



•Field Nanostructures & devices •Office Industry-Academic Cooperation
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Educational Background

- 2009-2016 Chungnam National University (Ph.D. in Physics)
- 2007-2009 Chungnam National University (M.S. in Physics)
- 2003-2007 Chungnam National University (B.S. in Physics)

Major Careers

- 2021-Present Assistant Professor of the School of Nano Convergence Technology, Hallym University
- 2017-2021 Postdoc of Research Center of BIT Convergence, Pusan National University

Research and Books

- "Neural Mechanism Mimetic Selective Electronic Nose based on Programmed M13 Bacteriophage," Jong-Min Lee[†], Vasanthan Devaraj[†], Na-Na Jeong[†], Yujin Lee, Ye-Ji Kim, Taehyeong Kim, Seung Heon Yi, Won-Geun Kim, Eun Jung Choi, Hyun-Min Kim, Chulhun L Chang, Chuanbin Mao, Jin-Woo Oh. *Biosensors & Bioelectronics* 196, 113567 (2022)
- "Programmable self-assembly of M13 bacteriophage for micro-color pattern with a tunable colorization," Thanh Mien Nguyen, Won-Geun Kim, Hyun-Ju Ahn, Minjun Kim, Young Do Kim, Vasanthan Devaraj, Ye-Ji Kim, Yujin Lee, Jong-Min Lee^{*}, Eun Jung Choi^{*}, Jin-Woo Oh.^{*} *RSC Advances* 11, 32305 (2021)
- "Engineering Efficient Self-Assembled Plasmonic Nanostructures by Configuring Metallic Nanoparticle's Morphology," Vasanthan Devaraj[†], Jong-Min Lee[†], Ye-Ji Kim, Hyuk Jeong, Jin-Woo Oh. *International Journal of Molecular Sciences* 22, 10595 (2021)
- "Recent Trends in Exhaled Breath Diagnosis Using an Artificial Olfactory System," Chuntae Kim, Iruthayapandi Selestin Raja, Jong-Min Lee, Jong Ho Lee, Moon Sung Kang, Seok Hyun Lee, Jin-Woo Oh, Dong-Wook Han. *Biosensors* 11, 337 (2021)

- "A DNA-derived Phage Nose using Machine Learning and Artificial Neural Processing for Diagnosing Lung Cancer," Jong-Min Lee†, Eun-Jung Choi†, Jae Heun Chung†, Ki-wook Lee†, Seong Hoon Yoon, Hee Yun Seol, Yujin Lee, Ye-Ji Kim, Won-Geun Kim, Vasanthan Devaraj, Jong Seong Ha, Donghan Lee, Sang-Mo Kwon, Yun Seong Kim, Chulhun L. Chang, Jin-Woo Oh. *Biosensors & Bioelectronics* 194, 113567 (2021).
- "Investigation of colorimetric biosensor array based on programable surface chemistry of M13 bacteriophage towards artificial nose for volatile organic compound detection: From basic properties of the biosensor to practical application," Jong-Min Lee†, Yujin Lee†, Vasanthan Devaraj†, Thanh Mien Nguyen, Ye-Ji Kim, You Hwan Kim, Chuntae Kim, Eun Jung Choi, Dong-Wook Han, Jin-Woo Oh, *Biosensors & Bioelectronics* 188, 113339 (2021).
- "Optical Bioelectronic Nose of Outstanding Sensitivity and Selectivity Toward Volatile Organic Compounds Implemented with Genetically Engineered Bacteriophage: Integrated Study of Multi-Scale Computational Prediction and Experimental Validation," JungYun Park†, Jong-Min Lee†, Hoje Chun, Sung Jun Hong, Hyunwook Jung, Ye-Ji Kim, Won-Geun Kim, Vasanthan Devaraj, Eun Jung Choi, Jin-Woo Oh, Byungchan Han, *Biosensors & Bioelectronics* 177, 112979 (2021)
- "M13 Bacteriophage-templated Gold Nanowires as Stretchable Electrodes in Perovskite Solar Cells," Jiye Han, Jeong-Seok Nam, Kyusun Kim, Eun Jung Choi, Jong-Min Lee, Shigeo Maruyama, Il Jeon, Jin-Woo Oh, *Materials Advances* 2, 488-496 (2021)
- "Nanogenerators facilitated piezoelectric and flexoelectric characterizations for bioinspired energy harvesting materials," Yan Yan†, Won-Geun Kim†, Xiaoting Ma, Tirusew Tegafaw, Thanh Mien Nguyen, Jong-Min Lee, Eun-Jung Choi, Heesang Ahn, Sung-Hun Ha, Kyujung Kim, Jong-Man Kim, Hyung Kook Kim, Jin-Woo Oh, Yoon-Hwae Hwang, Dong-Myung Shin, *Nano Energy* 81, 105607 (2021)
- "High Quantum Efficiency and Stability of Biohybrid Nanojunctions in Bacteriophage-Perovskite Quantum Dots," Jong-Min Lee†, Jin Woo Choi†, Il Jeon†, Ye Zhu, Tao Yang, Hoje Chun, Jongmoon Shin, Juyun Park, Joohee Bang, Kyounga Lim, Won-Geun Kim, Hyuk Jeong, Eun Jung Choi, Vasanthan Devaraj, Jeong-Seok Nam, Hyungju Ahn, Yong-Cheol Kang, Byungchan Han, Myungkwan Song, Jin-Woo Oh, Chuanbin Mao. *Materials Today Nano* 13, 100099 (2021).
- "A single bottom facet outperforms random multifacets in a nanoparticle-on-metallic-mirror system," Vasanthan Devaraj†, Jong-Min Lee†, Samir Adhikari†, Minjun Kim, Donghan Lee, Jin-Woo Oh. *Nanoscale* 12, 22452 (2020).
- "Influence of cavity geometry towards plasmonic gap tolerance and respective near-field in nanoparticle-on-mirror," Vasanthan Devaraj†, Jong-Min Lee†, Jin-Woo Oh. *Curr. Appl. Phys.* 20, 1335 (2020).

- "Large-Area Virus Coated Ultrathin Colorimetric Sensors with a Highly Lossy Resonant Promoter for Enhanced Chromaticity," Young Jin Yoo, Won-Geun Kim, Joo Hwan Ko, Yeong Jae Kim, Yujin Lee, Stefan G. Stanciu, Jong-Min Lee, Seungchul Kim, Jin-Woo Oh, Young Min Song. *Advanced Science* 7, 20000978 (2020).
- "Denatured M13 Bacteriophage-Templated Perovskite Solar Cells Exhibiting High Efficiency," Hao-Sheng Lim, Jong-Min Lee, Jiye Han, Chang-Soo Lee, Shaun Tan, Hyuck Mo Lee, Michael S. Strano, Yang Yang, Shigeo Maruyama, Eun Jung Choi, Il Jeon, Yutaka Matsuo, Jin-Woo Oh. *Advanced Science* 7, 2000782 (2020).
- "Defining plasmonic cavity performance based on mode transitions to realize highly efficient device design." Vasanthan Devaraj, Jong-Min Lee, Donghan Lee, Jin-Woo Oh. *Materials Advances* 1, 139 (2020) [Back cover]
- "Shell isolated label-free Ag NPs@Si Architecture Based SERS Active Substrate: Hot Spot Evaluation by FDTD Simulations and DNA Detection at Single-Cell Level," Thankaraj Salammal Sheena, Vasanthan Devaraj, Jong-Min Lee, Perumalsamy Balaji, Paulraj Gnanasekar, Jin-Woo Oh, Mohammad Abdulkader Akbarsha, K. Jeganathan. *Applied Surface Science* 515, 145955 (2020).
- "Gap plasmon effect of a virus-templated nanoparticle assembly to enhance the performance of optoelectronic devices," Hock Beng Lee, Won-Geun Kim, Miso Lee, Jong-Min Lee, Siwei He, Neetesh Kumar, Vasanthan Devaraj, Eun Jung Choi, Il Jeon, Myungkwan Song, Jin-Woo Oh, Jae-Wook Kang. *Advanced Optical Materials* 8, 1902080 (2020). [Cover]
- "Revealing plasmonic property similarities and differences between a nanoparticle on a metallic mirror and free space dimer nanoparticle," Vasanthan Devaraj, Na-Na Jeong, Jong-Min Lee, Jong-Ryeul Sohn, Jin-Woo Oh. *Journal of Korean Physical Society* 75, 313-318 (2019).
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- "Improvement of high affinity and selectivity on biosensors using genetically engineered phage by binding isotherm screening," Jong-Min Lee, Eun Jung Choi, Juyun Park, Vasanthan Devaraj, Chuntae Kim, Jiye Han, Won-Geun Kim, Kyujung Kim, Yong-Cheol Kang, Kwang Ho Kim, Jin-Woo Oh. *Viruses* 11, 248 (2019).
- "Dependences of the Near-field Characteristics of the Nano-gap Structures on the difference between Pentagonal and Circular Nano-wires: A Numerical Study," Vasanthan Devaraj, Jong-Min Lee, Chuntae Kim, Won-Geun Kim, Jin-Woo Oh; *New Phys. Sae Mulli*, 69, 25 (2019).

- "Distinguishable Plasmonic Nanoparticle and gap Mode Properties in a Silver Nanoparticle on a Gold Film System Using Three-Dimensional FDTD Simulations," Vasanthan Devaraj, Jong-Min Lee, Jin-Woo Oh; *Nanomaterials* 8(8), 582 (2018).
 - "Fabrication of ultra-smooth 10nm silver films without wetting layer," Vasanthan Devaraj, Jongmin Lee, Jongseo Baek, Donghan Lee; *Appl. Sci. Converg. Technol.* 25(2), 32 (2016).
 - "Microscopic mechanism underlying double-state lasing in an InAs/GaAs quantum dot laser diode elucidated using coupled rate equations and the spontaneous emission recorded from a window structure," J. M. Lee, B. H. Jeon, J. Kim, D. Lee; *Optics Express* 23 (2015).
 - "Double-state Lasing from Semiconductor Quantum Dot Laser Diodes Caused by Slow Carrier Relaxation," Jongmin Lee, Donghan Lee; *Journal of the Korean Physical Society* 58 (2011)
 - "Gain dynamics of an InAs/InGaAsP quantum dot semiconductor optical amplifier operating at 1.5 μm ," J. Park, N. J. Kim, Y. D. Jang, E. G. Lee, J. M. Lee, J. S. Baek, J. H. Kim, H. S. Lee, K. J. Yee, D. Lee, S. H. Pyun, W. G. Jeong, J. Kim; *Applied Physics Letters* 98 (2009)
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