

DONG-MYEONG SHIN

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1. Academic qualifications

Ph.D.	In Nanofusion Technology (Nanomaterials), Pusan National University	2016
M.S.	In Nanofusion Technology (Nanomaterials), Pusan National University	2011
B.S.	In Nanoscience and Nanotechnology, Pusan National University	2009

2. Previous/Present academic positions held

<i>Assistant Professor</i> of Mechanical Engineering, The University of Hong Kong	2019–present
<i>Postdoctoral Scholar</i> of Chemistry, University of California, Berkeley	2017–2019
<i>Postdoctoral Fellow</i> , Pusan National University	2016–2017
<i>Lecturer</i> of Nanoenergy Engineering, Pusan National University	2016–2016
<i>Researcher</i> of Alternative Military Service as Technical Research Personnel	2013–2016

3. Awards

2016: Outstanding Dissertation Award, The Korean Academy of Science and Technology
2016: Outstanding Young Researcher Award, Minister of Education, South Korea
2015: Young Scientist Award, Busan Metropolitan City, South Korea
2015: Best Oral Group Project Presentation Award, 8th Asia Nanotech Camp
2015: Outstanding Graduate Student Researcher Award, Chancellor of PNU
2014: Best Oral Presentation Award, Autumn Meeting of Korean Physical Society
2013: Best Poster Award, Nano Korea 2013

4. Research fundings

- HK Early Career Scheme (as PI: 27202920)
- HK General Research Fund (as PI: 17201721; 17200222)
- HK Collaborative Research Fund (as Co-PI: C6047-23G)
- HK Environmental Conservation Fund (as PI: 100/2019)

5. Theses completed under my primary supervision to date: Ph.D.: 2 (including 1 HKPFS)

On-going theses under my primary supervision to date: Ph.D.: 2; M. Phil.: 1
(including 1 HKUPS)

6. Professional Services

- **Member** of the Royal Society of Chemistry, 2022-present;
- **Member** of the Materials Research Society, 2019-present;
- **Session Organizer** of Materials Challenges in Alternative and Renewable Energy 2024, 2024;
- **Editorial Board** of J. Korean Inst. Electr. Electron. Mater. Eng., 2025-present;
- **Session Organizer** of 6th International Conference on Vibration and Energy Harvesting Applications, 2025;
- **Session Organizer** and **International Committee** of 8th International Conference on Nanogenerators and Piezotronics, 2025;

7. Research Interests

Seeking to build a successful career as an experimental researcher in the field of nanotechnology. Broad range of interest in experimental physics, chemistry and material engineering. The specific research fields are listed as follow: **Nanomaterials; Energy harvesting and storage; Portable, wearable and mountable smart devices; Ionic conduction in polymers.**

8. Publication record

- Over 70 publications in peer-reviewed journals; 2 KOR patents and 5 US pending patents; Over 60 conference and departmental presentations (including >20 invited presentations)

Five featured publications in the past 5 years

- 1) J. Jeong, S. Jeon, X. Ma, Y. W. Kwon, D.-M. Shin^{*}, S. W. Hong^{*}, “Sustainable and flexible microbrush-faced triboelectric generator for portable/wearable applications”, *Advanced Materials* (2021) 33, 2102530 (IF=26.8).
Selected as Frontispiece of Vol. 33 (No. 39)
- 2) D.-M. Shin, J. E. Bachman, M. K. Taylor, J. Kamcev, J. G. Park, M. E. Ziebel, E. Velasquez, N. N. Jarenwattananon, G. K. Sethi, Y. Cui, J. R. Long, “A single-ion conducting borate network polymer as a viable quasi-solid electrolyte for lithium metal batteries”, *Advanced Materials* (2020) 32, 1905771 (IF=26.8).
- 3) J. Kamcev, M. K. Taylor, D.-M. Shin, N. N. Jarenwattananon, K. A. Colwell, J. R. Long, “Functionalized porous aromatic frameworks as high-performance adsorbents for the rapid removal of boric acid from water”, *Advanced Materials* (2019) 31, 1808027 (IF=26.8).
- 4) E. Kim, X. Ma, J. Zhou, J. Gao, A. Liu, Y. Ru, Y. Kim, S. Lee, D.-M. Shin^{*}, “Long-lasting moisture energy scavenging in dry ambient air empowered by a salt concentration-gradient cationic hydrogel”, *Advanced Functional Materials* (2025) 35, 2419710 (IF=19).
- 5) X. Ma, J. Zhou, E. Kim, J. Gao, W. Hu, D.-M. Shin^{*}, “Quantifying electron and ion transfers in contact electrification with ionomers”, *Advanced Functional Materials*, doi: 10.1002/adfm.202506471 (IF=19).

Five other featured publications in a career

- 1) D.-M. Shin[†], H. J. Han[†], W.-G. Kim, E. Kim, C. Kim, S. W. Hong, H. K. Kim, J.-W. Oh, Y.-H. Hwang, “Bioinspired piezoelectric nanogenerators based on vertically aligned phage nanopillars”, *Energy & Environmental Science* (2015) 8, 3198–3203 (IF=30.8).
[†]These authors contributed equally to this work.
- 2) X. Ma, E. Kim, J. Zhou, J. Gao, C. Kim, X. Huan, J. T. Kim, D.-M. Shin^{*}, “Self-Powered Smart Skins for Multimodal Tactile Perception based on Triboelectric and Hygroelectric Working Principles”, *Nano Energy* (2023) 113, 108589 (IF=17.1).
- 3) J. Gao, J. Zhou, X. Chen, R. Tao, Y. Li, Y. Ru, C. Li, E. Kim, X. Ma, M. Wang, Y. Kim, S. Lee, D.-M. Shin^{*}, “Accelerated Selective Li⁺ Transports Assisted by Microcrack-Free Anionic Network Polymer Membranes for Long Cyclable Lithium Metal Batteries”, *Advanced Science* (2024) 11, 2308530 (IF=14.1).
- 4) J. Zhou, X. Ma, J. Gao, E. Kim, Z. Deng, Q. Rao, W.-D. Li, D.-K. Ki, D.-M. Shin^{*}, “Switchable power generation in triboelectric nanogenerator towards chip-less wearable power module applications”, *Small* (2024) 20, 2306980 (IF=12.1).
Selected as Back Cover of Vol. 20 (No. 31)
- 5) J. Gao, J. Zhou, C. Wang, X. Ma, K. Jiang, E. Kim, C. Li, H. Liu, L. Xu, H. C. Shum, S.-P. Feng, D.-M. Shin^{*}, “Engineered Networking in a Family of Solvent-Free Single-Ion Conducting Borate Network Polymer Electrolytes for Li-Metal Battery Applications”, *Chemical Engineering Journal* (2022) 450, 138407 (IF=13.2).

9. Ph.D. and MPhil Students Supervised

Haoyu Fu (Ph.D., 2023-present)
Jingyi Gao (Ph.D., 2020-present) Principal Engineer at BYD Co. Ltd.
Wenyu Hu (Ph.D., 2023-present)
Eunjong Kim (Ph.D., 2022-present)
Yihong Lin (MPhil, 2025-present)
Yixin Liu (Ph.D., 2025-present)
Yuxing Liu (Ph.D., 2025-present)
Xioating Ma (Ph.D., 2020-2024) Senior Engineer at GRST Holdings Limited
Andy Yingqi Su (Ph.D., 2023-present)
Zhouran Wang (Ph.D., 2022-present)
John Kin Chiu Yip (Ph.D., 2025-present)
Hui Zhou (Ph.D., 2024-present)
Jiaming Zhou (Ph.D., 2021-2025) Postdoctoral Scholar, The University of Hong Kong

10. Postdoctoral Scholars Supervised

Jiaming Zhou (2025-present)

11. Research Assistant Supervised

Cong Wang (2020-2021) Ph.D. student at City University of Hong Kong
Eunjong Kim (2021-2022) Ph.D. student at The University of Hong Kong

12. MSc Students Supervised

Yuxuan Cao (MSc., 2024-present)
Kan Kwok Chin (MSc., 2024-present)
Min Seok Cho (MSc., 2021-2022) GP Batteries Hong Kong
Leo Wing Hong Chu (MSc., 2022-2023) Cathay Pacific Airways Limited
Yiming Deng (MSc., 2022-2023) BYD Co. Ltd.
Fangyi Fu (MSc., 2022-2023) Commercial Aircraft Corporation of China, Ltd.
Yihao Fu (MSc., 2022-2023) BYD Co. Ltd.
Ray Poon Chi Fung (MSc., 2023-2024) CLP Power Hong Kong Ltd.
Vinay K Gautam (MSc., 2024-present)
Wenyu Hu (Ph.D., 2023-present)
Jun Huang (MSc., 2022-2023) PhD student at The Hong Kong Polytechnic University
Liangjin Ke (MSc., 2024-present)
Zihao Li (MSc., 2024-present)
Kaibin Lin (MSc., 2023-2024) Shenzhen Semiconductor Company
Yihong Lin (MSc., 2023-2024) MPhil student at The University of Hong Kong
Aohua Liu (MSc., 2023-2024) Haier Group Corp.
Dongkai Liu (MSc., 2023-2024)
Ziyu Liu (MSc., 2024-present)
Yuhang Wang (MSc., 2024-present)
Chenshuo Yang (MSc., 2021-2022) BYD Co. Ltd.
John Kin Chiu Yip (MSc., 2023-2024) PhD student at The University of Hong Kong
Mengzhen Yu (MSc., 2024-present)
Quanhua Zeng (MSc., 2024-present)
Can Zhang (MSc., 2023-2024) BYD Co. Ltd.
Wanyu Zhao (MSc., 2022-2023) PhD student at George Washington University
Jun Zhou (MSc., 2023-2024) Hestia Technology Ltd.
Yuhao Zhu (MSc., 2024-present)

Yutong Zhu (MSc., 2024-present)

13. Detailed External Research Grant

- (1) Environment and Conservation Fund, “Single-ion conducting network polymers as the viable electrolytes for lithium metal battery – A key technology toward high capacity battery,” PI, HKD 499,500, 2020-2022.
- (2) Research Grants Council, Early Career Scheme, “Boosting the output performance of nanogenerators using porous frameworks,” PI, HKD 791,961, 2021-2023.
- (3) Research Grants Council, General Research Fund, “Leveraging solvent-free single-ion conducting polymer electrolytes for next-generation battery technologies,” PI, HKD 815,601, 2022-2024.
- (4) Research Grants Council, General Research Fund, “Crystallinity-controlled 3D printing of dipeptides for multilevel anticounterfeiting,” PI, HKD 1,098,559, 2023-2025.
- (5) Collaborative Research Fund, “High-Energy-Density All-Solid-State Lithium-Metal Batteries,” Co-PI, HKD 5,509,993, 2024-2027.

14. Patents Published

- (1) KOR Patent No. 10-1659225: “Nanowire Growing Method on Both Sides of Graphene and Structure Thereby” Y.-H. Hwang, H. K. Kim, S. W. Hong, D.-M. Shin, S. H. Kang, filed November 4, 2014, issued February 24, 2016.
- (2) KOR Patent No. 10-1599153: “Virus Arrangement Method with Extrusion and Electric Device Thereby” Y.-H. Hwang, H. K. Kim, J.-W. Oh, D.-M. Shin, H. J. Han, E. Kim, W. G. Kim, filed May 12, 2015, issued September 13, 2016.

15. Patents Applied

- (1) US Patent Application No. 63/453,817; China Patent Application No. 202410319211.5: “Self-Powered Smart Skins for Multimodal Static and Dynamic Tactile Perception” D.-M. Shin, X. Ma, E. Kim, J. Zhou, J. Gao, filed March 22, 2023.
- (2) US Patent Application No. 18/126,026: “Switchable Power Generation in Triboelectric Nanogenerators” D.-M. Shin, J. Zhou, E. Kim, X. Ma, J. Gao, filed March 24, 2023.
- (3) US Patent Application No. 63/598,788; China Patent Application No. 202411611573.8: “Crack-Free Polymer Electrolyte Membranes for Long Cycle Life Lithium Batteries” D.-M. Shin, J. Gao, J. Zhou, X. Ma, E. Kim, filed November 14, 2023.
- (4) US Patent Application No. 63/650,159; China Patent Application No. 202510638079.9: “Structure of Triboelectric Nanogenerator Utilizing Volume-Effect for Harvesting Low Frequency Omnidirectional Ocean-Wave Energy” D.-M. Shin, J. Zhou, X. Ma, J. Gao, E. Kim, filed May 21, 2024.
- (5) US Patent Application No. 63/673,193: “Self-assembled Salt-Gradient Ionic Hydrogel-based Moisture-enabled Electric Generator” D.-M. Shin, E. Kim, filed July 19, 2024.

16. Full Publications List

- (1) H.-J. Kwon, J.-A. Seo, S.-I. Kim, D.-M. Shin, S. C. Ryu, H. K. Kim, Y.-H. Hwang, “The Protection Effect of Disaccharide Sugars on Cryopreservation in Unilamellar Vesicles by Using Photon Correlation Spectroscopy”, *New Physics: Sae Mulli* (2009) 58, 623-627.
- (2) J. H. Lee, H. Y. Kim, D.-M. Shin, Y.-H. Hwang, O. S. Jin, H. K. Kim, D.-W. Han, “Protective Effects and Action Mechanisms of Intracellular Trehalose on Survival of L-929 Fibroblastic Cells During Cryopreservation”, *Biomaterials Research* (2010) 14, 140-144.
- (3) D.-M. Shin, J.-A. Seo, J.-G. Kim, S.-I. Kim, K. Lee, H. S. Wi, H.-J. Kwon, H. K. Pak, H. K. Kim, Y.-H. Hwang, “Effects of The Disaccharide Concentration and The Extrusion Speed on The Size of Unilamella Vesicles”, *Current Applied Physics* (2011) 11, 1401-1404.

- (4) J.-A. Seo, H.-J. Kwon, D.-M. Shin, H. K. Kim, Y.-H. Hwang, "Caramelization Processes in Sugar Glasses and Sugar Polycrystals", *New Physics: Sae Mulli* (2012) 62, 761-767.
- (5) D.-M. Shin, H.-J. Kwon, H. K. Kim, Y.-H. Hwang, "Effect of Nanoscale Confinement on Dielectric Relaxations in a 3wt.% Water-galactose Mixture", *Journal of the Korean Physical Society* (2012) 60, 1092-1096.
- (6) J.-A. Seo, H.-J. Kwon, K. Kataoka, K. Ohshima, D.-M. Shin, H.-K. Kim, Y.-H. Hwang, "Compressed-Exponential Relaxations in Supercooled Liquid Trehalose", *Current Applied Physics* (2012) 12, 1548-1552.
- (7) H. L. Kim, D.-M. Shin, H. K. Kim, Y.-H. Hwang, "Effects of Water Layer on a Through Silicon Via by Using a KrF Excimer Laser", *New Physics: Sae Mulli* (2013) 63, 432-437.
- (8) Y.-H. Hwang, H.-J. Kwon, J.-A. Seo, D.-M. Shin, J.-H. Ha, H.-K. Kim, "Relaxation Processes in Disaccharide Sugar Glasses", *AIP Conference Proceeding* (2013) 1518, 38-46.
- (9) D.-M. Shin, Y.-C. Shin, J. H. Ha, J.-H. Lee, D.-W. Han, J.-M. Kim, H. K. Kim, Y.-H. Hwang, "Cell-Based Capacitance Sensor for Analysis of EGFR Expression on Cell Membrane", *AIP Conference Proceeding* (2013) 1518, 586-589.
- (10) B. Kwon, D.-M. Shin, H. K. Kim, Y.-H. Hwang, "Improvement of Electrodeposition Rate of Cu Layer by Heat Treatment of Electroless Cu Seed Layer", *Korean Journal of Materials Research* (2014) 24, 186-193.
- (11) T. H. Kim, T. Shibata, S. Kojima, D.-M. Shin, Y.-H. Hwang, J.-H. Ko, "Comparison of Thermal and Elastic Properties of Glassy Racemic and Enantiomorphic Ibuprofen Studied by Brillouin Light Scattering and Modulated Differential Scanning Calorimetry", *Current Applied Physics* (2014) 14, 965-969.
- (12) J. Qiu, D.-M. Shin, W. He, H.-K. Kim, Y.-H. Hwang, X. Li, X. Gao, "Synthesis and Physical Properties of Zinc-oxide Textured Films by Using a Filtered Preheated Hydrothermal", *Journal of the Korean Physical Society* (2014) 65, 1423-1429.
- (13) Q. Wang, D.-M. Shin, S.-J. Park, H.-K. Kim, Y.-H. Hwang, X. Li, Y. Zhang, "Effects of N- and N-In Doping on ZnO Films Prepared by Using Ultrasonic Spray Pyrolysis", *Journal of the Korean Physical Society* (2014) 65, 1890-1895.
- (14) D.-M. Shin, Y.-C. Shin, J.-H. Lee, T.-H. Kim, D.-W. Han, J.-M. Kim, H. K. Kim, K. Kim, Y.-H. Hwang, "Highly Sensitive Detection of Epidermal Growth Factor Receptor Expression Levels Using a Capacitance Sensor", *Sensors and Actuators B: Chemical* (2015) 209, 438-443.
- (15) D.-M. Shin, E. L. Tsege, S. H. Kang, W. Seung, S.-W. Kim, H. K. Kim, S. W. Hong, Y.-H. Hwang, "Freestanding ZnO Nanorod/Graphene/ZnO Nanorod Epitaxial Double Heterostructure for Improved Piezoelectric Nanogenerators", *Nano Energy* (2015) 12, 268-277.
- (16) K. H. Kim, D.-M. Shin, S. Lee, H.-K. Kim, Y.-H. Hwang, "Effect of the Dielectric Layer on the Electrical Output of a ZnO Nanosheet-based Nanogenerator", *Journal of the Korean Physical Society* (2015) 67, 1920-1924.
- (17) D.-M. Shin, Y.-H. Hwang, J.-H. Ko, S. Kojima, "Relaxation Behaviors of Enantiomorphic S-ibuprofen as revealed by Dielectric and Photon Correlation Spectroscopies", *Current Applied Physics* (2015) 15, 958-963.
- (18) D.-M. Shin, H. J. Han, W.-G. Kim, E. Kim, C. Kim, S. W. Hong, H. K. Kim, J.-W. Oh, Y.-H. Hwang, "Bioinspired Piezoelectric Nanogenerators Based on Vertically Aligned Phage Nanopillars", *Energy & Environmental Science* (2015) 8, 3198-3203.
- (19) D.-M. Shin, S. H. Kang, S. Kim, W. Seung, E. L. Tsege, S.-W. Kim, H. K. Kim, S. W. Hong, Y.-H. Hwang, "Preparation of ZnO Nanorod/Graphene/ZnO Nanorod Epitaxial Double Heterostructure for Piezoelectrical Nanogenerator by using Preheating Hydrothermal", *Journal of Visualized Experiments* (2016) 107, e53491.
- (20) E. L. Tsege, D.-M. Shin, S. Lee, H.-K. Kim, Y.-H. Hwang, "Highly Durable Ti-mesh Based Triboelectric Nanogenerator for Self-Powered Device Applications", *Journal of Nanoscience and Nanotechnology* (2016) 16, 4864-4869.

- (21) H. Song, J.-r. Choi, W. Lee, D.-M. Shin, D. Kim, D. Lee, K. Kim, "Plasmonic Signal Enhancements using Randomly Distributed Nanoparticles on a Stochastic Nanostructure Substrate", *Applied Spectroscopy Reviews* (2016) 51, 646-655.
- (22) B. W. Lee, J.-H. Ko, J. Park, D.-M. Shin, Y.-H. Hwang, "Acoustic and Relaxation Behaviors of Polydimethylsiloxane Studied by Brillouin and Dielectric Spectroscopy", *Journal of the Korean Physical Society* (2016) 68, 896-900.
- (23) J.-S. Moon, Y. Lee, D.-M. Shin, C. Kim, W.-G. Kim, M. Park, J. Han, H. Song, K. Kim, J.-W. Oh, "Identification of Endocrine Disrupting Chemicals using a Virus-Based Colorimetric Sensor", *Chemistry-An Asian Journal* (2016) 11, 3097-3101.
- (24) D.-M. Shin, Y.-H. Hwang, "Piezoelectric Nanogenerators: Energy Harvesting Technology", *Vacuum Magazine in Korea* (2016) 3, 17-20.
- (25) J.-r. Choi, D.-M. Shin, H. Song, D. Lee, K. Kim, "Current Achievements of Nanoparticle Applications in Developing Optical Sensing and Imaging Techniques", *Nano Convergence* (2016) 3, 30.
- (26) Y. C. Shin, D.-M. Shin, E. J. Lee, J. H. Lee, J. E. Kim, D.-Y. Hwang, J. J. Lee, B. Kim, D. Lim, S.-H. Hyon, Y.-J. Lim, D.-W. Han, "Hyaluronic Acid/PLGA Core/Shell Fiber Matrices Loaded with EGCG Beneficial to Diabetic Wound Healing", *Advanced Healthcare Materials* (2016) 5, 3035-3045.
- (27) S. E. Kim, M. S. Kim, Y. C. Shin, S. U. Eom, J. H. Lee, D.-M. Shin, S. W. Hong, B. Kim, J.-C. Park, B. S. Shin, D. Lim, D.-W. Han, "Cell Migration According to Shape of Graphene Oxide Micropatterns", *Micromachines* (2016) 7, 186.
- (28) J.-S. Moon, W.-G. Kim, D.-M. Shin, S.-Y. Lee, C. Kim, Y. Lee, J. Han, K. Kim, S. Y. Yoo, J.-W. Oh, "Bioinspired M-13 Bacteriophage-based Photonic Nose for Differential Cell Recognition", *Chemical Science* (2017) 8, 921-927.
- (29) D. H. Kang, D.-M. Shin, H. K. Kim, Y.-H. Hwang, "A Facile Meniscus Dragging Depositions for Lateral Alignment of ZnO Nanowires", *New Physics: Sae Mulli* (2017) 67, 41-45.
- (30) T. Yoon, D.-M. Shin, S. Kim, S. Lee, T.G. Lee, K. Kim, "Precise Observation of *C. elegans* Dynamic Behaviours under Controlled Thermal Stimulus Using a Mobile Phone-based Microscope", *Journal of Microscopy* (2017) 266, 28-34.
- (31) H. Phan, D.-M. Shin, S. H. Jeon, T. Y. Kang, G. H. Kim, H. K. Kim, K. Kim, Y.-H. Hwang, S. W. Hong, "Aerodynamic and Aeroelastic Flutters Driven Triboelectric Nanogenerators for Harvesting Broadband Airflow Energy", *Nano Energy* (2017) 33, 476-484.
- (32) S. Kaewinn, S. W. Jun, C. S. Kim, D.-M. Shin, Y.-H. Hwang, K. Kim, B. Shin, C. Kaewpiboon, H. H. Jeong, S. S. Koh, O. H. Krämer, R. N. Johnston, Y.-H. Chung, "Increased EGFR Expression Induced by A Novel Oncogene, CUG2, Confers Resistance to Doxorubicin through Stat1-HDAC4 Signaling", *Cellular Oncology* (2017) 40, 549-561.
- (33) T. Y. Kang, W. Lee, H. Ahn, D.-M. Shin, C. Kim, J.-W. Oh, D. Kim, K. Kim, "Plasmon-Coupled Whispering Gallery Modes on Nanodisk Arrays for Signal Enhancements", *Scientific Reports* (2017) 7, 1173.
- (34) H.-Y. Park, H. K. Kim, Y.-H. Hwang, D.-M. Shin, "Water-through Triboelectric Nanogenerator Based on Ti-mesh for Harvesting Liquid Flow Energy", *Journal of the Korean Physical Society* (2018) 72, 499-503.
- (35) Y. C. Shin, S.-J. Song, D.-M. Shin, J.-W. Oh, S. W. Hong, Y. S. Choi, S.-H. Hyon, D.-W. Han, "Nanocomposite Scaffolds for Myogenesis Revisited: Functionalization with Carbon Nanomaterials and Spectroscopic Analysis", *Applied Spectroscopy Reviews* (2018) 53, 129-156.
- (36) H. Ahn, H. Song, D.-M. Shin, K. Kim, J.-r. Choi, "Emerging Optical Spectroscopy Techniques for Biomedical Applications – A Brief Review of Recent Progress", *Applied Spectroscopy Reviews* (2018) 53, 264-278.
- (37) D.-M. Shin, J.-r. Choi, J.-W. Oh, H. K. Kim, D.-W. Han, K. Kim, Y.-H. Hwang, "Exploring the Use of Impedance Spectroscopy in Relaxation and Electrochemical Studies", *Applied Spectroscopy Reviews* (2018) 53, 157-176.

- (38) T. Kim, S. H. Jeon, S. Lone, J. Doh, D.-M. Shin, H. K. Kim, Y.-H. Hwang, S. W. Hong, "Versatile Nanodot-patterned Gore-Tex Fabric for Multiple Energy Harvesting in Wearable and Aerodynamic Nanogenerators", *Nano Energy* (2018) 54, 209-217.
- (39) J. Kamcev, M. K. Taylor, D.-M. Shin, N. N. Jarenwattananon, K. A. Colwell, J. R. Long, "Functionalized Porous Aromatic Frameworks as High-Performance Adsorbents for the Rapid Removal of Boric Acid from Water", *Advanced Materials* (2019) 31, 1808027.
- (40) D.-M. Shin, S. W. Hong, Y.-H. Hwang, "Recent Advances in Organic Piezoelectric Biomaterials for Energy and Biomedical Applications", *Nanomaterials* (2020) 10, 123.
- (41) D.-M. Shin, J. E. Bachman, M. K. Taylor, J. Kamcev, J. G. Park, M. E. Ziebel, E. Velasquez, N. N. Jarenwattananon, G. K. Sethi, Y. Cui, J. R. Long, "A Single-ion Conducting Borate Network Polymer as a Viable Quasi-solid Electrolyte for Lithium Metal Batteries", *Advanced Materials* (2020) 32, 1905771.
- (42) T. N. T. Thuy, S. K. Cho, Y. Amangeldinova, D. Yoo, G. Tukyei, Y. Sissembayeva, T. Sh. Atabaev, D. Lee, J. Lee, N. N. Dinh, H. K. Kim, D.-M. Shin, Y.-H. Hwang, "WO₃-ZnO and CuO-ZnO Nanocomposites as Highly Efficient Photoanodes under Visible Light Illumination", *Nanotechnology* (2020) 31, 255702.
- (43) M. S. Kang, J. H. Lee, S.-J. Song, D.-M. Shin, J.-H. Jang, S.-H. Hyon, S. W. Hong, J. H. Lee, D.-W. Han, "Graphene Oxide-Functionalized Nanofibre Composite Matrices to Enhance Differentiation of Hippocampal Neuronal Cells", *Materials Advances* (2020) 1, 3496-3506.
- (44) I. S. Raja, J. H. Lee, S. W. Hong, D.-M. Shin, J. H. Lee, D.-W. Han, "A Critical Review on Genotoxicity Potential of Low Dimensional Nanomaterials", *Journal of Hazardous Materials* (2021) 409, 124915.
- (45) Y. Yan, W.-G. Kim, X. Ma, T. Tegafaw, T. M. Nguyen, J.-M. Lee, E.-J. Choi, H. Ahn, S.-H. Ha, K. Kim, J.-M. Kim, H. K. Kim, J.-W. Oh, D.-M. Shin, Y.-H. Hwang, "Nanogenerators Facilitated Piezoelectric and Flexoelectric Characterizations for Bioinspired Energy Harvesting Materials", *Nano Energy* (2021) 81, 105607.
- (46) Y. Amangeldinova, D. Aben, X. Ma, H. Ahn, K. Kim, D.-M. Shin, Y.-H. Hwang, "Enhancing electrical outputs of piezoelectric nanogenerators by controlling the dielectric constant of ZnO/PDMS composite", *Micromachines* (2021) 12, 630.
- (47) Y. Zhang, S.-C. Fu, K. C. Chan, D.-M. Shin, C. Y. H. Chao, "Boosting power output of flutter-driven triboelectric nanogenerator by flexible flagpole", *Nano Energy* (2021) 88, 106284.
- (48) J. Jeong, S. Jeon, X. Ma, Y. W. Kwon, D.-M. Shin, S. W. Hong, "Sustainable and Flexible Microbrush-Faced Triboelectric Generator for Portable/Wearable Applications", *Advanced Materials* (2021) 33, 2102530.
- (49) S. Jeon, J. H. Lee, H. J. Jang, Y. B. Lee, B. Kim, M. S. Kang, Y. C. Shin, D.-M. Shin, S. W. Hong, D.-W. Han, "Spontaneously promoted osteogenic differentiation of MC3T3-E1 preosteoblasts on ultrathin layers of black phosphorus", *Materials Science & Engineering C* (2021).
- (50) Y. Wu, J. Qu, P. K. Chu, D.-M. Shin, Y. Luo, S.-P. Feng, "Hybrid Photovoltaic-Triboelectric Nanogenerators for Simultaneously Harvesting Solar and Mechanical Energies", *Nano Energy* (2021) 89, 106376.
- (51) J. Gao, W. Cong, D.-W. Han, D.-M. Shin, "Single-ion conducting polymer electrolytes as a key jigsaw piece for the next-generation batteries applications", *Chemical Science* (2021) 12, 13248-13272.
- (52) S. Kim, H. Song, H. Ahn, T. Kim, J. Jung, S. K. Cho, D.-M. Shin, J.-r. Choi, Y.-H. Hwang, K. Kim, "A Review of Advanced Impedance Biosensors with Microfluidic Chips for Single Cell Analysis", *Biosensors* (2021) 11, 412.
- (53) Y. Amangeldinova, X. Ma, J. Kim, D.-M. Shin, and Y.-H. Hwang, "Cooperativity of Silver Nanostructures upon Electric Power Generation in Triboelectric Polyimide Layers", *Advanced Engineering Materials* (2022) 24, 2200226.

- (54) C. Kim, K. K. Lee, M. S. Kang, D.-M. Shin; J.-W. Oh, C.-S. Lee, D.-W. Han, “Artificial Olfactory Sensor Technology that Mimics the Olfactory Mechanism: A Comprehensive Review”, *Biomaterials Research* (2022) 26, 40.
- (55) J. Gao, J. Zhou, C. Wang, X. Ma, K. Jiang, E. Kim, C. Li, H. Liu, L. Xu, H. C. Shum, S.-P. Feng, D.-M. Shin, “Engineered Networking in a Family of Solvent-Free Single-Ion Conducting Borate Network Polymer Electrolytes for Li-Metal Battery Applications”, *Chemical Engineering Journal* (2022) 450, 138407.
- (56) Y. Yan, X. Ma, T. M. Nguyen, S.-H. Ha, H. Ahn, D. Aben, K. Kim, J.-M. Kim, J.-W. Oh, D.-M. Shin, Y.-H. Hwang, “Quadrant-Electroded Nanogenerators for Decoupling Piezoelectricity and Flexoelectricity in the Electromechanical Outputs in Flexible Devices”, *Nano Energy* (2022) 104, 107909.
- (57) I. T. Y. Lam, Y. Yuan, K.-T. Bang, S.-J. Choi, D.-M. Shin, D. Lu, Y. Kim, “Towards the Fastest Kinetics and Highest Uptake of Post-Functionalized UiO-66 for Hg²⁺ Removal from Water”, *Nanoscale* (2023) 15, 10558.
- (58) X. Ma, E. Kim, J. Zhou, J. Gao, C. Kim, X. Huan, J. T. Kim, D.-M. Shin, “Self-Powered Smart Skins for Multimodal Tactile Perception based on Triboelectric and Hygroelectric Working Principles”, *Nano Energy* (2023) 113, 108589.
- (59) H. Chen, K.-T. Bang, Y. Tian, C. Hu, R. Tao, Y. Yuan, R. Wang, D.-M. Shin, M. Shao, Y. M. Lee, Y. Kim, “Poly(Ethylene Piperidinium)s for Anion Exchange Membranes”, *Angewandte Chemie Int Ed* (2023) 62, e202307690
- (60) X. Ma, W.-H. Kim, J. H. Lee, D.-W. Han, S.-H. Lee, J. Kim, D. Lee, B. Kim, D.-M. Shin, “The Effectiveness of a Novel Air-barrier Device for Aerosol Reduction in Dental Environment: Computational Fluid Dynamics Simulation”, *Bioengineering* (2023) 10, 947.
- (61) Ke Jiang, L. Long, L. E. Peng, Z. Yang, W. Liu, D.-M. Shin, C. Y. Tang, “Precise regulation of monomer reactive sites enhances water permeance and membrane selectivity of polyamide nanofiltration membranes: mechanistic insights and environmental implications”, *Industrial & Engineering Chemistry Research* (2023) 62, 19813-19821.
- (62) G. Ma, Y. Xu, A. Cai, H. Mao, X. Zhang, D.-M. Shin, L. Wang, H. Zhou, “Binder-free LiMn₂O₄ Nanosheets on Carbon Cloth for Selective Lithium Extraction from Brine via Capacitive Deionization”, *Small* (2024) 20, 2306530.
- (63) Y. Amangeldinova, J.-W. Oh, W. Lee, D.-M. Shin, Y.-H. Hwang, “A study of contact electrification process on PVDF metal interface: Effect of β phase composition”, *Advanced Materials Interfaces* (2024) 11, 2300727.
- (64) J. Zhou, S. Xiang, X. Wang, D.-M. Shin, L. Wang, H. Zhou, “Highly Selective Lithium Extraction from Salt Lake via Carbon Coated Lithium Vanadium Phosphate”, *Chemical Engineering Journal* (2024) 482, 148985.
- (65) J. Gao, J. Zhou, X. Chen, R. Tao, Y. Li, Y. Ru, C. Li, E. Kim, X. Ma, M. Wang, Y. Kim, S. Lee, D.-M. Shin, “Accelerated Selective Li⁺ Transports Assisted by Microcrack-Free Anionic Network Polymer Membranes for Long Cyclable Lithium Metal Batteries”, *Advanced Science* (2024) 11, 2308530.
- (66) J. Zhou, X. Ma, J. Gao, E. Kim, Z. Deng, Q. Rao, W.-D. Li, D.-K. Ki, D.-M. Shin, “Switchable power generation in triboelectric nanogenerator”, *Small* (2024) 20, 2306980.
- (67) J. Huang, C. Li, D. Jiang, Jingyi Gao, L. Cheng, G. Li, H. Luo, Z.-L. Xu, D.-M. Shin, Y. Wang, Y. Lu, Y. Kim, “Solid-State Electrolytes for Lithium Metal Batteries: State-of-the-Art and Perspectives”, *Advanced Functional Materials*, *Advanced Functional Materials* (2025) 35, 2411171.
- (68) J. Zhou, X. Ma, Z. Deng, J. Gao, E. Kim, H. Zhou, D.-M. Shin, “Floating electricity generator for omnidirectional droplet vibration harvesting”, *Device* (2025) 3, 100653.
- (69) D. Aben, H. Ahn, T. M. Nguyen, S.-H. Ha, Y. Amangeldinova, W. Lee, D.-M. Shin, Y.-H. Hwang, “Enhancing Triboelectric Nanogenerator Output by the Optimization of Amine Group Surface Functionalization”, *Journal of Electronic Materials* (2025) 54, 1816.

- (70) J. Zhou, Y. Xu, D.-M. Shin, H. Zhou, “Breaking the trade-off between capacity, stability, and selectivity for electrochemical lithium extraction via a dual-ion doping strategy”, *Desalination* (2025) 600, 118530.
- (71) E. Kim, X. Ma, J. Zhou, J. Gao, A. Liu, Y. Ru, Y. Kim, S. Lee, D.-M. Shin, “Long-lasting moisture energy scavenging in dry ambient air empowered by a salt concentration-gradient cationic hydrogel”, *Advanced Functional Materials* (2025) 35, 2419710.
- (72) Y. Tian, X. Hui, K. Wang, Y. Yuan, H. Chen, K.-T. Bang, R. Tao, R. Wang, D.-M. Shin, Y. Lan, Z.-L. Xu, Y. Kim, “Freestanding Phosphonium Covalent Organic Frameworks with Efficient Hydroxide Conduction for Zinc–Air Batteries”, *Angewandte Chemie Int Ed* (2025) 64, 3202419257.
- (73) E. Jiang, D. Chen, Z. Ying, Jiaming Zhou, A. Jarusarunchai, X. Zhang, C. Xiong, K. Jeong, D.-M. Shin, J. Shang, S. Lee, “Zero- to One-Dimensional Transformation in a Highly Porous Metal–Organic Framework to Enhance Physicochemical Properties”, *Journal of the American Chemical Society* (2025) 147, 16766.
- (74) J. M. Lee, W. Son, M. Oh, D. Han, H. Seo, H. J. Sim, S. H. Kim, D.-M. Shin, C.-S. Kim, S. J. Kim, C. Choi, “Dual-Scale Hydration-Induced Electrical and Mechanical Torsional Energy Harvesting in Heterophilically Designed CNT Yarns”, *Advanced Materials* (2025) 37, 2501111.
- (75) D. Aben, Y. Amangeldinova, H. Ahn, K. Kunanbayev, D.-M. Shin, Y.-H. Hwang, “Electric Output Analysis of Sliding Mode Metal-Semiconductor based DC-TENG”, *Transactions on Electrical and Electronic Materials*, Accepted for Publication.
- (76) Y. Yan, X. Liang, L. Wang, Y. Zhang, J. Zhou, W. Wang, Z. Zhang, Y. Zhou, I. Firdous, Z. Lai, W. Wang, P. Xie, Y. Xiong, H. Shao, B. Li, D. Li, D. Yin, W. A. Daoud, Z. Fan, Y. Yang, D.-M. Shin, Y. Lu, X. C. Zeng, Y. Meng, J. C. Ho, “Flexoelectric manipulation of ferroelectric polarization in self-strained tellurium”, *Science Advances*, Accepted for Publication
- (77) X. Ma, J. Zhou, E. Kim, J. Gao, W. Hu, D.-M. Shin, “Quantifying electron and ion transfers in contact electrification with ionomers”, *Advanced Functional Materials*, Accepted for Publication.