THE 26TH KSEA NORTHEAST REGIONAL CONFERENCE
(NRC2017)

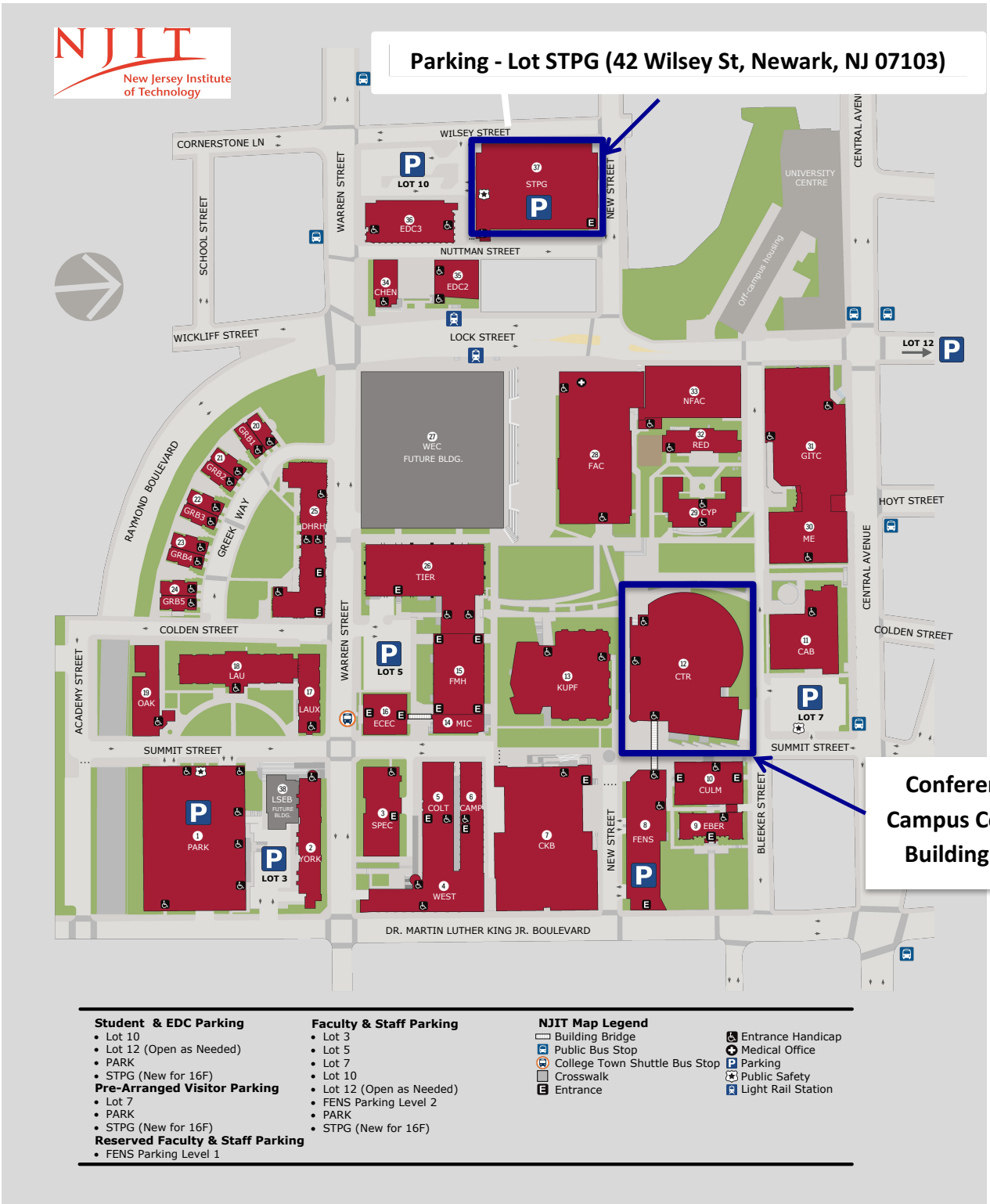
Future Convergence of Nano, Bio and Information Technologies

April 29, 2017
New Jersey Institute of Technology
Campus Center - Atrium

Hosted by
Korean-American Scientists and Engineers Association
New York Metropolitan, New Jersey and Philadelphia Chapters

Partnered with
Korean-American Society in Biotech and Pharmaceuticals (KASBP)
Korean-American IT Engineers and Entrepreneurs (KITEE)
New York Korean Biologists (NYKB)
Philadelphia Korean Scholars Associations (PKSA)

NJIT PARKING



*** Visitor parking permit at page ---**

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The 25th KSEA Northeast Regional Conference
Crowne Plaza Englewood, NJ, April 30, 2016

CONGRATULATORY MESSAGE FROM THE KSEA PRESIDENT

Dear NRC participants,

It is my great pleasure and honor to welcome you all to NRC. I hope you will take part in enthusiastic discussions for technological aspects of the conference and build close personal network between all participants.

Building on the efforts of previous administrations, KSEA has been focusing on expanding the bases for its collaborations throughout the 45th administration. First of all, following arguably one of the most meaningful SEED which was jointly organized with Korean Academy of Science and Technology (KAST) in December 2016. This is followed by the first joint workshop between KAST and KSEA in Korea to work together in putting together a document helpful for establishing science and technology policy in Korea. Our former president Dr. Young Soo Kim (44th) and KAST's vice president Dr. Wook Jun Yoo are working together to make this first event most successful. In addition, we have had several contacts from other Korean agencies beyond the traditional partners.

In addition to our well stablished activities such as the National Math and Science Contest (NMSC), we will have many more activities for our members as a professional society. On May 6 and 7, the first ever Mentorship and Leadership Training workshop (MeLT) will occur at the KSEA headquarter in DC. MeLT is led by our project director NY Metro's very own Dr. Seogjoo Jang, membership director Jim Lee, YG committee chair Dr. Benjamin Lee and many others. MeLT plans on training at least 10 MeLT leaders and develop and share materials for early career training for KSEA members. This will allow KSEA to increase the number of qualified early career trainers and will enable local and regional activities to offer trainings as a regular part of the program so that KSEA's mission to help member's early career will be better fulfilled.

MeLT will be immediately followed by the first Industry Professional Entrepreneurship Conference (iPEC) on May 20 and 21 in LA. iPEC is being organized by two project directors, Drs. Jong Park and Hae Bum Yoon, with the strong leadership of the Small and Medium Business Administration (SMBA) of Korea (KSMBA) Task Force chair, Dr. Seon Ho Kim who also is the president of Southern California Chapter. This opportunity will be offered not only to KSEA members but be open to non-KSEA members as well to spread KSEA's reputation and to develop a potential revenue stream for the future. An effort is ongoing to make this event a joint event together with KSME to provide a firm foundation for our collaboration in the future.

To continue our ongoing effort of ensuring a continued participation of the U.S. Congressional delegates, such as the chairs and vice chairs of the U.S. Congressional committee of Science, Space and Technology and the Energy and Commerce Committee to UKC through the foreseeable future, the current leadership had a meeting with the US Congressman, the Honorable Mr. Joe Barton and his legislative assistant at his Washington D.C. office. The discussion focused on how to proceed to accomplish our

goals collaborating with the Honorable Barton's office. The first action suggested by the Barton office has been fulfilled by providing them a desired list of congressional members in the two committees to Barton's D.C. office. Per the subsequent phone discussion, we will be issuing official invitations to Congressional members and their staffers for a follow up meeting to put together a science and technology policy forum between U.S. Congressional team and the Korean counterpart.

All these efforts can only stand on the foundation of a strong organization and passionate participation of all members. This means, local chapter activities, regional activities and the APS activities provide the foundation for KSEA to be strong ongoing at a full strength. In this regard, NRC is an important corner stone of KSEA. We must solidify KSEA's bedrock, the members, local chapters and APS's to continue strengthening KSEA. As mentioned above, we are already seeing an effect of the change of KSEA's nature. Our efforts on expanding partnerships seem to be working well, attracting potential for many more projects than from the traditional ones. We, all of our members, must work together to complete these projects at our utmost strengths, quality and excellence. A stronger KSEA will be able to broaden and spread its benefits to all members and the next generation in both U.S. and Korea!

I thank you all for your strong and steadfast participation and ownership! I hope you can create something new and obtain innovative idea out of this two-day conference.

Enjoy the conference!

Jaehoon Yu
45th KSEA President

WELCOME TO THE 26TH KSEA NORTHEAST REGIONAL CONFERENCE

Distinguished Guests and Fellow KSEA Members,

Welcome to all of you to the 2017 Northeast Regional Conference (NRC), jointly organized by **Korean-American Scientists and Engineers Association (KSEA) New York Metropolitan, New Jersey** and **Philadelphia**.

The 2017 NRC is collaborated with professional organizations including **KASBP, KITEE, NYKB,** and **PKSA**. The Theme of 2017 NRC is "***Future Convergence of Nano, Bio and Information Technologies***" and its goal is to promote the spirit of service in pursuing technical excellence by exemplifying those who have led such a life of service. The objective of this conference is to provide a forum in which scientists and engineers in major areas present their research findings and share ideas.

We are hoping that the 2017 NRC will also contribute greatly to the advancement of research and development in both US and Korea. In addition, we believe it will provide an opportunity for members and experts in other technical fields to establish professional networks, as well as to explore career opportunities.

On behalf of the NRC organizing committees, we express sincere gratitude to all the distinguished guests and KSEA NY, NJ and PA members for their participation in 2017 NRC.

Thank you again for participating in the 2017 NRC.

Eon Soo Lee , Ph.D.	**Jaewon Kang , Ph.D.**	**Moses Noh, Ph.D.**
KSEA New York Metropolitan	KSEA New Jersey	KSEA Philadelphia
Conference Chair	Conference Chair	Conference Chair

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INTRODUCTION TO PROFESSIONAL ASSOCIATION

KITEE

Myung Jong Lee, CUNY City College and Graduate Center
President of KITEE (42nd KSEA president)

KITEE (Korean-American Innovative Technology Engineers and Entrepreneurs) was established in May 2015 to become the center of startup ecosystem for Korean-Americans in the IT, BT, FT and other fields in the greater NY metropolitan area. NY-NJ hub is the most favorable environment with strong growth in startups, IT, BT, FT research and development, and business. The KITEE's business ecosystem will have features essential to any startups: human capital in many innovative technologies, finance, business service, education, startup incubation and collaboration with Korea. KITEE is meeting monthly on every third Thursday, carrying out the series of initiatives toward creating startups by offering seminars and sharing and supporting members' startup ideas. KITEE is open to anyone who is interested in the entrepreneurship. Current KITEE Members comprise IT, BT, FT engineers and researchers, entrepreneurs, developers, designers, investors, marketing and business development, financial and legal service experts, and students. I welcome you to join KITEE today and look forward to meeting you at the next monthly meeting.

Please send your inquiry to info@kitee.org.
Home page: www.kitee.org
Facebook: https://www.facebook.com/kitee.org

PKSA

Junil Kim*, University of Pennsylvania*
President of PKSA

The Philadelphia Korean Scholars Association (PKSA) is aimed at promoting networking among Korean scholars in the greater Philadelphia area. PKSA holds bi-weekly meetings on Friday either at 6pm at the Smilow Translational research building (12th floor). PKSA warmly welcomes new Korean scholars in the region regardless of research fields and affiliations.

Any inquiries or questions can be submitted to pksa.scholar@gmail.com
Please sign up at Facebook: https://www.facebook.com/home.php?sk=group_169144909800932 for receiving seminars and other events.

KASBP

Stephen K. Suh*, Hackensack Med Center*
Vice President of KASBP

KASBP (Korean American Society in Biotech and Pharmaceuticals) is a non-profit organization founded in May 2001 and the current members include Korean-American professionals working throughout the US, mostly in Biotech or Pharmaceutical field. There are about 820 KASBP members currently registered. The member profile includes not only professionals working in 100 pharmaceutical industries (BMS, Novartis, GSK, Merck, Sanofi, J&J, Pfizer, etc.) but also 60 academics in universities as faculties, researchers, post-docs, or graduate students; government employees in FDA, NIH, or other local and federal government organizations; and employees in Korean corporation or sponsoring

companies even in Korea. KASBP's activities are held mainly in or around New Jersey, the Capital State of US Pharmaceutical industry. In addition, four local chapters are established recently, in Philadelphia, Boston, Connecticut and Washington DC.

KASBP's goal is to promote networking, collaboration and information exchange among members in the life science related fields. For this matter, KASBP organizes and hosts various activities to assist networking among its members. KASBP also aims to contribute to the growth of drug discovery, development and other pharmaceutical technology in Korean and US companies. Especially, through a collaboration and information exchange with Korean Biotech companies, pharmaceutical companies and government funded research centers, KASBP has been helping new drug discovery, technology transfer, drug development and commercialization by Korean companies in Korea and US. One important goal of KASBP is to identify and nurture young Korean researchers to grow up to become future leaders for Korean Biotech and Pharmaceutical industries.

KASBP holds two symposiums every year, one in spring and one in fall, focusing on the new issues and trends in drug discovery and development. During the symposium, KASBP also holds a panel discussion, with invited experts from all over the US working in various stages in drug discovery and development, to share updated information and their experience. Moreover, various collaborations in recent years with Korean pharmaceutical companies and research institutes promoted high level information exchange, providing assistance for drug discovery research and development in Korean companies. In addition to the above-mentioned technical activities, KASBP actively involved providing employment information for job seekers and employers. Furthermore, KASBP partners with other Korean-American Organizations hosting The National Math Competition in conjunction with KSEA/NJ chapter. KASBP also organize several family and social activities for its members, such as bowling, golf, picnic, end-of-year, or new-year parties.

Home page: http://www.kasbp.org/

NYKB

Patrick Hong, Mount Sinai School of Medicine
President of NYKB

NYKB (Society of New York Korean Biologists) is established to construct academic and social networks between Korean biologists around New York Metro and to further support each other to pursue academic and professional excellences in their research and career. Currently, Albert Einstein College of Medicine, Stony Brook University, Cold Spring Harbor Laboratory, Columbia University, Weill Cornell Medical College, Memorial Sloan-Kettering Cancer Center, Mount Sinai School of Medicine, New York University, Rockefeller University, Rutgers University are affiliated and 250 members are registered. Last year, NYKB hosted various events including NYKB annual conference, social night, IBS talent forum, etc.

For more information, please contact NYKB2008@gmail.com
Home page: http://nykb.org/
Facebook: https://www.facebook.com/newyorkkoreanbiologists

PROGRAM AT A GLANCE

08:00 AM - 09:00 AM	Registration and Breakfast Networking
09:00 AM - 09:30 AM	Welcoming Address
09:30 AM - 10:10 AM	Plenary Session I
10:10 AM - 10:50 AM	Plenary Session II
10:50 AM – 11:00 AM	Coffee Break
11:00 AM - 11:40 AM	Congratulatory Remarks
11:40 AM - 12:00 PM	Group Photo
12:00 PM - 01:30 PM	Lunch (will be served)
01:30 PM - 03:00 PM	Technical Session I
03:00 PM - 03:20 PM	Coffee Break
03:20 PM - 04:50 PM	Technical Session II
04:50 PM - 05:00 PM	Closing remarks
05:00 PM - 07:00 PM	Cocktail Networking (Light snacks will be served)

- Have a Safe Trip Home and See You Next Year -

NRC 2017 PROGRAM

Registration & Breakfast Networking — **Hall**

8:00 AM – 9:00 AM

Coordinators:
Dahea Diana You, Rutgers University
Hojun Ryu, Temple University
Hyung-Suk James Chang, Temple University
Jiwoon Park, Cooper-Union
Joanne Lee, Columbia University
Richard Oh, CVS
Seo Young Lee, Rutgers University
Seok Chan Yoon, Rutgers University

Opening & Welcoming Address — **Atrium**

9:00 AM – 9:30 AM
Eonsoo Lee, Ph.D., KSEA NY Metropolitan President, NJIT
Jaewon Kang, Ph.D., KSEA New Jersey President**,** Vencore Labs
Moses Noh, Ph.D., KSEA Philadelphia President**,** Drexel University

MORNING SESSION

Plenary Session I - Keynote Speech — **Atrium**

9:30 AM -10:10 AM
Myung Y. Jeong, Ph.D.
Pusan National University
"The strategy for commercialization of nanotechnology-driven products in Korea"

Plenary Session II - Keynote Speech — **Atrium**

10:10 AM – 10:50 AM
Hak Soo Choi, Ph.D.
Harvard Medical School, Massachusetts General Hospital
"Targeted Contrast Agents for Bioimaging and Nanomedicine'

Coffee Break

10:50 AM – 11:00 AM

Congratulatory Remarks — **Atrium**

11:00 AM – 11:20 AM
Donald H. Sebastian, Ph.D.
President, New Jersey Innovation Institute (NJII)
. Senior Vice President, Technology and Business Development, NJIT
"Talk regarding NJII"

11:20 AM – 11:40 AM
Jaehoon Yu, Ph.D., KSEA President
University of Texas at Arlington
"My One Thousand Year Dream"

Photo & Networking Lunch — **Lobby & Atrium**

11:40AM – 1:30 PM

AFTERNOON TECHNICAL SESSION

BIO & PHARMA SCIENCE FORUM

Opening Remarks **Room 225**

1:30 PM - 1:40 PM **Junil Kim**, University of Pennsylvania

Bio & Pharma Science Forum I **Room 225**

1:40 PM– 3:00 PM Chair: **Junil Kim**, University of Pennsylvania

Kyoung-Dong Kim, The Wistar Institute
"SMC-mediated chromosome organization in fission yeast"

Jae Ho Seo, The Wistar Institute
"The Mitochondrial Unfoldase-Peptidase Complex ClpXP Controls Bioenergetics Stress and Metastasis"

Hyeran Helen Jeon, University of Pennsylvania
"Easy understanding of Orthodontics & Bridging the gap between basic science and clinical orthodontics"

Coffee Break

3:00 PM – 3:20 PM

Bio & Pharma Science Forum II **Room 225**

3:20 PM - 4:50 PM Chair: **Patrick Hong**, Icahn School of Medicine at Mount Sinai

Haekyung Lee, School of Medicine at Mount Sinai
"Microbial metabolites direct lung dendritic cell-mediated IgA class-switch recombination to promote immune defense against influenza A virus challenge."

Keun Woo Park, Burke-Cornell Medical Research Institute
"Mitochondrial STAT3 is negatively regulated by SOCS3 and upregulated after spinal cord injury."

Seok-Man Ho, Icahn School of Medicine at Mount Sinai
"Synthetic activation and repression of neuropsychiatric related genes in multiple hiPSC-derived neural cell types."

Closing Remarks **Room 225**

4:50 PM - 5:00 PM **Junil Kim**, University of Pennsylvania

ENGINEERING FORUM

Opening Remarks **Room 230**

1:30 PM - 1:40 PM **Ohbong Kwon**, New York City College of Technology (CUNY)

Engineering I **Room 230**

1:40 PM – 3:00 PM Chair: **Ohbong Kwon**, New York City College of Technology (CUNY)

Kwan H. Nam, BASF Catalyst
"Mobile Emission Catalysts at BASF"

Dugwon Seo, Engineering Technology Department, Queensborough Community College (CUNY)
"Assimilation of SMOS soil moisture data and incorporation to the HL-RDHM"

Chang-Yong Nam, Scientist, Brookhaven National Lab - Center for Functional Nanomaterials
"Application of Resonant Energy Transfer for Enhanced Light Harvesting in Ultrathin Inorganic Solar Cell and Two-Dimensional Layered Semiconductors"

Minkyu Kim, ASML
"Popularity analysis in social networks Using Topological Data Analysis"

Coffee Break

3:00 PM – 3:20 PM

Engineering II **Room 230**

3:20 PM - 4:50 PM Chair: **Ohbong Kwon**, New York City College of Technology (CUNY)

Yongbeom Lee, LG electronics
"Evolution of mobile OS and beyond"

Jin Ryoun Kim, Dep. of Chemical and Bimolecular Engineering, New York University
"Engineering of protein/peptide probes for detection of amyloid assemblies in neurodegenerative diseases"

Joyoung Lee, Dep. of Civil and Environmental Engineering, NJIT
"Assessing the Impact of Managed Lane Strategies for Connected and Automated Vehicle"

Chang-Hwan Choi, Dep. of Mechanical Engineering, Stevens Institute of Technology
"Nanoengineering of Bioinspired Multifunctional Surfaces"

Closing Remarks **Room 230**

4:50 PM - 5:00 PM **Ohbong Kwon**, New York City College of Technology (CUNY)

INFORMATION TECHNOLOGIES FORUM

Session theme: Cognitive and Software-defined Service and Infrastructure

Opening Remarks **Room 235**

1:30 PM - 1:40 PM **Young-Jin Kim**, Bell-Labs, Nokia

Information Technology **Room 235**

1:40 PM – 3:00 PM Chair: **Young-Jin Kim**, Bell-Labs, Nokia

Nakjung Cho, Bell-Labs, Nokia
"Future 5G Service and Technology"

Jeongran Lee, Bell-Labs, Nokia
"Data Science for Cognitive Service and Infrastructure"

Young-Jin Kim, Bell-Labs, Nokia
"Software-Defined Traffic Load Balancing for Cost-Effective DC Interconnection Service"

Closing Remarks **Room 235**

3:00 PM - 3:10 PM **Young-Jin Kim**, Bell-Labs, Nokia

ENTREPRENEURSHIP FORUM

Opening Remarks **Room 235**

3:20 PM - 3:25 PM **Kooksang Moon**, JP Morgan

Entrepreneurship Forum **Room 235**

3:25 PM - 4:25 PM Chair: **Kooksang Moon**, JP Morgan

Seon Gon Park, Startup Assistance Program of the Korea Small & medium Business Corporation (SBC)
"Korea Startup Ecosystem and Collaboration Opportunities"

Myung Jong Lee, CUNY
"Startup Ecosystem for Korean Americans in the New York Metropolitan Area"

Kyeong Ho Yang, KITEE
"Risk of Pursuing Startups - Seasoned Engineers and Scientists"

Panel Discussion **Room 235**

4:25 PM ~ 4:55 PM Moderator: **Kyeong Ho Yang**, KITEE

Closing Remarks **Room 235**

4:55 PM - 5:00 PM **Kooksang Moon**, JP Morgan

NANOTECHNOLOGY FORUM

Opening Remarks **Room 220**

1:30 PM - 1:40 PM **HeaYeon Lee**, Northeastern University

Nanotechnology I **Room 220**

1:40 PM – 3:00 PM Chair: **HeaYeon Lee**, Northeastern University

Hidekazu Tanaka, Osaka University, Japan
"Functional oxide nanostructures ~ Controlling behavior of correlated electrons in nanomaterials"

Eui-Hyeok Yang, Stevens Institute of Technology
"2D FLATLANDS BEYOND GRAPHENE"

Su Ryon Shin, Harvard-MIT Division of Health Sciences and Technology, MIT
"Organ-on-a-Chip System with in-line Biosensors for Continual Monitoring of Biomarkers"

Coffee Break

3:00 PM – 3:20 PM

Nanotechnology II **Room 220**

3:20 PM - 4:50 PM Chair: **HeaYeon Lee**, Northeastern University

Hargsoon Yoon, Norfolk State University
"Nanodevices for Sensing and Functional Imaging of Dynamic and Networked Neural Activity in the Brain"

June Bae, Boditech Med Inc.
"Boditech Med's way to Respect for Life"

HeaYeon Lee, Northeastern University
"A Scalable Nanowell Array based Portable Point-Of-Care Nanosensor"

Closing Remarks **Room 220**

4:50 PM - 5:00 PM **HeaYeon Lee**, Northeastern University

YOUNG GENERATION FORUM

Session theme: Your Possibility of Success? Limitless

YG Session Organizing Committee Chair: Sahee Kim

YG Session Organizing Committee Members: Dahea Diana You, Hojun Ryu, Hyung-Suk James Chang, Hyunkyung Lee, Jiwoon Park, Joanne Lee, Richard Oh, Seo Young Lee, Seok Chan Yoon

Opening Remarks **Atrium**

1:30 PM - 1:40 PM Moderator: **Sahee Kim**, PharmD, RevHealth LLC

YG Session I **Atrium**

1:40 PM – 2:00 PM **Icebreaker**
Moderator: **Seo Young Lee**, PharmD Candidate, Rutgers University

2:00 PM – 2:45 PM **Pharmaceutical Careers Panel Session**
Moderator: **Sandy Suh**, PharmD, Exeltis

Panelists:

- **Steve Zlotnick**, PharmD, Genentech (Medical Science Liaison)
- **Sophia Athanasiou**, RPh, Consultant (Pharmacovigilance and Drug Safety)
- **Donald Costello**, PhD, Daiichi Sankyo, Inc. (Medical Writing)
- **Sandy Suh**, PharmD, Exeltis (Regulatory Affairs)
- **Kirtida Pandya**, PharmD, Sandoz (Medical Affairs and Operations)

2:45 PM – 3:05 PM **Engineering Presentation 1**
Speaker: **Anthony Han**, Becton Dickinson

Coffee Break

YG Session II **Atrium**

3:20 PM – 3:40 PM **Engineering Presentation 2**
Speaker: **Michael Ko**, MS, Vitex LLC

3:40 PM – 4:20 PM **Career Development Workshop**
Speakers:

- **Stella Kim**, HRCap
- **Kelly Ahn**, M. Ed., Columbia University

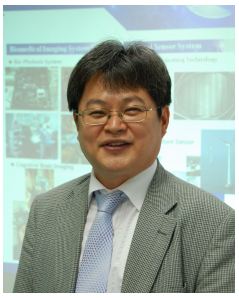
4:20 PM – 4:50 PM **Networking/Interactive Session**
Moderators:

- **Seo Young Lee**, PharmD Candidate, Rutgers University
- **Hojun Ryu,** PharmD Candidate, Temple University
- **Hyunkyung Lee**, PharmD Candidate, MCPHS
- **Seok Chan Yoon**, PharmD Candidate, Rutgers University

Closing Remarks **Atrium**

4:50 PM - 5:00 PM Moderator: **Richard Oh**, PharmD, MBA Candidate, CVS Health

ABSTRACT AND BIOGRAPHY



Myung Y. Jeong, Ph.D.
Pusan National University, Pusan, Korea

The Strategy for Commercialization of Nanotechnology-Driven Products In Korea

Abstract

As the result of the efforts put forth by Gyeongnam province, Miryang city and the Society related to the nanotechnology in Korea. Miryang city was designated as the host of the nano industrial complex by our government. Since the designation, interest in nanotechnology has been steadily increasing across many fields including education, business and research and development. Miryang city will focus on the development of products using nanoimprint lithography (NIL) which can manufacture nanostructure easily. In view of simplicity, process time and throughput, NIL is a good technology compared with conventional technology. Especially, roll to roll (RTR) - NIL will be the most promising technology that can replace conventional technology. And also, RTR- NIL is a green, low-cost technology without limitation for implementing nanostructures. In RTR-NIL, it is important to manufacture the mold precisely and maintain uniformly process condition. To this, process conditions have to include precision tension control, optimization of process parameters, etc. In this talk, I'll explain the plan to develop RTR-NIL technology and commercialize nanoproducts by RTR-NIL.

Biography

Myung Y. Jeong was born in Gyungnam, South Korea, in February 1960. He earned Ph. D. degree from Korea Advanced Institute of Science and Technology, South Korea in 2000. From 2013 to 2014, he has been at Harvard University as a visiting professor. He has been working for 35 years in the research field of IT convergence technology based on nano device fabrication since he started his research in 1983 at the Electronics and Telecommunications Research Institute (ETRI), South Korea. Since 2003, he has been a Professor in the Collage of Nanoscience and Nanotechnology, Pusan National University, South Korea. He has published over 150 SCI publications and holds over 60 patents related to optical devices and accomplished 15 patents on technology transfer to the industry. Meanwhile, he accomplished many governmental projects as a project leader including National Research Lab, World Class University Project, and others. He has introduced the novel fabrication method of optical device, optomechatronic components, photonic crystal using nano imprint technique. As an expert in field of optical interconnection, he received “Distinguished Research Award” from the College of Nanoscience and Nanotechnology in 2009-2010 and “Haedong Award” from KMEPS in 2014. He opened the field to signal transduction, a real-time optical imaging, the signal processing, and interpretation of imaging in branches of cogno mechatronics as a new nanoconvergence technology. He is currently working as the dean of Collage of Nanoscience and Nanotechnology at the Pusan National University and the chairman of Nanopia 2016-2017.

KEYNOTE SPEECH II

Hak Soo Choi, Ph.D.
Department of Radiology, Harvard Medical School
Director, Bioengineering and Nanomedicine Program,
Massachusetts General Hospital Faculty, Cancer Research Institute,
Dana-Farber/Harvard Cancer Center

Targeted Contrast Agents for Bioimaging and Nanomedicine

Abstract

Two fundamental and unsolved problems facing bioimaging and nanomedicine are nonspecific uptake of intravenously administered diagnostic and/or therapeutic agents by normal tissues and organs, and incomplete elimination of unbound targeted agents from the body. To solve these problems, we have synthesized a series of indocyanine near-infrared (NIR) fluorophores that varied systematically in net charge, conformational shape, hydrophilicity/lipophilicity, and charge distribution. Using 3D molecular modeling and optical fluorescence imaging, we have defined the relationship among the key independent variables that dictate biodistribution and tissue-specific targeting such as lung and sentinel lymph nodes (Nat Biotechnol. 2010), human prostate cancers (Nat Nanotechnol. 2010), and human melanomas (Nat Biotechnol. 2013). Recently, we have developed new pharmacophore design strategy "structure-inherent targeting," where tissue- and/or organ-specific targeting is engineered directly into the non-resonant structure of a NIR fluorophore, thus creating the most compact possible optical contrast agent for bioimaging and nanomedicine (Angew Chem. 2015, Nat Med. 2015). The biodistribution and targeting of these compounds vary with dependence on their unique physicochemical descriptors and cellular receptors, which permit 1) selective binding to the target tissue/organ, 2) visualization of the target specifically and selectively, and 3) provide curing options such as image-guided surgery or photo dynamic therapy. Our study solves two fundamental problems associated with fluorescence image-guided surgery and lays the foundation for additional targeted agents with optimal optical and in vivo performance.

Biography

Dr. Hak Soo Choi is an Associate Professor of Radiology at Harvard Medical School, Director of Bioengineering and Nanomedicine Program at Massachusetts General Hospital (MGH), and faculty of Dana Farber/Harvard Cancer Center. Dr. Choi is a graduate of the Polymer-Nano Science Program at Chonbuk National University and earned his advanced degree in nanomedicine from JAIST in 2004. After experiencing gene and drug delivery at Pharmaceutical College of Hokkaido University, he extended his research into molecular imaging and recently joined the Gordon Center for Medical Imaging of MGH. Since 2008, his laboratory focuses on the development of novel contrast agents for tissue- and organ-specific targeting and diagnosis. Of particular interest is targeted fluorophores, which can be used for image-guided surgery by specifically visualizing target tissue with high optical properties and by avoiding nonspecific uptake in normal background tissues.

TECHNICAL SESSION

BIO PHARM SCIENCE FORUM

SESSION I

Chair: Junil Kim, *University of Pennsylvania*

SMC-mediated chromosome organization in fission yeast

Kyoung-Dong Kim, The Wistar Institute, Philadelphia

Abstract

It is becoming clear that Structural Maintenance of Chromosomes (SMC) complexes, such as condensin and cohesin, are involved in the three-dimensional genome organization, yet the exact roles of these complexes in the functional organization remain unclear. We have employed the ChIA-PET approach to comprehensively identify genome-wide associations mediated by condensin and cohesin in fission yeast. We find that although cohesin and condensin often bind to the same loci, they direct different association networks and generate small and larger chromatin domains, respectively. Cohesin mediates local associations between loci positioned within 100 kb; condensin can drive longer-range associations. Moreover, condensin, but not cohesin, connects cell cycle-regulated genes bound by mitotic transcription factors. This study describes the different functions of condensin and cohesin in genome organization and how specific transcription factors function in condensin loading, cell cycle-dependent genome organization, and mitotic chromosome organization to support faithful chromosome segregation.

Biography

Education:

Ph.D. Seoul National University

B.S. Kyungpook National University

Major Professional Experiences:

2016.12-current	Associate Staff Scientist, The Wistar Institute, Philadelphia
2011-2016.12	Research Fellow, The Wistar Institute, Philadelphia, USA
2010-2011	Postdoctoral Fellow, Department of Biosciences, Seoul National University

The Mitochondrial Unfoldase-Peptidase Complex ClpXP Controls Bioenergetics Stress and Metastasis

Jae Ho Seo, The Wistar Institute, Philadelphia

Abstract

Mitochondria must buffer the risk of proteotoxic stress to preserve bioenergetics, but the role of these mechanisms in disease is poorly understood. Using a proteomics screen, we now show that the mitochondrial unfoldase-peptidase complex, ClpXP associates with the oncoprotein, survivin and the

respiratory chain Complex II subunit, SDHB in mitochondria of tumor cells. Knockdown of ClpXP subunits, ClpP or ClpX induces the accumulation of misfolded SDHB, impairing oxidative phosphorylation and ATP production, while activating "stress" signals of AMPK phosphorylation and autophagy. Deregulated mitochondrial respiration induced by ClpXP targeting causes oxidative stress, which in turn reduces tumor cell proliferation, suppresses cell motility and abolishes metastatic dissemination, in vivo. ClpP is universally overexpressed in primary and metastatic human cancer, correlating with shortened patient survival. Therefore, tumors exploit ClpXP-directed proteostasis to maintain mitochondrial bioenergetics, buffer oxidative stress and enable metastatic competence. This pathway may provide a "drugable" therapeutic target in cancer.

Biography

Education:

Ph.D.	Chonnam National University
M.S.	Chonnam National University
B.S.	Chonnam National University

Major Professional Experiences:

2017-present	Associate Staff Scientist, Wistar Institute, Philadelphia
2013-2016	Postdoc Fellow, Wistar Institute, Philadelphia
2011-2012	Postdoc Fellow, Winship Cancer Institute in Emory University
2010-2011	Postdoc Fellow, BK21 Higher Education Center for Bioregulator Research, Chonnam National University
2008-2009	Visiting Research, Lab of Biochemistry/NHLBI/NIH, Bethesda

Easy understanding of Orthodontics & Bridging the gap between basic science and clinical orthodontics

Hyeran Helen Jeon, DDS, MSD, DScD, University of Pennsylvania, Philadelphia

Abstract

This presentation will introduce the general concepts of Orthodontics including treatment timing, different treatment methods, adult orthodontic treatment, and orthognathic surgery combined treatment. In addition, how bioengineering and bone biology can be applied into clinical orthodontics will be discussed.

Biography

Education:

DScD	University of Pennsylvania School of Dental Medicine
	Certificate University of Pennsylvania School of Dental Medicine (Orthodontics)
MSD	Ewha Womans University (Implantology)
Certificate	Ewha Womans University Medical Center (Periodontics)
DDS	Pusan National University

Major Work Experience:

2016-Present Full-time Instructor, Department of Orthodontics, University of Pennsylvania, Philadelphia

SESSION II

Chair: **Patrick Hong**, Icahn School of Medicine at Mount Sinai, New York

Microbial metabolites direct lung dendritic cell-mediated IgA class-switch recombination to promote immune defense against influenza A virus challenge.

Haekyung Lee, School of Medicine at Mount Sinai

Abstract

Microbiota regulates the immunoglobulin A (IgA) class-switching function of lung dendritic cells (LDCs), but microbiota and their metabolites supporting protective IgA responses to respiratory antigens remain incompletely identified. Here, we show that short-chain fatty acids (SCFAs), metabolized by the gut microbiota as major fermentation products of dietary fibers, directly control the ability of LDCs to induce IgA class-switch recombination (CSR). Supplementation of germ-free mice or antibiotic-treated mice with SCFAs significantly increases the levels of LDCs-induced IgA. LDCs express SCFA receptors, GPR43, GPR41, and GPR109 and SCFAs directly act on LDCs via their receptors. IgA production by LDCs from GPR43-/- mice is significantly reduced. SCFA-stimulated lung DCs upregulate key genes important for IgA class switching. SCFAs increase the expression of GARP- a tether of transforming growth factor-β (TGF-β) on lung DCs and the expression of cytokines involved in IgA CSR by LDCs. Supplementation of SCFAs to antibiotic-treated mice results in IgA-mediated protection against influenza-induced lung injury. We thus demonstrate important roles of microbial metabolites in modulating the IgA class-switching function of LDCs.

Biography

Education:

Ph.D. State University of New York –Downstate Medical Center

B.S. Konkuk University

Major Professional Experiences:

2013-present Postdoctoral Fellow, The Mount Sinai Hospital, Icahn School of Medicine

Mitochondrial STAT3 is negatively regulated by SOCS3 and upregulated after spinal cord injury.

Keun Woo Park, Burke-Cornell Medical Research Institute, white plains, New York

Abstract

Suppressor of cytokine signaling-3 (SOCS3) expression is induced by the Janus kinase (JAK)-signal transducer and activator of transcription 3 (STAT3) signaling pathway. SOCS3 then acts as a feedback inhibitor of JAK-STAT signaling. Previous studies have shown that knocking down SOCS3 in spinal cord neurons with Lentiviral delivery of SOCS3-targeting shRNA (shSOCS3) increased spinal cord injury (SCI)-induced tyrosine phosphorylation of STAT3 (P-STAT3 Tyr), which in part contributed to decreased neuronal death and demyelination as well as enhanced dendritic regeneration and protection of neuronal morphology after SCI. However, the role of serine phosphorylation of STAT3 (P-STAT3 Ser) is in large part undetermined. Our purposes of this study were to evaluate the expression patterns of P-

STAT3 Ser and to explore the possible role of SOCS3 in the regulation of P-STAT3 Ser expression. Immunoblot analyses demonstrated that Oncostatin M (OSM), a member of the interleukin-6 (IL-6) cytokine family, induced both P-STAT3 Tyr and P-STAT3 Ser in SH-SY5Y cells. Subcellular fractionation further revealed that P-STAT3 Ser was localized in mitochondria. Overexpression of SOCS3 with a Lentivirus-mediated approach in SH-SY5Y cells inhibited OSM-induced P-STAT3 Ser in both cytosol and mitochondria fractions. In contrast, OSM-induced P-STAT3 Ser was further upregulated in both cytosol and mitochondria when SOCS3 was knocked down by Lentivirus-delivered shSOCS3. Using a rat T8 spinal cord complete transection model, we found that SCI induced upregulation of P-STAT3 Ser in the mitochondria of macrophages/microglia and neurons both rostral and caudal to the injury site of spinal cord. Collectively, these results suggest that SOCS3 regulation of STAT3 signaling plays critical roles in stress conditions.

Biography

Education:

Ph.D Ajou University

B.S. Kookmin University

Major Professional Experience:

2016- current Postdoctoral fellow, Burke-Cornell medical research institute

2012-2015 Postdoctoral fellow, Cleveland Clinic, Lerner Research Institute

2009-2012 Postdoctoral Fellow, University of Alabama at Birmingham

Synthetic activation and repression of neuropsychiatric related genes in multiple hiPSC-derived neural cell types

Seok-Man Ho, Icahn School of Medicine at Mount Sinai, New York

Abstract

Modulation of transcription, either by synthetic activating or repressive dCas9-fusion proteins is a relative new methodology to design up – or down- regulation studies to interpret gene function. Neurodevelopment risk variants include both common single nucleotide variants (SNVs) with small effects sizes and copy number variations (CNVs) with moderate effect sizes. Recent studies have implicated that particular non-coding GWAS-SNVs function as *cis*-acting expression quantitative trait loci (eQTLs). However, such imputed *cis*-eQTLs have been linked to genes with limited annotated function. Moreover, CNVs can span multiple genes and thus make interpretations of the contribution of individual gene or genes within CNVs to disease risk difficult to interpret. hiPSC-derived NPCs, neurons and astrocytes coupled with a synthetic activating or repressive dCas9 platform can be used to manipulate candidate risk genes in different neural cell types of interest, to further define their biological effects. Proof of concept studies has demonstrated transcriptional modulation in model cell lines. To facilitate designing future functional assays to ascertain the function of neurodevelopmental disease relevant risk genes using dCas9-effector based modulation in hiPSC-derived neural cell types, we performed a detailed survey of the reproducibility of gRNA positional effects across different donors and different cell types and different genes.

Biography

Education:

Ph.D. candidate in Development and Stem Cell Biology, Icahn School of Medicine at Mount Sinai

M.S. Molecular and Cellular Biology, Sungkyunkwan University
B.S. Biotechnology, Inje University

Major Professional Experience:
2014-present Brennand Lab, ISMMS

ENGINEERING FORUM

SESSION I

Chair: Ohbong Kwon, *CUNY/New York City College of Technology*

Mobile Emission Catalysts at BASF

Kwan H. Nam, BASF Catalyst

Abstract

An overview of the corporate mission and the technologies involved to address protecting the atmosphere from harmful emissions will be presented. As the world's leading supplier of catalyst, BASF has the expertise in the development of emission control technologies for a wide range of market applications that protect the air we breathe. This expertise enabled BASF to pioneer the development of the first catalytic converter for automobiles in the 1970s.

Biography

Kwan H. Nam earned his B.S. in Chemical Engineering from Worcester Polytechnic Institute, and M.S. and Ph.D. in Chemical Engineering from Syracuse University in 2004. His dissertation was on the development of sol-gel materials for various applications such as environmental remediation, nuclear waste treatment and radionuclide sensing. He started his career with General Electric as a research scientist working on detectors and sensors for homeland security purposes. He then moved on to work for Evans Analytical Group as a laboratory manager before joining BASF in 2010 as a team leader at the Catalyst research division at BASF. He is currently the Global Customer QA for the mobile emissions catalyst business at BASF.

Assimilation of SMOS soil moisture data and incorporation to the HL-RDHM

Dugwon Seo, Engineering Technology Department, Queensborough Community College

Abstract

Soil moisture is often derived from models and agencies such as the National Oceanic and Atmospheric Administration's National Weather Service (NOAA/NWS) use proxy estimates of soil moisture at the surface in order support operational flood forecasting. In particular, a daily national map of Flash Flood Guidance (FFG) is produced that is based on surface soil moisture deficit and threshold runoff estimates. Flash flood warnings are issued by Weather Forecast Offices (WFOs) and are underpinned by information from the Flash Flood Guidance (FFG) system operated by the River Forecast Centers (RFCs). The current FFG system at the ABRFC provides gridded flash flood guidance (GFFG) System using the NWS Hydrology Laboratory-Research Distributed Hydrologic Model (HL-RDHM) to translate the upper zone soil moisture to estimates of Soil Conservation Service Curve Numbers. The remote sensing

observations of soil moisture can improve the flood forecasting accuracy. The Soil Moisture Active and Passive (SMAP) and Soil Moisture and Ocean Salinity (SMOS) satellites are two potential sources of remotely sensed soil moisture data. SMOS measures the microwave radiation emitted from the Earth's surface operating at L-band (1.20-1.41 GHz) to measure surface soil moisture directly. Microwave radiation at this wavelength offers relatively deeper penetration and has lower sensitivity to vegetation impacts. The main objective of this research is to evaluate the contribution of remote sensing technology to quantifiable improvements in flash flood applications as well as adding a remote sensing component to the NWS FFG Algorithm. The challenge of this study is employing the direct soil moisture data from SMOS to replace the model-calculated soil moisture state which is based on the soil water balance in 4 km x 4 km Hydrologic Rainfall Analysis Project (HRAP) grid cells. The resolutions differences in spatial, vertical and temporal between SMOS data and the model needs involve with data assimilation and scale adjustment. This study will show the techniques of SMOS soil moisture data assimilation in four dimensions to be ingested by HL-RDHM.

Biography

Dugwon Seo is an Assistant Professor in Engineering Technology Department at Queensborough Community College. She holds Ph.D. in Civil Engineering from the City College of New York. Professor Seo has involved in a NOAA-CREST research project to study the effect of soil moisture on climate and weather. She has 7 years of college teaching experience including adjunct teaching in New York City College of Technology. She has been teaching courses on Digital Electronics, Energy, Power, Matlab, and Computer Applications.

Application of Resonant Energy Transfer for Enhanced Light Harvesting in Ultrathin Inorganic Solar Cell and Two-Dimensional Layered Semiconductors

Chang-Yong Nam, Scientist, Brookhaven National Lab - Center for Functional Nanomaterials

Abstract

Excitonic energy transfer (ET), a key process in natural photosynthesis, offers exciting opportunities for advances in optoelectronic devices such as solar cells. While recent experimental attempts have demonstrated its potential in both organic and inorganic photovoltaics (PVs), what remains to be addressed is quantitative understanding of how different ET modes contribute to PV performance and how ET contribution is differentiated from the classical optical coupling effects. In this work, we implement an ET scheme using a PV device platform, consisting of CdSe/ZnS nanocrystal energy donor and 500 nm-thick ultrathin Si acceptor layers, and present the quantitative mechanistic description of how different ET modes, distinguished from the optical coupling effects, increase the light absorption and PV efficiency. We find that nanocrystal sensitization enhances the short circuit current of ultrathin Si solar cells by up to 35%, of which the efficient ET, primarily driven by a long-range radiative mode, contributes to 38% of the total current enhancement. These results not only confirm the positive impact of ET but also provide a guideline for rationally combining the ET and OC effects for improved light harvesting in PV and other optoelectronic devices. Toward the end of the talk, I will also briefly discuss the application of ET for improving the photocurrent responsivity of two-dimensional SnS_2 metal dichalcogenide field effect transistors.

Biography

Dr. Chang-Yong Nam is a Scientist at the Center for Functional Nanomaterials of Brookhaven National Laboratory (BNL). He is also an Adjunct Professor/Lecturer at the Department of Materials Science and

Engineering of Stony Brook University. Dr. Nam received Ph.D. in Materials Science and Engineering from University of Pennsylvania (2007), M.S. in Materials Science and Engineering from KAIST (2001), and B.E. in Metallurgical Engineering from Korea University (1999). He started his tenure at BNL since 2007 first as a Goldhaber Distinguished Fellow (2007–2010), Assistant Scientist (2010–2012), Associate Scientist (2012–2016), and Scientist (2016–). His research is focused on developing nanostructured semiconductor architectures and understanding their electronic and optoelectronic properties for energy harvesting and electronic device applications. Particular interests include organic and hybrid PVs, nanostructured metal-oxide sensors, and unconventional nanofabrication based on atomic layer deposition.

Popularity analysis in social networks Using Topological Data Analysis

Minkyu Kim, ASML

Abstract

Topology is a branch of mathematics dealing with qualitative shapes rather than quantitative including the study of what the connected components of a space are. Topological data analysis is coordinate-free, and deals with the qualitative values. In topological approaches, high dimensional data in a point cloud is represented by qualitative distances. We explore the feasibility of the topological approach to the popularity analysis of images in social networks.

Biography

Education:

Ph.D.	University of Texas at Austin
M.S.	Seoul National University
B.S.	Chung-Ang University

Major Work Experience:

2007-Present	ASML
2006-2007	Tokyo Electron America
1997-2002	Samsung Electronics

Session II

Chair: Ohbong Kwon, *CUNY/New York City College of Technology*

Evolution of mobile OS and beyond

Yongbeom Lee, LG Electronics

Abstract

As of today, without doubt, Android is a dominant mobile OS globally as well as US even though there are plenty of customers who yet love IOS or others. Actually Android was and still is not such a perfect platform from technical perspective. I would like to introduce some aspects of such vulnerability and effort within industry to cope with them. I also would like to share brief roadmap of mobile OS and mobile vendor's strategy to follow it.

Biography

Education:
SW architect, Carnegie Mellon University SEI
M.S. Korea University (Major: Machine Vision)
B.S. Korea University (Major: Computer Science)

Major Work Experiences
2014 - present: Principal research engineer, LG electronics mobile research USA
2001 - 2014: Principal research engineer, LG electronics
2000 - 2001: KIST

Engineering of protein/peptide probes for detection of amyloid assemblies in neurodegenerative diseases

Jin Ryoun Kim, Department of Chemical and Biomolecular Engineering, New York University

Abstract

The long-term goal of research in my group is engineering of proteins to solve modern scientific and engineering problems related to protein stability, misfolding, aggregation and self-assembly. In this seminar, I will give a talk on our study of "interactive" protein domain assemblies for detection of amyloid protein aggregation implicated in neurodegenerative diseases. Specifically, I will present our molecular design to develop a conformation-switching protein/peptide probe for rapid, specific and quantitative detection of amyloid aggregates. My talk will illustrate how one can engineer interactive protein domain assemblies to solve important biomedical problems.

Biography

Jin Ryoun Kim is an associate professor in the Department of Chemical and Biomolecular Engineering at the NYU Tandon School of Engineering. Prior to his career at NYU, he earned his BS/MS degrees at Seoul National University and his PhD degree at the University of Wisconsin-Madison majoring in chemical engineering, followed by his postdoctoral research at Johns Hopkins University. He is interested in protein design to solve problems related to protein stability, misfolding, aggregation and self-assembly. His research has been supported by NSF, NIH and the Alzheimer's association.

Assessing the Impact of Managed Lane Strategies for Connected and Automated Vehicle

Joyoung Lee, Dept. Civil and Environmental Engineering, New Jersey Institute of Technology (NJIT)

Abstract

Connected and automated vehicle (CAV) technologies are the umbrella terms for systems that undertake a variety of cutting-edge vehicular controls with certain level of automation, such as cooperative adaptive cruising control (CACC), adaptive cruise control (ACC), driver drowsiness detection, and electronic stability control. CAV technologies are envisioned to fundamentally transform the safety, mobility, and environmental aspects of our transportation system. The United States Department of Transportation (USDOT) has outlined the vision for automated vehicle research which aims on large-scale deployment of partially automated vehicles. In recent, the USDOT has designated five CAV pilot test sites with the anticipation of moving it toward deployment and operations phase. Automobile

manufactures have also projected their visions and roadmap to CAV technologies to fundamentally reshape the driving experience. However, to produce sizable benefits from CAV technologies, sufficient market penetrations must be ensured. To this end, the USDOT has proposed managed lane strategies providing road users adopting CAV technologies with incentives to achieve rapid increase of CAV market penetration in the near future. Given the managed lane strategies, this research examines the impacts of CAV technology under different market penetrations using microscopic traffic simulation modeling approaches. This research also discusses step-wise policy recommendations for the deployment of CAV technologies into the current transportation system.

Biography

Dr. Joyoung Lee is a domain expert on Intelligent Transportation Systems (ITS) and Connected Vehicle (CV). Prior to joining NJIT he served as a laboratory manager of the Saxton Transportation Operations Laboratory (STOL) at the Turner-Fairbank Highway Research Center in the Federal Highway Administration (FHWA). STOL is a national laboratory established by the U.S. Department of Transportation (USDOT) to take a technical leadership for forefront ITS and CV research activities in the United States.

Dr. Lee's research interest lies in the developments and evaluations of diverse ITS applications covering CV-based route guidance system, smart intersection control, traffic congestion sensing, and advanced ITS modeling. In particular, Dr. Lee has lead several research projects developing CV applications for the field deployments. Dr. Lee is an expert on the area of ITS modeling: since 2005, Dr. Lee has participated in various research projects requiring the developments of simulation test-beds to assess the potential benefits of CV-based applications.

Dr. Lee has been a member of Transportation Research Board (TRB) Traffic Simulations Subcommittee and TRB Travel time, Speed, and Reliability Subcommittee. He also serves as a member of American Society of Civil Engineers (ASCE) Advanced Technologies Committee. Dr. Lee was awarded the best paper prizes of the 10th and 14th PTV VISSIM User Group Meeting in 2008 and 2012. He is also the recipient of the Excellence in Research Award of the Department of Civil and Environmental Engineering, University of Virginia in 2011.

Nanoengineering of Bioinspired Multifunctional Surfaces

Chang-Hwan Choi, Department of Mechanical Engineering, Stevens Institute of Technology

Abstract

Nature, such as plants, insects, and marine animals, uses micro/nano-textured surfaces in their components (e.g., leaves, wings, eyes, legs, and skins) for multiple purposes, such as water-repellency, anti-adhesiveness, and self-cleanness. Such multifunctional surface properties are attributed to three-dimensional surface structures with modulated surface wettability. Such micro/nano-structured surfaces with modulated surface wettability can offer numerous application potentials, such as hydrodynamic drag reduction, anti-biofouling, anti-corrosion, anti-fogging, anti-frosting, anti-icing, and so forth. Over the last couple of decades, we have witnessed a significant advancement in the understanding of such surface properties as well as the design, fabrication, and applications of them. In this talk, the designs, fabrications, and applications of such bioinspired surfaces for multifunctionalities will be presented, including hydrodynamic friction reduction, anti-biofouling, anti-corrosion, and anti-icing.

Biography

Dr. Chang-Hwan Choi is an Associate Professor in the Department of Mechanical Engineering at the Stevens Institute of Technology. He acquired his BS (1995) and MS (1997) in Mechanical & Aerospace Engineering from Seoul National University in Korea. He also earned his MS in Fluids, Thermal, and Chemical Processes from Brown University in 2002. Dr. Choi received his PhD in Mechanical Engineering from the University of California at Los Angeles (UCLA) in 2006, specializing in MEMS/Nanotechnology and minoring in Fluid Mechanics and Biomedical Engineering. He has two-year (1996, 2000) work experience at Korea Aerospace Research Institute and three-year (1997-1999) teaching experience at Chandrakasem Rajabhat University in Thailand. His research activities include large-area nanopatterning and nanofabrication, fluid physics and heat transfer at nanoscale interfaces, self-assembly of nanomaterials, nanofluidic energy harvesting, and cell-material interactions, funded by various federal agencies in US (NSF, DARPA, ONR, ARMY, and DOE) and industries. He is a recipient of the 2010 Young Investigator Program (YIP) award by the US Office of Naval Research (ONR) for his efforts in the development of hydrodynamically-efficient anti-corrosion surfaces, which was also highlighted in Nature (http://www.nature.com/naturejobs/2010/100520/pdf/nj7296-385a.pdf). He was also selected as one of Nanotechnology Thought Leaders in 2010 by AZoNano (The A to Z of Nanotechnology). In 2013, he was designated one of the eight US delegates to attend the CRDF Global Workshop to present and discuss the developments in energy research and collaboration between the US and foreign countries.

ENTREPRENEURSHIP FORUM

Chair: **Kooksang Moon**, JP Morgan

Startup Assistance Programs of the Korea Small & Medium Business Corporation (SBC)

Seon Gon Park, Small &Medium Business Corporation USA

Abstract

In Korea, SME is a very important part of economic foundation, and encouraging STARTUP is one of the most important economic policies these days. This talk will give a brief introduction on Small & Medium Business Corporation (SBC) as a Korean governmental executive body of SME policy and then explains its startup assistance programs.

Biography

Education

M.S. Korea University, Seoul, Korea (Major: Economics)
B.S. Korea University, Seoul, Korea (Major: Mass Communications)

Work Experience

2016. 12 - Present: Managing Director, Korea SME Business Center (KSBC) & SBC USA OFFICE, NJ. U.S.A.
1991. 01 - Present: Small & Medium Business Corporation (SBC)
SBC is a non-profit Korea government agency that implements governmental policies and programs for sound growth and development of small and medium industries in Korea.

Startup Ecosystem for Korean-Americans in the New York Metropolitan Area

Myung Jong Lee, CUNY

Abstract

This talk will review the startup ecosystem in the greater NY metropolitan area focusing on the recent trend and support from the state government and New York City, and then discuss the startup ecosystem for Korean Americans in the region. This talk will also introduce the KITEE, established in 2015, and its efforts to promote and support entrepreneurship of Korean-American engineers and researchers in various fields including IT, BT, and FT. Details will include its mission, major activities to transform innovative technologists to entrepreneurs, and upcoming events.

Biography

Myung Jong Lee received B.S. and M.S. from Seoul National University and Ph.D. from Columbia University. He is a professor at the Dept. of Electrical Eng. of City College and Computer Science of Graduate Center of City University of New York. His research interests include V2X communications, Security, IoT, mobile cloud computing, VANET, and V2G. He published more than 170 journal and conference papers including a book (Green IT: Technologies and Applications, Springer) and more than 25 U.S and international patents. Dr. Lee is the chair of IEEE 802.15.8 PAC and a technical editor for IEEE communications magazine. He received the best paper awards at IEEE CCNC 2005 and EAI conference on Smartgrid2016 and CUNY Excellence Performance Award. He was 42nd KSEA President and currently is the KITEE President.

Risk of Pursuing Startups - Seasoned Engineers and Scientists

Kyeong Ho Yang, Dialogic / KITEE

Abstract

Starting a startup is very exciting and is becoming easier to pursue with aggressive support from the federal and state governments and agencies, rapid advancement around the Internet, and recent changes in the technology development sector, including a large number of grants, free knowledge over the Internet, open sources, volunteer mentors, angel groups, and many networking opportunities. While it is a low risk option for young engineers and recent graduates (including Ph.D.'s), pursuing startup is still a very risky career move to seasoned scientists and engineers who have already established their successful career in their professional world. This talk discusses key risk factors for established engineers in pursuing startups in various angles and tries to find relatively safe options to start a life of technology entrepreneur, still expecting high return on investment.

Biography

Kyeong Ho Yang is an innovator and entrepreneur in the fields of video processing, multimedia communications systems, and multimedia applications with more than 20 years of R&D and product development experiences at companies of various sizes from a start-up to an R&D lab of a large company like Bell Laboratories. He has a proven track record of managing R&D and engineering teams to deliver video products and services applications to the market starting from a research stage, 3rd-party software, or an open source code. Dr. Yang is currently Director of Video Technologies at Dialogic and a Fellow of iNetS at Stevens Institute of Technology. He published more than 50 journal/conference

papers and technical articles and was awarded 20 U.S. and international patents with 7 pending. His main R&D interest is developments of multimedia and communications technologies and services for the broadband mobile & Internet applications. He received B.E., M.S., and Ph.D. from Seoul National University, all in Electronics Engineering. He is the founder and Vice President of KITEE (Korean-American Innovative Technology Engineers and Entrepreneurs) established in May 2015.

INFORMATION TECHNOLOGIES FORUM

Theme: Cognitive and Software-defined Service and Infrastructure

Chair: **Young-Jin Kim**, Bell-Labs, Nokia

Future 5G Service and Technology

Nakjung Choi, Bell-Labs, Nokia

Abstract

Recently, with the advent of IT/Communications technologies it is expected that innovative future services come true in near future. In this talk, we overview some of representative future services which operators and service providers are provisioning, using state-of-the-art IT/Communications technologies, e.g., VR, drone, edge cloud, at a high level. In addition, one of key 5G enablers, a concept of network OS is introduced.

Biography

He is a Member of Technical Staff in Nokia Bell Labs, at Murray Hill, NJ, where he has worked since April 2010. He received his B.S. (magna cum laude) and Ph.D. at School of Computer Science and Engineering, Seoul National University in 2002 and 2009, respectively. Also, he has received several awards such as Samsung Human Tech Paper Award, Best Paper Awards and Awards of Excellence (formerly Bell Labs, Alcatel-Lucent). His research focused on Future Internet, SDN/NFV, 4G/5G and future converged services.

Data Science for Cognitive Service and Infrastructure

Jeongran Lee, Bell-Labs, Nokia

Biography

She is a Member of Technical Staff in the Data Science Research at Nokia Bell Labs. She received her M.S. and Ph.D. degrees in Statistics from Seoul National University in South Korea. She has been with Bell Labs since 2013, where her earlier work focused on subscriber's mobility analysis of telco data and statistical inference on spatio-temporal data sets. Her current works are building statistical models on various data structures and its automation to achieve the data-driven/expert-free intelligence.

Software-Defined Traffic Load Balancing for Cost-Effective DC Interconnection Service

Young-Jin Kim, Bell-Labs, Nokia

Abstract

We propose new software-defined traffic load balancer, SD-TLB, that performs measurement-based flow distribution over multiple optical paths, with an implicit impairment detection method using per-port statistics on available paths and a flow redistributor that is immediately adjusted to the current network state. While our approach does not provide the same level of protection as 1+1 optical protection, it can provide the necessary redundancy for data center inter-connection at a lower cost. We experimentally implement the SD-TLB using ASIC-based switches and open virtual switches interconnected by wavelength-division multiplexed transport network test-bed. The experimental results show that SD-TLB outperforms today's hashing–based alternatives in balancing, throughput, and restoration in the presence of outages and impairments and thus achieves improved cost-efficiency.

Biography

He is a Member of Technical Staff in Nokia Bell Labs, Murray Hill, NJ. Dr. Kim received a Doctorate in Computer Science from University of Southern California, and his B.S. and M.S. degrees in Computer Science from Yonsei University, Korea. Since joining Bell Labs in 2010, he has been contributing to IP-optical networks, data-center networks, and machine-to-machine communications such as plug-in electrical vehicles, and smart grids. His work typically involves the design of software platforms, security measures, and routing algorithms on aspects of software-defined network, network operation systems, and information-centrism. Prior to joining Bell-Labs, he had worked as a senior software engineer at Telecommunication research center of Samsung Electronics, Korea. His research has been published in IEEE/ACM conference proceedings and journals, and has been distributed as publicly-available software.

NANOTECHNOLOGY FORUM

SESSION I

Chair: HeaYeon Lee, *Northeastern University*

Functional oxide nanostructures ~ Controlling behavior of correlated electrons in nanomaterials

Hidekazu Tanaka, Nanoscience and Nanotechnology Center, Institute of Scientific and Industrial Research (ISIR), Osaka University, Japan

Abstract

Transition metal oxides exhibit a rich variety of attractive properties such as a metal-insulator transition (MIT), colossal magnetoresistance, and High T_C ferromagnetism due to their strongly correlated electrons. VO_2 shows orders-of-magnitude changes in resistivity at around 340 K owing to MIT, which is applicable for multifunctional switching device/IR sensor at room temperature. The epitaxial VO_2 nanowire and their field effect transistor structure were constructed by nano-imprint lithography technique down to several ten-nm scale, to show very sharp temperature and current induced switching behavior. As further development, the ultra-small oxide nanostructures of magnetoresistive $(La,Pr,Ca)MnO_3$ nanowall wire/nanobox, optoelectronic ZnO nanobox, semiconductive- ferrimagnetic $(Fe,Zn)_3O_4$ nanowall wire constructed by 3D nano-template Pulsed Laser Deposition technique, which combine top-down nanoimprint lithograph and bottom-up thin film growth will also be presented for nanostructured electronics application.

Biography

Dr. Hidekazu Tanaka received his doctorate from Department of Materials Engineering Science, Graduate School of Engineering Science, Osaka University in 1998 studying the ferroelectric, ferromagnetic artificial superlattice prepared by Laser-MBE. He was an assistant professor in 1997, an associate professor in 2003 in the Institute of Scientific and Industrial Research, Osaka University. During 2001-2004, he also joined to Japan Science and Technology Agency (JST). He awarded Young Scientist Award (The Japan Institute of Metals) in 1993, Young Scientist Award (Japan Material Research Society) in 2000, Young Scientist Award for the Presentation of an Excellent Paper (The Japan Society of Applied Physics) in 2001, Excellent Scientist Award (Magnetics Society of Japan) in 2005. Since 2008, he is a Professor, in Nanoscience and Nanotechnology Center, The Institute of Scientific and Industrial Research, Osaka University. His research topics is construction of novel functional nano-materials and devices based on heterostructures and nanostructures prepared by epitaxial thin film growth and nano lithographic techniques in the field of functional oxides including ferromagnetic Fe_3O_4, ferroelectric $BiFeO_3$, metal-insulator transition VO_2, $SmNiO_3$, $LuFe_2O_4$, magnetoresistive manganites.

2D FLATLANDS BEYOND GRAPHENE

Eui-Hyeok Yang, Department of Mechanical Engineering, Stevens Institute of Technology

Abstract

I will present one of our primary research topics, focusing on our development of the chemical vapor deposition (CVD)-growth of 2D materials; we develop a direct growth process to enable localized, patterned, single crystalline or large-scale polycrystalline monolayers of TMDs, including MoS_2, WS_2, WSe_2 and $MoSe_2$, along with their heterostructures. TMDs are emerging graphene analogues with unique properties for optoelectronic applications, but they are prone to rapid oxidation in air, presenting a critical roadblock in practical device applications. In attempts to overcome this issue of TMD oxidation, we study CVD-growth and perform extensive material characterization to illuminate the role of dissimilar 2D substrates in the prevention of interior defects in TMDs, thus uncovering the conditions for anti-oxidation. This research provides a detailed look into the oxidation and anti-oxidation behaviors of TMDs, which corroborates the role of underlying 2D layers in the prevention of interior defects in TMDs. We furthermore show the epitaxial growth of TMDs on hBN and graphene, as well as vertical/lateral heterostructures of TMDs, uniquely forming in-phase 2D heterostructures, and we examine the resulting quality and integrity of differing heterostructure. If the technique could be developed to be highly reliable and high fidelity, it could have a high impact on the future research and commercializability of TMD-based devices.

Biography

Dr. E. H. Yang is a full professor of Mechanical Engineering Department at Stevens Institute of Technology. He received Ph.D. degrees from Ajou University, Korea. After his postdoctoral training at University of Tokyo and at California Institute of Technology, he joined NASA's Jet Propulsion Laboratory where he became a Senior Member of the Engineering Staff. At JPL, he received a number of awards, including NASA ICB Space Act Awards, Bonus (Level B and C) Awards and a number of Class 1 NASA Tech Brief Awards. In recognition of his excellence in advancing the use of MEMS-based actuators for NASA's space applications, he received the prestigious Lew Allen Award for Excellence at JPL in 2003. His scholarly leadership has been recognized by peers. Examples of these efforts include being appointed as an Associate Editor and/or Editorial Board of several journals including Nature's Scientific Reports, and being elected as the Division Chair of the ASME MEMS Division. Since joining Stevens in

2006, he has been responsible for obtaining competitive research funding from several federal agencies including NSF, AFOSR, US Army, NRO, NASA and DARPA (including 6 NSF and 3 AFOSR grants, and 5 NASA and 3 NRO contracts). Dr. Yang holds over 12 patents issued or pending. Dr. Yang is the director of the Micro Device Laboratory, a Stevens's multi-user microfabrication facility.

Organ-on-a-Chip System with in-line Biosensors for Continual Monitoring of Biomarkers

Su Ryon Shin, Biomaterials Innovation Research Center, Harvard Medical School, Harvard-MIT Division of Health Sciences and Technology, MIT

Abstract

Current paradigms for testing drug efficacy and toxicity are time-consuming, ineffective and expensive. One of the main reasons is that the animal models used in drug screening are often ineffective at predicting human responses to candidate drugs. There is an increasing demand for developing *in vitro* 3D organ models that better predict the physiological responses of the human body to novel pharmaceutical compounds, particularly with respect to tissue/organ toxicity. These *in vitro* models, featuring highly biomimetic compositions, architectures, and functions, are expected to replace the conventional planar, static cell cultures and bridge the gap between the currently used preclinical animal models and the human body. In addition, development of an efficient sensing platform capable of *in situ* continual monitoring of biomarkers is needed to assess the functionality of the *in vitro* 3D organ models and to evaluate their biological responses towards pharmaceutical compounds or chemical species over extended periods of time. In this talk, I will introduce 3D bioprinting methods which are emerging as a powerful technique for the development of highly organized and complex 3D organ models. Then I will introduce the first fully integrated organ-on-a-chip platform in conjunction with microfluidic electrochemical biosensor units, which operates in a continual and automated manner. The label-free microfluidic electrochemical biosensor has a unique built-in on-chip regeneration capability for continual measurement of cell-secreted soluble biomarkers from an organoid culture in a fully automated manner without attenuating the sensor sensitivity. We believe that, this novel platform technology has paved a new avenue for integrating biomimetic organoid models with the potential to achieve large-scale automation in drug screening processes.

Biography

Dr. Su Ryon Shin received a doctoral degree from Hanyang University, South Korea. In Nov. 2010, she was joined the Brigham and Women's Hospital (BWH) and Harvard Medical School (HMS), Division of Engineering in Medicine as a Postdoctoral Research Fellow. Dr. Su Ryon Shin was promoted to Instructor at HMS in July. 2014. She is one of the innovative and productive young faculty in regenerative medicine and biomedical engineering, with a growing international reputation for her accomplishments. Dr. Shin is fully committed to address this major challenge head-on by using an interdisciplinary approach at the interface between engineering, nanomaterials science, and biology. Dr. Shin's research focuses on developing micro- and nanoscale technologies to control and monitor cellular behavior with particular emphasis in developing microscale biomaterials and engineering systems for biomedical applications. She has been developing multifunctional cardiac scaffolds and 3D biohybrid actuator using biocompatible hydrogel for both therapeutic purposes and in vitro studies. Her team currently focuses on developing bioprinting technology to control cellular behavior, as

well as regulating cell alignment within engineered systems. Also, Dr. Shin has been developing and testing of integrated organs-on-chip systems with built-in biosensors.

SESSION II

Nanodevices for Sensing and Functional Imaging of Dynamic and Networked Neural Activity in the Brain

Hargsoon Yoon, Norfolk State University

Abstract

Recent neural sensing and imaging technologies have allowed the exploration of the brain at the molecular-cell-biological level for the understanding of the mechanisms of mentation and brain diseases. Group cellular events are associated with the global brain function and the local neuro-physiological changes. Despite various advances, understanding and interfacing molecular and cellular events with neural network functions is still quite challenging. To address the challenge, recording and imaging of neural activity in multiple spatial and temporal scales are critically important. The integrative sensing and functional imaging can lead to radical advances in understanding brain function and enable quantitative mathematical modeling and analysis of neural systems. This presentation introduces neurochemical and electrophysiological sensing in molecular and cellular levels of dynamic neural activity using nanotechnology. This presentation also discusses fast neural imaging technology using electrical impedance tomography to illustrate functional neuronal networks in the mesoscale level of cell populations, especially in deep brain structures. The principle of this imaging technology is based on the electrical impedance change by molecular transport through ion channels on nerve membranes.

Biography

Dr. Hargsoon is an Associate Professor of the Engineering Department, the Director of Nano-Electronics and Neural Engineering Laboratory at the Norfolk State University, and the Adjunct Associate Professor of Anatomy and Pathology Department at the Eastern Virginia Medical School. He earned his Ph.D. degree in Engineering Science from Pennsylvania State University in 2003. He has developed several flexible polymer nanoelectronic devices for neural recordings and functional imaging in the brain using electrical impedance tomography. His research works have been funded by NSF, NASA, DoD and NIH in external funding and led to the publications in many journals and conferences. He serves as a Guest Editor in a journal Biosensors, an editorial board member of a journal The Scientific Pages of Translational Medicine, and as a program committee member of the SPIE International Conference for Nano-, Bio-, Info-Tech Sensors and Systems. He also serves as a review panel of the NIH Brain Initiative Grant Program in 2015-2017. He is also involved in the peer-review processes of several internationally reputed journals in addition to holding membership in the Society for Neuroscience and the IEEE Engineering in Medicine and Biology Society as a Senior Member.

Boditech Med's way to Respect for Life

June Bae, General Counsel/Director of Sales, Boditech Med Inc.

Abstract

Boditech Med Inc. was established in 1998, as a start-up company from Hallym University, focused on antibody development. Since it was combined with an optics expertise in 2009, Boditech Med Inc. has been providing high quality in-vitro diagnostics analyzers and reagents to customers worldwide. It has significantly grown at a tremendous rate over the years and is currently providing over 90 countries with various kinds of products: ichroma, AFIAS and hemochroma Plus, etc. Particularly, it has maintained no. 1 position in reagent sales on CRP (C-reactive protein) over the past years in the Chinese market.

Boditech Med Inc. is leading a change of thinking in the in vitro diagnostics industry, by employing a whole blood-based technology. Also, its antibody engineering technology provides a wide range of quantitative test (about 40 kinds) to users, using its noble and portable analyzers. Acknowledging that a growing number of people recently need better healthcare services in modern society, Boditech wishes to contribute to improving access to accurate and simple diagnostics services backed by its own innovative technology. Currently, over 90 research professionals are concentrating on developing highly sensitive and reliable analyzer and reagent products. Moreover, the company is trying to expand its capability to U.S. and Chinese markets by acquiring Immunostics, Inc. located in New Jersey and opening new production facilities in Qingdao and Guangxi, China, respectively.

Finally, Boditech Med Inc. always thinks it owes a great deal of responsibilities to its employees as well as to its clients and shareholders. It is certain that taking care of the employees is a good start to realize its fundamental corporate value, “Respect for Life.” Today, the presenter wishes to share the R&D capability and business strategy of Boditech Med Inc. with the audience including many experts in different areas and to seek how to keep developing resources of sustainability.

Biography

Education
University of Pittsburgh School of Law - Pittsburgh, PA Juris Doctor (2003)
University of Utah - Salt Lake City, UT Master of Arts, Philosophy (2000), Bachelor of Arts, Sociology (1997)
Korea University Bachelor of Arts, Philosophy (1995)

Professional experience
Boditech Med Inc. – Chuncheon, Korea August 2013 to present, General Counsel/Director of Sales
Kim & Min – Seoul, Korea April 2011 to July 2013 Foreign Legal Consultant
Business Solutions – Seoul, Korea March 2010 to March 2011 Foreign Legal Consultant
EYP Law – Seoul, Korea July 2007 to February 2010 Foreign Legal Consultant
Kim & Min – Seoul, Korea December 2006 to July 2007 Foreign Legal Consultant
Sewha Park & Goo – Seoul, Korea March 2005 to November 2006 Foreign Legal Consultant

A scalable nanowell array based portable point-of-care testing (POCT) nanosensor

HeaYeon Lee, Department of Pharmaceutical Sciences, Bouve College of Health Sciences, Northeastern University

Abstract

In recent years, a new paradigm of nanobiomedical devices combining miniaturization and integration has been exploited in areas such as combinational chemistry, biotechnology, engineering, proteomics and clinical diagnostics. One of the critical issues in the development of nanobiomedical system is how to

differentiate signal-to-noise ratio per very small amount of signal. Developing biocompatible integrated nanosystem requires the fabrication of appropriately designed nanowell array structure for high sensitivity homogenous assays. Until now, we achieved high specific detection of biomolecule using nanowell array structure integrated top-down and bottom-up nanotechnology. We obtained a 150-orders–of-magnitude enhancement in sensitivity of biosensor. This nanowell array system could be applied to numerous the integrated digitizing biosensors. Here I will describe a demonstration of precious molecule recognition without nonspecific binding while maintaining the bioactivity on nanostructured space. The developed miniaturized/integrated nanowell array-device system has shown excellent advantages over conventional instrumental systems for analysis of biomaterials in its size, cost, detection time and multiplex detection capability. It also showed high potential to apply in various nanobiomedical devices for high throughput analysis.

Biography

Dr. HeaYeon Lee is a visiting professor at the Department of Pharmaceutical Sciences at the Northeastern University, and the Adjunct Associate Professor of Department of Nano-Integrated Cogno-Mechatronics, Engineering at Pusan National University. Last year, she found startup company, Mara Nanotech New York, Inc. She earned his Ph.D. degree in Inorganic and Physical Chemistry from Osaka University, Japan in 1995. She has developed electrochemical nanobiosensors with DNA, protein, carbohydrate, lipid, artificial cell membrane, aptamer, small molecule, radical using materials chemistry and nanotechnology for biomedical applications. Over the past 16 years, she has successfully fabricated a 50, 100, 300 nm NWA structure using PEG copolymer, inorganic polymer based various nanostructure fabrication methods and demonstrated that it can be used to fabricate a new miniaturized label-free electrochemical nanobiosensor with ultra-high sensitivity and good reproducibility. She has published several papers in several important journals, and she has also been invited to several international conferences to give invited presentations.

YOUNG GENERATION (YG) FORUM

Session Theme: Your Possibility of Success? Limitless.

When it comes to possibilities in choices you make in life, it seems limitless. So then what are the possibilities that the choices you make in your 20's will lead to success? The answer is limitless, but you must first define what success means to you. That way, you are one step closer to making the choices you need to achieve your goal(s).

In the 2017 NRC YG Session, we would like you, the young scientists, to further refine your own definition of success in career development and explore your limitless possibilities through inspiring stories and personal tips from experts in various fields of science. In addition, experts of human resource management will coach you on key strategies of marketing yourself to tap into the job opportunities you won't want to miss. Furthermore, we hope that this informative session full of chances to expand your network with experienced professionals and motivated peers will open the doors to success in your career.

#Limitless Possibilities
2017 NRC YG Session Organizer Committee

Pharmaceutical Careers Panel Session

Abstract: With an estimated $1.2 trillion in the US economic output each year, pharmaceutical industry offers a great variety of career opportunities for scientists and healthcare professionals. In the United States alone, more than 854,000 employees work in the biopharmaceutical industry across a broad range of occupations. Furthermore, the industry directly and indirectly supports a total of 4.4 million jobs. The pharmaceutical industry requires a highly-skilled and educated workforce, including high-level administrators, scientists and healthcare professionals. Explore your career options as young scientists with our five experienced professionals, who are distinguished experts in various sectors of the industry.

Panelists

- Sophia Athanasiou, RPh, Consultant (Pharmacovigilance and Drug Safety)
- Donald Costello, PhD, Daiichi Sankyo, Inc. (Medical Writing)
- Sandy Suh, PharmD, Exeltis (Regulatory Affairs)
- Kirtida Pandya, PharmD, Sandoz (Medical Affairs and Operations)
- Steve Zlotnick, PharmD, Genentech (Medical Science Liaison)

Biographies

Sophia Athanasiou is a healthcare professional with expertise in Pharmacovigilance and Clinical Development. She graduated from Rutgers University with a BS degree in Pharmacy and worked as a staff pharmacist in hospitals and a pharmacist in charge in a community pharmacy. Since 1992, she has been working in the industry setting and was promoted to various director levels in the Drug Safety Department at Hoffmann-La Roche Inc, Ferring Pharmaceuticals, and Acorda Therapeutics. With more than 25 years of experience in the pharmaceutical industry, she now serves as a pharmacovigilance and drug safety consultant to pharmaceutical companies.

Don Costello is a Senior Director of Medical Writing at Daiichi Sankyo, Inc. After graduating from Providence College with a BS Degree in Biology, he went to Giesel School of Medicine at Dartmouth for his Ph.D. in Pharmacology and University of Wisconsin-Madison for Post-Doctoral Research in Physiology & Neurosurgery. For more than 30 years, he served as a Director of Medical Writing at Hoechst-Roussel Pharmaceuticals, Pfizer, Covance, and Daiichi Sankyo, Inc as well as a Scientific Director in Clinical Development at MannKind Corporation

Sandy S. Suh started her industry career two decades ago. Her experience includes "big pharma" such as Abbott Labs and Pharmacia Corporation (later became Pfizer). She's also worked in smaller pharmaceutical companies and is currently the Head of Regulatory Affairs (R&D) at Exeltis (a Chemo company). Her experience covers mostly Regulatory Affairs but she's accomplished in Medical Affairs, Pharmacovigilance, and Project Management. She holds a BS Pharmacy and PharmD degrees and is also a Registered Pharmacist (RPh).

Kirtida Pandya joined the Sandoz US Biopharmaceuticals Medical Affairs team as a Head of Medical Services and Operations in July 2016. In this role, she leverages her extensive expertise in medical communications and information to collaborate with the medical directors and cross-functional stakeholders to strategize and develop medical affairs plans and scientific platforms for all products. As a graduate of Rutgers University with a Bachelors and a Doctorate degree in Pharmacy, she has a strong clinical background with expertise in several therapeutic areas and supported products at various stages in their lifecycle. These skills have been honed based on her extensive experiences from working with

pharmaceutical industry, including Novartis for almost 8 years, as well as the agencies. Kirtida also recently graduated with a Masters in Healthcare Management degree program in 2014 and is a Certified Medical Publication Professional who volunteers across several committees within International Society of Medical Publication Professionals (ISMPP).

Steve Zlotnick is a Principal Medical Science Liaison at Genentech on the Immunology-Rheumatology therapeutic team. Steve received his BSc in Pharmacy from the Philadelphia College of Pharmacy, where he also is as an adjunct professor teaching geriatrics in long-term care, and his PharmD from Rutgers University. Steve has also served in a Medical Director role for Genentech, Pfizer, and Bayer and has over 20 years of Industry experience.

Engineering Session

Title: TBD
Anthony Han, *Becton Dickinson*

Abstract: TBD

Biography: Anthony Han is currently an R&D Engineer at Becton Dickinson and Company (BD) working on Disposable Self-Administered Injection Systems as part of the BD Pharmaceutical Systems group. Anthony completed his BE in Mechanical Engineering at the City College of New York in June of 2013 and started at BD in July of 2013 thanks to a very fortunate timing, and a contact/mentor he met through KSEA who had an open position on her team in the BD Medical Surgical Systems business unit. After a year at BD, he went on to take a position as a Product Development Engineer at DepuySynthes, Johnson and Johnson, in their Orthopedics group. Soon, after being invited to rejoin his former team at BD, he returned to the NY area and has been with BD ever since. Anthony is a former chapter president of KSEA CCNY and credits much of the launch of his career to his experience with KSEA.

"I don't want to be an engineer or scientist anymore. Now what? Beyond pure technical career"
Michael Ko, MS, *Vitex LLC*

Abstract: After graduating from school with a science degree, there are defined career paths an engineer or a scientist could take. Is the traditional career model still valid or useful in the modern world? How do we approach our career challenges smartly? These are difficult questions we must answer and Mr. Ko offers his perspective based on his own experience.

Biography: Michael Ko is a business entrepreneur. He is the president of Vitex LLC, a fiber optic solutions company he founded in 2003. Prior to founding Vitex, he has worked as a marketing manager at JDSU and also as a management consultant at Mars & Co. based in San Francisco. He received an M.S. from University of Southern California and a B.S. from University of Rochester. His outside interests include reading history books, dining, and movies.

Career Development Workshop

"Turning your Job into a Career with Personal Branding and Professional Development"

Stella H. Kim, SPHR, *HRCap, Inc*

Abstract: Those with successful jobs oftentimes complete and perfect their work so that they could go to sleep soundly at night, whereas those with successful careers eagerly wake each morning to get to work sooner instead. What does it take to turn a competitive job into a meaningful career? This presentation will talk through the importance of personal branding, and will provide useful tips on gaining greater expertise and deepened passion through continuous professional development.

Biography: Stella H. Kim, SPHR is a Talent Solutions Leader focused on Business Development and Executive Recruiting at HRCap, Inc - one of the largest Asian Executive Search firms in the United States. She is responsible for prospecting new clientele in leading industries, providing HR consultancy through client M&A initiatives and restructurings, and successfully placing best-fit hires at entry levels to C-suite executive levels. Prior to HRCap, she specialized in Workforce Management and People Analytics Solutions at the Professional Development Center of Excellence at IBM Headquarters. She provided data-driven talent strategy and change management strategies that enhanced enterprise-wide employee engagement and met global business growth objectives. Formerly, she was a Senior Consultant at IBM Global Business Services focusing on org change and transformation projects for IBM's clients and internal stakeholders. She leveraged data and analytics to drive insightful change management, workforce engagement and talent development strategies. Stella graduated from Princeton University with a BA in Economics, holds a Master Certificate in HR Management from Villanova University, and completed the 2015 CSIS Executive Program for Social Impact Strategy at UPenn's School of Social Policy & Practice. Stella's education in technology and econometric analysis, work experience in strategy and change, and passion in talent management have driven her to find increasing value in the unique intersection of technology, change and talent. She serves advisory leadership roles on various communities and non-profit organizations, and believes in the power of community-building for greater social impact and professional development.

"You Think You Know: Make LinkedIn Work for You"

Kelly Ahn, Columbia University Center for Career Education

Abstract: Professionals are now joining LinkedIn at a rate of more than two new members per second. LinkedIn is the world's largest professional network with more than 467 million members in over 200 countries in 24 different languages. Many users, however, are unaware of obvious benefits that one can easily reap applying simple strategies and techniques.

Biography:

Education:

Ed.M.Teachers College, Columbia University, NY (Specialization: Educational Psychology)

B.A. Hamilton College, NY (Major: Psychology)

Major Work Experiences:

2016-PresentAssociate Dean, Columbia University Center for Career Education

2014-2016 Director of Career Success, The New School

2012-2014 Director of Career Services, Manhattan College

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