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RESEARCH INTEREST

BioMEMS

- Microactuator (micropump, microvalve)
- LOC (Lab-on-a-chip)
- Polymer microfabrication
- Flexible microdevice

Microfluidics

- Electrokinetic phenomena in microfluidics
- Acoustofluidic phenomena in microfluidics
- Mass-transport/thermal phenomena in microfluidics

Microfluidics application for biology/chemistry

- Biophysics/biochemistry research using microfluidics
- Biomolecule analysis for clinical diagnostics
- Impedimetric and optical biomolecule detection methods

EDUCATION AND RESEARCH TRAINING

Postdoctoral Scholar, 2012, UC Berkeley

Research topic: "Microfluidic Western Blotting"

Research advisor: Prof. Amy E. Herr

Postdoctoral Scholar, 2009, Center for Embedded Networked Sensing, UCLA

Research topic: "Micromachined Nitrate Sensor using Total Internal Reflection in a Microchannel"

Research advisor: Prof. Jack W. Judy

Ph. D. UCLA, 2008, Electrical Engineering Department

Dissertation topic: "Micromachined Chronocoulometric Nitrate Sensor and Parallel-Plate Donnan-Dialytic Sample-Preparation System using Anion-Exchange Membrane", Dissertation advisor: Prof. Jack W. Judy

M. S. Sogang University, 2001, Department of Mechanical Engineering

Thesis topic: "Research on Auto Feed Rate Control of Milling Processes by Fuzzy Control of Spindle Motor Currents", Thesis Advisor: Prof. Doyoung Jeon

B. S. Sogang University, 1999, Department of Mechanical Engineering (Cum Laude)

APPOINTMENTS

2021-present **Professor, School of Mechanical Systems Engineering, Myongji University**

2019-2020 **Visiting Associate Professor, Department of Mechanical Engineering, Johns Hopkins University**
(Prof. Claire S. Hur)

2016-2021 **Associate Professor, Department of Mechanical Engineering, Myongji University**

2012-2016 **Assistant Professor, Department of Mechanical Engineering, Myongji University**

2009-2012 **Postdoctoral Scholar**, *California Institute for Quantitative Biosciences, UC Berkeley*
 2008-2009 **Postdoctoral Scholar**, *Center for Embedded Networked Sensing, UCLA*
 2002-2008 **Research Assistant**, *Electrical Engineering Department, UCLA*
 1999-2001 **Research Assistant**, *Department of Mechanical Engineering, Sogang University*

PUBLICATIONS

Peer Reviewed Journals:

1. Bhargav Krishna Pullagura, Sofonias Nursefa Kedir, Adisu Bezu Bedane, Abdi Mirgissa Kaba, Issac Jang, Seunghyun Shin, Nguyen Anh Nhung Tran, Minsub Chung, and Dohyun Kim, "In situ Nanoporous Hydrogel Photopartitioning Enables Fluidics-free, Scalable, and Tunable Digital PCR", *Small* (Impact Factor 11.8), *submitted*.
2. Abdi Mirgissa Kaba, Woongsub Lee, Hyunjin Jeon, Sofonias Nursefa Kedir, and Dohyun Kim, "DOE-assisted CO₂-laser Machining of PMMA Microfluidic Devices with Sub-50- μ m Channel and Optically Smooth Surfaces", *Sensors and Actuators A: Physical* (Impact Factor 5.1), *revision submitted*.
3. Yeji Yang, Sofonias Nursefa Kedir, Heeyeon Kim, Dohyun Park, Abdi Mirgissa Kaba, and Dohyun Kim, "Robust Acoustofluidic Micromixer based on an Ultrathin PDMS Microballoon Oscillator", *Sensors and Actuators B: Chemical* (Impact Factor 8.3), vol. 448, Oct. 2025, pp. 139009.
4. Nhung Nguyen Anh Tran, Chansik Oh, Isac Jang, Seung Hyun Shin, Sangmin Lee, Bhargav Krishna Pullagura, Bumsang Kim, *Dohyun Kim, and *Minsub Chung, "Inhibition of Polymerase Chain Reaction by Hydrogel Monomers", *Applied Materials Today* (Impact Factor 7.0), vol. 45, June 2025, pp. 102821 *Co-corresponding author.
5. Teklebrahan Gebrekrstos Weldemhret, Nebiyu Tadesse Debele, Sofonias Nursefa Kedir, Alemtehay Tesfay Reda, Dohyun Kim, Kwun-Bum Chung, Yong Tae Park, "Thermally Stable and Shape-Adaptive Triboelectric Nanogenerators Based on Liquid Electrolytes with Low Vapor Pressure", *Small* (Impact Factor 11.8), vol. 21, April 2025, pp. 2500318.
6. Seungmin Lee, Bhargav Krishna Pullagura, Youngbin Kim, Chan Lee, Abdi Mirgissa Kaba, Boseok Huh, Jintae Kim, Sang Kug Chung, and Dohyun Kim, "UV adhesive hybrid bonding for sub-100- μ m 3D-printed microchannels and its application to inertial and droplet microfluidics", *Biochip Journal* (Impact Factor 6.7), vol. 19, June 2025, pp. 367-384.
7. Jianyun Meng, Nebiyu Getachew Arega, Bhargav Krishna Pullagura and Dohyun Kim, "Numerical-simulation-based Buffer Design for Microchip Electrophoresis with Capacitively Coupled Contactless Conductivity Detection", *Biochip Journal* (Impact Factor 6.7), vol. 18, Jan. 2024, pp. 115-136.
8. Seonhyeok Baek, Hakhyun Kim, Heewon Hwang, Abdi Mirgissa Kaba, Hyeonsik Kim, Minsub Chung, Jintae Kim, and Dohyun Kim, "A Laser-micromachined PCB Electrolytic Micropump using an Oil-based Electrolyte Separation Barrier", *Biochip Journal* (Impact Factor 6.7), vol. 17, Mar. 2023, pp. 244-262.
9. Hyun Namgung, Abdi Mirgissa Kaba, Hyeonkyu Oh, Hyunjin Jeon, Jeonghwan Yoon, Haseul Lee and Dohyun Kim, "Quantitative Determination of 3D-printing and Surface-treatment Conditions for Direct-printed Microfluidic Devices", *Biochip Journal* (Impact Factor 6.7), vol. 16, Feb. 2022, pp. 82-98.
10. Nebiyu Getachew Arega, Whitney N. Heard, Nguyen Anh Nhung Tran, Sukyo Jung, Jianyun Meng, Minsub Chung, Moon-Soo Kim, and Dohyun Kim, "Zinc-finger-protein-based Microfluidic Electrophoretic Mobility Reversal Assay for Quantitative Double-stranded DNA Analysis", *Biochip Journal* (Impact Factor 6.7), vol. 15, Nov. 2021, pp. 381-395 (*Cover article*)
11. Abdi Mirgissa Kaba, Hyunjin Jeon, Areum Park, Kyungjin Yi, Seonhyuk Baek, Aeja Park, and Dohyun Kim,

- "Cavitation-microstreaming-based Lysis and DNA Extraction using a Laser-machined Polycarbonate Microfluidic Chip", *Sensors & Actuators: B. Chemical* (Impact Factor 8.3), vol. 346, Nov. 2021, pp.130511
12. Jiyoung Shim, Langley Williams, Dohyun Kim, Kisung Ko, and Moon-Soo Kim, "Application of engineered zinc finger proteins immobilized on paramagnetic beads for multiplexed detection of pathogenic DNA", *Journal of Microbiology and Biotechnology* (Impact Factor 3.4), vol. 31, Sep. 2021, pp. 1-7
 13. Srivathsan Kalyan, Corinna Torabi, Harrison Khoo, Hyun Woo Sung, Sung-Eun Choi, Wenzhao Wang, Benjamin Treutler, Dohyun Kim, Soojung Claire Hur, "Inertial Microfluidics Enabling Clinical Research", *Micromachines* (Impact Factor 3.5), vol. 12, Mar. 2021, 257.
 14. Hyunjin Jeon, Kaba Abdi Mirgissa, Seonhyuk Baek, Kyehan Rhee, and Dohyun Kim, "Excitation-Frequency Determination Based on Electromechanical Impedance Spectroscopy for a Laser-Microfabricated Cavitation Microstreaming Micromixer", *Sensors & Actuators: A. Physical* (Impact Factor 5.1), vol. 326, Apr. 2021, pp. 112730.
 15. Minh Khang Chau, Nebiyu Getachew Arega, Nguyen Anh Nhung Tran, Jin Song, Sangmin Lee, Jintae Kim, Minsub Chung, and Dohyun Kim, "Single-point, Multianalyte, Label-free Contactless Conductivity Detection for Microfluidic Isoelectric Focusing", *Analytical Chimica Acta* (Impact Factor 6.1), vol. 1125, Mar. 2020, pp. 60–70.
 16. Hakhyun Kim, Heewon Hwang, Seonhyeok Baek, and Dohyun Kim, "Design, Fabrication, and Performance Evaluation of a Printed-circuit-board Microfluidic Electrolytic Pump for Lab-on-a-chip Devices", *Sensors & Actuators: A. Physical* (Impact Factor 5.1), vol. 277, July 2018, pp. 73-84.
 17. Yeji Kim, Kyung Joo Song, Jintae Kim, Minsub Chung, and Dohyun Kim, "Single Amino Acid Replacement transforms mCherry to a Far-red fluorescence protein", *Biotechnology and Bioprocess Engineering* (Impact Factor: 2.8), vol. 21, Jan. 2017, pp. 720–725.
 18. Jin Song, Minsub Chung, and Dohyun Kim, "Microfluidic ice generation and freezing of biological solution using water-based evaporative cooling of atomized microdroplets", *Review of Scientific Instruments* (Impact Factor: 1.6), vol. 86, Jan. 2015, pp. 016103.
 19. Minsub Chung, Dohyun Kim*, and Amy E. Herr, "Polymer sieving matrices in microanalytical electrophoresis", *Analyst* (Impact Factor: 3.6), vol. 139, Aug. 2014, pp. 5636-5655 (*Two authors equally contributed).
 20. Dohyun Kim, and Jack W. Judy, "Analysis of Donnan-dialyzer irreproducibility and experimental study of a microfluidic parallel-plate membrane-separation module for total analysis systems", *Journal of Membrane Science* (Impact Factor: 8.8), vol. 460, June 2014, pp. 148–159.
 21. Jeong Byung Chae, Jun O Kwon, Ji Sun Yang, Dohyun Kim, Kyehan Rhee, Sang Kug Chung, "Optimum thickness of hydrophobic layer for operating voltage reduction in EWOD systems", *Sensors and Actuators A: Physical* (Impact Factor: 5.1), vol. 215, Aug 2014, pp. 8–16.
 22. Dohyun Kim, and Amy E. Herr, "Protein Immobilization Techniques for Microfluidic Assays", *Biomicrofluidics* (Impact Factor: 2.7), vol. 7, July 2013, pp. 041501.1-47 (*cited 517 times*)
 23. Minsub Chung, Dohyun Kim, and Amy E. Herr, "Microchamber Western Blotting using Poly-L-Lysine Conjugated Polyacrylamide Gel for Blotting of SDS coated proteins", *Analytical Chemistry* (Impact Factor: 7.3), vol. 85, Aug. 2013, pp. 7753–7761.
 24. Dohyun Kim, Kelly Karns, Samuel Q. Tia, Mei He, and Amy E. Herr, "Electrostatic Protein Immobilization Using Charged Polyacrylamide Gels and Cationic Detergent Microfluidic Western Blotting", *Analytical Chemistry* (Impact Factor: 7.3), vol. 84, Mar. 2012, pp. 2533–2540.
 25. Samuel Tia, Mei He, Dohyun Kim, and Amy E. Herr, "Multi-analyte On-Chip Native Western Blotting",

Analytical Chemistry (Impact Factor: 7.3), vol. 83, May 2011, pp. 3581-3588.

26. Dohyun Kim, Ira B. Goldberg, and Jack W. Judy, "Micromachined Electrochemical Nitrate Sensor using Double-potential-step Chronocoulometry", *Sensors and Actuators B* (Impact Factor: 8.3), vol. 135, Jan. 2009, pp. 618–624.
27. Dohyun Kim, Ira B. Goldberg, and Jack W. Judy, "Chronocoulometric Determination of Nitrate on Silver Electrode and Sodium Hydroxide Electrolyte", *Analyst* (Impact Factor: 3.6), vol. 132, No. 4, Apr. 2007, pp. 350-357.
28. Dohyun Kim, Do Hyeon Son, and Doyoung Jeon, "Feed-system autotuning of a CNC Machining Center: Rapid System Identification and Fine Gain Tuning Based on Optimal Search", *Precision Engineering* (Impact Factor: 4.5), vol. 36, Apr. 2012, pp. 339– 348.
29. Dohyun Kim, and Doyoung Jeon, "Fuzzy-Logic Control of Cutting Forces in CNC Milling Processes and Comparison of Feed and Spindle Motor Currents as an Indirect Force Sensor", *Precision Engineering* (Impact Factor: 4.5), vol. 35, Jan. 2011, pp. 143–152.
30. Usob Lee, Dohyun Kim, Namkeon Hur and Doyoung Jeon, "Design Analysis and Experimental Evaluation of an MR Fluid Clutch", *Journal of Intelligent Material Systems and Structures* (Impact Factor: 2.7), vol. 10, No. 9, Sep. 1999, pp. 701-707.

Peer-reviewed International Conference Proceedings:

1. Seungmin Lee, Bhargav Krishna Pullagura, Youngbin Kim, Chan Lee, Abdi Mirgissa Kaba, Boseok Huh, Jintae Kim, Sang Kug Chung and Dohyun Kim, "UV-adhesive Hybrid Bonding Advances 3D-printed Microfluidics by Enabling Highly Transparent Sub-100- μm Microchannels without Surface Treatment", MicroTAS 2025, Adelaide, Australia, Nov. 2-6, 2025
2. Bhargav Krishna Pullagura, Sophia Ahktar, Sofonias Nursefa Kedir, Abdi Mirgissa Kaba, Nhung Tran, Seunghyun Shin, Minsub Chung, and Dohyun Kim, "Fluidics-free Gel-grid Digital PCR", MicroTAS 2024, Montreal, Canada, Oct. 14-17, 2024.
3. Yeji Yang, Heeyeon Kim, Dohyun Park, Abdi Mirgissa Kaba, and Dohyun Kim, "Robust Acoustofluidic Micromixer based on An Ultrathin PDMS Microballoon Oscillator", MicroTAS 2024, Montreal, Canada, Oct. 14-17, 2024.
4. Sofonias Nursefa Kedir, Bhargav Krishna Pullagura, Abdi Mirgissa Kaba, and Dohyun Kim, "High-performance Microfluidic DNA Extractor Based- on Optimized Excitation Voltage and 3d Out-of-plane Cavitation Microstreaming", MicroTAS 2023, Katowice, Poland, Oct. 15-19, 2023.
5. Sukyo Joung, Dohyun Kim, Jintae Kim, and Minsub Chung, "Microscale Formation of Immobilized pH Gradient in Simple Straight Channel", MicroTAS 2019, Basel, Switzerland, Oct. 27-31, 2019
6. Kaba Abdi Mirgissa, Hyunjin Jeon, and Dohyun Kim, "A Microfluidic Cavitation-Microstreaming DNA Extractor", MicroTAS 2019, Basel, Switzerland, Oct. 27-31, 2019
7. Hyunjin Jeon, Kaba Abdi Mirgissa, and Dohyun Kim, "Impedance-based Excitation-frequency Optimization for a Transfer-tape-supported Laser-micromachined Cavitation-microstreaming Micromixer", MicroTAS 2019, Basel, Switzerland, Oct. 27-31, 2019
8. Kaba Abdi Mirgissa, Woongsub Lee, and Dohyun Kim, "Toward Rapid Prototyping of High-Aspect-Ratio Sub-100- μm PMMA Microfluidic Devices: Optimization of CO₂ Laser Machining and Solvent-Assisted Thermal Bonding", IEEE MEMS 2019, Seoul, Korea, Jan. 27-31, 2019
9. Minh Khang Chau, Nebiyu Getachew Arega, Jin Song, Hwajin Lee, Jintae Kim, Minsub Chung, and Dohyun Kim, "Quantitative and Multi-Species Determination of Isoelectric-Focused-Proteins Using

- Single-Point Microfluidic Contactless Conductivity Detection", MicroTAS 2018, Kaohsiung, Taiwan, Nov. 11-15, 2018
10. Seonhyeok Baek, Hakhyun Kim, Heewon Hwang, Junhee Lee, and Dohyun Kim, "A Tape-backing-supported-Laser-micromachined PCB Electrolytic Micropump Using an Oil-based Electrolyte-separation Barrier", MicroTAS 2018, Kaohsiung, Taiwan, Oct. 11-15, 2018
 11. Nebiyu Getachew Arega, Whitney N. Heard, Moon-Soo Kim, and Dohyun Kim, "Zinc-Finger-Protein-Based Rapid Microfluidic Homogenous Electrophoresis Affinity Assay For Quantitative Gene Analysis", MicroTAS 2017, Savannah, USA, Oct. 22-26, 2017.
 12. Hakhyun Kim, Heewon Hwang, Jongwon Kim, and Dohyun Kim, "An Electrolytic Micropump Fabricated On Printed Circuit Board For Integrated Microfluidic System", MicroTAS 2017, Savannah, USA, Oct. 22-26, 2017.
 13. Nebiyu Getachew Arega, Jin Song, Kyung Joo Song, Jintae Kim, Minsub Chung, and Dohyun Kim, "Contactless Conductivity Detection Of Proteins For Microfluidic Isoelectric Focusing", 2016 MicroTAS, Dublin, Ireland, Oct. 9-13, 2016.
 14. Jin Song, Minsub Chung, and Dohyun Kim, "Evaporation-cooling-based Microfluidic Temperature Control And Ice Generation", 2014 MicroTAS, San Antonio, TX, Oct. 26-30, 2014.
 15. Samuel Q. Tia, Alex J. Hughes, Kelly Karns, M. Kursad Araz, Mei He, Dohyun Kim and Amy E. Herr, "Towards Next-Generation Proteomic Assays: Functional Materials as Sieving Matrices and Binding Scaffolds", 2011 MRS Fall Meeting, Boston, MA, Nov. 28-Dec. 2, 2011, Vol. 1415, mrsf11-1415-ii06-05, doi:10.1557/opl.2011.1537
 16. Dohyun Kim, Samuel Q. Tia, Mei He, and Amy E. Herr, "Microfluidic Western Blotting: Cationic Surfactant Based Protein Sizing Integrated With Electrostatic Immobilization", the 24th International Conference on Micro Electro Mechanical Systems, MEMS 2011, Cancun, Mexico, January 23 - 27, 2011, p. 197-200.
 17. Samuel Q. Tia, Mei He, Dohyun Kim, and Amy E. Herr, "On-chip Multi-analyte Far Western Blotting In Two Minutes", *Proceedings of The 14th International Conference on Miniaturized Systems for Chemistry and Life Sciences*, Groningen, Netherlands, October 3-7, 2010, p. 731-733.
 18. Dohyun Kim, Ira B. Goldberg, and Jack W. Judy, "Micromachined Amperometric Nitrate Sensor with an Anion Permeable Membrane", *the 206th Meeting of The Electrochemical Society, Chemical Sensors VI: Chemical and Biological Sensors and Analytical Methods*, Honolulu, Hawaii, Oct. 3-8, 2004, p. 223-231.
 19. Dohyun Kim, Ira B. Goldberg, and Jack W. Judy, "Micromachined Amperometric Nitrate Sensor with Integrated Microfluidics", *Hilton Head 2004: A Solid State Sensor, Actuator and Microsystems Workshop*, Hilton Head Island, South Carolina, June 6-10, 2004, p. 97-98.
 20. Usob Lee, Dohyun Kim, Namkeon Hur and Doyoung Jeon, "Design analysis and experimental evaluation of an MR fluid clutch", *Proceedings of the 7th International Conference on Electro-Rheological Fluids and Magneto-Rheological Suspensions*, Honolulu, Hawaii, July 19-23, p. 674-681

Peer-reviewed Domestic Conference Proceedings:

1. Sofonias Nursefa Kadir, Abdi Mirgissa Kaba, Bhargav Krishna Pullagura, Dohyun Kim, "μPIV-assisted optimization of operating conditions and device geometry for a microfluidic cavitation-microstreaming DNA extractor", The KMEMS 2026 Spring Conference 2026, Jeju, Korea, Mar. 25-27, 2026
2. Admas Dagnachew Temesgen, Minjoon Jeon, Sofonias Nursefa Kadir, Hyungjoon Ryu, Hoyoung Choi, Myunghee Kim, Joonhui Kim, Dohyun Kim, "Microfluidic Cell-viability Monitoring Device based on Sharp-edge Acoustic Streaming", The KMEMS 2026 Spring Conference 2026, Jeju, Korea, Mar. 25-27, 2026

3. Minjun Jeon, Dohyun Park, Yeji Yang, Sangmin Lee, Jintae Kim, Hyun Namgung, Minsub Chung, Dohyun kim, "Rapid Synthesis of Lipid Nanoparticles for RNA Vaccines using Sharp-edge Acoustic Microstreaming", *The Korean KMEMS Spring Conference 2025*, Jeju, Korea, Mar. 26-28, 2025
4. Sofonias Nursefa Kediri, Abdi Mirgissa Kaba, Bhargav Krishna Pullagura, Dohyun Kim, "Optimized Operating Conditions and 3D Out-of-plane Mixing Advance Cavitation-microstreaming-based Microfluidic DNA Extraction", *The Korean KMEMS Spring Conference 2025*, Jeju, Korea, Mar. 26-28, 2025
5. Yeji Yang, Sofonias Nursefa Kediri, Heeyeon Kim, Dohyun Park, Abdi Mirgissa Kaba, Dohyun Kim, "Rapid DNA Extraction using a PDMS-Microballoon-based Acoustofluidic Micromixer", *The Korean KMEMS Spring Conference 2025*, Jeju, Korea, Mar. 26-28, 2025
6. Hyun Namgung, Abdi Mirgissa Kaba, Hyeonkyu Oh, Hyunjin Jeon, and Dohyun Kim, "Quantitative Determination of 3D Printing and Surface Treatment Conditions for Direct-printed Microfluidic Devices", *The Korean KMEMS Spring Conference 2022*, Jeju, Korea, Apr. 6-8, 2022
7. Seonhyeok Baek, Hakhyun Kim, Heewon Hwang, Junhee Lee, Abdi Mirgissa Kaba, Hyunjin Jeon, and Dohyun Kim, "Oil-plug electrolysis micropump fabricated with PCB and tape-based laser machining", *The Korean KMEMS Spring Conference 2022*, Jeju, Korea, Apr. 6-8, 2022
8. Dohyun Kim, Kelly Karns, Samuel Q. Tia, Mei He, and Amy E. Herr, "Electrostatic Protein Immobilization Gel for Microfluidic Western Blotting", *The Korean MEMS conference 2012*, Jeju, Korea, Apr. 5-7, 2012, p.1-2.
9. Dong-Uk Seo, Do-Hyun Kim, and Doyoung Jeon, "Tool Monitoring of a CNC Machining Center Using The Wavelet Transform", *Proceedings of the Korean Society of Precision Engineering Annual Meeting*, Suwon, Korea, Oct. 28, 2000, p. 148-152.
10. Do-Hyun Kim and Doyoung Jeon, "Research on the Auto Feedrate Control of Milling Processes by Fuzzy Control of Spindle Motor Currents", *Proceedings of the Korean Society of Mechanical Engineering Annual Meeting, Dynamics and Control*, Muju, Korea, July 13-14, 2000, p. 396-401.
11. Do-Hyun Kim and Doyoung Jeon, "Research on the Auto Feedrate Control of Milling Process by the Fuzzy Control of Motor Currents", *Proceedings of the Korean Society of Precision Engineering Annual Meeting*, Pusan, Korea, May 13, 2000, Vol. 2, p. 708-713.

RESEARCH GRANT AWARD

1. **Validation and optimization of an AI-Based imaging system for Ultra-high-sensitivity digital PCR technology (2026-2027)**
 Sponsor: Alwaygen Co.
 Funding: 88,000,000 KRW
 Role: Principal Investigator
2. **Fully automated flow microscope for high-throughput inspection of biopharmaceuticals (2025-2026)**
 Sponsor: GBSA (Gyeonggi Business & Science Accelerator)
 Funding: 40,000,000 KRW
 Role: Co-principal Investigator
3. **A microfluidics-free digital amplification method for absolute quantification of nucleic acids (2024-2025)**
 Sponsor: Myongji University Research Grant
 Funding: 5,000,000 KRW
 Role: Principal Investigator
4. **Fully automated cell counter based on a flow imaging microscope and a pipeline-type automatic**

- sample feeder (2024-2026)**
Sponsor: TIPS (Tech Incubator Program for startup)
Funding: 55,000,000 KRW/year
Role: Co-principal Investigator
5. **3D dPCR (2022-2025)**
Sponsor: Samsung Future Technology Foundation
Funding: 330,000,000 KRW/year
Role: Principal Investigator
6. **Ultra-rapid microfluidic nucleic-acid preparation and amplification based on sharp-edge acoustic streaming and photothermal temperature cycling (2022-2027)**
Sponsor: National Research Foundation
Funding: 100,000,000 KRW/year
Role: Principal Investigator
7. **Acoustic microstreaming micromixer based on ultra-thin elastomeric membrane oscillator (2021-2022)**
Sponsor: National Research Foundation
Funding: 50,000,000 KRW/year
Role: Principal Investigator
8. **Skin phantom simulating a capillary network of wrist (2021-2021)**
Sponsor: Samsung Electronics
Funding: 104,500,000 KRW/year
Role: Principal Investigator
9. **A contactless-conductivity biomolecular analysis platform based on supercharged bioconjugates and microfluidic mobility shift assay (2019-2022)**
Sponsor: National Research Foundation
Funding: 50,000,000 KRW/year
Role: Principal Investigator
10. **Microfluidic DNA extraction cartridge based on cavitation microstreaming (2018-2019)**
Sponsor: The Ministry of SMEs and Startups
Funding: 40,000,000 KRW/year
Role: Principal Investigator
11. **Chemically-writable Multi-level/Multi-cell Memory using Protein (2016-2019)**
Sponsor: Samsung Future Technology Foundation
Funding: 144,000,000 KRW/year
Role: Co-principal Investigator
12. **Contactless conductivity detection and microchip electrophoresis for development of a high-performance, portable biomolecular analysis system (2016-2019)**
Sponsor: National Research Foundation
Funding: 50,000,000 KRW/year
Role: Principal Investigator
13. **Development of CMOS/MEMS hybrid biosensor array platform (2015-2018)**
Sponsor: Ministry of Trade, Industry, and Energy
Funding: 80,000,000 KRW/year
Role: Co-Principal Investigator

14. **Next-generation versatile microfluidic platform for biomolecular analysis based on hybrid mass transfer and maskless gel patterning** (2014-2017)
 Sponsor: National Research Foundation
 Funding: 50,000,000 KRW/year
 Role: Principal Investigator
15. **Microfluidic Freeze Using Evaporative Cooling of Microdroplets** (2014-2015)
 Sponsor: Myongji University Research Grant
 Funding: 5,000,000 KRW
 Role: Principal Investigator
16. **Protein-based Nanofluidic Flash Memory** (2014-2016)
 Sponsor: Samsung Future Technology Foundation, Contract #: SRFC-IT1401-07
 Funding: 200,000,000 KRW
 Role: Co-principal Investigator
17. **Laboratory Instrument Grant** (2014)
 Sponsor: Ministry of Science, ICT & Future Planning
 Funding: 20,000,000 KRW
 Role: Principal Investigator
18. **The Integration of in-situ Electrochemical Microsensor Arrays to Enable the Reliable Electrodeposition of Complex Metal Alloys in Microsystems** (2008-2009)
 Sponsor: DARPA Microsystems Technology Office-Wide BAA 09-25, Contract #: W31P4Q-10-C-009
 Funding: \$300,000.00, PI: Trevor Niblock, Magzor Corporation (www.magzor.com)
 Role: 45% Ph.D.-level engineer, provided an initial concept of electrochemical elemental sensors for magnetic alloy plating, and wrote all the technical contents of the proposal.

PATENTS

Registered:

1. Minsub Chung, Sangmin Lee, Hwajin Lee, Tran Nguyen Anh Nhung, Dohyun Kim, Nebiyu Getachew Arega, Minh Khang Chau, "Protein memory cell and protein memory system", US Patent # US 11,152,082
2. Dohyun Kim, Jin Song, and Nebiyu Getachew Arega, "Single Point Detection Type Microfluidic Isoelectric Focusing Assay and Chips Using The Same", US Patent # US 10,620,157
3. Dohyun Kim, Jin Song, Jintae Kim, Minsub Chung, Kyungju Song, Yeji Kim, "Nonvolatile protein memory system with optical write/erase and electrical readout capability", US Patent # US 10,403,360
4. Amy E. Herr and Dohyun Kim, "Multi-Directional Microfluidic Devices Comprising a Pan-Capture Binding Region and Methods of Using the Same", US Patent # US 8,921,123
5. Samuel Tia, Amy E. Herr, Mei He, and Dohyun Kim, "Microfluidic Devices and Methods for Assaying a Fluid Sample Using the Same ", US Patent # US 9,841,417
6. 김도현, 송진, 김이연, "미립화된 수용액 방울의 증발냉각을 이용한 미소유체 냉각장치", 등록번호 10-1787407
7. 김도현, 송진, 김진태, 정민섭, 송경주, 김예지, "광학적 쓰기/지우기와 전기적 읽기가 가능한 비휘발성 단백질 메모리 시스템", 등록번호 10-1985920
8. 김도현, 송진, 네비유 아레가 게타츄, "단일 지점 검출 방식 미소유체 등전점 전기영동 및 미소유체 칩", 출원번호 10-2064388
9. 김도현, 김학현, 황희원, "미세 유동 장치 및 미세 유동 장치용 칩과 이를 이용한 미세 유동 장치의

제조 방법” , 출원번호 10-2018-0055590

10. 김도현, 전현진, “미소유체 교반기 및 미소유체 교반기 제조 방법” , 출원번호 10-2018-0055596
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12. 정민섭, 이상민, 이화진, 트란 응옌 앤 뇡, 김도현, 네비유 아레 가 게타츄, 민캉차우, “단백질 메모리 셀 및 단백질 메모리 시스템”, 등록번호 10-2817176
13. 윤인호, 김도현, 김영현, 카바 압디 머기사, 윤정환, “웨어러블 장치의 심박 센서의 성능을 검증하기 위한 전자 장치 및 그의 동작 방법” , 등록번호 10-2925671

Applied:

1. 김도현, 가바 압디 밀기사, 플라구라 바가브 크리슈나, 정민섭, 트란 응옌 앤 뇡, 오찬식, 신승현, “광 중합 기술을 이용한 다차원 디지털 중합효소 연쇄반응 분석 방법” , 출원번호 10-2023-0142467
2. 김도현, 가바 압디 밀기사, 플라구라 바가브 크리슈나, 정민섭, 트란 응옌 앤 뇡, 오찬식, 신승현, “광 중합 기술기반 디지털 중합효소 연쇄반응용 용액을 제조하기 위한 키트 및 이의 용도” , 출원번호 10-2024-0126614
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4. Dohyun Kim, Abdi Mirgissa Kaba, Bhargav Krishna Pullagura, Minsub Chung, Nguyen Anh Nhung Tran, Chan Sik Oh, Seunghyun Shin, “Multi-dimensional Digital Polymerase Chain Reaction Analysis Method using Photopolymerization Technology”, US 18869547
5. 김도현, 강동혁, 백수성, 김용찬, 이찬용, 민철홍, 정진우, “사서 로봇을 이용한 도서 인출 시스템 및 방법” , 10-2025-0003554
6. 김도현, 양예지, 김희연, “마이크로 믹서 및 이를 포함하는 마이크로 믹싱 장치”, 10-2025-0063134
7. 김도현, 양예지, 김희연, “마이크로 플레이트 및 마이크로 플레이트 처리장치”, 10-2025-0201438
8. 김도현, 김진태, 전민준, 박도현, 이승민, “마이크로 채널 교반장치”, 10-2025-0214269
9. 김도현, 이승민, “광경화 하이브리드 접합 기술을 이용한 미세유체 장치 제조방법”, 10-2026-0044612

PRESENTATION

Conferences:

1. Admas Dagnachew Temesgen, Minjoon Jeon, Sofonias Nursefa Kedir, Hyungjoon Ryu, Hoyoung Choi, Myunghee Kim, Joonhui Kim, Dohyun Kim, “In-line Sharp-edge Acoustofluidic Device for Continuous Cell Viability Monitoring”, The Biochip 2026 Spring Conference, Yeosu, Korea, May 13-15 (poster)
2. Bhargav Krishna Pullagura, Sofonias Nursefa Kedir, and Dohyun Kim, “Gg-dPCR: Fluidics-Free Digital PCR via In-Situ Hydrogel Photopatterning”, The Biochip 2026 Spring Conference, Yeosu, Korea, May 13-15 (oral)
3. Sofonias Nursefa Kedir, Abdi Mirgissa Kaba, Bhargav Krishna Pullagura, Dohyun Kim, “ μ PIV-assisted optimization of operating conditions and device geometry for a microfluidic cavitation-microstreaming DNA extractor”, The KMEMS 2026 Spring Conference, Jeju, Korea, Mar. 25-27, 2026 (oral presentation)
4. Admas Dagnachew Temesgen, Minjoon Jeon, Sofonias Nursefa Kedir, Hyungjoon Ryu, Hoyoung Choi, Myunghee Kim, Joonhui Kim, Dohyun Kim, “Microfluidic Cell-viability Monitoring Device based on Sharp-edge Acoustic Streaming”, The KMEMS 2026 Spring Conference, Jeju, Korea, Mar. 25-27, 2026 (oral presentation)

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5. Yonghoo Son, Yeji Yang, Dohyun Kim, "Microfluidic mixer based on DLP-3D-printed elastomer microballoon", The KMEMS 2026 Spring Conference 2026, Jeju, Korea, Mar. 25-27, 2026 (poster presentation)
6. Seungmin Lee, Bhargav Krishna Pullagura, Youngbin Kim, Chan Lee, Abdi Mirgissa Kaba, Boseok Huh, Jintae Kim, Sang Kug Chung and Dohyun Kim, "UV-adhesive Hybrid Bonding Advances 3D-printed Microfluidics by Enabling Highly Transparent Sub-100- μm Microchannels without Surface Treatment", MicroTAS 2025, Adelaide, Australia, Nov. 2-6, 2025
7. Minjun Jeon, Dohyun Park, Yeji Yang, Sangmin Lee, Jintae Kim, Hyun Namgung, Minsub Chung, Dohyun kim, "Rapid Synthesis of Lipid Nanoparticles for RNA Vaccines using Sharp-edge Acoustic Microstreaming", The Korean KMEMS Spring Conference 2025, Jeju, Korea, Mar. 26-28, 2025 (poster presentation)
8. Sofonias Nursefa Kadir, Abdi Mirgissa Kaba, Bhargav Krishna Pullagura, Dohyun Kim, "Optimized Operating Conditions and 3D Out-of-plane Mixing Advance Cavitation-microstreaming-based Microfluidic DNA Extraction", The Korean KMEMS Spring Conference 2025, Jeju, Korea, Mar. 26-28, 2025 (poster presentation)
9. Yeji Yang, Sofonias Nursefa Kadir, Heeyeon Kim, Dohyun Park, Abdi Mirgissa Kaba, Dohyun Kim, "Rapid DNA Extraction using a PDMS-Microballoon-based Acoustofluidic Micromixer", The Korean KMEMS Spring Conference 2025, Jeju, Korea, Mar. 26-28, 2022 (oral presentation)
10. Yeji Yang, Heeyeon Kim, Dohyun Park, Abdi Mirgissa Kaba and Dohyun Kim, "Robust acoustofluidic mixer based on a resonating ultra-thin PDMS microballoon", The KSME 2024 Fall Conference, Jeju, Korea, November 6-8 (oral presentation)
11. Seung-min Lee, Youngbin Kim, Boseok Heo, Abdi Mirgissa Kaba and Dohyun Kim, "Sub-100- μm microchannel fabrication based on 3D printing and UV adhesive", The KSME 2024 Fall Conference, Jeju, Korea, November 6-8 (oral presentation)
12. Bhargav Krishna Pullagura, Sofonias Nursefa Kadir, and Dohyun Kim, "Fluidics-free digital PCR based on microphotopartitioning", The Biochip 2024 Spring Conference, Gyeongju, Korea, May 22-24 (poster)
13. Sophia Akhtar, Bhargav Krishna Pullagura, Sofonias Nursefa Kadir, and Dohyun Kim, "UV laser-based light-sheet photolithography system for the gel-grid-based digital assays", The Biochip 2024 Spring Conference, Gyeongju, Korea, May 22-24 (poster)
14. Seung-min Lee, Youngbin Kim, Boseok Heo, Abdi Mirgissa Kaba and Dohyun Kim, "UV-adhesive-assisted hybrid bonding of a 3D-printed microfluidic chip and PMMA coverslip", The Biochip 2024 Spring Conference, Gyeongju, Korea, May 22-24 (poster)
15. Dohyun Park, Jintae Kim, Seungmin Lee, Hyun Namgung, Abdi Mirgissa Kaba, and Dohyun Kim, "Design and operation optimization of a 3D-printed sharp-edge micromixer using streaming analysis", The Biochip 2024 Spring Conference, Gyeongju, Korea, May 22-24 (poster)
16. Yeji Yang, Heeyeon Kim, Dohyun Park, Abdi Mirgissa Kaba and Dohyun Kim, "Robust acousto-fluidic micromixer based on a PDMS microballoon actuator", The Biochip 2024 Spring Conference, Gyeongju, Korea, May 22-24 (poster)
17. Seungmin Lee, Boseok Heo, Abdi Mirgissa Kaba, Jintae Kim, and Dohyun Kim, "UV-adhesive-based hybrid bonding between a 3D-printed chip and PMMA sheet", The KSME Fall 2023 Conference, Incheon, Korea, Nov. 1-4 (poster)
18. Yeji Yang, Heeyeon Kim, Boseok Heo, Abdi Mirgissa Kaba, and Dohyun Kim, "Fabrication and Characterization of Ultra-thin PDMS Membrane Actuator", The KSME Fall 2023 Conference, Incheon,

Korea, Nov. 1-4 (poster)

19. Sofonias Nursefa Kediri, Bhargav Krishna Pullagura, Abdi Mirgissa Kaba, and Dohyun Kim, "High-performance Microfluidic DNA Extractor Based- on Optimized Excitation Voltage and 3d Out-of-plane Cavitation Microstreaming", MicroTAS 2023, Katowice, Poland, Oct. 15-19 (poster)
20. Sofonias Nursefa Kediri, Abdi Mirgissa Kaba, and Dohyun Kim, "Effects of Operating Conditions and Device Design on Extraction Performance of Cavitation-microstreaming-based Microfluidic DNA Extractor", The BioChip 2023 Spring Conference, Yeosu, Korea, May 31-June 2 (Poster)
21. Bhargav Krishna Pullagura, Meng Jianyun, Abdi Kaba Mirgissa, and Dohyun Kim, "In-situ Polyacrylamide Gel-grid Microphotopatterning for Digital Bioassays", The BioChip 2023 Spring Conference, Yeosu, Korea, May 31-June 2 (Poster)
22. Bhargav Krishna Pullagura, Abdi Kaba Mirgissa, Nguyen Anh Nhung Tran, Chansik Oh, Minsub Chung and Dohyun Kim, "Dropletless Digital PCR (DIdPCR) with In-situ Microphotopatterned Hydrogel Grids", The 2023 Samsung Global Technology Symposium, Seoul, Korea, April 21 (Poster)
23. Boseok Heo, Hyun Namgung, Abdi Mirgissa Kaba, and Dohyun Kim, "Adhesive Bonding of 3D-printed Microfluidic Chip and PMMA Coverslip", The KSME 2022 Fall Conference, Jeju, Korea, Nov. 9-11 (Poster)
24. Jintae Kim, Hyun Namgung, Abdi M. Kaba, and Dohyun Kim, "3D-printed Sharp-edge Acoustic Microfluidic Mixer", The KSME 2022 Fall Conference, Jeju, Korea, Nov. 9-11 (Poster)
25. Heeyeon Kim, Abdi M. Kaba, Hyun Namgung, and Dohyun Kim, "Fabrication and Characterization of Ultra-Thin PDMS Membrane Using Polystyrene Petri Dish", The KSME 2022 Fall Conference, Jeju, Korea, Nov. 9-11 (Poster)
26. Jianyun Meng, Nebiyu Getachew Arega, and Dohyun Kim, "Numerical-simulation-based selection of microchip electrophoresis buffer for contactless conductivity detection", The BioChip 2022 Spring Conference, Busan, Korea, May 18-20 (Poster)
27. Hyun Namgung, Abdi Mirgissa Kaba, Hyeonkyu Oh, Hyunjin Jeon, and Dohyun Kim, "Optimization of 3D-printing and surface-treatment conditions for microfluidic devices by quantitative measurement of optical quality", The KMEMS 2022 Spring Conference, Jeju, Korea, April 6-8 (Poster)
28. Seonhyeok Baek, Hakhyun Kim, Heewon Hwang, Junhee Lee, Abdi Mirgissa Kaba, Hyunjin Jeon, and Dohyun Kim, "Oil-plug electrolysis micropump fabricated with PCB and tape-based laser machining", The KMEMS 2022 Spring Conference, Jeju, Korea, April 6-8 (Poster)
29. Abdi Mirgissa Kaba, Hyunjin Jeon, Sowon Moon, Seonhyeok Baek, and Dohyun Kim, "Cavitation-microstreaming-based Microfluidic Lysis and DNA-extraction Device", The BioChip 2021 Spring conference, Hongcheon, Korea, June 16-18 (Poster)
30. Hyun Namgung, Abdi Mirgissa Kaba, Hyeonkyu Oh, Hyunjin Jeon, and Dohyun Kim, "Quantitative Determination of 3D-printing and Surface-treatment Conditions for Direct-printed Microfluidic Devices", The BioChip 2021 Spring conference, Hongcheon, Korea, June 16-18 (Poster)
31. Seonhyeok Baek, Hakhyun Kim, Heewon Hwang, Junhee Lee, Abdi Mirgissa Kaba, Hyunjin Jeon, and Dohyun Kim, "Advances in a PCB Electrolytic Micropump with Oil Separation Barrier", The BioChip 2020 fall conference, Jeju, Korea, Nov. 25-27 (Poster)
32. Abdi Mirgissa Kaba, Hyunjin Jeon, Sowon Moon, Seonhyeok Baek, and Dohyun Kim, "Microfluidic DNA Extraction Device Based On Cavitation Microstreaming", The BioChip 2020 fall conference, Jeju, Korea, Nov. 25-27 (Poster)
33. Nebiyu Getachew Arega, Nguyen Anh Nhung Tran, Minsub Chung, Moon-Soo Kim, and Dohyun Kim, "Zinc-finger-protein-based Rapid Microfluidic Electrophoretic Mobility Reversal Assay For Quantitative

- Gene Analysis", The BioChip 2020 fall conference, Jeju, Korea, Nov. 25-27 (Poster)
34. Hyeonkyu Oh, Kaba Abdi Mirgissa, Hyunjin Jeon, and Dohyun Kim, "A 3D-printed Cavitation-microstreaming micromixer", The KSPE 2019 Fall conference, Changwon, Korea, October 29-31 (Poster)
 35. Sukyo Joung, Dohyun Kim, Jintae Kim, and Minsub Chung, "Microscale Formation of Immobilized pH Gradient in Simple Straight Channel", MicroTAS 2019, Basel, Switzerland, Oct. 27-31, 2019
 36. Kaba Abdi Mirgissa, Hyunjin Jeon, and Dohyun Kim, "A Microfluidic Cavitation-Microstreaming DNA Extractor", MicroTAS 2019, Basel, Switzerland, Oct. 27-31, 2019
 37. Hyunjin Jeon, Kaba Abdi Mirgissa, and Dohyun Kim, "Impedance-based Excitation-frequency Optimization for a Transfer-tape-supported Laser-micromachined Cavitation-microstreaming Micromixer", MicroTAS 2019, Basel, Switzerland, Oct. 27-31, 2019
 38. Kaba Abdi Mirgissa, Woongsub Lee, and Dohyun Kim, "Toward Rapid Prototyping of High-Aspect-Ratio Sub-100- μ M PMMA Microfluidic Devices: Optimization of CO₂ Laser Machining and Solvent-Assisted Thermal Bonding", IEEE MEMS 2019, Seoul, Korea, Jan. 27-31, 2019
 39. Hyunjin Jeon, Kye-Han Rhee, and Dohyun Kim, "Performance Optimization of A Laser-machined Micromixer Based on Cavitation Microstreaming Using High-speed Flow Visualization", The BioChip 2018 fall conference, Jeju, Korea, Nov. 7-9 (Poster)
 40. Abdi Mirgissa Kaba, Woongsub Lee, and Dohyun Kim, "Optimization of CO₂-Laser Machining and Solvent-assisted Thermal Bonding of PMMA for a High-aspect-ratio Sub-100- μ m Microfluidic Channel", The BioChip 2018 fall conference, Jeju, Korea, Nov. 7-9 (Poster)
 41. Hyunjin Jeon and Dohyun Kim, " Visualization of Cavitation Microstreaming in the Laser-machined PMMA Microfluidic Mixer", The KSPE 2018 spring conference, Jeju, Korea, May 9-11 (Poster)
 42. Seonhyuk Baek, Hakhyun Kim, Heewon Hwang, Junhee Lee, and Dohyun Kim, "Printed-circuit-board Electrolytic Micropump using Oil-based Electrolyte-separation Barrier", The KSPE 2018 spring conference, Jeju, Korea, May 9-11 (Poster)
 43. Hyunjin Jeon, and Dohyun Kim, "Precision laser machined microfluidic mixer based on cavitation microstreaming", The KSPE 2017 Spring Meeting, Jeju, Korea, May 18-19 (Poster)
 44. Hakhyun Kim, Heewon Hwang, and Dohyun Kim, " An electrolytic micropump using interdigitated electrode fabricated on a printed circuit board", The KSPE 2017 Spring Meeting, Jeju, Korea, May 18-19 (Poster)
 45. Barnabas Kim, Dohyun Kim, and Moon-Soo Kim, "Utilizing zinc finger proteins and beads for detection of pathogen-specific DNA sequence", The annual meeting of Kentucky Academy of Science, Louisville, KY, USA, Nov. 4-5 (Poster)
 46. Hakhyun Kim, Hyunjin Jeon, and Dohyun Kim, "A micropump based on electrolysis of sodium sulfate", The 2016 KSME Micro/Nano Engineering Meeting, Busan, Korea, May 19-20 (Poster)
 47. Jin Song, Saro Chhorn, Kyung Joo Song, Jintae Kim, Minsub Chung, and Dohyun Kim, "Noninvasive conductivity detection of proteins for microchip isoelectric focusing", The 2015 Biochip Conference Fall Meeting, Hongchun, Korea, Nov.19-20 (Poster)
 48. Jin Song, and Dohyun Kim, "Microfluidic freezer of biological solution using water-based evaporative cooling of atomized microdroplets", The 2014 Biochip Conference Fall Meeting, Osong, Korea. Sept.30-Oct.2 (Poster).
 49. Jin Song, and Dohyun Kim, "Integrated microfluidic temperature control and ice generation using evaporation cooling", The 2014 KSME Bioengineering Division Spring Meeting, Kyungjoo, Korea. Apr. 9-11 (Poster).

50. Dong Hee Lee, Jin Song, Sung Yub Kim, Seongu Cho, Min Hyeok Kim, Woo Jin Jung, Sung Jin Cho, Kyo Sun Kim, Hee Ho Lee, Yi Yeon Kim, Sang Baek Lee, and Dohyun Kim, "A high-throughput, semi-automated, \$1500 hot-embossing machine for replication of thermoplastic microfluidic devices", The 2013 Biochip Conference, Chuncheon, Korea, Nov. 13-14, 2013 (poster).
51. Dohyun Kim, Kelly Karns, Samuel Q. Tia, Mei He, and Amy E. Herr, "Cationic Detergent Microfluidic Western Blotting Integrated with Electrostatic Protein Immobilization", *The 2012 UC Systemwide Bioengineering Conference*, Berkeley, June 21-23, 2012 (Poster).
52. Dohyun Kim, Kelly Karns, Samuel Q. Tia, Mei He, and Amy E. Herr, "Electrostatic Protein Immobilization Gel for Microfluidic Western Blotting", *The Korean MEMS conference 2012*, Jeju, South Korea, Apr. 5-7, 2012 (Oral).
53. Samuel Q. Tia, Alex J. Hughes, Kelly Karns, M. Kursad Araz, Mei He, Dohyun Kim and Amy E. Herr, "Towards Next-Generation Proteomic Assays: Functional Materials as Sieving Matrices and Binding Scaffolds", *2011 MRS Fall Meeting*, Boston, MA, Nov. 28-Dec. 2, 2011 (Oral).
54. Dohyun Kim, Kelly Karns, Samuel Q. Tia, Mei He, and Amy E. Herr, "Cationic Detergent Microfluidic Western Blotting of Proteins: Molecular-weight-based Separation, Electrostatic Immobilization, and Retention of Native Activity", *the 36th Federation of Analytical Chemistry and Spectroscopy Societies Conference*, Reno, NV, USA, Oct 2 -7, 2011 (Oral).
55. Samuel Q. Tia, Dohyun Kim, Mei He, and Amy E. Herr, "Multi-analyte native Western blotting", *Gordon-Kenan Research Seminar (GRS)*, Waterville Valley, NH, June 25-26, 2011 (Oral)
56. Dohyun Kim, Samuel Q. Tia, Mei He, and Amy E. Herr, "Microfluidic Western Blotting: Cationic Surfactant Based Protein Sizing Integrated With Electrostatic Immobilization", *the 24th International Conference on Micro Electro Mechanical Systems, MEMS 2011*, Cancun, Mexico, January 23 - 27, 2011 (Oral).
57. Samuel Q. Tia, Mei He, Dohyun Kim, and Amy E. Herr, "On-chip Multi-analyte Far Western Blotting In Two Minutes", *Proceedings of The 14th International Conference on Miniaturized Systems for Chemistry and Life Sciences*, Groningen, Netherlands, October 3-7, 2010 (Oral).
58. Dohyun Kim, Ira B. Goldberg, and Jack W. Judy, "Micromachined Amperometric Nitrate Sensor with an Anion Permeable Membrane", *the 206th Meeting of The Electrochemical Society, Chemical Sensors VI: Chemical and Biological Sensors and Analytical Methods*, Honolulu, Hawaii, Oct. 3-8, 2004 (Oral).
59. Dohyun Kim, Ira B. Goldberg, and Jack W. Judy, "Micromachined Amperometric Nitrate Sensor with Integrated Microfluidics", *Hilton Head 2004: A Solid State Sensor, Actuator and Microsystems Workshop*, Hilton Head Island, South Carolina, June 6-10, 2004 (Oral).
60. Dong-Uk Seo, Do-Hyun Kim, and Doyoung Jeon, "Tool Monitoring of a CNC Machining Center Using The Wavelet Transform", *Korean Society of Precision Engineering Annual Meeting*, Suwon, Korea, Oct. 28, 2000 (Poster).
61. Do-Hyun Kim and Doyoung Jeon, "Research on the Auto Feedrate Control of Milling Processes by Fuzzy Control of Spindle Motor Currents", *Korean Society of Mechanical Engineering Annual Meeting, Dynamics and Control*, Muju, Korea, July 13-14, 2000 (Oral).
62. Do-Hyun Kim and Doyoung Jeon, "Research on the Auto Feedrate Control of Milling Process by the Fuzzy Control of Motor Currents", *Korean Society of Precision Engineering Annual Meeting*, Pusan, Korea, May 13, 2000 (Oral).
63. Usob Lee, Dohyun Kim, Namkeon Hur and Doyoung Jeon, "Design analysis and experimental evaluation of an MR fluid clutch", *Proceedings of the 7th International Conference on Electro-Rheological Fluids and Magneto-Rheological Suspensions*, Honolulu, Hawaii, July 19-23, 1999 (Poster).

JOURNAL REVIEW

International Journal of Precision Engineering and Manufacturing (IJPEM)
Electrophoresis
Analyst
Lab on a Chip
Biomicrofluidics (BMF)
Micro and Nano Systems Letters (MNSL)
KSME Journal Series C
Biochip Journal (BCJ)

TECHNICAL SERVICE

Associate Editor, *Biochip Journal*, 2023~2025
Technical Program Committee, *The Korean MEMS conference* 2012, 2013, 2015, 2016, 2019
General Affair Director, *The Korean Society of Mechanical Engineers, Education Chapter*, 2022
Project Director, *The Korean Society of Mechanical Engineers, Education Chapter*, 2021, 2023~2025
Academia-industry Collaboration Committee, *The Korean Society of Mechanical Engineers, Micro/Nano Chapter*, 2023~2025
Public Relation Committee, *Korean Biochip Society* 2018~2022
Journal Editing Committee, *Korean Biochip Society* 2023~2024
Regents, *Korean Biochip Society* 2015~2018
Planning Committee, *Korean Biochip Society* 2016, 2017, 2025
Information Committee, *MicroNano System Society*, 2020, 2021
Member, Medical MEMS Chapter, *MicroNano System Society*, 2020, 2021
Director, Gyeongin-Gangwon-Jeju Chapter, *MicroNano System Society* 2022, 2023
Member, International Relation Committee, *MicroNano System Society* 2017, 2018, 2019
Director, Bio Chapter, *MicroNano System Society*, 2025
Chief Financial Director, Bio Chapter, *Biomedical Engineering Society for Circulation Disorders*, 2016, 2017

INVITED TALK

1. "Acoustic Microstreaming and its Biomedical Applications", Bioelectronics Session, The Biochip 2026 Spring Conference, Yeosu, Korea, May 14
2. "Microfluidic Electrophoresis and Functional Polyacrylamide Gel for High-performance Biomolecular Separation and Detection", Department of Molecular Science and Technology, Ajou University, Suwon, Sep. 20, 2022
3. "Application of cavitation microstreaming-based microfluidic mixing to DNA extraction", 2022 Symposium for the Society of Micro and Nano Systems local chapter (Gyeonggi-Incheon-Kangwon-Jeju), Myongji University, Yongin, Korea, August 26, 2022
4. "Application of cavitation microstreaming-based microfluidic mixing to DNA extraction", BIT Convergence Research Center, Hallym University, Chuncheon, Korea, June 20, 2022
5. "Summary of Recent Research Activities in BNML", Inventage Lab Inc., Seongnam, Korea, June 23, 2021
6. "Recent Research Activities in the BNML, Myongji University", The Hur Lab, Mechanical Engineering Department, Johns Hopkins University, Baltimore, USA, Sep. 10, 2019

7. "Recent Research Activities in the BNML, Myongji University", The New Technology Forum, Micro Nano Systems Society, Ansan, Korea, Dec. 7, 2018
8. "Research Activity in the BNML, Myongji University", The Annual Research Review of Mechanical Engineering Department, Sogang University, Seoul, Korea, Dec. 6, 2018
9. "Toward integrated microfluidics: a PCB-based electrolytic micropump and cavitation-microstreaming micromixer", The KSBB International Academia/Industry Joint Meeting, Seoul, Korea, Oct. 11, 2018
10. "PCB-based Electrolytic Micropump and Cavitation-microstreaming micromixer for Integrated Microfluidics", Daegu Gyeongbuk Medical Innovation Foundation, Daegu, Korea, July 6, 2018
11. "An abridged course on MEMS and Microfabrication", Korea Semiconductor Industry Association (KISA), Seongnam, Korea, April 7, 2017
12. "Multifunctional Photopatterned Polyacrylamide Gels for Microfluidic Protein Analysis", 2014 Fall Meeting of Korean Rheology Society, Suwon, Korea, Nov. 11, 2014.
13. "Quick Overview on Microfluidics and its Bioanalytical Application", National NanoFab Center (NNFC), Korea Advanced Institute of Science and Technology (KAIST), Invited Lecture, Jan. 14, 2014.
14. "Microfluidic protein analysis using microchamber geometry and charged polyacrylamide gel", Department of Mechanical Engineering, Pohang Institute of Science and Technology, Department Seminar Series, Nov. 8, 2013.
15. "Protein Detection on Chip: Microfluidic Western Blotting and Isotachopheresis", The KSME 2012 Fall Annual Meeting, Changwon, Korea, Nov. 7-9, 2012).
16. "Protein Detection on Chip: Microfluidic Western Blotting and Isotachopheresis", Department of Mechanical Engineering, Myongji University, The 2nd Electrowetting Workshop, Nov. 8, 2013
17. Department of Mechanical Engineering, Myongji University, Department Seminar Series, Nov. 28, 2012
18. "Protein Detection on Chip: Microfluidic Western Blotting and Isotachopheresis", College of Natural Science, Myongji University, Convergence Research Seminar Series, Nov. 22, 2012
19. "Integrated Sample Preparation, Separation, and Detection for Chemical and Biochemical Microsensor", Korea Electronics Technology Institute, Technical Seminar, Apr. 30, 2012
20. "Integrated Microfluidic Sample Purification, Enrichment, Separation, and Detection for Biochemical and Chemical Analysis", Korea Institute of Science and Technology, Center for BioMicrosystems, Technical Seminar Series, Apr. 10, 2012
21. "Microfluidic Western Blotting Platform for High-throughput, Low-sample-consuming, High-specificity Protein Detection", Electronics and Telecommunications Research Institute, Technical Seminar, Jan. 11, 2012
22. "Cationic Detergent Microfluidic Western Blotting Integrated with Electrostatic Protein Immobilization Gel", Samsung Advanced Institute of Technology, Technical Seminar, Jan. 5, 2012
23. "Cationic-detergent Microfluidic Western Blotting using Electrostatic Immobilization of Proteins", Dongguk University, Department of Biomedical Engineering, Technical Seminar Class, Dec. 13, 2011
24. "Microfluidic Western Blotting Integrated with Electrostatic Immobilization Gel", Korea Institute of Science and Technology, Energy Mechanics Research Center, Technical Seminar Series, Dec. 12, 2011
25. "Microfluidic Biochemical/Chemical Analysis Systems Integrated with Sample Preparation and Separation", Sogang University, Department of Mechanical Engineering, Technical Seminar Class, Dec.

- 9, 2011
26. "Microfluidic Biochemical/Chemical Analysis Systems Integrated with Sample Preparation and Separation", Chung-ang University, Energy Safety Research Institute, Technical Symposia Series, Dec. 8, 2011
 27. "Micromachined Chronocoulometric Nitrate Sensor and Parallel-plate Donnan-dialytic Sample-preparation System Using Anion-exchange Membrane", University of California, Los Angeles, Center for Embedded Network Sensing, Technical Seminar Series, Apr. 3, 2009
 28. "A High-Performance Micromachined Amperometric Nitrate Sensor for Environmental Monitoring", University of California, Los Angeles, The 2nd UCLA – Nagoya University Symposium on MEMS, Nano, and Bio Technologies, Jan. 18, 2008
 29. "A High-Performance Micromachined Amperometric Nitrate Sensor for Environmental Monitoring", University of California, Los Angeles, Center for Embedded Network Sensing, The 5th Annual Research Review, Oct. 10, 2007

TEACHING

Graduate Classes

- 2025-present **Advanced Mechanical Engineering Seminar 1**, Myongji University
 2016-present **Introduction to MEMS and Micromachining**, Myongji University
 2014-present **Introduction to BioMEMS**, Myongji University
 2004 **Micromachining and MEMS Laboratory**, UCLA
 1999 **Advanced Control Systems**, Sogang University

Undergraduate Classes

- 2021-present **Special Topics in Mechanical Engineering**, Myongji University
 2018-present **Smart Sensor and Measurement Systems**, Myongji University
 2016-present **Introduction to Mechanical Engineering**, Myongji University
 2013-present **Mechanical Engineering Experiment**, Myongji University
 2013-present **Capstone Design**, Myongji University
 2013-2015 **Electrical Engineering for Mechanical Engineers**, Myongji University
 2012-2013 **Creative Engineering Design**, Myongji University
 2012-present **Engineering Mechanics: Statics**, Myongji University
 2000 **Automatic Control Systems**, Sogang University

Postdoctoral Scholar Advising

- 2023-2024 **Sohpia Akhtar**, 3D dPCR
 2022-present **Bhargav Krishna Pullagura**, 3D dPCR
 2022-2023 **Abdi Kaba Mirgissa**, Ultrafast DNA extraction based on cavitation microstreaming

Graduate Students Advising

- 2026-present **Adisu Bezu Badane**, AI-assisted quantification of gel-grid digital PCR
 2025-present **Admas Dagnachew Temesgen**, Fully automated cell counter based on a flow imaging microscope and a pipeline-type automatic sample feeder
 2023-present **Sofonias Nursefa Kedir**, Ultra-rapid microfluidic PCR based on sharp-edge acoustic

streaming and photothermal temperature cycling

2024-2026 **Jaehyung Jeong**, Design and fabrication of SiC wafer boats for high-temperature furnace processes

2022-2024 **Kwanseong Lee**, CFD-based design of guide vanes of a THC system for optimizing temperature/humidity control without leakage

2021-2024 **Jayoung Koo**, A heat-sink design for a plasma generator

2020-2022 **Jianyun Meng**, A biomolecular conductometry based on supercharged bioconjugates

2020-2022 **Seonkyuk Baek**, PCB-based electrochemical micropump with an oil-separation barrier

2018-2021 **Hyunjin Jeon**, Cavitation-microstreaming-based microfluidic mixer

2018-2022 **Abdi Kaba Mirgissa**, Solvent-based bonding for microfluidic device fabrication

2017-2019 **Chau Minh Khang**, Microfluidic isoelectric focusing and noninvasive C4D detection

2016-2018 **Hakhyun Kim**, PCB-based electrochemical micropump

2015-2016 **Saro Chhorn**, Microfluidic isoelectric focusing and noninvasive C4D detection

2015-present **Nebiyu Getachew Arega**, Next-generation versatile microfluidic platform for biomolecular analysis based on hybrid mass transfer and maskless gel patterning

2014-2016 **Song Jin**, Microfluidic coolant-free cooler, protein flash memory

2008-2009 **Buddy Aswin**, UV spectrochemical analysis of nitrate

2005-2006 **Michael Glickman**, Wireless microcontroller-based chemical-sensor control board

Undergraduate Student Advising

2026-present **Junseo One**, Mechanical properties of 3D-printed elastic resins

2026-present **Gyeongtak Heo**, 3D-printed sharp-edge micromixer for lipid nanoparticle synthesis

2026-present **Hyeona An**, 3D-printed soft microballoon in-line micromixer

2025-present **Yonghoo Son**, 3D printed soft microballoon micromixer

2024-2025 **Minjoon Jeon**, Hybrid 3D-printed sharp-edge micromixer for lipid nanoparticle synthesis

2025-2025 **Huiro Yun**, Acoustic microstreaming using sharp edges anchored on single end

2024-2025 **Youngbin Kim**, Hybrid 3D-printed oil-in-water droplet generator

2022-2025 **Dohyun Park**, Hybrid 3D-printed sharp-edge micromixer

2022-2025 **Seungmin Lee**, AI-based flow cytometry

2022-2024 **Yeji Yang**, Ultrasonic microfluidic mixer based on ultrathin PDMS membrane

2022-2023 **Heeyeon Kim**, Ultra-thin PDMS membrane

2021-2023 **Haseul Lee**, 3D printed PDMS mold

2021-2022 **Jeonghwan Youn**, 3D-printed PDMS mold

2020-2022 **Hyun Namgung**, Optimization of SLA 3D printing condition for a microfluidic chip

2018-2021 **Hyeonkyu Oh**, 3D printed microfluidic mixer

2018-2021 **Sowon Moon**, Embedded system for fluidic control

2018-2018 **Woogsub Lee**, Solvent-assisted PMMA bonding

2018-2020 **Seonkyuk Baek**, PCB-based electrochemical pump with an oil-separation barrier

2018-2020 **Junhee Lee**, PCB-based electrochemical pump

2016-2018 **Heewon Hwang**, PCB-based Microfluidic electrochemical pump

2016-2018 **Hyunjin Jeon**, Cavitation-microstreaming-based microfluidic mixer

2015-2016 **Hakhyun Kim**, Microfluidic electrochemical pump

2015-2016 **Jaehyuk Lee**, Liquid metal thermally actuated valve

2015-2016	Hyunsik Lim , Gold nanorod based microfluidic heater
2013-2014	Song Jin , Microfluidic coolant-free cooler
2013-2014	Yiyeon Kim , Flow-field measurement on a microfluidic chip
2010-2011	Byungsoo Min , Bidirectional current measuring circuit for microchip electrophoresis

ALUMNI

Doctoral Students

2022	Abdi Kaba Mirgissa, Ph.D. dissertation title "Optimized Laser Machining for High-resolution Thermoplastic Microfabrication and a Cavitation-microstreaming-based DNA Extraction Microdevice"
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Master Students

2026	Jaehyung Jeong, M.S. dissertation title "Development of a Wafer Boat for High-Temperature Processes in Next-Generation Power Semiconductors Using CVD SiC Materials"
2026	Yeji Yang, M.S. dissertation title "Robust Acoustofluidic Micromixer Based on an Ultrathin PDMS Microballoon Oscillator"
2024	Kwanseong Lee, M.S. dissertation title "CFD-based design of guide vanes of a THC system for optimizing temperature/humidity control without leakage"
2024	Jayoung Koo, M.S. dissertation title "A heat-sink design for a plasma generator"
2023	Jianyun Meng, M.S. dissertation title "Numerical-simulation-based Selection of Microchip Electrophoresis Buffer for Contactless Conductivity Detection"
2022	Seonhyuk Baek, M.S. dissertation title "Tape-supported Laser Micromachining and Performance Characterization of a PCB Electrolytic Micropump using an Oil-based Electrolytic Separation Barrier"
2021	Hyunjin Jeon, M.S. dissertation title "Optimization of Excitation Frequency for a Laser-micromachined Acoustic Micromixer based on Impedance Spectroscopy"
2019	Chau Minh Khang, M.S. dissertation title "Single-point Microfluidic Contactless Conductivity Detection for Quantitative, Multispecies, Isoelectric-focusing Protein Analysis"
2018	Hakhyun Kim, M.S. dissertation title "Design, Fabrication and Performance Evaluation of a High-Performance electrolytic PCB Micropump for Pressure-source-integrated Lab-on-a-chip Device"
2016	Song Jin, M.S. dissertation title "Evaporative Temperature Control and Noninvasive Conductivity Detection Method of Protein in a Lab-on-a-chip Device"

Undergraduate Students

2026	Seungmin Lee
2025	Dohyun Park
2025	Youngbin Kim
2024	Yeji Yang
2024	Jintae Kim
2024	Bo Seok Heo

2024	Yeji Yang
2023	Haseul Lee, B.S.
2023	Heeyeon Kim, B.S.
2022	Jeonghwan Youn, B.S.
2022	Hyun Namgung, B.S.
2021	Sowon Moon, B.S.
2021	Hyeonkyu Oh, B.S.
2020	Junhee Lee, B.S.
2020	Seonkyuk Baek, B.S.
2019	Ung Seop Lee, B.S.
2018	Heewon Hwang, B.S.
2016	Hyun Sik Lim, B.S.
2016	Jae Hyuk Lee, B.S.
2013	Yiyeon Kim, B.S.
2013	Seo Woo Seok, B.S.

AWARDS / HONORS

Excellent Paper Award, KSME Fall Conference, 2024
Best Design Award, The 9th Korean Society of Precision Engineering design competition, 2024
Innovation Award, MEDITEK Innovation Awards, 2024
Best Poster Award, BioChip Conference, 2024
Biochip Journal Citation Award, Korean Biochip Society, 2023
Excellent Reviewer Award, Accreditation Board for Engineering Education of Korea (ABEEK), 2022
Excellent Poster Award, BioChip Conference, 2018
Excellent Poster Award, BioChip Conference, 2015
Excellent Course Portfolio Award, School of Engineering, Myongji University, 2015
Design Advisor Award, The 4th national student design competition, 2014
Excellent Course Portfolio Award, School of Engineering, Myongji University, 2014
Graduate Research Assistantship, UCLA, 2002-2008
Graduate Teaching Assistantship, UCLA, 2004
Rotary Ambassadorial Scholarship Award, Rotary Foundation, 2001
Department Chair Scholarship, Mechanical Engineering Department, Sogang University, 2000
Excellent Grades Scholarship, Sogang University, 1995, 1996

PROFESSIONAL MEMBERSHIPS

Member, Korean Society of Precision Engineering (KSPE)
Member, Korean Society of Mechanical Engineering (KSME)
Member, Korean Biochip Society (KBCS)
Member, MicroNano System Society (MNS)

(updated 07-07-2026)