Dohyub Jang, Ph.D.

Chemical and Biological Integrative Research Center, Korea Institute of Science and Technology, Korea
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EDUCATION

Combined M.S. and Ph.D. in Biomicrosystem technology 03. 2017 – 08. 2025
Department of Biomicrosystem technology,
Korea University, Korea
Advisor: Dong June Ahn

B.S. in Bioengineering 03. 2009 - 08. 2016
Department of Bioengineering,
Yanbian University of Science and Technology, China
Advisor: Jina Kook

EXPERIENCE

Postdoctoral Fellow 09. 2025 - Present
Chemical and Biological Integrative Research Center,
Korea Institute of Science and Technology, Korea
Supervisor: Sehoon Kim

Graduate Researcher
Chemical and Biological Integrative Research Center, 03. 2017 - 10. 2022
Korea Institute of Science and Technology, Korea
Supervisor: Sehoon Kim

Undergraduate Research Intern
Department of Chemistry and Nano science, Ewha Womans University, Korea 07. 2016 - 02. 2017
Advisor: Dong Ha Kim
Center for Theragnosis, Korea Institute of Science and Technology, Korea 07. 2016 - 02. 2017
Advisor: Sehoon Kim

AWARDS & FELLOWSHIPS

NRF Domestic Postdoctoral Fellowship, Support Program for Next-Generation Scholars, National Research Foundation of Korea (09. 2025 – 08. 2027)
Best Poster Award, 2026 Nano Korea, (7. 2026)
Best Poster Award, 2025 spring The Korean Biochip Society (5. 2025)
Best Poster Award, 2020 fall The Korean Biochip Society (11. 2020)
Best Poster Award, 2020 fall The Korean Society of Industrial and Engineering Chemistry (10. 2020)
Springer Academic Award, 2019 fall The Korean Biochip Society (11. 2019)

RESEARCH INTERESTS

Endogenous- and Exogenous-Stimuli-Responsive Nanomaterials for Precision Theranostics

- Design of nanomaterials responsive to pathological microenvironments and external physical stimuli.
- Development of plasmonic, chiral, semiconductor and carbon-based nanostructures for enhanced therapeutic and diagnostic applications
- Engineering of polymeric nanocarriers for controlled drug and prodrug delivery
- Investigation of structure-property-bioactivity relationships and preclinical therapeutic performance

Engineered Bacterial Platforms for Tumor-Targeted Therapy and Fluorescence-Guided Surgery

- Application of engineered tumor-targeting bacteria for molecular imaging, fluorescence-guided surgery, and localized therapeutic delivery
- Integration of engineered bacterial platforms with functional nanocarriers for targeted drug and prodrug delivery
- Evaluation of bacteria-mediated delivery and prodrug activation within the tumor microenvironment

TECHNICAL EXPERTISE

- **Nanomaterial Synthesis and Formulation:** Shape-controlled metal nanoparticles, core–shell and organic–inorganic hybrid nanostructures, sol–gel synthesis, polyphenol-derived carbon nanoparticles, ligand exchange, self-assembled monolayers, surface functionalization, EDC/NHS coupling, PEGylation, silanization and bioconjugation
- **Polymeric Nanocarriers and Drug Delivery:** Formulation and surface modification of polymeric micelles and nanoparticles, drug and fluorescent-probe loading, nanoprecipitation, nano-emulsion, drug-release evaluation, extrusion and nanocarrier–biomolecule conjugation
- **Purification and sample processing:** Column chromatography, dialysis, centrifugal ultrafiltration, centrifugation, precipitation, solvent extraction, solvent evaporation, and lyophilization
- **Materials and Molecular Characterization:** NMR spectroscopy, TEM, SEM, DLS, zeta-potential analysis, UV–Vis–NIR spectroscopy, fluorescence spectroscopy, circular dichroism spectroscopy, Raman/SERS, and X-ray diffraction, SPR spectrometer
- ***In Vitro* Biological Evaluation:** Mammalian cell culture, cell viability and cytotoxicity assays, cellular uptake analysis, ROS and antioxidant assays, flow cytometry, confocal microscopy, and fluorescence microscopy
- ***Animal Disease Models:*** Xenograft tumor models, orthotopic syngeneic breast cancer models, and systemic inflammation, arthritis, and inflammatory bowel disease models
- ***In Vivo* and *Ex Vivo* Preclinical Evaluation:** drug administration (intravenous injection, peritumoral injection, intratumoral injection, peritoneal injection, intranasal injection etc.), general anesthesia, therapeutic efficacy evaluation, biodistribution analysis, IVIS imaging, *ex vivo* organ imaging, and tissue collection
- **Molecular and Biochemical Analysis:** RT-PCR, gel electrophoresis, and protein- and enzyme-activity assays
- **Scientific Software:** OriginPro, ChemDraw, BioRender, ImageJ, Microsoft Office, EndNote, and Rhino

LANGUAGES

Korean (native), English (fluent), Chinese (fluent)

PUBLICATIONS

- **First Author Publications**

1. D. Lee[†], H. J. Jeon[†], D. Jang[†], D. Lee, S. Kim, M. Han, J. Lee, J. Choi, D. H. Kim, D. J. Ahn, K. Kim, H-J, Lee[*], S. Kim[*], S. Suh[*]. "Engineering Bacterial Secretion Systems for Enhanced Tumor Imaging and Surgical Guidance" Adv. Mater, **2025**, *37*(34), 2504389 (**Front cover article**) (Wiley, IF: 27.4)
2. S. Yu[†], D. Jang[†], H. Kang, J. Park, H. Choi, W. Huang, M. Kim, K. Chung, R. Liu[*], J. Bang, S[*]. Kim, L. P. Lee[*], D. H. Kim[*]. "Photoinduced Plasmon Electron Transfer-Based Bioorthogonal Cleavage Reaction for Precision Tumor Therapy" Adv. Mater, **2025**, 2418134 (**Front cover article**) (Wiley, IF : 27.4)
3. D. Jang, H. Choi, J. Lee, Y. Chun, YH. Heo, L. P. Lee, D. J. Ahn, I-S. Shin[*], D. H. Kim[*], Y. H. Seo[*], S. Kim[*]. "Inflamed Tissue-Targeting Polyphenol-Condensed Antioxidant Nanoparticles with Therapeutic Potential." Adv. Health. Mater., **2025**, 2500495. (Wiley, IF : 10.0)
4. D. Jang, S. Yu, K. Chung, J. Yoo, F. M. Mota, J. Wang, D. J. Ahn, S. Kim[*], D. H. Kim[*] "Direct deposition of anatase TiO_2 on thermally unstable gold nanobipyramid: Morphology-conserved plasmonic nanohybrid for combinational photothermal and photocatalytic cancer therapy." Appl. Mater. Today., **2022**, *27*, 101472. (Elsevier, IF : 10.041)

[†] Equal contribution

- **Co-author Publications**

1. K. Chae, Y. Kim, Y. Oh, H. Hahn, J. Son, Y. Kim, H.-J. Kim, H. J. Lee, D. Jang, J. Moon*, K. Kang*, J. W. Han*, F. M. Mota*, D. H. Kim* "Chirality-Induced Suppression of Singlet Oxygen in Lithium-Oxygen Batteries with Extended Cycle Life", Nano-micro Lett., **2026**, *18*(1), 40 (Springer Nature, IF: 36.3).
2. S. Yu†, H.E. Kang†, S. Jee, D. Jang, W.-T. Huang, K. Chung, R.-S. Liu, K. Choi*, L.P. Lee*, S. Kim*, D.H. Kim* "Ultrasmall Metal-organic Framework mediated Simple Fabrication Method of Single Fe-atom Nanozymes with Preserved Oxidation States for Multimodal Tumor Therapy", Adv. Health. Mater, **2025**, 2501058, (Wiley, IF: 10).
3. H. E. Kang†, S.Yu†, R. M. Kim, D. Jang, K. T. Nam*, S. Kim*, D. H. Kim* "Optically Tunable Catalytic Cancer Therapy Using Enzyme-Like Chiral Plasmonic Nanoparticles ", Nat. Comm., **2025**, *16*(1), 2562 (Nature, IF: 14.7)
4. Y. H. Seo*, D. E. A. Estrada, D. Jang, S. Baik, J. Lee, D. H. Kim, S. Kim*. "Aggregation-induced emission carbon dots as Al3+-mediated nanoaggregate probe for rapid and selective detection of tetracycline", Spectrochim. Acta A Mol. Biomol. Spectrosc., **2024,** *310***,** 123925 (Elsevier, IF: 4.3)
5. H. Yuan, S. Yu, M. Kim, JE. Lee, H. Kang, D. Jang, M. S. Ramasamy, D. H. Kim*. "Dopamine-mediated self-assembled anisotropic Au nanoworms conjugated with MoS2 nanosheets for SERS-based sensing" Sens. Actuators B Chem., **2022,** *371***,** 132453 (Elsevier, IF: 8.0)
6. H. Yuan, S. Yu, D. Jang, M. Kim, H. Hong, D. H. Kim,* "Palladium Nanoparticles Decorated MXene for Plasmon-enhanced Photocatalysis", *J. Ind. Eng. Chem.* **2022**, *108*, 501. (Elsevier, IF: 6.064)
7. S. K. Maji, S. Yu, E. Choi, J. W. Lim, D. Jang, G. Kim, S. Kim,* H. Lee,* D. H. Kim,* "Anisotropic Plasmonic Gold Nanorod Indocyanine Green@Reduced Graphene Oxide Doxorubicin Nanohybrids for Image-Guided Enhanced Tumor Theranostics", ACS Omega **2022**, 7(*17*), 15186–15199. (ACS publication, IF: 3.512)
8. S. Yu, D. Jang, S. K. Maji, K. Chung, J. S. Lee, F. M. Mota, J. Wang, S. Kim,* D. H. Kim,* "Sophisticated Plasmon-enhanced Photo-Nanozyme for Anti-angiogenic and Tumor-Microenvironment-Responsive Combinatorial Photodynamic and Photothermal Cancer Therapy", *J. Ind. Eng. Chem.,* **2021***, 104,* 106-116. (Elsevier, IF: 6.064)
9. S. Yu, D. Jang, H. Yuan, W.-T. Huang, M. Kim, F. M. Mota, D. J. Ahn, R.-S. Liu,* H. Lee,* S. Kim,* D. H. Kim,* "Plasmon-triggered Upconversion Emissions and Hot Carrier Injection for Combinatorial Photothermal and Photodynamic Cancer Therapy", *ACS Appl. Mater. Interfaces* **2021**, *13*(49), 58422–58433. (ACS publication, IF: 9.229)
10. K. Jeong, D. Kim, H. J. Kim, Y. D. Lee, J. Yoo, D. Jang, S. Lee. H. Park, Y. Kim, A. Singh, D. J. Ahn, D. H. Kim, J. Bang, J. Kim, P. N. Prasad*, S. Kim*. "Photoechogenic inflatable nanohybrids for upconversion-mediated sonotheranostics" ACS Nano, **2021**, *15*(11), 18394-18402. (ACS publication, IF : 15.8)
11. Y. Nah, D. Jang, D. H. Kim* "Block copolymer micelles enable facile synthesis of organic–inorganic perovskite nanostructures with tailored architecture" Chem. Comm., **2021**, *57*(15), 1879-1882. (RSC, IF : 4.3)

PATENTS

1. Dong Ha Kim, Dohyub Jang, Sehoon Kim, Subin Yu, "Nanozymes Including Anisotropic Plasmonic Nanostructures and Pharmaceutical Composites Including The Same", 10-2020-0033337, 2020. 03. 18.
2. Dong Ha Kim, Dohyub Jang, Sehoon Kim, Subin Yu, "Anisotropic Plasmonic Particles Incorporating Inorganic Photosensitizer, and a Pharmaceutical Composition Comprising The Same", 10-2020-0033375, 2020. 03. 18.
3. Dong Ha Kim, Dohyub Jang, Sehoon Kim, Subin Yu, "Nanozymes Including Double Single Atom and Pharmaceutical Compositions Including The Same", 10-2021-0032677, 2021. 03. 12.
4. Dong Ha Kim, Dohyub Jang, Sehoon Kim, Subin Yu, "Pharmaceutical Composition Including Plasmonic Nanostructure as Bioorthogonal Catalyst and Method for Preventing or Treating Proliferative Diseases Using the Same", 10-2021-0045439, 2021. 04. 07.
5. Dong Ha Kim, Dohyub Jang, Sehoon Kim, Subin Yu, "Anisotropic Plasmonic Structure in Which Upconversion Nanoparticles Are Introduced, and a Pharmaceutical Composition Comprising The Same", 10-2021-0045753, 2021. 04. 08.
6. Hyo Jin Lee, Dohyub Jang, Jeon Heung Jin, Sehoon Kim, Seung Beum Suh, "Recombinant Expression Vector for

Secretion of Interferon-b and Attenuated Samonella Transformed Therewith", 10-2024-0015036, 2024. 02. 02.

7. Hyo Jin Lee, Dohyub Jang, Jeon Heung Jin, Sehoon Kim, Seung Beum Suh, "Recombinant Expression Vector for Secretion of VC-1 and Attenuated Samonella Transformed Therewith", 10-2024-0015037, 2024. 02. 02.
8. Sehoon Kim, Dohyub Jang, Ik-Soo Shin, Young Hun Seo, "Nanoparticles, Their Preparation Method and Pharmaceutical Compositions Containing Them as Active Ingredients", 10-2026-0039206, 2026. 03. 04.

CONFERENCES

- **Domestic Conferences**

1. D. Jang, Y. Kim, D. H. Kim, D. J. Ahn, S. Kim, "Fluorogenic detection of bio-thiols using nanocrystal-thiol interaction" 2017 Polymer Society of Korea, Jeju, Korea, October 11–13 2017 (Poster presentation).
2. D. Jang, D. J. Ahn, S. Kim D. H. Kim, "NIR-responsive anatase TiO_2 coated gold nanobipyramids for cancer therapy" 2018 Polymer Society of Korea, Gyeongju, Korea, October 10–12 2018 (Poster presentation).
3. D. Jang, S. Yu, K. Chung, J. Wang, D. J. Ahn, S. Kim, D. H. Kim, "NIR-responsive anisotropic hybrid gold nanobipyramid@anatase TiO_2 photosensitizer core-shell nanostructures for synergistic photo cancer therapy" 2019 fall Korean Biochip Society, Jeju, Korea, November 13–15 2019 (Oral presentation; **Springer Academic Award**).
4. D. Jang, S. Yu, J. Choi, K. Chung, D. J. Ahn, J. Wang, S. Kim, D. H. Kim, "NIR-responsive anisotropic gold nanobipyramids/annealing-free anatase TiO_2 photosensitizer for synergistic photo cancer therapy" 2020 spring Korean Biochip Society, Yeosu, Korea, July 8–10 2020 (Poster presentation).
5. D. Jang, S. Yu, K. Chung, J. Wang, D. J. Ahn, S. Kim, D. H. Kim, "NIR-responsive anatase TiO_2 decorated gold nanobipyramid nanostructures for synergistic photo cancer therapy" 2020 fall Korean Biochip Society, Jeju, Korea, November 25–27 2020 (Poster presentation; **Best Poster Award**).
6. D. Jang, S. Yu, J. Choi, K. Chung, D. J. Ahn, J. Wang, S. Kim, D. H. Kim, "Synergistic photo cancer therapy using NIR-triggered anisotropic gold nanobipyramids/anatase TiO_2 photocatalyst" 2020 spring The Korean Society of Industrial and Engineering Chemistry (KSIEC 2020), Gwangju, Korea, May 6–8 2020 (Poster presentation; **Best Poster Award**).
7. D. Jang, S. Yu, J. Choi, K. Chung, D. J. Ahn, J. Wang, S. Kim, D. H. Kim, "Anisotropic gold nanobipyramids decorated with anatase TiO_2 for NIR-triggered synergistic photothermal and photodynamic cancer therapy" Korean Chemical Society (KCS), Busan, Korea, October 13–15 2021 (Poster presentation).
8. D. Jang, S. Yu, K. Chung, J. Wang, D. J. Ahn, S. Kim, D. H. Kim, "Photothermal and photodynamic combinational cancer therapy using NIR-responsive gold nanobipyramids/anatase TiO_2" 2021 spring Korean Biochip Society, Hongcheon, Korea, June 16–18 2021 (Poster presentation).
9. D. Jang, S. Yu, K. Chung, J. Wang, D. J. Ahn, S. Kim, D. H. Kim, "Anatase TiO_2-decorated gold nanobipyramids synthesized by low temperature hydrothermal method for dual photothermal and photodynamic cancer therapy" 2021 fall Korean Biochip Society, Jeju, Korea, November 17–19 2021 (Poster presentation).
10. D. Jang, S. Yu, J. Choi, K. Chung, D. J. Ahn, J. Wang, S. Kim, D. H. Kim, "Morphology conserved anatase TiO_2 coated gold nanobipyramids for synergistic photothermal and photodynamic cancer therapy" Korean Chemical Society (KCS), Jeju, Korea, April 13–15 2022 (Poster presentation).
11. D. Jang, S. Yu, K. Chung, J. Wang, D. J. Ahn, S. Kim, D. H. Kim, "Synthesis of anatase TiO_2 coated gold nanobipyramids using mild temperature hydrothermal method for synergistic phototherapy" 2022 spring Korean Biochip Society, Busan, Korea, May 18–20 2022 (Poster presentation).
12. D. Jang, D. J. Ahn, Ik-Soo Shin, Young Hun Seo, D. H. Kim, S. Kim, "Polyphenol-based nanoparticles for ROS scavenging and inflammation mitigation" 2025 spring Korean Biochip Society, Yeosu, Korea, May 14–16 2025 (Poster presentation ; **Best Poster Award**).

- **International Conferences**

1. D. Jang, Y. Kim, D. J. Ahn, S. Kim, "Anion-assisted photoluminescence enhancement from iron oxide nanocrystals" The 15th International Nanotech Symposium & Nano-Convergence Expo (Nano Korea 2017), Ilsan, Korea, July 12–14 2017 (Poster presentation).
2. D. Jang, S. Yu, J. Choi, K. Chung, D. J. Ahn, J. Wang, S. Kim, D. H. Kim, "NIR-responsive gold nanobipyramids with TiO_2 shell." The International Symposium on Plasmonics and Nano-photonics (iSPN 2018), Hangzhou, China, May 24–27 2018, (Poster presentation)
3. D. Jang, S. Yu, J. Choi, K. Chung, D. J. Ahn, J. Wang, S. Kim, D. H. Kim, "Plasmonic induced photothermal and photodynamic therapy using anatase TiO_2 coated gold nanobipyramids" The 17th International Nanotech Symposium & Exhibition (Nano Korea 2019), Ilsan, Korea, July 3–5 2019 (Poster presentation).
4. D. Jang, S. Yu, K. Chung, J. Wang, D. J. Ahn, S. Kim, D. H. Kim, "NIR-responsive anisotropic gold nanobipyramids@anatase TiO_2 photosensitizer for synergistic photo cancer therapy" The 6th International Conference on Electronic Materials and Nanotechnology for Green Environment (ENGE 2020), Jeju, Korea, November 1–4 2020 (Oral presentation).
5. D. Jang, S. Yu, K. Chung, J. Wang, D. J. Ahn, S. Kim, D. H. Kim, "NIR-triggered gold nanobipyramids@anatase TiO_2 for synergistic dual-photo cancer therapy" The 18th International Nanotech Symposium & Exhibition (Nano Korea 2020), Ilsan, Korea, July 1–3 2020 (Oral presentation).
6. D. Jang, S. Yu, K. Chung, J. Wang, D. J. Ahn, S. Kim, D. H. Kim, "NIR-responsive anisotropic gold nanobipyramids/annealing-free anatase TiO_2 photosensitizer for synergistic photo cancer therapy" The 30th Anniversary World Congress on Biosensor, Busan, Korea, May 26–29 2020 (Poster presentation)
7. D. Jang, S. Yu, K. Chung, J. Wang, D. J. Ahn, S. Kim, D. H. Kim, "Photothermal and photodynamic cancer therapy using NIR-triggered anisotropic gold nanobipyramids/anatase TiO_2" The 19th International Nanotech Symposium & Exhibition (Nano Korea 2021), Ilsan, Korea, July 1–3 2021 (Oral presentation).
8. D. Jang, S. Yu, K. Chung, J. Wang, D. J. Ahn, S. Kim, D. H. Kim, "Anatase TiO_2-coated gold nanobipyramids for combinational photothermal and photodynamic therapy" 2021 fall Materials Research Society (2021 MRS fall Meeting & Exhibit), Boston, USA, December 6–8 2021 (Poster presentation).
9. D. Jang, Young Hun Seo, S. Kim, "Inflammation-targeted polyphenol-condensed antioxidant nanoparticles for therapeutic application" The 24th International Nanotech Conference & Exhibition (Nano Korea 2026), Ilsan, Korea, July 8–10 2026 (Poster presentation ; **Best Poster Award**).
10. D. Jang, Young Hun Seo, S. Kim, "Polyphenol-condensed antioxidant nanoparticles for targeted modulation of inflammatory microenvironments" 2026 fall European Materials and Research Society (E-MRS 2026), Warsaw, Poland, September 14–17 2026 (Accepted Poster presentation ; Scheduled for September 2026).