

## Hee-Tae Jung

Chair Professor, Dept. of Chemical & Biomolecular Engineering,  
Director, Saudi Aramco-KAIST CO<sub>2</sub> management Center  
Director, KAIST-UCB-VNU Global Climate Change Research Center  
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## Research Interests

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Research in OEM focuses on developing advanced functional nanomaterials and nanostructures to address critical challenges in climate change and sustainability, including greenhouse gas management, sustainable energy, and sensing technologies. We explore a wide range of top-down and bottom-up approaches for precise control of materials and nanostructures, including novel secondary sputtering, soft lithography, and supramolecular self-assembly. Our group aims to develop novel materials and innovative technologies that overcome the limitations of existing approaches and achieve world-leading performance. Beyond fundamental scientific advances, we strive to translate our discoveries into practical technologies and devices with real-world industrial applications.

## Education

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Postdoctoral Research Fellow, University of California at Santa Barbara,  
Chemical Engineering & Materials, USA (1998-2000)  
Ph.D in Macromolecular Sci.& Eng., Case Western Reserve University, USA (1998)  
MS in Chemical & Biomolecular Engineering, KAIST, Korea (1989)  
BS in Chemical Engineering, Yonsei University, Korea (1987)

## Professional Career

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2026: Chair, Global MXene and 2D Materials Conference 2026  
2024-2025: President, Korean Environmental Science Society  
2023-present: KEPCO (Korea Electric Power Corporation) Chair Professor  
2023-present: Adjunct Prof., Graduate School of the KAIST Green Growth & Sustainability  
2023-present: National K-Tech Committee for Carbon Neutrality  
2022-present: Director, Saudi Aramco – KAIST CO<sub>2</sub> management Center  
2022-present: Director, KAIST-SK on Battery Human Resource Program  
2021-present: Director, KAIST-UC Berkeley-VNU Global Climate Change Research Center  
2020-2025: Adjunct Professor, College of Business, KAIST  
2019-present: Member of ‘The National Academy of Engineering of Korea’  
2019-2022: Program Head, Tsinghua – KAIST Chem. Eng. Symposium  
2015-2022: Director, KAIST Institute for Nano-century  
2018-present: Director of ‘KAIST Polymer Program’  
2018-2022: Director of ‘CEPP (LG Chem. Corp. – KAIST Education Program)’  
2017-2018: Head of Polymer Division of Korean Chemical Engineering Society

2016-present: Adjunct Professor, National Nano-Fab Center  
2013-2015: Advisory Board Member of ‘Samsung Future Technology Committee’  
2011-2014: Director, World Class University Program  
2011-present: KAIST Chair Professor  
2009-2010: Visiting Professor, Electronic Materials Group, Polymer Division,  
National Institute of Standard & Technology (USA)  
2007-2015: Adjunct Professor, Dept. of Chemistry, KAIST  
2003-2005: Adjunct Professor, Laboratory of Integrative Biotechnology,  
Korea Research Institute of Bioscience & Biotechnology  
2000-present: Assistant, Associate, Full Professor, Dept. of Chemical & Biomolecular  
Engineering, KAIST  
1989-1994: Senior Research Scientist, Material & Devices Research Center, Samsung  
Advanced Institute of Technology

## **Journal Editor**

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2021-present: ACS Sensors, Associate Editor  
2020-2025: Chemosensor, Editorial Board  
2016-2025: Scientific Reports, Editorial Board  
2015-2025: Current Nanomaterials, Editorial Board  
2011-2015: Associate Editor, Macromolecular Research  
2008-2011: Advisory Board, Nice Science (KJChE)  
2007-2015: NPG Asian Materials (Nature Publishing Group), Editorial Board  
2007-2010: Macromolecular Research, Editorial Board  
2004: Journal of Industrial Engineering Chemistry, Special Edition “Nanotechnology”, Guest Editor  
2003-2011: Journal of Industrial Engineering Chemistry, Editorial Board

## **Awards & Honors**

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2025: KAIST Impact Research Award  
2025: KAIST Education Innovation Award  
2024: KAIST International Collaboration Award  
2022: LG Chem. Polymer Best Award (PSK)  
2021: 2021 NNFC Nanotechnology Award (NNFC)  
2018: Korean Membrane Science Committee Award (Korean Membrane Society)  
2018: The Best Patent of KAIST  
2017: Korea Top 10 Nanotechnology of the year (Ministry of Science and ICT)  
2016: Outstanding Paper Award (Korea Electrical and Technology Society)  
2016: Korean Environmental Science Committee Award (Korean Environmental Society)  
2013: KAIST Top10 Research Award of the year  
2012: Best Scientist of the Month (Ministry of Science & Technology, Korea)  
2011: Leading Research Lab. (NRF)  
2010 & 2011: Top 10 technology of the year  
2010: KAIST Technical Renovation Award  
2010: Korean in PubMed Award (Biology Research Information Center)

2009: Campus Patent Strategy Universiade Outstanding Professor Award (National Academy of Engineering, Korea)  
 2008: KAIST Academic Award of The Year (KAIST)  
 2008: 2000 Outstanding scientists Award (International Biography)  
 2008: Top 100 Scientist Award (International Biography)  
 2005-2007: Top Scientist (Marquis Who is Who?)  
 2005-2007: The IBC Leading Scientist of World  
 2004: Key Research Laboratory (DongA Science)  
 2002: Outstanding Research Scientist (LG YonAm Foundation)  
 1997: Outstanding Research Scientist Award (Advanced Liquid Crystal Materials Center, USA)  
 1993: Patent Map Competition Award (Samsung Electronics)

### **Selected Publications (Corresponding Author)**

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- “Competitive reactivity drives size- and composition-focusing in multimetallic nanocrystals”, **Science**, 392, 6798 (2026)
- “Significant Stability Enhancement in Photocatalytic CO<sub>2</sub> Reduction via Flow-Driven Strategies”, **Nature Communications**, 17, 4137 (2026)
- “Continuous biochemical profiling of the gastrointestinal tract using a multiparametric smart capsule”, **Nature Electronics**, 8, 844-855 (2025)
- “Continuous flow-reactor with superior production rate and stability for CO<sub>2</sub> reduction using semiconductor photocatalysts”, **Energy & Environmental Science**, 16, 2689 (2023)
- “Atomic-scale homogeneous Ru-Cu alloy nanoparticles for highly efficient electrocatalytic nitrogen reduction”, **Adv. Mater.**, 34, 22055270 (2022)
- “Generation of high-density nanoparticles in the carbothermal shock method”, **Science Advances**, 7, eabk2984 (2021)
- “Large-area alignment of supramolecular columns by photo-thermal laser writing”, **Advanced Materials**, 32, 2002620 (2020)
- “Metallic Ti<sub>3</sub>C<sub>2</sub>T<sub>x</sub> MXene Gas Sensors with Ultrahigh Signal-to-Noise Ratio”, **ACS Nano**, 12, 986 (2018) [**#1802 citation since 2018**]
- “Direct visualization of large-area graphene domains and boundaries by optical birefringence”, **Nature Nanotechnology**, 7, 29-34 (2012)
- “Internal structure visualization and lithographic use of periodic toroidal holes in liquid crystals”, **Nature Materials**, 6, 866-870 (2007)

### **Supervised Students & Postdoctoral Researchers**

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- **Former Group Members:** PhD Graduates (64), MS Graduates (37), Postdoctoral

Researchers (12)

- **Current Group Members:** Postdoctoral Researchers (4), PhD Students (9), MS Students (12)