Multi-scale Bio-Mechanical Engineering (MBME) Lab.

Jae Sung Park

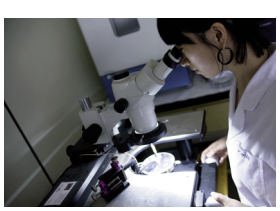
Education

Ph.D. 2002 University of Wisconsin-Madison(ME)
M.S. 1997 Seoul National University (ME)
B.S. 1995 Pohang University of Science and Technology(ME)

Experience

2013~2014 Visiting Scholar in Electrical Engineering, University of Michigan
2007~ Assistant Professor in mechanical Engineering/IBio in Postech
2005~2007 Research Associate, Center for Engineering in Medicine, Massachusetts General Hospital, Harvard Medical school
2002~2005 Postdoctoral Research Fellow, Center for Engineering in Medicine, Massachusetts General Hospital, Harvard Medical School
2000~2002 Project Assistant , Center for Nano-Technology, Department of Electrical Engineering, University of Wisconsin-Madison
1998~2002 Research Assistant in mechanical/electrical engineering, University of Wisconsin-Madison

Contact
Tel: 82-54-279-2188
Fax: 82-54-279-5899
E-mail: jpark@postech.ac.kr
Web site: http://mbme.postech.ac.kr/



The research goal is to develop micro/nano-scale devices applicable to biology and medicine. I have worked in a variety of environments, including mechanical engineering, electrical engineering and bioengineering, and have continually expanded my research abilities and interests. For my initial research program, I plan to develop serious efforts in: 1) Developing cell derived nano vesicles for biological and medical applications and 2) Micro/Nano electromechanical Systems for separation and purification of extracellular vesicles.

- **Cell derived nano vesicles for biological and medical applications**
  - Developing a various ways of fabricating cell derived nano vesicles
  - Application of nano vesicles for tissue and organ regeneration
  - Application of nano vesicles for epigenetic cell reprogramming
  - Application of nano vesicles for differentiation of stem cells

- **Micro/Nano electromechanical Systems for separation and purification of extracellular vesicles.**
  - Developing an efficient method for separation of extracellular vesicles using MEMS techniques
  - Developing an efficient method for purification of extracellular vesicles using polyethylene glycol and dextran aqueous two phase system
  - Developing an diagnostic device for detecting sub types of extracellular vesicles using Marangoni effect

Major Publications

※ 2014

Jo, Wonju, Dayeong Jeong, Junho Kim, Siwoo Cho, Su Chul Jang, Chungmin Han, Ji Yoon Kang, Yong Song Gho, and Jaesung Park. "Microfluidic fabrication of cell-derived nanovesicles as endogenous RNA carriers." Lab on a Chip 14, no. 7 (2014): 1261-1269.

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Jo, Wonju, Junho Kim, Jaewoong Yoon, Dayeong Jeong, Siwoo Cho, Hwapyeong Jeong, Yae jin Yoon, Song Cheol Kim, Yong Song Gho, and Jaesung Park. "Large-scale generation of cell-derived nanovesicles." Nanoscale (2014).

Park, Byoung Kyoo, Namwoo Yi, Jaesung Park, Yonggoo Kim, and Dongsik Kim. "Development of a thermal sensor to probe cell viability and concentration in cell suspensions." AIP Advances 4, no. 4 (2014): 047120.

※ 2013

Ji Hyun Kim , Yae Jin Yoon, Jaewook Lee,Eun-Jeong Choi, Namwoo Yi, Kyong-Su Park, Jaesung Park, Jan Lötvall, Yoon-Keun Kim, Yong Song Gho " Outer Membrane Vesicles Derived from Escherichia coli Up-Regulate Expression of Endothelial Cell Adhesion Molecules In Vitro and In Vivo ",PLOS ONE, 2013

Y.-S. Kim, E.-J. Choi, W.-H. Lee, S.-J. Choi, T.-Y. Roh, J. Park, Y.-K. Jee, Z. Zhu, Y.-Y. Koh, Y. S. Gho,Y.-K. Kim" Extracellular vesicles, especially derived from gram-negative bacteria, in indoor dust induce neutrophilic pulmonary inflammation associated with both Th1 and Th17 cell responses ", CLINICAL AND EXPERIMENTAL ALLERGY, 2013

Siwoo Choi, Sangmin Lee,Seong Hee Jeong,Yeongae Kim,Song Cheol Kim ,Woonbong Hwang, Jaesung Park" Anodic Aluminium Oxide Membranes for Immunoisolation with Sufficient Oxygen Supply for Pancreatic Islets ", Integrative Biology, 2013

Park, Byoung Kyoo, Namwoo Yi, Jaesung Park, and Dongsik Kim. "Monitoring protein denaturation using thermal conductivity probe." International journal of biological macromolecules 52 (2013): 353-357.

Park, Byoung Kyoo, Namwoo Yi, Jaesung Park, and Dongsik Kim. "Thermal conductivity of single biological cells and relation with cell viability." Applied Physics Letters 102, no. 20 (2013): 203702.

Shim, Jin-Hyung, Arthur Joon Kim, Ju Young Park, Namwoo Yi, Inhye Kang, Jaesung Park, Jong-Won Rhie, and Dong-Woo Cho. "Effect of solid freeform fabrication-based polycaprolactone/poly (lactic-co-glycolic acid)/collagen scaffolds on cellular activities of human adipose-derived stem cells and rat primary hepatocytes." Journal of Materials Science: Materials in Medicine 24, no. 4 (2013): 1053-1065.

※ 2012

Ryan Thomas Davies, Junho Kim, soochul Jang, eunjung choi,Youngsong Cho, Jaesung Park," Microfluidic filtration system to isolate extracellular vesicles from blood ", Journal of Micromechanics and microengineering, Vol. 12, 2012,

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Jin Woo Jung, Hyun-Wook Kang, Tae-Yun Kang, Jeong Hun Park,Jaesung Park, Dong-Woo Cho" Projection Image-generation Algorithm for Fabrication of a complex structure using projection-based microstereolithography ", INTERNATIONAL JOURNAL OF PRECISION ENGINEERING AND MANUFACTURING, Vol. 13, 2012, .

Byoung Kyoo Park Namwoo Yi, Jaesung Park,Dongsik Kim" Development of a microfabricated sensor to measure thermal ", REVIEW OF SCIENTIFIC INSTRUMENTS, Vol. 83, 2012, .

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Do Jin Im, Jihoon Noh, Nam Woo Yi, Jaesung Park, and In Seok Kang," Influences of electric field on living cells in a charged water-in-oil droplet under electrophoretic actuation", Biomicrofluidics, Vol. 5(4), 2011, 044112.

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Jin-Hyung Shim, Jong Young Kim, Min Park, Jaesung Park and Dong-Woo Cho," Development of a hybrid scaffold with synthetic biomaterials and hydrogel using solid freeform fabrication technology", Biofabrication, Vol. 3, 2011, 034102.

Namwoo Yi, Byoung Kyoo Park, Dongsik Kim and Jaesung Park," Micro-droplet Detection and Characterization Using Thermal Responses", Lab on a Chip ,Vol. 11, 2011, pp. 2378-2384.

Tae-Yun Kang, Hyun-Wook Kang, Chang Mo Hwang, Sang Jin Lee, Jaesung Park, James J. Yoo, Dong-Woo Cho," The realisstic prediction of oxygen transport in tissue-engineered scaffold by introducing time-varying effective diffusion coefficients", Acta Biomaterialia, Vol. 7(9), 2011, pp. 3345-3353.

Dong-Sic Choi et.al., " , Proteomic Analysis of Microvesicles Derived From Human Colorectal Cancer Ascites," Proteomics, Vol. 11(13), 2011, pp. 2745-2751.

W. Hwang, K. H. Lee, H. Park, J. Kim, J. Park, J. H. Cho, J. H. Jeon, D. Choi, D. Kim, D. Kim, S. Kim, K. Lee, T. Jing, and S. Lee, "Some aspects of the design and applications of nanohoneycomb and nanofiber array structures," Mecahnics of composite materials, Vol 47, 2011, pp.11-36.

Sangmin Lee, Min Park, Heon-Seok Park, Yeongae Kim, Siwoo Cho, Jae Hyoung Cho,* Jaesung Park* and Woonbong Hwang*, "A polyethylene oxide-functionalized self-organized alumina nanochannel array for an immunoprotection," Lab on a chip, Vol.11, 2011, pp. 1049-1053.

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Cheul H. Cho, Jaesung Park, Arno W. Tilles, Francois Berthiaume, Mehmet Toner, and Martin L. Yarmush, "Layered patterning of hepatocytes in co-culture systems using microfabricated stencils", BioTechniques, Vol. 48, No. 1, 2010, pp. 47-52