

BIOGRAPHICAL SKETCH

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NAME Kim, Peter eRA COMMONS USER NAME (credential, e.g., agency login) pkim40	POSITION TITLE 2nd year PhD Graduate Program of Bioengineering at the University of Washington		
EDUCATION/TRAINING (Begin with baccalaureate or other initial professional education, such as nursing, include postdoctoral training and residency training if applicable.)			
INSTITUTION AND LOCATION	DEGREE (if applicable)	MM/YY	FIELD OF STUDY
Johns Hopkins University, Baltimore, MD	B.S.,B.S.	06/2012	Biomedical Engineering & Applied Mathematics and Statistics Bioengineering
University of Washington, Seattle, WA			

NOTE: The Biographical Sketch may not exceed four pages. Follow the formats and instructions below.

A. Personal Statement

The goal of this project is to design a high-throughput platform incorporated with nanofabricated tumor microenvironment-mimicking matrix substrata for screening genes and networks to understand underlying mechanisms of glioblastoma multiforme (GBM) metastasis. Approach of analyzing phenotypic properties of tumor cells on biomimetic contact guidance for a rapid, simple, high-throughput and scalable platform would significantly contribute to develop treatments to GBM. Even though large-scale genomic and transcriptomic profiling by The Cancer Genome Atlas and myriads of cancer researches profiled various cancer regulating factors, little has been understood on the cause of GBM and development of the tumor leading to metastasis in response to mechanical and chemical cues. I have multiple years of experience with culturing various types of tissue cells including cardiomyocytes, epithelial, breast cancer, neutrophil, and glioblastoma cells and have conducted multiple experiments with micro/nanofabricated polymer substrata. My research group has been investigating this topic for past 7 years, and we have developed a device which could faithfully recapitulate native mechanical properties of extracellular matrix. Incorporating our automated stage microscopy system, we have quantitatively analyzed cancer migration to investigate mechanisms of oncogenes underlying tumor invasion.

B. Positions and Honors

Name	Year
Dean's list	Every semesters from 2008 to 2011
Charles Charretton Reeder Scholar	2009, 2010, 2011, 2012
Tau Beta Pi membership	2011
National Nanotechnology Infrastructure Network (NNIN)	2011
Fellowship finalist	
KSEA NWRC 2013 poster award	2013
National Science Foundation Graduate Research Fellowship Program Honorable mention	2014

C. Selected Peer-reviewed Publications

- K. Gupta, J.S. Park, **P. Kim**, W. Helen, A.J. Engler, A. Levchenko, and D.H. Kim, "Control of stem cell signaling, fate and function by engineering stem cell niches" *Integr. Biol.*, 2012,4, 1008-1018.
- **P. Kim**, A. Yuan, and D. H. Kim, "Fabrication poly(ethylene glycol): gelatin methacrylate composite nanostructures with tunable stiffness and degradation for vascular tissue engineering" *Biofabrication* 2013
- S. Chaterji, **P. Kim**, S.H. Choe, D. S. Ho, J. H. Tsui, A. B. Baker, and D.H. Kim. "Synergistic Effects of Matrix Nanotopography and Stiffness on Vascular Smooth Muscle Cell Function" *Tissue Engineering* (Manuscript submitted)
- K.H. Nam, **P. Kim**, S. Kwon, D.H. Kim, "Engineered biomimetic platform using nanotopography and surface patterning for migratory contact guidance of oncogenic PIK3CA knockin mutations of MCF-10A" *Lab Chip* (Manuscript submitted)
- P. Kim, K.H. Nam, N. Bhattacharjee, A. Folch, D.H. Kim. "Incorporation of Mechanical Guidance with Chemical Gradients for Guided Cellular Migration within Open-chamber Array Device" *Lab Chip* (Manuscript under review)
- D.H. Kim, J.S. Park, K. Gupta, **P. Kim**, K.Y. Suh, and A. Levchenko, "Collective migration of an epithelial cell sheet on nanoengineered extracellular matrices," (Manuscript in preparation)
- S.S. An, W.C.H. Wang, D. A. Deshpande, C. Koziel-White, D. Lee, **P. Kim**, R. Panettieri, and S. B. Liggett, "Chloroquine, a TAS2R agonist, promotes airway smooth muscle relaxation despite beta₂-adrenergic receptor tachyphylaxis." (Manuscript under review)

C.1 Presentations

- BMES 2013 "Incorporation of Mechanical Guidance with Chemical Gradients for Guided Cellular Migration by Open-chamber Array Device"
- KSEA YGTL 2013 "Fabrication of Biodegradable Poly(Ethylene Glycol)-Methacrylated Gelatin Composite Hydrogel for Vascular Tissue Engineering Applications"
- Accepted presenter of NEMB 2014 "Role of PI3K/PTEN Signaling in Contact Guidance Mediated Rapid Cell Migration"
- KSEA NWRC 2013 Poster award winner "Incorporation of Mechanical Guidance with Chemical Gradients for Guided Cellular Migration by Open-chamber Array Device"
- ISCRM 2014 Annual Stem Cell Symposium "Role of PI3K Signaling in Contact Guidance Mediated Rapid Cell Migration"

D. Research Support

Role: Graduate Researcher

Period: 07/2013-04/2014

"Role of PI3K Signaling in Contact Guidance Mediated Rapid Cell Migration"

The goal of this project is to investigate the role of oncogenes that are involved in PI3K signaling on cancer cell migration through automated stage microscopy system.

Role: Graduate Researcher

Period: 09/2012-12/2014

"Effect of EGF chemical gradient on MCF10A cell migration for investigating a better cancer model"

The goal of this project is to study MCF10A wt and knock-in cells to provide a better cancer model by studying its migration from EGF gradient generated by microfluidic channel.

Role: Undergraduate Researcher

Period: 09/2011-05/2012

Design of novel multi-well chip embedded with nanoscale structure for cellular migration and drug screening"

The goal of this project is to design an optimal multi-well chip with mechanical cues to provide a model system to study cellular migration and drug screening.

Role: Undergraduate Researcher

Period: 06/2011-09/2011

Program Director/Principal Investigator (Last, First, Middle):

" Fabrication of biodegradable Poly(Ethylene Glycol)-Methacrylated Gelatin composite hydrogel for vascular tissue engineering applications"

The goal of this project is to synthesize a novel biomaterial and fabricate it for the applications of vascular tissue engineering

Role: Undergraduate Researcher

Period: 09/2011-05/2012

"Role of YAP protein pathway in epithelial collective migration"

The goal of this project is to study the role of YAP protein in collective cell migration mechanism.