Curriculum Vitae
SHIN, Dong-Myeong

Office Address: 7-06 Haking Wong Building, The University of Hong Kong, Pokfulam Road, Hong Kong
ORCID: 0000-0002-5402-9947

Work Phone: 852) 3917-8061
Work Email: dmshin@hku.hk
Web: https://meweb.hku.hk/ShinLab

Academic Qualification

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

Academic Appointments

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

Professional Services and Memberships

Member of the Royal Society of Chemistry, 2022-present;
Member of the Materials Research Society, 2019-present

Honours and 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

Research and Scholarship

I. Peer-reviewed journal publications

† Students and Research Assistant primarily supervised by Dong-Myeong Shin,
# Co-first author, and * Corresponding author.

1) Ten featured publications since first appointment at HKU

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 (**JCR Top 2.9%** (6th) in Physics, Applied, **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 (**JCR Top 2.9%** (6th) in Physics, Applied, **IF: 26.8**)
3) 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 (**JCR Top 2.9%** (6th) in Physics, Applied, **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 (**JCR Top 4.5%** (9th) in Physics, Applied, **IF: 19.0**)

Selected as Back Cover of Vol. 35 (No. 25)

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*, in press, doi: 10.1002/adfm.202506471 (**JCR Top 4.5%** (9th) in Physics, Applied, **IF: 19.0**)
6) 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 (**JCR Top 5.1%** (10th) in Physics, Applied, **IF: 17.1**)
7) 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 (**JCR Top 5.1%** (10th) in Physics, Applied, **IF: 17.1**)
8) 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 (**JCR Top 7.7%** (19th) in Chemistry, Multidisciplinary, **IF: 14.1**)
9) 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 (**JCR Top 3.0%** (3rd) in Engineering, Environmental, **IF: 13.2**)
10) 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 (**JCR Top 7.2%** (14th) in Physics, Applied, **IF: 12.1**)

Selected as Back Cover of Vol. 20 (No. 31)

2) Ten featured publications before joining HKU

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 (**JCR Top 0.9%** (2nd) in Engineering, Chemical, **IF: 30.8**)
2) 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 (**JCR Top 2.9%** (6th) in Physics, Applied, **IF: 26.8**)
3) 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 (**JCR Top 5.1%** (10th) in Physics, Applied, **IF: 17.1**)
4) 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 (**JCR Top 5.1%** (10th) in Physics, Applied, **IF: 17.1**)
5) **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 (**JCR Top 5.1%** (10th) in Physics, Applied, **IF: 17.1**)

6) 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 (**JCR Top 8.8%** (17th) in Physics, Applied, **IF: 11.0**)
7) 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 (**JCR Top 8.5%** (11th) in Engineering, Biomedical, **IF: 9.6**)
8) **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 (**JCR Top 1.9%** (2nd) in Instruments & Instrumentation, **IF: 7.7**)
9) 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 (**JCR Top 17.8%** (43th) in Chemistry, Multidisciplinary, **IF: 7.4**)

Selected as a Back Cover of Vol. 8 (No. 2)

10) 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 (**JCR Top 42.5%** (102rd) in Chemistry, Multidisciplinary, **IF: 3.3**)

Selected as an Inside Cover of Vol. 11 (No. 21)

3) Full publications list (in chronological order)

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. Kaowinn, 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) 128, 112309.
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***, 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 $LiMn_2O_4$ 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 towards chip-less wearable power module applications", *Small* (2024) 20, 2306980.
67) J. Huang, C. Li, D. Jiang, J. 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* (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* (2025) 26, 679.
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, W. A. Daoud, Z. Fan, Y. Yang, **D.-M. Shin**, Y. Yang, Y. Lu, X. C. Zeng, Y. Meng, J. C. Ho, "Flexoelectric manipulation of ferroelectric polarization in self-strained tellurium", *Science Advances* (2025) 11, eadu1716.
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.
78) M. Gu, J. Wu, C. Li, Z. Zhang, R. Li, Y. Tian, G. Bang, R. Wang, S. Suleman, Y. Yuan, J. Huang, **D.-M. Shin**, Z. Xu, Y. Wang, Y. Kim, "Mechanically Assisted Li+-Conduction in Crown Ether-Covalent Organic Frameworks for Lithium Metal Batteries", *Advanced Materials*, Accepted for Publication

II. Patents

† Students and Research Assistant primarily supervised by Dong-Myeong Shin,

1) 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.

2) 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 in US & March 20, 2024 in CN.
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 in US & November 12, 2024 in CN.

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 in US & May 19, 2025 in CN.
5) US Patent Application No. 63/673,193; China Patent Application No. 202510949264.X: "Self-assembled Salt-Gradient Ionic Hydrogel-based Moisture-enabled Electric Generator" **D.-M. Shin**, E. Kim†, filed July 19, 2024 in US & July 10, 2025 in CN.

III. Invited Lectures in International/Regional Conferences and Department Seminars

1) *Department Seminar*, "The Study Of A Single-ion Conducting Borate Network Polymer Electrolyte For Next Generation Batteries", Department of Nanoenergy Engineering, Pusan National University, Republic of Korea, Jan. 20, 2020.
2) *Department Seminar*, "A Single-ion Conducting Borate Network Polymer As A Viable Electrolyte For Lithium Metal Batteries", Department of Polymer Engineering, Pukyong National University, Republic of Korea, Jan. 21, 2020.
3) *Virtual Department Seminar*, "A Single-Ion Conducting Borate Network Polymer as a Viable Quasi-Solid Electrolyte for Lithium Metal Batteries", Department of Energy Science and Engineering, Daegu Gyeongbuk Institute of Science & Technology (DGIST), Republic of Korea, Nov. 25, 2020.
4) *International Conference*, "Energy scavenging from the mechanical resource, and energy storage to high performing battery", Online International Symposium on Materials Chemistry, Virtual, Republic of Korea, Nov. 11, 2021.
5) *Virtual Department Seminar*, "Energy scavenging from the mechanical resource, and energy storage to high performing battery", Department of Cogno-Mechatronics Engineering, Pusan National University, Republic of Korea, Feb. 21, 2022.
6) *Virtual Department Seminar*, "Energy scavenging from the mechanical resource, and energy storage to high performing battery", Department of Chemistry, Korea University, Republic of Korea, May 19, 2022.
7) *International Conference*, "Mechanical energy scavenging using piezoelectric and triboelectric nanogenerators", The 7th International Conference on Electronic Materials and Nanotechnology for Green Environment, Jeju (Virtual), Republic of Korea, Nov. 7, 2022.
8) *International Conference*, "Mechanical energy scavenging using piezoelectric and triboelectric nanogenerators", The 17th International Symposium on Novel and Nano Materials, Jeju (Virtual), Republic of Korea, Nov. 16, 2022.
9) *International Conference*, "Power Management of Triboelectric Nanogenerators for Wearable Electronics Applications", 2023 IEEE 18th International Conference on Nano/Micro Engineered and Molecular Systems (NEMS), Jeju, Republic of Korea, May 16, 2023.
10) *International Conference*, "Power Management of Triboelectric Nanogenerators for Wearable Electronics Applications", Nano Korea 2023, Ilsan, Republic of Korea, Jul. 6, 2023.
11) *International Conference*, "Selective ion-conducting borate network polymer electrolytes for lithium metal battery applications", CNU Conference of Advanced Technology 2023, Daejeon, Republic of Korea, Oct. 31, 2023.
12) *International Conference*, "Switchable power generation in triboelectric nanogenerator", The 13th Asian Meeting on Ferroelectrics jointly with the 13th Asian Meeting on Electroceramics, Macao, China, Nov. 14, 2023.
13) *Department Seminar*, "Energy Management of Triboelectric Nanogenerators for Wearable Electronic Applications", Department of Chemical and Biological Engineering, The Hong Kong University of Science and Technology, Hong Kong SAR, Nov. 17, 2023.
14) *International Conference*, "Cooperative contact electrification enabled by control over electron and ion transfer directions", Materials Research Society (MRS) Spring 2024, Seattle, USA, Apr. 23, 2024.

15) *International Conference*, "Single-ion Conducting Borate Network Polymer Electrolytes for Lithium Metal Battery Applications", The 21st International Symposium on the Physics of Semiconductors and Applications, Jeju, Republic of Korea, Jun. 5, 2024.
16) *International Conference*, "Power Manipulation of Droplet-based Triboelectric Nanogenerators", Materials Challenges in Alternative and Renewable Energy 2024, Jeju, Republic of Korea, Aug. 20, 2024.
17) *International Conference*, "Power Management of Droplet-based Triboelectric Nanogenerators", The 7th International Conference on Active Materials and Soft Mechatronics, Incheon, Republic of Korea, Oct. 29, 2024.
18) *Department Seminar*, "Electromechanical and Electrochemical Energy Harvesting from Ambient Moisture", Department of Energy Science and Engineering, Daegu Gyeongbuk Institute of Science & Technology (DGIST), Republic of Korea, Dec. 19, 2024.
19) *International Conference*, "Electromechanical and Electrochemical Energy Harvesting from Environmental Moisture", Symposium for the promotion of Applied Research Collaboration in Asia 2025, Okinawa, Japan, Mar. 1, 2025.
20) *International Conference*, "Electromechanical and Electrochemical Energy Harvesting from Ambient Water", 247th Electrochemical Society (ECS) Meeting, Montréal, Canada, May 21, 2025.
21) *International Conference*, "Single-ion conducting borate network polymer electrolytes for lithium metal battery applications", The 20th Asian Chemical Congress (20ACC), Bangkok, Thailand, Jun. 25, 2025.
22) *International Workshop*, "Single-ion conducting borate network polymer electrolytes for lithium metal battery applications", PolyU-SKKU Workshop of Advanced Materials for Rechargeable Batteries (AMRB 2025), Hong Kong SAR, Jul. 14, 2025.

IV. Lectures in International/Regional Conferences

1) *International Conference,* "Power Management of Triboelectric Nanogenerators for Self-Powered Electronics Applications", Materials Research Society (MRS) Spring 2023, San Francisco, USA, Apr. 13, 2023.
2) *International Conference*, "Power Management of Triboelectric Nanogenerators for Self-Powered Electronics Applications", EcoMat Conference 2023, Hong Kong SAR, Jun. 20, 2023.
3) *International Conference,* "Single-Ion Conducting Borate Network Polymer Electrolytes for Lithium Metal Battery Applications", Materials Research Society (MRS) Fall 2023, Boston, USA, Nov. 28, 2023.
4) *International Conference,* "Cooperative Contact Electrification Enabled by Control Over electron and Ion Transfer Directions", The 7th International Conference of Nanogenerator and Piezotronics (NGPT 2024), Madison, USA, May 20, 2024.
5) *International Conference,* "Single-Ion Conducting Borate Network Polymer Electrolytes for Lithium Metal Battery Applications", The 9th International Conference on Metal-Organic Frameworks and Open Framework Compounds (MOF 2024), Singapore, Jul. 16, 2024.
6) *International Conference*, "Electromechanical and Electrochemical Energy Harvesting from Ambient Moisture", Materials Research Society (MRS) Spring 2025, Seattle, USA, Apr. 10, 2025.

V. External Peer-Reviewed Competitive Research Grants

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.
Transferred grant from Prof. Ji Tae Kim on Jul. 2024.
5) **Collaborative Research Fund**, "High-Energy-Density All-Solid-State Lithium-Metal Batteries", **Co-PI**, HKD 5,509,993, 2024-2027.
6) Research Grants Council, **General Research Fund**, "Exploiting highly ordered porous frameworks for comprehensive inter-material ionic transfers", **PI**, HKD 868,612, 2026-2028.

Knowledge Exchange

- Invited speaker for several public events, including **the information day for Korean secondary school students** living in Hong Kong (2023, 2024; organized by Korean Residents Association H.K. Ltd.), and Techtalk (2024; organized by Faculty of Engineering).
- Developed **five** inventions (4 of them were filed in both the US and China; the other was filed in the US only).
- Supervised **a short-term research intern program** of a Korean secondary school student (Jan.-Apr. 2025; organized by Korean Residents Association H.K. Ltd.).

Services/Administration

- Served as **organizing committee members** for several international conferences, including Materials Challenges in Alternative and Renewable Energy 2024 (2024), The 6th International Conference on Vibration and Energy Harvesting Applications (2025), and The 8th International Conference on Nanogenerators and Piezotronics (2025).
- Served as an **Independent Evaluator** for the Environment and Conservation Fund of the Hong Kong Government.
- Served on the **Board of the Faculty of Engineering**.

[Last updated: November 13, 2025]