The 1st

Y-KAST International Conference

March 30(Thu) ~ April 1(Sat), 2023 Jeju Shinhwa World

KAST 한국과학기술한림원
The Korean Academy of Science and Technology

YKAST Young Korean Academy of Science and Technology

Day 1 - March 30

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<tr><td rowspan="3">13:00~13:30</td><td rowspan="3">Opening</td><td colspan="5">• Opening Remarks — Prof. Young Keun Kim (Chair, Young Korean Academy of Science and Technology)</td></tr>
<tr><td colspan="5">• Welcoming Remarks — Prof. Ook Joon Yoo (President, The Korean Academy of Science and Technology)</td></tr>
<tr><td colspan="5">• Group Photo</td></tr>
<tr><td rowspan="2">13:30~16:40</td><td rowspan="2">Academic Program</td><td>Session 1</td><td>Session 2</td><td>Session 3</td><td>Session 4</td><td>Session 5</td></tr>
<tr><td>Progression and Advance in Science from Theory to AI
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Olle Room</td><td>Biomedical Research for Clinical Application
Landing Ballroom A</td><td>Energy & Environment for Sustainable Future
Youngju Room</td><td>Soft Bioelectronics
Udo Room</td></tr>
<tr><td>16:40~17:00</td><td colspan="6">Break</td></tr>
<tr><td rowspan="5">17:00~18:30</td><td rowspan="5">Special Session of Policy Research Division</td><td colspan="5">Theme: A New R&D Policy Direction in The Era of Technology Supremacy</td></tr>
<tr><td>17:00~17:10</td><td colspan="4">Greetings & Introduction</td></tr>
<tr><td>17:10~17:40</td><td>Topic Presentation</td><td colspan="3">Hyuk-Chae Koo
(Director General, R&D Policy Bureau, Ministry of Science and ICT)</td></tr>
<tr><td>17:40~18:05</td><td>Designated Discussion</td><td colspan="3">Chair: Soo-keun Kwak (Deputy Editor, Chosunilbo)
• Panels from Y-KAST Policy Research Division
Joon Mo Ahn (Professor, Korea University)
Sungjoo Lee (Professor, Seoul National University)
• Panels from Korea Science Journalists Association
Jae-won Ko (Journalist, Dongascience)
Yang-kyun Kim (Medical Reporter, ZDNET Korea)</td></tr>
<tr><td>18:05~18:30</td><td>Round Table</td><td colspan="3">• Dialogue with Y-KAST members (Voices of young leading scientists)
Chair: Joon Mo Ahn (Professor, Korea University)
Keun Su Kim (Professor, Yonsei University)
Mi-hyun Kim (Professor, Gachon University)
Soon-Kyeong Kwon (Professor, Gyeongsang National University)
Jung-Hwan Lee (Professor, Dankook University)</td></tr>
<tr><td>18:30~20:30</td><td colspan="6">Dinner & Networking</td></tr>
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Day 2 - March 31

Time	Program	Details				
9:30~12:00	Academic Program	Session 6	Session 7	Session 8	Session 9	Session 10
		Progression and Advance in Science from Theory to AI	Novel Opportunities for Food Biotechnology	Innovations in Biomedical Research	Energy & Environment for Sustainable Future	Next Electronic Materials
		Baengnok Room	Olle Room	Landing Ballroom A	Youngju Room	Udo Room
12:00~13:00	Lunch					
13:00~18:00	Networking Activity	Hiking Mountain Hallasan (1hr 30min round trip)				
18:00~20:00	Dinner & Networking					

Day 3 April 1

Time	Program	Details				
9:30~12:00	Group Discussion	Session 1 & 6	Session 2	Session 3	Session 4 & 9	Session 5
		Progression and Advance in Science from Theory to AI	New Challenges in Biomaterials	Biomedical Research for Clinical Application	Energy & Environment for Sustainable Future	Soft Bioelectronics
			Session 7	Session 8		Session 10
			Novel Opportunities for Food Biotechnology	Innovations in Biomedical Research		Next Electronic Materials
		Baengnok Room	Olle Room	Landing Ballroom A	Youngju Room	Udo Room
12:00~13:00	Lunch					

Day 1 - March 30

Time	Program
13:30 ~ 16:40	**Session 1** Progression and Advance in Science from Theory to AI (Baengnok Room) **Chair:** Hyo Jae Yoon (Korea University) • What Constitute Promising Patents? Sungjoo Lee (Seoul National University) • Quantum Entanglement in Many-Body Systems Eun-Gook Moon (KAIST) • Metamaterials: A Mathematical Alchemy Jonghwa Shin (KAIST) • A New Mathematical Theory of Computation Donghoon Hyeon (Seoul National University) • A.I in Public Administration: Opportunity and Challenges Joon Mo Ahn (Korea University)
	Session 2 New Challenges in Biomaterials (Olle Room) **Chair:** Soon-Kyeong Kwon (Gyeongsang National University) • Diabetes and Biomaterials for Immunoisolation Suk-Yeon Hwang (Seoul National University) • Efficient Synthesis of Biologically Active Compounds for Drug Development Suckchang Hong (Seoul National University) • Tissue Regeneration using Biomaterials Jung-Hwan Lee (Dankook University) • Chemical-driven Disaggregation of Misfolded Proteins for Alzheimer's Disease YoungSoo Kim (Yonsei University) • Biosynthetically Inspired Synthesis of Complex Natural Products Sunkyu Han (KAIST)
	Session 3 Biomedical Research for Clinical Application (Landing Ballroom A) **Chair:** Ok-Nam Bae (Hanyang University) • Theranostic Nanomedicine: Bioimaging and Spatial Transcriptomics Hyung-Jun Im (Seoul National University)

Time	Program
13:30 ~ 16:40	• Targeting the Gut-Liver Axis and Microbiome to Treat Non-Alcoholic Steatohepatitis Yong-ho Lee (Yonsei University) • Epigenetic Regulation of Skin Aging Dong Hun Lee (Seoul National University) • Future Perpective of Convergence Research in the Field of Liver Disease Beom Kyung Kim (Yonsei University)
	Session 4 Energy & Environment for Sustainable Future (Youngju Room) **Chair:** Eunji Lee (GIST) • Environmental Science Engagement with the DPRK: The Mount Paektu Research Centre James Hammond (Birkbeck, University of London) • Growth and Gas Sensing Properties of 2D Materials for Environmental Monitoring Mahesh Kumar (Indian Institute of Technology Jodhpur) • Deep Learning for Global Ocean States Monitoring Yoo-Geun Ham (Chonnam National University) • Earth System Modeling Jong-Yeon Park (Jeonbuk National University) • Building an Artificial Sun on Earth with the Temperature Above 100 Milion Degree Yong-Su Na (Seoul National University)
	Session 5 Soft Bioelectronics (Udo Room) **Chair:** Seokwoo Jeon (Korea University) • Nanomaterials-based Soft Bioelectronics Dae-Hyeong Kim (Seoul National University) • The Role of Magnetostatic Interactions in a System of Closely Packed Magnetic Elements on the Example of Fe/Au Barcode Nanowires Arrays Aleksei Samardak (Far Eastern Federal University) • 3D Printing of Thermoelectric Materials and Devices Jae Sung Son (UNIST) • Bio-Inspired Sensory Devices and Electronics for Smart Healthcar Hyun Jung Yi (KIST) • Bioimetic approaches with Stretchable Ionics Jeong-Yun Sun (Seoul National University)

Day 2 - March 31

Time	Program
9:30 ~ 12:00	**Session 6** Progression and Advance in Science from Theory to AI (Baengnok Room) **Chair:** Joon Mo Ahn (Korea University) • Compressible Flows and Nonlinear PDEs Myoungjean Bae (KAIST) • Data-driven Methods for Materials, Structures, and Process Design Seunghwa Ryu (KAIST) • Convergent Cross Mapping and Distributed Lag Non-Linear Model Seung-Won Lee (Sungkyunkwan University) • In-house Machine Learning Platform for Drug Discovery Mi-hyun Kim (Gachon University)
	Session 7 Novel Opportunities for Food Biotechnology (Olle Room) **Chair:** Tae-Gyu Lim (Sejong University) • The Future of the Food Industry and Its Challenges Hojae Bae (Konkuk University) • Identification of Novel Functional Food Materials Sanguine Byun (Yonsei University) • Food Material as a Potential Candidate for Sport Nutrition and Prevention of Sarcopenia Young Jin Jang (Seoul Women's University) • Improvement of Meat Quality Samooel Jung (Chungnam National University) • Structural and Functional Divergence of Transcription Factors in Plants Seungill Kim (University of Seoul)
	Session 8 Innovations in Biomedical Research (Landing Ballroom A) **Chair:** Seunghee Lee (Seoul National University) • Multi-disciplinary Research_for Treatments of Hearing Loss Young Joon Seo (Yonsei University) • Sleep Digital Transformation Hyun-Woo Shin (Seoul National University) • Dynamic Regulation of GPCR Signaling Ka Young Chung (Sungkyunkwan University) • From Gene Regulation to Beyond: The Emerging Role of 3D Genome Inkyung Jung (KAIST) • Accurate Identification of Genomic Variants Sangwoo Kim (Yonsei University) • Better Understanding the Skin Microbiome Hei Sung Kim (The Catholic University of Korea) • PHR (Personal Health Record)-based KM (Korean Medicine)-CDSS (Clinical Decision Support System) "Ye-Jin" Woong Mo Yang (Kyung Hee University)

Time	Program
9:30 ~ 12:00	**Session 9** Energy & Environment for Sustainable Future (Youngju Room) **Chair:** Yong-Mook Kang (Korea University) • Energy Cascade and Dissipation based on Remotely Sensed Ocean Turbulence Sung Yong Kim (KAIST) • Advanced Redox Technology (ART) for Water and Wastewater Treatment Changha Lee (Seoul National University) • Electrochemical CO2 Conversion Catalyst for Green Carbon Cycle Yun Jeong Hwang (Seoul National University) • Monolayer Transfer of Single-Crystalline Ruddlesden-Popper Perovskite for Two-Dimensional Opto-Electronic Devices Yun Seog Lee (Seoul National University) • Microbial Biotechnology Towards Environmental Sustainability Sukhwan Yoon (KAIST) **Session 10** Next Electronic Materials (Udo Room) **Chair:** Soo Young Kim (Korea University) • Frontier of Giant Tunnel Magnetoresistance Effect for Future Spintronic Applications Hiroaki Sukegawa (National Institute for Materials Science) • Synthesis of Single-crystal 2D Materials on a Wafer Scale Ki Kang Kim (Sungkyunkwan University) • Modulating Light Scattering and Absorption for Active Structural Colors Kartham Hyun (Ewha Womans University) • Developing Graphene Josephson Junction-based Microwave Detector Gil-Ho Lee (POSTECH) • Atomically thin 2D Semiconductor Electronics Toward Beyond-CMOS Technology Chul-Ho Lee (Korea University) • Topology, Correlations, and Disorder in Quantum Materials Keun Su Kim (Yonsei University) • Multi-modal Imaging: Photoacoustic Imaging Plus More Chulhong Kim (POSTECH)

■ Day 3 - April 1

Time	Program	Details				
9:30 ~ 12:00	Group Discussion	Session 1 & 6 Progression and Advance in Science from Theory to AI	Session 2 New Challenges in Biomaterials	Session 3 Biomedical Research for Clinical Application	Session 4 & 9 Energy & Environment for Sustainable Future	Session 5 Soft Bioelectronics
			Session 7 Novel Opportunities for Food Biotechnology	Session 8 Innovations in Biomedical Research		Session 10 Next Electronic Materials
		Baengnok Room	Olle Room	Landing Ballroom A	Youngju Room	Udo Room

The 1st Y-KAST
International Conference

Contents

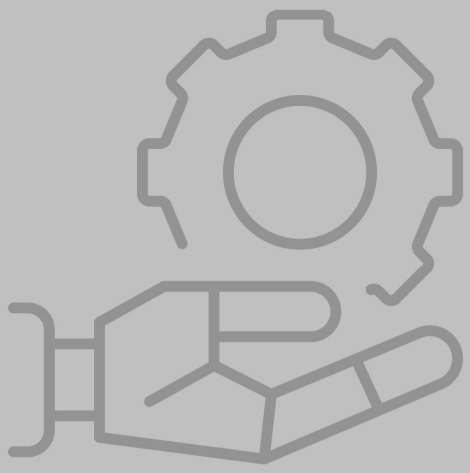
March 30(Thu)

The 1st Y-KAST International Conference

Session 1~5

1
Session

Progression and Advance in Science from Theory to AI



Natural Sciences

Chair

Hyo Jae Yoon

Korea University
hyoon@korea.ac.kr

Education

1999–2005	B.S. in Chemistry, Sogang University
2006–2010	Ph.D in Chemistry, Northwestern University, Evanston, IL, USA
2010–2014	Postdoc, Harvard University, Cambridge, MA, USA

Major Activities

2014–present	Professor, Department of Chemistry, Korea University, Seoul, Korea
2022–present	Y-KAST member

Honors and Awards

2015	IUPAC Young Scientist Award, IUPAC
2017	Research Achievement Commendation, Prime Minister Ministry of Education, Korea
2021	Granite Teaching Award, Korea University

Research Interests

Molecular electronics, molecular energy conversion, surface chemistry, supramolecular chemistry

Publications

• Yoon et al. Nano Lett. 2022, 22, 9693.
• Yoon et al. J. Am. Chem. Soc. 2022, 144, 7966.
• Yoon et al. Angew. Chem. Int. Ed. 2021, 60, 23564.
• Yoon et al. Adv. Mater. 2021, 33, 2103177.
• Yoon et al. Nano Lett. 2021, 21, 3162.

Policy Research

What Constitute Promising Patents?

Sungjoo Lee

Seoul National University
sungjoolee@snu.ac.kr

Education

1998–2002	B.S. in Industrial Engineering, Seoul National University, Republic of Korea
2002–2007	Ph.D.in Industrial Engineering, Seoul National University, Republic of Korea
2016–2019	Ph.D. in Technology and Innovation Management, Science Policy Research Unit, Sussex University, UK

Major Activities

2008	Visiting Scholar, Institute for Manufacturing, Cambridge University, UK
2009–2021	Faculty Member, Department of Industrial Engineering, Ajou University, Korea
2021–present	Associate Professor, Department of Industrial Engineering, Seoul National University, Korea
2019–present	Member of Young Korean Academy of Science and Technology, Korea
2018–present	Advisory Editor, Research Policy
2021–present	Editorial Board Member, Technovation
2023–present	Associate Editor, Journal of Engineering and Technology Management

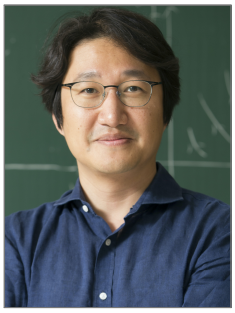
Research Interests

Technology planning and roadmapping, Business/service/technology intelligence, Intellectual property management and patent engineering, SME policy and management

Publications

• Technological trend mining: identifying new technology opportunities using patent semantic analysis. *Information Processing & Management*, 59(4), 102993, 2022.
• Identifying emerging technologies to envision a future innovation ecosystem: A machine learning approach to patent data. *Scientometrics*, 126, 5431–5476, 2021.
• From stones to jewellery: Investigating technology opportunities from expired patents. Technovation, 103, 102235, 2021.
• Forecasting forward patent citations: comparison of citation-lag distribution, tobit regression, and deep learning approaches. *IEEE Transactions on Engineering Management*, 69(4), 1185–1196, 2020.
• What constitutes a promising technology in the era of open innovation? An investigation of patent potential from multiple perspectives. *Technological Forecasting and Social Change*, 157, 120046, 2020.

Natural Sciences



Quantum Entanglement in Many-Body Systems

Eun-Gook Moon

KAIST
egmoon@kaist.ac.kr

Education

1998-2005	B. S. in Physics, Seoul National University, Korea
2006-2011	Ph.D in Physics., Harvard University, USA

Major Activities

2015-present	Associate/Assistant Professor of Physics, KAIST, Korea
2020-2023	Principal Investigator of Ultra Quantum Physics Basic Research Lab, NRF
2021-present	Member of Young Korean Academy of Science and Technology, Korea

Honors and Awards

2017	the TJ Park Science Fellowship, Korea
2019	Young Physicist Prize, Korean Physical Society, Korea
2020	Academic Prize, Korea Advanced Institute of Science and Technology, Korea

Research Interests

Many-body Quantum Entanglement, Strongly Correlated Systems, Statistical Mechanics

Publications

• Monolayer Kagome metals, Nature Communications, 14, 591 (2023)
• Identification of a Kitaev Quantum Spin Liquids by Magnetic Field Angle Dependence, Nature Communications, 13, 323 (2022)
• Using Disorder to Identify Bogoliubov Fermi Surfaces, Physical Review Letters, 127, 257002 (2022)
• Emergent Anisotropic Non-Fermi Liquid at a Topological Phase Transition in Three Dimensions, Physical Review Letters, 122, 167201 (2019)
• Vestiges of Topological Phase Transitions in Kitaev Quantum Spin Liquids, Physical Review Letters, 122, 147203 (2019)

Engineering

Metamaterials: A Mathematical Alchemy

Jonghwa Shin

KAIST
qubit@kaist.ac.kr

Education

1998-2001	B.S. in Electrical Engineering, Seoul National University, Korea
2001-2003	M.S. in Electrical Engineering, Stanford University, United States
2003-2008	Ph.D. in Electrical Engineering, Stanford University, United States

Major Activities

2008-2012	Post-doctoral Researcher/Research Assistant Professor in Physics, KAIST, Korea
2019	Board Member in Academy, Optical Society of Korea, Korea
2012-present	Assistant/Associate professor in Materials Science and Engineering, KAIST, Korea
2023-present	Member of Young Korean Academy of Science and Technology, Korea

Honors and Awards

2020	Rising Stars 30, Optical Society of Korea, Korea
2017	Young Academic Researcher Award, Korean Institute of Metals and Materials, Korea
2017	Synergic Research Prize, KAIST, Korea

Research Interests

Waves and structured materials, metamaterials, metasurfaces, nanophotonics, imaging systems, holographic displays, radiative cooling

Publications

- T. Chang et al., "Universal metasurfaces for complete linear control of coherent light transmission," Advanced Materials, v. 34, n. 44, 2204085 (2022).
- S. Nam et al., "Photolithographic realization of target nanostructures in 3D space by inverse design of phase modulation," Science Advances, v. 8, n. 21, eabm6310 (2022).
- S. Min et al., "All-color sub-ambient radiative cooling based on photoluminescence," ACS Photonics, v. 9, n. 4, 1196 (2022).
- N. Kim et al., "Spectrally sharp metasurfaces for wide-angle high extinction of green lasers," Optics Express, v. 28, n. 15, 22121 (2020).
- J. Jung et al., "Broadband metamaterials and metasurfaces: a review from the perspectives of materials and devices," Nanophotonics, v. 9, n. 10, 3165 (2020).

Natural Sciences

A New Mathematical Theory of Computation

David Donghoon Hyeon

Seoul National University
dhyeon@snu.ac.kr

Education

1992–1996	B.S. in Physics, Mathematics, KAIST, Korea
1996–2001	Ph.D. in Mathematics, University of Illinois at Urbana-Champain, USA

Major Activities

2009–2015	Assistant/Associate Professor, POSTECH, Korea
2015–2018	Associate Professor, Seoul National University, Korea
2018–Present	Professor, Seoul National University, Korea
2020–Present	CEO, H Machines Inc.
2017–2020	Member of Y-KAST, Korea

Honors and Awards

2014	Young Scientist Award, The Korean Academy of Science and Technology

Research Interests

Algebraic geometry, computational complexity, computer vision

Publications

• Conjugacy classes of commuting nilpotents
(with William Haboush), Transactions of the American Mathematical Society 372 (2019), no. 6, 4293-4311.
• Birational contraction of genus two tails in the moduli space of genus four curves I (with Yongnam Lee), International Mathematical Research Notices (2014), no.13, 3735-3757.
• Log minimal model program for the moduli space of curves: The first flip
(with Brendan Hassett), Annals of Mathematics 177 (2013), no.3, 911-968.

Policy Research

A.I in Public Administration: Opportunity and Challenges

Joon Mo Ahn

Korea University
joonmo@korea.ac.kr

Education

1997–2003	B.Sc in Chemincal Engineering, Seoul National University
2011–2015	Ph.D., Technology Management, University of Cambridge, UK

Major Activities

2003–2015	Deputy director, Ministry of Science and Technology
2015–2021	Associate Professor, Sogang University, Korea
2020–present	Y-KAST member, The Korean Academy of Science and Technology
2021–present	Auditor, Gwangju Inistitute of Science and Technology (GIST)
2021–present	Associate Professor, Korea University, Korea
2022–present	Associate editor, R&D Management Journal (SSCI)
2023–present	Associate member, The National Academy of Engineering of Korea

Honors and Awards

2007	Official Commendation, Presidential Security Operation, Korea
2020	Best paper award, The Korean Society of
2023	Official Commendation, Ministry of Science and ICT, Korea

Research Interests

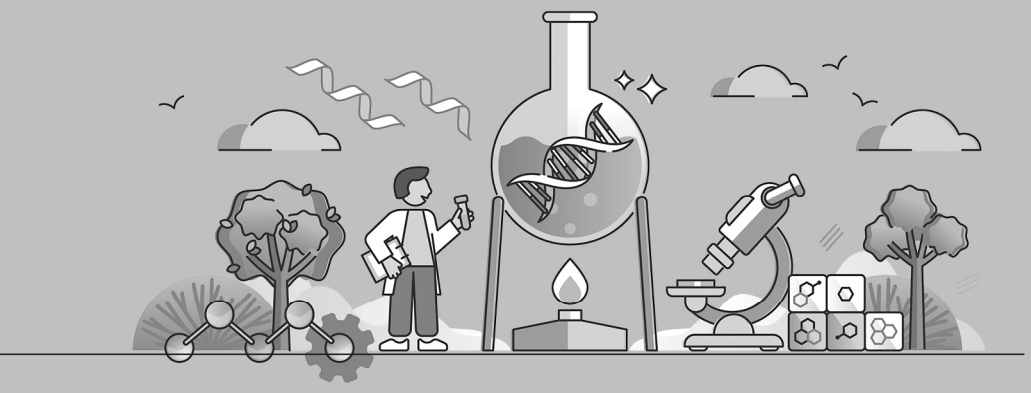
Open innovation, Innovation Policy, Digital Transformation, Data-driven government

Publications

- Do government R&D subsidies stimulate collaboration initiatives in private firms? (in TFSC)
- Dynamic capability and Economic crisis: Has open innovation enhanced firm performance in an economic downturn?(in Industrial and Corporate Change)
- Understanding the human side of openness: the fitbetween open innovation modes and CEO characteristics (in R&D Management)
- A doc2vec and local outlier factor approach to measuring the novelty of patents (in TFSC)
- Artificial Intelligence in Public Administration : New Opportunities and Threats (in The Korean Journal of Public Administration)

2
Session

New Challenges in Biomaterials



Agricultural and Fishery

Chair

Soon-Kyeong Kwon

Gyeongsang National University
skkwon@gnu.ac.kr

Education

2001-2006	B.S., Department of Genetic Engineering, Kyungpook National University, Korea
2006-2008	M.S., Functional Genomics, University of Science and Technology (UST), Korea
2008-2013	Ph.D., Biosystems and Bioengineering, University of Science and Technology (UST), Korea

Major Activities

2013-2015	Postdoctoral Researcher/Research Professor, Institute for Life Science and Biotechnology, Yonsei University, Korea
2019-present	Assistant Professor/Associate Professor, Division of Life Science, Gyeongsang Natioanl University, Korea

Honors and Awards

2017	MSK Young Investigator Award (Grand Prize), The Microbiological Society of Korea
2020	Hahn Kwang Ho Agriculture Prize (Agricultural Research Award)
2022	Meditox Research Achievement Award, The Microbiological Society of Korea

Research Interests

Microbial genomics, Microbiome: metagenomics, Systems microbiology /synthetic biology

Publications

- Kim K, Kwon SK*, Kim P, Kim JF*. Transcriptional potential determines the adaptability of Escherichia coli strains with different fitness backgrounds. Microbiology Spectrum 10(6):e0252822, 2022 *Co-correspondence
- Kwon SK*, Park JC, Kim KH, Yoon J, Cho Y, Lee B, Lee JJ, Jeong H, Oh Y, Kim SH, Lee SD, Hwang BR, Chung Y, Kim JF, Nam KT, Lee YC. Human gastric microbiota transplantation recapitulates premalignant lesions in germ-free mice. Gut 71(7):1266-1276, 2022.
- Kwon SK*, Jun SH, Kim JF*. Omega rhodopsins: A versatile class of microbial rhodopsins. Journal of Microbiology and Biotechnology 30:633-641, 2020. *Co-correspondence
- Kwak MJ*, Kong HG*, Choi K*, Kwon SK*, Song JY*, Lee J, Lee PY, Choi SY, Seo M, Lee HJ, Jung EJ, Park H, Roy N, Kim H, Lee MM, Rubin EM, Lee SW, Kim JF. Rhizosphere microbiome structure alters to enable wilt resistance in tomato. Nature Biotechnology 36:1100-1109, 2018. *Equal contribution
- Kim K*, Kwon SK*, Jun SH*, Cha JS, Kim H, Lee W, Kim JF, Cho HS. Crystal structure and functional characterization of a light-driven chloride pump having an NTQ motif. Nature Communications 7:12677, 2016. *Equal contribution

Engineering

Diabetes and Biomaterials for Immunoisolation

Nathaniel Suk-Yeon Hwang

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Education

1998-2002	BSE, Biomedical Engineering (BME) with a concentration in Materials Science Engineering and minor in Computer Science, Johns Hopkins University School of Engineering, Baltimore, MD
2002-2008	Ph.D., Department of Biomedical Engineering, Johns Hopkins University School of Medicine, Baltimore, MD

Major Activities

2007-2008	Visiting Scholar, Department of Bioengineering, University of California, San Diego
2008-2011	Postdoctoral Associate (Robert Langer Laboratory), MIT
2011-2015	Assistant Professor, School of Chemical and Biological Engineering, Seoul National University
2015-2020	Associate Professor, School of Chemical and Biological Engineering, Seoul National University
2020-Present	Professor, School of Chemical and Biological Engineering, Seoul National University

Honors and Awards

2021	Elected Member of Young Korean Academy of Science and Technology
2021	Amgen-Korea Academy of Science and Technology Biotechnology Award

Research Interests

Biomaterials, tissue engineering, immunoisolation, islet cell transplantation, hydrogel

Publications

- Lee UJ, Ko J, Kim SH, Lee PG, An YH, Yun H, Flood DT, Dawson PE, **Hwang NS***, Kim BG*"Light-triggered in situ Biosynthesis of Artificial Melanin for Skin Protection" **Advanced Science**, 2022, In Press.
- Kim M, Km H, Lee YS, Lee S, Kim SE, Lee UJ, Jung S, Park CG, Hong J, Lee DY*, Kim BG*, **Hwang NS*** "Novel enzymatic cross-linking-based hydrogel nanofilm caging system on pancreatic β cell spheroid for long-term blood glucose regulation" **Science Advances** Vol. 7, no. 26, eabf7832
- Lee SS, Kim JH, Jeong J, Kim SL, Koh RH, Kim I, Bae S, Lee H, and **Hwang NS*** "Sequential growth factor releasing double cryogel stem for enhanced bone regeneration" **Biomaterials** 257, 120223
- An WH, Lee J, Son DU, Kang DH, Park MJ, Cho KW, Kim S, Kim SH, KO J, Jang MH, Lee JY, Kim DH, **Hwang NS*** "Facilitated Transdermal Drug Delivery Using Nanocarriers-Embedded Electroconductive Hydrogel Coupled with Reverse Electrodialysis (RED)-Driven Iontophoresis" **ACS Nano**, 14 (4), 4523-4535
- Kim SH, Kim K, Kim BS, An YH, Lee UJ, Lee SH, Kim SL, Kim BG, **Hwang NS*** "Fabrication of polyphenol-incorporated anti-inflammatory hydrogel via high-affinity enzymatic crosslinking for wet tissue adhesion" **Biomaterials**, 119905

Medical Sciences

Efficient Synthesis of Biologically Active Compounds for Drug Development

Suckchang Hong

Seoul National University
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Education

2004–2008	B.S. in Pharmacy, Seoul National University, Korea
2008–2014	Ph.D. in Pharmaceutical Chemistry, Seoul National University, Korea

Major Activities

2015–2016	Postdoctoral Fellow, Department of Chemistry, The University of Texas at Austin, USA
2016–2017	Senior Researcher, Center for Convergent Research of Emerging Virus Infection, Korea Research Institute of Chemical Technology (KRICT), Korea
2017–2021	Assistant Professor, College of Pharmacy, Seoul National University, Korea
2021–present	Associate Professor, College of Pharmacy, Seoul National University, Korea

Honors and Awards

2021	Next-generation Leading Scientist Award, Pharmaceutical Society of Korea (PSK)
2022	Young Scientist Award, Korea Society of Organic Synthesis (KSOS)

Research Interests

Organic Synthesis, Methodology, Iron Catalyst, *N*-Heterocycle, Total Synthesis, Medicinal Chemistry

Publications

- Design, Synthesis, and Biological Activity of Marinacarboline Analogs as STAT3 Pathway Inhibitors for Docetaxel-Resistant Triple-Negative Breast Cancer, Byun, W. S.; Lim, H.; Hong, J.; Bae, E. S.; Lee, S. B.; Kim, Y.; Lee, J.; Lee, S. K.; Hong, S. *J. Med. Chem.* **2023**, *Accepted*.
- Total Synthesis of Melicoptelines C–E: Antiviral Cyclopeptides Containing a Hexahydropyrrolo[2,3-*b*]indole Moiety, Jang, J.; Lee, J.; Lee, S. B.; Choi, S. H.; Park, E. J.; Yoon, S. J.; An, J. S.; Oh, D.-C.; Oh, W. K.; Hong, S. *Org. Lett.* **2022**, *24*, 6043–6048.
- First Total Synthesis of Gaylussacin and Its Stilbene Derivatives, Song, I.; Lim, H.; Chun, S.; Lee, S. B.; Huh, J.; Oh, D.-C.; Hong, S. *J. Nat. Prod.* **2021**, *84*, 1366–1372.
- Direct Synthesis of Pyrrolo[1,2-α]quinoxalines via Iron-Catalyzed Transfer Hydrogenation between 1-(2-Nitrophenyl)pyrroles and Alcohols, Chun, S.; Ahn, J.; Putta, R. R.; Lee, S. B.; Oh, D.-C. Hong S. *J. Org. Chem.* **2020**, *85*, 15314–15324.
- One-Pot Synthesis of 4-Quinolone via Iron-Catalyzed Oxidative Coupling of Alcohol and Methyl Arene, Lee, S. B.; Jang, Y.; Ahn, J.; Chun, S.; Oh D.-C.; Hong, S. *Org. Lett.* **2020**, *22*, 8382–8386.

Medical Sciences

Tissue Regeneration using Biomaterials

Jung-Hwan Lee

Dankook University
ducious@gmail.com

Education

2002-2005	Han-Young foreign language high school, Chinese specialty, Seoul
2005-2011	College of dentistry, Dankook University, Republic of Korea (D.D.S, dentist)
2015	Applied life science, Yonsei University, Seoul, Korea

Major Activities

2015-2018	**Research fellow**, Institute of Tissue Regeneration Engineering (ITREN),
2018-present	**Assistant Professor**, Department of Dental Biomaterials in Dental College,
2018-present	**Vice director**, Institute of Tissue Regeneration Engineering (**ITREN**)
2021-present	**Director**, Department of Nanobiomedical Science & BK21 Four NBM Global Research Center for Regenerative Medicine (BK21 four)
2021-present	**Director**, Cell and Matter institute, Dankook University, Republic of Korea

Honors and Awards

2018	**Best dental research scientist of year, silver medal, Korea Dental Society**
2019	**Best dental research scientist of year, Korea Dental Material Society**

Research Interests

Biomaterials, Mechanotransduction, Nanomaterials, Cell reprogramming, Immune-reaction

Publications

- Prog. Mater. Sci. (2021), 422, 1-13 **(IF 48.165, JCR 1.5% 이내)**
- *Matter (2022), 5. 3194-3224* **(IF 19.9, JCR 2% 이내)**
- *Biomaterials,* (2021), 276, 1-15 **(IF 15.3, JCR 3% 이내)**
- *Bio. Mater.,* (2021), 6, 123-136. **(IF 16.8, JCR 3% 이내)**
- *Chem. Eng. J.,* (2021), 422, 1-13 **(IF 16.7, JCR 3% 이내)**

Medical Sciences

Chemical-driven Disaggregation of Misfolded Proteins for Alzheimer's Disease

YoungSoo Kim

Yonsei Unviersity
y.kim@yonsei.ac.kr

Education

1997–2001	B.A. in Biochemistry, New York University, NY, USA
2002–2007	Ph.D. in Chemistry, Scripps Research Institute, CA, USA

Major Activities

2006–2017	Principal Research Scientist, KIST, Korea
2017–Present	Associate Professor, Department of Pharmacy, Yonsei University, Korea
2017–Present	CSO, Amyloid Solution Inc., Korea

Honors and Awards

2016–2019	BRIC Top 5 Research Achievements, BRIC, Korea
2019	Commendation Award by Minister of Health and Welfare, Korea
2020	POSCO Science Fellowship, POSCO TJ Park Foundation, Korea
2021	Next-Generation Pharmaceutical Scientist, Pharmaceutical Society of Korea, Korea
2021	Member of Young Korean Academy of Science and Technology (Y-KAST), Korea

Research Interests

Chemical Biology, Alzheimer's Disease, Drug Discovery, Diagnostic Tool Development

Publications

- Angew. Chem. 2023;62(7):e202210209. Amyloid Against Amyloid: Dimeric Amyloid Fragment Ameliorates Cognitive Impairments by Direct Clearance of Oligomers and Plaques. Corresponding Author.
- Adv. Sci. 2022;9(12):e2104542. Chemical-driven outflow of dissociated amyloid burden from brain to blood. Corresponding Author.
- Angew. Chem. 2020;59(28):11491 . Discovery of chemicals to either clear or indicate amyloid aggregates by targeting memory-impairing anti-parallel Aβ dimers. Corresponding Author.
- Sci. Adv. 2019;5(4):eaav1388. Comparative analyses of plasma amyloid-β levels in heterogeneous and monomerized states by interdigitated microelectrode sensor system. Corresponding Author.
- Nat. Commun. 2015;6:8997. EPPS rescues hippocampus-dependent cognitive deficits in APP/PS1 mice by disaggregation of amyloid-β oligomers and plaques. Corresponding Author.

Natural Sciences

Biosynthetically Inspired Synthesis of Complex Natural Products

Sunkyu Han

KAIST
sunkyu.han@kaist.ac.kr

Education

2000–2006	B.S. in Chemistry, Department of Chemistry, KAIST
2006–2012	Ph.D. in Organic Synthesis, Department of Chemistry, MIT

Major Activities

2012–2014	Postdoctoral Associate, Department of Chemistry, Yale University
2014–2019	Assistant Professor, Department of Chemistry, KAIST
2019–present	Associate Professor, Department of Chemistry, KAIST
2021–present	Member of Young Korean Academy of Science and Technology, Korea

Honors and Awards

2018	Thieme Chemistry Journals Award, Thieme, Germany
2019	LINKGENESIS Best Teacher Award, KAIST, Korea
2019	Hanseong Science Award, Hanseong Sonjaehan Foundation, Korea
2020	Young Organic Chemist Award, Korean Chemical Society, Korea
2021	Young Scientist Award, Korean Society of Organic Synthesis, Korea
2022	KCS-Wiley Young Chemist Award, Korean Chemical Society, Korea
2022	Young Scientist Award, The President of the Republic of Korea, Korea

Research Interests

Natural products synthesis, development of synthetic methods, natural products-inspired drug development, natural products chemistry

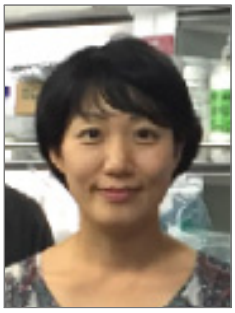
Publications

- Jeon, S.; Han, S. "An Accelerated Intermolecular Rauhut-Currier Reaction Enables the Total Synthesis of (-)-Flueggenine C." *J. Am. Chem. Soc.* **2017**, 139, 6302.
- Seong, S.; Lim, H.; Han, S. "Biosynthetically Inspired Transformation of Iboga to Monomeric Post-Iboga Alkaloids" *Chem* **2019**, *5*, 353.
- Lee, S.; Kang, G.; Chung, G.; Kim, D.; Lee, H.-Y.; Han, S. "Biosynthetically Inspired Syntheses of Secu'amamine A and Fluvirosaones A and B" *Angew. Chem. Int. Ed.* **2020**, *59*, 6894.
- Lim, H.; Seong, S.; Kim, Y.; Seo, S.; Han, S. "Biopatterned Reorganization of Alkaloids Enabled by Ring-Opening Functionalization of Tertiary Amines" *J. Am. Chem. Soc.* **2021**, *143*, 19966.
- Kang, G; Han, S. "Synthesis of Dimeric Securinega Alkaloid Flueggeacosine B: From Pd-Catalyzed Cross-Coupling to Cu-Catalyzed Cross-Dehydrogenative Coupling" *J. Am. Chem. Soc.* **2022**, *144*, 8932.

3
Session

Biomedical Research for Clinical Application

Medical Sciences



Chair

Ok-Nam Bae

Hanyang University
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Education

1995-1999	BS in Pharmacy, Seoul National University, Korea
1999-2001	MS in Pharmacology and Toxicology, Seoul National University, Korea
1986-1989	Ph.D. in Pharmacology and Toxicology, Seoul National University, Korea

Major Activities

2011-present	Assistant/ Associate/ Full Professor in Department of Pharmacy, Hanyang University, Korea
2011-present	Member of the Korean Society of Toxicology, Korea
2019-present	Director, Animal Facility in Hanyang University ERICA campus, Korea
2017-present	Active/ Alumni member of Y-KAST, Korean Academy of Science and Technology, Korea

Honors and Awards

2021	Award for Women Scientist, from the Ministry of Gender Equality and Family
2022	Seokoh Life Science Award, Korea

Research Interests

Chemical Toxicity, Risk Assessment, Cardiovascular diseases, Microplastic Health Effects

Publications

- Kim EH, Choi S, Kim D, Park HJ, Bian Y, Choi SH, Chung HY, Bae ON., Amine-modified nanoplastics promote the procoagulant activation of isolated human red blood cells and thrombus formation in rats. *Part Fibre Toxicol*, 2022
- Kim D, Shin Y, Kim EH, Lee Y, Kim S, Kim HS, Kim HC, Leem JH, Kim HR, Bae ON., Functional and dynamic mitochondrial damage by chloromethylisothiazolinone/methylisothiazolinone (CMIT/MIT) mixture in brain endothelial cell lines and rat cerebrovascular endothelium. *Toxicol Lett*. 2022
- Lee GY, Zeb A, Kim EH, Suh B, Shin YJ, Kim D, Kim KW, Choe YH, Choi HI, Lee CH, Qureshi OS, Han IB, Chang SY, Bae ON, Kim JK., CORM-2-entrapped ultradeformable liposomes ameliorate acute skin inflammation in an ear edema model via effective CO delivery *Acta Pharm Sin B*. 2020
- Kim KA, Kim D, Kim JH, Shin YJ, Kim ES, Akram M, Kim EH, Majid A, Baek SH, Bae ON., Autophagy-mediated occludin degradation contributes to blood-brain barrier disruption during ischemia in bEnd.3 brain endothelial cells and rat ischemic stroke models *Fluids Barriers CNS*. 2020
- Kim KA, Shin D, Kim JH, Shin YJ, Rajanikant GK, Majid A, Baek SH, Bae ON., Role of Autophagy in Endothelial Damage and Blood-Brain Barrier Disruption in Ischemic Stroke *Stroke*. 2018

Medical Sciences

Theranostic Nanomedicine: Bioimaging and Spatial Transcriptomics

Hyung-Jun Im

Seoul National University
iiihjjj@gmail.com

Education

2007 MD. School of Medicine, The Catholic University of Korea
2015 Ph.D. Graduate School of Convergence Science and Technology, Seoul National University (Major: Molecular Medicine and Biopharmaceutical Sciences)

Major Activities

2007-2012 **Residency**, Seoul National University Hospital (Department of Nuclear Medicine)
2015-2016 **Research Associate**, University of Wisconsin-Madison (Department of Radiology), USA
2022-present **Member**, Young Korean Academy of Science and Technology, (YKAST)
2021-present **Co-founder and Chief Scientific Officer**, Portrai, South Korea
2017-present **Assistant/Associate Professor**, Seoul National University (Graduate School of Convergence Science and Technology), South Korea

Honors and Awards

2021 Ones to Watch in 2021, Society of Nuclear Medicine and Molecular Imaging (SNMMI)
2019 **The Best Paper Award**, The 58th The Korean Society of Nuclear Medicine
2019 **The Best Poster Award**, The 16th Korea-U.S. Forum on Nanotechnology

Research Interests

Theranostics, Molecular Imaging, Nanomedicine, Drug delivery system

Publications

- Development of Spleen Targeting H2S Donor Loaded Liposome for the Effective Systemic Immunomodulation and Treatment of Inflammatory Bowel Disease. ACS Nano 2023 Feb 6. Online ahead of print.
- Spatial Transcriptomics-Based Identification of Molecular Markers for Nanomedicine Distribution in Tumor Tissue. Small Methods. 2022 Sep 30:e2201091.
- Head-to-Head Comparison of ^{68}Ga-NOTA (^{68}Ga-NGUL) and ^{68}Ga-PSMA-11 in Patients with Metastatic Prostate Cancer: A Prospective Study. J Nucl Med. 2021 62(10):1457-1460
- Europium-Diethylenetriaminepentaacetic Acid Loaded Radioluminescence Liposome Nanoplatform for Effective Radioisotope-Mediated Photodynamic Therapy. ACS Nano 2020;14:10:13004-13015
- DNA origami nanostructures can exhibit preferential renal uptake and alleviate acute kidney injury. Nature Biomedical Engineering 2018;2:865-877.

Medical Sciences

Targeting the Gut-Liver Axis and Microbiome to Treat Non-Alcoholic Steatohepatitis

Yong-ho Lee

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Education

1999-2005	Yonsei University College of Medicine: M.D.
2006-2014	Graduate School, Yonsei University College of Medicine; M.S., Ph.D.
2020-2022	Buck Institute for Research on Aging, Visiting scientist

Major Activities

2013-2015	Fellowship, Yonsei University College of Medicine Severance Hospital
2015-Present	Associate professor, Department of Internal Medicine, Yonsei University College of Medicine Severance Hospital
2019-Present	Adjunct professor of Postech

Honors and Awards

2015	11st Young Investigator Award, Korean Diabetes Association
2017	27th Wunsch Medical Award (Young investigator/Clinical), Korean Academy of Medical Sciences Research Award
2020	The 13th Asan Award in Medicine (2020), Award for Young Medical Scientists
2021	Ministry of Health and Welfare Award on Biomedical Research, Korea

Research Interests

Non-alcoholic steatohepatitis, aging, diabetes, obesity

Publications

- Kim ER, Park JS, et al, &, Bae SH, **Lee YH (Co-corres)**. A GLP-1/GLP-2 receptor dual agonist to treat non-alcoholic steatohepatitis: targeting the gut-liver axis and microbiome. Hepatology, 2022;75(6):1523-1538.
- Y Cho, H Rhee, & **Lee YH (Corres)**. Ezetimibe combination therapy with statin for non-alcoholic fatty liver disease: an open label randomized controlled trial (ESSENTIAL study). BMC Medicine 2022;20:93.
- Kim SR, Lee SG, et al, &, Kim JS, **Lee YH (Co-corres)**. SGLT2 inhibition modulates NLRP3 inflammasome activity via changes in ketones and insulin in diabetes and cardiovascular disease. Nature communications 2020;11:2127.
- Lee HH, **Lee YH (Co-corres)**, Kim SU, Kim HC. Metabolic Dysfunction-Associated Fatty Liver Disease and Incident Cardiovascular Disease Risk: A Nationwide Cohort Study. Clin Gastroenterol Hepatol. 2021;19:2138-2147.
- **Lee YH (co-first)**, Kim SR, Han DH, Yu HT, Han YD, Kim JH, Kim SH, Lee CJ, Min BH, Kim DH, Kim KH, Cho JW, Lee WW, Shin EC, Park S. Senescent T Cells Predict the Development of Hyperglycemia in Humans. Diabetes. 2019;68(1):156-162.

Medical Sciences

Epigenetic Regulation of Skin Aging

Dong Hun Lee

Seoul National University
ivymed27@snu.ac.kr I

Education

1997–2003	M.D. Seoul National University College of Medicine, Seoul, Korea
2005–2008	M.S.in Molecular and Genomic Medicine, Seoul National University College of Medicine
2008–2012	Ph.D. in Department of Biomedical Science, Seoul National University College of Medicine

Major Activities

2004–2008	Dermatology Resident, Seoul National University Hospital
2012–2013	Postdoctoral Fellow,Seoul National University Hospital
2014–Present	Assistant Professor, Associate Professor, Department of Dermatology, Seoul National University Hospital, Seoul National University College of Medicine,
2020–Present	Member, Y-KAST (Young Korean Academy of Science and Technology)
2021–Present	Project Manager (PM), Medicine and Pharmacy Department, Basic Research Division, National Research Foundation of Korea
2021–Present	Associate Editor, Photodermatology, Photoimmunology & Photomedicine
2022–Present	Associate Editor, Experimental Dermatology
2022–Present	Professor in charge, Office for Planning & Coordination, Seoul National University College of Medicine
2022–Present	Director of Research Planning, Medical Research Center (MRC), Seoul National University
2023–Present	Deputy Editor, Allergy, Asthma and Immunology Research

Major Activities

2016	**Young Investigator Award** (1st awardee) by the Korean Society for Investigative Dermatology
2016	**Dong-Ah Academic Award** by the Korean Dermatological Association
2017	**Dong Wha Academic Award** by the Korean Dermatological Association
2017	**Young Researcher Award** by Seoul National University Hospital
2018	**Young Researcher Award** by Seoul National University College of Medicine
2018	**In-Bong Academic Award** by the Korean Dermatological Association
2020	Commendation by the Chairman of the Seoul Metropolitan Council
2022	**Outstanding Researcher Award** at Seoul National University College of Medicine

Research Interests

skin aging, matrix biology, skin allergy, skin immunology

Medical Sciences

Future Perpective of Convergence Research in the Field of Liver Disease

Beom Kyung Kim

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beomkkim@yuhs.ac

Education

1997-2003	Yonsei University College of Medicine, Seoul, Republic of Korea
2005-2007	Master Degree, Graduate School, Yonsei University College of Medicine, Seoul, Republic of Korea
2010- 2013	Ph.D., Graduate School, Yonsei University College of Medicine Seoul, Republic of Korea

Major Activities

Korean Association of Internal Medicine; Korean Association for the Study of the liver; Korean Society of Gastrointestinal Endoscopy; Korean Liver Cancer Study Group

Honors and Awards

2016	Outstanding paper award, Korean Liver Cancer Association
2018	Asan award for young medical scientists, ASAN Foundation
2020	Faculty of the year in internal medicine, Department of Internal Medicine, Yonsei University College of Medicine

Research Interests

Viral hepatitis, liver cirrhosis, and liver cancer; Epidemiology of liver disease; Pharmacoeconomics in liver disease

Publications

• Efficacy and Safety of Liver-Directed Concurrent Chemoradiotherapy and Sequential Sorafenib for Advanced Hepatocellular Carcinoma: A Prospective Phase 2 Trial. Int J Radiat Oncol Biol Phys. 2020 May 1;107(1):106-115.
• A multi-centre study of trends in hepatitis B virus-related hepatocellular carcinoma risk over time during long-term entecavir therapy. J Viral Hepat. 2020 Aug 27. doi: 10.1111/jvh.13384. Online ahead of print.
• Natural History of Untreated HBeAg-Positive Chronic HBV Infection With Persistently Elevated HBV DNA but Normal Alanine Aminotransferase. Clin Transl Gastroenterol. 2020 Mar;11(3):e00140
Publications (Max 5 items as the major author)

4

Session

Energy & Environment for Sustainable Future

Engineering

Chair

Eunji Lee

GIST
eunjilee@gist.ac.kr

Education

1999–2002	B.Sc. Chemistry, Yonsei University, Republic of Korea
2003–2005	M.Sc. Chemistry, Yonsei University, Republic of Korea
2005–2009	Ph.D. Chemistry, Yonsei University, Republic of Korea

Major Activities

2022–present	Member of Young Korean Academy of Science and Technology, Republic of Korea
2018–present	Professor, MSE, Gwangju Institute of Science and Technology, Republic of Korea
2011–2018	Associate Professor, Chungnam National University, Republic of Korea
2009–2011	Postdoctoral Research Associate, Polymer Science and Engineering, University of Massachusetts Amherst, USA

Honors and Awards

2022	Ministerial Commendation, Ministry of Trade, Industry and Energy, Republic of Korea
2020	Asian Young Scientist Award in Chemical Society of Japan (CSJ), Japan
2020	GIST College Outstanding Teaching Award, Gwangju Institute of Science and Technology, Republic of Korea
2017	50 Outstanding Performances in Basic Research, Deputy Prime Minister and Minister of Education, Republic of Korea
2007	Chung Sung Kee Academic Award for Excellent Thesis, Yonsei University, Republic of Korea

Research Interests

Molecular self-assembly, hierarchical and complex nanostructures, stimuli-responsive nanoparticles, supramolecular polymerization, functional nanohybrids, advanced transmission electron micriscopy (cryo-TEM, 3D tomography, in-situ TEM)

Publications

- Precise Control of Quantum Dot Location within the P3HT-b-P2VP/QD Nanowires Formed by Crystallization-Driven 1D Growth of Hybrid Dimeric Seeds, J. Am. Chem. Soc. 2014, 136(7), 2767-2774
- Stepwise Drug-Release Behavior of Onion-Like Vesicles Generated from Emulsification-Induced Assembly of Semicrystalline Polymer Amphiphiles, Adv. Funct. Mater. 2015, 25, 4570-4579, selected as a front cover
- Interfacial Crystallization-Driven Assembly of Conjugated Polymers/Quantum Dots into Coaxial Hybrid Nanowires: Elucidation of Conjugated Polymer Arrangements by Electron Tomography, Adv. Funct. Mater. 2016, 26(19), 3226-3235
- Supramolecular Carbon Monoxide-Releasing Peptide Hydrogel Patch, Adv. Funct. Mater. 2018, 28(47), 1803051, selected as a cover
- Synthesis of Alternating Polyisocyanate Copolymers by Anionic Polymerization for Mimicking Amphiphilic Helical Peptides, Angew. Chem. Int. Ed. 2022, 61(51), e202212398, selected as a front cover

Invited Speaker

Environmental Science Engagement with the DPRK: The Mount Paektu Research Centre

James Hammond

Birkbeck, University of London
James.hammond@bbk.ac.uk

Education

1999–2003	**MGeophys Geophysics,** University of Leeds UK & Queen's University, Canada
2003–2007	**PhD in Geophysics,** University of Leeds, UK

Major Activities

2007–2011	NERC Research Associate, University of Bristol, UK
2011–2015	NERC Research Fellow, Imperial College London, London, UK
2015–present	Full Professor of Geophysics, Birkbeck, University of London (Full Professor since 2022)
2015–present	Honorary Research Associate, University College London, London, UK

Research Interests

Seismology, Volcanology, Disaster Risk Reduction, Tectonophysics, Science Diplomacy

Publications

- **Hammond, J. O. S.,** et. al., Distribution of partial melt beneath Paektu/Changbaishan Volcano, China/ Democratic People's Republic of Korea, *Geochem. Geophys. Geosyst., doi:10.1029/2019GC008461* (2020)
- Goitom, B., Werner, M. J., Goda., K., Kendall, J-M., **Hammond, J. O. S.**, et. al., Probabilistic seismic hazard assessment for Eritrea, *Bull. Seis. Soc. Am., 107, doi:10.1785/0120160210* (2017)
- Kyong-Song, R., **Hammond, J. O. S.**, et. al., Evidence for partial melt in the crust beneath Mt. Paektu (Changbaishan), Democratic People's Republic of Korea and China, *Science Advances, 2, doi:10.1126/sciadv.1501513* (2016)
- **Hammond, J. O. S.** Understanding volcanoes in isolated locations: engaging Diplomacy for Science, *Science and Diplomacy*, *5*, (2016)
- Rychert, C. A., **Hammond, J. O. S.**, Harmon, N., Kendall, J-M., Keir, D., Ebinger, C., Bastow, I. D., Ayele, A., Belachew, M., Stuart, G. Volcanism in the Afar Rift sustained by decompression melting with minimal plume influence. *Nature Geosci. 5, doi:10.1038/ngeo1455* (2012)

Invited Speaker

Growth and Gas Sensing Properties of 2D Materials for Environmental Monitoring

Mahesh Kumar

Indian Institute of Technology Jodhpur
mkumar@iitj.ac.in

Education

2008-2011	Ph.D in Engineering, Indian Institute of Science Bangalore, India
2003-2005	M.Tech in Solid State Materials, Indian Institute of Technology Delhi, India
2000-2003	M.Sc in Physics, University of Rajasthan Jaipur, India

Major Activities

2019-till date	Associate Professor at Indian Institute of Technology Jodhpur, India
2013-2019	Assistant Professor at Indian Institute of Technology Jodhpur, India
2005-2013	Member (Research Staff) at Bharat Electronics Ltd. Bangalore, India

Honors and Awards

2022	Abdul Kalam Technology Innovation National Fellowship by Indian National Academy of Engineering
2021	Friedrich-Wilhelm-Bessel Research Award by Alexander von Humboldt Foundation
2016	The MRSI Medal by Materials Research Society of India
2016	Young Achiever Award by Department of Atomic Energy
2014	INSA Award for Young Scientists-2014 by Indian National Academy of Sciences

Research Interests

Semiconductor materials and devices, 2D materials, Gas sensors, HEMTs, Heavy metal ion sensors, photodetectors

Publications

- Ashok Kumar, Akash Popat Gutal, Neelu Sharma, Deepu Kumar, Ge Zhang, Hyunah Kim, Pradeep Kumar, Manikandan Paranjothy, Mahesh Kumar and Michael S. Strano "Investigations of Vacancy-Assisted Selective Detection of NO2 Molecules in Vertically Aligned SnS2" ACS Sensors (In Press).
- Amit Kumar, Amit Kumar Shringi, Mahesh Kumar "RF sputtered CuO anchored SnO2 for H2S gas sensor" Sensors and Actuators B: Chemical 370, 132417 (2022).
- Amit Kumar Shringi, Atanu Betal, Satyajit Sahu, Michael Saliba and Mahesh Kumar "Resistive Switching and Synaptic Behavior of Perovskite Lanthanum Orthoferrite Thin Film for Neuromorphic Computing" IEEE Transactions on Electron Devices 69, 6465 (2022).
- Nipun Sharma, Adarsh Nigam, Dmitry Lobanov, Ankur Gupta, Alexey Novikov, Mahesh Kumar "Mercury (II) Ion Detection using AgNWs-MoS2 Nanocomposite on GaN HEMT for IoT Enabled Smart Water Quality Analysis" IEEE Internet of Things Journal 16, 14317 (2022).
- Deepu Kumar, Vivek Kumar, Rahul Kumar, Mahesh Kumar and Pradeep Kumar "Electron-phonon coupling, thermal expansion coefficient, in resonance and phonon dynamics in high quality CVD grown mono and bilayer MoSe2" Physical Review B 105, 085419 (2022).

Natural Sciences

Deep Learning for Global Ocean States Monitoring

Yoo-Geun Ham

Chonnam National University
ygham@jnu.ac.kr

Education

2003-2009	Ph. D., Atmospheric Sciences, Seoul National University, South Korea
1999-2003	B. S., Atmospheric Sciences, Seoul National University, South Korea

Major Activities

2010-2013	Researcher, Global Modeling and Assimilation Office, NASA/GSFC, U.S.A.
2013-2016	Assistant Professor, Chonnam National University, South Korea
2016-2021	Associate Professor, Chonnam National University, South Korea
2021-Current	Professor, Chonnam National University, South Korea

Honors and Awards

2020	Young Scientist Award (젊은 과학자상), Ministry of Science and ICT, Korea

Research Interests

Deep learning for climate research, Climate Change, Climate Prediction, Atmospheric Dynamics

Publications

- H. -S. Jo, **Y. -G. Ham**, J. -S. Kug, T. Li, J. -H. Kim, and J. -G. Kim, 2022: Southern Indian Ocean Dipole as a trigger for El Niño events since the 2000s, *Nature Communications*, **13(1)**, *6965*.
- **Ham. -Y. -G.**, J. -H. Kim, and J. -J. Luo, 2019: Deep learning for multi-year ENSO forecasts. *Nature*, **573**, 568-572. https://doi.org/10.1038/s41586-019-1559-7.
- **Ham Y. -G.**, 2018 : El Nino events set to intensify, *Nature*, **564**, 192-193. doi:10.1038/d41586-018-07638-w.
- **Ham, Y. -G**., J. -S. Kug, J. -Y. Choi, F. -F. Jin, and M. Watanabe 2018 : Inverse relationship between present-day tropical precipitation and its sensitivity to greenhouse warming, *Nature Climate Change*, **8**, 64-69, doi:10.1038/s41558-017-0033-5.
- **Ham, Y.-G.**, J.-S. Kug, J.-Y. Park, and F.-F. Jin, 2013 : Sea surface temperature in the north tropical Atlantic as a trigger for El Niño/Southern Oscillation events, *Nature Geoscience*, **6**, 112-116, 10.1038/ngeo1686.

Natural Sciences

Earth System Modeling

Jongyeon Park

Jeonbuk National University
jongyeon.park@jbnu.ac.kr

Education

2013-2015	Studies in Earth Science, Max Planck Institute for Meteorology/Hamburg University, Germany
2008-2009	M.S. in Earth and Environmental Science, Seoul National University, Korea
2008-2009	B.A. in Earth and Environmental Science, Seoul National University, Korea

Major Activities

2018-present	Assistant/Associate professor, Department of Earth and Environmental Sciences, Jeonbuk National University
2016-2018	Postdoctoral researcher/Research Associate, Princeton University/GFDL
2016	Postdoctoral researcher, Max Planck Institute for Meteorology,
2010-2012	Research scientist, Korea Institute of Ocean Science & Technology,

Honors and Awards

2020	2020's Top 100 Outstanding National R&D Achievements
2018	Young scientist award from Korean Meteorological Society
2015	Best young scientist award from EKC2015
2012	Excellence Research Paper Award, Korea Institute of Ocean Science & Technology
2012	Best Presentation Award in 2nd International (PICES/ICES/IOC) Symposium

Research Interests

Earth system modeling, Marine biogeochemical prediction, Climate dynamics

Publications

• 2019 Park, J.-Y, Charles A. Stock, J.P. Dunne, Xiaosong Yang, and Anthony Rosati, "Seasonal to multiannual marine ecosystem prediction with a global Earth system model", Science, 365 (6450), 284-288.
• 2016 Park, J.-Y, J. Bader, and D. Matei, "Anthropogenic Mediterranean warming essential driver for present and future Sahel rainfall", Nature Climate Change, 6, 941-945.
• 2015 Park, J.-Y., J.-S. Kug, J. Bader, R. Rolph, and M. Kwon, "Amplified Arctic warming by phytoplankton under greenhouse warming", PNAS, 112(19), 5921-5926.
• 2015 Park, J.-Y., J. Bader, and D. Matei, "Northern-hemispheric differential warming is the key to understanding the discrepancies in the projected Sahel rainfall", Nature Communications, 6.

Engineering

Building an Artificial Sun on Earth with the Temperature Above 100 Milion Degree

Yong-Su Na

Seoul National University
ysna@snu.ac.kr

Education

1994-1998	Bachelor, Nuclear Engineering, Seoul National University
1998-2000	Master, Nuclear Engineering, Seoul National University
2001-2003	Dr.rer.nat., Physics, Technische Universität München (TUM)/Max-Planck-Institut für Plasmaphysik (IPP), Germany

Major Activities

2004-2006	Postdoctorate, Max-Planck-Institut für Plasmaphysik (IPP), Germany/ National Fusion Research Center, Korea
2006-2008	Senior Researcher, National Fusion Research Institute, Korea
2008-present	Assistant Professor, Associate Professor, Professor, Department of Nuclear Engineering, College of Engineering Seoul National University, Korea
2014-2020	Deputy chair, Chair, Integrated Operation Scenario (IOS) topical group on International Tokamak Physics Activity (ITPA)
2021-2022	Vice Dean of Student Affairs, College of Engineering, Seoul National University
2022-present	Member, International Thermonuclear Experimental Reactor (ITER) Science and Technology Advisory Committee

Honors and Awards

2012	Excellent Lecture Award of Seoul National University College of Engineering
2015	Award of Korean Minister of Science, ICT and Future Planning
2017	Award of Shinyang Engineering Academy
2019	Award of National Fusion Research Institute for KSTAR 10th Anniversary

Research Interests

Nuclear fusion, plasma physics, fluid dynamics, nuclear engineering, modelling and simulation

Publications

- Yong-Su Na, Jaemin Seo et al, "Observation of a new type of self-generated current in magnetized plasmas", *Nature Communications* 13 6477 (2022)
- H. Han, S. J, Park, and Yong-Su Na et al, "A sustained high-temperature fusion plasma regime facilitated by fast ions", *Nature* 609 269 (2022)
- S. M. Yang, Yong-Su Na et al, "Nonambipolar Transport due to Electrons with 3D Resistive Response in the KSTAR Tokamak", *Physical Review Letters* 123 095001 (2019)
- Min-Gu Yoo, Yong-Su Na et al, "Evidence of a turbulent ExB mixing avalanche mechanism of gas breakdown in strongly magnetized systems", *Nature Communications* 9 3523 (2018)

5

Session

Soft Bioelectronics

Engineering

Chair

Seokwoo Jeon

Korea University
jeon39@korea.ac.kr

Education

1993-2000	Bachelor in Inorganic Materials Science and Engineeringl, Seoul Natl. Univ.
2001-2003	Master in Materials Science and Engineering, Seoul Natl. Univ.
2003-2006	Ph.D. in Materials Science and Engineering, UIUC, USA

Major Activities

2007-2008	Postdoctoral fellow at Nanoscale Science and Engineering Center, Columbia Univ.
2008-2022	Professor at MSE, KAIST
2014	Visiting Scholar, Argonne National Lab.
2018-2019	Visiting Professor, City University of Hong Kong and HKUST
2023-present	Professor at MSE, Korea University

Honors and Awards

2019	'Fusion Research Award (The greatest number)' from KINC
2017	Research Achievement Award from Korean Society of Composite Materials
2017-2020	Selected as KAIST chair professor
2017	Y-KAST member (founding member of young Korean Academy of Science and Technology)
2016	Chungwoong award from Korean Institute of Metals and Materials
2015	Presidential award of young scientist under 40 from Korean Academy of Science and Technology

Research Interests

3D lithgoraphy, 3D metamaterial, Graphene Quantum Dot, Semiconductor device

Engineering

Nanomaterials-based Soft Bioelectronics

Dae-Hyeong Kim

Seoul National University
dkim98@snu.ac.kr

Education

Seoul National University, Chemical Engineering, 2000 (B. S.); 2002 (M. S.)
University of Illinois at Urbana-Champaign, Materials Science and Engineering, 2009 (Ph. D.)

Major Activities

2017-Present	Associate Director, Center for Nanoparticle Research, Institute for Basic Science
2020-Present	Professor in Chemical and Biological Engineering
2011-2020	Assistant & Associate Professor in Chemical and Biological Engineering
2009-2011	Post-doctoral Research Associate in University of Illinois at Urbana-Champaign

Honors and Awards

2022	2022 Highly Cited Researcher, Clarivate Analytics, USA
2021	Top 10 Science and Technology News, Korean Federation of Science and Technology Societies, Korea
2021	2021 Highly Cited Researcher, Clarivate Analytics, USA
2020	2020 Highly Cited Researcher, Clarivate Analytics, USA
2020	KJChE Award (2020 fall, for the contribution to advances of KJChE)
2020-2023	KIChE Fellow, Korean Institute of Chemical Engineers, Korea
2019	Highly Cited Researcher 2019, Clarivate Analytics, USA
2019-2022	YKAST Member, Korean Academy of Science and Technology
2018	Highly Cited Researcher 2018, Clarivate Analytics, USA
2017	The 21th Young Scientist Award, The Korean Academy of Science and Technology
2016	SCEJ Award for Outstanding Asian Researcher and Engineer, Society of Chemical Engineers Japan
2015	The 6th Hong Jin-ki Creative Award, Yumin Cultural Foundation
2013	2020 Future 100 Technologies and Leaders of Korea, National Academy of Engineering of Korea
2011	TR 35 Award (TR 35 2011), MIT Technology Review
2011	SPIE Green Photonics Award (Photonics West 2011 Meeting), SPIE
2009	George Smith Award (best paper in IEEE Electron Device Letters), IEEE

Publications

- "Stretchable colour-sensitive quantum dot nanocomposites for shape-tunable multiplexed phototransistor arrays" Nature Nanotechnology 17, 849 (2022).
- "Highly conductive and elastic nanomembrane for skin electronics" Science 373, 1022 (2021).
- "Highly conductive, stretchable and biocompatible Ag-Au core-sheath nanowire composite for wearable and implantable bioelectronics" Nature Nanotechnology 13, 1048 (2018).
- "A Graphene-based Electrochemical Device with Thermoresponsive Microneedles for Diabetes Monitoring and Therapy" Nature Nanotechnology 11, 566 (2016).
- "Multifunctional wearable devices for diagnosis and therapy of movement disorders" Nature Nanotechnology 9, 397 (2014).

Invited Speaker

The Role of Magnetostatic Interactions in a System of Closely Packed Magnetic Elements on the Example of Fe/Au Barcode Nanowires Arrays

Aleksei Samardak

Far Eastern Federal University
lsamardak@gmail.com

Education

2009–2016 Bachelor's and master's degrees in School of Natural sciences, Far Eastern Federal University, Vladivostok, Russia.

2016–2022 Preparation and defense of PhD dissertation "Effect of Elemental Composition, Structure, and Geometry on the Magnetic Properties of Electrodeposited Ferromagnetic Nanostructures" in the field of physics of condensed matter, FEFU.

Major Activities

2016–2018 Engineer at Department of low-dimensional Structures, FEFU.
2019–2020 Teacher of Educational program "ROSNANO".
2020–2022 Assistant teacher, FEFU.
2020–2023 Junior Researcher, laboratory of thin film technologies, FEFU.
2022–present Senior lecturer, FEFU.

Research Interests

Nanomagnetism, ferromagnetic materials and alloys, arrays of one-dimensional nanostructures, thin films, nanoparticles, electrochemical deposition, anodization, FORC-method, micromagnetic simulations

Publications

• A. Yu. Samardak [et. al], Interwire and Intrawire Magnetostatic Interactions in Fe-Au Barcode Nanowires with Alternating Ferromagnetically Strong and Weak Segments. // Small 18(47) (2022) 2203555.
• V. K. Belyaev [et. al], FORC-Diagram Analysis for a Step-like Magnetization Reversal in Nanopatterned Stripe Array // Materials 14 (24) (2021) 7523.
• E. Yoo, [et. al], Composition-driven crystal structure transformation and magnetic properties of electrodeposited Co-W alloy nanowires // Journal of Alloys and Compounds 843 (2020) 155902.
• A.S. Samardak, [et. al], Enhancement of perpendicular magnetic anisotropy and Dzyaloshinskii-Moriya interaction in thin ferromagnetic films by atomic-scale modulation of interfaces // NPG Asia Materials 12 (2020) 51.
• D. Y. Nam, [et. al], Magnetization reversal of ferromagnetic nanosprings affected by helical shape // Nanoscale 10 (2018) 20405.

Engineering

3D Printing of Thermoelectric Materials and Devices

Jae Sung Son

UNIST
jsson@unist.ac.kr

Education

1998–2005	B.S. in Applied Chemistry, Seoul National University
2005–2011	M.S & Ph.D. (Joint degree) in Interdisciplinary of Nanoscience and Technology, Seoul National University

Major Activities

2011–2012	Postdoctoral Researcher, School of Chemical and Biological Engineering, Seoul National University
2012–2014	Postdoctoral Researcher, Department of Chemistry, University of Chicago
2014–2022	Assistant & Associate Professor, School of Materials Science and Engineering, UNIST
2022–present	Professor, School of Materials Science and Engineering, UNIST
2021–present	Member, Young Korean Academy of Science and Technology (Y-KAST)

Honors and Awards

2019	UNIST's Outstanding Faculty Award
2019	UNIST's Rising-Star Distinguished Professor (2019~2022)
2019	Felloship, LG Yeonam Foundation
2020	Samsung Humantech Bronz Medal

Research Interests

3D printing, Thermoelectrics, Thin films, Solution process, Electronic devices, Nanoparticles

Publications

- Generalised optical printing of photocurable metal chalcogenides Seongheon Baek, et al. Nature Commun. 2022, 13, 5262.
- Direct ink writing of three-dimensional thermoelectric microarchitectures Fredrick Kim, et al. Nature Electronics 2021, 4, 579-587.
- Cu2Se-based Thermoelectric Cellular Architectures for Efficient and Durable Power Generation Seungjun Choo, et al. Nature Commun. 2021, 12, 3550.
- Composition change-driven texturing and doping in solution-processed SnSe thermoelectric thin films Seung Hwae Heo, et al. Nature Commun. 2019, 10, 864.
- 3D printing of shape-conformable thermoelectric materials using all-inorganic Bi2Te3-based inks Fredrick Kim, et al. Nature Energy 2018, 3, 301-309.

Engineering

Bio-Inspired Sensory Devices and Electronics for Smart Healthcar

Hyunjung Yi

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hjungyi@kist.re.kr

Education

1997–2001	B.S., Materials Science and Engineering, POSTECH, Pohang, Korea
2001–2003	M.S., Materials Science and Engineering, POSTECH, Pohang, Korea
2007–2011	Ph.D., Massachusetts Institute of Technology, Cambridge, MA, USA

Major Activities

2003–present	Researcher, Senior Researcher, Principal Researcher, KIST, Seoul, Korea
2017–2017	Visiting Scholar, Lawrence Berkeley National Laboratory, Berkeley, CA, USA
2019–present	Adjunct Professor, Materials Science and Engineering, YU-KIST, Yonsei University, Seoul, Korea
2021–present	Member of the Young Korean Academy of Science and Technology, Korea

Honors and Awards

2007	Recipient of the Korean Government Overseas Scholarship (2007-2010)
2011	Outstanding PhD Thesis Research Award, Materials Science and Engineering, MIT
2016	Outstanding Researcher, National Research Council of Science and Technology (NST)
2016	KIST Young Fellow, KIST (2016-2018)
2022	Researcher of the Month, KIST
2023	Outstanding Research Team, KIST

Research Interests

Bio-inspired sensors and devices, on-skin sensors and devices, electrochemical devices, nanoelectronics, nanomaterials, soft hybrid electronic materials, hydrogels

Publications

• S. Kim, et al., ***Nature Communications,*** **2022,** 13, 6705,
• J. Lee, et al., ***Advanced Materials,*** **2022,** 34, 2201606
• T. H. Park, et al., ***Advanced Healthcare Materials,*** **2021,** 2100469
• H. Kim, et al., ***ACS Nano,*** **2020,** 14, 17213
• T.-H. Kang, et al., ***Nano Letters,*** **2019,** 19, 3684

Engineering

Bioimetic approaches with Stretchable Ionics

Jeong-Yun Sun

Seoul National University
jysun@snu.ac.kr

Education

1998-2005	Bachelor, Materials science & engineering, Seoul National University, Korea
2005-2007	Master, Materials science & engineering, Seoul National University, Korea
2007-2012	Ph.D., Materials science & engineering, Seoul National University, Korea

Major Activities

2012-2013	Post Doc. in SEAS at Harvard University, USA
2013-2014	Research Associate, in SEAS at Harvard University, USA
2014-2018	Assistant Professor, Materials science & engineering, Seoul National University, Korea
2018-2023	Associate Professor, Materials science & engineering, Seoul National University, Korea
2023-present	Full Professor, Materials science & engineering, Seoul National University, Korea

Honors and Awards

2020	"Top 100 National R&D Outstanding Achievements." Award from Korean Ministry of Science and ICT
2019	"Top 10 Nanotechnologies" Award from Korean Ministry of Science and ICT
2018	"The Scientist of this Month" Award from Korean Government
2017	Young Scientist Award from The Polymer Society of Korea
2016	Young Scientist Award from Korean Materials Research Society

Research Interests

Soft Materials, Gels, Ionics, Soft machines, Bio-inspired systems.

Publications

- "Hydrogel-based strong and fast actuators by electroosmotic turgor pressure." ***Science*** (2022)
- "Ion-to-Ion Amplification through an Open Junction Ionic Diode." ***PNAS*** (2019)
- "Highly Stretchable, Transparent Ionic Touch Panel." ***Science*** (2016)
- "Stretchable, Transparent Ionic Conductors." ***Science*** (2013).
- "Highly stretchable and tough hydrogels." ***Nature*** (2012)

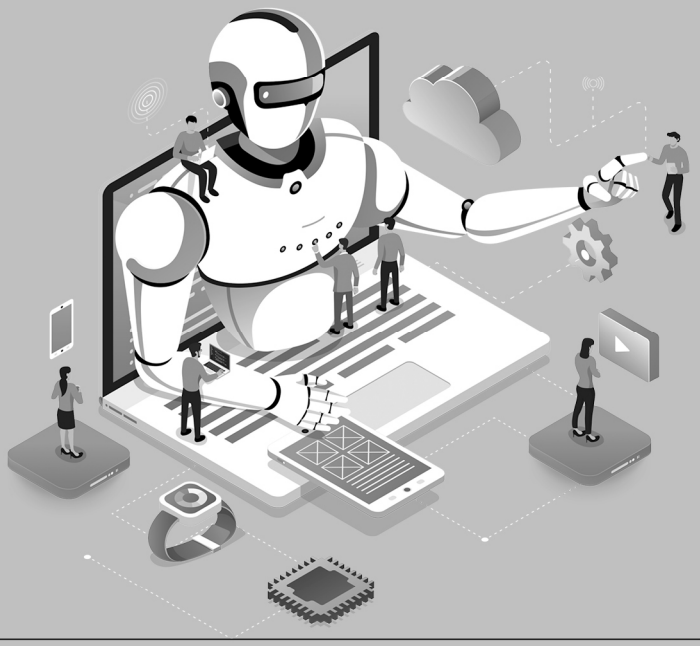
March 31(Fri)

The 1st Y-KAST International Conference

Session 6~10

6
Session

Progression and Advance in Science from Theory to AI



Policy Research

Chair

Joon Mo Ahn

Korea University
joonmo@korea.ac.kr

Education

1997-2003	B.Sc in Chemincal Engineering, Seoul National University
2011-2015	Ph.D., Technology Management, University of Cambridge, UK

Major Activities

2003-2015	Deputy director, Ministry of Science and Technology
2015-2021	Associate Professor, Sogang University, Korea
2020-present	Y-KAST member, The Korean Academy of Science and Technology
2021-present	Auditor, Gwangju Inistitute of Science and Technology (GIST)
2021-present	Associate Professor, Korea University, Korea
2022-present	Associate editor, R&D Management Journal (SSCI)
2023-present	Associate member, The National Academy of Engineering of Korea

Honors and Awards

2007	Official Commendation, Presidential Security Operation, Korea
2020	Best paper award, The Korean Society of
2023	Official Commendation, Ministry of Science and ICT, Korea

Research Interests

Open innovation, Innovation Policy, Digital Transformation, Data-driven government

Publications

- Do government R&D subsidies stimulate collaboration initiatives in private firms? (in TFSC)
- Dynamic capability and Economic crisis: Has open innovation enhanced firm performance in an economic downturn?(in Industrial and Corporate Change)
- Understanding the human side of openness: the fitbetween open innovation modes and CEO characteristics (in R&D Management)
- A doc2vec and local outlier factor approach to measuring the novelty of patents (in TFSC)
- Artificial Intelligence in Public Administration : New Opportunities and Threats (in The Korean Journal of Public Administration)

Natural Sciences

Compressible Flows and Nonlinear PDEs

Myoungjean Bae

KAIST
mybjean@gmail.com

Education

2003	B.S. Yonsei University (Major: Mathematics Minor: Astronomy)
2009	Ph.D in Mathematics, University of Wisconsin-Madison, US

Major Activities

2009-2011	Ralph-Boas Assistant Professor, Northwestern University, US
2011-2015	Assistant Professor, POSTECH, Korea
2015-2021	Associate Professor, POSTECH, Korea
2015-2021	Affiliated Professor, KIAS, Korea
2021-present	Associate Professor (tenured), KAIST, Korea

Research Interests

My research interest lies on analysis of nonlinear partial differential equations. Currently, I am working on free boundary problem with nonlinear mixed-type PDEs arising from fluid mechanics. In particular, my recent research is focused on smooth/non-smooth transonic flows of Euler system/Euler-Poisson system.

Publications

- Regularity of Solutions to Regular Shock Reflection for Potential Flow (with G.-Q. Chen and M. Feldman) Invent. Math. 175(2009) no 3, pp. 505-543
- Transonic Shocks in Multi-dimensional Divergent Nozzles (with M. Feldman) Arch. Rat. Mech. Anal., 201(2011), no 3, pp. 777-840
- Subsonic flow for multidimensional Euler-Poisson system (with B. Duan and C. Xie) Arch. Rational Mech. Anal. 220 (2016) 155-191
- Structural stability of Supersonic solutions to the Euler-Poisson system (with B. Duan, J.-J. Xiao and C. Xie), Arch. Rat. Mech. Anal. 239, 679-731 (2021).

Engineering

Data-driven Methods for Materials, Structures, and Process Design

Seunghwa Ryu

KAIST
ryush@kaist.ac.kr

Education

2000–2004	B.S. in Physics, KAIST, Korea
2004–2011	Ph.D. in Physics, Stanford University, CA, USA

Major Activities

2011–2012	Postdoc, Dept of Mechanical Engineering, Stanford University, CA, USA
2012–2013	Postdoc, Dept of Civil and Environment Engineering, MIT, MA, USA
2013–2017	Assistant Professor of Mechanical Engineering, KAIST, Korea
2017–2022	Associate Professor of Mechanical Engineering, KAIST, Korea
2018–2019	Visiting Assoc. Professor of Mechanical Engineering, Stanford University, CA, USA
2022–Present	Full Professor of Mechanical Engineering, KAIST, Korea
2022–present	Member of Young Korean Academy of Science and Technology, Korea

Honors and Awards

2019	Young Investigator Award, Asia-Pacific Association of Computational Mechanics
2019	Impact Research Prize, College of Engineering, KAIST
2018	Technology Innovation Award, College of Engineering, KAIST
2006–2008	Stanford Graduate Fellowship, Stanford University, USA

Research Interests

Mechanics, Multiscale/Multiphysics Modeling, Data-driven Design, Composites

Publications

• "Machine Learning-enabled Development of High Performance Gradient-index Phononic Crystals for Energy Focusing and Harvesting", Nano Energy 103, 107846 (2022)
• "A Study on Dislocation Mechanisms of Toughening in Cu-Graphene Nanolayered Composite", Nano Letters 22, 188 (2022)
• "Adaptive Affine Homogenization Method for Visco-hyperelastic Composites with Interfacial Damage", Applied Mathematical Modelling 107, 72 (2022)
• "Deep Learning Framework for Material Design Space Exploration using Active Transfer Learning and Data Augmentation", npj Computational Materials 7, 140 (2021).
• "Multiscale Modeling Framework to Predict Effective Stiffness of Crystalline-Matrix Nanocomposite", International Journal of Engineering Science 161, 103457 (2021).

Medical Sciences

Convergent Cross Mapping and Distributed Lag Non-Linear Model

Seung Won Lee

Sungkyunkwan University
LSW2920@gmail.com

Education

2008–2011	Electrical and Computer Engineering, Seoul National University
2011–2015	M.D., CHA University School of Medicine
2015–2018	Ph.D. in Medical Science, CHA University

Major Activities

2019–2022	Assistant and Associate Professor, Department Head, Department of Data Science, Sejong University
2022–present	Associate Professor, Sungkyunkwan University School of Medicine
2020–present	Associate Editor, BMC Public Health
2021–present	Member of Young Korean Academy of Science and Technology, Korea

Honors and Awards

2019	Grand Prize of Korea Clinical Datathon, Korea
2019	Grand Prize of MIT Hacking Medicine: CureSPG50, USA
2020	Minister's Commendation, Korea
2020	Award of Data Research, Korean Institute of Information Scientists and Engineers, Korea
2022	Minister's Commendation, Korea
2022	Korea Big Data Award, Korea

Research Interests

Medical Big Data Informatics, Medical AI

Publications

- Physical activity and the risk of SARS-CoV-2 infection, severe COVID-19 illness and COVID-19 related mortality in South Korea: a nationwide cohort study (2022.08, IF 18.5, British Journal of Sports Medicine)
- Predictors of mortality in thrombotic thrombocytopenia after adenoviral COVID-19 vaccination: the FAPIC score (2021.09, IF 35.9, European Heart Journal)
- Association between mental illness and COVID-19 susceptibility and clinical outcomes in South Korea: a nationwide cohort study (2020.09, IF 77.1, Lancet Psychiatry)
- Severe clinical outcomes of COVID-19 associated with proton pump inhibitors: a nationwide cohort study with propensity score matching (2020.07, IF 31.8, Gut)
- Short-term effects of multiple outdoor environmental factors on risk of asthma exacerbations: age-stratified time-series analysis (2019.12, IF 14.3, Journal of Allergy and Clinical Immunology)

Medical Sciences

In-house Machine Learning Platform for Drug Discovery

Mi-hyun Kim

Gachon University
kmh0515@gachon.ac.kr

Education

2000-2004	BS, College of Pharmacy, Seoul National University, Korea
2004-2010	Ph.D., College of Pharmacy, Seoul National University, Korea

Major Activities

2010-2013	Post-Doc. College of Pharmacy, Hanyang University, Korea
2013-2019	Assistant Professor College of Pharmacy, Gachon University, Korea
2019-present	Associate Professor College of Pharmacy, Gachon University, Korea
2013-present	Member of the Pharmaceutical Society of Korea (PSK)
2014-present	Member of the Korean Society for Molecular and Cellular Biology (KSMCB)
2017-present	Member of the Korean Institute of Chemical Engineers (KIChE)
2019-present	Member of the American Chemical Society (ACS)
2019-present	Member of Korean Academy of Science and Technology, Korea
2021-present	Member of the Korean Society of Organic Synthesis (KSOS)
2022-present	Member of the Korean Society for Biochemistry and Molecular Biology (KSBMB)
2022-present	Member of the Korean Society of Applied Pharmacology (KSAP)
2021-present	Associate Editor of Frontiers in Drug Discovery (in In Silico Methods and Artificial Intelligence for Drug Discovery)
2023-present	Associate Editor of Archives of Pharmacal Research (ARPR)

Honors and Awards

2012	Presidential Post-Doc. Fellowship, NRF, Korea

Research Interests

Chemical space, unprecedented drug scaffolds, cheminformatics, machine learning, inverse design, asymmetric catalysis

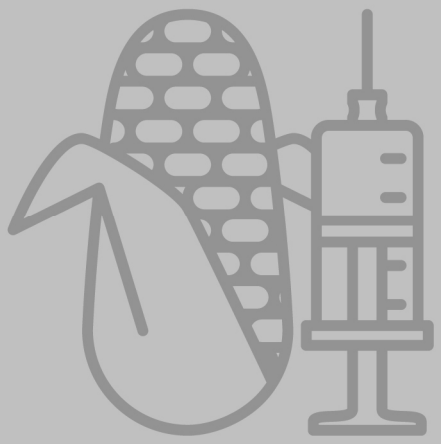
Publications

• *Eur. J. Med. Chem.* **2022,** *227, 113880;*
• *Eur. J. Med. Chem.* **2019,** *163, 453;*
• *Org. Lett.* **2019,** *21, 3098;*
• *J. Cheminformatics* **2022,** *14, 67;*
• *J. Cheminformatics* **2021,** *13, 28*

7

Session

Novel Opportunities for Food Biotechnology




TEST

Agricultural and Fishery

Chair

Tae-Gyu Lim

Sejong University
tglim@sejong.ac.kr

Education

2007-2012 Ph.D., Biotechnology, Department of Bioscience & Biotechnology, Konkuk University, Seoul, South Korea

2003-2007 B.S., Microbiological engineering, Department of Microbiological engineering, Konkuk University, Seoul, South Korea

Major Activities

2003-present Member of Young-Korean Academy of Science and Technology, Korea

2023-present CEO, Xenbio

2023-present Editorial member, Journal of Medicinal Food

2023-present Executive director, The Korean Society of Toxicogenomics and Toxicoproteomics

2021-present Scientific committee member, The Korean Society of Ginseng

2023-present Scientific committee member, Korean Society for Food Science and Animal Resources

2021-2022 Editorial member, Food Science of Animal Resources

Research Interests

Bioactive compound, Cell signaling, Molecular Target, Target identification, Chemical-Protein interaction

Publications

- Ji-Won Seo, Seongin Jo, Young Sung Jung, Mohammad-Al Mijan, Joy Cha, Seungpyo Hong, Sanguine Byun, **Tae-Gyu Lim*** (2023). *Rosa gallica* and its active compound, cyanidin-3,5-O-diglucoside, improve skin hydration via the GLK signaling pathway. Biofactors
- Su Jin Eom, Nam Hyouck Lee, Min-Cheol Kang, Young Ho Kim, **Tae-Gyu Lim***, Kyung-Mo Song (2020). Silk peptide production from whole silkworm cocoon using ultrasound and enzymatic treatment and its suppression of solar ultraviolet-induced skin inflammation. Ultrasonics Sonochemistry 60
- Ahram Han, Jinhyuk Lee, Myung-hee Lee, Sung-Young Lee, Eun Ju Shin, Young-Ran Song, Kwang Min Lee, Ki Won Lee, **Tae-Gyu Lim*** (2019). Sulfuretin, a natural Src family kinases inhibitor for suppressing solar UV-induced skin aging. Journal of Functional Foods 52:442-449

Agricultural and Fishery

The Future of the Food Industry and Its Challenges

Hojae Bae

Konkuk University
hojaebae@konkuk.ac.kr

Education

1995–2001	Genetic Engineering, Korea University, Seoul, Korea
2002–2004	MS, Bioengineering, Korea University, Seoul, Korea
2004–2007	Ph.D., Food Technology, Clemson University, Clemcon, SC, USA

Major Activities

2015–2022	Lecturer, Department of Medicine and Health Sciences and Technology (HST), Brigham and Women's Hospital, Harvard Medical School, Cambridge, USA
2023–present	Full Professor, Department of Stem Cell and Regenerative Biotechnology, KU Convergence Science and Regenerative Biotechnology, Konkuk University

Research Interests

3D Bioprinting, Tissue Engineering. Reusable Biopolymer, Smart Hydrogel

Publications

- D. Jeong, J. W. Seo, H. Lee, W. K. Jung, Y. H. Park, and **Hojae Bae***, Efficient Myogenic/Adipogenic Transdifferentiation of Bovine Fibroblasts in a 3D Bioprinting System for Steak-type Cultured Meat Production, Advanced Science, Published online on 3 Oct 2022, https://doi.org/10.1002/advs.202202877. [IF=17.52]
- Q. T. Che, K. Charoensri, J. W. Seo, M. H. Nguyen, G. Jang, **Hojae Bae***, and H. J. Park*, Triple-conjugated photo-/temperature-/pH-sensitive chitosan with an intelligent response for bioengineering applications, Carbohydrate Polymers, Published online on 2 Sep 2022, https://doi.org/10.1016/j.carbpol.2022.120066. [IF=10.12]
- H. J. Yoon, H. Lee, S. Y. Shin, Y. A. Jodat, H. J. Jhun, W. Lim, J. W. Seo, G. Kim, J. Y. Mun, K. Zhang, K. Wan, S. Noh, Y. J. Park, S. H. Baek, S. R. Shin*, and **Hojae Bae***, Photo-crosslinkable Human Albumin Colloidal Gels Facilitate in vivo Vascular Integration for Regenerative Medicine, ACS Omega, 6(49), 33511-33522 (Dec2021). [IF=3.512]
- J. W. Seo, S. R. Shin, M. Lee, J. M. Cha, K. H. Min, S. C. Lee, S. Y. Shin, and Hojae Bae*, Injectable Hydrogel Derived from Chitosan with Tunable Mechanical Properties via Hybrid-Crosslinking System, Carbohydrate Polymers, 251(117036), 1-12 (Jan2021). [IF=10.12]
- J. W. Seo, S. R. Shin, Y. J. Park, and **Hojae Bae***, Hydrogel Production Platform with Dynamic Movement Using Photo-Crosslinkable/Temperature Reversible Chitosan Polymer and Stereolithography 4D Printing Technology, Tissue Eng Regen Med, 17(4), 423-431 (21May2020). [IF=4.169]

Agricultural and Fishery

Identification of Novel Functional Food Materials

Sanguine Byun

Yonsei University
sanguine@yonsei.ac.kr

Education

2000-2007	B.S., Food Science and Biotechnology / Biology, Seoul National University, Seoul, Korea
2007-2009	M.S., Agricultural Biotechnology, Seoul National University, Seoul, Korea
2009-2012	Ph.D., Agricultural Biotechnology, Seoul National University, Seoul, Korea

Major Activities

2012-2016	Postdoctoral Research Fellow, Harvard Medical School and Massachusetts General Hospital, USA
2016-2020	Assistant Professor, Incheon National University, Korea
2020-2022	Assistant Professor, Yonsei University, Korea
2022-present	Associate Professor, Yonsei University, Korea

Research Interests

Functional foods, bioactive compounds, immunomodulation

Publications

- Kim DH, Jeong M, Kim JH, Son JE, Lee JY, Park S, Lee J, Kim M, Oh JW, Park MS, **Byun S.** Lactobacillus salivarius HHuMin-U activates innate immune defense against norovirus infection through TBK1-IRF3 and NF-κB signaling pathways. *Research*. 2022 Dec; Vol 2022
- Jo S, Samarpita S, Lee JS, Lee YJ, Son JE, Jeong M, Kim JH, Hong S, Yoo SA, Kim WU, Rasool M, **Byun S**. 8-Shogaol Inhibits Rheumatoid Arthritis through Targeting TAK1. *Pharmacological Research*. Volume 178, April 2022, 106176
- Kim JH, Kim DH, Jo S, Cho MJ, Cho YR, Lee YJ, **Byun S**. Immunomodulatory functional foods and their molecular mechanisms. *Experimental & Molecular Medicine.* 2022 Jan;54(1):1-11.
- Cheong Y, Kim M, Ahn J, Oh H, Lim J, Chae W, Yang SW, Kim MS, Yu JE, **Byun S***, Jang YH* and Seong BL*. Epigallocatechin-3-Gallate as a Novel Vaccine Adjuvant. *Frontiers in Immunology*. 2021 Nov 12.;12:769088 (*Co-corresponding authors)
- Shin SH, Lee JS, Zhang JM, Choi S, Boskovic ZV, Zhao R, Song M, Wang R, Tian J, Lee MH, Kim JH, Jeong M, Lee JH, Petukhov M, Lee SW, Kim SG, Zou L, **Byun S**. Synthetic Lethality by Targeting the RUVBL1/2-TTT Complex in mTORC1-Hyperactive Cancer Cells. *Science Advances*. 2020 Jul 31: Vol. 6, no. 31, eaay9131

Agricultural and Fishery

Food Material as a Potential Candidate for Sport Nutrition and Prevention of Sarcopenia

Young Jin Jang

Seoul Women's University
jyj@swu.ac.kr

Education

2003–2007 Bachelor of Science, Food Science and Technology, Seoul National University, Seoul, Republic of Korea

2007–2013 Philosophy of Doctor, Food Science and Biotechnology, Department of Agricultural Biotechnology, Seoul National University, Seoul, Republic of Korea

Major Activities

2010–2012 Harvard Medical School, Department of Cell Biology, Visiting Researcher

2014–2020 Korea Food Research Institute, Senior Researcher

2020–present Seoul Women's University, Assistant Professor

Honors and Awards

2022 Young Scientist Award, Korean Society of Food Science and Nutrition, Korea

2022 Academic Award, BioChip Journal, Korea

Research Interests

Bioactive compound, functional food, sarcopenia, skeletal muscle, molecular mechanism,

Publications

- Ahn J, Kim MJ, Yoo A, Ahn J, Ha TY, Jung CH, Seo HD, **Jang YJ***. Identifying Codium fragile extract components and their effects on muscle weight and exercise endurance. Food Chem. 2021. 353:129463 *Corresponding author
- Ahn J, Son HJ, Seo HD, Ha TY, Ahn J, Lee H, Shin SH, Jung CH, **Jang YJ***. γ-Oryzanol Improves Exercise Endurance and Muscle Strength by Upregulating PPARδ and ERRγ Activity in Aged Mice. Mol Nutr Food Res. 2021. 65(14):e2000652
- Ahn J, Ha TY, Ahn J, Jung CH, Seo HD, Kim MJ, Kim YS, **Jang YJ***. Undaria pinnatifida extract feeding increases exercise endurance and skeletal muscle mass by promoting oxidative muscle remodeling in mice. FASEB J. 2020. 34(6):8068-8081
- **Jang YJ***, Ahn J, Son HJ, Jung CH, Ahn J, Ha TY*. Hydrangea serrata Tea Enhances Running Endurance and Skeletal Muscle Mass. Mol Nutr Food Res. 2019. 63(17):e1801149
- **Jang YJ**, Son HJ, Kim JS, Jung CH, Ahn J, Hur J, Ha TY. Coffee consumption promotes skeletal muscle hypertrophy and myoblast differentiation. Food & Function. 2018. 9(2):1102-1111.

Agricultural and Fishery

Improvement of Meat Quality

Samooel Jung

Chungnam National University
samooel@cnu.ac.kr

Education

2001-2008	B.Sc., Animal Science, Chungnam National University, Korea
2008-2010	M.Sc., Meat Science, Chungnam National University, Korea
2010-2013	Ph.D., Meat Science Chungnam National University, Korea

Major Activities

2014-present	Professor for Meat Science, Chungnam National University, Korea
2022-present	Member of Young Korean Academy of Science and Technology, Korea

Research Interests

Digestibility of protein and lipid, Prediction of meat quality, Development of natural sources for replacements of food additives.

Publications

• Prediction of cooking loss of pork belly using quality properties of pork loin. 2022. Meat Science
• Freezing-induced denaturation of myofibriilar proteins in frozen meat. 2022. Critical Reviews In Food Science and Nutrition
• Improvement of meat protein digestibility in infants and the elderly. 2021. Food Chemistry
• Freezing-then-aging treatment improved the protein digestibility of beef in an in vitro infant digestion model. 2021. Food Chemistry
• No mutagenicity and oral toxicity of winter mushroom powder treated with atmospheric non-thermal plasma. 2021. Food Chemistry

Agricultural and Fishery

Structural and Functional Divergence of Transcription Factors in Plants

Seungill Kim

University of Seoul
ksi2204@uos.ac.kr

Education

2002–2008	B. S. in Department of Statistics, University of Seoul, Korea
2009–2015	Ph.D. in Interdisciplinary Program in Agricultural Biotechnology, Seoul National University, Korea

Major Activities

2015–2019	Research assistant professor of Plant Genomics and Breeding Institute (PGBI) in Seoul National University, Korea
2019–present	Assistant professor of Dept. of Environmental Horticulture in University of Seoul

Honors and Awards

2015	The Deputy Prime Minister & Minister of Education Citation (Feb. 2015)
2016	Takara Excellence Thesis Awards given by KSMCB (Oct. 2016)
2019	The 5th Hahn Kwang Ho Agriculture Prize (Jan. 2019)

Research Interests

Plant genomics, bioinformatics, genome evolution, comparative genomics, genome-based breeding

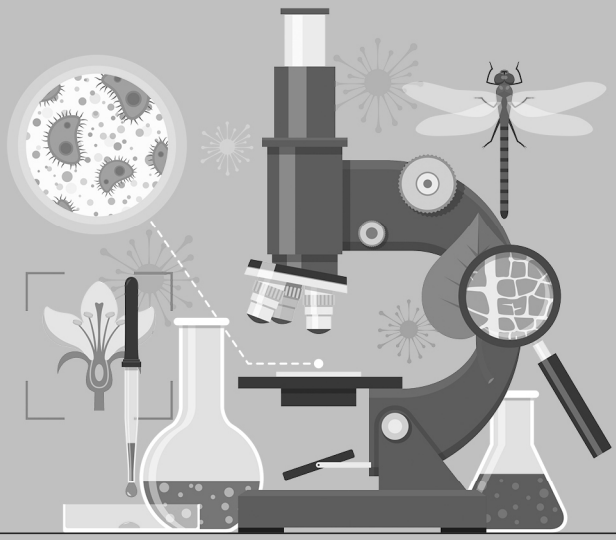
Publications

- Ji-Yoon Guk, Min-Jung Jang, Jin-Wook Choi, Yeon-Mi Lee and **Seungill Kim.**, De novo phasing resolves haplotype sequences in complex plant genomes, Plant biotechnology journal. doi: 10.1111/pbi.13815 (2022).
- Geun Young Chae, Woo-Jong Hong, Min-Jung Jang, Ki-Hong Jung and **Seungill Kim.**, Recurrent mutations promote widespread structural and functional divergence of MULE-derived genes in plants, Nucleic acids research. doi: 10.1093/nar/gkab932 (2021).
- **Seungill Kim** et al. TGFam-Finder: a novel solution for target-gene family annotation in plants. New phytologist, 227(5):1568-1581. (2020).
- **Seungill Kim** et al. New reference genome sequences of hot pepper reveal the massive evolution of plant disease-resistance genes by retroduplication. Genome biology 18(1):210, doi: 10.1186/s13059-017-1341-9 (2017).
- **Seungill Kim** et al. Genome sequence of the hot pepper provides insights into the evolution of pungency in Capsicum species. Nature genetics 46, 270-278 (2014). Cover page

8

Session

Innovations in Biomedical Research



Medical Sciences

Chair

Seunghee Lee

Seoul National University
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Education

1997-2001	B.S. in Pharmacy, Chonnam National University, Korea
2003-2006	Ph.D., Molecular and Cellular Biology, Baylor College of Medicine, Houston, Texas, USA

Major Activities

2006-2012	Postdoctoral Associate, Baylor College of Medicine, Houston, Texas; Oregon Health and Science University, Portland, Oregon, USA
2012-Present	Assistant, Associate, Professor, College of Pharmacy, Seoul National University, Seoul, Korea

Honors and Awards

2012	POSCO TJ Park Science Fellowship, POSCO, Korea
2013	L'Oreal Korea-UNESCO For Women in Science Fellowship
2013	Frontier Science Award, The Korean Academy of Science and Technology
2017	BLUE Ribbon Lectureship, KSMCB
2017	Young Pharmacologist Award, The Pharmaceutical Society of Korea

Research Interests

Gene regulatory networks, epigenetic regulation, neuronal differentiation, cell fate specification, hypothalamic arcuate neurons, metabolic syndrome

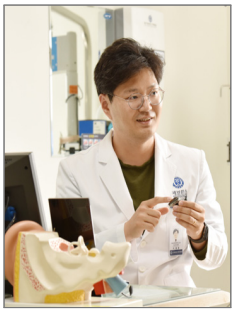
Publications

• Huisman C, Kim YA, Jeon S,Shin B, Choi J, Lim SJ, Youn SM, Park Y, Medha K C, Kim S, Lee SK, **Lee S***, Lee JW*. The histone H3-lysine 4-methyltransferase Mll4 regulates thedevelopment of growth hormone-releasing hormone-producing neurons in the mousehypothalamus. ***Nature Communications***, 2021 Jan 11;12(1):256.

• Nam H, Jeon S, An H, Yoo J, Lee HJ, Lee SK, **Lee S***. Critical roles ofARHGAP36 as a signal transduction mediator of Shh pathway in lateral motorcolumnar specification. ***Elife***. 2019 Jul 15;8. pii: e46683.

• Kim J, Lee B, Kim DH, YeonJG, Lee J, Park Y, Lee Y, Lee SK, **Lee S***, Lee JW*. UBE3A suppresses overnutrition-induced expression ofthe steatosis target genes of MLL4 by degrading MLL4. ***Hepatology***. 2019 Mar;69(3):1122-1134

Medical Sciences



Multi-disciplinary Research for Treatments of Hearing Loss

Young Joon Seo

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Education

2000.3-2011.2 M.D and Resident in Otorhinolarynoglogy in Severance Hospital, Yonsei University College of Medicine, shinchon, Seoul , Korea
2008.3-2009.2 Ms, The Graduate school, Yonsei University, Seoul, Korea
2009.3-2015.2 Ph.D., The Graduate school, Yonsei University, Seoul, Korea

Major Activities

2015.3-Present Associate Professor in Department of Otorhinolaryngology, Yonsei Wonju University College of Medicine, Wonju, Korea
2015.7-Present Managing Editor in Journal of audiology and otology The Korean audiological society, Korea
2019.1-Present Director of the Korean Hearing Reference Center (National designated unique center), Korea
2015.3-Present Director of Research Institute of Hearing Enhancement (SmileSnail.com), Korea

Honors and Awards

2019 Prize of Korea Industry minister “Best Medical Industry Contribution”

Research Interests

Stem cell therapy, Exosome therapy, Big Data, AI, VR

Publications

- Park DJ, Park JE, Lee SH, Eliceiri BP, Choi JS, Seo YJ. Protective effect of MSC-derived exosomes against cisplatin-induced apoptosis via heat shock protein 70 in auditory explant model. Nanomedicine. 2021 Jul 25;38:102447
- Park JE, Seo YJ. Protection of Hearing Loss in Ototoxic Mouse Model Through SPIONs and Dexamethasone-Loaded PLGA Nanoparticle Delivery by Magnetic Attraction. Int J Nanomedicine. 2022 Dec 13;17:6317-6334.
- Ahn YJ, Park DJ, Park JE, Key J, Seo YJ. Biodistribution of poly clustered superparamagnetic iron oxide nanoparticle labeled mesenchymal stem cells in aminoglycoside induced ototoxic mouse model. Biomed Eng Lett. 2021 Jan 8;11(1):39-53.
- Park YS, Jeon JH, Kong TH, Chung TY, Seo YJ. Deep learning techniques for ear diseases based on segmentations of normal tympanic membrane. Clin Exp Otorhinolaryngol. 2022 Oct 31.
- Lee J, Lee JH, Yoon C, Kwak C, Ahn JJ, Kong TH, Seo YJ. Relationship between Nutrient Intake and Hearing Loss According to the Income Level of Working-Aged Adults: A Korean National Health and Nutrition Survey. Nutrients. 2022 Apr 15;14(8):1655.

Medical Sciences

Sleep Digital Transformation

Hyun-Woo Shin

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Education

1998-2004	M.D., Seoul National University College of medicine
2007-2009	M.S., Seoul National University College of medicine, Otorhinolaryngology
2009-2012	Ph.D., Seoul National University Graduate School, Biomedical sciences

Major Activities

2005-2009	Resident, Seoul National University Hospital, Department of Otorhinolaryngology
2017-2019	Visiting Faculty, Stanford University School of Medicine
2014	Certified Physician for BioMedical Informatics (CPBMI), Korean Society of Medical Informatics
2020-present	Director of Korean Society of Sleep Medicine, Korea
2014-present	A/Prof. for Biomedical Sciences, Seoul National University College of Medicine
2014-present	A/Prof. for Otorhinolaryngology, Seoul National University Hospital, Korea
2022-present	Vice Dean of Research Affairs, Seoul National University College of Medicine

Honors and Awards

2017	The 27th Wunsch Medical Award from Korean Medical Association (Young Medical Scientist Prize)
2012	Young Investigator Award for excellent research in basic medicine from Korean Medical Association

Research Interests

Sleep, Upper Airway Biology, Chronic Rhinosinusitis, Obstructive Sleep Apnea, AI

Publications

- DEP-induced ZEB2 promotes nasal polyp formation via epithelial-to-mesenchymal transition. Journal of Allergy and Clinical Immunology 2022 (corresponding)
- Bone morphogenetic protein-2 as a novel biomarker for refractory chronic rhinosinusitis with nasal polyps. Journal of Allergy and Clinical Immunology 2021 (co-corresponding)
- Effects of Wnt signaling on epithelial to mesenchymal transition in chronic rhinosinusitis with nasal polyp. Thorax. 2020;75:982-993. (co-corresponding)
- α-Helical cell-penetrating peptide-mediated nasal delivery of resveratrol for inhibition of epithelial-to-mesenchymal transition. J Control Release. 2020 Jan 10;317:181-194. (co-corresponding)
- Interleukin (IL)-13 and IL-17A contribute to neo-osteogenesis in chronic rhinosinusitis by inducing RUNX2. EBioMedicine. 2019 Aug;46:330-341. (co-corresponding)

Medical Sciences

Dynamic Regulation of GPCR Signaling

Ka Young Chung

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kychung2@skku.edu

Education

1997–2001	B.Pharm., Seoul National University, Seoul, Korea
2001–2003	M.Pharm., Seoul National University, Seoul, Korea
2003–2008	Ph.D., Molecular and Cellular Pharmacology, University of Wisconsin-Madison, USA

Major Activities

2008–2011	Postdoc, Molecular and Cellular Physiology, Stanford University, CA, USA (Brian Kobilka lab)
2012–2023	Assistant/Associate Professor, School of Pharmacy, Sungkyunkwan University, Korea
2017–present	Member of Young Korean Academy of Science and Technology, Korea
2023–present	Professor, School of Pharmacy, Sungkyunkwan University, Korea

Honors and Awards

2021	Next Generation Scientist, S-oil, Korea
2019	Basic Researcher of the Year, Ministry of Science and ICT
2019	Next Generation Pharmaceutical Scientist, The Pharmaceutical Society of Korea
2017	Young Academy Award, The Korean Society of Applied Pharmacology

Research Interests

Structural mechanism of cellular signaling, G protein-coupled receptor signaling, Target site identification

Publications

- Qu C, Park JY, Yun MW, Yang F, He Q, Kim K, Ham D, Li R, Iverson TM, Gurevich VV, Sun, JP*, **Chung KY***. Scaffolding mechanism of arrestin-2 in cRaf/MEK1/ERK signaling cascade. ***Proceedings of the National Academy of Science USA***. 2021:118(37):e2026491118. doi: 10.1073/pnas.2026491118
- Kim HR, Xu J, Maeda S, Duc NM, Ahn D, Du Y*, and **Chung KY***. Structural mechanism underlying primary and secondary coupling between GPCRs and the Gi/o family. ***Nature Communications***. 2020:11:3160. doi: 10.1038/s41467-020-16975-2
- Du Y, Duc NM, Rasmussen SGF, Hilger D, Kubiak X, Wang L, Bohon J, Kim HR, Wegrecki M, Asuru A, Jeong KM, Lee JM, Chance MR, Lodowski DT*, Kobilka BK*, **Chung KY***. Assembly of a GPCR-G protein complex. ***Cell***. 2019:177(5):1232-1242.e11. doi: 10.1016/j.cell.2019.04.022
- Bang I, Kim HR, Beaven AH, Kima J, Ko SB, Lee GR, Lee H, Im W, Seok C, **Chung KY***, Choi H-J*. Biophysical and functional characterization of Norrin signaling through Frizzled4. ***Proceedings of the National Academy of Science USA***. 2018:115(35):8787-8792. doi: 10.1073/pnas.1805901115

Natural Sciences

From Gene Regulation to Beyond: The Emerging Role of 3D Genome

Inkyung Jung

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ijung@kaist.ac.kr

Education

2002–2006	B.S., Biosystems, Korea Advanced Institute of Science and Technology (KAIST)
2006–2011	Ph.D., Bio and Brain Engineering, KAIST

Major Activities

2016–present	Member of Korea Genome Organization
2016–present	Member of Korean Society for Bioinformatics
2016–present	Member of Korean Society for Biochemistry and Molecular Biology
2016–present	Member of Korean Society for Molecular and Cellular Biology
2021–present	IEEE BIBM Program Committee member
2023–present	Member of Young Korean Academy of Science and Technology
2016–2020	Assistant professor, Department of Biological Sciences at KAIST, Korea
2020–present	Associate professor, Department of Biological Sciences at KAIST, Korea

Honors and Awards

2021	Macrogen Young Bioinformatician Award
2020	Appointed as Kwon Oh-Hyun Endowed Chair Professor
2018	SUHF Science Foundation Fellowship
2018	POSCO TJ Park Science Fellowship for Junior Faculty
2015	Keystone symposia travel awards
2013	American Heart Association Fellowship
2011	Excellence Award (Best paper) of 2011 Creative Research Paper

Research Interests

Epigenetic gene regulation, 3D genome organization, Single-cell omics

Publications

- Lee A, Kim C, Park S, Jun K, Eom J, Lee S-J, Chung SJ, Rissman RA, Chung J, Masliah E, **Jung I (2023)** Characterization of altered molecular mechanisms in Parkinson's disease through cell type-resolved multi-omics analyses. **Sci Adv.** (accepted)
- Joo J, Cho S, Hong S, Min S, Kim K, Kumar R, Choi JM, Shin Y, **Jung I (2023)** Probabilistic establishment of speckle-associated interchromosomal interactions, **Nucleic Acids Res.** (accepted).
- Kim K,Jang I, Kim M, Choi J, Kim MS, Lee B, **Jung I (2021)** 3DIV Update for 2021: a comprehensive resource of 3D genome and 3D cancer genome. **Nucleic Acids Res**. Jan 8;49(D1):D38-D46
- Lee JS,Park S, Jeong HW, Ahn JY, Choi SJ, Lee H, Choi B, Nam SK, Kwon JS, Jeong SJ,Lee HK, Park SH, Park SH, Choi JY#, Kim SH#, **Jung I#**, Shin EC#**(2020)** Immunophenotyping of COVID-19 and influenza highlights the role of type I interferons in development of severe COVID-19. **Sci Immunol.** Jul 10;5(49)
- **Jung I#**, Schmitt A, Diao Y, Lee AJ, Liu T, Yang D, Tan C, Eom J, Chan M, Chee S,Chiang Z, Kim C, Masliah E, Barr CL, Li B, Kuan S, Kim D, Ren B#.**(2019)** A Compendium of Promoter-Centered Long-Range Chromatin Interactions in the Human Genome. **Nat Genet.** Oct;51(10):1442-1449

Medical Sciences

Accurate Identification of Genomic Variants

Sangwoo Kim

Yonsei University
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Education

1998–2002	B,S. Computer Science (minor: Biology Science), KAIST, Daejeon, South Korea
2002–2004	M.S. Bio and Brain Engineering, KAIST, Daejeon, South Korea
2005–2010	Ph.D., Bio and Brain Engineering, KAIST, Daejeon, South Korea

Major Activities

2010–2013	Postdoc Research Associate (PI: Vineet Bafna), UC San Diego, U.S.
2014–present	Assistant/Associate Professor, Yonei University College of Medicine
2014–present	Bioinformatics Director, Yonsei Genomics Center
2022–2023	Visiting Scholar, Dept. of Neuroscience (Host. Dr. Joseph Gleeson), UC San Diego

Honors and Awards

2019	Top 5 Biomedical Research, BRIC, Korea
2019	KSBI Macrogen Young Bioinformatics Scientist Award
2020	Young Research Award, Yonsei University College of Medicine
2021	Excellent Research Award, Yonsei University College of Medicine
2022	Excellent Research Award, Yonsei University

Research Interests

Genomics, Bioinformatics, Somatic mutation, Mosaicism, Variant analysis, Variant Calling

Publications

- Kim JH, et al, **Kim S***. Genomic and transcriptopic characterization of heterogeneous immune subgroups of microsatellite instability-high colorectal cancers, **Journal for Immunotherapy of Cancer** 2021; 9: e0033414
- Kim T-M et al, **Kim S***, Cross-species Oncogenic Signatures of Breast Cancer in Canine Mammary Tumors, **Nature Communications** 2020, 11, 3616
- Jo S-Y, Kim E and **Kim S***, Impact of mouse contamination in genomic profiling of patient-derived models and best practice for robust analysis, **Genome Biology** 2019, 20:231
- Kim J et al, **Kim S***, The use of technical replication for detection of low-level somatic mutations in next-generation sequencing, **Nature Communications** 2019, 10, 1047
- Kim S, et al, **Kim S***, Neopepsee: accurate genom-level prediction of neoantigens by harnessing sequence and amino acid immunogenicity information, **Annals of Oncology** 2018, 29(4):1030-1036

Medical Sciences

Better Understanding the Skin Microbiome

Hei Sung Kim

The Catholic University of Korea
hazelkimhoho@gmail.com

Education

1997–2003	School of Medicine, The Catholic University of Korea, Seoul, Korea
2004–2008	Dermatology Resident, The Catholic Medical Center
2011	Ph.D. in Dermatology, The Catholic Graduate School

Major Activities

2018–	Professor, Department of Dermatology, The Catholic University of Korea
2019–2021	Visiting Researcher, The Itch Center, Philip Frost Department of Dermatology, The University of Miami, USA
2021–	Chair, Department of Dermatology, Incheon St. Mary's Hospital
Current	Board Member of the Korean Society of Dermatologic Laser Surgery, the Korean Society of Acne and Rosacea, the Korean Society of Cosmetics, the Korean Society of Itch, the Korean Society of Skin Barrier, the Korean Society for Investigative Dermatology

Research Interests

Itch, Skin microbiome, Acne, Rosacea, Laser and Light Therapy, Cosmetics, Anti-aging, Hair loss

Medical Sciences

PHR (Personal Health Record)-based KM (Korean Medicine)-CDSS (Clinical Decision Support System) "Ye-Jin"

Woong Mo Yang

Kyung Hee University
wmyang@khu.ac.kr

Education

1997–2003	B.S., College of Korean Medicine, Kyung Hee University, Seoul, Korea
2003–2005	M.S., College of Korean Medicine, Kyung Hee University, Seoul, Korea
2005–2007	Ph.D., College of Korean Medicine, Kyung Hee University, Seoul, Korea

Major Activities

2007–2008	Postdoc., Burnham Institute for Medical Research, San Diego, CA, USA
2016–2017	Director of Academic Affairs, The Association of Korean Medicine, Korea
2008–present	Professor, College of Korean Medicine, Kyung Hee University, Seoul, Korea
2013–present	Expert member, ISO/TC249
2023–present	President, Academy of Convergence Korean Medicine, Korea

Honors and Awards

2007	Award for Excellence in Doctoral Thesis, Kyung Hee University, Korea
2019	Certificate for developing the ISO standard (ISO/TC249)

Research Interests

Korean Medicine, Herbal drug development, bioinformatics, digital health

Publications

- Exploring the Potential Effects and Mechanisms of Asarum sieboldii Radix Essential Oil for Treatment of Asthma. Han JM, Kim MH, Choi Y, Kim G, Yang WM. Pharmaceutics. 2022 Mar 3;14(3):558.
- Efficacy and mechanism of essential oil from Abies holophylla leaf on airway inflammation in asthma: Network pharmacology and in vivo study. Park N, Park SJ, Kim MH, Yang WM. Phytomedicine. 2022 Feb;96:153898.
- Ameliorative effects of Osteo-F, a newly developed herbal formula, on osteoporosis via activation of bone formation. Lee H, Kim MH, Choi Y, Yang WM. J Ethnopharmacol. 2021 Mar 25;268:113590.
- Palmul-Tang, a Korean Medicine, Promotes Bone Formation via BMP-2 Pathway in Osteoporosis. Choi Y, Kim MH, Nam YK, Kim JH, Cho HY, Yang WM. Front Pharmacol. 2021 Mar 26;12:643482.

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Session

Energy & Environment for Sustainable Future

Engineering

Chair

Yong-Mook Kang

Korea University
dake1234@korea.ac.kr

Education

1995-1999	B. S. in Department of Materials Science and Engineering(DMSE), Korea Advanced Institute of Science and Technology (KAIST), Republic of Korea.
1999-2001	M. S. in DMSE, KAIST, Republic of Korea
2001-2004	Ph. D. in DMSE, KAIST, Republic of Korea.

Major Activities

2018-2019	Visiting Scholar, Lawrence Berkeley National Lab., US
2019-present	Full Professor, DMSE, Korea University, Republic of Korea
2021-present	Editor-in-Chief, Battery Energy, Wiley

Honors and Awards

2015-present	Fellow and Representative of Korea, RSC(Royal Society of Chemistry), UK

Research Interests

Nucleation and growth dynamics of particles, Secondary batteries, Energy storage materials

Publications

- **Yong-Mook Kang*** et al, "Regulating Pseudo-Jahn-Teller Effect and Superstructure in Layered Cathode Materials for Reversible Alkali-Ion Intercalation", *Journal of the American Chemical Society, Vol. 144 (2022), P. 7929.*
- **Yong-Mook Kang*** et al, "Activating a Multielectron Reaction of NASICON-Structured Cathodes toward High Energy Density for Sodium-Ion Batteries", *Journal of the American Chemical Society, Vol. 143 (2021), P. 18091.*
- **Yong-Mook Kang*** et al, "Reversible Anionic Redox Activities in Conventional LiNi1/3Co1/3Mn1/3O2 Cathodes", *Angewandte Chemie Int. Ed., Vol. 59 (2020), P. 8681.*
- **Yong-Mook Kang*** et al, "Triggered Reversible Phase Transformation between Layered and Spinel Structure in Mn-based layered compounds", *Nature Communications, Vol. 10 (2019), p. 3385.*
- **Yong-Mook Kang*** et al, "Critical design factors for kinetically favorable P-based compounds toward the alloying with Na ions for high-power sodium-ion batteries", *Energy & Environmental Science, Vol. 12 (2019), p. 1326.*

Natural Sciences

Energy Cascade and Dissipation based on Remotely Sensed Ocean Turbulence

Sung Yong Kim

KAIST
syongkim@kaist.ac.kr

Education

1995–1999	B.A. Naval Architecture and Ocean Engineering, Seoul National University, Seoul, Republic of Korea
2003–2009	Ph.D., Scripps Institution of Oceanography, University of California, San Diego, La Jolla, CA USA

Major Activities

2015–2020	Advisory Panel Co-Chair, North Pacific Coastal Ocean Observing Systems (AP-NPCOOS), North Pacific Marine Science Organization
2016–present	Pool of Experts and Writing Team, United Nations World Ocean Assessment
2017–present	Member and Alumni of Young Korean Academy of Science and Technology
2019–present	Chair, MONITOR Committee, North Pacific Marine Science Organization
2021–present	Associate Editor, Frontiers in Marine Science (Coastal Ocean Processes)

Honors and Awards

2016	30 Young Scientists to brighten Korea in Natural Sciences (Oceanography), Pohang Un iversity of Science and Technology & The Dong-A Ilbo, Korea
2019	Excellence Award of Marine and Fisheries Science and Technology Grand Award, Ministry of Oceans and Fisheries, Korea
2020	Top 50 Best Science Books of the Year 2020: Coffee and the Ocean, Ministry of Science and Information and Communication Technology and Korea Foundation for the Advancement of Science and Creativity, Korea
2020	Sejong Academic Book Award: Coffee and the Ocean, Publication Industry Promotion Agency of Korea, Korea

Research Interests

Geophysical Ocean Turbulence, Statistical Data Analysis, Coastal Ocean Observing System

Publications

• Lee, E. A. and S. Y. Kim, 2018: Regional variability and turbulent characteristics of the satellite-sensed submesoscale surface chlorophyll concentrations, J. Geophys. Res. Oceans 123(6), 4250 – 4279, doi:10.1002/2017JC013732

Engineering

Advanced Redox Technology (ART) for Water and Wastewater Treatment

Changha Lee

Seoul National University
leechangha@snu.ac.kr

Education

1997–2001	B.S., Chemical and Biological Engineering, Seoul National University, Seoul, Republic of Korea
2001–2007	Ph.D., Chemical and Biological Engineering, Seoul National University, Seoul, Republic of Korea

Major Activities

2005–2006	Visiting Scientist, Swiss Federal Institute for Aquatic Science and Technology (EAWAG), Zurich, Switzerland
2007–2009	Postdoctoral Fellow, Department of Civil and Environmental Engineering, University of California, Berkeley, CA, USA
2009–2018	Assistant/Associate/Full Professor, School of Urban and Environmental Engineering, Ulsan National Institute of Science and Technology (UNIST), Ulsan, Republic of Korea
2018–present	Associate/Full Professor, School of Chemical and Biological Engineering, Seoul National University, Seoul, Republic of Korea

Honors and Awards

2013	The Award for Excellence in Environmental Technology, Korea Environmental Industry and Technology Institute, Republic of Korea
2021	Scientist of the Month Award, Ministry of Science and ICT, Republic of Korea
2021	K-water Academic Award, K-water, Republic of Korea
2022	JSWE-IDEA Water Environment International Exchange Award, Japan Society on Water Environment, Japan

Research Interests

Environmental engineering, Water and wastewater treatment, Advanced Oxidation Processes (AOPs), Water chemistry, Disinfection

Publications

• Water Res., 2020, 169, 115230
• Water Res., 2020, 184, 116172
• Environ. Sci. Technol., 2021, 54, 15424–15432.
• Environ. Sci. Technol., 2021, 55, 709–718.
• Water Res., 2021, 201, 117338

Natural Sciences

Electrochemical CO2 Conversion Catalyst for Green Carbon Cycle

Yun Jeong Hwang

Seoul National University
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Education

1999–2003	B.S., Korea Advanced Institute of Science and Technology(KAIST), Daejeon, Korea
2003–2005	M.S., (KAIST), Daejeon, Korea
2006–2012	Ph.D., University of California, Berkeley, California, USA

Major Activities

2021–present	Associate Professor, Chemistry Department, Seoul National University, Korea
2012–present	Associate Editor, Journal of Materials Chemistry A, Royal Society of Chemistry
2012–2021	Researcher/Senior Researcher/ Principal Investigator, Korea Institute of Science and Technology, Seoul, Korea

Honors and Awards

2023	Women Scientists at the Forefront of Energy Research selected by ACS Energy Letter
2020	Top 100 National R&D Award, Project Investigator Yun Jeong Hwang, Korean Government, Ministry of Science and Technology information and communication, Korea (2020. 10. 29)

Research Interests

Electrocatalyst, Nanoparticle, CO2 conversion, Water splitting, Solar fuel

Publications

- Kim, Hyunsung Jang, and **Yun Jeong Hwang***, et al. “Insensitive cation effect on single-atom Ni catalyst allows selective electrochemical conversion of captured CO2 in universal media” *Energy Environ.* Sci. 2022, 15, 4301.
- Woong Choi, and **Yun Jeong Hwang***, et al. “Origin of Hydrogen Incorporated into Ethylene during Electrochemical CO2 Reduction in Membrane Electrode Assembly” *ACS Energy Lett.* **2022**. 7, 3, 939–945.
- Kim, Y.+; Par, S.+; S, Kim, W.*; **Hwang, Y. J.***, et al. “Time-resolved observation of C–C coupling intermediates on Cu electrodes for selective electrochemical CO_2 reduction” *Energy Environ. Sci.* **2020**, 13, 4301–4311.
- Jung, H; and **Hwang, Y. J.*** et al. *J. Am. Chem. Soc.* **2019**, 141, 4624–4633.
- Lee, S. Y. and Hwang, Y. J.* et al. *J. Am. Chem. Soc.* **2018**, *140*, 8681–8689.

Engineering

Monolayer Transfer of Single-Crystalline Ruddlesden-Popper Perovskite for Two-Dimensional Opto-Electronic Devices

Yun Seog Lee

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Education

1999–2006	B.S. in Mechanical Engineering, Seoul National University, Korea
2006–2007	M.S. in Mechanical Engineering, Stanford University, USA
2007–2013	Ph.D. in Mechanical Engineering, Massachusetts Institute of Technology, USA

Major Activities

2013–2014	Postdoctoral Research Associate, Massachusetts Institute of Technology, USA
2014–2017	Research Staff Member, IBM T. J. Watson Research Center
2017–present	Associate Professor, Seoul National University, Korea

Honors and Awards

2017	IBM Invention Plateau Award, IBM Corporation, USA
2016	IBM Research Outstanding Accomplishment Award, IBM Corporation, USA

Research Interests

Compound Semiconductor Devices; Thin-Film Mechanics and Processes; Defect Engineering; Energy Conversion Devices

Publications

- $Cu_2ZnSnSe_4$ thin-film solar cells by thermal co-evaporation with 11.6% efficiency and improved minority carrier diffusion length, *Advanced Energy Materials* 5.7 (2015): 1401372.
- Atomic layer deposited gallium oxide buffer layer enables 1.2 V open-circuit voltage in cuprous oxide solar cells, *Advanced Materials* 26.27 (2014): 4704-4710.
- Ultrathin amorphous zinc–tin–oxide buffer layer for enhancing heterojunction interface quality in metal–oxide solar cells, *Energy & Environmental Science* 6.7 (2013): 2112-2118.
- Investigation of defect-tolerant perovskite solar cells with long-term stability via controlling the self-doping effect, *Advanced Energy Materials* 11.17 (2021): 2100555.
- Vertical Metal-Oxide Electrochemical Memory for High-Density Synaptic Array Based High-Performance Neuromorphic Computing, *Advanced Electronic Materials* 8.8 (2022): 2200378.

Engineering

Microbial Biotechnology Towards Environmental Sustainability

Sukhwan Yoon

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Education

1999–2006	B.S.E., Civil, Urban, and Geosystem Engineering, Seoul National University
2006–2008	M.S.E. Environmental Engineering, University of Michigan
2008–2010	Ph.D, Environmental Engineering, University of Michigan

Major Activities

2010–2011	Postdoctoral Fellow, Department of Biogeochemistry, Max Planck Institute for Terrestrial Microbiology, Marburg, Germany
2011–2014	Postdoctoral Fellow, Department of Microbiology, University of Tennessee, Knoxville, Tennessee, US
2014–present	Assistant / Associate Professor, Department of Civil and Environmental Engineering, KAIST, Daejeon, Korea

Honors and Awards

2021	KAIST Technology Innovation Award

Research Interests

Microbial Ecology, biogeochemistry, nitrogen cycle, greenhouse gas emission reduction technology, Water and wastewater engineering, metagenomics and metatranscriptomics

Publications

- Han, H., Kim, D.D., Song, M.J., Yun, T., Yoon, H., Lee, H.W., Kim, Y.M., Laureni, M., Yoon, S.* (2023) Biotrickling filtration for the reduction of N2O emitted during wastewater treatment: results from a longterm *in-situ* pilot-scale testing. *Environ. Sci. Technol.* 57:3883-92.
- Kim, D.D., Han, H., Yun, T., Song, M.J., Terada, A., Laureni, M., Yoon, S.* (2022) Identification of high affinity N2O reducers in microaerobic chemostat consortia dominated by an uncultured *Burkholderiales*. *ISME J.* 16:2087-98.
- Yoon, H., Song, M. J., Kim, D. D., Sabba, F., Yoon, S.* Serial biofiltration system for effective removal of low-concentration nitrous oxide in oxic gas streams. *Environ. Sci Technol.* 53:2063-74.
- Chang, J., Park, D., Semrau, J.D., Gu, W., DiSpirito A.A., Yoon, S.* (2018) Methanobactin from Methylosinus trichosporium strain OB3b inhibits N2O reduction in denitrifiers. *ISME J.* 12:2086-9.
- Yoon, S., Sanford, R., Cruz-Garcia, C., Ritalahti, K.M., and Löffler, F.E.* (2015) Denitrification versus ammonification: environmental controls of two competing respiratory nitrate/nitrite reduction pathways in Shewanella loihica strain PV-4. *ISME J.* 9:1093-104.

Invited Speaker

Towards Computational High-Throughput Screening of Electrocatalysts

Stefan Ringe

Korea University
sringe@korea.ac.kr

Education

2004–2013	B.Sc. and M.Sc. in Chemistry, Georg-August University of Göttingen
2013–2017	PhD in Theoretical Chemistry, Technical University of Munich

Major Activities

2017–2019	Postdoctoral research scholar, Stanford University (Jens K. Nørskov)
2019–2020	Postdoctoral research scholar, KAIST (Hyungjun Kim)
2020–2022	Assistant Professor at the Department of Energy Science & Engineering, DGIST
2022–	Assistant Professor at the Department of Chemistry, Korea University
2022–	Research fellow at the Institute for Basic Science (IBS Center of Molecular Spectroscopy and Dynamics), Korea University

Research Interests

Computational electrochemistry, multi-scale modeling, machine learning

Publications

S. Hong *et al., Adv. Mater.* **35**, e2208996 (**2023**)
S. Ringe *et al., Chem. Rev.* **122**, 10777-10820 (**2022**)
S. Ringe *et al., Nat. Commun.* **11**, 1-11 (**2020**)
C. Xia *et al., Nature Catalysis* **3**, 125-134 (**2020**)

10
Session

Next Electronic Materials

Engineering

Chair

Soo Young Kim

Korea University
sooyoungkim@korea.ac.kr

Education

1995-2001	Bachelor, Materials Science and Engineering, POSTECH, Pohang, South Korea
2001-2003	Master, Materials Science and Engineering, POSTECH, Pohang, South Korea
2003-2007	Ph.D., Materials Science and Engineering, POSTECH, Pohang, South Korea

Major Activities

2007-2009	Post Doc., Department of Chemistry, Georgia Institute of Technology, USA
2009-2019	Professor, Chemical Engineering and Materials Science, Chung-Ang University
2015-2016	Visiting Scholar, Department of Chemistry, University of Chicago
2018-2021	Steering Committee of Young Korean Academy of Science and Technology, Korea
2019-present	Professor, Department of Materials Science and Engineering, Korea University, Korea

Honors and Awards

2022	Minister's Commendation, Ministry of Science and ICT, Korea
2021	Electronic & informative materials' award, The Korean Institute of Metals and Materials, Korea

Research Interests

Organic light emitting diodes, Organo/inorgano halide perovskite materials, Catalysts, Hydrogen evolution reaction, CO2 reduction

Publications

- "Transition metal ions doping on ZIF-8 for enhancing the electrochemical CO2 reduction reaction", accepted at **Advanced Materials** (2023).
- "Full-color active-matrix organic light-emitting diode display on human skin based on a large-area MoS2 backplane", **Science Advances**, vol. 6, eabb5898 (1-6) (2020).
- "Flexible active-matrix organic light-emitting diode display enabled by MoS2 thin-film transistor", **Science Advances**, vol. 4, p.eaas8721 (2018).
- "Polarized light-emitting diodes based on patterned MoS2 nanosheet hole transport layer", **Advanced Materials**, vol. 29, p.1702598 (2017).
- "Wafer-scale transferable molybdenum disulfide thin-film catalysts for photoelectrochemical hydrogen production", **Energy and Environmental Science**, vol. 9, p. 2240 ~ 2248 (2016).

Invited Speaker

Frontier of Giant Tunnel Magnetoresistance Effect for Future Spintronic Applications

Hiroaki Sukegawa

National Institute for Materials Science
SUKEGAWA.Hiroaki@nims.go.jp

Education

2004–2007 Dr. Eng., Department of Materials Science, Tohoku University, Sendai, Japan

Major Activities

2007–2014 Researcher, National Institute for Materials Science, Japan
2014–2018 Senior researcher, National Institute for Materials Science, Japan
2018–present Principal researcher, National Institute for Materials Science, Japan

Honors and Awards

2020 The AUMS Young Researcher Award (Asian Union of Magnetic Societies)

Research Interests

Spintronic devices, Thin film growth, Magnetism

Publications

• T. Scheike, **H. Sukegawa** *et al.*, "631% room temperature tunnel magnetoresistance with large oscillation effect in CoFe/MgO/CoFe(001) junctions", Appl. Phys. Lett. **122**, 112404 (2023)
• T. Scheike, **H. Sukegawa** *et al.*, "Exceeding 400% tunnel magnetoresistance at room temperature in epitaxial Fe/MgO/Fe(001) spin-valve-type magnetic tunnel junctions", Appl. Phys. Lett. **118**, 042411 (2021)
• Z. Wen, **H. Sukegawa** *et al.*, "A 4-Fold-Symmetry Hexagonal Ruthenium for Magnetic Heterostructures Exhibiting Enhanced Perpendicular Magnetic Anisotropy and Tunnel Magnetoresistance", Adv. Mater. **26**, 6483 (2014)
• **H. Sukegawa** *et al.* "Tunnel Magnetoresistance with Improved Bias Voltage Dependence in Lattice-Matched Fe/Spinel $MgAl_2O_4$/Fe(001) Junctions", Appl. Phys. Lett. **96**, 212505 (2010)
• **H. Sukegawa** *et al.,* "Significant Magnetoresistance Enhancement Due to a Cotunneling Process in a Double Tunnel Junction with Single Discontinuous Ferromagnetic Layer Insertion", Phys. Rev. Lett. **94**, 068304

Natural Sciences

Synthesis of Single-crystal 2D Materials on a Wafer Scale

Ki Kang Kim

Sungkyunkwan University
kikangkim@skku.edu

Education

1997-2004	BS., Physics, Sungkyunkwan University, Suwon, Korea
2004-2008	Ph.D., Physics, Sungkyunkwan University, Suwon, Korea

Major Activities

2008-2009	Postdoctoral Research Associate, SKKU, Suwon, Korea
2009-2012	Postdoctoral Research Associate, MIT, Cambridge, MA, USA
2012-2018	Assistant Professor, Department of Energy and Materials Engineering, Dongguk University-Seoul, Korea
2018-2019	Associate Professor, Department of Energy and Materials Engineering, Dongguk University-Seoul, Korea
2019-present	Associate Professor, Department of Energy Science, SKKU, Suwon, Korea,

Honors and Awards

2016	30 Young Scientists to Shine Korea, Postech/Dong-A Ilbo, Korea
2020	34 young researchers to lead the Korean science, Y-KAST, Korea

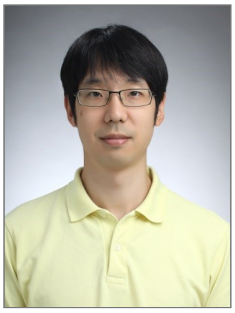
Research Interests

Growth of large-area single crystal 2D materials to realize their intrinsic properties
Growth of 2D superlattice for unprecedented devices.
Explore atomic thick catalysts for hydrogen evolution reaction

Publications

- 1T' RexMo1-xS2-2H MoS2 Lateral Heterojunction for Enhanced Hydrogen Evolution Reaction Performance, **Advanced Functional Materials,** 33(3), 2209572 (2022) [IF:19.924]
- Substitutional VSn nanodispersed in MoS2 film for Pt-scalable catalyst, **Advanced Science**, 8, 2003709 (2021) [IF:15.840]
- Epitaxial Single-Crystal Growth of Transition Metal Dichalcogenide Monolayers via the Atomic Sawtooth Au Surface, **Advanced Materials**, 33(15), 2006601 (2021) [IF: 27.398]
- Wafer-scale single-crystal hexagonal boron nitride film via self-collimated grain formation, **Science**, 362(6416), 817-821 (2018) [IF: 41.845]
- Synthesis of hexagonal boron nitride heterostructures for 2D van der Waals electronics, **Chemical Society Reviews**, 47(16), 6342-6369 (2018) [IF: 42.846]

Natural Sciences



Modulating Light Scattering and Absorption for Active Structural Colors

Jerome Kartham Hyun

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kadam.hyun@ewha.ac.kr

Education

2002–2009 Ph.D./M.S., Dept. of Physics, Cornell University, USA

1998–2002 B.S., Dept. of Applied Physics, Columbia University, USA

Major Activities

2015–Present Assistant/Associate/Full Professor, Dept. of Chemistry and Nanoscience, Ewha Womans University, South Korea

Honors and Awards

2012–2014 TJ Park Science Fellow, POSCO TJ Park Foundation, Korea

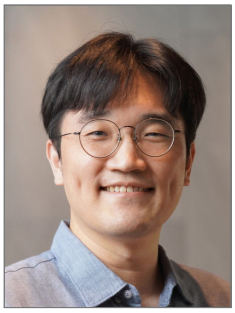
Research Interests

Scattering and absorption of light, Dynamic metasurfaces, Structural colors, Nanophotonics, Electronic paper

Publications

• C. W. Moon, Y. Kim (Equal contribution), J. K. Hyun*, “Active electrochemical high-contrast gratings as on/off switchable and color tunable pixels”, Nature Communications, 2022, 13, 3391
• M. Kim, K. Jung, Y. Choi, S.S. Hwang*, J. K. Hyun*, “Coupled solid and inverse antenna stacks above metal ground as metamaterial perfect electromagnetic wave absorbers with extreme subwavelength thicknesses”, Advanced Optical Materials, 2022, 10, 2101672
• J.S. Lee, J.Y. Park (Equal contribution), Y.H. Kim, S. Jeon, O. Ouellette, E.H. Sargent*, D.H. Kim*, J. K. Hyun*, “Ultrahigh Resolution and Color Gamut with Scattering-Reducing Transmissive Pixels”, Nature Communications, 2019, 10, 4782
• Y. Kim, K. Jung (Equal contribution), J. Cho, J.K. Hyun*, “Realizing vibrant and high-contrast reflective structural colors from lossy metals supporting dielectric gratings”, ACS Nano, 2019, 13, 10717-10726

Natural Sciences



Developing Graphene Josephson Junction-based Microwave Detector

Gil-Ho Lee

POSTECH
lghman@postech.ac.kr

Education

2003-2007	B. S. in Chemistry and Physics (double major), Dept. of Chemistry, POSTECH, Pohang, Republic of Korea
2007-2014	Ph. D. in Physics, Dept. of Physics, POSTECH, Pohang, Republic of Korea

Major Activities

2014	Postdoctoral researcher, Dept. of Physics, POSTECH, Pohang, Republic of Korea
2014-2017	Postdoctoral researcher, Dept. of Physics, Harvard University, Cambridge, MA 02138, USA
2017-2021	Assistant Professor, Dept. of Physics, POSTECH, Pohang, Republic of Korea
2021-present	Associate Professor, Dept. of Physics, POSTECH, Pohang, Republic of Korea
2021-present	Member of Young Korean Academy of Science and Technology, Korea

Honors and Awards

2018	Bom-Bi Physics Award, Korean Physics Society
2021	POSTECHian Award in Research, POSTECH
2021	S-oil Scientist Award, Korean academy of science and technology
2022	Researcher Award, Korean Graphene Society
2022	Young Physicist Award, Korean Physics Society
2022	Young Scientist Award, Ministry of Science and ICT

Publications

• “Steady Floquet-Andreev states in graphene Josephson junctions“ Nature 603, 421-426 (2022)
• “Spin-orbit Torque Switching in an All-Van der Waals Heterostructure“ Advanced Materials 34, 2101730 (2022)
• “Graphene-based Josephson junction microwave bolometer“ Nature 586, 42-46 (2020)
• “Evidence of Higher Order Topology in Multilayer WTe2 from Josephson Coupling through Anisotropic Hinge States“ Nature Materials 19, 974-979 (2020)
• “Inducing superconducting correlation in quantum Hall edge states” Nature Physics 13, 693-698 (2017)

Engineering

Atomically thin 2D Semiconductor Electronics Toward Beyond-CMOS Technology

Chul-Ho Lee

Seoul National University
chulholee@gmail.com

Education

1999–2005	B.S., Materials Science and Engineering, POSTECH, Korea
2005–2011	Ph.D., Materials Science and Engineering, POSTECH, Korea

Major Activities

2012–2013	Postdoctoral Fellow, Department of Physics, Columbia University, USA
2014–2022	Assistant & Associate Professor, KU-KIST Graduate School of Converging Science and Technology & Department of Integrative Energy Engineering, Korea University, Korea
2022–present	Member of Young Korean Academy of Science and Technology, Korea
2023–present	Associate Professor, Department of Electrical and Computer Engineering, Seoul National University, Korea

Honors and Awards

2020	Jin Jung Il Academic Achievement Award, Korea University
2019	Young Scientist Award, Korean Graphene Society
2015	T. J. Park Science Fellowship (Physics)

Research Interests

2D semiconductors, Device physics & applications of nanodevices, Optoelectronic physics in nanosemiconductors, MOCVD growth & heteroepitaxy of 2D semiconductors

Publications

- D. Lee & C.-H. Lee *et. al*, "Remote modulation doping in van der Waals heterostructure transistors", *Nature Electron.* 4, 664 ('21).
- Y. S. Kim & C.-H. Lee *et. al*, "Atomic-layer-confined multiple quantum wells enabled by monolithic bandgap engineering of transition metal dichalcogenides", *Sci. Adv.* 7, eabd7921 ('21).
- W. Huh & C.-H. Lee *et. al*, "Memristors based on two-dimensional materials as an artificial synapse for neuromorphic electronics", *Adv. Mater.* 32, 2002092 ('20).
- J. Shin, S. Yang, C.-H. Lee & G. Wang *et. al*, "Tunable rectification in a molecular heterojunction with two-dimensional semiconductors", *Nat. Commun.* 11, 1412 ('20).
- C.-H. Lee & P. Kim *et. al*, "Atomically thin p-n junctions with van der Waals heterointerfaces", *Nature Nanotech.* 9, 676 ('14).

Natural Sciences

Topology, Correlations, and Disorder in Quantum Materials

Keun Su Kim

Yonsei University
keunsukim@yonsei.ac.kr

Education

2001–2005	B. S. in Physics, Yonsei University, Korea
2005–2010	Ph. D. in Physics, Yonsei University, Korea

Major Activities

2010–2013	Postdoctoral Researcher, Lawrence Berkeley National Lab, United States
2013–2017	Assistant Professor of Physics, Pohang University of Science and Technology (POSTECH), Korea
2017–2019	Assistant Professor of Physics, Yonsei University, Korea
2019–present	Associate Professor of Physics, Yonsei University, Korea
2021–present	Director, Center for Bandstructure Engineering (Leader Grant, NRF)
2022–present	Member, Young Korean Academy of Science and Technology (Y-KAST), Korea

Honors and Awards

2016	Scientist of the Month, Ministry of Science and ICT, Korea
2019	Prime Minister's Commendation, the Korean Government, Korea
2021	Hanseong Science Award, Hanseong Sonjaehan Scholarship Foundation, Korea

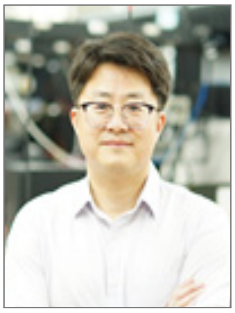
Research Interests

Condensed Matter Physics, Quantum Materials, Electronic Structure, ARPES

Publications

• Tunable band gap and Dirac semimetal in black phosphorus, *Science* **349**, 723 (2015)
• Two-dimensional Dirac fermions in black phosphorus, *Phys. Rev. Lett.* **119**, 226801 (2017)
• Holstein polarons in a two-dimensional semiconductor, *Nature Mater.* **17**, 676 (2018)
• Black phosphorus as a bipolar pseudospin semiconductor, *Nature Mater.* **19**, 277 (2020)
• Pseudogap in a crystalline insulator doped by disordered metals, *Nature* **596**, 68 (2021)

Engineering



Multi-modal Imaging: Photoacoustic Imaging Plus More

Chulhong Kim

POSTECH
Chulhong@postech.ac.kr

Education

1997–2004 B. Sc., Department of Electrical, Electronic and Computer Engineering, Kyungpook National University, Dague, Republic of Korea
2006–2009 Ph.D., Department of Biomedical Engineering, Washington University

Major Activities

2010–2013 Assistant Professor of Department of Biomedical Engineering, University at Buffalo
2013–present Professor of Department of Electrical Engineering, Convergence IT Engineering, and Mechanical Engineering, POSTECH
2018–present Chief Executive Officer and Founder of OPTICHO (Valuation of ~$22.7M)
2022–present Program Chair of Medical Science and Engineering, POSTECH
2022–present Department Chair of Convergence IT Engineering, POSTECH

Honors and Awards

2017 The 21st Korean Academy of Science and Technology (KAST) Young Scientist Award
2017 The 2017 IEEE EMBS Academic Early Career Achievement Award
2020 IEEE Engineering in Medicine and Biology Society (EMBS) Distinguished Lecturer
2020 2020 Microscopy Today Innovation Award
2021 2020 Light: Science & Applications Outstanding Paper Award
2022 The Korean Presidential Award endorsed by the Ministry of SMEs and Startups
2022 The Minister's Award, Ministry of Science and ICT
2022 The Minister's Award, Ministry of Health and Welfare

Research Interests

Multimodal Imaging(Photoacoustic/Ultrasound/Optical/AFM/RF/Magnetic) ; Digital Healthcare
High Performance Computing (CPU/GPU/DSP), Processing, and Artificial Intelligent in Healthcare

Publications

• J. Kim, ⋯, [L. Wang*, S. Lee*, and C. Kim*], "Deep Learning Acceleration of Multiscale Localization-Based Photoacoustic Imaging", Light Science & Applications, Vol. 11, pp. 131 (2022). IF: 20.257
• W. Choi, ⋯, J. Cho and C. Kim*, "3D Multi-structural Quantitative Photoacoustic and Ultrasound Imaging of Human Feet In Vivo", Radiology, 303, pp. 467-473, (2022). IF:29.146
• J. Park, ⋯, [H. Kim*, U. Jeong*, H. Kim*, and C. Kim*], "Quadruple Fusion Imaging via Transparent Ultrasound Transducer: Ultrasound, Photoacoustic, Optical Coherence, and Fluorescence Imaging", Proceedings of the National Academy of Sciences of the United States of America, Vol. 118, pp. e1920879118 (2021). IF: 12.779

The 1st

Y-KAST International Conference

General Participants

General Participants

General Participants

Engineering

Daegyoum Kim

KAIST
daegyoum@kaist.ac.kr

Education

1999–2003	B.S. Mechanical and Aerospace Engineering, Seoul National University, Korea
2006–2007	M.S. Graduate Aerospace Laboratories, California Institute of Technology, USA
2007–2010	Ph.D. Graduate Aerospace Laboratories, California Institute of Technology, USA

Major Activities

2010–2011	Postdoctoral scholar, California Institute of Technology, USA
2011–2013	Research scientist, California Institute of Technology, USA
2013–2014	Postdoctoral research associate, Brown University, USA
2014–2019	Assistant professor, KAIST, Korea
2019–present	Associate professor, KAIST, Korea

Honors and Awards

2007	Rolf D. Buhler Memorial Award in Aeronautics, California Institute of Technology, USA
2010	William F. Ballhaus Prize, California Institute of Technology, USA
2019	Songam Young Investigator Award, KAIST, Korea

Research Interests

Fluid-structure interaction, Bio-inspired flow, Multi-phase flow, Vortex dynamics, Aero- & hydrodynamics

Publications

- Minho Song, Janggon Yoo, Junkyu Ham, and Daegyoum Kim 2022 “Three-dimensional reconfiguration of an elastic sheet with unidirectional side flaps”, Journal of Fluid Mechanics, 953, A25
- Junyoung Kim and Daegyoum Kim 2022 “Flow-induced vibration and impact of a cylinder between two close sidewalls”, Journal of Fluid Mechanics, 937, A28
- Cheolgyun Jung, Minho Song, and Daegyoum Kim 2021 “Starting jet formation through eversion of elastic sheets”, Journal of Fluid Mechanics, 924, A7
- Hyeonseong Kim, Mohsen Lahooti, Junsoo Kim, and Daegyoum Kim 2021 “Flow-induced periodic snap-through dynamics”, Journal of Fluid Mechanics, 913, A52
- Seung Hun Lee, Minhyeong Lee, and Daegyoum Kim 2020 “Optimal configuration of a two-dimensional bristled wing”, Journal of Fluid Mechanics, 888, A23

Engineering

Jin Young Kim

Seoul National University
jykim.mse@snu.ac.kr

Education

1996–2000	BS, Materials Science and Engineering, Seoul National University, Korea
2000–2002	MS, Materials Science and Engineering, Seoul National University, Korea
2002–2006	PhD, Materials Science and Engineering, Seoul National University, Korea

Major Activities

2007–2010	Postdoctoral Researcher, National Renewable Energy Laboratory, USA
2010–2011	Research Staff (Science III), National Renewable Energy Laboratory, USA
2011–2015	Senior Scientist, Korea Institute of Science and Technology, Korea
2015–present	Assistant/Associate Professor, Seoul National University, Korea
2019–present	Member of Young Korean Academy of Science and Technology, Korea
2018–2021	Review Board, Korea Research Foundation, Korea

Honors and Awards

2019	Director's Award (Industry Collaboration), Korea Research Foundation, Korea
2019	Director's Award (Best RB), Korea Research Foundation, Korea
2020	Minister's Award, Ministry of Science and ICT Korea
2021	Next-Generation Scientist Award, S-OIL Science and Culture Foundation, Korea
2022	Excellent Education Award, Seoul National University, Korea

Research Interests

Next generation solar cells (perovskite, CZTSSe, tandem, etc.), Solar fuel generation, Solar-powered green electrocatalysts, Water treatment

Publications

- "Efficient, stable silicon tandem cells enabled by anion-engineered wide-bandgap perovskites", Science, 368, 155-160 (2020).
- "High-Efficiency Perovskite Solar Cells," Chem. Rev., 120, 7867-7918 (2020).
- "Rational Design of Dimensionally Stable Anodes for Active Chlorine Generation," ACS Catal., 11, 12423-12432 (2021).
- "Stable pure-iodide wide-bandgap perovskites for efficient Si tandem cells via kinetically controlled phase evolution," Joule, 6, 2390-2405 (2022).
- "Liquid-Diffusion Electrode with Core-Shell Structured Mixed Metal Oxide Catalyst for Near-Zero Polarization in Chlor-Alkali Electrolysis," Appl. Catal. B, 322, 122095 (2023).

Engineering

Taek-Soo Kim

KAIST
tskim1@kaist.ac.kr

Education

1997-2001	B.S., Department of Mechanical Engineering, Yonsei University
2004-2006	M.S., Department of Mechanical Engineering, Stanford University
2006-2010	Ph.D., Department of Mechanical Engineering, Stanford University

Major Activities

2023-present	Vice-President for International Cooperation, the Korean Microelectronics and Packaging Society
2023-present	Chief Business Director of Reliability Division, the Korean Society of Mechanical Engineers

Honors and Awards

2022	The 13th Heading Prize for Young Engineer
2021	The 31st Science and Technology Excellent Paper Award, the Korean Federation of Science and Technologies Societies
2021	2020 IEEE Transactions on Components, Packaging and Manufacturing Technology Best Paper Award, IEEE Electronic Packaging Society
2020	The 2020 Technology Innovation Award, KAIST College of Engineering
2020	KAIST Outstanding Faculty Award for Academic Excellence

Research Interests

Mechanics-related subjects of advanced packaging and thin films for microelectronics, flexible display, fuel cell and solar cell.

Publications

- T.-S Kim* et al., "Thermally Stable and Soft Pressure-sensitive Adhesive for Foldable Electronics", Chemical Engineering Journal, 452(1), 139050, 2023.
- T.-S Kim* et al., "Controlled Surface Topography of Nanofilm by Local Strain Modulation in Mechanical Transfer Process", Applied Surface Science, 608, 155113, 2023.
- T.-S. Kim* et al., "Geometrically engineered rigid island array for stretchable electronics capable of withstanding various deformation modes", Science Advances, 8, eabn3863, 2022.
- T.-S. Kim* et al., "Thermo-mechanical Behavior of Poly(3-hexylthiophene) Thin Film on Water Surface", ACS Omega, 7, 23, 19706-19713, 2022.
- T.-S. Kim* et al., "Intrinsic Mechanical Properties of Free-Standing SiNx Thin Films depending on PECVD Conditions for Controlling Residual Stress", ACS Applied Electronic Materials, 4(8), 3980-3987, 2022.

Engineering

Jun Hong Noh

Korea University
junhnoh@korea.ac.kr

Education

1999–2003	BS, Materials Science & Engineering, Seoul National University, S. Korea
2003–2009	Ph.D., Materials Science & Engineering, Seoul National University, S. Korea

Major Activities

2009–2011	Postdoctoral researcher –Department of Materials Science and Engineering, Seoul National University
2011–2017	Senior researcher –Solar Energy Materials Research Center, Division of Advanced Materials, Korea Research Institute of Chemical Technology (KRICT)
2017–present	Assistant/Associate Professor, School of Civil, Environmental & Architectural Engineering, College of Engineering, Korea University.

Honors and Awards

2015	Excellent young researcher award, National Research Council of Science & Technology
2015	Minister's Commendation, Ministry of Science, ICT and Future Planning
2019	Minister's Commendation, Ministry of Science and ICT
2019	Young Scientists Award, The Korean Academy of Science and Technology
2018–2022	Clarivate Analytics, '2018–2022 Highly Cited Researchers'

Research Interests

Halide Perovskite solar cells and photoelectrochemical cells, Semiconducting and conducting materials for photoelectric energy conversion systems, Oxides and inorganic–organic hybrid materials, Oxide nanoparticles and thin film for energy conversion systems

Publications

- "Intact 2D/3D halide junction perovskite solar cells via solid-phase in-plane growth", Nature Energy 6,63 (2021)
- "Efficient, stable and scalable perovskite solar cells using poly(3-hexylthiophene)", Nature 567,511 (2019)
- "Iodide management in formamidinium-lead-halide-based perovskite layer for efficient solar cells", Science 356,1376 (2017)
- "Colloidally prepared La-doped BaSnO3 electrodes for efficient, photostable perovskite solar cells", Science 356, 167 (2017)
- "Compositional engineering of perovskite materials for high performance solar cells", Nature 517, 479 (2015)

Engineering

Jungwon Park

Seoul National University
jungwonpark@snu.ac.kr

Education

2000-2003	B.A., Department of Chemistry, POSTECH, Republic of Korea
2006-2012	Ph.D., Department of Chemistry, University of California, Berkeley, USA

Major Activities

2012-2015	Postdoc researcher, Harvard University, USA
2015-2016	Research Associate, Harvard University, USA
2016-present	Assistant and Associate Professor, Seoul National University

Honors and Awards

2020	Presidential Award for Young Scientist, Korea
2020	Hanseong Science Award, Korea

Research Interests

Materials Physics, Nanomaterials, Energy Storage, Energy Conversion, Microscopy

Publications

• Observation of H2 evolution and electrolyte diffusion on MoS2 monolayer by in situ liquid-phase transmission electron microscopy, ***Adv. Mater***. 2022, 34, 2206066.
• In situ multi-scale probing solid-state synthesis of Ni-rich layered oxide cathode reveals reaction heterogeneity driven by competing kinetic pathways, ***Nature Chem***. 202214, 614.
• Reversible disorder-order transitions in atomic crystal nucleation, ***Science***, 2021, 371, 498.
• Critical differences in 3D atomic structure of individual ligand-protected nanocrystals in solution, ***Science***, 2020, 358, 60.
• Amorphous-Phase-Mediated Crystallization of Ni Nanocrystals Revealed by High-Resolution Liquid-Phase Electron Microscopy, ***J. Am. Chem. Soc***. 2019, 141, 763.

Engineering

Seok Su Sohn

Korea University
sssohn@korea.ac.kr

Education

2006–2010 B.S., Materials Science and Engineering, Hanyang University, Korea
2010–2015 Ph.D., Materials Science and Engineering, POSTECH, Korea

Major Activities

2015–2017 Research Professor, POSTECH, Korea
2017–2019 Alexander von Humboldt postdoctoral fellow, Max Planck Institute for Iron Research, Düsseldorf, Germany,
2019–2022 Assistant Professor, Dept. Materials Science and Engineering, Korea University
2020–present Advisory Committee, Research Center for Materials Science, LG Electronics
2022–present Associate Professor, Dept. Materials Science and Engineering, Korea University
2022–present Member of Young Korean Academy of Science and Technology, Korea

Honors and Awards

2019 Rising scientist awards, The Korean Institute of Metals and Materials, Korea
2020 POSCO Science fellowship, POSCO TJ Park Foundation, Korea
2022 Crimson Professor, Korea University, Korea

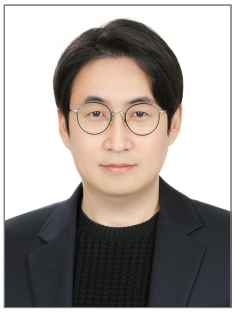
Research Interests

Alloy design for extreme environments, Mechanical properties, Metal 3D printing, Hydrogen storage/transportation, Cryogenic temperature

Publications

- "Maraging effect and dynamic precipitate transformation in ultrastrong medium-entropy alloy" S.S. Sohn* et al. Nature Communications, 14 (2023) 145.
- "Shear band-driven precipitate dispersion for ultrastrong ductile medium-entropy alloys S.S. Sohn* et al. Nature Communications, 12 (2021) 4703.
- "Ultrastrong medium-entropy single-phase alloys designed via severe lattice distortion" S.S. Sohn* et al. Advanced Materials, (2019) 1807412.
- "Cryogenic strength improvement by utilizing room-temperature deformation twinning in partially recrystallized VCrMnFeCoNi high entropy alloy" S.S. Sohn* et al. Nature Communications, (2017) 8:15719.

Engineering



Kyunghan Lee

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Education

2004–2009	Ph.D., Electrical Engineering, KAIST, Daejeon, Korea
2002–2004	M.S., Electrical Engineering, KAIST, Daejeon, Korea
1998–2002	B.S., Electrical Engineering, KAIST, Daejeon, Korea

Major Activities

2010–2012	Post-Doctoral Research Scholar/Senior Research Scholar, Computer Science, North Carolina State University, Raleigh, USA
2012–2020	Assistant Professor/Associate Professor, Electrical and Computer Engineering, UNIST, Ulsan, Korea
2020–present	Associate Professor, Electrical and Computer Engineering, Seoul National University, Seoul, Korea
2021–present	Member of Y-KAST, Korea

Honors and Awards

2021	ACM MobiSys Best Paper Award
2016	IEEE ComSoc William R. Bennett Prize
2013	IEEE ComSoc William R. Bennett Prize
2022	Commendation from the Minister of Science and ICT 2022
2018	Commendation from the Minister of Education
2022	Best Teaching Faculty Award, KSEE (Korea Society for Engineering Education)

Research Interests

- Performance-guaranteed Networking for 6G Cellular Systems and Services
- New Internet Architecture (Network-Computing Convergence): Network-as-a-Computer
- Thermally-reliable and Low-power Machine Learning for Mobile Systems

Publications

- J. Kim, B. Shim, and K. Lee*, "Towards Enabling Performance-Guaranteed Networking in Next-Generation Cellular Networks," IEEE Communications Magazine, vol. 61, no. 1, pp.32-37, Jan. 2023.
- J. Park, K. Bin, and K. Lee*, "mGEMM: Low Latency Con- volution with Minimal Memory Overhead Optimized for Mobile Devices," ACM MobiSys, Oregon, PO, 2022.
- S. Kim, K. Bin , S. Ha, K. Lee*, and S. Chong, "zTT: Learning-based DVFS with Zero Thermal Throttling for Mobile Devices," ACM MobiSys, Milky way, Mars, 2021.
- H. Jiang, Y. Wang, K. Lee*, and I. Rhee, "DRWA: A Receiver-centric Solution to Bufferbloat in Cellular Network," IEEE Transactions on Mobile Computing, vol. 15, no. 11, pp. 2719-2734, Nov. 2016.
- K. Lee, J. Lee*, Y. Yi, I. Rhee, and S. Chong, "Mobile Data Offloading: How Much Can WiFi Deliver?," IEEE/ACM Transactions on Networking, vol. 21, no. 2, pp. 536-550, Apr. 2013.

Engineering

Min Seok Jang

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Education

2003–2006	B.S. in Physics, KAIST
2007–2013	Ph.D. in Applied Physics, California Institute of Technology

Major Activities

2016–present	Assistant/Associate Professor of Electrical Engineering, KAIST, Korea
2022–present	Member of Young Korean Academy of Science and Technology, US

Honors and Awards

2014	POSCO TJ Park Science Fellowship, Korea
2020	Technology Innovation Award, KAIST, Korea

Research Interests

Nanophotonics, plasmonics, metasurfaces, two-dimensional materials, mid-infrared, polaritons, inverse design, deep learning

Publications

- "Near-field probing of image phonon-polaritons in hexagonal boron nitride on gold crystals" *Sci. Adv.* 8, eabn0627 (2022)
- "Full 2π tunable phase modulation using avoided crossing of resonances", *Nat. Commun.* 13, 2103 (2022)
- "Real-space imaging of acoustic plasmons in large-area graphene grown by chemical vapor deposition", *Nat. Commun.* 12, 938 (2021)
- "Complete complex amplitude modulation with electronically tunable graphene plasmonic metamolecules", *ACS Nano* 14, 1166 (2020)
- "Electronically tunable perfect absorption in graphene", *Nano Lett.* 18, 971 (2018)

Engineering

Seung Hyun Cha

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Education

2003-2009	BE in Acrchitectural Engineering, Korea University, Seoul, Korea
2009-2011	MS in Sustainable Design and Construction, Stanford University, USA
2011-2015	Ph.D. in Architecture, University of Cambridge, Cambridge, UK

Major Activities

2021-present	Associate Editor, Journal of Computational Design and Engineering, Oxford University press
2023-present	Editor, Journal of Building Information modeling, KIBIM

Honors and Awards

2020	Young Researcher Award, Hanyang University, Korea
2021	Young Researcher Award, Hanyang University, Korea
2022	Research Innovation Award, KAIST, Korea

Research Interests

Future cities, Virtual Architecture and Design, Metaverse, Human-Space Interaction

Publications

- Cha, S., Ma, J., Seo, J., Kim, J., and Han, S., "Empirical comparison of spatial experience between photo-based IVE and real space," Architectural Science Review, Taylor & Francis, in press, 2022
- Lee, J., Ma, J., Seo, J., and Cha, S.(Corresponding author), "Review of Applications and User Perceptions of Smart Home Technology for Health and Environmental Monitoring," Journal of Computational Design and Engineering, Oxford University Press, 9(3), 857-889, 2022
- Ma,J., Lee, J., and Cha,S. (Corresponding author), "Effects of lighting CCT and illuminance on visual perception and task performance in immersive virtual environments", Building and Environment, Elsevier, 209, 108678, 2022
- Gassar, A., and Cha, S. (Corresponding author), "Feasibility assessment of adopting distributed solar photovoltaics and phase change materials in multifamily residential buildings", Sustainable Production and Consumption, Elsevier, 29, 507-528, 2022
- Jo, T., Ma, J. and Cha, S. (Corresponding author), "Elderly Perception on the Internet of things-based Integrated Smart-Home System", Sensors, MDPI, 21(4), 1284, 2021

Agricultural and Fishery

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Education

1997–2001	B.S. Dept. of Food and Nutrition, Hallym University, Korea
2001–2003	M.S. Dept. of Food and Nutrition, Hallym University, Korea
2003–2006	Ph.D. Dept. of Biochemistry and Molecular Biology, Seoul National University College of Medicine, Korea

Major Activities

2008–2012	Post Doc. Lee Gil Ya Cancer and Diabetes Institute, Korea
2012–2014	Research professor, Gachon Medical Research Institute, Gil Hospital, Korea
2014–2017	Assistant professor, Department of molecular medicine, Gachon University, Korea
2017–present	Associate professor, Department of Food and Nutrition, Eulji University, Korea
2021–present	Member of Young Korean Academy of Science and Technology, Korea

Honors and Awards

2005	Yuhan Scholarship, Yuhan Foundation, Korea
2006	Young Investigator Award, International conference on biochemistry of exercise, Korea
2021	EMM Award, Korea society for biochemistry and molecular biology, Korea

Research Interests

diabetes, metabolic syndrome, aging, customized food materials, future food resources, edible insects

Publications

- Blocking lysophosphatidic acid receptor 1 signaling inhibits diabetic nephropathy in db/db mice. Kidney international, 2017
- Lysophosphatidic acid increases mesangial cell proliferation in models of diabetic nephropathy via Rac1/MAPK/KLF5 signaling, Experimental molecular medicine, 2019
- Allomyrina dichotoma Larva extract ameliorates the hepatic insulin resistance of high-fat diet-induced diabetic mice, Nutrients, 2019
- Prevention of oxidative stress-induced pancreatic beta cell damage by Broussonetia kazinoki Siebold Fruit extract via the ERK-NOX4 pathway, Antioxidants, 2020
- Prevention of LPS-induced acute kidney injury in mice by Bavachin and its potential mechanisms, Antioxidants, 2022

Medical Sciences

Heejung Kim

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Education

1999–2004	BSN in Nursing, Yonsei University, Seoul, Republic of Korea
2007–2010	MSN in Nursing, University of Virginia, Charlottesville, VA, USA
1986–1989	Ph.D. in Nursing, University of Virginia, Charlottesville, VA, USA

Major Activities

2004–2006	Staff Nurse RN, Samsung Medical Center, Seoul, Republic of Korea
2012–2015	Assistant professor, University of Kansas School of Nursing, Kansas, USA
2018–2019	Editor-in-Chief, Journal of Korean Academy of Psychiatric and Mental Health Nursing, Republic of Korea

Honors and Awards

2020–2022	Faculty Best Research Award, *Yonsei University* (Republic of Korea)
2021	Best Faculty Poster presentation, 7th Pan-Pacific Nursing Conference (China)
2020	Best Reviewer Award, *Journal of Korean Academy of Psychiatric and Mental Health Nursing* (Republic of Korea)
2020	Best oral presentation, *23rd East Asian Forum of Nursing Scholar* (Thailand)
2019	22nd Edna Stilwell Writing Award, 2019 *Gerontological Society of America* (USA)

Research Interests

Geriatric depression, Suicide prevention, Ecological momentary assessment and intervention, wearable device, sensor data

Publications

- Hong, S., Lee, S., Song, K., Kim, M., Kim, Y., Kim, H., & **Kim, H.** (2023). A nurse-led mHealth intervention to alleviate depressive symptoms in older adults living alone in the community: A quasi-experimental study. *International Journal of Nursing Studies,* 138, 104431. (Data based)
- Kim, H., Park, S., Kim, Y., Kwon, S., & **Kim, H.** (2022). Ecological momentary assessment of mental health in adults at suicide risk: An observational study protocol. *Journal of Advanced Nursing, 78*(3), 883-893. DOI: 10.1111/jan.15142 (Data based)
- Lee, S., Gandla, S., Naqi, M., Jung, U., Youn, H., Pyun, D., Rhee, Y., Kang, S., Kwon, H-J., **Kim, H.**, Lee, M. G., & Lim, S. (2020). All-day mobile healthcare monitoring system based on heterogeneous stretchable sensors for medical emergency. *IEEE Transactions on Industrial Electronics, 67*(1010), 8808-8816. (Data based)

Medical Sciences

Gunhyuk Park

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Education

2006-2009	B.S, Pharmaceutical engineering, Daegu Haany University
2006-2009	B.S, Cosmeceutical science, Daegu Haany University
2009-2011	M.S, Department of Life and Nanopharmaceutical Science, Kyung Hee University
2011-2014	Ph.D, Department of Life and Nanopharmaceutical Science, Kyung Hee University

Major Activities

2013-2013	**Visiting Researcher**, Department of Neuropsychiatry, McLean hospital, Harvard Medical School, Harvard University
2013-2013	**Part-time Lecturer**, Department of Oriental Pharmaceutical Science, College of Pharmacy, Kyung Hee University
2014-2017	**Senior Researcher**, Korea Institute Oriental Medicine
2017-2018	**C.E.O.**, Ektos Industries Ltd.
2018-2018	**Senior Researcher**, Department of Dermatology, Seoul National University Hospital, Institute of Human-Environments Interface Biology, Seoul National University
2018-present	**Senior Researcher**, Korea Institute Oriental Medicine
2022-present	**Associate professor**, University of Science&Technology(UST), Campus of Korea Institute of Oriental Medicine

Honors and Awards

2020	Chairman's Award, National Research Council of Science & Technology, Korea

Research Interests

Oriental medicine, skin-brain axis, Neurodegernative disease, skin disease

Publications

- Early stage ultraviolet irradiation damage to skin collagen can be suppressed by HPA axis control via controlled CYP11B. Biomed Pharmacother. 2022 Nov;155:113716
- The insect molting hormone 20-hydroxyecdysone protects dopaminergic neurons against MPTP-induced neurotoxicity in a mouse model of Parkinson's disease. Free Radic Biol Med. 2020 Jul 31;159:23-36
- Enhanced Nrf2 up-regulation by extracellular basic pH in a human skin equivalent system. J Cell Mol Med. 2021 Apr;25(7):3646-3653

Medical Sciences

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Education

1998–2002	B.S., Computer Science, Yonsei University, Korea
2002–2004	M.S., Computer Science, Yonsei University, Korea
2007–2011	Ph.D., Bio and Brain Engineering, KAIST, Korea

Major Activities

2004–2012	Research Scientist, Samsung Biomedical Research Institute, Korea
2012–2015	Research Fellow, Massachusetts General Hospital, Harvard Medical School, USA
2016–2020	Assistant Professor, Sungkyunkwan University, Samsung Medical Center, Korea
2020–present	Associate Professor, Sungkyunkwan University, Samsung Medical Center, Korea
2022–present	Member of Young Korean Academy of Science and Technology, Korea

Honors and Awards

2018	SAIHST ARROW Research Award, Korea
2015–2016	Founders Affiliate Postdoctoral Fellowship, American Heart Association (AHA), USA
2015	Trainee Winner for the Best Paper for Human Genetic Research, MGH, USA

Research Interests

Human genetics, multi-omics, next-generation sequencing, GWAS, Mendelian randomization, single-cell analysis, polygenic risk score, prediction model, machine learning

Publications

- Association of Rare and Common Variation in the Lipoprotein Lipase Gene With Coronary Artery Disease, *JAMA*, 2017.
- Diagnostic Yield and Clinical Utility of Sequencing Familial Hypercholesterolemia Genes in Patients With Severe Hypercholesterolemia, *J Am Coll Cardiol*, 2016.
- Exome sequencing identifies rare LDLR and APOA5 alleles conferring risk for myocardial infarction, *Nature*, 2015.
- A comprehensive 1000 Genomes-based genome-wide association meta-analysis of coronary artery disease, *Nat Genet*, 2015.
- Inactivating mutations in NPC1L1 and protection from coronary heart disease, *N Engl J Med*, 2014.

Natural Sciences

Tae-Wook Kim

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Education

1999-2006	B.S., Division of Environmental Science and Ecological Engineering, Korea University, Seoul, South Korea
2006-2012	Ph.D., School of Environmental Science and Engineering, Pohang University of Science and Technology, Pohang, South Korea

Major Activities

2012-2013	Presidential Post-Doc. Fellow, Pohang University of Science and Technology, Pohang, South Korea
2013-2015	Senior Research Scientist, Korea Institute of Ocean Science and Technology, Ansan (currently Busan), South Korea
2015-2018	Assistant Professor, Incheon National University, Incheon, South Korea
2018-present	Assistant/Associate professor, Korea University, South Korea
2021-present	Member of the the Young Korean Academy of Science and Technology (Y-KAST), Korea

Honors and Awards

2012	Best Dissertation Award (Earth Science, 2nd place), Korean Academy of Science and Technology, Korea

Research Interests

Ocean biogeochemistry of carbon and nitrogen, Air-sea exchanges and atmospheric deposition over oceans.

Publications

- Y. H. Ko, ..., and T.-W. Kim, 2022, "Monthly and seasonal variations in the surface carbonate system and air-sea CO_2 flux of the Yellow Sea", Marine Pollution Bulletin, 181, 113822.
- G.-H. Park, ..., and T.-W. Kim, 2019, "Atmospheric deposition of anthropogenic inorganic nitrogen in airborne particles and precipitation in the East Sea in the northwestern Pacific Ocean", Science of the Total Environment, 681, 400-412
- T.-W. Kim et al., "Seasonal variations in the aragonite saturation state in the upper open-ocean waters of the North Pacific Ocean", 2015, Geophysical Research Letters, 42, 4498-4506.
- T.-W. Kim et al.,, "Increasing N abundance in the Northwestern Pacific Ocean due to atmospheric nitrogen deposition", 2011, Science, 334, 505-509.

Natural Sciences

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Education

1999-2003	B.S. Department of Physics, KAIST, Korea
2003-2010	Ph.D., Department of Physics, Seoul National University, Korea

Major Activities

2010-2012	Research Staff Member, Samsun, Korea
2012-2014	Scientific Researcher, CNRS/Thales, France
2014-2021	Assistant.Associate Professor, SKKU, Korea
2021-present	Associate Professor, KAIST, Korea
2023-present	Member of Y-KAST, Korea

Honors and Awards

2018	Young Scientist Prize, IUPAP, Korea

Research Interests

2D Materials

Publications

- **H. Yang**, J. Heo, S. Park, H J Song, D. H. Seo, K.-E Byun, P. Kim, I. Yoo, H.-J Chung, and K. Kim, "Graphene Barristor, a Triode Device with a Gate-Controlled Schottky Barrier". Science, 336, 1140 (2012)
- S. Cho, S. Kim, J. H. Kim, J. Zhao, J. Seok, D. H. Keum, J. Baik, D.-H. Choe, K. J. Chang, K. Suenaga, S. W. Kim*, Y. H. Lee*, **H. Yang***, Phase Patterning for Ohmic Homojunction Contact in $MoTe_2$". Science, 349, 625-628 (2015)
- **H. Yang***, S. W. Kim, M. Chhowalla, Y. H. Lee, "Structural and quantum-state phase transition in van der Waals layered materials". Nature Physics, 13, 931-937 (2017)
- L. Sun, Z. Wang, J. Jiang, Y. Kim, B. Joo, S. Zheng, S. Lee, W. J. Yu, B. S. Kong, H. Yang*, In-sensor Reservoir Computing for Language Learning via Two-dimensional Memristor (PDF). Science Advances, 7, eabg1455 (2021)
- D. Kim, E. C. Shin, Y. Lee, Y. H. Lee, M. Zhao, Y.-H. Kim, H. Yang* Atomic-scale thermopower in charge density wave states. Nature Communications 13, 4516 (2022)

Natural Sciences

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Education

2003-2008	B.A. in Mathematics, University of Seoul, Korea
2008-2012	Ph.D. in Mathematics, Seoul National University, Korea

Major Activities

2012-2016	Visiting Postdoctoral Researcher & Research Associate, Imperial College London, UK
2016-2017	Postdoctoral Fellow & Humboldt Research Fellow, Technische Universität München, Germany.
2017-2019	Assistant Professor, Inha University, Korea
2019-present	Associate Professor, Yonsei University, Korea

Honors and Awards

2022	Member of Y-KAST, Korean Academy of Science and Technology
2022	Excellent Research Paper Award, The Korean Mathematical Society
2017	POSCO TJ Park Science Fellowship, POSCO TJ Park Foundation
2017	Sangsan Prize for Young Mathematicians, The Korean Mathematical Society

Research Interests

Analysis of nonlinear dynamics of particle systems, kinetic theory and fluid dynamics, asymptotic analysis

Publications

- Y.-P. Choi and O. Tse, J. Differential Equations, 330, (2022), 150-207.
- J. A. Carrillo and Y.-P. Choi, Arch. Ration. Mech. Anal., 241, (2021), 1529-1573.
- J. A. Carrillo, Y.-P. Choi, and O. Tse, Comm. Math. Phys., 365, (2019), 329-361.
- J. A. Carrillo, Y.-P. Choi, M. Hauray, and S. Salem, J. Eur. Math. Soc., 21, (2019), 121-161.
- Y.-P. Choi, J. Math. Pures Appl., 108, (2017), 991-1021.

Policy Research

Younghwan Kim

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younghwankim@stepi.re.kr

Education

1999-2005	B.S. in Industrial Engineering, KAIST, Korea
2005-2011	MS & Ph.D. Integrated Degree in Industrial & Systems Engineering, KAIST, Korea

Major Activities

2011-2012	Post-doctoral researcher in the Center for Science-based Entrepreneurship, KAIST, Korea
2012-2013	Visiting research scholar in the Sol C. Snider Entrepreneurial Research Center, Wharton School, University of Pennsylvania, U.S.
2013-2018	Associate Research Fellow in Science and Technology Policy Institute (STEPI), Korea
2018-2019	Head of External Strategy and Public Relations Team in Science and Technology Policy Institute (STEPI), Korea
2018-present	Research Fellow in Science and Technology Policy Institute (STEPI), Korea

Research Interests

Entrepreneurship theory and policy, Innovation ecosystem, R&D collaboration and university spin-offs, Entrepreneur's career and role models, Entrepreneurial network and market strategy, Corporate transparency and firm sustainability, Public policy for nuclear and renewable energy

Publications

- (SSCI) Kim, Y., Kim, W. J., and Kim, M. K. (2014). "An international comparative analysis of public acceptance of nuclear energy," Energy Policy, 66, 475-483.
- (SSCI) Kim, Y., Kim, M. K., and Kim, W. J. (2013). "Effect of the Fukushima nuclear disaster on the global public acceptance of nuclear energy," Energy Policy, 61, 822-828.
- (SSCI) Kim, Y., Lee, J., and Yang, T. (2013). "Corporate transparency and firm performance: Evidence from venture firms listed on the Korean stock market," Asia-Pacific Journal of Financial Studies, 42 (4), 653-688.
- (SSCI) Kim, Y., Kim, W. J., and Yang, T. (2012). "The effect of triple helix system and habitat on regional entrepreneurship: Empirical evidence from the U.S.," Research Policy, 41 (1), 154-166.
- (Book) Kim, Y., Kim S., Lee, J., Son, J., Lee, S., and Kim, B. (2017). Korean Young Innovators, STEPI(Center for Innovation & Entrepreneurship Research), Sejong.

Policy Research

Jooyoung Park

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Education

2007–2012	Ph.D., School of Forestry and Environmental Studies, Yale University
2004–2006	M.S., Department of Civil, Urban, and Geosystems Engineering, Seoul National University
2000–2004	B.S., Department of Civil, Urban, and Geosystems Engineering, Seoul National University

Major Activities

2022–present	Associate Professor, Department of Civil and Environmental Engineering, Seoul National University
2018–2022	Assistant/Associate Professor, Graduate School of Energy and Environment, Korea University
2014–2018	Assistant Professor, School of Management, Universidad de los Andes, Colombia
2020–present	Board member, International Society for Industrial Ecology
2016–present	Associate Editor, Journal of Industrial Ecology

Honors and Awards

2020	Minister Award, Female Engineers in Education, Ministry of Trade, Industry, and Energy

Research Interests

Sustainable engineering, industrial ecology, circular economy, resource efficiency, sustainable materials management

Publications

- Hong and Park, 2022. Exploring circular water options for a water-stressed city: Water metabolism analysis for Paju City, South Korea, Sustainable Cities and Society 89: 104355.
- Park et al. 2019. Scaling-up of industrial symbiosis in the Korean National Eco-Industrial Park Program: Examining its evolution over the 10 years between 2005-2014, Journal of Industrial Ecology 23(1): 197-207.
- Park et al. 2018. Challenges in implementing the extended producer responsibility in an emerging economy: The end-of-life tire management in Colombia, Journal of Cleaner Production 189: 754-762.
- Park and Chertow, 2014. Establishing and testing the "reuse potential" indicator for managing wastes as resources, Journal of Environmental Management 137: 45-53.

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