Curriculum Vitae

Hyoungsu Kim, Ph.D.

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Education and Experience

BS (1994-1998): College of Pharmacy, Seoul National University, Seoul, Korea

MS (1998-2000): College of Pharmacy, Seoul National University, Seoul, Korea
(Advisor: Prof. Deukjoon Kim)

Ph.D. (2000-2005): College of Pharmacy, Seoul National University, Seoul, Korea
(Advisor: Prof. Deukjoon Kim)

Post Graduate (2005-2006): Research Institute of Pharmaceutical Sciences
College of Pharmacy, Seoul National University
(Advisor: Prof. Deukjoon Kim)

Post Graduate (2006.12-2011.01): Department of Chemistry, Duke University.
(Advisor: Prof. Jiyong Hong)

Assistant Professor (2011.03-2015.02): Department of Pharmacy, Ajou University

Associate Professor (2015.02-2020.02): Department of Pharmacy, Ajou University

Professor (2020.03-present): Department of Pharmacy, Ajou University

Research Interests

1. Synthesis of Biologically Active Natural Products as New Drug Candidates. The natural product estate has proven itself to be an invaluable resource in the search for new lead agents of medicinal import. More often are the instances where the natural products themselves serve as lead agents, providing the chemist with a structural platform which can be elaborated upon, or simplified, to yield a therapeutically valuable pharmaceutical. By this context, total syntheses of biologically active natural products and their analogues would give the opportunities for easy access to new drug candidates.

2. Development of Novel Synthetic Methods. Design and development of unique and efficient synthetic strategies will allow rapid access to molecular complexity and structural diversity. A specific area of interest includes the development of novel methods for the stereoselective synthesis of structurally complex oxygen and nitrogen heterocycles (especially tetrahydropyran, tetrahydrofuran and piperidine) that are found in a wide range of biologically interesting natural products. These molecules exhibit significant pharmacological activities, including antitumor, antibiotic, antiviral, antifungal, anti-inflammatory, immunosuppressive, cardiovascular, and neuroprotective activities. Due to the importance of these molecules, a number of methods have been developed for the construction of heterocycles. Despite these developments, there is still a great need for a synthetic approach towards these classes of molecules that (1) allows for easy access to substrates, (2) rapidly increases molecular complexity from readily available, inexpensive starting materials, (3) proceeds with excellent stereoselectivity and yield, (4) possesses the versatility for a wide range of substitution patterns of cyclic ethers, and (5) requires mild reaction conditions compatible with various functional groups.

Publication

2021

61. Liang Li, Ming Yang, Saroj Kumar Shrestha, **Hyoungsu Kim**, William H. Gerwick and Yunjo Soh*. Kalkitoxin Reduces Osteoclast Formation and Resorption and Protects against Inflammatory Bone Loss. *Int. J. Mol. Sci.* **2021**, *22,* 2303. Publication Date: February 25, 2021 *https://doi.org/10.3390/ijms22052303*

60. Hongjun Jang, Soo Yeon Kwak, Dongjoo Lee, Juan V. Alegre-Requena, **Hyoungsu Kim***, Robert S. Paton, and Deukjoon Kim. Asymmetric Total Synthesis and Determination of the Absolute Configuration of (+)-Srilankenyne via Sequence-Sensitive Halogenations Guided by Conformational Analysis. *Org. Lett.* **2021**, *23*(4), 1321−1326. Publication Date: February 19, 2021. DOI: 10.1021/acs.orglett.0c04303

59. Heesun Yu, Ryangha Lee, **Hyoungsu Kim**, and Dongjoo Lee*. Diastereoselective Construction of trans-2-Alkyl-6-aryl-3,6-dihydro-2H-pyrans via Dehydrogenative Cycloetherification Promoted by DDQ. *Org. Lett.* **2021**, *23*(3), 1135−1140. Publication Date : February 05, 2021. DOI: 10.1021/acs.orglett.1c00154

2020

58. Heesun Yu, **Hyoungsu Kim**, Seung-Hoon Baek* and Dongjoo Lee*. Direct and Efficient C(sp3)–H Functionalization of N-Acyl/Sulfonyl Tetrahydroisoquinolines (THIQs) With Electron-Rich Nucleophiles via 2,3-Dichloro-5,6-Dicyano-1,4-Benzoquinone (DDQ) Oxidation. *Frontiers in Chemistry.* **2020**, *8*, 629.

57. Hosam Choi, Hanho Jang, **Hyoungsu Kim**, Kiyoun Lee*. Synthesis of γ-Lactones via the Kowalski Homologation Reaction: Protecting-Group-Free Divergent Total Syntheses of Eupomatilones-2,5,6, and 3-*epi*-Eupomatilone-6. *Org. Lett.* **2019**, *21*, 7857−7862.

56. Chan-Hee Yu, Beomseon Suh, **Iljin Shin**, Eun-Hye Kim, Donghyun Kim, Young-Jun Shin, Sun-Young Chang, Seung-Hoon Baek, **Hyoungsu Kim,*** and Ok-Nam Bae.* Inhibitory Effects of a Novel Chrysin-Derivative, CPD 6, on Acute and Chronic Skin Inflammation. *Int. J. Mol. Sci.* **2019**, *20*, 2607.

55. Sungjin Ahn, Jungmin Kim, Seungchan An, Jeong Joo Pyo, Daram Jung, Joochang Lee, Seok Young Hwang, Junpyo Gong, **Iljin Shin**, Hong Pyo Kim, **Hyoungsu Kim,*** Minsoo Noh* 2-Phenyl-8-(1-phenylallyl)-chromenone compounds have a pan-PPAR modulator pharmacophore. *Bioorg. Med. Chem.* **2019**, *27*, 2948−2958.

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54. Heesun Yu, Ryangha Lee, **Hyoungsu Kim**, and Dongjoo Lee*, Lewis Acid-Promoted Regio- and Diastereoselective Cross-Coupling of Aryl-Substituted 1,2-Diols and Boronic Acids. *J. Org. Chem.* **2019**, *84*, 3566−3578.

53. Seok-Ho Kim, Shin Hee Hong, Young-Joon Park, Jong-Hyuk Sung, Wonhee Suh, Kyeong Won Lee, Kiwon Jung, Changjin Lim, Jin-Hee Kim, **Hyoungsu Kim**, Kyong Soo Park and Sang Gyu Park*, MD001, a Novel Peroxisome Proliferator-activated Receptor α/γ Agonist, Improves Glucose and Lipid Metabolism. *Sci. Rep.* **2019**, *9,* 1656.

2018

52. Eun-Sun Kim,† **Hongjun Jang**,† Sun-Young Chang, Seung-Hoon Baek, Ok-Nam Bae* and **Hyoungsu Kim*,** Total Synthesis and Biological Evaluation of Sericetin for Protection against Cisplatin-Induced Acute Kidney Injury. *J. Nat. Prod*. **2018**, *81*, 2647−2653. († co-first authors)

51. Hong Pyo Kim , Heesun Yu, **Hyoungsu Kim**, Seok-Ho Kim* and Dongjoo Lee*, DDQ-Promoted Mild and Efficient Metal-Free Oxidative-Cyanation of N-Acyl/Sulfonyl 1,2,3,4-Tetrahydroisoquinolines. *Molecules* **2018**, 23, 3223; doi:10.3390/molecules23123223.

50. **Hyoungsu Kim**, Hosam Choi, Kiyoun Lee*, A Concise Total Synthesis of (±)-Mesembrine, *Synlett*. **2018**, *29*, 1203-1206.

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48. Kiyoun Lee, **Iljin Shin**, **Hongjun Jang**, Hyukrae Kwon, Jae Hong Seo, Dongjoo Lee,* **Hyoungsu Kim**,* Total Synthesis of (±)-Decytospolides A and B. *Synlett*. **2017**, *28,* 249-252.

2016

47. Kiyoun Lee, Megan L. Lanier, Jae-Hwan Kwak,* **Hyoungsu Kim**,* Jiyong Hong*, Advances in the synthesis of glycosidic macrolides: clavosolides A–D and cyanolide A, *Nat. Prod. Rep*. **2016**, 33, 1393-1424 .

46. **Iljin Shin**, Dongjoo Lee,* **Hyoungsu Kim**,* Substrate-Controlled Asymmetric Total Synthesis and Structure Revision of (–)-Bisezakyne A, *Org. Lett*. **2016**, *18(17)*, 4420−4423.

45. Muhammad Akram, **Iljin Shin**, Kyeong-A Kim, Dabi Noh, Seung-Hoon Baek, Sun-Young Chang, **Hyoungsu Kim**,* Ok-Nam Bae,* A newly synthesized macakurzin C-derivative attenuates acute and chronic skin

inflammation: the Nrf2/heme oxygenase signaling as a potential target, *Toxicology and Applied Pharmacology*, **2016**, 307, 62– 71.

44. **Hongjun Jang**†, **Iljin Shin**†, Dongjoo Lee, **Hyoungsu Kim**,* Deukjoon Kim, Stereoselective Substrate-Controlled Asymmetric Syntheses of both 2,5-*cis*- and 2,5-*trans*-Tetrahydrofuranoid Oxylipids: Stereodivergent Intramolecular Amide Enolate Alkylation, *Angew. Chem., Int. Ed.* **2016**, *55(22)*, 6497-6501; *Angew. Chem.* **2016**, *128*, 6607– 6611. († co-first authors)

2015

43. Jae-Hyoung Song, Bo-Eun Kwon, **Hongjun Jang**, Hyunju Kang, Sungchan Cho, Kwisung Park, Hyun-Jeong Ko,* **Hyoungsu Kim**,* Antiviral activity of Chrysin-derivatives against Coxsackievirus B3 in vitro and in vivo**.** *Biomolecules & Therapeutics* **2015**, *23*, 465-470.

42. **Hyoungsu Kim**, Dongjoo Lee.* A Concise Formal Total Synthesis of (±)-Centrolobine via DDQ-Mediated Diastereoselective Allylation and Ring-Closing Metathesis. *Synlett*. **2015**, *26*, 2583–2587.

41. Joseph B. Baker, **Hyoungsu Kim**,* Jiyong Hong,* Total synthesis of clavosolide A via tandem allylic oxidation/oxa-conjugate addition reaction. *Tetrahedron Lett.* **2015**, *56*, 3120-3122.

40. Seung-Hoon Baek, **Hongjun Jang**, **Hyoungsu Kim*** Synthesis and Biological Evaluation of Acetylcholinesterase Inhibitor Macakurzin C and Its Derivatives. *Synlett*. **2015**, *26*, 1131-1134.

39. Muhammad Latif, Jeong In Yun, Kalapati Seshadri, Hyoung Rae Kim, Chi Hoon Park, Haeil Park, **Hyoungsu Kim**, and Jongkook Lee.* Stereoselective Construction of 2,6-*cis*-Disubstituted Tetrahydropyrans via Intramolecular Amide Enolate Alkylation: Total Synthesis of (−)-Centrolobine. *J. Org. Chem*. **2015**, *80(6)*, 3315−3320

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cellular ATP. *Bioorg. Med. Chem. Lett.* ***2014***, *24,* 4845−4849.

35. **Hyoungsu Kim***, Donghee Lim, **Iljin Shin**, Dongjoo Lee*, Gram-scale synthesis of anti-pancreatic flavonoids (±)-8-[1-(4'-hydroxy-3'-methoxyphenyl)prop-2-en-1-yl]-chrysin and –galangin. *Tetrahedron* **2014**, *70*, 4738-4744

34. Megan L. Lanier, Amanda C. Kasper, **Hyoungsu Kim**, and Jiyong Hong* Synthesis of α,α′-trans-Oxepanes through an Organocatalytic Oxaconjugate Addition Reaction. *Org. Lett*. **2014**, *16*, 2406−2409.

33. Regina Lin, **Hyoungsu Kim**, Jiyong Hong,* and Qi-Jing Li*. Biological Evaluation of Subglutinol A As a Novel Immunosuppressive Agent for Inflammation Intervention. *ACS Med. Chem. Lett*. **2014**, *5*, 485−490.

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32. Kiyoun Lee, **Hyoungsu Kim*** and Jiyong Hong*, *N*-Heterocyclic Carbene Catalyzed Oxidative Macrolactonization: Total Synthesis of (+)-Dactylolide. *Angew. Chem., Int. Ed*. **2012**, *51(23)*, 5735–5738.

31. Won-Gil Lee, Woo-Seok Kim, Sung-Gyoo Park, **Hyoungsu Kim**, Jiyong Hong, Hyojin Ko, Yong-Chul Kim,* Immunosuppressive Effects of Subglutinol Derivatives. *ChemMedChem.* **2012**, *7(2)*, 218-222.

30. Kiyoun Lee, **Hyoungsu Kim**, Jiyong Hong,* Stereoselective Synthesis of Tetrahydropyrans via Tandem and Organocatalytic Oxa-Michael Reactions: Synthesis of the Tetrahydropyran Cores of *ent*-(+)-Sorangicin A. *Eur. J. Org. Chem.* **2012**, 1025–1032.

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27. Heekwang Park, **Hyoungsu Kim**, and Jiyong Hong*, A Formal Synthesis of SCH 351448. *Org. Lett*. **2011**, *13*, 3742–3745.

26. Kiyoun Lee, **Hyoungsu Kim**, Jiyong Hong*, A Stereoselective Formal Synthesis of Leucascandrolide A. *Org. Lett*. **2011**, *13*, 2722-2725.

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23. **Hyoungsu Kim**, Joseph B. Baker, Yongho Park, Hyung-Bae Park, Patrick D. DeArmond, Seong Hwan Kim, Michael C. Fitzgerald, Dong-Sup Lee, and Jiyong Hong,* Total Synthesis, Assignment of the Absolute Stereochemistry, and Structure–Activity Relationship Studies of Subglutinols A and B, *Chemistry An Asian Journal*. **2010**, 5, 1902-1910.

22. **Hyoungsu Kim** and Jiyong Hong* Total Synthesis of Cyanolide A and Confirmation of the Absolute Stereochemistry, *Org. Lett.* **2010**, *12*, 2880-2883.

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20. Kiyoun Lee, **Hyoungsu Kim**, and Jiyong Hong*, A Facile and Efficient Synthesis of 4-Hydroxy-2,6-*cis*-tetrahydropyrans via Tandem Cross-Metathesis/Thermal S_N2' Reaction: Protecting-Group-Free Synthesis of (±)-Diospongin A, *Org. Lett.* **2009**, *11*, 5202-5205.

19. **Hyoungsu Kim**, Yongho Park, Jiyong Hong*, Stereoselective Synthesis of 2,6-*cis*-Tetrahydropyrans through a Tandem Allylic Oxidation/Oxa-Michael Reaction Promoted by the *gem*-Disubstituent Effect: Synthesis of (+)-Neopeltolide Macrolactone. *Angew*. *Chem*., *Int*. *Ed*. **2009**, *48*, 7577-7581.

18. Amanda C. Kasper, Eui Jung Moon, Xiangqian Hu, Yongho Park, Ceshea M. Wooten, **Hyoungsu Kim**, Weitao Yang, Mark W. Dewhirst, Jiyong Hong*, Analysis of HIF-1 inhibition by manassantin A and analogues with modified tetrahydrofuran configurations, *Bioorg*. *Med*. *Chem*. *Lett*. **2009**, *19*, 3783-3786.

17. Amanda. C. Kasper, Joseph B. Baker, **Hyoungsu Kim**, Jiyong Hong*, The end game of chemical genetics: target identification. *Future Medicinal Chemistry*, **2009**, *1*, 727-736.

16. **Hyoungsu Kim**, Joseph B. Baker, Su-Ui Lee, Yongho Park, Kyle L. Bolduc, Hyung-Bae Park, Marina G. Dickens, Dong-Sup Lee, Yongchul Kim, Seong Hwan Kim* and Jiyong Hong*, Stereoselective Synthesis and Osteogenic Activity of Subglutinols A and B, *J. Am. Chem. Soc.* **2009**, *131*, 3192-3194.

15. **Hyoungsu Kim**, Amanda C. Kasper, Eui Jung Moon, Yongho Park, Ceshea M. Wooten, Mark W. Dewhirst,* and Jiyong Hong*, Nucleophilic Addition of Organozinc Reagents to 2-Sulfonyl Cyclic Ethers: Stereoselective Synthesis of Manassantins A and B, *Org. Lett.* **2009**, *11*, 89-92.

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13. Yongcheng Ying, Kanchan Taori, **Hyoungsu Kim**, Jiyong Hong,* and Hendrik Luesch*, Total Synthesis and Molecular Target of Largazole, a Histone Deacetylase Inhibitor, *J. Am. Chem. Soc.* **2008**, *130*, 8455-8459.

12. Hyunjoo Lee, Kwan Woo Kim, Janghyun Park, **Hyoungsu Kim**, Sanghee Kim, Deukjoon Kim*, Xiangqian Hu, Weitao Yang, and Jiyong Hong, A General Strategy for Construction of Both 2,6-*cis*- and 2,6-*trans*-Disubstituted Tetrahydropyrans: Substrate-Controlled Asymmetric Total Synthesis of (+)-Scanlonenyne, *Angew. Chem., Int. Ed.* **2008**, *47*, 4200-4203.

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10. **Hyoungsu Kim**, Ceshea M. Wooten, Yongho Park, and Jiyong Hong*, Stereoselective Synthesis of Tetrahydrofuran Lignans via $BF_3 \cdot OEt_2$-Promoted Reductive Deoxygenation/Epimerization of Cyclic Hemiketal: Synthesis of (–)-Odoratisol C, (–)-Futokadsurin A, (–)-Veraguensin, (+)-Fragransin A_2, (+)-Galbelgin, and (+)-Talaumidin. *Org. Lett.* **2007**, *9*, 3965-3968.

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8. **Hyoungsu Kim**, Hyunjoo Lee, Dongjoo Lee, Sanghee Kim, and Deukjoon Kim* Asymmetric Total Syntheses of (+)-3-(Z)-Laureatin and (+)-3-(Z)-Isolaureatin by "Lone Pair-Lone Pair Interaction-Controlled" Isomerization. *J. Am. Chem. Soc.* **2007**, *129*, 2269-2274.

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7. **Hyoungsu Kim**, Jae Hong Seo, Kye Jung Shin, Dong Jin Kim, and Deukjoon Kim* An Approach to Cyclic α-Amino Acids by a Novel Hetero Diels-Alder/Intramolecular Hydantoin Enolate Alkylation Strategy: An Approach to Halichlorine. *Heterocycles*, **2006**, *70*, 143-146.

6. **Hyoungsu Kim**, Hyunjoo Lee, Jayoung Kim, Sanghee Kim, and Deukjoon Kim*, A General Strategy for Synthesis of Both (6Z)- and (6E)-Cladiellin Diterpenes: Total Syntheses of (–)-Cladiella-6,11-dien-3-ol, (+)-Polyanthellin A, (–)-Cladiell-11-ene-3,6,7-triol, and (–)-Deacetoxyalcyonin Acetate. *J. Am. Chem. Soc.* **2006**, *128*, 15851-15855.

2005

5. Hyunjoo Lee, **Hyoungsu Kim**, Taehyun Yoon, Byungsook Kim, Sanghee Kim, Hee-Doo Kim, and Deukjoon Kim*, Novel “Protecting Group-Dependent” Alkylation-RCM Strategy to Medium-Sized Oxacycles: First Total Synthesis of (–)-Isoprelaurefucin. *J. Org. Chem.* **2005**, *70*, 8723-8729.

4. *Seungyoup Baek*, Hyunil Jo, Hansoo Kim, **Hyoungsu Kim**, Sanghee Kim, and Deukjoon Kim*, Highly Stereoselective and Efficient Total Synthesis of (+)-Laurencin, *Org. Lett.* **2005**, *7*, 75-77.

2003

3. Hyunil Jo, Jongkook Lee, **Hyoungsu Kim**, Sanghee Kim, and Deukjoon Kim*, Efficient Construction of Bicyclic Systems by an Internal S_N2' Enolate Alkylation/Ring-Closing Metathesis (RCM) Strategy: A Concise Synthesis of the *trans*-Hydrindane Nucleus, *Tetrahedron Lett.* **2003**, *44*, 7043-7044.

2. **Hyoungsu Kim**, Won-Jun Choi, Jaeyoon Jung, Sanghee Kim, and Deukjoon Kim*, Construction of 8-Membered Ether Rings by Olefin Geometry-Dependent Internal Alkylation: First Asymmetric Total Syntheses of (+)-3-(*E*)- and (+)-3-(*Z*)-Pinnatifidenyne, *J. Am. Chem. Soc.* **2003**, *125*, 10238-10240.

1. Hyunjoo Lee, **Hyoungsu Kim**, Seungyoup Baek, Sanghee Kim, and Deukjoon Kim*, Total Synthesis and Determination of the Absolute Configuration of (+)-Neoisoprelaurefucin, *Tetrahedron Lett.* **2003**, *44*, 6609-6612.

Patent

1. [특허] 김형수, 신일진, 마카커진 C 또는 이의 유도체를 함유하는 항염증 활성 조성물 및 이의 제조방법 **(등록) (10-1806031) (Nov, 2017)**

2. [특허] 김형수, 장홍준, 크리신 유도체 화합물을 유효성분으로 함유하는 콕사키 바이러스 관련 질환의 예방 및 치료용 조성물 **(등록) (10-1713026) (Feb, 2017)**

3. [특허] 김홍표, 이필준, 신일진, 김형수, 레스베라트톨 유도체를 유효성분으로 포함하는 간경화 또는 간섬유화 예방 또는 치료용 약학 조성물 **(등록) (10-1632839) (Jun, 2016)**