Ji-Young, Shim
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Education

PhD - Chemical and Biological Eng., Illinois Inst. of Tech., Chicago, IL. May 2017
Thesis: Removal of bacterial contaminant from model substrates using a micellar nanofluid formulation

MS - Chemical Eng., Seoul Nat'l Univ. of Tech. (SNUT), Seoul, Korea. Feb. 2004
Thesis: The Quantitative analysis of Aflatoxin B_1 from Kiwifruit

BS - Chemical Eng., SNUT, Seoul, Korea. Feb. 2002
Senior paper: Automated column exchangeable HPLC for Aflatoxin M_1 quantitative analysis

Research Experience

Biochemistry

Postdoctoral research associate in chemistry, Western Kentucky Univ., Bowling Green, KY May 2019
Development of desired double-stranded DNA sensing device by applying engineered/customized protein

Chemical and Biological Engineering

Research assistant as a Ph.D student, Illinois Inst. of Tech., Chicago, IL May 2017

Interfacial phenomena research: study oscillatory structural force in thin liquid film of nanofluid and colloidal science

Collaborated research with the FDA (Food and drug administration) and IFSH (Institute of Food Safety and Health): measure bacteriophage (e.g., MS2) adhesion force onto abiotic surface using AFM to facilitate pathogen removal from the surface

Biological Engineering research: Build extra-cellular matrix (ECM) on chemically modified surface

Biomedical Engineering research: form the PEG-DA (poly (ethylene glycol) di-acrylate) hydrogels with RGD (Arg-Gly-Asp) for fibroblast cell conjugation to build ECM

Work Experience

Junior Research Engineer, Seron Micro, Ltd., Seoul, Korea Dec. 2006
Research Engineer, Daejoo Electonic Materials Co. Ltd., Siheung, Korea Apr. 2006
Research Engineer Intern, Korean Institute of Ceramic Eng. & Tech., Seoul, Korea Apr. 2005

List of major publications and patents

American Proceedings

Recent publication (* shows the corresponding author)

- **J. Shim,** D.S. Stewart, A.D. Nikolov, D.T. Wasan, R. Wang, R. yan and, Y.C. Shieh*, **Differential MS2 Interaction with Food Contact Surfaces Determined by Atomic Force Microscopy and Virus Recovery**, *Applied & Environmental Microbiology* 83 (2017) 1-11
- **J. Shim**, A. Nikolov, D. Wasan*, **Escherichia coli removal from model substrates: underlying mechanism based on nanofluid structural forces**, *Journal of Colloidal and Interface Science* 498 (2017) 112–122

Manuscript in Preparation (* shows the corresponding author)

- **J. Shim**, B. Kim, D. Kim, M. Kim*, **Application of zinc finger proteins immobilized on paramagnetic beads for multiplexed detection of pathogenic DNA**
- **D. Ha,** J. Shim, M. Kim*, **Graphene oxide-based sensing technology for screening antibiotic resistance genes utilizing engineered zinc finger proteins**

Poster Presentations (presenting author in blue)

- **J. Shim**, M. Kim, **Engineered zinc finger proteins immobilized on the silane polymer surface for diagnostic probes to detect antibiotic resistance genes** (ACS) Spring (2019)

- **J. Shim**, B. Kim, M. Kim, **Direct detection of double-stranded DNA of a pathogenic strain of STEC (Shiga toxin-producing Escherichia coli) using engineered zinc finger proteins immobilized on paramagnetic beads** (ACS) Spring (2018)
- **J. Shim,** B. Kim, M. Kim, **Direct detection of double-stranded DNA of Staphylococcus aureus using engineered zinc finger proteins immobilized on paramagnetic beads** (KSA) Fall (2017)
- R. Wang, **Khadye R**, P. Shanmugam, W. Li, N. Mishra, D. Stewart, J. Shim, and C. Shieh, **Factors affecting the adhesion force of virus determined by atomic force microscopy** (IAFP) Summer (2016)
- **M.N. Dickson**, E.M. Brey, M. Turturro, J. Shim, and G. Papavasiliou, **Preparation of Characterization of Diffusion and Network Structure of Bio-functional poly (ethylene glycol) diacrylate Hydrogels** (BMES) Fall (2008)

Oral and Poster Presentations (presenting author in blue)

- **J. Shim**, D. Stewart, A. Nikolov, D. Wasan, R. Wang, E.W. Roth, and C. Shieh, **Differential adhesion forces of virus surrogate MS2 onto food contact surface** (IFT) Summer (2015) as the finalist in the poster competition

American Research Project Reports

Differential adhesion forces of virus surrogate MS2 onto food contact surface, IIT-FDA Joint Project (2011-2014, Authors: **Ji-Young Shim**, IIT; Alex Nikolov, PhD, IIT; Carol Shieh, PhD, FDA; Diane Stewart, FDA; Darsh Wasan, PhD, IIT / Collaborators: Rong Wang, PhD, IIT; Haiping Li, PhD, FDA; Tong-Jen Fu, PhD, FDA; Mary Lou Tortorello, PhD, FDA)

Korean Proceedings

Korean Patents

- B. Lee**,** C. Seo, J. Seon, J. Shim. **Manufacturing method of photocatalyst sol by using hydrothermal and hydrosis synthesis**, # 10-2006-0038239 (2006).
- J. Seon, B. Lee, J. Shim, C. Seo. **Insulator coated with hydrophilic photocatalyst**, # 10-2005-84099 (2005).

Korean Presentation (presenting author in blue)

- **J. Shim**, D. Kim, S. Choi, B. Lee. **Preparation of alumina sol for ink-jet glossy paper by hydrothermal method**, The Korean Society of Industrial and Engineering Chemistry (*KSIEC*) spring conference book, 1P-42, (2006).

Korean Research Project Reports

- J. Shim, B. Lee. **Development of alumina sol for digital image printing glossy paper/ film**, Korea Institute of Industrial Technology (KITECH), Korea-Germany International Joint Project (industrial project), (2005-2006)

Scholarships & Memberships

Received Schwitzer Scholarship 2014 - 2016

Teaching Assistant 2010

- Chemical Reaction Engineering, Transport Phenomena, Heat Mass Transfer Operations, Tissue engineering: tutoring students and grading all assignments

Professional Affiliations

- American Chemical Society *(ACS)* 2018-2019
- Kentucky Academy of Science *(KAS)* 2017-2018
- Institute of Food Technologists *(IFT)* 2015
- Korean Institute of Chemical Engineers *(KIChE)*
- The Korean Society of Industrial and Engineering Chemistry *(KSIEC)*