Taejoon Kang Ph.D.

Korea Research Institute of Bioscience and Biotechnology

Principal Researcher, Bionanotechnology Research Center

Korea Advanced Institute of Science and Technology

Adjunct Professor, Department of Biological Sciences

Sungkyunkwan University

Adjunct Professor, School of Pharmacy

Information

Contact Information

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http://www.kangtaejoon.com

Education

2004. 3 – 2010. 8	**Ph.D.** Department of Chemistry, KAIST Advisor : Prof. Bongsoo Kim Dissertation : Development of Nanowire based SERS Sensor: Optical Properties and Biomedical Applications
2000. 3 – 2004. 2	**B. S.** Department of Chemistry, KAIST

Appointments

2020. 3 – Present	**Principal Researcher** Bionanotechnology Research Center, KRIBB
2017. 9 – Present	**Adjunct Professor** Department of Biological Sciences, KAIST
2022. 8 – Present	**Adjunct Professor** School of Pharmacy, SKKU
2012. 10 – 2020. 2	**Senior Researcher** Bionanotechnology Research Center, KRIBB
2017. 3 – 2020. 2	**Associate Professor** Department of Nanobiotechnology, KRIBB School of Biotechnology, UST
2014. 1 – 2017. 4	**Senior Researcher** BioNano Health Guard Research Center in Global Frontier Program, KRIBB
2015. 3 – 2017. 2	**Assistant Professor** Major of Nanobiotechnology and Bioinformatics, UST
2010. 9 – 2012. 9	**Post-doctoral Researcher** Department of Chemistry, KAIST

Awards & Honor

Awards

2023. 2. 1	**KRIBB Outstanding Work Team Award**
2022. 4. 21	**Commendation from MSIT Minister of Korea**
2022. 1. 26	**NNFC Collaboration Research Award**
2021. 11. 19	**Industry-University Cooperation Achievement Award from the Korea BioChip Society**
2021. 11. 17	**BioChip Journal Academic Award**
2021. 2. 1	**KRIBB Paper Award of the Year**
2021. 2. 1	**KRIBB Outstanding Work Team Award**
2021. 1. 25	**KRIBB People of the Month**
2020. 11. 26	**Early Career Achievement Award from the Korean BioChip Society**
2018. 10. 25	**Korea Center for Women in Science, Engineering, and Technology Award Winner**
2011. 12. 2	**7th Samsung Electro-Mechanics 1nside Edge Thesis Award Silver Prize Winner**

Editorial Service

2022. 1. 1 – 2023. 12. 31	**BioChip Journal** Associated Editor
2017. 7. 1 – 2020. 5. 31	**Vacuum Magazine** Editorial Board Member

Conferences

2024. 7. 3 – 5	**Committee** Nano Korea 2024, KINTEX, Ilsan, Korea
2024. 5. 22 - 24	**Committee** 2024 Spring Meeting of the Korean BioChip Society, HICO, Gyeongju, Korea
2023. 7. 5 – 7	**Committee** Nano Korea 2023, KINTEX, Ilsan, Korea
2022. 5. 18 – 20	**Panel of Judges for Best Poster Award** 2022 Spring Meeting of the Korean BioChip Society, Paradise Hotel Busan, Busan, Korea
2021. 11. 17 – 19	**Special Session Organization Chair** 2021 Fall Meeting of the Korean BioChip Society, Shinhwa World, Jeju, Korea
2021. 6. 16 – 18	**Panel of Judges for Best Poster Award** 2021 Spring Meeting of the Korean BioChip Society, Vivaldi Park, Hongcheon, Korea
2019. 7. 3 – 5	**Panel of Judges for Best Poster Award** Nano Korea 2019, KINTEX, Ilsan, Korea
2019. 7. 3 – 5	**Committee** Nano Korea 2019, KINTEX, Ilsan, Korea
2018. 8. 26 – 31	**Session Chair** The 26th International Conference on Raman Spectroscopy (ICORS 2018), ICC, Jeju, Korea
2018. 8. 26 – 31	**Panel of Judges for Best Poster Award**

	The 26th International Conference on Raman Spectroscopy (ICORS 2018), ICC, Jeju, Korea
2018. 1. 10 – 11	**Session Chair** Nano Convergence Conference 2018, aT Center, Seoul, Korea
2016. 1. 18 – 19	**Panel of Judges for Best Poster Award** 3rd BioNano Health Guard Research Center Workshop, Maison Glad Jeju, Jeju, Korea
2013. 8. 21 – 23	**Panel of Judges for Best Poster Award** 45th Summer Meeting of the Korean Vacuum Society, Yeosu the Ocean Resort, Yeosu, Korea
2013. 2. 27 – 3. 1	**Session Chair** 2nd Bio Convergent Diagnosis R&D Partnering & Technology Transfer Forum, The Shilla Jeju, Jeju, Korea

Educational Service

2018	UST Examination Problem Bank Construction Committee Member

Memberships

American Chemical Society

Materials Research Society

The Korean BioChip Society

The Korean Chemical Society

The Korean Society for Biotechnology and Bioengineering

Korea Nano Technology Research Society

Korean Society for Extracellular Vesicles

Korean Society of Food Science and Technology

Projects

Ongoing

2024. 2. 1 – Present

Principal Investigator

"Development of AI based Raman signal analysis system for highly efficient on-site detection of multiple foodborne bacteria"

Research Supporting Program, OTTOGI Ham Taiho Foundation, Korea

2023. 3. 1 – Present

Principal Investigator

"Development of Platform Technology for Molecular Diagnostics based on Novel Nucleoprotein"

Basic Research Program, Ministry of Science and ICT, Korea

2022. 4. 1 – Present

Participating Researcher

"Nano-Opto-Biosensor Technology for Real-time and Rapid Diagnostics of Virus"

Market-led K-Sensor Technology Development Program, Ministry of Trade, Industry and Energy, Korea

2021. 6. 1 – Present

Principal Investigator (Total Research Project)

"Development of Diagnostic Platform Technology for Future Emerging and Re-emerging Infectious Diseases - Securing of Biocontents and Analytic Platform Technology Development for the Diagnosis of Infectious Disease"

Bio Medical Technology Development Program, Ministry of Science and ICT, Korea

2021. 4. 1 – Present

Principal Investigator (Unit Research Project)

"Development of ultrasensitive array sensor based on 3D CRISPLAS Nanobio materials for early cancer diagnosis - Development of CRISPR materials for cancer diagnosis and application to 3D plasmonic nanostructures"

Nano Material Technology Development Program, Ministry of Science and ICT, Korea

2021. 4. 1 – Present

Participating Researcher

"Development of analysis and measurement technology for biological hazardous materials in environmental aerosol - Development of on-site portable detection technology"

Environmental Technology Development Program, Ministry of Environment, Korea

2021. 1. 1 – Present

Participating Researcher

"Development of uncontact digital PCR for next wave (post corona)"

Nanomedical Devices Development Program, National Research Council of Science & Technology, Korea

2019. 1. 1 – Present

Participating Researcher

"Development of Theragnosis Platforms Based on Bionanotechnology"

KRIBB Initiative Research Program, National Research Council of Science & Technology, Korea

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Finished

2018. 4. 1 – 2022. 12. 31

Participating Researcher

"Development of exoNA Diagnosis Device for Companion Diagnostics and Monitoring of HER2 Overexpressed Cancer - Development of High-Precision, High-Sensitive exoNA Detection Technology based on Fluorescence Signal Amplification Probe" - **A Grade**

Bio Medical Technology Development Program, Ministry of Science and ICT, Korea

2018. 3. 1 – 2022. 8. 31

Principal Investigator (Consignment Research Project)

"BioNano Health Guard Research - Development of Practical Technologies and System for Early Detection & Diagnostics of Infectious Pathogens - Securement of Bio-Contents for H-GUARD

System and Development of Practical Technologies for Early Detection & Diagnostics - Development of Nanobio Interfacing Platform Technologies for Health Guard"
Global Frontier Program, Ministry of Science and ICT, Korea

2019. 3. 1 – 2022. 2. 28 **Principal Investigator**
"Technology Development for the Collection/Detection of Super-Bacteria by using Nanostructure-CRISPR Convergence Materials"
Basic Research Program, Ministry of Science and ICT, Korea

2020. 7. 1 – 2021. 6. 30 **Participating Researcher**
"Development of the human immune system-based therapeutic agents against RNA viruses"
Creative Allied Program, National Research Council of Science & Technology, Korea

2019. 4. 1 – 2020. 12. 31 **Principal Investigator**
"Study on the Optimized Assembly of High Functional Nanostructure and High Performance Bioreceptor: Construction of Ideal NanoBio Convergence Platform" - **A Grade**
KRIBB Initiative Research Program, National Research Council of Science & Technology, Korea

2020. 5. 21 – 2020. 12. 31 **Participating Researcher**
"Optimization of antibody detection technology for serosurveillance"
KRIBB Initiative Research Program, National Research Council of Science & Technology, Korea

2018. 8. 17 – 2020. 3 .31 **Participating Researcher**
"Development of Point-Of-Care-Test for Discriminating Safety of Fresh Meat - Development of Bioelectronic Noses for Measuring Meat Freshness"
Future Leading Technology Development Program, Ministry of Science and ICT, Korea

2015. 1. 1 – 2018. 12. 31 **Participating Researcher**
"Development of Nanobiomedical Convergence Technology"
KRIBB Initiative Research Program, National Research Council of Science & Technology, Korea

2018. 3. 1 – 2018. 12. 31 **Planning Committee Member**
"Development Project of Convergence Nanomaterials for Smart Patch which Can Recognize and Control the Biological Function"
KRIBB R&D Planning Program, National Research Council of Science & Technology, Korea

2018. 6. 1 – 2018. 12. 31 **Participating Researcher**
"Development of Safety Test Technology for Mixed Biocide Based on AOP - Product Development of Biocide Detector Based on AOP"
Environmental Technology Development Program, Ministry of Environment, Korea

2014. 9. 1 – 2018. 2. 28 **Principal Investigator (Unit Research Project)**
"BioNano Health Guard Research - Development of Fabrication Technologies for 3D Nano-micro Hybrid Structures for Nano Health Guard and its Application - Technology Developments for Design and Application of 3D Nanostructures to Control the Biomolecular Sensing Signals"
Global Frontier Program, Ministry of Science and ICT, Korea

2016. 12. 26 – 2017. 12. 25 **Participating Researcher**
"Convergence Cluster for the Development of Nanomedicine Innovative Technology-based Disease Response Platform"
Convergence Cluster Support Program, National Research Council of Science & Technology, Korea

2013. 9. 1 – 2017. 7. 31 **Principal Investigator (Unit Research Project)**
"Technology Development for Rapid On-Site Screening of Food Poisoning Pathogens - Development of Detection Technologies and

Integrated Module Systems for Rapid Screening of Food Poisoning Pathogens" - **A Grade**

Public Welfare & Safety Research Program, Ministry of Science, ICT & Future Planning, Korea

2014. 1. 1 – 2017. 4. 30 **Participating Researcher**

"BioNano Health Guard Research - Development of Technologies for Acquisition and Application of Biocontents for BioNano Convergence Health Guard - Development of Platform Technologies for Acquisition/Modification/Application and Analysis of Biocontents for BioNano Convergence Health Guard"

Global Frontier Program, Ministry of Science, ICT & Future Planning, Korea

2016. 7. 1 – 2016. 10. 31 **Participating Researcher**

"A Study on the Technology for Collection and Detection of Hazardous Biosubstances"

Research Planning and Evaluation Program, Ministry of Science, ICT & Future Planning, Korea

2016. 3. 1 – 2016. 8. 31 **Participating Researcher**

"Development of Ultrasensitive SERS Sensor for Early Diagnosis of Cancer"

K-Valley RED&B Program, Ministry of Science, ICT & Future Planning, Korea

2015. 11. 16 – 2016. 3. 31 **Participating Researcher**

"Collection of NBIT Convergence Theragnosis Technology Information for the Realization of Personalized Medicine"

Foreign Technology Information Program, Ministry of Science, ICT & Future Planning, Korea

2012. 12. 1 – 2015. 2. 28 **Participating Researcher**

"Development of Nanopore based Biomolecular Sensing/Control System - Design of Protein-based Bio Contents and Technology Development for Nanopore Application"
Pioneer Research Center Program, Ministry of Science, ICT & Future Planning, Korea

2012. 11. 1 – 2014. 12. 31 **Participating Researcher**
"Development of Nanobiomedical Convergence Technology for Disease Diagnosis/Therapy"
KRIBB Initiative Research Program, National Research Council of Science & Technology, Korea

2014. 5. 12 – 2014. 12. 11 **Participating Researcher**
"Optical Metasurface for Measuring Fine Refractive Index Change/Distribution and Analyzing Low-index Nano-biomaterials"
K-Valley RED&B Program, Ministry of Science, ICT & Future Planning, Korea

2014. 4. 3 – 2014. 9. 30 **Representative Mentor**
"Technology Developments for Real-time Monitoring of Bacteria in Pipes during Preparation, Transportation, and Supply of Beverages"
SMEs Technology Mentoring Program, Ministry of Science, ICT & Future Planning, Korea

2013. 3. 1 – 2014. 3. 31 **Participating Researcher**
"Production and Application of Biomolecules for Bio-electronical Devices"
Bio Medical Technology Development Program, Ministry of Science, ICT & Future Planning, Korea

2013. 3. 1 – 2014. 2. 28 **Participating Researcher**
"Bio Switch based Diagnostics· Imaging Convergence Research - Development of Novel Molecular Diagnosis and Imaging Technology Using Switch Molecules"

Pioneer Research Center Program, Ministry of Science, ICT & Future Planning, Korea

2014. 1. 1 – 2014 .2. 28 **Establishment Committee Member (Nanobio Subcommittee)**
"2nd National Nanotechnology Map (2014 ~ 2025)"
Establishment of National Nanotechnology Map, Ministry of Science, ICT & Future Planning, Korea

2013. 11. 1 – 2013. 12. 31 **Planning Committee Member (4th Subcommittee)**
"National Future Mega-Growth Engine Finding Program in a Viewpoint of Research Institutes Founded by Government - Health and Safety Society - Strengthening Techniques for Resilience against Multiple Compound Disasters"
Preliminary Feasibility Study, Ministry of Science, ICT & Future Planning, Korea

2012. 12. 1 – 2013. 8. 31 **Participating Researcher**
"Technology Development for Rapid On-Site Screening of Food Poisoning Pathogens - Development of Detection Technologies and Integrated Module Systems for Rapid Screening of Food Poisoning Pathogens"
Public Welfare & Safety Research Program, Ministry of Science, ICT & Future Planning, Korea

2013. 2. 18 – 2013. 7. 31 **Participating Researcher**
"Technology Convergence for Smart Health Monitoring using Innovative Nanotoxicity-free Biomolecular Nanomaterials with High Probe Activity"
Research Planning and Evaluation Program, Ministry of Science, ICT & Future Planning, Korea

2013. 2. 18 – 2013. 7. 31 **Participating Researcher**
"A Study on the BINT Convergence Health Guard Research" - **Selected as Global Frontier Program**

Research Planning and Evaluation Program, Ministry of Science, ICT & Future Planning, Korea

2013. 1. 1 – 2013. 4. 10 **Planning Committee Member**
"Bio Convergent Mediation Research Center Construction Program" - Suspended
KRIBB New Business Planning Program, National Research Council of Science & Technology, Korea

2012. 11. 1 – 2012. 12. 31 **Planning Committee Member**
"Nanohealth Guard Research" - **1st Grade**
KRIBB R&D Planning Program, National Research Council of Science & Technology, Korea

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Publications

Submitted

Advancing SARS-CoV-2 variant detection with high-affinity monoclonal antibodies and flexible plasmonic nanostructures
J. S. Ryu, S. H. Lee, H. Kim, H. Kang, P. Li, J. H. Lee, H. Jang, S. Kim, H.-J. Kwon, H. S. Jung, Y. Jung, E.-K. Lim, J. Jung,* S.-G. Park,* and T. Kang*

CRISPR/Cas12a antifouling nanocomposite biosensors enable amplification-free detection of Monkeypox virus in complex biological fluids
J.-C. Lee, S.-M. Ryu, Y. Lee, H. Jang, J. Song, T. Kang, K. H. Lee,* and S. Park*

CRISPR-Inspired Biosensing for High-Precision Mutational Profiling in Extracellular Vesicles
J. Song, M. H. Cho, H. Cho, Y. Song, S. W. Lee, H. C. Nam, T. H. Yoon, J. C. Shin, J.-S. Hong, Y. Kim, E. Ekanayake, D. G. You, S. G. Im, G.-S. Choi, J. S. Park, B. C. Carter, L. Balaj, A. N. Seo, M. A. Miller, S. Y. Park, T. Kang,* C. M. Castro,* and H. Lee*

Development of integrated microdroplet generation device with minimal loss for streamlining ddPCR-based SARS-CoV-2 detection

D. K. Jung,[+] H. Jang,[+] ([+]co-first author) J. Kim, S. Kim, S. J. Lee, N. H. Bae, D. Rho, B. G. Choi, D.-S. Lee, **T. Kang**,* and K. G. Lee*

Unveiling Cas12j Trans-Cleavage Activity for CRISPR Diagnostics: Application to miRNA Detection in Lung Cancer Diagnosis

J.-E. Kang,[+] H. Kim,[+] Y.-H. Lee,[+] H.-Y. Lee,[+] ([+]co-first author) Y. Park, H. Jang, M.-Y. Lee, B.-H. Jeong, J.-Y. Byun, S. J. Kim, E.-K. Lim, J. Jung, E.-J. Woo,* **T. Kang**,* and K.-H. Park*

Harnessing *Lactobacillus reuteri*-derived Extracellular Vesicles for Multifaceted Cancer Treatment *via* Oral Delivery

S. Yi,[+] E. Jung,[+] ([+]co-first author) H. Kim, J. Choi, S. Kim, E.-K. Lim, **T. Kang**, K. Kim, and J. Jung*

Nanoplasmonic Microarray-Based Solid Phase Isothermal Amplification for Highly Sensitive and Highly Multiplexed Gene Detection: An Application in SARS-CoV-2 Diagnosis

J. Y. Lee, **T. Kang**, H. Jang, S. Kim, S.-G. Park,* and M.-Y. Lee*

Nucleic Acid Amplification-Free Biosensing Platform for Concurrent Diagnosis of Twindemic of SARS-CoV-2 and Influenza A Virus

J. Lim, I. Maeng, J. Lee, R. Kim, **T. Kang**, J. Jung, S. Haam, S. J. Oh,* and E.-K. Lim*

Dual Structure-Switching Aptamer-Mediated Signal Amplification Cascade for SARS-CoV-2 Detection

J. Lim, J. Ki, S. Kim, J. Lee, S. Jang, S. U. Son, S. B. Seo, **T. Kang**, J. Jung, E. Kim, and E.-K. Lim*

Small

2024, In Press

Multiplex Detection of Foodborne Pathogens using 3D Nanostructure Swab and Deep Learning-Based Classification of Raman Spectra

H. Kang,[+] J. Lee,[+] J. Moon,[+] T. Lee,[+] ([+]co-first author) J. Kim, Y. Jeong, E.-K. Lim, J. Jung, Y. Jung, S. J. Lee, K. G. Lee,* S. Ryu,* and T. Kang*

Talanta

2024, In Press

On-site detection of methicillin-resistant *Staphylococcus aureus* (MRSA) utilizing G-quadruplex based isothermal exponential amplification reaction (GQ-EXPAR)

S. B. Seo, J. Lee, E. Kim, J. Lim, S. Jang, S. U. Son, Y. Jeong, T. Kang, J. Jung, K. G. Lee, S.-W. Lee, K. Kim,* and E.-K. Lim*

Biosens. Bioelectron.

2024, *253*, 116147

Multifunctional self-priming hairpin probe-based isothermal nucleic acid amplification and its applications for COVID-19 diagnosis

H. Kim, S. Lee, Y. Ju, H. Y. Kim, H. Jang, Y. Park, S. M. Lee, D. Yong, T. Kang,* and H. G. Park*

Biosens. Bioelectron.

2024, *251*, 116102

A CRISPR/Cas12 trans-cleavage reporter enabling label-free colorimetric detection of SARS-CoV-2 and its Variants

H. Kim, H. Jang, J. Song, S. M. Lee, S. Lee, H.-J. Kwon, S. Kim, T. Kang,* and H. G. Park*

Nat. Commun.

2024, *15*, 1366

Biporous silica nanostructure-induced nanovortex in microfluidics for nucleic acid enrichment, isolation, and PCR-free detection

E. Jeon,[+] B. Koo,[+] S. Kim,[+] ([+]co-first author) J. Kim, Y. Yu, H. Jang, M. Lee, S.-H. Kim, T.

Kang, S. K. Kim, R. Kwak,* Y. Shin,* and J. Lee*

Nat. Commun.

2024, *15*, 711

Micrometer-thick and porous nanocomposite coating for electrochemical sensors with exceptional antifouling and electroconducting properties

J.-C. Lee,[+] S. Y. Kim,[+] J. Song,[+] ([+]co-first author) H. Jang, M. Kim, H. Kim, S. Q. Choi, S. Kim, P. Jolly, T. Kang,* S. Park,* and D. E. Ingber*

Food Chem.

2024, *438*, 138043

PoreGlow: A split green fluorescent protein-based system for rapid detection of *Listeria monocytogenes*

K. Guk,[+] So. Yi,[+] ([+]co-first author) H. Kim, S. Kim, E.-K. Lim, T. Kang, and J. Jung*

Sens. Actuat. B

2024, *399*, 134748

RdRp activity test using CRISPR/Cas13a enzyme (RACE) for screening of SARS-CoV-2 inhibitors

S. Yi,[+] K. Guk,[+] ([+]co-first author) H. Kim, K.-S. Lee, E.-K. Lim, T. Kang,* and J. Jung*

Nat. Commun.

2023, *14*, 8033

ANCA: artificial nucleic acid circuit with argonaute protein for one-step isothermal detection of antibiotic-resistant bacteria

H. Jang, J. Song, S. Kim, J.-H. Byun, K. G. Lee, K.-H. Park, E. Woo, E.-K. Lim, J. Jung, and T. Kang*

BMC Infect. Dis.

2023, *23*, 732

Kinetics of adaptive immune responses after administering mRNA-Based COVID-19 vaccination in individuals

with and without prior SARS-CoV-2 infections

S.-W. Yoon, K. Widyasari, J. Jang, S. Lee, T. Kang, and S. Kim*

Biosens. Bioelectron.

2023, *241*, 115700

Rapid and Simultaneous Multiple Detection of a Tripledemic Using a Dual-gate Oxide Semiconductor Thin-film Transistor-based Immunosensor

S. Jeong,[+] S. U. Son,[+] ([+]co-first author) J. Kim, S.-I. Cho, T. Kang, S. Kim, E.-K. Lim,* and S.-H. K. Park*

Nano Converg.

2023, *10*, 45

3D printed fluidic swab for COVID-19 testing with improved diagnostic yield and user comfort

J. Kim, J. Jeon, H. Jang, Y. Moon, A. T. Abafogi, J. Lee, T. Kang,* and S. Park*

J. Hazard. Mater.

2023, *460*, 132398

A portable smartphone-based colorimetric sensor that utilizes dual amplification for the on-site detection of airborne bacteria

J. Ki, I. H. Kwon, J. Lee, J. Lim, S. Jang, S. U. Son, S. B. Seo, Y. Oh, T. Kang, J. Jung, K. G. Lee, J. Hwang, and E.-K. Lim*

Viruses

2023, *15*, 1756

Effectiveness of Bivalent Omicron-Containing Booster Vaccines against SARS-CoV-2 Omicron Variant among Individuals with and without Prior SARS-CoV-2 Infection

K. Widyasari, J. Jang, T. Kang, and S. Kim*

Mater. Horiz.

2023, *10*, 4571

Charge-shifting Polyplex as a Viral RNA Extraction Carrier for Streamlined Detection of Infectious Viruses

Y. Song,[+] J. Song,[+] ([+]co-first author) S. Kim, H. Jang, H. Kim, B. Jeong, N. Park, S. Kim, D. Yong, E.-K. Lim, K. G. Lee,* **T. Kang**,* and S. G. Im*

Biosens. Bioelectron.

2023, *237*, 115522

One-pot, ultrasensitive, and multiplex detection of SARS-CoV-2 genes utilizing self-priming hairpin-mediated isothermal amplification

Y. Li, **T. Kang**,* and H. G. Park,*

Nano Converg.

2023, *10*, 25

Polyaniline-based 3D network structure promotes entrapment and detection of drug-resistant bacteria

Y. Song, N. Park, D. A. Jo, J. Kim, D. Yong, J. Song, Y. M. Park, S. J. Lee, Y. T. Kim, S. G. Im, B. G. Choi,* **T. Kang**,* and K. G. Lee*

Lab Chip

2023, *23*, 2389

Droplet digital recombinase polymerase amplification for multiplexed detection of human coronavirus

J. W. Choi,[+] W. H. Seo,[+] ([+]co-first author) **T. Kang**, T. Kang, and B. G. Chung*

Sens. Actuat. B

2023, *382*, 133521

SERS-ELISA using silica-encapsulated Au core-satellite nanotags for sensitive detection of SARS-CoV-2

Q. Yu,[+] H. D. Trinh,[+] Y. Lee,[+] ([+]co-first author) **T. Kang**,* L. Chen,* S. Yoon,* and J. Choo*

ACS Appl. Mater. Interfaces

2023, *15*, 7759

Conductive Thread-Based Immunosensor for Pandemic Influenza A (H1N1) Virus Detection

S. U. Son, S. Jang, J. Lim, S. B. Seo, **T. Kang**, J. Jung, S. Y. Oh, S.-W. Yoon, D. Yong, J. Lee, and E.-K. Lim*

Biosens. Bioelectron.

2023, *225*, 115085

Elution-free DNA detection using CRISPR/Cas9-mediated light-up aptamer transcription: Toward all-in-one DNA purification and detection tube

J. Song,[+] Y. Song,[+] ([+]co-first author) H. Jang, J. Moon, H. Kang, Y.-M. Huh, H. Y. Son, H. W. Rho, M. Park, E.-K. Lim, J. Jung, Y. Jung, H. G. Park, K. G. Lee,* S. G. Im,* and T. Kang*

Biosens. Bioelectron.

2023, *220*, 114930

***In-situ* fabrication of 3D interior hotspots templated with a protein@Au core–shell structure for label-free and on-site SERS detection of viral diseases**

I. B. Ansah,[+] S. H. Lee,[+] ([+]co-first author) J.-Y. Yang, C. Mun, S. Jung, H. S. Jung, M.-Y. Lee, T. Kang, S. Lee, D.-H. Kim, and S.-G. Park*

Chem. Eng. J.

2023, *454*, 140066

3D interior hotspots embedded with viral lysates for rapid and label-free identification of infectious diseases

S. H. Lee,[+] I. B. Ansah,[+] W.-C. Lee,[+] ([+]co-first author) J.-Y. Yang, C. Mun, H. Jang, S. Kim, S. Jung, M.-Y. Lee, H. S. Jung, T. Kang, S. Lee, D.-H. Kim, and S.-G. Park*

Biosens. Bioelectron.

2023, *219*, 114819

Hybrid CRISPR/Cas protein for one-pot detection of DNA and RNA

K. Guk,[+] S. Yi,[+] ([+]co-first author) H. Kim, Y. Bae, D. Yong, S. Kim, K.-S. Lee, E.-K. Lim, T. Kang,* and J. Jung*

Food Chem.

2023, *403*, 134317

Polydiacetylene-based hydrogel beads as colorimetric sensors for the detection of biogenic amines in spoiled meat

S. Jang, S. U. Son, J. Kim, H. Kim, J. Lim, S. B. Seo, B. Kang, **T. Kang**, J. Jung, S. Seo,* and E.-K. Lim*

Anal. Chem.

2022, *94*, 17448

Ultrasensitive Isothermal Detection of SARS-CoV-2 Based on Self-Priming Hairpin-Utilized Amplification of the G-Rich Sequence

Y. Li, H. Kim, Y. Ju, Y. Park, **T. Kang**, D. Yong, and H. G. Park*

ACS Appl. Mater. Interfaces

2022, *14*, 54550

Highly Adsorptive Au-TiO_2 Nanocomposites for the SERS Face Mask Allow the Machine-Learning-Based Quantitative Assay of SARS-CoV-2 in Artificial Breath Aerosols

C. S. H. Hwang,[+] S. Lee,[+] ([+]co-first author) S. Lee, H. Kim, **T. Kang**, D. Lee,* and K.-H. Jeong*

ACS Sens.

2022, *7*, 3470

Rapid and Accurate On-Site Immunodiagnostics of Highly Contagious Severe Acute Respiratory Syndrome Coronavirus 2 Using Portable Surface-Enhanced Raman Scattering-Lateral Flow Assay Reader

Y. Joung, K. Kim, S. Lee, B.-S. Chun, S. Lee, J. Hwang, S. Choi, **T. Kang**,* M.-K. Lee,* L. Chen,* and J. Choo*

J. Microbiol. Immunol. Infect.

2022, *55*, 1013

Evaluation of the T cell and B cell response following the administration of COVID-19 vaccines in Korea

K. Widyasari, J. Jang, S. Lee, **T. Kang**, and S. Kim*

Nano Converg.

2022, *9*, 39

Dual-mode SERS-based lateral flow assay strips for simultaneous diagnosis of SARS-CoV-2 and influenza a virus

M. Lu,[+] Y. Joung,[+] ([+]co-first author) C. S. Jeon, S. Kim, D. Yong, H. Jang, S. H. Pyun,* T. Kang,* and J. Choo*

BioChip. J.

2022, *16*, 280

Magnetic Nanochain-Based Smart Drug Delivery System with Remote Tunable Drug Release by a Magnetic Field

B. Kang, M.-K. Shin, S. Han, I. Oh, E. Kim, J. Park, H. Y. Son, T. Kang, J. Jung, Y.-M. Huh,* S. Haam,* and E.-K. Lim*

ACS Nano

2022, *16*, 11300

Smartphone-Based SARS-CoV-2 and Variants Detection System using Colorimetric DNAzyme Reaction Triggered by Loop-Mediated Isothermal Amplification (LAMP) with Clustered Regularly Interspaced Short Palindromic Repeats (CRISPR)

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S. Park, C. S. Jeon, N. Choi, J.-I. Moon, K. M. Lee, S. H. Pyun,* T. Kang,* and J. Choo*

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S. Lee, K. Widyasari, H.-R. Yang, J. Jang, T. Kang, and S. Kim*

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H. Y. Kim,[+] J. Song,[+] ([+]co-first author) H. G. Park,* and T. Kang*

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Ultrasensitive Detection of Ovarian Cancer Biomarker Using Au Nanoplate SERS Immunoassay

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Using Surface-Enhanced Raman Scattering

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Naked-eye detection of pandemic influenza a (pH1N1) virus by polydiacetylene (PDA)-based paper sensor as a point-of-care diagnostic platform

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Single-step multiplex detection of toxic metal ions by Au nanowires-on-chip sensor using reporter elimination

T. Kang, S. M. Yoo, M. Kang, H. Lee, H. Kim, S. Y. Lee, and B. Kim*

Nano Lett.

2012, *12*, 2331

Rainbow Radiating Single-Crystal Ag Nanowire Nanoantenna

T. Kang, W. Choi, I. Yoon, H. Lee, M.-K. Seo,* Q.-H. Park,* and B. Kim*

Small

2012, *8*, 1527

Topotaxial Fabrication of Vertical Au_xAg_{1-x} Nanowire Arrays: Plasmon-Active in the Blue Region and Corrosion Resistant

H. Lee, Y. Yoo, **T. Kang**, J. In, M.-K. Seo, and B. Kim*

Small

2011, *7*, 3371

Combining a Nanowire SERRS Sensor and a Target Recycling Reaction for Ultrasensitive and Multiplex Identification of Pathogenic Fungi

S. M. Yoo,[+] T. Kang,[+] ([+]co-first author) H. Kang, H. Lee, M. Kang, S. Y. Lee,* and B. Kim*

Chem. Eur. J.

2011, *17*, 8657

Detection of Single Nucleotide Polymorphisms by a Gold Nanowire-on-Film SERS Sensor Coupled with S1 Nuclease Treatment

S. M. Yoo,[+] T. Kang,[+] ([+]co-first author) B. Kim,* and S. Y. Lee*

Chem. Asian J.

2011, *6*, 2500

Stereoaligned Epitaxial Growth of Single-Crystalline Platinum Nanowires by Chemical Vapor Transport

Y. Yoo, S. Han, M. Kim, T. Kang, J. In, and B. Kim*

Nanotechnology

2011, *22*, 235303

Multi-layer nanogap array for high-performance SERS substrate

M.-L. Seol, J.-H. Kim, T. Kang, H. Im, S. Kim, B. Kim, and Y.-K. Choi*

J. Phys. Chem. Lett.

2011, *2*, 956

Epitaxially Integrating Ferromagnetic $Fe_{1.3}Ge$ Nanowire Arrays on Few-Layer Graphene

H. Yoon, T. Kang, J. M. Lee, S.-I. Kim, K. Seo, J. Kim, W. I. Park, and B. Kim*

Chem. Eur. J.

2011, *17*, 2211

Au Nanowire-on-Film SERRS Sensor for Ultrasensitive Hg^{2+} Detection

T. Kang, S. M. Yoo, I. Yoon, S. Lee, J. Choo, S. Y. Lee, and B. Kim

Adv. Funct. Mater.

2010, *20*, 4273

Large-Scale Highly Ordered Chitosan-Core Au-Shell Nanopatterns with Plasmonic Tunability: A Top-Down Approach to Fabricate Core–Shell Nanostructures

Y.-K. Baek, S. M. Yoo, T. Kang, H.-J. Jeon, K. Kim, J.-S. Lee, S. Y. Lee, B. Kim, and H.-T. Jung*

Nano Lett.

2010, *10*, 1189

Patterned Multiplex Pathogen DNA Detection by Au Particle-on-Wire SERS Sensor

T. Kang,[+] S. M. Yoo,[+] ([+]co-first author) I. Yoon, S. Y. Lee,* and B. Kim*

Chem. Eur. J.

2010, *16*, 1351

Au Nanowire–Au Nanoparticles Conjugated System which Provides Micrometer Size Molecular Sensors

T. Kang, I. Yoon, J. Kim, H. Ihee, and B. Kim*

Nanotechnology

2009, *20*, 235302

A well-ordered flower-like gold nanostructure for integrated sensors via surface-enhanced Raman scattering

J.-H. Kim, T. Kang, S. M. Yoo, S. Y. Lee, B. Kim,* and Y.-K. Choi*

J. Phys. Chem. C

2009, *113*, 7492

Creating Well-Defined Hot Spots for Surface-Enhanced Raman Scattering by Single-Crystalline Noble Metal Nanowire Pairs

T. Kang, I. Yoon, K.-S. Jeon, W. Choi, Y. Lee, K. Seo, Y. Yoo, Q.-H. Park, H. Ihee, Y. D. Suh,* and B. Kim*

J. Phys. Chem. C

2009, *113*, 5352

Synthesis and Magnetic Properties of Single-Crystalline Mn/Fe-Doped and Co-doped ZnS Nanowires and Nanobelts

T. Kang, J. Sung, W. Shim, H. Moon, J. Cho, Y. Jo, W. Lee, and B. Kim*

J. Am. Chem. Soc.

2009, *131*, 758

Single Nanowire on a Film as an Efficient SERS-Active Platform

I. Yoon, T. Kang, W. Choi, J. Kim, Y. Yoo, S.-W. Joo, Q.-H. Park, H. Ihee,* and B. Kim*

J. Am. Chem. Soc.

2007, *129*, 9576

Simple Vapor-Phase Synthesis of Single-Crystalline Ag Nanowires and Single-Nanowire Surface-Enhanced Raman Scattering

P. Mohanty, I. Yoon, T. Kang, K. Seo, K. S. K. Varadwaj, W. Choi, Q.-H. Park, J. P. Ahn, Y. D. Suh, H. Ihee, and B. Kim*

J. Phys. Chem. B

2006, *110*, 791

Synthesis of Single Crystalline Tellurium Nanotubes with Triangular and Hexagonal Cross Sections

P. Mohanty, T. Kang, B. Kim,* and J. Park

Patents

Technology Transfer

2023. 6. 14 **Technology for the detection of nucleic acid using ribonucleoprotien**
Revosketch
100,000,000 won, 3% of total sales

2023. 5. 31 **Technology for utilizing nanobody to inhibit degenerative arthritis**
Sharperon
100,000,000 won, 2% of total sales

2023. 5. 24 **Fluid testing-based diagnostic and monitoring technology for neurodegenerative diseases**
NGeneBio
100,000,000 won, 4% of total sales

2023. 5. 9 **Reagent compositions for detecting narcotic illegal drugs and sheet-like kit technology**
DXGENE KOREA
55,000,000 won, 2% of total sales

2022. 7. 20 **Optical-digital PCR chambers and the optical-digital PCR instruments that use them**

Denomics
385,000,000 won, 1.5% of total sales

2021. 7. 1 **Virus and healthcare diagnostic devices**
LG Electronics
181,800,000 won, 1.5% of net sales

Issued

2024. 1. 29 **Novel concept multi-gene diagnosis technology capable of amplifying gene detection signals**
E. K. Lim, T.-S. Han, J. Lim, J. Hwang, S. Jang, S. U. Son, S. Seo, J. S. Ki, **T. Kang**, J. Jung, and J. S. Kim
Korea 10-2632594

2024. 1. 24 **Target RNA detecting method based on dCas9/gRNA complex**
T. Kang, J. Moon, J. Jung, K.-S. Lee, E. K. Lim, H. Kang, and H. Kim
Korea 10-2630635

2023. 10. 23 **Surface-enhanced Raman scattering (SERS)-based immunoassay for virus**
T. Kang, J. Jung, H. R. Kim, H. Kang, J. Moon, H. Jang, K. Guk, and E. K. Lim
Korea 10-2594680

2023. 2. 15 **Carbene compound, carbene-metal nanoparticle complex and method for manufacturing thereof**
O. S. Kwon, **T. Kang**, C.-S. Lee, K. H. Kim, J. Y. Kim, S. J. Park, C. S. Park, and J. Lee
Germany 3865477

2023. 2. 15 **Carbene compound, carbene-metal nanoparticle complex and method for manufacturing thereof**
O. S. Kwon, **T. Kang**, C.-S. Lee, K. H. Kim, J. Y. Kim, S. J. Park, C. S. Park, and J. Lee

France 3865477

2023. 2. 15 **Carbene compound, carbene-metal nanoparticle complex and method for manufacturing thereof**

O. S. Kwon, T. Kang, C.-S. Lee, K. H. Kim, J. Y. Kim, S. J. Park, C. S. Park, and J. Lee

UK 3865477

2023. 1. 17 **Carbene compound, carbene-metal nanoparticle complex and method for manufacturing thereof**

O. S. Kwon, T. Kang, C.-S. Lee, K. H. Kim, J. Y. Kim, S. J. Park, C. S. Park, and J. Lee

Japan 7212409

2022. 12. 7 **Degenerative brain disease diagnosis and monitoring technology based on body fluid test**

E. K. Lim, J. Lim, M. Moon, S. Kim, B. Kang, T. Kang, J. Jung, S. Seo, S. U. Son, and K.-S. Lee

Korea 10-2476525

2022. 12. 7 **Antibody for periodontal disease and use thereof**

J. Jung, H. R. Kim, K.-S. Lee, K. Guk, E. K. Lim, and T. Kang

Korea 10-2476515

2022. 8. 12 **Reagent composition for detecting narcotic illegal drugs and sheet-like kit for detecting illegal drugs comprising the same**

E. K. Lim, S. Jang, S. U. Son, B. Kang, T. Kang, K.-S. Lee, and J. Jung

Korea 10-2433624

2022. 3. 2 **CRISPR/dCas9-mediated surface-enhanced Raman scattering assay for detecting pathogen**

T. Kang, H. Kim, C.-M. Ryu, S. Lee, H. W. Seo, B. Kang, J. Moon, H. Kang, J. Jung, and E. K. Lim

Korea 10-2370880

2021. 8. 13 **Carbene compound, carbene-metal nanoparticle complex and method for manufacturing thereof**
O. S. Kwon, T. Kang, C.-S. Lee, K. H. Kim, J. Y. Kim, S. J. Park, C. S. Park, and J. Lee
Korea 10-2291885

2021. 2. 17 **Antibody against oseltamivir resistant influenza virus**
J. Jung, H. R. Kim, E. K. Lim, T. Kang, and K. Guk
Korea 10-2218980

2019. 10. 31 **System and method for capturing and assaying hazardous biomaterials using hybrid nano-structures**
T. Kang, K. G. Lee, A. R. Hwang, Y. T. Kim, N. H. Bae, J. Jeong, D. E. Yoo, D. W. Lee, M. K. Lee, S. J. Lee, W. S. Lee, T. J. Lee, E. K. Lim, J. Jung, J. Moon, and J. Byun
Korea 10-2041611

2019. 4. 16 **Biosensor comprising coating layer modified with polydopamine and protein G mixture and method for detecting biological material using the same**
T. Kang, J. Moon, J. Jeong, W. S. Lee, E. K. Lim, and J. Jung
Korea 10-1971246

2019. 1. 22 **Method for detecting a target gene using a dCas9/gRNA complex and fluorescence marker**
J. Jung, E. K. Lim, K. Guk, O. K. Joo, and T. Kang
Korea 10-1942947

2014. 4. 1 **Optical nano antenna using single-crystalline Ag nanoplate, and nano optical equipment including the same**
B. Kim, M.-K. Seo, H. Lee, and T. Kang
Korea 10-1382258

2014. 1. 28 **Transition metal nano electrode and a method of fabricating thereof**

B. Kim, M. Kang, and T. Kang
Korea 10-1358989

2013. 12. 4 **Method of fabricating an AuAg nanowire**
B. Kim, H. Lee, and T. Kang
Korea 10-1339962

2013. 4. 1 **Optical nano antenna using single-crystalline Ag nanowire, method of manufacturing the same and optical nano antenna using single-crystalline metal nanowire**
B. Kim, T. Kang, and I. Yoon
Korea 10-1251379

2011. 8. 22 **Detection method of bio-chemical material using surface-enhanced Raman scattering**
B. Kim, T. Kang, I. Yoon, S. Y. Lee, and S. M. Yoo
Korea 10-1059896

2009. 4. 2 **Spectra sensor for surface-enhanced Raman scattering**
B. Kim, I. Yoon, and T. Kang
Korea 10-0892629

2007. 1. 3 **Room temperature ferromagnetic ZnS nanobelts and the fabrication method thereof**
W. Lee, B. Kim, W. Jung, K. Lee, S. Shim, and T. Kang
Korea 10-0666729

Pending

2024. 4. 12 **Technology for detecting nucleic acid biomarker based on ultra-small genetic scissors Cas12j**
K. H. Park, T. Kang, H. Kim, J. Kang, E. Woo, Y. Lee, H. Jang, and Y. Park
Korea 10-2024-0049381

2023. 11. 20 **Composition for treating or preventing cancer comprising extracellular vesicles derived from *Lactobacillus reuteri* strain and extracellular vesicles with encapsulated indocyanine green**
J. Jung, S. Y. Yi, H. R. Kim, T. Kang, and E. K. Lim
Korea 10-2023-0161537

2023. 9. 21 **Signal amplification cascade system mediated by dual structure-switching aptamer**
E. K. Lim, J. Lim, J. Jung, and T. Kang
Korea 10-2023-0126441

2023. 9. 8 **Target nucleic acid sequence detection technology using argonaute protein and artificial nucleic acid circuit**
T. Kang, H. Jang, J. Song, E. K. Lim, and J. Jung
Korea 10-2023-0119796

2023. 9. 6 **Single domain antibodies against CD155/PVR and use thereof**
J. Jung, H. R. Kim, S. Y. Yi, K. Guk, E. K. Lim, and T. Kang
Korea 10-2023-0118277

2023. 8. 23 **Technique for diagnosing and monitoring neurodegenerative diseases on basis of body fluid analysis**
E. K. Lim, J. Lim, M. Moon, S. Kim, B. Kang, T. Kang, S. Seo, S. U. Son, K.-S. Lee, and J. Jung
USA 18/278,584

2023. 8. 23 **Technique for diagnosing and monitoring neurodegenerative diseases on basis of body fluid analysis**
E. K. Lim, J. Lim, M. Moon, S. Kim, B. Kang, T. Kang, S. Seo, S. U. Son, K.-S. Lee, and J. Jung
Japan

2023. 8. 10 **Portable Assay System and Method for Cancer Mutation Detection**
H. Lee, C. Castro, J. Song, and T. Kang

USA 63/518,602 and 63/578,535

2023. 8. 1 **Naked eye detection method for RdRp variation of SARS-CoV-2**
J. Jung, K. Guk, H. R. Kim, S. Y. Yi, E. K. Lim, and T. Kang
PCT/KR2023/011245

2023. 5. 30 **Single domain antibodies against Serpin A12 and use thereof**
J. Jung, K.-S. Lee, S. Yang, S. Y. Yi, T. Kang, and E. K. Lim
Korea 10-2023-0069597

2023. 5. 30 **Dual enzyme amplification based colorimetric sensor system for on-site detection of pathogen**
E. K. Lim, J. S. Ki, J. Lim, T. Kang, and J. Jung
Korea 10-2023-0069568

2023. 5. 16 **Composition for detecting target nucleic acid and method for detecting target nucleic acid using the same**
E. K. Lim, J. Lim, B. Kang, T. Kang, S. Seo, S. Jang, and J. Jung
USA 18/037,222

2023. 2. 28 **Reagent composition for detecting narcotic illegal drugs and sheet-like kit for detecting illegal drugs comprising the same**
E. K. Lim, S. Jang, S. U. Son, B. Kang, T. Kang, K.-S. Lee, and J. Jung
China

2023. 2. 3 **Target RNA detecting method based on dCas9/gRNA complex**
T. Kang, J. Moon, J. Jung, K.-S. Lee, E. K. Lim, H. Kang, and H. Kim
USA 18/163,936

2023. 1. 13 **Reagent composition for detecting narcotic illegal drugs and sheet-like kit for detecting illegal drugs comprising the same**
E. K. Lim, S. Jang, S. U. Son, B. Kang, T. Kang, K.-S. Lee, and J. Jung
EP 21838558.1

2023. 1. 13 **Container with positively-charged polymer thin film for extracting nucleic acid and one-pot method utilizing charge-shifting polyplexes for detecting nucleic acid**

S. G. Im, S. E. Kim, N. H. Park, B. S. Jeong, Y. S. Song, K. G. Lee, Y. M. Park, D. A. Jo, T. Kang, J. Y. Song, and H. W. Jang

Korea 10-2023-0005511

2023. 1. 9 **Reagent composition for detecting narcotic illegal drugs and sheet-like kit for detecting illegal drugs comprising the same**

E. K. Lim, S. Jang, S. U. Son, B. Kang, T. Kang, K.-S. Lee, and J. Jung

USA 18/015,189

2022. 10. 26 **Synagis-resistant respiratory syncytial virus detection method**

J. Jung, H. R. Kim, K. Guk, T. Kang, and E. K. Lim

PCT/KR2022/016442

2022. 10. 14 **Screening method for discovery of RdRP (SARS-CoV-2) inhibitory therapeutics using Cas13a**

J. Jung, S. Y. Yi, K. Guk, H. R. Kim, T. Kang, and E. K. Lim

Korea 10-2022-0132547

2022. 8. 4 **Naked eye detection method for RdRp variation of SARS-CoV-2**

J. Jung, K. Guk, H. R. Kim, S. Y. Yi, E. K. Lim, and T. Kang

Korea 10-2022-0097195

2022. 7. 4 **Kit for detecting nucleic acid based on CRISPR/Cas9 and method using the same**

K. G. Lee, S. G. Im, Y. S. Song, Y. M. Park, T. Kang, J. Song, H. S. Kim, H. J. Kang, E. K. Lim, J. Y. Jung, and H. W. Jang

Korea 10-2022-0082014

2022. 6. 23 **A human angiotensin-converting enzyme 2 receptor mimic peptide beacon and uses thereof**

E. K. Lim, M. H. Kim, B. Kang, Y. Lee, T. Kang, J. Lim, S. Seo, S. U. Son, S. Jang, J. Jung, and K.-S. Lee

Korea 10-2022-0076999

2022. 4. 28 **Ligation-free isothermal nucleic acid amplification for detection of target nucleic acid**

T. Kang, J. Moon, H. Jang, J. Song, H. Kang, E. K. Lim, and J. Jung

Korea 10-2022-0052588

2022. 2. 18 **An antibody specific to nucleoprotein of SARS-CoV-2 and uses thereof**

J. Jung, H. R. Kim, K. Guk, S. Y. Yi, T. Kang, and E. K. Lim

Korea 10-2022-0021781

2022. 1. 5 **Target gene detection system based on novel isothermal amplification technology**

T. Kang, J. Song, J. Moon, H. Jang, E. K. Lim, and J. Jung

Korea 10-2022-0001806

2021. 11. 8 **Synagis-resistant respiratory syncytial virus detection method**

J. Jung, H. R. Kim, K. Guk, T. Kang, and E. K. Lim

Korea 10-2021-0152000

2021. 11. 5 **Cas complex for simultaneous detection of DNA and RNA and uses thereof**

J. Jung, K. Guk, H. R. Kim, T. Kang, E. K. Lim, and Y. Bae

Korea 10-2021-0151822

2021. 11. 3 **Composition for detecting target nucleic acid and method for detecting target nucleic acid using the same**

E. K. Lim, J. Lim, B. Kang, T. Kang, S. Seo, S. Jang, and J. Jung

Korea 10-2021-0150099

2021. 5. 13 **Carbene compound, carbene-metal nanoparticle complex and method for manufacturing thereof**

O. S. Kwon, T. Kang, C.-S. Lee, K. H. Kim, J. Y. Kim, S. J. Park, C. S. Park, and J. Lee

China 201980079045.3

2021. 4. 9 **Carbene compound, carbene-metal nanoparticle complex and method for manufacturing thereof**
O. S. Kwon, **T. Kang**, C.-S. Lee, K. H. Kim, J. Y. Kim, S. J. Park, C. S. Park, and J. Lee
USA 17/284,249

Presentations

Invited Seminars

2024. 4. 23 – 26 **2024 KPS Spring Meeting**
"Convergence Bionanotechnology for Disease Diagnosis"
DCC, Daejeon, Korea

2023. 8. 20 – 23 **2023 International Forum on Functional Materials (IFFM 2023)**
"Development of diagnostic platform using CRISPR"
Shinhwa World, Jeju, Korea

2023. 8. 20 – 23 **65th KVS Summer Annual Conference**
"Convergence Bionanotechnology for Disease Diagnosis"
Shinhwa World, Jeju, Korea

2023. 6. 28 **SCL Precision Medicine Forum**
"Convergence Bionanotechnology for Disease Diagnosis"
Seoul Clinical Laboratories, Seoul, Korea

2023. 5. 19 **2023 Spring Meeting of Korea Society for Zoonoses**
"BioNano Technology for Diagnosis of Infectious Diseases"
Konkuk University New Millennium Hall, Seoul, Korea

2023. 5. 10 **Department of Chemistry, Kongju National University**
"Convergence BioNano Technology for Disease Diagnosis"
Kongju, Korea

2023. 4. 5	**RevoSketch** "Introduction of Laboratory and Isothermal Nucleic Acid Amplification Technology" Hotel Onoma, Daejeon, Korea
2023. 3. 29 – 30	**2023 Spring Meeting of the Korean Sensors Society** "NanoBio Sensor using CRISPR/Cas system" ST Center, Seoul, Korea
2023. 3. 22	**Division of Drug Resistance Research, National Institute of Health, Korea Disease Control and Prevention Agency** "Development of diagnostic platform using CRISPR" Cheongju, Korea
2023. 2. 28	**Department of Chemistry, Pusan National University** "Convergence Technology for Biomedical Engineering" Busan, Korea
2023. 2. 10	**The 13th Symposium of The Korean Society of Clinical Microbiology** "Development of diagnostic platform using CRISPR" Gyeongsan National University Changwon Hospital, Changwon, Korea
2022. 10. 26	**Department of Physics and Astronomy, Sejong University** "Convergence Technology for Biomedical Engineering" Seoul, Korea
2022. 10. 21	**Department of Biotechnology, Yonsei University** "Convergence Technology for Biomedical Engineering" Seoul, Korea
2022. 10. 19 – 21	**130th Meeting of the Korean Chemical Society** "CRISPR-based Diagnostics for Infectious Diseases" HICO, Gyeongju, Korea

2022. 9. 28 – 30	**2022 Fall Meeting of the Korean Society for Biomaterials** "Convergence Bionanotechnology for Infectious Disease Diagnosis" Sono Belle Jeju, Jeju, Korea
2022. 8. 24 – 26	**2022 Fall Meeting of the Korean Sensors Society** "Bionano Sensor Technology for the Diagnosis of Infectious Disease" Yeosu the Ocean Resort, Yeosu, Korea
2022. 7. 5	**Institute of Quantum Biophysics, Sungkyunkwan University** "Convergence Bionanotechnology for Disease Diagnosis" Suwon, Korea
2022. 6. 28	**KRIBB-H-GUARD Symposium** "CRISPR/Cas System-based Precise Gene Detection Technology" KRIBB, Daejeon, Korea
2022. 4. 27	**Department of Bio and Brain Engineering, KAIST** "Convergence Bionanotechnology for Disease Diagnosis" Daejeon, Korea
2021. 11. 17 – 19	**2021 Fall Meeting of the Korean BioChip Society** "Convergence Bionanotechnology for Infectious Disease Diagnosis" Shinhwa World, Jeju, Korea
2021. 11. 6	**Daejeon, Chungnam, Sejong Academic Symposium of Korean Chemical Society** "Convergence BioNanotechnology for Disease Diagnosis" Hannam University, Daejeon, Korea
2021. 10. 27	**Colloquium Fall 2021, Pusan National University** "Convergence BioNanotechnology for Disease Diagnosis" Online

2021. 9. 13 **2021 3rd Technology Exchange Meeting, Government-wide R&D Fund for Infectious Diseases Research**
"Convergence BioNanotechnology for Diagnosis of Infectious Diseases"
Seoul, Korea

2021. 7. 1 **2021 KRIBB-GBSA TechBiz Partnering**
"Convergence BioNanotechnology for Diagnosis of Infectious Diseases"
Online

2021. 6. 4 **IQB Colloquium Spring 2021, Sungkyunkwan University**
"Convergence BioNanotechnology for Disease Diagnosis"
Suwon, Korea

2021. 3. 31 **2021 1st Technology Strategy Seminar, National Research Council of Science & Technology**
"Convergence Bionanotechnology for Disease Diagnosis"
Sejong National Research Complex, Sejong, Korea

2021. 2. 18 **KSEV 1st WebEVChat**
"Exosomal RNA Detection using Isothermal Gene Amplification Method"
Online

2020. 11. 11 **Department of Integrated Biotechnology, Sungkyunkwan University**
"Integrative BioNanotechnology for Disease Diagnosis"
Suwon, Korea

2020. 7. 7 **125th Meeting of the Korean Chemical Society**
"Noble Metal Nanostructures for Biomolecular Sensing"
Online

2020. 4. 29 **Department of Chemistry, KAIST**

"Convergence Bionanotechnology for Disease Diagnosis"
Daejeon, Korea

2019. 10. 1 **Seoul Center, KBSI**
"Noble Metal Nanostructures for Biomolecular Sensing"
Seoul, Korea

2019. 9. 5 **Department of Biotechnology, Yonsei University**
"Food Science and Biotechnology based on Convergence Research"
Seoul, Korea

2019. 8. 28 – 30 **2019 Fall Meeting of the Korean Sensors Society**
"Noble Metal Nanostructures for Biomolecular Sensing"
Lakai Sandpine, Gangneung, Korea

2019. 8. 27 **Center for Theragnosis, KIST**
"Synthesis of Noble Metal Nanostructures and Biosensing Applications"
Seoul, Korea

2019. 5. 28 **Food Science and Biotechnology Major, Seoul National University**
"Food Science and Biotechnology based on Convergence Research"
Seoul, Korea

2018. 12. 18 **Philosys**
"Synthesis of Noble Metal Nanostructures and Biomedical Applications"
Seong-Nam, Korea

2018. 11. 22 **Material Chemistry Research Institute, Chungnam National University**
"Synthesis of Noble Metal Nanostructures and Biomedical Applications"
Daejeon, Korea

2018. 11. 20	**Food Science and Biotechnology Major, Seoul National University** "Convergence Research on Food Science and Biotechnology" Seoul, Korea
2018. 10. 26 – 27	**Annual Biophotonics Conference 2018** "Synthesis of Noble Metal Nanostructures and Biomedical Applications" Asia Culture Center, Gwangju, Korea
2018. 9. 17	**Department of Chemistry, Kongju National University** "Synthesis of Nanostructures and Biomedical Applications" Kongju, Korea
2018. 8. 26 – 31	**The 26th International Conference on Raman Spectroscopy (ICORS 2018)** "Synthesis of Au Nanostructures and Biomedical Applications" ICC, Jeju, Korea
2018. 6. 18	**Food Science and Biotechnology Major, Seoul National University** "Convergence Research on Food Science and Biotechnology" Seoul, Korea
2017. 12. 19	**Department of Optics & Mechatronics Engineering, Pusan National University** "Noble Metal Nanowires for Biomedical Applications" Busan, Korea
2017. 11. 5 – 9	**46th International Symposium on High Performance Liquid Phase Separations and Related Techniques (HPLC 2017 Jeju)** "Noble Metal Nanowires for Biomedical Applications" ICC, Jeju, Korea
2017. 11. 1	**KRIBB Conference, Hazards Monitoring Bionano Research Center** "Synthesis of Au Nanostructure and Biosensing Application" KRIBB, Daejeon, Korea

2017. 2. 22 – 24	**The 3rd SPIE's International Conference on Nano-Bio Sensing, Imaging & Spectroscopy** "Nanobio Sensing using Gold Nanowire" ICC, Jeju, Korea
2016. 10. 26 – 28	**2016 Fall Meeting of the Korean BioChip Society** "BioNano Health Guard" Hanwha Resort Haeundae Tivoli, Busan, Korea
2015. 10. 29	**Department of Chemistry, Gyeongsang National University** "Synthesis of Noble Metal Nanostructures and Biomedical Applications" Jinju, Korea
2014. 3. 26	**KRIBB Conference, Super Bacteria Research Center** "Introduction of BioNano Health Guard Research Center" KRIBB, Daejeon, Korea
2014. 1. 17	**The Seo Group, Interdisciplinary School of Green Energy, UNIST** "Noble Metal Nanowires for Biomedical Applications" Ulsan, Korea
2013. 10. 15 – 17	**Germany-Korea Nano Bio Material Expert Workshop** "Noble Metal Nanowires for Biomedical Applications" KIST Europe, Saarbrückent, Germany
2013. 8. 21 – 23	**45th Summer Meeting of the Korean Vacuum Society** "Noble Metal Nanowire based SERS Sensor" Yeosu the Ocean Resort, Yeosu, Korea
2013. 7. 25	**I^2DEA Laboratory, Department of Industrial Design, KAIST** "Nanobio Sensors" Daejeon, Korea

2013. 7. 15 **Germany-Korea Nano Technology Forum**
"Noble Metal Nanowires for Biomedical Applications"
KRICT, Daejeon, Korea

2012. 8. 28 **BioNanotechnology Research Center, KRIBB**
"Noble Metal Nanowires for Biomedical Applications"
Daejeon, Korea

2011. 10. 10 **BioNanotechnology Research Center, KRIBB**
"Nanowire based Surface-enhanced Raman Scattering Sensor"
Daejeon, Korea

International Conferences

2023. 10. 4 - 6 **2023 Fall Meeting and International Symposium of The Korean Society for Biotechnology and Bioengineering**
"Multiplex Detection of Foodborne Pathogens using 3D Nanostructure Swab and Deep Learning-Based Classification of Raman Spectra"
H. Kang, J. Lee, Y. Jung, S. Ryu, and T. Kang
BEXCO, Busan, Korea

2023. 10. 4 - 6 **2023 Fall Meeting and International Symposium of The Korean Society for Biotechnology and Bioengineering**
"Rapid and Efficient Detection of Antibiotic Resistant Bacteria through Polydopamine-Assisted Approach"
J. H. Lee, J. Ryu, and T. Kang
BEXCO, Busan, Korea

2023. 10. 4 - 6 **2023 Fall Meeting and International Symposium of The Korean Society for Biotechnology and Bioengineering**
"Hairpin Probe Enhanced Amplification-free Detection of SARS-CoV-2 Using a Boosted Cascade Reaction of CRISPR/Cas13a and Csm6"
P. Li, H. Jang, and T. Kang

BEXCO, Busan, Korea

2023. 10. 4 - 6 **2023 Fall Meeting and International Symposium of The Korean Society for Biotechnology and Bioengineering**
"Self-Priming Hairpin-utilized Isothermal Amplification of the G-rich Sequence for Target Nucleic Acid Detection"
Y. Li, Y. Shim, T. Kang, D. Yong, and H. G. Park
BEXCO, Busan, Korea

2023. 8. 13 – 17 **ACS Fall 2023**
"Amplification-free detection of antibiotic resistant bacteria based on the cross-catalytic cleavage of Argonaute protein"
H. Jang and T. Kang
The Moscone Center, San Francisco, USA

2023. 7. 5 – 7 **Nano Korea 2023**
"SARS-CoV-2 Variant Detection in One Step, Portable, and Transcription-Free using Universal Hairpin Probe-Based Isothermal Amplification and the CRISPR/Cas12 System"
H. Jang and T. Kang
KINTEX, Ilsan, Korea

2023. 7. 5 – 7 **Nano Korea 2023**
"Development of SERS-Based CRISPR/Cas9 Sensor for the Comprehensive Detection of Cancer-Associated cfDNA Utilizing Transcription Mediated Production of Malachite Green Aptamer "
H. Kang, Y. Jung, and T. Kang
KINTEX, Ilsan, Korea

2023. 7. 5 – 7 **Nano Korea 2023**
"Label-Free Detection of Antibiotic-Resistant Bacteria in Clinical Samples using Biomolecular Raman Fingerprints and Machine Learning"
J. H. Lee, J. S. Ryu, and T. Kang
KINTEX, Ilsan, Korea

2023. 7. 5 – 7 **Nano Korea 2023**

"Detection of Drug Resistive Bacteria using Droplet-Digital PCR"

D. A. Jo, N. K. Jeong, S. H. Pyo, A R. Bae, H. Jang, N. H. Bae, S. J. Lee, **T. Kang**, and K. G. Lee

KINTEX, Ilsan, Korea

2023. 7. 5 – 7 **Nano Korea 2023**

"Surface-Enhanced Raman Scattering (SERS)-Based SARS-CoV-2 IgG Antibodies Detection using Epitope-Immobilized Gold Nanodimple Substrates"

P. Li, J. Ryu, S.-G. Park, and **T. Kang**

KINTEX, Ilsan, Korea

2023. 7. 5 – 7 **Nano Korea 2023**

"Suspension Array Platform Utilizing Fluorescence-Activated Cell Sorting for the Multiplexed Detection of miRNA"

Y. Park, **T. Kang**, and H. G. Park

KINTEX, Ilsan, Korea

2023. 7. 5 – 7 **Nano Korea 2023**

"Multifunctional Self-Priming Hairpin Probe-Based Isothermal Nucleic Acid Amplification for COVID-19 Diagnosis"

H. Kim, **T. Kang**, and H. G. Park

KINTEX, Ilsan, Korea

2023. 7. 5 – 7 **Nano Korea 2023**

"3D Printed Fluidic Swab for Painless Self-Collection of Large Volumes of Nasal Specimen"

J. Kim, S. Bahrami, **T. Kang**, and S. Park

KINTEX, Ilsan, Korea

2023. 6. 5 - 8 **Biosensors 2023**

"Self-priming hairpin probe-utilized isothermal amplification reaction for SARS-CoV-2 detection"

L. Yan, **T. Kang**, D. Yong, and H. G. Park

BEXCO, Busan, Korea

2022. 7. 6 – 8 **Nano Korea 2022**

"3D printed fluidic swab for painless self-collection of large volumes of nasal specimen"

J. Kim, J. Jeon, T. Kang, and S. Park

KINTEX, Ilsan, Korea

2021. 11. 15 – 17 **Nature Conference Bio-Inspired Nanomaterials**

"Surface-Enhanced Raman Scattering-Based SARS-CoV-2 Detection using CRISPR/Cas12-mediated Isothermal Amplification"

H. Jang and T. Kang

Seoul National University, Seoul, Korea

2021. 11. 15 – 17 **Nature Conference Bio-Inspired Nanomaterials**

"Ligation-independent isothermal nucleic acid amplification: Detection of urinary exosomal mRNA"

J. Moon, H. G. Park, and T. Kang

Seoul National University, Seoul, Korea

2021. 11. 15 – 17 **Nature Conference Bio-Inspired Nanomaterials**

"Machine learning-based Colorimetric multiplex detection of SARS-CoV-2 by combining DNAzyme reaction triggered by RT-LAMP with CRISPR system"

J. Song, B. Cha, and T. Kang

Seoul National University, Seoul, Korea

2020. 7. 1 – 3 **Nano Korea 2020**

"Urinary Exosomal mRNA Detection using Novel Isothermal Gene Amplification Method based on Three-way Junction"

J. Moon, H. G. Park, and T. Kang

KINTEX, Ilsan, Korea

2020. 7. 1 – 3 **Nano Korea 2020**

"An effective neutralizing antibody against H275Y oseltamivir resistance mutation in Influenza A/H1N1 2009 and its implication for diagnostic detection"

H. Kang, J. Jung, and T. Kang
KINTEX, Ilsan, Korea

2019. 7. 2 – 5 **Nano Korea 2019**
"Synthesis of Noble Metal Nanostructures and Biomedical Applications"
T. Kang
KINTEX, Ilsan, Korea

2019. 7. 2 – 5 **Nano Korea 2019**
"Surface-Independent Antibody Immobilization via One-step Polydopamine/Protein G Coating: Application to Influenza Virus Immunoassay"
J. Moon and T. Kang
KINTEX, Ilsan, Korea

2018. 8. 26 – 31 **The 26th International Conference on Raman Spectroscopy (ICORS 2018)**
"Nanowire based Surface-enhanced Raman Scattering Platform for Biochemical Sensing"
H. Kim and T. Kang
ICC, Jeju, Korea

2018. 8. 19 – 23 **SPIE Nanoscience + Engineering**
"Multivalent antibody-nanoparticle conjugates to enhance the sensitivity of SERS-based immunoassays"
Environmental Technology Development Program, Ministry of Environment, Korea
T. Kang
San Diego Convention Center, San Diego, USA

2017. 11. 26 – 12. 1 **2017 MRS Fall Meeting**
"Label-Free Detection of Influenza Virus Using Biomimetic Nanopillar-Based Biosensor"
W. S. Lee, T. Kang, and J. Jeong

Hynes Convention Center, Boston, USA

2017. 11. 12 – 16

EMN Meeting on Colloid and Interface

"Nanogap-Rich Au Nanowire SERS Sensor for Ultrasensitive Telomerase Activity Detection: Application to Gastric and Breast Cancer Tissue Diagnosis"

T. Kang

Chatrium Hotel, Bangkok, Thailand

2017. 8. 31 – 9. 2

BIEN 2017

"Au Nanoparticles-deposited Au Nanowire SERS Sensor for Telomerase Activity Detection in Cancer Cells and Tissues"

G. Eom, A. Hwang, B. Kim, and T. Kang

The Plaza Hotel, Seoul, Korea

2017. 8. 31 – 9. 2

BIEN 2017

"Fabrication of nanowire-based nonviral vector for effective delivery of DNA into stem cell"

K. Park, B. Kim, and T. Kang

The Plaza Hotel, Seoul, Korea

2017. 8. 31 – 9. 2

BIEN 2017

"Colorimetric detection of influenza A (H1N1) virus by a peptide-functionalized polydiacetylene (PEP-PDA) nanosensor"

K. Guk, S. Hwang, J. M. Choi, T. Kang, P. Bae, J. Jung, and E.-K. Lim

The Plaza Hotel, Seoul, Korea

2017. 7. 12 – 14

Nano Korea 2017

"Facile Immobilization of Antibody using Polydopamine and Protein G Mixture: Towards Substrate-Free Influenza Virus Detection"

J. Moon and T. Kang

KINTEX, Ilsan, Korea

2017. 7. 12 – 14

Nano Korea 2017

"Well-Ordered Troponin Apatamers on Ultraflat, Ultraclean Gold Nanoplates for Early-Diagnosis of Acute Myocardial Infarction"

A. Hwang, H. Lee, T. Kang, and B. Kim
KINTEX, Ilsan, Korea

2017. 7. 12 – 14

Nano Korea 2017
"Sensitive and Specific Detection of Telomerase Activity using Au Nanoparticles-deposited Au Nanowire SERS Sensor"
G. Eom, B. Kim, and T. Kang
KINTEX, Ilsan, Korea

2017. 7. 12 – 14

Nano Korea 2017
"Efficient Transportation of Biomolecules for Living Cells by Novel Metal Nanowire"
K. Park, T. Kang, and B. Kim
KINTEX, Ilsan, Korea

2017. 5. 29 – 31

10th World Congress on Nutrition & Food Sciences
"A novel and highly specific phage endolysin cell wall binding domain for detection of Bacillus cereus"
T. Kang, G. Eom, A. Hwang, and J. Moon
Hyatt Regency Osaka, Osaka, Japan

2017 2. 22 – 24

The 3rd SPIE's International Conference on Nano-Bio Sensing, Imaging & Spectroscopy
"Real-time Detection of Aflatoxin B1 using Portable SPR"
J. Moon, G. Eom, A. Hwang, J. Byun, and T. Kang
ICC, Jeju, Korea

2017 2. 22 – 24

The 3rd SPIE's International Conference on Nano-Bio Sensing, Imaging & Spectroscopy
"Selective Monitoring of H_2O_2 Release from a Mechanically Stimulated Single HeLa Cell Using Prussian Blue modified Au Nanowire Electrode"
R. Gwak, H. Kim, T. Kang, and B. Kim
ICC, Jeju, Korea

2016. 10. 20 – 22

11th International Conference and Expo on Nanoscience and Molecular Nanotechnology

"Single nanowire on graphene (SNOG) as an efficient, reproducible, and stable SERS-active platform"
T. Kang
Holiday Inn Rome Aurelia, Rome, Italy

2016. 7. 13 – 15 **Nano Korea 2016**
"Facile and sensitive identification of influenza viruses using SERS antibody probes"
J. Moon, S. Y. Yi, A. Hwang, G. Eom, J. Sim, J. Jeong, E.-K. Lim, B. H. Chung, B. Kim, J. Jung, and T. Kang
KINTEX, Ilsan, Korea

2015. 7. 20 – 22 **ICCBE 2015**
"A Novel and Highly Specific Phage Endolysin Cell Wall Binding Domain for Detection of Foodborne Pathogens by Surface Plasmon Resonance"
J. Sim, M. Kong, T. Kang, S. Ryu, and B. H. Chung
University Paris 8, Paris, France

2015. 7. 20 – 22 **ICCBE 2015**
"Ultrasensitive Detection of Telomerase Activity by Au-sputtered Au Nanowire SERS Sensor"
G. Eom, T. Kang, and B. Kim
University Paris 8, Paris, France

2015. 7. 20 – 22 **ICCBE 2015**
"Ultrasensitive Targeting from Well-ordered Antibodies on Ultraflat Single-crystalline Au Nanoplates for Attomolar Detection of C-reactive Protein"
A. Hwang, T. Kang, and B. Kim
University Paris 8, Paris, France

2015. 7. 1 – 3 **Nano Korea 2015**
"Ultrasensitive detection of disease biomarker by Au nanoplate-Au nanoparticle platform"
G. Eom, T. Kang, and B. Kim

COEX, Seoul, Korea

2015. 7. 1 – 3 **Nano Korea 2015**

"Highly Sensitive Detection of *Bacillus cereus* Food Poisoning using Magnetic Nanoparticles"

J. Sim, M. Kong, T. Kang, S. Ryu, and B. H. Chung

COEX, Seoul, Korea

2015. 7. 1 – 3 **Nano Korea 2015**

"Ultrasensitive Targeting from Well-ordered Antibodies on Ultraflat Single-crystalline Au Nanoplates for Detection of C-reactive Protein"

T. Kang, A. Hwang, H. Lee, M. Lee, E. Kim, and B. Kim

COEX, Seoul, Korea

2014. 7. 14 – 18 **EMBO Conference on Viruses and Microbes III**

"Surface Plasmon Resonance Detection of *Bacillus cereus* using a Cell Wall Binding Domain of a Phage Endolysin"

M. Kong, J. Sim, T. Kang, B. H. Chung, and S. Ryu

ETH Zurich, Zurich, Switzerland

2014. 7. 2 – 4 **Nano Korea 2014**

"Ultra-Specific Zeptomole MicroRNA Detection by Plasmonic Nanowire Interstice Sensor with Bi-Temperature Hybridization"

T. Kang, H. Kim, J. M. Lee, H. Lee, Y.-S. Choi, G. Kang, M.-K. Seo, B. H. Chung, and B. Kim

COEX, Seoul, Korea

2014. 7. 2 – 4 **Nano Korea 2014**

"Composition-Selective Fabrication of Ordered Intermetallic Au-Cu Nanowires; Application in Interference-Free Electrochemical Glucose Sensors"

G. Eom, S. Kim, M. Kang, T. Kang, H. Lee, A. Hwang, H. Yang, and B. Kim

COEX, Seoul, Korea

2014. 7. 2 – 4 **Nano Korea 2014**

"Surface Plasmon Resonance Detection of Foodborne Pathogens by Phage Endolysin Cell Wall Binding Domains and Magnetic Nanoparticle"
J. Sim, M. Kong, T. Kang, S. Ryu, and B. H. Chung
COEX, Seoul, Korea

2013. 9. 25 – 27

2013 DASAN CONFERENCE on Photonic Nanostructure-Based Bio-Detection Technologies
"Detection of Multiple MicroRNAs by Patterned Plasmonic Nanowire Sensor"
H. Kim, T. Kang, J. M. Lee, H. Lee, G. Kang, Y. Jung, B. H. Chung, and B. Kim
Sheraton Grande Walkerhill, Seoul, Korea

2013. 8. 27 – 29

ASIASENSE 2013
"Facile Fabrication of Multi-targeted and Stable Biochemical SERS Sensors"
T. Kang, H. Kim, H. Lee, S. M. Yoo, S. Y. Lee, and B. Kim
Ramada Plaza Melaka, Melaka, Malaysia

2013. 3. 29 – 30

Thailand-Korea Bio Nano Joint Symposium 2013
"Noble Metal Nanowires for Biomedical Applications"
T. Kang
Intercontinental Hotel Bangkok, Bangkok, Thailand

2012. 4. 11 – 13

2012 the Korea Society for Biotechnology and Bioengineering & International Symposium
"Diagnosis of Genetic Disease using S1 Enzymatic Reaction-combined Nanowire Sensor"
S. M. Yoo, T. Kang, B. Kim, and S. Y. Lee
Changwon Exhibition Convention Center, Changwon, Korea

2012. 4. 11 – 13

2012 the Korea Society for Biotechnology and Bioengineering & International Symposium

"SERRS Sensor coupled with Target Recycling Reaction for Ultrasensitive and Multiplex Identification of Pathogenic Fungi"
S. M. Yoo, **T. Kang**, B. Kim, and S. Y. Lee
Changwon Exhibition Convention Center, Changwon, Korea

2012. 2. 14 – 17 **2012 NTHU-KAIST Junior Chemists Symposium**
"Aptameric Nanowire SERS Sensor for Molecular Detection"
T. Kang, H. Kim, S. M. Yoo, S. Y. Lee, and B. Kim
National Tsing Hua University, Hsinchu, Taiwan

2011. 10. 18 – 21 **2011 IEEE Nanotechnology Materials and Devices Conference**
"Fabrication and Characterization of Single-Crystalline Au Nanowire Electrode and its Biological Application"
M. Kang, H. Kang, **T. Kang**, J. H. Kwak, and B. Kim
The Shilla Jeju, Jeju, Korea

2010. 8. 2 – 4 **International Conference on Cellular & Molecular Bioengineering**
"Multiple Detection of Pathogenic Bacteria using Patterned Au Particle-on-Wire SERS Sensor"
S. M. Yoo, **T. Kang**, I. Yoon, B. Kim, and S. Y. Lee
Nanyang Technological University, Nanyang, Singapore

2009. 2. 8 – 12 **AMN4 Conference**
"SERS active Platforms based on Noble Metal Nanowires"
T. Kang, I. Yoon, W. Choi, Q.-H. Park, K.-S. Jeon, Y. D. Suh, J. Kim, H. Ihee, and B. Kim
University of Otago, Dunedin, New Zealand

2008. 12. 20 – 23 **10th KAIST-KYOTO Chemistry Symposium (1st KAIST-KYOTO-TSING HUA Chemistry Symposium)**
"SERS-active Systems based on Noble Metal Nanowires"
T. Kang, I. Yoon, and B. Kim
KAIST, Daejeon, Korea

2008. 2. 21 – 23	**2008 BK International Symposium** "Simple Vapor Phase Synthesis of Single-crystalline Ag NWs and Single NW Surface-enhanced Raman Scattering" T. Kang, P. Mohanty, I. Yoon, K. Seo, K. S. K. Varadwaj, W. Choi, Q.-H. Park, J. P. Ahn, Y. D. Suh, H. Ihee, and B. Kim Ramada Plaza Jeju Hotel, Jeju, Korea
2008. 1. 30 – 2. 1	**2008 KAIST-NTHU Junior Chemists Workshop** "Simple Vapor Phase Synthesis of Single-crystalline Ag NWs and Single NW Surface-enhanced Raman Scattering" T. Kang, P. Mohanty, I. Yoon, K. Seo, K. S. K. Varadwaj, W. Choi, Q.-H. Park, J. P. Ahn, Y. D. Suh, H. Ihee, and B. Kim KAIST, Daejeon, Korea
2005. 11. 10 – 11	**2005 International Conference on Nanoscience and Nanotechnology** "Room Temperature Ferromagnetism in Mn and Fe co-doped ZnS Nanobelts" T. Kang, J. Sung, P. Mohanty, B. Kim, W. Shim, and W. Lee GIST, Gwangju, Korea

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Domestic Conferences

2023. 11. 15 - 17	**2023 Fall Meeting of the Korean BioChip Society** "Multiplex Detection of Foodborne Pathogens using 3D Nanostructure Swab and Deep Learning Based Classification of Raman Spectra" H. Kang, J. Lee, Y. Jung, S. Ryu, and T. Kang Shinhwa World, Jeju, Korea
2023. 11. 15 - 17	**2023 Fall Meeting of the Korean BioChip Society** "Colorimetric point-of-care testing of SARS-CoV-2 using CRISPR/Cas12 and unmodified DNA reporter" H. Kim, T. Kang, and H. G. Park

Shinhwa World, Jeju, Korea

2023. 10. 11 – 13

2023 Fall Meeting of the Korean Sensors Society

"**Multiplex** Detection of Foodborne Pathogens using 3D Nanostructure Swab and Deep Learning-Based Classification of Raman Spectra"

H. Kang, J. Lee, Y. Jung, K. G. Lee, S. Ryu, and T. Kang

Yeosu the Ocean Resort, Yeosu, Korea

2023. 10. 11 – 13

2023 Fall Meeting of the Korean Sensors Society

"An ultrasensitive assay RNase H utilizing collateral cleavage activity of CRISPR-Cas12a "

H. Kim, H. G. Park, and T. Kang

Yeosu the Ocean Resort, Yeosu, Korea

2023. 8. 20 – 23

65th KVS Summer Annual Conference

"Multiplex detection of miRNAs based on suspension array utilizing fluorescence-activated cell sorting"

Y. Park and T. Kang

Shinhwa World, Jeju, Korea

2023. 8. 20 – 23

65th KVS Summer Annual Conference

"SARS-CoV-2 Detection with Human Fab Conjugated Reporter and Surface-Enhanced Raman Scattering (SERS) Nanodimple Sensors in Immunoassays"

J. Ryu and T. Kang

Shinhwa World, Jeju, Korea

2023. 8. 20 – 23

65th KVS Summer Annual Conference

"Hairpin probe and chemical enhancers assisted amplification-free detection of SARS-CoV-2 using a boosted cascade reaction of CRISPR/Cas13a and Csm6"

L. Pei and T. Kang

Shinhwa World, Jeju, Korea

2023. 2. 8 – 10 **The 64th Winter Annual Conference of The Korean Vacuum Society**

"Development of SERS-based CRISPR/Cas9 sensor for the comprehensive detection of cancer-associated cfDNA utilizing transcription mediated production of Malachite Green Aptamer"

H. Kang, Y. Jung, and T. Kang

Welli Hilli Park, Heongsung, Korea

2023. 2. 8 – 10 **The 64th Winter Annual Conference of The Korean Vacuum Society**

"CRISPR/Cas12a collateral cleavage activity for an ultrasensitive assay of RNase H"

H. Kim, T. Kang, and H. Park

Welli Hilli Park, Heongsung, Korea

2022. 8. 24 – 26 **2022 Fall Meeting of the Korean Sensors Society**

"Development of SERS-based CRISPR/Cas9 sensor for the comprehensive detection of cancer-associated cfDNA utilizing transcription mediated production of Malachite Green Aptamer"

H. Kang, Y. Jung, and T. Kang

Yeosu the Ocean Resort, Yeosu, Korea

2021. 2. 4 – 6 **The 60th Winter Annual Conference of The Korean Vacuum Society**

"Development of a novel Antibody-Mediated SERS Immunoassay for Drug-Resistant Influenza Virus"

H. Kang, J. Jung, and T. Kang

Online

2021. 2. 4 – 6 **The 60th Winter Annual Conference of The Korean Vacuum Society**

"Colorimetric Virus Detection using CRISPR/dCas9"

J. Moon, J. Jung, H. G. Park, and T. Kang

Online

2020. 11. 25 – 27	**2020 Fall Meeting of the Korean BioChip Society** "Development of Antibody-Mediated SERS Immunoassay for Drug-Resistant Influenza Virus" H. Kang, J. Jung, and T. Kang Shinhwa World, Jeju, Korea
2019. 6. 13 – 15	**6th BioNano Health Guard Research Center Workshop** "Surface-Independent Antibody Immobilization via One-step Polydopamine/Protein G Coating: Application to Influenza Virus Immunoassay" J. Moon and T. Kang Maison Glad Jeju, Jeju, Korea
2019. 1. 17 – 18	**Nano Convergence Conference 2019** "Metal-Organic Framework coated Corrosion-resistant Silver Nanowire Surface-enhanced Raman Scattering Platform" H. Kim, and T. Kang Elysian Gangchon, Chuncheon, Korea
2016. 11. 16 – 18	**2016 Fall Meeting of Materials Research Society of Korea** "Au-sputtered Au Nanowire SERS Sensor for Telomerase Activity Detection" G. Eom, B. Kim, and T. Kang Hotel Hyundai Gyeongju, Gyeongju, Korea
2016. 11. 16 – 18	**2016 Fall Meeting of Materials Research Society of Korea** "Well-oriented Antibodies on Ultraclean Single-crystalline Au Nanoplate for Attomolar Detection of CRP" A. Hwang, T. Kang, and B. Kim Hotel Hyundai Gyeongju, Gyeongju, Korea
2016. 11. 16 – 18	**2016 Fall Meeting of Materials Research Society of Korea** "Detection of Influenza Virus using Inverse Opal Nanostructure-based Biosensor" W. S. Lee, T. Kang, and J. Jeong

Hotel Hyundai Gyeongju, Gyeongju, Korea

2016. 11. 16 – 18

2016 Fall Meeting of Materials Research Society of Korea

"Facile and sensitive identification of influenza viruses using SERS antibody probes"

J. Moon and **T. Kang**

Hotel Hyundai Gyeongju, Gyeongju, Korea

2016. 1. 21 – 22

Nano Convergence Conference 2016

"Facile and sensitive identification of influenza viruses using SERS antibody probes"

J. Moon, S. Y. Yi, A. R. Hwang, G. Eom, J. Sim, B. H. Chung, B. Kim, J. Jung, and **T. Kang**

Seoul National University, Seoul, Korea

2016. 1. 18 – 19

3rd BioNano Health Guard Research Center Workshop

"Facile and sensitive identification of influenza viruses using SERS antibody probes"

J. Moon, S. Y. Yi, A. R. Hwang, G. Eom, J. Sim, B. H. Chung, B. Kim, J. Jung, and **T. Kang**

Maison Glad Jeju, Jeju, Korea

2015. 4. 15 – 17

115th Spring Meeting of the Korean Chemical Society

"Ultrasensitive detection of disease biomarker by Au nanoplate-Au nanoparticle platform"

G. Eom, **T. Kang**, and B. Kim

KINTEX, Ilsan, Korea

2015. 2. 12 – 14

2nd BioNano Health Guard Research Center Workshop

"Highly sensitive assay for Telomerase Activity Detection on Au-sputtered Au Nanowire SERS Platform"

G. Eom, H. Kim, and **T. Kang**, and B. Kim

Jeju Grand Hotel, Jeju, Korea

2014. 10. 15 – 17

114th Spring Meeting of the Korean Chemical Society

"Au-Sputtered Au Nanowire SERS Platform for Telomerase Activity Detection"
G. Eom, H. Kim, and **T. Kang**, and B. Kim
KIMDAEJUNG Convention Center, Gwangju, Korea

2014. 10. 15 – 17

114th Spring Meeting of the Korean Chemical Society
"SERS based Immunoassay using Single Crystalline Gold Nanoplate and Cysteine-tagged Protein G for Detection of C-reactive Protein (CRP)"
A. Hwang, H. Lee, M. Lee, E. Kim, **T. Kang**, and B. Kim
KIMDAEJUNG Convention Center, Gwangju, Korea

2014. 10. 5 – 7

2014 Fall Meeting of the Korean Society for Biotechnology and Bioengineering
"Ultrasensitive Detection of Telomerase Activity by Au-Sputtered Au Nanowire SERS Sensor"
G. Eom, H. Kim, **T. Kang**, and B. Kim
Changwon Exhibition Convention Center, Changwon, Korea

2014. 10. 5 – 7

2014 Fall Meeting of the Korean Society for Biotechnology and Bioengineering
"Detection of C-reactive Protein (CRP) using Single Crystalline Gold Nanoplate and Cysteine-tagged Protein G based SERS Platform"
A. Hwang, H. Lee, **T. Kang**, and B. Kim
Changwon Exhibition Convention Center, Changwon, Korea

2014. 4. 9 – 11

2014 Spring Meeting of the Korean Society for Biotechnology and Bioengineering
"Specific Detection of *Bacillus cereus* by Surface Plasmon Resonance Using Phage Endolysin Cell Wall Binding Domains"
J. Sim, M. Kong, **T. Kang**, S. Ryu, and B. H. Chung
Hyundai Hotel, Gyeongju, Korea

2012. 12. 20

Symposium of Division of Convergent BioMedical Research of KRIBB

"Noble Metal Nanowires for Biomedical Applications"
T. Kang
KRIBB, Daejeon, Korea

2011. 4. 28 – 29 **107th Spring Meeting of the Korean Chemical Society**
"Fabrication and Characterization of Single-Crystalline Au Nanowire Electrode"
M. Kang, T. Kang, J. H. Kwak, and B. Kim
ICC, Jeju, Korea

2011. 4. 28 – 29 **107th Spring Meeting of the Korean Chemical Society**
"Detection of Single Nucleotide Polymorphism by Au Nanowire-on-Film SERS Sensor Coupled with S1 Nuclease Treatment"
T. Kang and B. Kim
ICC, Jeju, Korea

2011. 4. 28 – 29 **107th Spring Meeting of the Korean Chemical Society**
"Epitaxially-driven Stereoaligned Growth of Pt Nanowires from Oriented Seed Crystals"
Y. Yoo, T. Kang, and B. Kim
ICC, Jeju, Korea

2010. 4. 29 – 30 **105th Spring Meeting of the Korean Chemical Society**
"Plasmonic Properties of Single Nanowire on a Film"
T. Kang, J. Ahn, I. Yoon, W. Choi, Q.-H. Park, and B. Kim
Songdo Convensia, Incheon, Korea

2010. 4. 29 – 30 **105th Spring Meeting of the Korean Chemical Society**
"Ultrasensitive Single-Nanowire-on-Film SERS Sensor for Hg^{2+} Detection"
T. Kang, S. M. Yoo, I. Yoon, S. Lee, J. Choo, S. Y. Lee, and B. Kim
Songdo Convensia, Incheon, Korea

2010. 4. 29 – 30 **105th Spring Meeting of the Korean Chemical Society**
"Patterned Multiplex Pathogen DNA Detection by Au Particle-on-Wire SERS Sensor"

T. Kang, S. M. Yoo, I. Yoon, S. Y. Lee, and B. Kim
Songdo Convensia, Incheon, Korea

2009. 10. 28 – 30

104th Fall Meeting of the Korean Chemical Society
"Au Nanowire-Au Nanoparticles Conjugated System Provides Micrometer Size Molecular Sensor"
T. Kang, I. Yoon, J. Kim, H. Ihee, and B. Kim
DCC, Daejeon, Korea

2009. 6. 28 – 30

Summer Symposium of Division of Physical Chemistry of the Korean Chemical Society
"Surface-enhanced Raman Scattering Sensor based on Noble Metal Nanostructures"
T. Kang, I. Yoon, W. Choi, K.-S. Jeon, K. Seo, Y. Yoo, J. Kim, H. Ihee, Y. D. Suh, Q.-H. Park, and B. Kim
Haeundae Grand Hotel, Busan, Korea

2009. 4. 16 – 17

103rd Spring Meeting of the Korean Chemical Society
"Creating Well-Defined Hot Spots for Surface-enhanced Raman Scattering by Single-Crystalline Noble Metal Nanowire Pairs"
T. Kang, I. Yoon, K.-S. Jeon, W. Choi, Y. Lee, K. Seo, Y. Yoo, Q.-H. Park, H. Ihee, Y. D. Suh, and B. Kim
COEX, Seoul, Korea

2009. 4. 16 – 17

103rd Spring Meeting of the Korean Chemical Society
"Single Nanowire on a Film as an Efficient SERS-Active Platform"
I. Yoon, T. Kang, J. Kim, H. Ihee, and B. Kim
COEX, Seoul, Korea

2007. 12. 17

2007 BK Student Symposium
"Simple Vapor Phase Synthesis of Single-crystalline Ag NWs and Single NW Surface-enhanced Raman Scattering"
T. Kang, P. Mohanty, I. Yoon, K. Seo, K. S. K. Varadwaj, W. Choi, Q.-H. Park, J. P. Ahn, Y. D. Suh, H. Ihee, and B. Kim
KAIST, Daejeon, Korea

2007. 4. 19 – 20 **99th Spring Meeting of the Korean Chemical Society**
"Surface-enhanced Raman Scattering of Individual Metallic Nanostructures"
T. Kang, I. Yoon, and B. Kim
COEX, Seoul, Korea

2007. 4. 19 – 20 **99th Spring Meeting of the Korean Chemical Society**
"Synthesis and Characterization of ZnS Nanostructures and its doping"
T. Kang, J. Sung, and B. Kim
COEX, Seoul, Korea

2005.7. 4 – 5 **Summer Symposium of Division of Physical Chemistry of the Korean Chemical Society**
"Synthesis and Characterization of ZnS Nanostructures and its doping"
T. Kang, J. Sung, and B. Kim
Deogyusan Resort, Muju, Korea

2004. 8. 17 – 18 **2nd ABRL Workshop**
"Fabrication of Nanodevices using Optical Microscope"
T. Kang and B. Kim
Arpina Youth Hostel, Busan, Korea

Teaching

Lecturer

2023. 9 – 12 **Bioanalytical Technology**
Department of Biological Sciences, KAIST

2023. 9. 4 **Innovative Drug Development Research**
School of Pharmacy, SKKU

2022. 9 – 12 **Bioanalytical Technology**

Department of Biological Sciences, KAIST

2021. 9 – 12 **Bioanalytical Technology**
Department of Biological Sciences, KAIST

2020. 9 – 12 **Bioanalytical Technology**
Department of Biological Sciences, KAIST

2020. 8. 27 **Education on the ICT Convergence in Vitro Diagnosis**
Division of Nano-Bio Sensors/Chips Development, NNFC

2020. 5. 21 **Nanomaterials**
Department of Nanobiotechnology, KRIBB School of Biotechnology, UST

2019. 9 – 12 **Bioanalytical Technology**
Department of Biological Sciences, KAIST

2018. 9 – 12 **Bioanalytical Technology**
Department of Biological Sciences, KAIST

2018. 3 – 6 **Nanomaterials**
Department of Nanobiotechnology, KRIBB School of Biotechnology, UST

2017. 9 – 12 **Bioanalytical Technology**
Department of Biological Sciences, KAIST

2016. 9 – 12 **Laboratory Research on the Synthesis and Application of Nanomaterials**
Major of Nanobiotechnology and Bioinformatics, UST

2016. 3. 31 **Nanobiotechnology**
Department of Chemistry, Catholic University of Korea

2014. 12. 17 **Nanobiotechnology**
Department of Chemistry, Chungnam National University

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Teaching Assistant

2010. 3 – 10 **High School Research Program (Laboratory)**

Department of Chemistry, KAIST

2010. 2 – 5 **Undergraduate Research Program (Laboratory)**

Department of Chemistry, KAIST

2009. 2 – 5 **Undergraduate Research Program (Laboratory)**

Department of Chemistry, KAIST

2008. 9 – 12 **Molecular Spectroscopy (Theory)**

Department of Chemistry, KAIST

2008. 2 – 5 **Nano Science (Theory)**

Interdisciplinary Program for Nano Science and Technology, KAIST

2006. 3 – 6 **Physical Chemistry Experiment (Laboratory)**

Department of Chemistry, KAIST