JEONG HOON BYEON (J. H. BYEON)

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PROFESSIONAL CAREER PATH

10/15/2024 ~ Present
Adjunct Professor, Department of Biological Systems Engineering, **University of Nebraska, Lincoln**
09/01/2023 ~ Present
Professor, School of Mechanical Engineering, **Yeungnam University**, Gyeongsan, South Korea
03/01/2019 ~ 08/31/2023
Visiting Scholar, 09/01/2022 ~ 08/31/2023, School of Health Sciences, **Purdue University**
Assistant and Associate Professor, 09/01/2014 ~ 08/31/2023, School of Mechanical Engineering, **Yeungnam University**, Gyeongsan, South Korea
03/01/2011 ~ 08/16/2014
Postdoctoral Research Associate, Department of Chemistry, **Purdue University**
Supervisor: Dr. Jeffrey Roberts (Frederick Hovde Dean and Professor of Chemistry)
(Current: Dean and Professor of Chemistry, San Diego State University)
03/01/2008 ~ 02/28/2011
Senior Engineer, LCD R&D Center in **Samsung Electronics Co., Ltd.**, Yongin, South Korea
03/01/2001 ~ 02/25/2008
PhD (MS combined), Mechanical Engineering, **Yonsei University**, Seoul, South Korea
Academic Advisor: Dr. Jungho Hwang (Editor, Aerosol Air Quality Research)
Dissertation: Synthesis of Nanoparticles by Electroless Deposition and/or Spark Generation and Their Applications

PRINCIPAL AREAS OF INTEREST AND ACADEMIC ACTIVITIES

- Aerosol Material Processing; Aerosol Nanomedicine; Aerosol Antimicrobial; Aerosol Exposure; Bioaerosol
- Former Leader of Bio-Health Sector in Korean Association for Particle and Aerosol Research (KAPAR)

REPRESENTATIVE HONORS AND AWARDS

- EDUCATION: Received an ABEEK (Korean ABET Accreditation) Presidential Citation (Nov 2019, Accreditation Board for Engineering Education of Korea)
- RESEARCH: A Winner of Asian Young Aerosol Scientist Award (July 2017, Asian Aerosol Research Assembly)

BOOK CHAPTER

- **Spark Ablation: Building Blocks for Nanotechnology**, Jenny Stanford Publishing, JAN, 2020.
  - *Chapter 13. Spark Ablation for Biomedical Application*

*by Bijay Kumar Poudel, Jungho Hwang, Jae Hong Park, and Jeong Hoon Byeon**

SELECTED PUBLICATIONS (recent four years, lead author only)

PUBLISHED (Recent Five Years)

- L. Liao, Z.–Q. Luo, **J.H. Byeon***, and J.H. Park, "Size-selective sampler combined with an immunochromatographic assay for the rapid detection of airborne *Legionella pneumophila*," ***Science of the Total Environment*** [IF 8.2, 31/359 (ranked in the top 8.49%) in Environmental Sciences], 927 (2024) 172085.
- S. Kang, J. Hwang, and **J.H. Byeon***, "Electrospinning-based nanofiber architectures for outstanding CO_2 capture," ***Separation and Purification Technology*** [IF 8.1, 15/171 (ranked in the top 8.48%) in Engineering, Chemical], 320 (2023) 124202.
- J. Oh, J. Choi, M. Massoudifarid, J.Y. Park, J. Hwang, J. Lim, and **J.H. Byeon***, "Size-classified monitoring of ATP bioluminescence for rapid assessment of biological distribution in airborne particulates," ***Biosensors & Bioelectronics*** [IF 10.7, 3/106 (ranked in the top 2.36%) in Chemistry, Analytical], 234 (2023) 115356.
- S. Park, K. Poudel, J. Lim, J. Oh, S.K. Ku, J. Hwang, J.O. Kim, and **J.H. Byeon***, "Aerosol additive manufacturing of multi-component supraparticles for Fenton reaction-assisted multi-modal anticancer treatment," ***Chemical Engineering Journal*** [IF 13.3, 3/81 (ranked in the top 3.09%) in Engineering, Environmental], 465 (2023) 142971.
- J. Choi, K. Poudel, K.S. Nam, A. Piri, A. Rivera–Piza S.K. Ku, J. Hwang, J.O. Kim, and **J.H. Byeon***, "Aero-manufacture of nanobulges for an in-place anticoronaviral on air filters," ***Journal of Hazardous Materials*** [IF 12.2, 12/359 (ranked in the top 3.20%) in Environmental Sciences], 445 (2023) 130458.
- K. Poudel, K.S. Nam, J. Lim, S.K. Ku, J. Hwang, J.O. Kim, and **J.H. Byeon***, "Modified aerotaxy for the plug-in manufacture of cell-penetrating Fenton nanoagents for reinforcing chemodynamic cancer therapy," ***ACS Nano*** [IF 15.8, 14/232 (ranked in the top 5.82%) in Chemistry, Multidisciplinary], 16 (2022) 19423.
- B. Kwak, J. Choi, J. Lim, and **J.H. Byeon***, "Coaxial multiphase flame for continuous-flow assembly of ternary nanocomposite photocatalysts," ***Advanced Functional Materials*** [IF 18.5, 10/232 (ranked in the top 4.09%) in Chemistry, Multidisciplinary], 32 (2022) 2110471.
- S. Maharjan, M. Gautam, K. Poudel, C.S. Yong, S.K. Ku, J.O. Kim, and **J.H. Byeon***, "Streamlined plug-in aerosol prototype for reconfigurable manufacture of nano-drug delivery systems," ***Biomaterials*** [IF 12.8, 2/53 (ranked in the top 2.83%) in Materials Science, Biomaterials], 284 (2022) 121511.
- K. Poudel, S. Park, J. Hwang, S.K. Ku, C.S. Yong, J.O. Kim, and **J.H. Byeon***, "Photothermally modulatable and structurally disintegratable sub-8-nanometer Au_1Ag_9 embedded nanoblocks for combination cancer therapy produced by plug-in assembly," ***ACS Nano*** [IF 15.8, 14/232 (ranked in the top 5.82%) in Chemistry, Multidisciplinary], 14 (2020) 11040.
- W. Ou, K.S. Nam, D.H. Park, J. Hwang, S.K. Ku, C.S. Yong, J.O. Kim, and **J.H. Byeon***, "Artificial nanoscale erythrocytes from clinically relevant compounds for enhancing cancer immunotherapy," ***Nano-Micro Letters*** [IF 31.6, 8/439 (ranked in the top 1.71%) in Materials Science, Multidisciplinary], 12 (2020) 90.
- D.H. Park, Y.H. Joe, J. Hwang, and **J.H. Byeon***, "Evaporation-condensation in the presence of unipolar ionic flow for solvent-free production of ultrasmall antibacterial particles," ***Chemical Engineering Journal*** [IF 13.3, 3/81 (ranked in the top 3.09%) in Engineering, Environmental], 381 (2020) 122639.
- M. Gautam, D.H. Park, S.J. Park, K.S. Nam, G.Y. Park, C.S. Yong, J. Hwang, J.O. Kim, and **J.H. Byeon***, "Plug-in safe-by-design nanoinorganic antibacterials," ***ACS Nano*** [IF 15.8, 14/232 (ranked in the top 5.82%) in Chemistry, Multidisciplinary], 13 (2019) 12798.
- W. Ou, **J.H. Byeon***, Z.C. Soe, B.K. Kim, R.K. Thapa, B. Gupta, B.K. Poudel, S.K. Ku, C.S. Yong, and J.O. Kim, "Method for the instant in-flight manufacture of black phosphorus to assemble core@shell nanocomposites for targeted photoimmunotherapy," ***Theranostics*** [IF 12.4, 8/190 (ranked in the top 3.95%) in Medicine, Research & Experimental], 9 (2019) 6780.

REGISTERED PATENTS AND TECHNICAL TRANSFER

- Nanocomposite Preparation Apparatus (US 12,520,846), January 13, 2026
- Apparatus for Capturing Bioaerosols (US 11,833,527), December 05, 2023: Allowance Notification Date (15-November-2023)
- Personal Sampler for Bioaerosol (US 11,754,475), September 12, 2023
- Multifunctional Filter Medium, and Method and Apparatus for Manufacturing Same (US 10,688,425), June 23, 2020: Allowance Notification Date (03-April-2020)
- Functional Fiber for Adsorbing Heavy Metal and Method for Producing Same (US 10,722,834), July 28, 2020: Allowance Notification Date (18-March-2020)
- Preparation Apparatus for Nanocomposite Material and Self-Assembly Preparation Method (US 10,786,460), Sep 29, 2020: Allowance Notification Date (04-June-2020)
- Method of Forming Metal Pattern and Method of Manufacturing Display Substrate Having the Same (US 8,871,075), Oct 28, 2014.

Technical Transfer (280,000 USD + Running Royalty [4% of the net profit for 7 years]), Nov. 2023.
Technical Transfer (220,000 USD + Running Royalty [2% of the total sales for 7 years]), Nov. 2022.
Technical Transfer (270,000 USD + Running Royalty [2% of the total sales for 7 years]), Dec. 2018.
Technical Transfer (42,000 USD + Running Royalty [1% of the total sales for 7 years]), Apr. 2019.

REPRESENTATIVE REVIEWER ACTIVITIES

1) *Advanced Materials, ACS Nano, Angewandte Chemie-International Edition, Small*
2) *ACS Applied Materials & Interfaces, Chemical Engineering Journal*
3) *Journal of Materials Chemistry A, Journal of Colloid and Interface Science*
4) *Journal of Materials Chemistry B, Journal of Physical Chemistry C*
5) *Nanoscale, Advanced Healthcare Materials, Biomacromolecules*
6) *Journal of Controlled Release, Advanced Functional Materials, Advanced Science*
7) *Small Methods, Journal of Hazardous Materials, Chemical Communications*
8) *Environment International, Journal of Cleaner Production, Environmental Research*

REPRESENTATIVE RESEARCH PROJECTS

5. 12/01/2023-11/30/2024, Antifouling Surface for Heat Exchanger Through Constructing Hierarchical Nanostructures, 223C000837, Industry-University Collaboration Project, LG Electronics.

4. 04/01/2022-12/31/2026, Development of Technology to Identify Adverse Effects of Particulate Materials on the Cardiovascular Diseases, 2022003310013, Environmental Technology Development Project, Korea Environmental Industry & Technology Institute (KEITI).

3. 10/01/2021-08/31/2022, Advanced Plasma Device from Nanoscale Electrostatic Discharge, 221C000880, Industry-Academic Project, LG Electronics.

2. 04/01/2021-12/31/2025, Harmful Factor DB Construction and IoT-Based Air Capture-Concentration-Pretreatment-Continuous Diagnosis Linkage Technology Development, RE202101004, Environmental Technology Development Project, Korea Environmental Industry & Technology Institute (KEITI).

1. 05/01/2015-04/30/2018, Constant Generation System of Simulated Nanoparticles for Uncontrollable Exposure and Their Applications for Efficient Health Risk Assessment and In Situ Nanotoxicity Reduction, 2015005809, Middle-Grade Researcher Supporting Program, National Research Foundation of Korea (NRF).

REPRESENTATIVE INVITED SEMINARS

- Aerosol-based biomedical engineering – Anticancer, antimicrobial, and antitransmission
  : University of Nebraska, Lincoln, United of States, May 3, Biosystems Engineering, 2023
- Plug-in Inorganic Nanoantibacterials
  : Nano Korea 2020, KINTEX, S. Korea, July 01-03, I20Se_0015, 2020
- Gas-phase processing to fabricate nanoscale hybrid materials and their applications
  : University of Missouri, Columbia, United of States, Apr 27-29, Mechanical and Aerospace Engineering, 2014
- Aerosol-based processing to fabricate nanoscale hybrid materials and their applications
  : ETH, Zurich, Switzerland, Apr 15-16, Mechanical and Process Engineering, 2014
  : University of Michigan, Ann Arbor, MI, United States, May 9, Chemical Engineering, 2014
  : Rutgers University, Piscataway Township, Jul 18, Mechanical and Aerospace Engineering, 2014
- Aerosol-based fabrication of nanoscale materials and patterns
  : University of Iowa, Iowa City, IA, United States, Feb 07, National Institute of Environmental Health Sciences (NIEHS), 2014.
  : Northwestern University, Evanston, IL, United States, Feb 14, Materials Science and Engineering, 2014.
- Gas-phase materials processing as a green nanotechnology, Purdue University, West Lafayette, IN, United States, May 08, Environmental and Ecological Engineering, 2013.
- There's something in the air: Surface chemistry at aerosol nanoparticles, 243rd ACS National Meeting & Exposition, San Diego, CA, United States, Mar 25-29, ENVR-263, 2012.

MAJOR TEACHING COURSES

1) Heat Transfer
2) Nano Engineering
3) Air Conditioning and Environment
4) Fluid Mechanics
5) Bio-Mechanical Engineering
6) Thermodynamics

RESEARCH COLLABORATIONS

Dr. Pavel A. Levkin (Head of Group)
Institute of Toxicology and Genetics, Karlsruhe Institute of Technology

Prof. Wolfgang J. Parak
Center for Hybrid Nanostructures (CHyN), Universität Hamburg

Prof. Jae Hong Park
School of Health Sciences, Purdue University

Prof. Jiaxing Huang
Department of Materials Science and Engineering, Northwestern University

Prof. Stephen Tse
Department of Mechanical and Aerospace Engineering, Rutgers University

Prof. Hyun-Seob Song
Department of Biological Systems Engineering, University of Nebraska-Lincoln