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EDUCATION

Stanford University, CA, USA	Ph.D	Environmental Science / Environmental Engineering	**2004**
KAIST, Taejon, South Korea	MS	Analytical Chemistry / Environmental Chemistry	**1994**
KAIST, Taejon, South Korea	BS	Chemistry	**1992**

PROFESSIONAL ACTIVITIES

- Professor, Dept. of Chemistry, Hanyang Univ., Sept. 2005 to Present
- Director, Center for Next Generation Cytometry, Hanyang Univ.. Nov. 2017 to Present
- Director, Institute of Next Generation Material Design, Hanyang Univ., Nov. 2019 to Present

MAIN SCIENTIFIC PUBLICATION

- M. K. Ha, S. J. Kwon, J.-S. Choi, N. T. Nguyen, J. Song, Y. Lee, Y.-E. Kim, I. Shin, J.-W. Nam and T. H. Yoon, (2020) “Mass Cytometry and Single-Cell RNA-seq Profiling of the Heterogeneity in Human Peripheral Blood Mononuclear Cells interacting with Silver Nanoparticles” ***Small***, *Accepted for publication*
- M. K. Ha, J.-S. Choi, S. J. Kwon, J. Song, Y. Lee, Y.-E. Kim, and T. H. Yoon, (2020) “Mass Cytometric Study on the Heterogeneity in Cellular Association and Cytotoxicity of Silver Nanoparticles in Primary Human Immune Cells” ***Environ. Sci.: Nano***, *Accepted for publication*
- M. K. Ha, T. X. Trinh, J.-S. Choi, D. Maulina, H. G. Byun, T. H. Yoon*, (2018) “Toxicity Classification of Oxide Nanomaterials: Effects of Data Gap Filling and PChem Score-based Screening Approaches.” ***Scientific Reports,*** **8**, 3141
- T. X. Trinh, M. K. Ha, J.-S. Choi, H.-G. Byun, T. H. Yoon*, (2018) “Dataset Curation, Assessment of their Quality and Completeness, and nanoSAR Classification Model Development for Metallic Nanoparticles” ***Environ. Sci.: Nano,*** 5, 1902
- H. W. Nho, N Yang, J Song, J. S. Park, T. H. Yoon*, (2017) "Separation of spherical and disc-shaped polystyrene particles and blood components (red blood cells and platelets) using pinched flow fractionation device with a tilted side wall and vertical focusing channels (t-PFF-v)", ***Sensors & Actuators: B. Chemical,*** 249, 131-141
- J. Park, M.K. Ha, N. Yang, T. H. Yoon* (2017) Flow Cytometry- Based Quantification of Cellular Au Nanoparticles, ***Analytical Chemistry,*** 89 (4), 2449-2456
- S. Y. Choi, N Yang, S. K. Jeon, T. H. Yoon*, (2014) "Semi-quantitative estimation of cellular SiO2 nanoparticles using flow cytometry combined with X-ray fluorescence measurements”, ***Cytometry Part A*** 85

- H. J. Yoo, J Park, T. H. Yoon*, (2013) "High throughput cell cycle analysis using microfluidic image cytometry (μFIC)", ***Cytometry Part A***, 83A (4), 356-362
- H. W. Nho, T. H. Yoon* (2013) “Enhanced separation of colloidal particles in AsPFF device with tilted side wall and vertical focusing channels (t-AsPFF-v)”, ***Lab on a Chip***, 13, 773-776
- D. Kwon, M.J. Kim, C. Park, J. Park, K. Choi, T. H. Yoon*,(2012)"In vivo biodegradation of colloidal quantum dots by a freshwater invertebrate, Daphnia magna", ***Aquatic Toxicology*** 114, 217-222
- K. H. Lim, J Park, S. W. Rhee, T. H. Yoon*, (2012) "Multiparametric assessment of Cd2+ cytotoxicity using MTT- based microfluidic image cytometry", ***Cytometry Part A***, 691-697
- M. J. Kim, K. H. Lim, H. J. Yoo, S. W. Rhee, T. H. Yoon* (2010) Morphology-based Assessment of Cd2+ Cytotoxicity using Microfluidic Image Cytometry (uFIC). ***Lab on a Chip***, Vol. 10, No. 4, pp 415-417

RESEARCH INTERESTS

- Recent advances in nanotechnology and their applications in biological and medical sciences have resulted in a widely open area of new research & developments. Particularly, nanoparticles (NPs) have been extensively used in drug delivery systems, medical diagnostics and other areas of biomedical applications. However, despite of the urgent engineering needs for maximizing their benefits as well as the increasing concerns on their potential harmful effects, only limited understandings on the interactions of these NPs with biological systems are available. This lack of understanding is mainly due to the extremely complex nature of these phenomena that require multidisciplinary approach, including physics & chemistry of NPs-water interface, colloidal science of NPs & biomacromolecules, cell biology & tissue engineering and in vivo & in vitro toxicology. My research interest is focused on the systematic understanding of these complex phenomena based on the fundamental principles of physics, chemistry, and biology. I strongly believe that knowledge on these phenomena will provide breakthroughs in maximizing beneficial effects of NPs as well as in minimizing adverse effects of NPs as a potentially toxic chemicals.

- My current research is mainly focused on the 1) Developments of Novel Analytical Techniques for Cells and Nanoparticles, 2) Predictive Model Developments for Clinical Diagnostics and Toxicity Assessment, and 3) Synchrotron-based Soft X-ray SpectroNanoscopy.