annulations
- **김진호 (인천대):** Aerobic Oxidative Transformations Using Azo/Hydrazide Redox

11:30 – 13:00 중식

Session II **소노캄B 지하2층 그랜드볼룸**

13:00 – 14:00 **구두발표 3** 좌장: 김 민 (충북대)

- **지형민 (POSTECH)**: Lewis Pair-Catalyzed, E/Z Selective Hydrohalogenation of Alkynes
- **최수혁 (연세대)**: Structural Mimicry of β-Helical DL-Peptides in Dynamic Equilibrium
- **김기태 (충북대)**: Transducing Nucleic Acid Signals into Chemical Reactions: Toward Biosensing

14:00 – 14:20	기업체 발표 우석훈 (에스티팜)-합성의약품에서 RNA 치료제까지: 에스티팜의 연구와 기술의 진화	
14:20 – 14:50	휴식 및 기념촬영	
Session III		**소노캄B 지하2층 그랜드볼룸**
14:50 – 15:00	감사패 증정 및 제18회 젊은 유기화학자상 시상식	진행: 강은주 (경희대)
15:00 – 15:30	**젊은 유기화학자상 수상강연 1** - **김현진 (KRICT)**: The Construction of DNA-encoded LIibrary for Drug Discovery	좌장: 정원진 (GIST)
15:30 – 16:00	**젊은 유기화학자상 수상강연 2** - **한서정 (서강대)**: Development of Novel Organic Methodologies Utilizing Aryne Intermediates	좌장: 정원진 (GIST)
16:00 – 16:10	이동 (소노캄B 지하1층 포스터장 및 구두발표장)	
Session IV		**소노캄B 지하1층**
16:10 – 17:10	**학생 포스터 발표 1: 홀수 번호**	
	학생 구두발표 1A (장소: 루비I홀)	좌장: 박종민 (강원대)
	학생 구두발표 1B (장소: 루비II홀)	좌장: 한예리 (덕성여대)
17:20 – 18:20	**학생 포스터 발표 2: 짝수 번호**	
	학생 구두발표 2A (장소: 루비I홀)	좌장: 동방선 (서강대)
	학생 구두발표 2B (장소: 루비II홀)	좌장: 정시원 (인하대)
18:20 – 18:30	이동 (소노캄B 지하2층 그랜드볼룸)	
Session V		**소노캄B 지하2층 그랜드볼룸**
18:30 – 20:30	**만찬 및 유기분과 레크레이션 행사**	
20:30 – 21:00	**우수발표 시상식**	진행: 정원진 (GIST)

■ 2025년 8월 27일 (수)

09:30 – 10:30	**분과토론 1**: 유기합성방법론	진행: 정원진 (GIST)
10:30 – 11:30	**분과토론 2**: 유기재료 및 생유기화학	진행: 김 민 (충북대)
11:30 – 12:00	**폐회 및 정리**	진행: 강은주 (경희대)

김동석 (Dongseok Kim)

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Education

(2012) 서울대학교 사범대학 체육교육학 석사

Professional Experience

현) 이달희 의원실 AI 정책 자문위원

현) 서울시 인재개발원 생성형 AI 강의 전담강사

현) 한국금융연수원 금융인 대상 AI 활용 강의 전담교수

현) 대한축구협회 경기력 향상을 위한 AI 축구 Data 분석 자문위원

현) 울산시교육청 교육연수원 AI 강의 전담강사

2025.07 국가기록원 기록사 대상 '메타데이터 기반 AI 활용법' 강연

2025.06 국회 중앙연수위원회 'AI 활용 정책제안서 작성 실습' 강의

2025.05 한국화학 플랫폼 연구단 '생성형 AI 연구 혁신' 강연

2025.04 카이스트 연구자 대상 '생성형 AI 연구 혁신' 강연

2025.03 대통령직속 경제사회노동위원회 'AI 정책 업무 혁신' 강연

2025.02 기획재정부 정책조정국/대외경제국 'AI 업무 혁신' 강연

2025.01 감사원 연수원 'AI 감사 업무 혁신' 강연

Major Books

『AI 전략 수업』(베가북스)

『AI 수익화 전략』(경향BP)

생성형 AI 실전 마스터클래스: 연구 생산성 2.5배 향상! 연구자를 위한 스마트 R&D 혁신 전략

김동석 (Dongseok Kim)

AI 브랜딩 연구소

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최근 생성형 AI는 신진 연구자들에게 '새로운 디지털 동료'로 자리잡았습니다. 연구노트 정리, 보고서 작성, 과제 수행 자료 등 반복적이고 표준화된 업무에 이미 실무적으로 적용되고 있으며, 이제는 '누가 더 전략적으로 AI에게 지시하느냐'가 연구 경쟁력을 좌우합니다.
본 강의에서는 연구기획서, 과제요약, 보고서 초안, 연구자료 작성 등 실제 연구 현장에서 생성형 AI를 어떻게 효율적으로 활용하는지 구체적인 사례와 전략을 제시합니다.

과학기술 분야 문서 작성의 핵심은 '정확성과 속도'입니다. 생성형 AI는 과제 정리, 연구보고서, 기관 대응 문서 등 반복 업무의 요약, 정리, 검색, 정합성 검토를 자동화해 연구자들이 본질적 기획과 창의적 판단에 집중할 수 있도록 돕습니다.

AI는 더 이상 단순 보조 도구가 아니라, 연구 현장에서 즉시 성과로 연결되는 전략적 파트너입니다. 반복되는 산출물 표준화와 발표자료 정리를 AI가 자동화함으로써, 연구자는 창의적 해석과 전략 구성에 몰입할 수 있습니다. 특히 부처 보고용 과제서류, 산학협력 문서, 공동연구 대응자료 등 R&D 협업과 성과관리 단계에서 생성형 AI는 협업문서 준비와 번역을 신속히 지원하며, 연구협업과 문서 품질을 한 단계 도약시킵니다.

마지막으로, 한 줄 프롬프트 설계만으로 과제요약, 연구성과 보고서, 기관 회신문서 등 모든 단계의 문서성과와 연구효율을 극대화할 수 있는 'AI 300% 활용법'을 공유합니다. 조건문·시나리오 기반 지시와 맞춤형 템플릿 설계를 통해 실제 현장 적용성과 반복 활용성을 높일 수 있습니다.

Hong Geun Lee

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Education

Ph.D. (2012)	Harvard University, USA (Prof. Matthew D. Shair)
M.S. (2006)	Seoul National University, Republic of Korea (Prof. B. Moon Kim)
B.S. (2002)	Seoul National University, Republic of Korea

Position

2017 – present	Assistant & Associate Professor, Seoul National University, Republic of Korea
2016 – 2017	Research Investigator, Bristol-Myers Squibb, USA
2012 – 2015	Postdoctoral Fellow, MIT (Prof. Stephen L. Buchwald)

Representative Publications

1. Koo, J.; Kim, W.; Jhun, B. H.; Park, S.; Song, S.; You, Y.; **Lee, H. G.** Halogen Atom Transfer-Induced Homolysis of C–F Bonds by the Excited-State Boryl Radical. *J. Am. Chem. Soc.* **2024**, *146*, 22874.

2. Lee, Y.; Nam, Y. S.; Kim, S. Y.; Ki, J. E.; **Lee, H. G.** Mechanistic Duality of Indolyl 1,3-Heteroatom Transposition. *Chem. Sci.* **2023**, *14*, 7688.

3. Roh, B.; Farah, A. O.; Kim, B.; Feoktistova, T.; Moller, F.; Cheong, P. H.; **Lee, H. G.** Stereospecific Acylative Suzuki-Miyaura Cross-Coupling: Access to a Variety of Optically Active α-Aryl Carbonyl Compounds. *J. Am. Chem. Soc.* **2023**, *145*, 7075.

4. Go, S. Y.; Chung, H.; Shin, S. J.; An, S.; Youn, J. H.; Im, T. Y.; Kim, J. Y.; Chung, T. D.; **Lee, H. G.** A Unified Synthetic Strategy to Introduce Heteroatoms via Electrochemical Functionalization of Alkyl Organoboron Reagents. *J. Am. Chem. Soc.* **2022**, *144*, 9149.

How to Turn a Lab Notebook into Publication

Hong Geun Lee

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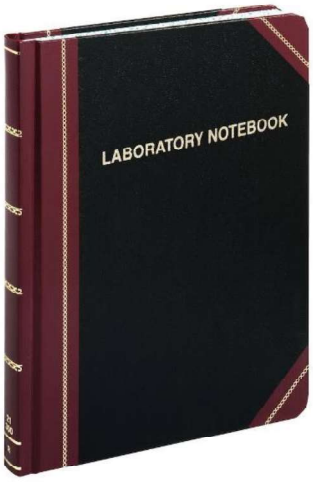
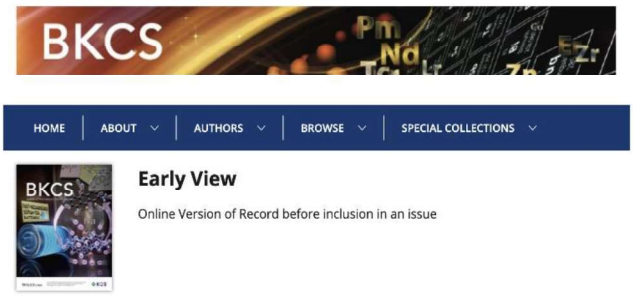
This presentation intends to showcase the general procedure for scientific publications in organic chemistry. Common processes for preparing a manuscript from the raw data with a high level of academic integrity should be discussed. Also, the processes of manuscript submission, review, and revision will be explained in detail. Finally, effective strategies for successfully managing the overall processes will be demonstrated.





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Education

Ph.D. (2001)	Shanghai Institute of Organic Chemistry, CAS (Prof. Li-Xin Dai)
B.S. (1996)	Nankai University, Tianjin, China

Position

2006 – present	Professor, State Key Laboratory of Organometallic Chemistry, Shanghai Institute of Organic Chemistry, China
2004 – 2006	Principal Investigator, Genomics Institute of the Novartis Research Foundation, USA
2001 – 2004	Postdoctoral fellow, The Scripps Research Institute, USA (Prof. J. W. Kelly)

Recent Publications

1. “Rhodium-Catalyzed Atroposelective Synthesis of Axially Chiral 1-Aryl Isoquinolines via De Novo Isoquinoline Formation”, Gou, B.-B.; Shen, W.-J.; Gao, Y.-J.*; Gu, Q.; You, S.-L.*, *Angew. Chem. Int. Ed.* **2025**, *64*, e202502131.

2. “Enantioselective Dearomative [2π + 2σ] Photocycloaddition of Naphthalene Derivatives with Bicyclo[1.1.0]butanes Enabled by Gd(III) Catalysis”, Shen, W.-J.; Zou, X.-X.; Li, M.; Cheng, Y.-Z.; You, S.-L.*, *J. Am. Chem. Soc.* **2025**, *147*, 11667.

3. “Rhodium-Catalyzed Asymmetric Allylic Dearomatization of β-Naphthols with gem-Difluorinated Cyclopropanes”, Yang, Z.-Q.; Gong, Y.; Gu, Q.; You, S.-L.*, *ACS Catal.* **2025**, *15*, 4287.

4. “Interrupting Associative π−σ−π Isomerization Enables Z-Retentive Asymmetric Tsuji−Trost Reaction”, Liu, J.; Dong, Z.; Cao, W.-B.; Zheng, C.*; You, S.-L.*, *J. Am. Chem. Soc.* **2025**, *147*, 2776.

Developing New Synthetic Methodologies of Dearomatization Reactions

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Dearomatization reactions are widely recognized as powerful methods for the synthesis of highly functionalized three-dimensional structures from simple planar aromatic compounds. Among those, catalytic asymmetric dearomatization (CADA) reactions are very attractive due to the abundance and ready availability of aromatic compounds and the direct access to enantiopure polycycles and spirocycles offered by them. That latter are frequently the key motifs in biologically active natural products and pharmaceuticals. However, due to the extra stability of “aromaticity” of the arenes, their dearomatization reactions with good enantioselective control has been a great challenge. In this talk, we present our recent results toward the development of new dearomatization reactions. The dearomatization reactions of indoles, pyrroles, phenols, naphthols, pyridines, and naphthalenes have been achieved, affording various highly functionalized heterocycles bearing all-carbon quaternary chiral centers in most of the cases. These results provide not only the efficient synthesis of highly enantioenriched spiro- or polycycles, but also a novel concept in synthetic methodology development.

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4. Jiang, R.; Ding, L.; Zheng, C.; You, S.-L. *Science* **2021**, *371*, 380.
5. Wang, Y.; Zhang, W.-Y.; Yu, Z.-L.; Zheng, C.; You, S.-L. *Nature Synth.* **2022**, *1*, 401.
6. Huang, X.-Y.; Xie, P.-P.; Zou, L.-M.; Zheng, C.; You, S.-L. *J. Am. Chem. Soc.* **2023**, *145*, 11745.
7. Li, M.-Z.; Huang, X.-L.; Zhang, Z.-Y.; Wang, Z.; Wu, Z.; Yang, H.; Shen, W.-J.; Cheng, Y.-Z.; You, S.-L. *J. Am. Chem. Soc.* **2024**, *146*, 16982.
8. Yu, X.; Zheng, C.; You, S.-L. *J. Am. Chem. Soc.* **2024**, *146*, 25878.
9. Shen, W.-J.; Zou, X.-X.; Li, M.; Cheng, Y.-Z.; You, S.-L. *J. Am. Chem. Soc.* **2025**, *147*, 11667.

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Education

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Position

2020 – present	Assistant/Associate Professor, Sungkyunkwan University (SKKU)
2018 – 2020	Postdoctoral Associate, Massachusetts Institute of Technology (MIT)
2017 – 2018	Postdoctoral Associate, Center for Catalytic Hydrocarbon Functionalizations, Institute for Basic Science (IBS)

Representative Publications

1. “PdH-Electrocatalytic Formal Conjugate Fluorination of β-Aryl-α,β-Unsaturated Amides with Mild and Safe Nucleophilic Fluorine Sources”, B. Yang, D. Lee, K. Shin*, *J. Org. Chem.* **2025**, *ASAP*.

2. “Electrooxidative Pd-Catalyzed Remote Hydrofunctionalization of Alkenes with Nucleophiles”, S. Park, B. Yang, D. Lee, H. Kim*, K. Shin*, *ACS Catal.* **2024**, *14*, 15858.

3. “Palladium-Catalyzed Electrooxidative Hydrofluorination of Aryl-Substituted Alkenes with Nucleophilic Fluorine Source”, A. Mandal, J. Jang, B. Yang, K. Shin*, *Org. Lett.* **2023**, *25*, 195.

4. “Ligand-Free NiH-Catalyzed Hydroacylation of Aryl Alkenes with Aroyl Fluorides”, J. Kim, J. Jang, K. Shin*, *Org. Lett.* **2022**, *24*, 5412.

5. “Electrocatalytic Radical-Polar Crossover Hydroetherification of Alkenes with Phenols”, S. H. Park, J. Jang, K. Shin*, H. Kim*, *ACS Catal.* **2022**, *12*, 10572.

Electrooxidative Pd-Catalyzed Remote Hydrofunctionalization of Alkenes via Carbocationic Intermediates

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Alkenes are widely recognized as valuable feedstocks in modern organic synthesis, owing to their abundance, accessibility, and remarkable synthetic versatility. Among the numerous transformations available, remote hydrofunctionalization has emerged as a powerful strategy for converting simple olefinic precursors into structurally complex molecules with high regio- and/or stereocontrol. A variety of approaches have been developed to achieve such remote functionalization, with metal-hydride-catalyzed processes drawing particular attention due to their tunability through careful catalyst and ligand design. Nonetheless, many existing methods rely on electrophilic coupling partners that require pre-functionalization, thereby limiting efficiency and applicability.

In this talk, I will introduce our group's efforts to develop an electrocatalytic platform that integrates palladium-hydride catalysis with electrooxidation for the remote hydrofunctionalization of alkenes using nucleophiles. I will first describe the development of an electrooxidative palladium-catalyzed system that enables efficient remote hydrofunctionalization across a broad range of nucleophiles.[1] I will then highlight our recent advances in a remote Ritter-type hydroamidation strategy, which leverages imidate intermediates to access structurally diverse products through divergent synthetic pathways.[2]

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1. "Electrooxidative Pd-Catalyzed Remote Hydrofunctionalization of Alkenes with Nucleophiles", S. Park, B. Yang, D. Lee, H. Kim*, K. Shin*, *ACS Catal.* **2024**, *14*, 15858.

2. S. Park, T. Kim, J. Choi, K. Shin* *Manuscript in preparation*.

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Position

2024-current: Associate Professor, Seoul National University
2019-2020: Visiting Scholar, CALTECH
2017-2024: Associate Professor, Professor, POSTECH
2013-2018: Research Fellow, IBS
2013-2017: Assistant Professor, POSTECH
2009-2013: Postdoctoral Associate, Harvard University

Representative Publications

1. Y. Yang, M. Jang, H. Kang, S. Choe, E. Lee*, T.-L. Choi*, "Synthesis of Linear and Cyclic Poly(allenamer)s by Powerful Cyclic–Alkyl–Amino–Carbene (CAAC) Ruthenium Catalysts and Facile Post-modification", *Angew. Chem. Int. Ed.,* **2025**, e202425648.
2. M. Jang, E. Jung, Y. Yang, J. Noh, H. Song, H. Kim, H. Kang, S. Choe, T.-L. Choi*, E. Lee*, "Air and Thermally Stable Cyclic (Alkyl)(amino)carbene Ruthenium Complexes for Efficient Ring Expansion Metathesis Polymerization", *J. Am. Chem. Soc.,* **2025**, 147, 2571.
3. J. Park, J. Kim, G. Jeong, Y. Kim, E. Lee, “Uncovering Nitrosyl Reactivity at N-Heterocyclic Carbene Center", *Angew. Chem. Int. Ed.*, **2023**, *62*, e202314978.
4. S. Choe, H. Song, H. Choi, S. Yoo, J. Kim, Y. H. Ko, E. Lee, "Formation of Highly Stable 1, 2-Dicarbonyl Organic Radicals from Cyclic (Alkyl)(amino) carbenes", *Org. Lett.* **2023**, *25*, 4292.
5. H. Song, E. Pietrasiak, E. Lee, "Persistent Radicals Derived from N-Heterocyclic Carbenes for Material Applications", *Acc. Chem. Res.* **2022,** *55*, 2213.
6. Y. Kim, J. E. Byeon, G. Y. Jeong, S. S. Kim, H. Song, and E. Lee, "Highly Stable 1,2-Dicarbonyl Radical Cations Derived from N-Heterocyclic Carbenes", *J. Am. Chem. Soc.*, **2021**, *143*, 8527.

Radical Innovations: Carbene-Derived Stable Organic Radicals and Their Application

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Over the past two decades, the field of organic and main group radical chemistry has experienced significant advancements, primarily due to the incorporation of N-heterocyclic carbenes (NHCs) and cyclic (alkyl)(amino) carbenes (CAACs). These developments have led to the creation of new reactive species with unique properties, broadening the applications of radical chemistry in areas such as catalysis and the development of electronic and magnetic materials. Despite these advances, the synthesis of highly stable organic radicals has largely depended on aminoxyl (TEMPO) or trityl derivatives. Recognizing the need for new structural frameworks, our research group has been investigating diverse NHC/CAAC-based organic radicals, including those with novel structural platforms or incorporating nitric oxide. In our ongoing quest for stable organic radicals, we have successfully designed, synthesized, and characterized 1,2-dicarbonyl radical cations derived from NHCs and CAACs.1-4 Remarkably, these new radicals demonstrate stability in air and water, as well as chemical and thermal resistance, matching or surpassing the stability of current state-of-the-art organic radicals like TEMPO, trityl, and others. We anticipate that our 1,2-dicarbonyl radical cations will complement existing stable organic radicals across various fields. The detailed applications and implications of these novel radicals will be presented in our work.

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4. Kim, Y.; Byeon, J. E.; Jeong, G. Y.; Kim, S. S.; Song, H.; Lee, E. *J. Am. Chem. Soc.* **2021**, 143, 8527.

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Education

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Position

2003 – present	Senior/Principal Scientist, KRICT
2010 – present	Joint Professor, Graduate School of Drug Development and Discovery, Chungnam National University, Daejeon
2023 – present	Director, Department of DEL Technology, KRICT
2001 – 2003	Postdoc, University of Michigan, USA (Prof. W. R. Roush)
1992 – 1997	Scientist, Hanwha Group Research & Engineering Center, Daejeon

Representative Publications

1. “One-Pot Synthesis of Benzo[*g*]indazoles vis Suzuki-Miyaura Coupling and Aldol Condensation Cascade Reaction”, H. S. Ko, R. G. Jeoung, N. S. Kang, J.-N. Heo**, Synthesis* **2025**, *57*, 1867.

2. “Discovery of CA9-005 as a new carbonic anhydrase 9 inhibitor using a DNA-encoded libraries”, J. H. Lee et al. *Result Chem*. **2025**, *16*, 102455.

3. “Synthesis of All Regioisomers of 2-Arylazaindole-3-acetic Acid Derivatives”, T. Kim; J. H. Park; C. Jeong; E. Park; J. M. Kim; Y.-J. Kim; J.-N. Heo;* C.-H. Cheon,* *Synthesis* **2024**, *56*, 860.

4. “Synthesis and biological evaluation of benzoxepinoindol-1-one analogs as Brd4 bromodomain inhibitors”, G. Jung; J.-Y. Lee; C. H. Park; E. Yoon;* J.-N. Heo,* *Bull. Korean Chem. Soc.* **2022**, *44*, 213-221.

One-Pot Synthetic Strategies for the Rapid Construction of Polycyclic Heterocycles

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This study presents a novel and efficient approach to the total synthesis of analogues from two distinct families of natural products: bauhiniastatins and bauhinoxepins, which are characterized by dibenzo[*b,f*]oxepin and dihydrodibenzo[*b,f*]oxepin core structures, respectively.

The bauhiniastatin family comprises five known natural products, including pacharin and bauhiniastatins 1–4, while the bauhinoxepin family encompasses nine members, bauhinoxepins A–J. We report the total synthesis of all known members of both families—except bauhinoxepins A and B—along with several novel analogues not yet observed in nature.

All synthesized compounds were evaluated for their cytotoxic activity against various human cancer cell lines. Our findings offer valuable insights into the structure-activity relationships of these compounds, highlighting their potential as anticancer agents.

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2. “Synthesis of Dibenzoxepine Lactams via a Cu-Catalyzed One-Pot Etherification/Aldol Condensation Cascade Reaction; Application toward the Total Synthesis of Aristoyagonine”, H.-S. Lim, Y.-L. Choi, J.-N. Heo*, Org. Lett.* **2013***, 15,* 4718.

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Education

Ph.D. (2007) Biomedical Engineering, Northwestern University (Prof. Phil Messersmith)
Diplom. (1997) Biological Sciences, KAIST

Position

2009 – present Professor, Department of Chemistry, KAIST
2023 – present CEO, Polyphenol Factory Inc. (KAIST Start-up)
2010 – 2022 CTO, InnoTherapy

Representative Publications

1. “Polyphenol-enabled 2D nanopatch for enhanced nasal mucoadhesion and immune activation”, J. P. Han et al., *Nano Letters* **2024**, 24, 10380.

2. “Less-suture vascular anastomosis: development of alternative protocols with multifunctional self-wrapping, transparent, adhesive, elastic biomaterials”, J. Wu et al. *Adv. Mater.* **2023**, 35, 2301098.

3. “Coagulopathy-independent, bioinspired hemostatic materials: a full research story from preclinical models to a huma clinical trial”, K. Kim et al., *Science Adv*. **2021**, *7*, eabc9992.

4. “Targeting protein and peptide therapeutics to the heart via tannic acid modification”, M. Shin et al. *Nat. Biomed. Eng.* **2018**, *2,* 304-317.

5. “Progressive fuzzy cation-pi assembly of biological catecholamines”, S. Hong et al. *Science Adv.* **2018**, *4*, eaat7457.

6. “Complete prevention of blood loss with self-sealing hemostatic needles”, M. Shin et al., *Nat. Materials.* **2017**, *16*, 147-152.

Polyphenolic Adhesion and Coatings

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Polyphenolic compounds, abundant in nature, exhibit exceptional interfacial adhesion properties, inspiring innovations in biomaterial engineering. Marine organisms, particularly mussels, utilize catechol-containing polyphenols to strongly adhere to wet surfaces, motivating our research into these molecular mechanisms and their applications. Our work harnesses polyphenolic adhesives, especially tannic acid and catechol derivatives, to create durable coatings as useful biomaterials.

Leveraging these properties, we developed advanced biomaterials applicable in hemostatic agents, hair care products, and bioactive medical device coatings. Additionally, polyphenolic materials show significant potential in drug delivery systems and tissue engineering due to their biocompatibility, biodegradability, and functional versatility. Our recent studies further demonstrate their utility in nanoparticle stabilization and immune modulation.

This presentation summarizes our key findings in polyphenolic adhesion and coating, highlighting fundamental principles, synthetic strategies, and practical applications. Special emphasis will be placed on innovative approaches in polyphenol-mediated surface functionalization, discussing opportunities and challenges for translating laboratory discoveries into practical solutions.

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Education

BS and MS (1996-2004) Department of Chemistry, Sungkyunkwan Univ., Suwon, Korea
Ph.D. (2004-2010) Department of Chemistry, Princeton Univ., Princeton NJ 08544, USA
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Position

2010 – 2012 Postdoctoral Fellow, California Institute of Technology (Caltech), Pasadena, CA 91125, USA (Prof. Brian M. Stoltz)
2012 – 2014 Senior Scientist, Pfizer, Oncology Division, La Jolla, California.
2014 – present Assistant, Associate, and Professor, Department of Chemistry, Chonnam National University, Gwangju 61186

Representative Publications

1. “Regioselective Aryne Annulations of N-Tosyl-2-enamides and N-tert-Butylsulfinyl-2-enamides for the Construction of Dihydroquinolin-4-one and Chroman-4-imine Units”, A. Zhang, S. Y. Yu, J. Lee, S. Yang, J. Lee, J. Kim*, *Org. Lett.* **2025**, *27,* 1792.

2. “Synthesis of (+)-Xylogiblactones B and C through a Kinetic Resolution of the Allenoate γ-Addition: Stereochemical Establishment”, A. Zhang, G. Pak, S. Y. Yu, S. Yang, J. Kim*, *J. Org. Chem.* **2023**, *88*, 2605.

3. “Cyclocarbonylation of Allenyl Glyoxylate Strategy to Build the Tricyclic Core of Cyclocalopin A”, W. Yu, J. Song, S. Y. Yu, J. Kim*, *Org. Lett.* **2022**, *24*, 2242.

4. “Synthesis of (+)-Hypoxylactone through Allenoate γ-Addition: Revision of Stereochemistry”, G. Pak, E. Park, S. Park, J. Kim*, *J. Org. Chem.* **2020**, *85*, 14246.

5. “Kinetic Resolution of Racemic Aldehydes through Asymmetric Allenoate γ-Addition: Synthesis of (+)-Xylogiblactone A”, S. Park, G. Pak, C. Oh, J. Lee, J. Kim*, C.-M. Yu*, Org. Lett.* **2019***, 21, 7660.*

Regio- and Stereoselective Aryne Annulations

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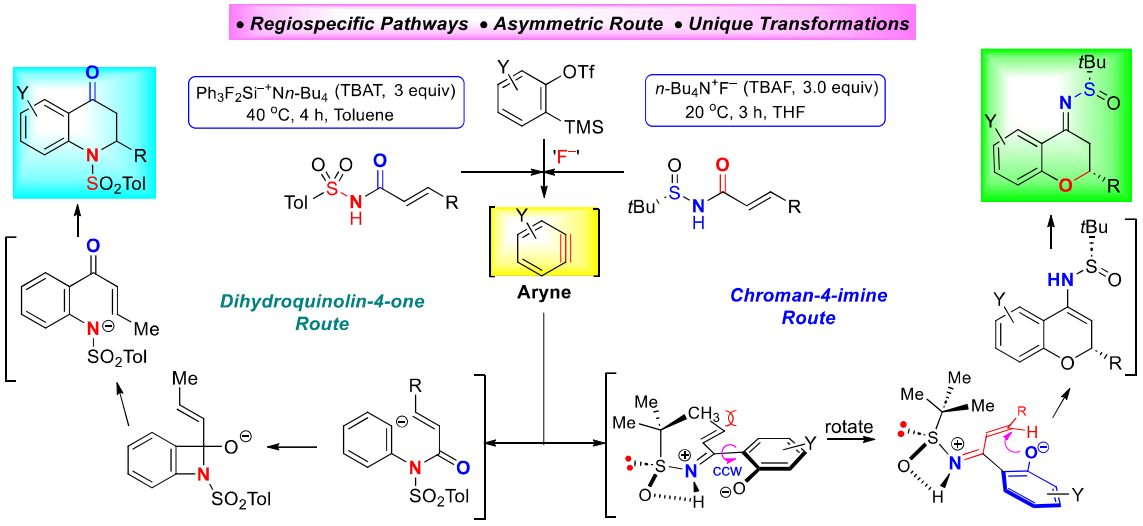
Aryne species are geometrically highly strained and kinetically reactive intermediates, which are recognized as valuable active species from a synthetic point of view in the production of useful chemical architectures.[1] Various chemical transformations involving the use of aryne intermediates have been developed in the construction of useful natural or unnatural substances such as heterocyclic compounds,[2] polycyclic aromatic compounds,[3] and bioactive natural products.[4] Recently, we discovered the aryne annulation reaction routes to dihydroquinolin-4-ones and chroman-4-imines units using aryne-mediated cyclization with readily available *N*-tosyl-2-enamides and *N*-*t*-butylsulfinyl-2-enamides.[5] The reactions were found to be stereo- and regioselective concerning the substituents of the amides as shown scheme below.



This presentation will focus on the following events: regioselective chemical routes, asymmetric chemical pathways, and synthetic manipulations of products.

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2. Dubrovskiy, A. V.; Markina, N. A.; Larock, R. C. *Org. Biomol. Chem.* **2013**, *11*, 191–218.

3. Garcia-López, J.-A.; Greaney, M. F. *Chem. Soc. Rev.* **2016**, *45*, 6766–6798.

4. Tadross, P. M.; Stoltz, B. M. *Chem. Rev.* **2012**, *112*, 3550–3577.

5. Zhang, A.; Yu, S. Y.; Lee, J.; Yang, S.; Lee, J.; Kim, J. *Org. Lett.* **2025**, *27*, 1792–1797.

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Education

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Position

2014 – present	Professor, Incheon National University
2021 – 2022	Fulbright Visiting Scholar, University of Illinois Urbana-Champaign, Department of Chemistry (Prof. M. Christina White)
2012 – 2014	Post-doc, University of Wisconsin-Madison, Department of Chemistry (Prof. Shannon S. Stahl)

Representative Publications

1. “$Mn(acac)_3$/Hydrazide-Catalyzed Aerobic Oxidative Cross-Dehydrogenative Couplings of 1,2,3,4-Tetrahydroisoquinolines and Their Mechanistic Studies”, G. Y. Kim, S. Park, G. Park, Y. Kang, H. Kim*, J. Kim*, *J. Org. Chem.* **2025**, *90*, 5966.

2. “Mn-Catalyzed Aerobic Oxidative α-Cyanation of Tertiary Amines Using Azo/hydrazide Redox”, S. B. Kim†, G. Park†, E. S. Park, S. Maiti, J. Kim*, *J. Org. Chem.* **2024**, *89*, 14543.

3. “Cu-catalyzed aerobic oxidative dehydrogenation of tertiary indolines to indoles using azo/hydrazide redox”, S. Maiti, J. S. Kim, J. Kim*, *New J. Chem.* **2024**, *48*, 3342.

4. “A preparative small-molecule mimic of liver CYP450 enzymes in the aliphatic C–H oxidation of carbocyclic *N*-heterocycles”, R. K. Chambers, J. D. Weaver, J. Kim, J. L. Hoar, S. W. Krska, M. C. White, *Proc. Natl. Acad. Sci. U.S.A.* **2023**, *120*, e2300315120.

5. “Synthesis of 2-Imino-1,3,4-oxadiazolines from Acylhydrazides and Isothiocyanates via Aerobic Oxidation and DMAP-Mediated Annulation Sequence”, J. H. Lim, S. E. Baek, B. Lad, J. Kim*, *ACS Omega* **2022**, *7*, 28148.

6. “Copper-Catalyzed Aerobic Oxidative Azo-Ene Cyclization”, J. Kim, D. H. Lee, J. Kim,* *Adv. Synth. Catal.* **2021**, *363*, 4728.

Aerobic Oxidative Transformations Using Azo/Hydrazide Redox

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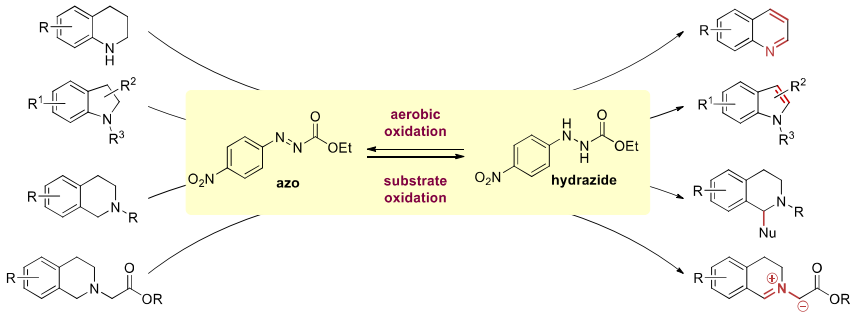
Aerobic oxidative transformations using molecular oxygen are of importance in terms of green and sustainable chemistry because molecular oxygen is abundant and readily accessible, and water is produced as the sole byproduct. However, the direct oxidation of an organic substrate by O_2 is not facile due to the high energy barrier for electron transfer from a singlet organic substrate to triplet molecular oxygen.

Azo compounds, which contain a nitrogen-nitrogen double bond, are versatile compounds in multifarious areas. In particular, electron-deficient dialkyl azodicarboxylates such as diethyl azodicarboxylate (DEAD), diisopropyl azodicarboxylate (DIAD), and di-tert-butyl azodicarboxylate (DTBAD) are useful in organic synthesis. They are key reagents in Mitsunobu reactions to generate crucial zwitterions with triphenylphosphine (PPh_3). Furthermore, the dialkyl azodicarboxylates have been employed as oxidants in dehydrogenations as well as cross dehydrogenative couplings.

Our group has studied aerobic oxidations of hydrazides to azo compounds and their applications. In this presentation, I would like to introduce our efforts to develop new aerobic oxidation transformations using azo/hydrazide redox.



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2. “Cu-catalyzed aerobic oxidative dehydrogenation of tertiary indolines to indoles using azo/hydrazide redox”, S. Maiti, J. S. Kim, J. Kim*, *New J. Chem.* **2024**, *48*, 3342.

3. “Mn-Catalyzed Aerobic Oxidative α-Cyanation of Tertiary Amines Using Azo/hydrazide Redox”, S. B. Kim†, G. Park†, E. S. Park, S. Maiti, J. Kim*, *J. Org. Chem.* **2024**, *89*, 14543.

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B.S. (2009)	Seoul Nation University, Korea

Position

2019 – present	Assistant Professor, POSTECH
2017 – 2019	Postdoctoral Scholar, Department of Chemistry, The University of Chicago (Scott A. Snyder)

Representative Publications

1. “HFIP-Empowered One-Pot Synthesis of C4-Aryl-Substituted Tetrahydro-quinolines with Propargylic Chlorides and Anilines”, S. H. Lee, H. M. Chi, *Org. Lett.* **2023**, *25*, 1083.

2. “Total Syntheses of Spiroviolene and Spirograterpene A: A Structural Reassignment with Biosynthetic Implications”, H. M. Chi, C. J. F. Cole, P. Hu, C. A. Taylor, S. A. Snyder, *Chem. Sci.* **2020**, *11*, 10939.

3. “Quaternary-Centre-Guided Synthesis of Complex Polycyclic Terpenes”, P. Hu†, H. M. Chi†, K. C. DeBacker, X. Gong, J. Keim, I. T. Hsu, S. A. Snyder, *Nature* **2019**, *569*, 703.

4. “Lewis Base Catalyzed, Enantioselective, Intramolecular Sulfenoamination of Olefins”, S. E. Denmark, H. M. Chi, *J. Am. Chem. Soc.* **2014**, *136*, 8915.

5. “Catalytic, Enantioselective, Intramolecular Carbosulfenylation of Olefins. Mechanistic Aspects: A Remarkable Case of Negative Catalysis”, S. E. Denmark, H. M. Chi, *J. Am. Chem. Soc.* **2014**, *136*, 3655.

Lewis Pair-Catalyzed, E/Z Selective Hydrohalogenation of Alkynes

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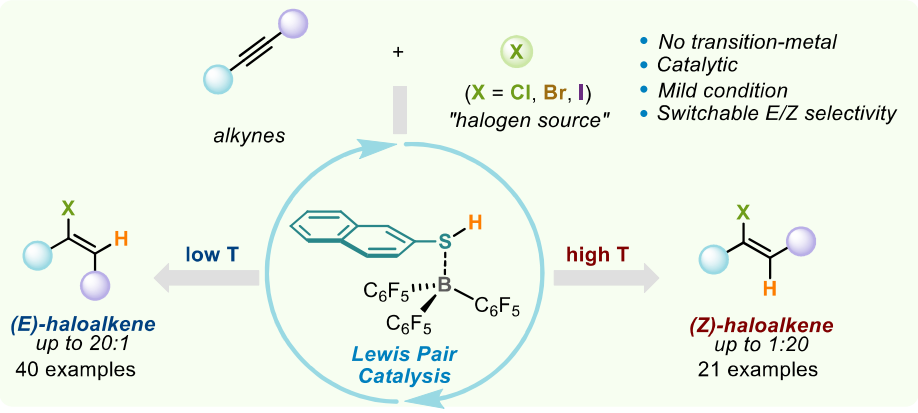
A catalytic hydrohalogenation of alkynes enabled by a sulfur–boron Lewis pair complex provides a new route to haloalkenes with tunable E/Z stereoselectivity. Remarkably, this transformation produces Markovnikov haloalkenes, despite multiple evidence indicating a radical-based mechanism, an outcome that is counterintuitive in the context of traditional radical chemistry. The catalytically active species, generated from 2-naphthalenethiol and $B(C_6F_5)_3$, initiates hydrogen atom transfer (HAT) with the alkynes to form vinyl radicals, which undergo regioselective halogen capture. Chloro-, bromo-, and iodoalkenes are all accessible in good yields, with E/Z selectivity controlled simply by altering the reaction temperature. Detailed mechanistic studies and calculations both support a pathway involving S–B complex-mediated HAT followed by halogen-radical trapping. This work presents a new strategy for harnessing main-group catalyzed radical processes to achieve regio- and stereoselective transformations of alkynes.



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Education

Ph.D. (2008)	Department of Chemistry, University of Wisconsin-Madison (Prof. Samuel H. Gellman)
M.S. (2000)	Department of Chemistry, Seoul National University (Prof. B. Moon Kim)
B.S. (1998)	Department of Chemistry, Seoul National University

Position

2011-present	Assistant, Associate Professor, Department of Chemistry, Yonsei University
2018	Visiting Scholar, Department of Chemistry, Purdue University
2009-2011	Postdoctoral fellow, Department of Chemistry, Northwestern University

Representative Publications

1. “Crystallographic characterization of the 9/11-helix: a left-handed helix for 1:1 α/β-peptides containing L-α-amino acid residues”, N. Seo, Y. Kim, J. Lee, J. Kim, P. Kang, I. A. Guzei, H. -J. Lee, S. H. Choi*, *Org. Biomol. Chem.* **2025**, *23*, 6133.

2. “Exploring a β-amino acid with a seven-Membered ring constraints as a foldamer building block for nontraditional helices”, N. Seo, H. Son, Y. Kim, I. A. Guzei, P. Kang, S. H. Choi, *Org. Lett.* **2023**, *25*, 7497.

3. “Effect of *cis*-4-aminopiperidine-3-carboxylic acid (*cis*-APiC) residue on mixed-helical folding of unnatural peptides”, S. Choi, J. Shim, P. Kang, S. H Choi*, *Org. Biomol. Chem.* **2022**, *20*, 613.

4. “12/10-Helical β-Peptide with Dynamic Folding Propensity: Coexistence of Right- and Left-Handed Helices in an Enantiomeric Foldamer”, S. H. Shin, M. Lee, I. A. Guzei, Y. K. Kang, S. H. Choi*, *J. Am. Chem. Soc.* **2016**, *138*, 13390.

5. “Stabilization of 11/9-helical α/β-peptide foldamers in protic solvents”, M. Lee, J. Shim, P. Kang, M. -G. Choi, S. H. Choi*, *Chem. Commun.* **2016**, *52*, 5950.

Structural Mimicry of β-Helical DL-Peptides in Dynamic Equilibrium

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DL-peptide are a class of nonribosomal peptides (NRPs) biosynthesized by microorganisms. Unlike common ribosomal peptides and proteins, NRPs can contain non-proteinogenic amino acids and D-amino acids. DL-peptides consist of the alternation of L- and D-amino acid residues, and are regarded as potential candidates for therapeutic applications.

Several DL-peptides have been known to exist as multiple types of β-helical conformations in dynamic equilibrium, including single- vs double-stranded, right- vs left-handed forms.[1] However, only a limited number of double-stranded β-helices have been crystallographically characterized to date.[2-4] The single-stranded β-helical forms remain evasive, presumably because the double-helical forms are predominant in solutions, while the single-stranded ones are stable only within lipid bilayers.

Stabilizing single-stranded β-helices could be achieved by incorporating structurally constrained β-amino acids. In this regard, a series of α/β-peptides were synthesized to mimic DL-peptide β-helices. In this presentation, I will discuss the atomic-resolution structures of β-helical α/β-peptides, which mimic one of the major single-stranded β-helices: the $\beta^{4.4}$-helix. The nontraditional β-helical backbone can be utilized as a scaffold for potential applications.

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2. “A Double-Stranded β-Helix with Antiparallel Chains in a Crystalline Oligo-L-D-peptide”, E. Benedetti, B. D. Blasio, C. Pedone, G. P. Lorenzi, L. Tomasic, V. Gramlich, *Nature* **1979**, *282*, 630.
3. “Three-Dimensional Structure at 0.86 A of the Uncomplexed Form of the Transmembrane Ion Channel Peptide Gramicidin A”, D. A. Langs, *Science* **1988**, *241*, 188.
4. “The Antiviral Antibiotic Feglymycin: First Direct Methods Solution of a 1000+ Equal-Atom Structure”, G. Bunkóczi, L. Vértesy, G. M. Sheldrick*, Angew. Chem. Int. Ed.* **2005**, *44*, 1340.

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Education

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Position

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2016 – 2020	Postdoctoral Researcher, University of Geneva, Switzerland (Prof. Nicolas Winssinger)
2015 – 2016	Postdoctoral Researcher, POSTECH, Republic of Korea (Prof. Byeang Hyean Kim)

Representative Publications

1. “Fluorescein-switching-based lateral flow assay for the detection of microRNAs”, J. Ryu, T. S. Choi, K. T. Kim*, *Org. Biomol. Chem.* **2024**, *22*, 8182.

2. “A Facile Strategy to Output Fluorescein from Nucleic Acid Interactions”, Y. Kim, S. Jang, C. Chang, K. T. Kim*, *Bioconjugate Chem.* **2023**, *34*, 1606.

3. “Riboflavin-catalyzed templated reaction to translate nucleic acid cues into signals of rhodamine derivatives”, H. Kim, H. Choi, K. S. Min, W. J. Han, J. W. Park*, K. T. Kim*, *Chem. Commun.* **2022**, *58*, 13743.

4. “A minimal hybridization chain reaction (HCR) system using peptide nucleic acids”, K. T. Kim, S. Angerani, N. Winssinger*, *Chem. Sci.* **2021**, *12*, 8218.

5. “Enhanced SNP-sensing using DNA-templated reactions through confined hybridization of minimal substrates (CHOMS)”, K. T. Kim, N. Winssinger*, *Chem. Sci.* **2020**, *11*, 4150.

6. “Coupling of DNA Circuit and Templated Reactions for Quadratic Amplification and Release of Functional Molecules”, K. T. Kim, S. Angerani, D. Chang, N. Winssinger*, *J. Am. Chem. Soc.* **2019**, *141*, 16288.

Transducing Nucleic Acid Signals into Chemical Reactions: Toward Biosensing

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Biological processes are based on biochemical circuits operated by interactions among specific biomolecules, such as proteins, nucleic acids, and metabolites. These circuits use biomolecular interactions as inputs to induce intended and essential chemical reactions for biological activities—such as enzyme activation and protein complex formation—as outputs. Inspired by such natural circuit systems, artificial biochemical circuits are emerging as programmable molecular systems that can utilize a broader range of molecular inputs to trigger diverse and customizable chemical reactions. These systems offer new opportunities to mimic natural functions and to implement novel behaviors not observed in nature.

Among the various types of artificial biochemical circuits, nucleic acid-based circuit designs offer a powerful platform due to their inherent sequence specificity and programmability. In particular, nucleic acid-templated reactions serve as an effective tool for circuit construction by leveraging the sequence-specific hybridization of nucleic acid inputs, which in turn positions chemical reactants in close proximity and initiates selective chemical transformations. This approach enables the development of new circuits that convert nucleic acid signals into functional chemical outputs, which can be applied to a wide range of biological applications, including biosensing, diagnostics, smart drug delivery, and precision therapeutics.

In this presentation, I introduce the design principles and examples of nucleic acid-templated reaction-based circuits that we have developed, and discuss how the resulting new chemical outputs are applied in the design of biological systems with emerging functions. Among various possible applications, I will specifically highlight their use in constructing highly sensitive nucleic acid sensors for advanced diagnostics.

References

1. “Fluorescein-switching-based lateral flow assay for the detection of microRNAs”, J. Ryu, T. S. Choi, K. T. Kim*, *Org. Biomol. Chem.* **2024**, *22*, 8182.

2. “A Facile Strategy to Output Fluorescein from Nucleic Acid Interactions”, Y. Kim, S. Jang, C. Chang, K. T. Kim*, *Bioconjugate Chem.* **2023**, *34*, 1606.

3. “Riboflavin-catalyzed templated reaction to translate nucleic acid cues into signals of rhodamine derivatives”, H. Kim, H. Choi, K. S. Min, W. J. Han, J. W. Park*, K. T. Kim*, *Chem. Commun.* **2022**, *58*, 13743.

제18회 젊은 유기화학자 수상자

김현진 (Hyun Jin Kim)

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학력 및 경력

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2015-현재	책임연구원, 한국화학연구원 (KRICT)
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연구분야: Organic Reaction for DNA-Encoded Library, Library Construction, Drug Development

The Construction of DNA-encoded Library for Drug Discovery

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The importance of novel screening platforms in the discovery of lead compounds for new drug development is well established. In particular, the screening of hundreds of thousands of compounds from small-molecule libraries serves as a critical starting point that can determine the ultimate success of drug development efforts. However, the construction of high-throughput screening (HTS) systems for large-scale compound evaluation is often hindered by financial and spatial limitations, which vary depending on the size and type of the compound library. To address these challenges, DNA has been employed as a molecular barcode through its conjugation with small-molecule compounds. This innovation led to the emergence of DNA-encoded library (DEL) technology, which allows for rapid and efficient screening of vast chemical spaces. First conceptualized by Brenner and Lerner in 1992, DEL technology has since undergone extensive development and is now widely adopted by pharmaceutical companies in conjunction with HTS to identify promising drug candidates. For example, RIPK1 and soluble epoxide hydrolase (sEH) inhibitors developed by GSK during clinical trials were selected through chemical optimization of hit compounds originally identified via DEL screening.

Despite its potential, current synthetic methodologies for constructing DELs remain limited in scope. In this study, we report a novel synthetic approach for the incorporation of N-acylsulfonamide and N-sulfonylamidine moieties into DNA-encoded libraries. These compounds were synthesized via copper-catalyzed reactions using simple and commercially available alkynes and sulfonyl azides, with suitable nucleophiles such as water or amines. This method offers a practical and versatile alternative for DEL construction, potentially expanding the chemical diversity accessible through this platform.

References

1. “Copper-Mediated Three-Component Reaction for the Synthesis of *N*-Sulfonylamidine on DNA”, T. Y. Kwon, Y. Lee, K.-J. Cho, H. J. Kim*, *Org. Lett.* **2025**, *27*, 4316.

2. “Copper-Mediated Three-Component Reaction for the Synthesis of *N*-Acylsulfonamide on DNA”, S. Eom, T. Kwon, D. Y. Lee, C. H. Park*, H. J. Kim*, *Org. Lett.* **2022**, *24*, 4881.

제18회 젊은 유기화학자 수상자

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2016	이학박사, Caltech (지도교수: Brian M. Stoltz)
2010-2011	연구원, 한국화학연구원 (KRICT)
2016-2017	박사 후 연구원, UC Berkeley (지도교수: F. Dean Toste)
2017-2025	책임연구원, 한국과학기술연구원 (KIST)
2019-2025	부교수, 과학기술연합대학원대학교 (UST)
2025-현재	조교수, 서강대학교

연구분야: Organic Synthesis, Aryne Chemistry, Small Molecule Drug Discovery, Immuno-Oncology

Development of Novel Organic Methodologies Utilizing Aryne Intermediates

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A straightforward, mild, and transition-metal-free three-component coupling reaction involving arynes, phosphites, and silyl fluorides was developed through Si−F bond activation. Although the Si−F bond is one of the strongest bonds, Si−C bond formation via Si−F bond cleavage with the assistance of bidentate silicon and phosphonium Lewis acids has been successfully achieved. This unprecedented strategy provides a facile approach for synthesizing ortho-silyl-substituted aryl phosphonates. Notably, this method allows the use of not only dialkylarylsilyl fluorides and diarylalkylsilyl fluorides but also triarylsilyl fluorides as coupling partners, which is uncommon in the field of arylsilane synthesis. Furthermore, a variety of ortho-silyl-substituted aryl phosphonates were produced in moderate to good yields with broad functional group tolerance. Additionally, the versatility of ortho-silyl-substituted aryl phosphonates was demonstrated by the elaboration of the products into a range of silicon-containing compounds.

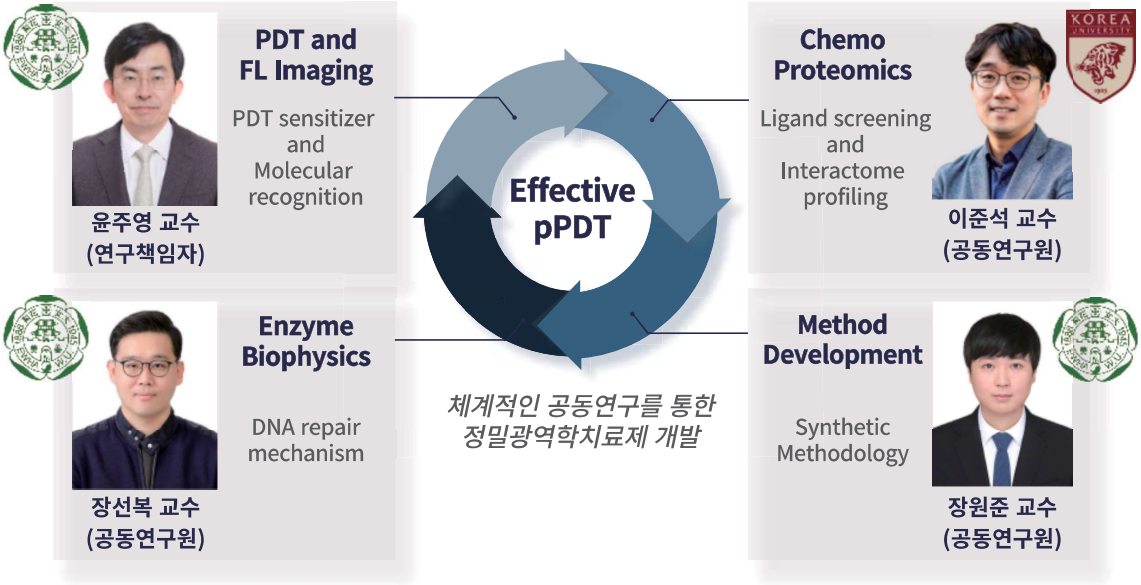
Also, a synthetic approach to dibenzophospholes was developed via the gold- and copper-catalyzed annulation reactions of arynes and phosphites. The reaction conditions demonstrated a broad functional group tolerance, enabling the synthesis of a diverse range of dibenzophosphole 5-oxides. This method is useful for preparing dibenzophospholes with unique optical and electronic properties.

Moreover, an efficient and straightforward method for the synthesis of aryl(alkynyl)phosphinates was developed via a three-component coupling reaction involving arynes, phosphites, and alkynes. An array of aryl(alkynyl)phosphinates were produced from both aryl and aliphatic group-substituted acetylenes. This operationally simple reaction is tolerant to many functional groups, affording various aryl(alkynyl)phosphinates in moderate to good yields. The synthetic utility of alkynyl phosphinates afforded by this method was demonstrated by the elaboration of the products into various phosphorus-containing compounds.

기초연구실 (BRL)

활성산소 방어기전 직접 표적을 통한 정밀 광역학 치료법 개발 연구

Q1 공동연구진 및 최종 연구목표

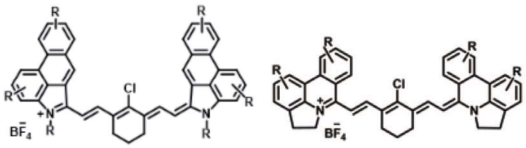


체계적인 공동연구를 통한 정밀광역학치료제 개발

Q2 연구 내용 및 세부 연구 계획

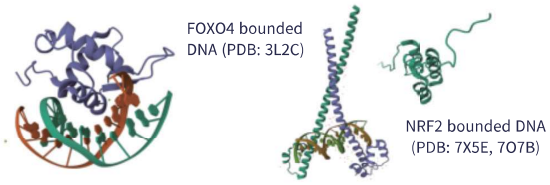
기존 PDT의 한계 극복을 위한 융합 연구 기반 정밀광역학치료제 개발

신규 광감응 구조체 개발



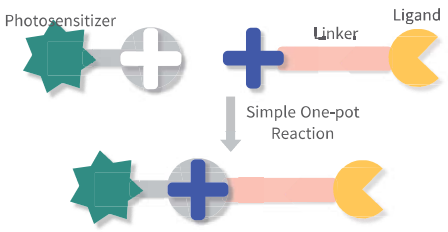
- π 결합의 연장을 통한 빛 투과율을 높일 수 있는 장파장 광감응제 개발
- Heptamethine cyanine 과 polycyclic 방향족 고리 이용

항산화 표적 가능 리간드 개발



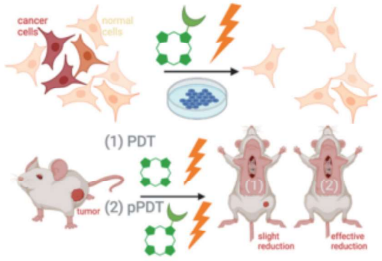
- 항산화 효소 타겟 선택 및 단백질과 리간드의 구조 분석 연구
- 리간드 결합력 증대 및 photosensitizer와의 결합을 위한 최적의 위치 도출하여 structure-based 약물 디자인

리간드를 연결한 유기감응제 합성



- 다양한 광역학 감응제와 도출한 리간드를 연결
- 리간드와 광감응제 연결을 위한 다양한 링커 도입 방법 개발

유기감응제의 표적 선택성 평가 및 동물모델 실험



- 유기감응제의 표적 선택성 평가를 위한 가이드라인 구축
- 세포 및 동물모델 실험을 통한 정밀광역학치료 효능 평가

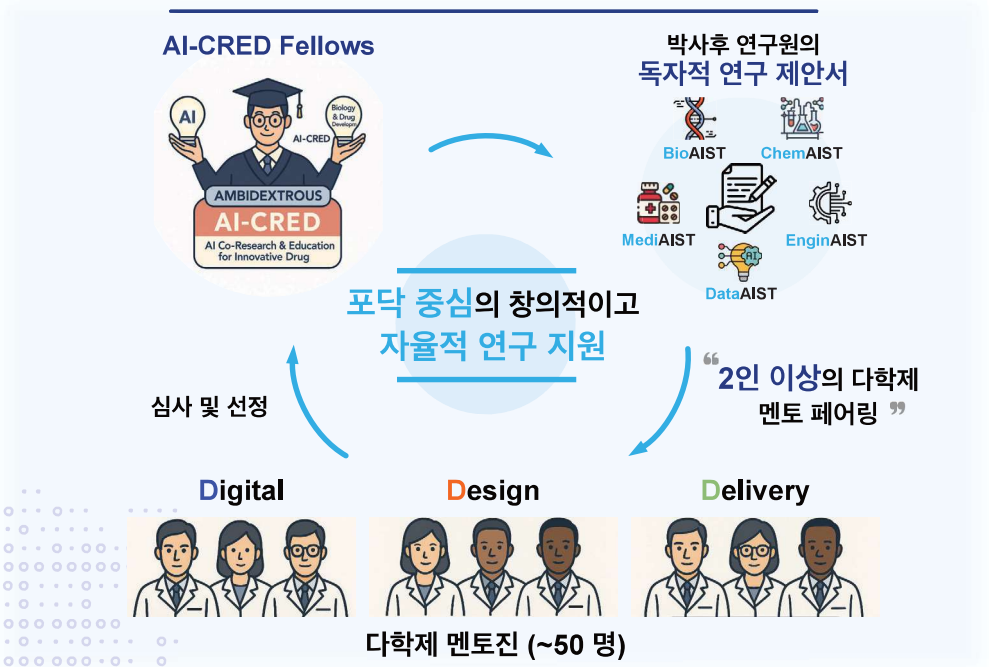
AI-CRED INSTITUTE
AI Co-Research & Education for Innovative Drug

AI-CRED FELLOWSHIP

AI Co-Research & Education for Innovative Drug

AI와 신약개발을 통합적으로 설계하는 '양손잡이형' Co-Researcher 인재양성 프로그램
AI 기반 혁신신약 및 약물전달 新모달리티 창출을 통한 신약 개발

(i) AI models for drug design, (ii) de-novo new modality, (iii) drug-delivery systems, (iv) lab-in-the-loop automation, (v) bio-data analytics, (vi) AI virtual cells



• 개인 융합: 포닥 1인 + 멘토 2인 (KAIST, DGIST, GIST, UNIST)	연구비: 0.4~0.5억/년
• Cross-IST: 포닥 1인 + 멘토 2인 (다른 IST 소속멘토)	연구비: 0.5~0.6억/년
• 팀 기반 융합: 포닥 2~3인 + 멘토그룹	연구비: 1.0~2.4억/년
• 산학연 연계: 포닥 1인 + 출연(연)/기업 멘토 포함	연구비: 0.5~0.6억/년

Notice

- 최대 5년(3+2년)의 계약기간.
- 3년차 중간 컨설팅 및 수행 중 트랙 변경 가능
- 2명 이상의 다학제 멘토 페어링 필수

연봉 9천만원 + 타 과제 중복참여 가능 + 개인 연구비
(4대 보험 등 법적 부담금 포함)

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**지원 상세 내용 홈페이지 참조

[학생 및 신진연구자 구두발표 종합 일정표]

학생 구두발표 1A, 장소: 루비I홀, 좌장: 박종민 (강원대)			
16:10-16:25	OP-01	김호윤	Visible-Light Photoredox Catalysis of Polydopamine with Triethanolamine in Water
16:25-16:40	OP-02	K. Kozoriz	Photoswitchable BOAHY-BODIPY dyads as photosensitizers for photodynamic therapy
16:40-16:55	OP-03	김도현	CAIX-Targeting Cancer Specific Supramolecular Lysosome-Targeting Chimeras (Supra-LYTAC) for Targeted Protein Degradation
16:55-17:10	OP-04	이도경	Photoredox Catalysis of Bridged Fluoresceins under Red Light
학생 구두발표 1B, 장소: 루비II홀, 좌장: 한예리 (덕성여대)			
16:10-16:25	OP-05	이종현	Installations of TEMPO Radicals and Ag–Cytosine for Catalytic Applications of Metal–Organic Frameworks
16:25-16:40	OP-06	임성준	Rational Design of Photoredox-Switchable Chalcogen Bonding for High-Contrast Solar Windows
16:40-16:55	OP-07	한인규	Assemblies of Helical β-Peptide Foldamers into Porous Metal–Peptide Frameworks with Tunable Functionality
16:55-17:10	OP-08	홍정우	Programmable Secondary Structure Control in β-Peptides via Site-Selective Thioamide Substitution

학생 구두발표 2A, 장소: 루비I홀, 좌장: 동방선 (서강대)			
17:20-17:35	OP-09	이세민	Nickel-catalyzed enantioselective alkylation of 1,1-diborylalkane with unactivated alkyl halides
17:35-17:50	OP-10	이윤호	Ni-H Catalyzed Hydroacylation: A General Strategy for Accessing α-Substituted Carbonyl Compounds Using Acyl Fluorides
17:50-18:05	OP-11	김성하	Cu-catalyzed protosilylation of allenes for synthesis of (Z)-allylsilanes through the homolytic cleavage of Cu-Si bond
18:05-18:20	OP-12	홍준화	Iron Carbonyl-Catalyzed Transfer Hydrogenation of Alcohols and Nitro Compounds for N-Heterocycle Synthesis
학생 구두발표 2B, 장소: 루비II홀, 좌장: 정시원 (인하대)			
17:20-17:35	OP-13	함민경	Catalytic and Stereoselective Control of N-N and C-C Axial Chirality via Dynamic Kinetic Resolution and Desymmetrization
17:35-17:50	OP-14	송일우	Regiodivergent and Stereoselective Synthesis of Homoallylic Tertiary Fluorides by Lewis Pair
17:50-18:05	OP-15	김서영	A Unified C5,6-Oxidation Strategy for Securinega Alkaloids: Structure Revision, Molecular Editing, and Bioactive Derivatives
18:05-18:20	OP-16	김도연	Photon-Primed Organic Electrosynthesis Enabled by Oxidation of Photon-Induced Intermediates

[학생 및 신진연구자 구두발표 초록 모음]

아래 QR 코드를 통해 PDF 파일을 다운 받으실 수 있습니다.

학생 구두발표 초록집

MGRC 다차원유전체연구소
Multidimensional Genomics Research Center

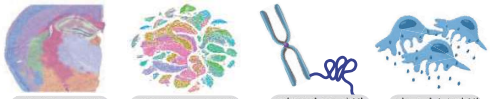
강원대학교 램프(LAMP) 사업 중점테마연구소

주요 연구분야

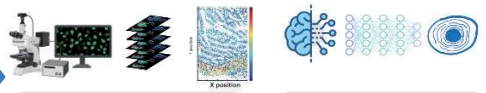
노화 면역나이테 지도화 기반 연구플랫폼 구축 및 면역노화 제어

면역 노화의 다층적 기전에 대한 통합적 이해 필요

1. 시공간 다차원 면역 나이테 분석



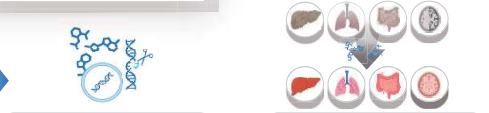
2. 인공지능 기반 면역나이테 지도화



면역 노화 제어 및 맞춤형 질병 치료

3. 면역노화 결정인자 조절 기전 규명

4. 면역노화 제어기술 및 노화질환 치료전략 제시



면역 나이테 지도 완성과 결정인자 제어를 통한 면역 노화 맞춤형 치료 전략 제시

연구진 구성

시공간 유전체 분석

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강원대학교 의학대학
엑소좀 및 전사체 분석

반연희 교수
강원대학교 의생명과학대학
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단일세포 다중오믹스 분석

면역 나이테 이미징 및 제어

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면역 노화 동물 모델 구축

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면역세포 및 유전자 치료

공동연구 장비구축

단일세포 전사체 분석기
Single-cell Transcriptome Analyzer 10x genomics Chromium X

공간 전사체 분석기
Spatial Transcriptome Analyzer
10x genomics Visium CytAssist

질량 분석기
Mass Spectrometry
Thermo Fisher Scientific Orbitrap Exploris 120

투과 전자 현미경
Field Emission Transmission Electron Microscope (FE-TEM)
(Tecnai F30, FEI/USA)

액체 크로마토 그래피 질량 분석기
Liquid chromatography / Mass Spectrometry(LC/MS)
(LC/MSD XT, Agilent/USA)

다기능 플레이트 리더
Plate reader
(SpectraMax i3x, Molecular Devices/USA)

가변레이져 분광공초점현미경
Tunable Laser Confocal Microscope

삼차원세포 이미징시스템
3D Cell Imaging system

자동 유세포 분리기
Automated Flow Cytometry Sorter

G-LAMP
KANGWON NATIONAL UNIVERSITY

다원자 전형원소 촉매 실험실

Laboratory for Multicentered Main-Group Catalysis

Multicentered Main group Catalysis Laboratory

다학제간 연구진의

중앙대학교 **조은진** 교수

POSTECH **김현우** 교수

GIST **정원진** 교수

서울대학교 **홍승윤** 교수

원소의 상호작용을 통한

전형원소 (MG)

^{15}P phosphorus x ^{16}S sulfur

synergistic

MG---MG
MG---MG
or
MG---MG

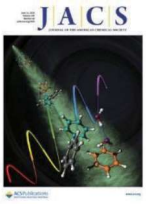
MG^n ⇄ *Bidirectional redox* ⇄ MG^{n+m}

자연과학의 향연

ACS Catal., **2024**
(다원자 인 기반 촉매반응)

JACS, **2024**
(다치환 전형원소 합성)

JACS Au, **2025**
(인 기반 합성법)



JACS, **2025**
(**황 기반** 촉매 개발)

합성화학, 광화학, 전기화학, 계산화학의 융합

원소의 주기성에 벗어난 전형원소 시료/촉매 개발

지속가능한 차세대 "분자합성" 실현

저희 기초연구실은 유기화학을 큰 틀로 하여, 서로 다른 전문 분야 간의 긴밀한 "상호작용"을 바탕으로 다원자 전형원소의 "상호작용"을 활용한 새로운 합성법을 개발하고 있습니다.

[포스터 발표 정보]

[포스터 발표 장소]	[포스터 발표 시간]
PO-001 ~ PO-128: 에메랄드룸 PO-129 ~ PO-165: 사파이어룸	홀수 번호: 16:10~17:10 짝수 번호: 17:20~18:20

PO-001	Photoinduced Phenolate Organocatalysis for Isoindoloindolone Synthesis with *N*-Iodobenzoyl Indoles Annaram Thirupathi, Su Bin Yoon, and Eun Joo Kang*
PO-002	Topochemical Azide-Alkyne Cycloaddition in Crystalline Peptide: Regioselective Construction of Pseudo-Proteins Sungmo Koo, Hee-Seung Lee*
PO-003	Green-Light Driven $Fe(btz)_3$ Photocatalysis for the Radical Cationic [3+2] Cycloaddition Reaction Wonbeen Lee , Eunjoo Kang*
PO-004	Foldamer Design and Coordination Optimization for Chiral Metal–Peptide Cage Synthesis Suhyun Kim, Hee-Seung Lee*
PO-005	Photocatalytic Aldol Surrogate Reactions via C-H Functionalization of Ethers Quynh H. Nguyen and Seunghoon Shin*
PO-006	Efficient Analysis of Single Crystal Structure for Complex Organic Molecules with Semi-Automatic Algorithm Jiyu Park, Jaeho Kim, Sang Jun Lee, Hee-Seung Lee* and Jintaek Gong*
PO-007	N-Insertion of Diazonium Salts into Ketones Derivatives Jiwon Jang and Seunghoon Shin*
PO-008	Chiral Deep Eutectic Solvents Enable Supramolecular Chirality Transfer to Achiral Gelators SeYeon Jeong, Hee-Seung Lee*
PO-009	Stereoselective Construction of Tricycles via Cascade Prins-Cyclization and Diels–Alder Reaction Dohoon Cha, Sun-Joon Min*
PO-010	Design of Photoswitchable *N,N'*-linked Oligourea Helices as Enantioselective Organocatalysts Yejin Lee, and Sung Hyun Yoo*
PO-011	An Improved Eight-Step Synthesis of (-)-Rotundone via Ring-Expansion Using Trimethylsilyldiazomethane Suhyeon Kim, Terim Seo, Inho Jeong, and Do Hyun Ryu*
PO-012	Interfacial Synthesis of Naphthorosarin-based MOF Thin Film Yewon Kim, Woo-Dong Jang*
PO-013	Accelerated Development of Enantio- and Regioselective Catalysis via High-Throughput Experimentation and Machine Learning Terim Seo, Donghun Kim, Shinwon Ham, You Kyoung Chung, Inho Jeong, Joonsuk Huh,* Hyunwoo Kim,* Do Hyun Ryu*
PO-014	Effect of Structural Modification of *cis*-3-Aminopiperidine-4-Carboxylic Acid (APiC) Derivatives on Helicity Hyo Seong Lee, Soo Hyuk Choi*
PO-015	Organocatalytic Asymmetric Synthesis of Triaryl- and Diarylalkanes Jin Won Lee, Hayoung Song, Do Hyun Ryu*
PO-016	Manipulating the Degradation of Cyanoarene-based Photocatalysts for the Enhanced Photocatalytic Halogen-Atom-Transfer Reaction Soeon Park, Chung Whan Lee*

PO-017	Bifunctional L-Proline Derived Primary Amines Enable Chemo- and Enantioselective α-Amination of α-Substituted β-Ketocarbonyls Jiwan Yun, Sudip Shit, Jin Won Lee, Do Hyun Ryu*
PO-018	Iminium-Promoted Halogen Atom Transfer in Photocatalytic Reaction Strategy Jinmin Park, Chung Whan Lee*
PO-019	Chiral Lewis Acid Catalyzed Stereoselective Construction of Tetrahydrofurans via Formal [3+2] Cycloaddition of Allylsilanes with Glyoxals Hosung Lee, Dong Kyu Kim, Terim Seo, Do Hyun Ryu*
PO-020	Finely Tuned Reactivities between Cyanoarene-based Photocatalysts and Amines: Methodology Development for Hydroalkylation of Alkyl Bromide with Styrene Dongil Kim, Sukhyun Shin, Chungwhan Lee*
PO-021	Enantioselective Synthesis of Diarylindolylmethanes via Lewis Acid-Catalyzed Friedel–Crafts Alkylation of Indoles Hee Seo Jung, Jin Won Lee, Do Hyun Ryu*
PO-022	Synthesis of Water-Soluble Organic Electron Transfer Mediators for Blood Glucose Sensors Sihyun Kim and Bongjin Moon*
PO-023	Copper-Catalyzed Regio-, Diastereo- and Enantioselective Allylic Alkylation with 1,1-Diborylalkanes Gwanggyun Kim, Seung Hwan Cho*
PO-024	Stereochemistry-dependent Ionization Efficiency in LC-MS: A Case Study on Cyclohexane-Based Dicarboxylates Junyoung Moon, Soyeon Lee, Han Bin Oh, and Bongjin Moon*
PO-025	Axially chiral α-boryl-homoallenyl boronic esters as versatile toolbox for accessing centrally and axially chiral molecules Yonghoon Jin, Junseok Lee, Woohyun Jo, Jeongwoo Yu, Seung Hwan Cho*
PO-026	Synthesis of Metabolites of Acetyl Tributylcitrate (ATBC) Plasticizer Gahee Lee, Sujin Park, and Bongjin Moon*
PO-027	Synthesis and applications of 1,2-dicarbonyl radical superstructures Minseop Kim, Dokyun Hwang , Hyunyong Kim and Eunsung Lee*
PO-028	Mechanistic Insights into the Spontaneous Decomposition of Acetyl Monoalkyl Citrate Metabolites in Protic Solvents Hyeondeok Joo and Bongjin Moon*
PO-029	Aromatic Fulvalenes: Synthesis, Characterization, and Metalation for Diatomic Metal Complexes Seunghyuk Yoo, Jihye Choi, Eunsung Lee*
PO-030	Grubbs catalysts with cyclic (alkyl)(amino)carbene(CAAC) for stereoretentive ring-expansion metathesis polymerization(REMP) Hoonseok Kang, Yang Yongkang, Minjae Jang, Jeewoo Lim*, Tae-Lim Choi*, and Eunsung Lee*
PO-031	Quinoxalinoquinoxaline photosensitizer for H-bonding network-based amide nitrilation Seongwoo Bae, Jinwoo Kim*
PO-032	Metal Acetylacetonate-Based Photoresist Platform: EUV-Triggered Chemistry and Simple Thermal Development Strategy Jinhwan Byeon, Dowon Kim, Sangjin Kim, Jaeboong Ahn, Dong Suk Oh, Yang Hun Yoon, Hae-geun Jee, Yejoon Kim, Chan-Cuk Hwang* Sukwon Hong*
PO-033	Streamlined Umpolung Coupling to Diarylamine Using an Easily Accessible Copper Catalyst under Mild Conditions Yeongyeon Lee, Seohyeon Yoon, and Jinwoo Kim*
PO-034	Ni-Catalyzed C(sp^3)-H Dehydrogenative Acylation Toward Post-Functionalization of Commodity Polymers Min Jong Jeong and Sukwon Hong*
PO-035	Transition-Metal-Free Cross-Coupling of Pyridyl Pyrimidylsulfones with Azaaryl Grignard Reagents for Synthesis of Bipyridyl Derivatives Hayoung Kim, Seonghun Kim, Younghwa Jin, and Jeong-Hun Sohn*

PO-036	SuFEx-Driven Fabrication of Fluorescent Sulfur-Containing Polymers for Rapid Explosive Detection Sun Bu Lee, Jaeyoung Heo, Seunghyun Noh, Tae Eun An, Gyeongsoo Kim, Gang Min Lee, Junggong Kim, Keunyoung Kim, Jongman Lee, Taeyeon Kim,* Changsik Song,* and Han Yong Bae*
PO-037	Fingerprinting of Saccharides via ^{19}F NMR Spectroscopy Dohyeong Kim, Jumi Kim, Hyunwoo Kim*
PO-038	Catalytic Upcycling of Poly(butylene terephthalate) Joohyun Park, Mi-hyun Lee, Hye-Young Jang*
PO-039	^{19}F NMR Based Chiral Analysis of Alkynes Enabled by Cu- and Ru-catalyzed Azide-Alkyne Cycloaddition Reaction Inkyu Choi, Hyunwoo Kim*
PO-040	Two Different Clar's Sextets: Clar's Rule Does Not Necessarily Contradict the Global Pathway of Conjugated Macrocycles Pradeep P. Desale, Min-Sung Ko, Tae-Ho Roh, Jeong-Im Ham, Dong-Gyu Cho*
PO-041	Organocatalytic enantioselective [4+2]-cycloaddition of 2-nitroallylic alcohols with isatin-derived ketimines Haneul Kang, Sung-Gon Kim*
PO-042	Quinoliporphyrin as an Aromatic Monoanionic Porphyrinoid and Its Degradation Promoted by Cu^{2+} Yoon Hee Lee, Sung-Wook Choi, Min-Sung Ko, Tae-Ho Roh, and Dong-Gyu Cho*
PO-043	Stereoselective synthesis of 3-amino-4-substituted succinimides via [3+2]-annulation of *N*-alkoxy-4-oxo-acrylamides with azlactones Jaesung Shin, Sung-Gon Kim*
PO-044	Photodynamic Hijacking of DNA Repair via a Logic-Gated Prodrug Induces an ROS Storm for Melanoma Therapy Yi Nan, Hui Bian, Juyoung Yoon*
PO-045	Base-promoted [3+2]-cycloaddition of *N*-alkoxy-4-oxo-acrylamides with isatins for synthesis of spirooxindole-2-oxazolidinones Yeongju Kim, Sung-Gon Kim*
PO-046	Conversion of albumin into a BODIPY-like photosensitizer by a flick reaction, tumor accumulation and photodynamic therapy Gahyeon Park, Juyoung Yoon*
PO-047	Copper-Catalyzed sp^3–sp^3 Coupling of Tertiary Alkyl Chlorides and Ketones to Synthesize 1,4-Dicarbonyl Compounds Sieun Park and Sarah Yunmi Lee*
PO-048	Highly Sensitive Viscosity-Responsive Lysosomal Probe for Precise Imaging of Programmed Cell Death Haoyang Song, Hui Bian*, Juyoung Yoon*
PO-049	Enantioselective Synthesis of β-Aminoketones via Asymmetric Cyclopropenimine-Thiourea Catalysis Hooseung Lee, Semin Jang, and Sarah Yunmi Lee*
PO-050	Rational Design of an Activatable Near-Infrared Fluorogenic Platform for In Vivo Orthotopic Tumor Imaging and Resection Jeongyeon Hong, Juyoung Yoon*
PO-051	Visible light-induced synthesis of chroman-4-ones Hyemin Ko, Ujjwal Karmakar, Miseon Park, and Eun Jin Cho*
PO-052	Investigation of Proteome-Tetrazine Reactivity for a Highly Selective Tetrazine Ligation in Live Cells Junyoung Park and Jongmin Park[c]*
PO-053	Au-Photocatalyzed C-B bond formation Miseon Park, Sohee Lee, Youngmin You*, and Eun Jin Cho*

PO-054	Discovery of a KLHL41 Ligand for Muscle Specific Protein Degradation Jaeseok Lee, Junhyeong Yim, Solbi Kim, Ji-Eun Choi, Sunbin Jung, Hana Cho, Soyoung Yoon, Hankum Park,* Juyong Lee,* and Jongmin Park*
PO-055	Reductive Amination of Carboxylic Acids via Nickel(II) Catalysis: A Ligand-Tuned Strategy for C–N Bond Formation Gayeon Lee, Jaehan Bae, Kashif Ali, Eun Jin Cho*
PO-056	AI based E3 Ligase Ligand Discovery for Muscle Specific Protein Degradation JinYong Lee, Junhyeong Yim, Jaeseok Lee, Jongmin Park*
PO-057	Nickel-catalyzed Regioselective Hydroallylation of Allenes using Vinyl Cyclopropane as Allylation source towards the synthesis of 1,4-Dienes Haeryeong Jeong, Ujjwal Karmakar, and Eun Jin Cho*
PO-058	Heteroaryl Azides as Photocrosslinking Groups for Target Identification Junhyeong Yim Jongmin Park*
PO-059	Ni-Catalyzed Cyclotrimerization of Unactivated Internal Alkynes: Ligand Dependent Regioselectivity Ahyeon Cho, Jaehan Bae, Eun Jin Cho*
PO-060	Discovery of a Novel Cereblon-Based Molecular Glue for Ikaros Degradation via Structure-Based Virtual Screening Jinjoo Jung, Solbi Kim, Ji-Eun Choi, Juyong Lee and Jongmin Park*
PO-061	Total Synthesis of Suffruticosine Minju Kang, Taewan Kim, Sunkyu Han*
PO-062	Tau-Selective Dual-Functional Probes for Fluorescent Imaging and Aggregation Inhibition in Alzheimer's Disease MinJi Kim, Sun-Joon Min*
PO-063	Towards to synthesis of suffranidine A Taewan Kim, Youngho Jang, Sunkyu Han*
PO-064	Construction of Fluoroformates via Visible-Light-Induced DDQ Photocatalysis Hyejoon Moon Sun-Joon Min*
PO-065	Studies Toward the Total Synthesis of Nigelladine A and B Jonathan Kastner, Sunkyu Han*
PO-066	Light-Activated Ligands for Serotonin Receptor Control Hayeon Yi, Sun-Joon Min*
PO-067	Toward the Total Synthesis of Herpotriquinone A Hangyoung Kim, Yoojin Lee, Sunkyu Han*
PO-068	Design and Synthesis of Anti-Inflammatory Agents via Modulation of the NLRP3 Inflammasome Sojeong Choi, Sun-Joon Min*
PO-069	Progress towards the Synthesis of Flueggeacosine C Eric Jaewon Lee and Sunkyu Han*
PO-070	A COX-2 Selective Fluorescent Probe for Real-Time Imaging of Intervertebral Disc Inflammation Cheol Ho Heo, Yoonjung Choi, Soyoun Park, Bora Kim, Giseong Lee*
PO-071	Enantioselective Desymmetrization of 2-Aryl-1,3-propanediols So Yeon Kim, Giran Kim and Wonchul Lee*
PO-072	Organelle Localization-Induced Bio-orthogonal Polymerization (OLIBOP) for Photostable Super-Resolution Live-cell Imaging Gaeun Park, Sangpil Kim, Dohyun Kim, Injun Hwang, and Ja-Hyoung Ryu,*
PO-073	Total Synthesis and Assignment of Absolute Configuration of Hualyzin Seungbeom Son, Dong-Chan Oh, Jayoung Song* and Wonchul Lee*
PO-074	Endoplasmic Reticulum Targeting Unfolded Protein Binding Disulfide Oligomerization Strategy for Cancer Treatment Md Sajid Hasan, Gaeun Park, Ja-Hyoung Ryu*

PO-075	Copper-Catalyzed α,β-C(sp^3)–H Difunctionalization of Tertiary Alkylamines as a Dual C2 Synthon for Pyrimidine Construction Doyun Lee, Ramachandra Reddy Putta, Jinwoo Lee, Suckchang Hong*
PO-076	Biofouling-Resistant Mesoporous Organosilica Nanoparticles via Hyperbranched Polyglycerol Coating for Efficient Drug Delivery Gyeongseok Yang, Ja-Hyoung Ryu*
PO-077	Total synthesis of cyclodepsipeptide WS9326B *via* macrolactonization Seung Hyun Choi, Dong-chan Oh, Suckchang Hong*
PO-078	Sequential Enzyme-Responsive Supramolecular System for Selective Mitochondrial Disruption in Senescent Cells Jaeeun Lee, Sangpil Kim, Dohyun Kim, Youjung Sim, Min-Seok Seu, Ja-Hyoung Ryu*
PO-079	Iron-catalyzed Oxidative Cyclization using *N*,*N*-Dimethylacetamide as an Electrophilic Carbon Source for *N*-Heterocycle Synthesis Minseok Han, Dayoung Chun, Seok Beom Lee and Suckchang Hong*
PO-080	A Senescence-Selective Self-Assembling Senolytic Prodrug for Oral Treatment of Age-Related Macular Degeneration Haewon Ok, Hyun-Seo Park, Jungin Park, Sunyoung Hwang, Jiwon Jang, Jiye Kim, Gaeun Park, Dojoon Park, Tae-Eun Park*, Chaekyu Kim*, and Ja-Hyoung Ryu*
PO-081	Construction of Axial and Point Chirality via Photoredox Dual Catalysis: Toward the Synthesis of Ancistrobrevolines Junsoo Moon, Yongseok Kwon*
PO-082	Synthesis of 5-acylbenzimidazole DNA-encoded library: Focus on troubleshooting the nitro reduction step Yeongjoo Suh, Hongjun Jeon*
PO-083	Atroposelective Synthesis of *N*-Heterocyclic Biaryls via Catalytic Remote Control of a Stereogenic Axis Sujin Lee, Yongseok Kwon*
PO-084	Design and Synthesis of LATS1/2 Inhibitors for Tissue Regeneration Anagha Reneesh, Hongjun Jeon*
PO-085	[2+1+1] and [2+1] Cyclization: Diversifying Alkenes for Small Carbocycles via Photocatalytically Accessed 1,3-Dielectrophiles Chaewon Kim, Junseong Jang, and Seung Youn Hong*
PO-086	Development of antibody-drug conjugates with a novel payload exhibiting dual mechanism of action on microtubules and Src Yujin Han, Yeongjoo Suh, Yeongyeon Lee, Hongjun Jeon*
PO-087	Access to Hindered Alkyl Aryl Ethers via Radical–Polar Crossover C(sp^3)–O Coupling Enabled by Dual Organosulfur-Photoredox Catalysis Changkyu Park, Youngeun Hong, Insung Park and Seung Youn Hong*
PO-088	Development of a DNA-Compatible α-Amino Amide Synthesis for DNA-Encoded Library Construction Juyeon Lee and Gil Tae Hwang*
PO-089	Cooperative Organosulfur/Photoredox Catalysis Enables Radical-Polar Crossover C(sp^3)–N Coupling via Inner-Sphere Electron Shuttling Youngeun Hong, Changkyu Park, Junseong Jang, Minseok Oh, Dongwook Kim, Seunghoon Lee* and Seung Youn Hong*
PO-090	On-DNA Synthesis of α-Aminophosphonates for DNA-Encoded Library Construction In Young Jung, Ik Hwan Choi, and Gil Tae Hwang*
PO-091	Design of Molecular Photoswitches Inspired by Securingine B Sangbin Park, Sunkyu Han*
PO-092	Isothermal and Enzyme-Free Exponential Signal Amplification via Autocatalytic DNA-Templated Reaction Networks Ji Young Ryu, Ki Tae Kim*

PO-093	Total synthesis of Norsecurinamine B Minjoon shin, Seung Mo Seo, Sunkyu Han*
PO-094	On-DNA Synthesis of Vinyl Sulfone and γ-Keto Sulfone Scaffolds for DNA-Encoded Library Ji Young Ryu, Mi Kyeong Park, Ki Tae Kim*
PO-095	Photoexcited Nitroarene-Mediated Oxidation Enables Total Synthesis of Securingine G Valeriia Zvereva and Sunkyu Han*
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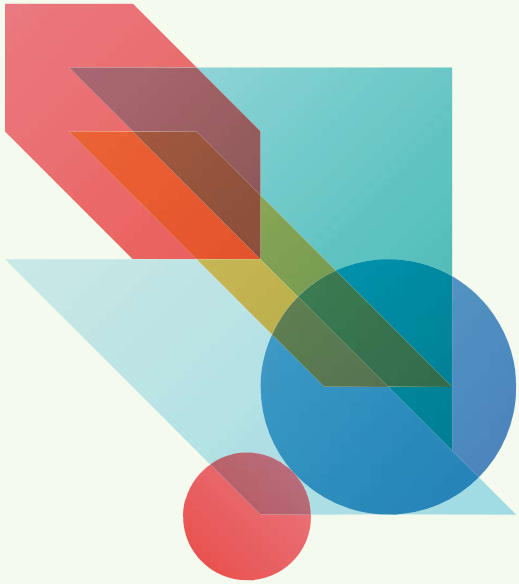

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당화 결합은 다당류나 뉴클레오사이드 등 생리 활성/기능성 물질의 기본 골격을 이루고 있으며 생명 현상의 화학적 고찰에서 매우 중요한 역할을 한다. 온화한 조건에서 수행되는 입체선택적이면서도 범용적인 당화 결합의 형성은 유기 화학 분야에서 가장 도전적인 주제 중 하나로 잘 알려져 있는데 이는 반응에 참여하는 헤테로원소 친핵체들의 낮은 반응성 및 당화 반응을 통해 얻어지는 아세탈 골격의 화학적 불안정성 때문이다. 본 연구단에서는 이러한 고전적인 화학적 당화 반응의 문제를 새로운 개념의 연속 금속 촉매 반응들을 통하여 해결하고 당화학 분야에서 새로운 패러다임을 구축하고자 한다. 또한, 이 방법론을 다양한 구조/크기와 기능을 가지는 당화합물 합성에 적용하고자 한다. 이러한 연구는 궁극적으로 질병을 치료할 수 있는 새로운 의약후보화합물질 개발 및 생명 현상을 탐구할 수 있는 화학적 탐침의 발굴로 확장될 수 있을 것이다.

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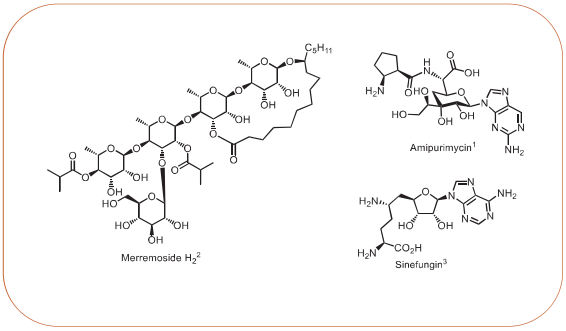
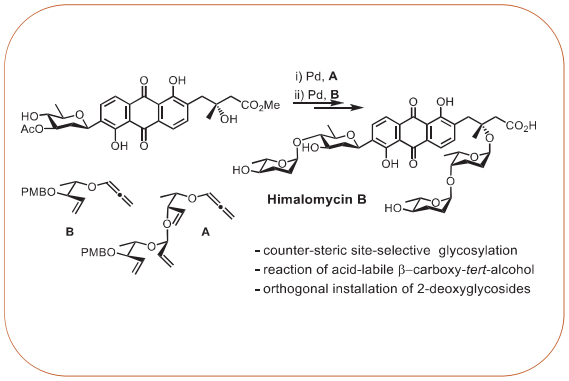


[1] *Org. Lett.* **2024**, *26*, 8537 [2] *Org. Lett.* **2024**, *26*, 602
[3] *Org. Lett.* **2024**, *26*, 3957

Total synthesis of Himalomycin B



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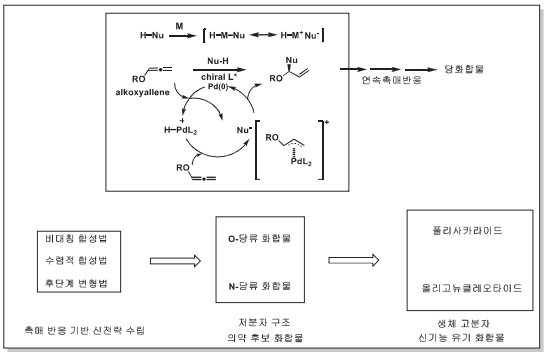
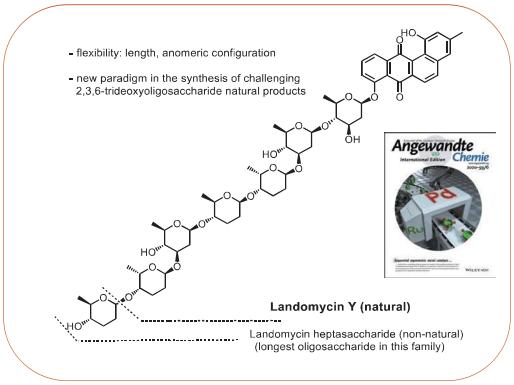


Flexible synthesis of Landomycin Y and its non-natural analogues



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C-N Bond Activation Laboratory

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Amide의 탄소-질소 결합 해리 반응 연구를 유기반응개발, 유기합성, 전이금속촉매 그리고 계산화학 전문가들의 공동 연구를 통해서 궁극적으로 난제로 알려진 2차 아마이드와 아로마틱 탄소-질소 결합 해리 반응 개발을 목표로 함

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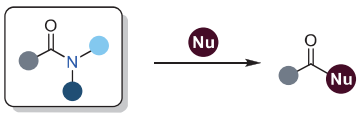

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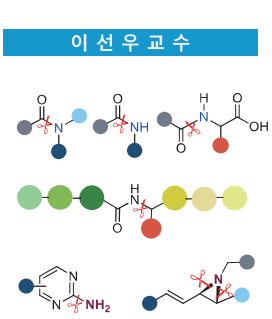

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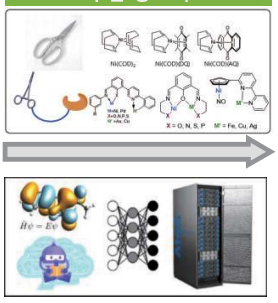

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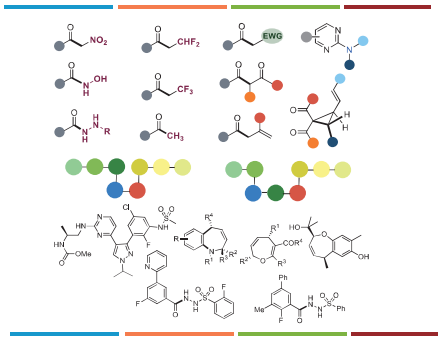
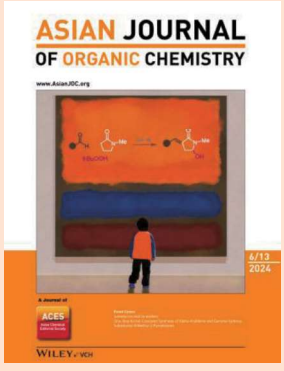
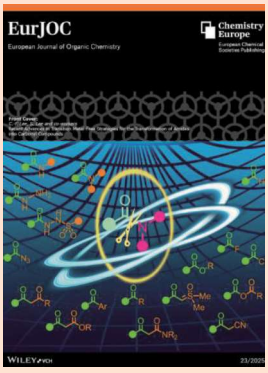
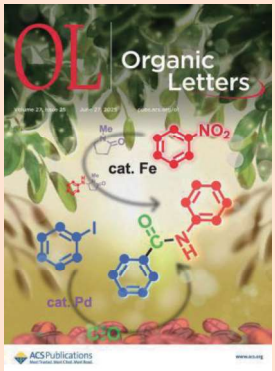


대표 연구 실적물 (저널 커버)







Chiral Material Core Facility Center

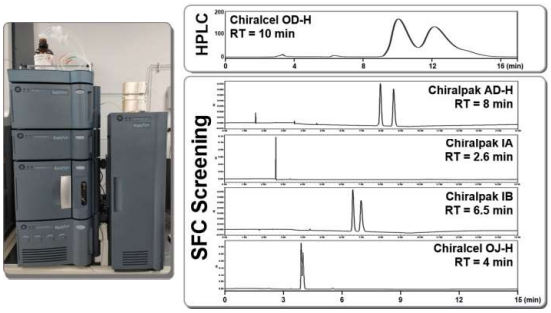
Director: Do Hyun Ryu

Strategic Direction of Research

- ◆ Develops new analysis methods to rapidly and accurately measure the properties and functionality of chiral materials
- ◆ Provision of high-efficiency chiral analysis services and promotion of joint research utilizing center equipment

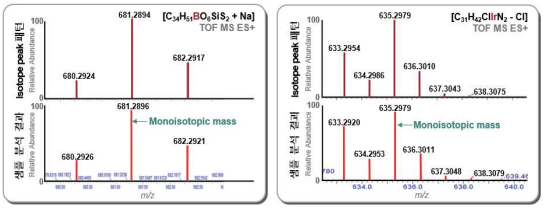
[Supercritical Fluid Chromatography (SFC)]

Enantioselectivity Evaluation of Chiral Pharmaceutical Compounds via SFC



[SFC-High Resolution Mass Spectrometer]

Mass Spectrometric Analysis of Chiral Pharmaceutical Compounds Using SFC-HRMS



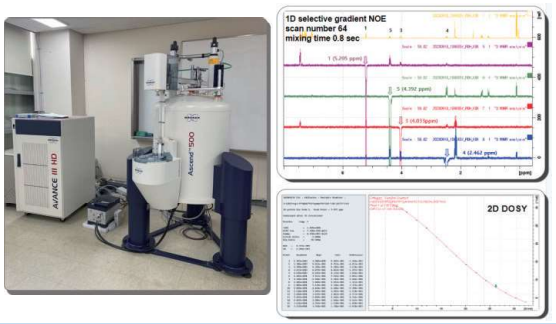
(Excluding VAT)

Item	Unit	Internal (Joint Research)	External (Non-SKKU)
HR-MS Analysis	Sample	32,000 KRW	40,000 KRW
Additional Data Processing (2h, fragment confirmation)		30,000 KRW	40,000 KRW
Express Analysis		70,000 KRW	80,000 KRW

* Express Analysis: For up to 5 samples, analyzed within 24 hours of arrival

[Nuclear Magnetic Resonance Spectrometer]

Molecular Structure Elucidation of Chiral Compounds by NMR



Inquiries via KakaoTalk Channel

View instrument-specific analysis fees and submission guidelines

https://www.zeus.go.kr/cloud/skkuchiral / 031-299-4890 / blackstar16@skku.edu
(16419) 81209, Research Complex 1, Sungkyunkwan University 2066, Seobu-ro, Jangan-gu, Suwon-si, Gyeonggi-do

CHIRAL MATERIAL CORE FACILITY CENTER

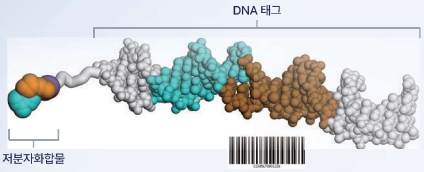
지속적인 DEL 기술의 수요자 맞춤형 전주기 One Stop 서비스 제공

DEL 기술연구단
Department of DEL Technology

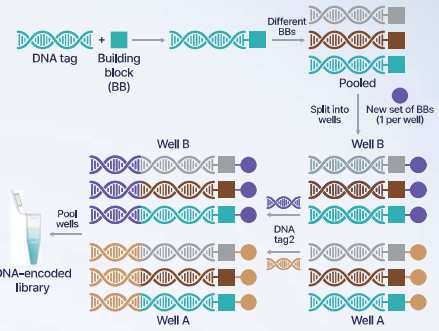
KRICT 한국화학연구원

DEL 기술이 뭔가요?

유전자 암호화 라이브러리
DNA Encoded Library, DEL



DNA 서열을 바코드로 사용하여 화합물을 식별하는
혼합물 형태의 라이브러리



2024	2025	2026	2027
기반기술 구축	플랫폼 구축	기술 고도화/검증	서비스
· 인프라 구축 시작 · 기술 도입 및 평가 · 코어뱅크 설립 및 조직 구성	· 첨단 인프라 구축 · 라이브러리 및 스크리닝 플랫폼 · 코어뱅크 운영 시스템 구축	· Focused 라이브러리 구축 · 스크리닝 플랫폼고도화, SOP 개발과 검증 · 코어뱅크 고도화	· 유효물질/스크리닝 서비스 · 수요 맞춤형 서비스 · 코어뱅크 One Stop 서비스

DEL

미래의료혁신 대응기술개발

대용량 유전자 암호화 라이브러리 플랫폼 기반 코어뱅크 구축

화학 정보학 및 통합정보시스템	분석기술 플랫폼
유전자 암호화 라이브러리 합성	스크리닝 및 약효평가

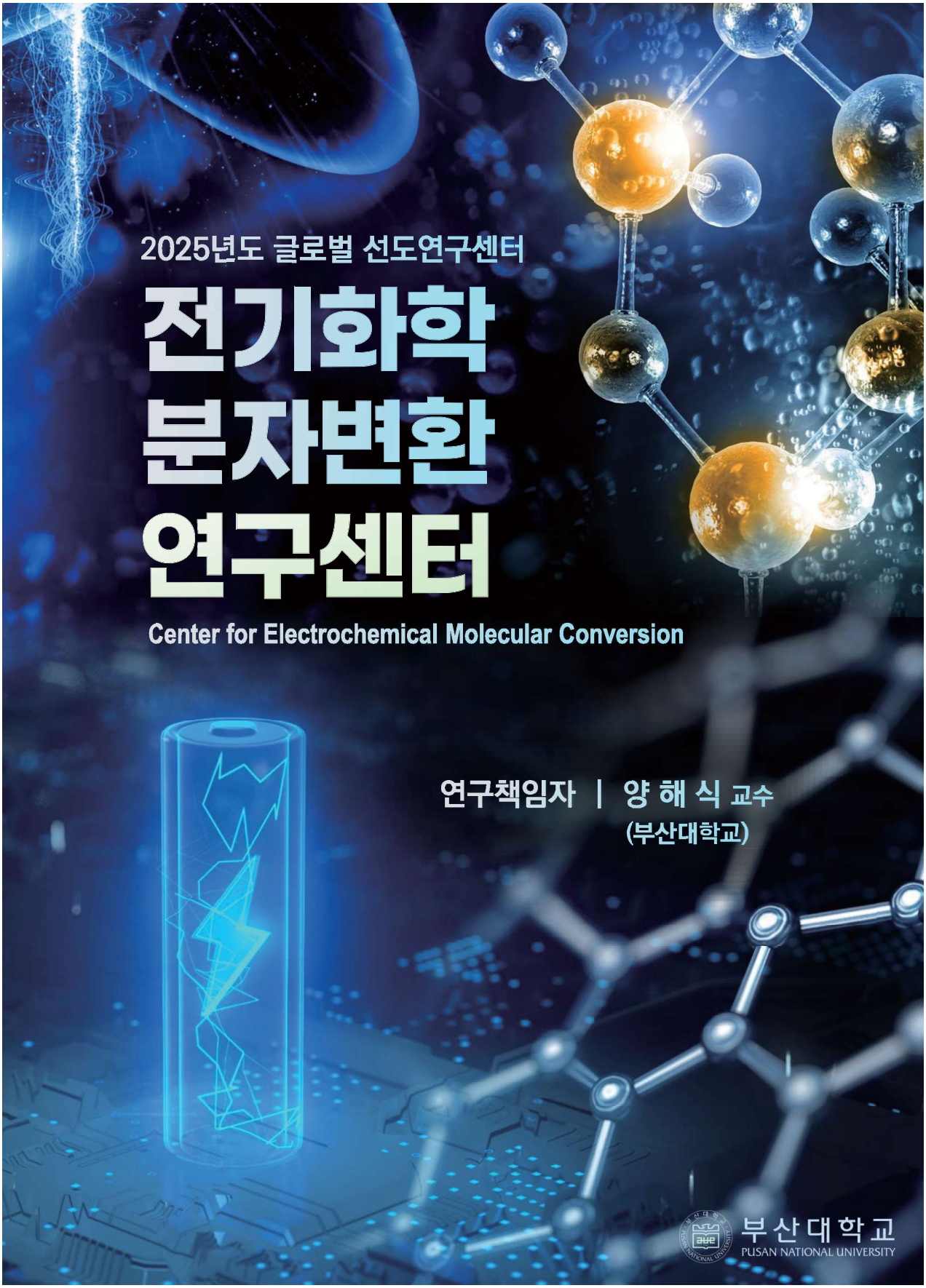
총괄	연구 1	위탁과제 1	위탁과제 2	연구 2	위탁과제 3
KRICT	KRICT	camel biosciences	성균관대학교	KRICT	KRICT
코어뱅크 구축 및 운영·지원	유전자 암호화 라이브러리 구축	펩타이드/모사체 기반 라이브러리 구축	독창적 핵심 헤테로고리 골격 합성	DEL 기반 스크리닝/분석 시스템 구축	대용량 유전체 데이터 분석 시스템 개발

시스템화
DEL 구축과 DELT 기반기술 도입,
정착 및 플랫폼 기술 구축을 통한
신약 연구 산업의 선진화

공공서비스화
산업체 지원 서비스 구축,
신약개발 프로그램의 전방위적 맞춤형
지원, 종합지원시스템의 공용화

글로벌화
외국 CRO 의존도 감소,
국내 신약 개발 파이프라인 확충,
미래 국가성장동력원 확보

글로벌 수준의 DEL 및 기반기술 구축 · 보존 · 관리 · 정보 체계 마련을 통한 공공 서비스 제공



2025년도 대한화학회 유기화학분과회 제25회 하계 워크숍 및 제10회 튜토리얼 강좌

한양대학교(ERICA) 글로벌기초연구실

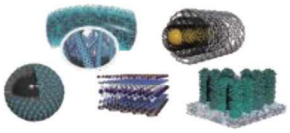
바이오매스 선택적 전환을 위한 광·전기화학 기초연구실

Chemoselective Biomass Conversion
via Photo/electrochemical System

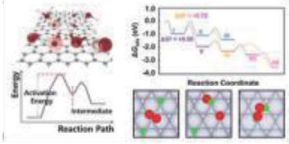
HANYANG UNIVERSITY ERICA
Education Research Industry Cluster @ Ansan

State University of New York College of
Environmental Science and Forestry

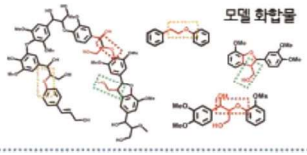
광·전기화학 촉매 합성 및 성능 평가



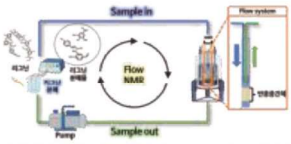
계산과학을 이용한 설계 및 기전 연구



바이오 매스 전환
및 수소 생산을 위한
친환경 촉매 시스템 개발



유기금속 착화합물 합성
리그닌 모델 화합물 합성



Flow NMR 기반
바이오매스 분해 기전 분석

고효율 촉매 설계 및 합성

상온 & 상압에서 작동 가능한 비백금계
광·전기화학 촉매 설계 및 개발

분해 기전 분석

Flow Chemistry를 활용한 실시간 분석
및 계산화학을 이용한 기전 분석

Gyu Leem 교수

- 가시광선 기반 바이오매스 분해 및 수소발생 연구
- 바이오매스 분해 기전 연구

이승현 교수

- 광·전기화학 촉매 설계 및 개발
- 광·전기화학 반응 및 기전 연구

민선준 교수

- 리그닌 모델 컴파운드 설계 및 합성
- 광촉매 적용 유기금속 화합물 합성

이영복 교수

- Flow NMR을 활용한 실시간 분석
- 복잡 반응 시스템의 동역학적 정보 분석

김병현 교수

- 계산화학을 통한 기전 연구
- 인공지능을 통한 데이터 기반 소재 설계

Contact info: Prof. Sun-Joon Min +82-31-400-5502 sjmin@hanyang.ac.kr

2025년도 대한화학회 유기화학분과회 제25회 하계 워크숍 및 제10회 튜토리얼 강좌

아주대학교 탄소-제로 신재생에너지시스템 사업단

Homepage Facebook Youtube 031-219-2206

기후 위기 및 에너지 문제 해결을 목표로 초융합 탄소-제로 신재생에너지 연구 교육

비전

탄소-제로 신재생에너지 신산업 창출·혁신 인재 양성

추진목표

탄소-제로 신재생에너지 융복합 혁신연구/교육 플랫폼 구축

교육연구단 목표

탄소-제로 Platform	연결지성 역량	기업수요 기반
초융합 신재생 에너지 연구	신재생 에너지 인력 양성	신재생 에너지 신산업 도출

교육 인재상	자기주도 연결지성 융복합 혁신인재

산업 수요 반영 신재생에너지 기술혁신 프로그램

수소 에너지 기술	에너지 효율화 기술	양자정보 과학
친환경 수소생산 그린수소 블루수소 수소센서	반도체소재 태양광 센서	양자컴퓨팅 양자소재

4대 에너지 중점분야 융복합 연구 교육

에너지 생산	• 태양 에너지 • 수소 에너지
에너지 저장/분배	• 이차전지, 에너지 저장장치 • 빅데이터 기반 연구
에너지 소비	• 에너지 효율 향상 • 센서, 안전
에너지 재활용	• 이산화탄소 활용 기술 • 에너지 수확 기술

'탄소-제로' 신재생에너지 시스템

지속가능 신산업 대응

수소 · 반도체 · 전지 · 양자

신재생에너지 분야 융복합 교육, 연구 수행을 위해 화학, 물리, 화공, 재료, 환경 전공 교수 중 본 사업단 4대 중점 분야에 전문성을 보유하고 있는 24인의 교수진이 본 교육연구단에 참여하고 있음

핵심전략

다학제 초융합교육(Hyper-Convergence)

융복합 교과 과정

- 자연과학, 공학, 사회과학 분야 연결지성 융복합 교육체계 운영
- 에너지 전주기 포괄 융합기초/융합선택/심화전공
- 융합기술 기술혁신 트랙 프로그램

수요중심 맞춤형 교육(Customized)

신산업 연계

- 에너지 신산업 트랙 프로그램 개발 : 수소에너지, 에너지수확(에너지효율화), 양자정보과학
- 산업수요 반영, 산학협력 교과 개발
- 탄소-중립, 국가전략 12대 분야 반영 융복합 프로그램 운영

열려있는 글로벌 교육(Open and Global)

자기주도 및 국제화

- 학생주도 프로그램 : 신재생에너지 프로젝트(문제해결형 PBL), 학생주도 성과 공유회 개최
- 열린교육체계 : 온라인 학습자료 구축, 타기관 학점 교류
- 해외 석학 활용 : Global Lecture Series, 에너지 여름학교/겨울학교

탄소-제로 신재생에너지 분야 전주기 인재양성 프로그램

우수 학부생 유치 프로그램
- 파란학기제, 학생설계전공 프로그램(자기주도 연구 주제 도출 및 수행)
- 융복합 교육(에너지융복합트랙, 수소 연료전지 트랙)
- Undergraduate Research(UR 운영), 실사구시 장학/학부생 대학원 진학독려 StAR장학

우수 대학원생 양성 프로그램
- 선진화된 학사 관리, 학위수여제도 석-박사, 학-석-박 연계 프로그램
- Energy-BTS(Best Thesis Student), 우수 논문상(학과 장려금), 우수 논문상(학장상, 대학원장상)

우수 신진연구인력 양성 프로그램
- 안정적 급여 지급과 아주대 인사규정에 따른 복지혜택
- 연구 파트너 제도, 아주대 신진연구인력 지원 제도(리서치 펠로우), 자율중점 과제 수행
- 독립 연구과제 수행 독려(한국연구재단 개인과제 수행)

에너지 혁신인력 석박사

BK21 FOUR 아주대학교 탄소-제로 신재생에너지시스템사업단

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Pauson-Khand Reaction / Chiral Resolution / Polymer Synthesis

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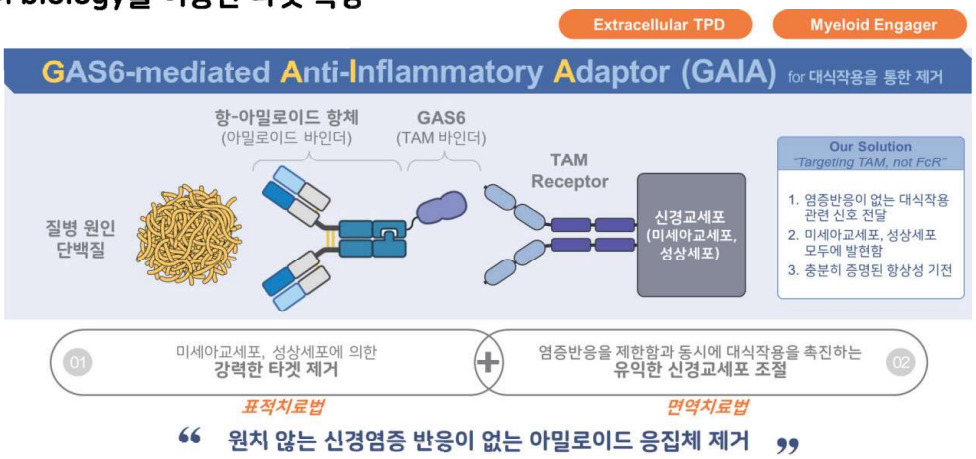
일리미스테라퓨틱스 (Illimis Therapeutics, Inc.)

- **대표:** 박상훈 대표
- **공동창업자:** 정원석 교수(KAIST), 김찬혁 교수(서울대)
- **소재지:** 서울시 강남구 헌릉로569길 18 (세곡동, 운성빌딩) 2층, 3층
- **설립일:** 2021.08.09
- **임직원:** 35명 (박사 12, 석사 17) 2025.07.18 기준

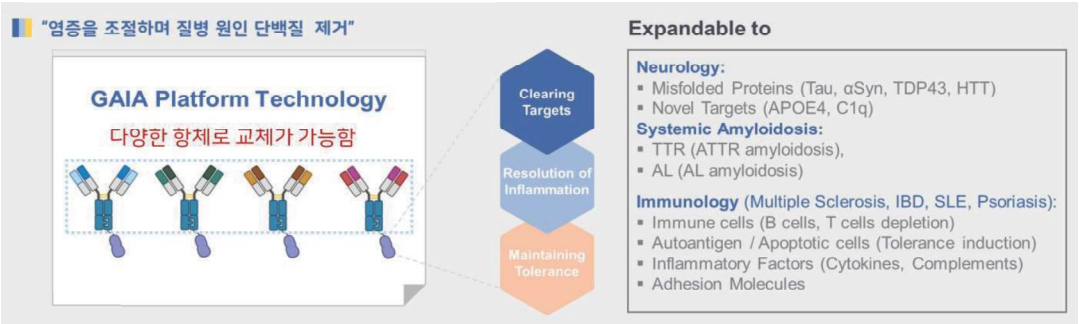
연혁

- 2017 ~ 2021: 플랫폼 기술 개발
- 2020.12 : 치매극복연구개발사업 선정 (총 9억, 3년)
- 2021.11 : TIPS 기술창업기업 선정 (총 5억, 2년)
- 2022.03-06 : AD/PD, Keystone 학회 구두발표
- 2022.06 : 논문 발표 (Nature Medicine)
- 2022.09 : 보스턴 사무소 오픈 (KHIDI K-블록버스터 사업)
- 2022.10 : Global 과학자문 계약 (Dr. Greg Lemke @SALK)
- 2022.10 : K-아기유니콘 과제 선정 (총 3억, 1년)
- 2023.07 : Series A 펀딩 (250억원)
- 2023.08 : 스케일업 TIPS 과제 선정 (총 11.4억, 3년)
- 2023.11 : Seoul-BMS 이노베이션 챌린지 우승
- 2024.03 : Global 과학자문 계약 (Dr. Morgan Sheng @MIT)
- 2024.10 : J&J Innovation – JLAB Singapore 선정
- 2024.10 : Lilly Catalyze360-ExploR&D 공동연구 체결
- 2025.03 : 치매극복연구개발사업 과제선정 (비임상, 6억*3년)
- 2025.06 : Series B 펀딩 (580억원)

TAM biology를 이용한 타겟 확장



TAM biology를 이용한 타겟 확장



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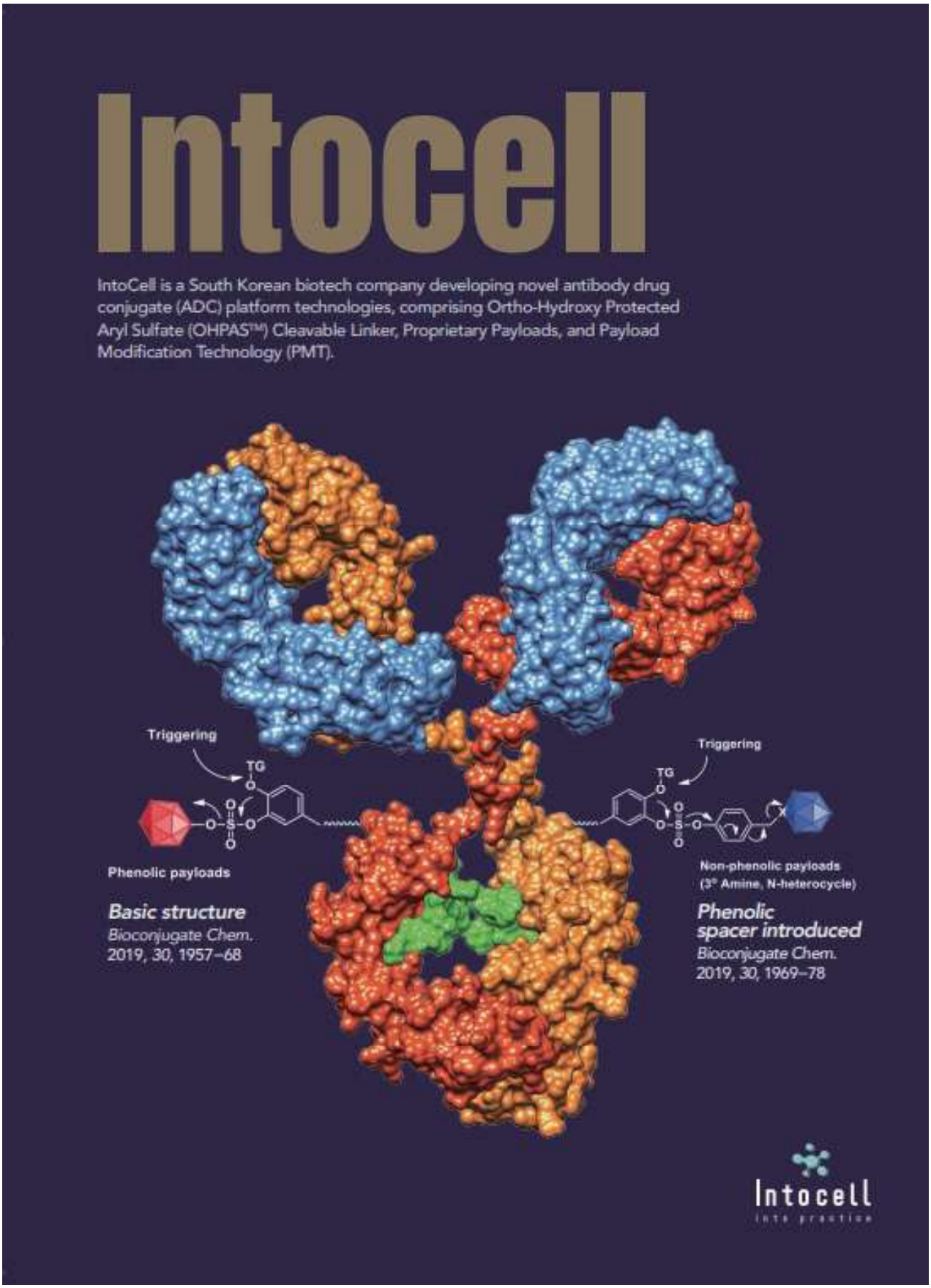
General inquiry: mgt@illimistx.com Business inquiry: BS@illimistx.com
Illimis therapeutics
http://www.illimistx.com/kr/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IntoCell is a South Korean biotech company developing novel antibody drug conjugate (ADC) platform technologies, comprising Ortho-Hydroxy Protected Aryl Sulfate (OHPAS™) Cleavable Linker, Proprietary Payloads, and Payload Modification Technology (PMT).
Triggering
TG
Phenolic payloads
Basic structure
Bioconjugate Chem.
2019, 30, 1957–68
Triggering
TG
Non-phenolic payloads
(3° Amine, N-heterocycle)
Phenolic spacer introduced
Bioconjugate Chem.
2019, 30, 1969–78
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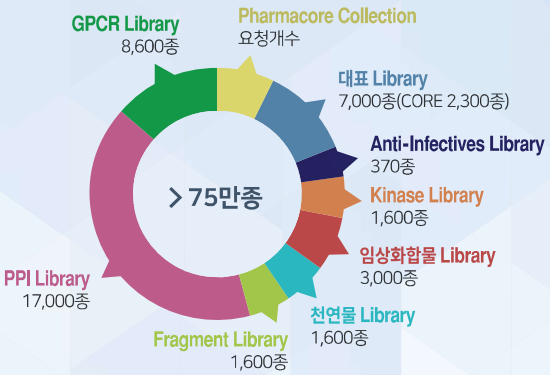
제공 라이브러리 종류



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한국화합물은행은 국가연구개발사업 연구성과 중 **화합물 및 관련 정보의 관리·유통체계 구축·운영 전담기관**으로 지정되어 있습니다.
(과학기술정보통신부 고시 제2022-41호)

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생명연구자원 기탁등록보존기관 지정

「생명연구자원의 확보·관리 및 활용에 관한 법률」 제 10조 규정에 따라 생명연구자원(신약소재화합물) 기탁등록 보존기관으로 지정되어 있습니다.

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Fax. 042-860-7096
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홈페이지. www.chembank.org
통합데이터 플랫폼. korea.chembank.org

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※동남권역 R-WeSET 사업단은 '복권기금'으로 운영되고 있습니다.

R-WeSET

설립목적

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사업목표

동남권역 신산업, 신기술 분야 생애주기별 교육을통한 이공계 여성인재 양성 및 활용으로 국가 경쟁력 극대화
- 동남권 미래 신산업 수요 대응 전략적 유입, 성장, 정착
- 동남권 젠더혁신 기본 여학생 교육 모듈 개발
- 동남권 신기술 적응력 향상 및 글로벌 역량 제고
- 공격적인 이공계 여학생 환경 개선과 취업촉진

생애주기별 지원과정

R-WeSET 지역 네트워크

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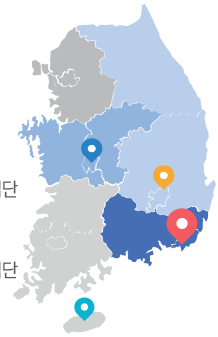
참여 : UNIST, 신라대, 인제대

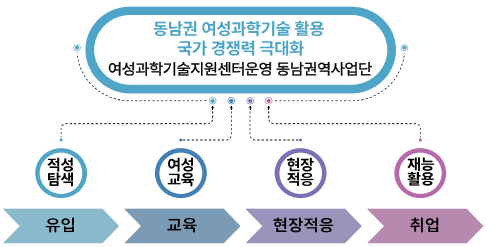
충청권역 R-WeSET 사업단
주관 : 충남대
참여 : 순천향대, 한국교통대

대경강원권역 R-WeSET 사업단
주관 : 계명대
참여 : 대구대, 가톨릭관동대

호남제주권역 R-WeSET 사업단
주관 : 제주대
참여 : 목포대,



동남권역 R-WeSET 사업단



여중고생 프로그램

미래 신산업 수요대응 전략적 유입
주니어 팀플 멘토링(JPM), 여학생 공학체험 주간(GEW)

젠더혁신 여중고생 교육모듈 개발
Women In Science(WIS) 과학문화 확산사업

신기술 적응력 향상 및 글로벌 역량
BTS(Busan Technology Science), GTS, UTS 체험교실

여중고생 환경개선과 진학촉진
Women In Science(WIS) 과학문화 확산사업

여대생 프로그램

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4차 산업혁명 IoT, AI 교육, 기업 맞춤형 커리어 쌓기,
해양로봇 아카데미, 기업연계 여대생 팀프로젝트

젠더혁신 여대생 교육모듈 개발
여성 공학교육 워크숍, 부경 애플 프로그램 아카데미

신기술 적응력 향상 및 글로벌 역량
여대생 산업인턴 지원 프로그램, 우먼 엔지니어 프로페셔널

여대생 환경개선과 취업촉진
엘리트 여대생 선발활동, 이공계 여학생의 날,
이공계 여대생 기업연계 취업멘토링

미취업자 프로그램

여성과학기술인 R&D 경력복귀 지원사업

지원내용
경력단절 여성과학기술인 채용 및 연구개발 참여를 위한 인건비 및 연구비 등 지원

지원금액
학석사 2,100만원, 박사 2,300만원 / 각 최대 3년 지원

지원대상
인력 이공계 학사이상 학위 취득자, 사업신청일 기준 고용보험 미가입자
기관 과학기술분야 연구기관 (기업, 대학, 정부출연연구소 등)

신청방법
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