

INVITED SPEAKERS

Keynote Speaker

Randolph V. Lewis, Ph.D.

Utah State University



Dr. Randolph V. Lewis received his bachelor's degree from CalTech in 1972 and his M.S. in 1974 and PhD in 1978 degrees from the University of California at San Diego. He was a postdoctoral fellow at the Roche Institute of Molecular Biology. He joined the faculty at U. of Wyoming in 1980 and was Professor of Molecular Biology until 2011. He served as Department chair for five years and as a special assistant to the Vice President for Research. Randy joined Utah State University in 2011 as USTAR Professor of Biology and in the Synthetic Biomanufacturing Center.

His group has published over 130 papers in a wide variety of journals and has written 16 book chapters. They have seven issued patents. He has had grants totaling over \$31 million. Dr. Lewis has had 18 PhD and 3 M.S. students and currently has six PhD students and 16 undergraduates.

His research focuses on spider silks and the proteins they are made from. In the past 20 years they identified, through DNA cloning, the proteins that make up all six of the different silks which spiders can make as well as the glue proteins. With that information they proposed the key parts of the proteins that are responsible for the high elasticity and the tensile strength of these fibers. Based on that data they constructed synthetic genes that make proteins in which the elastic or strength elements have been systematically varied. These proteins have been produced in bacteria, purified and are now being spun in to fibers to determine the effects of the different elements. They currently can produce fibers that have energies to break greater than Kevlar and steel. The goal of this work is to provide a method to produce fibers with custom designed strength and elasticity for applications such as ligament and tendon repair/replacement, high tech clothing, parachutes, etc. Their research has been featured on several TV shows including Discovery, Nova, BBC and CSI New York.



Erik Reimhult, Ph.D.

University of Natural Resources and Life Sciences, Vienna, Austria

Professor Erik Reimhult is head of the Laboratory for Biologically inspired Materials (BIMat) and the Department of Nanobiotechnology (DNBT) at the University of Natural Resources and Life Sciences Vienna (BOKU), Austria. He got his PhD in Physics and Engineering Physics in 2004 from Chalmers University of Technology, Sweden, on self-assembly of supported lipid assemblies and biosensor development. He has worked as postdoctoral researcher at the Institute of Materials Research and Engineering

Singapore, and as senior scientist (Oberassistent) at the Department of Materials at the ETH Zurich on biointerfaces, biosensing, nanofabrication, polymer surface modifications, supramolecular assembly, and multi-functional nanoparticles. In 2010 he became full professor at the BOKU and in 2012 Prof. Reimhult was recently awarded an ERC Starting Grant Award for research on NP-lipid membrane interactions. The current focus of research of the BIMat is the synthesis and properties of core-shell NPs, membrane

interactions, colloid strings and self-assembled and magnetically actuated membranes, investigated with colloid and surface sensitive techniques.



Suzie H. Pun, Ph.D.
University of Washington

Dr. Suzie H. Pun received her Chemical Engineering Ph.D. degree in 2000 from the California Institute of Technology. She then worked as a senior scientist at Insert Therapeutics for 3 years before joining the Department of Bioengineering at University of Washington (UW). She is currently the Robert J Rushmer Associate Professor of Bioengineering, an Adjunct Associate Professor of Chemical Engineering, and a member of the Molecular Engineering and Sciences Institute at UW. Her research focus area is in drug and gene delivery systems and she has published over 50 research articles in this area. For this work, she was recognized with a Presidential Early Career Award for Scientists and Engineers in 2006.

Ruth Shuman, Ph.D.
National Science Foundation

Dr. Ruth Shuman joined the National Science Foundation in August 2009. She is currently serving as Program Director for the Biology and Chemical Technologies (BC) Cluster in the SBIR/STTR Program, and was named Cluster Leader in 2011. Her area of technical focus at NSF is biological and biomedical technologies, and she has a keen interest in synthetic biology and metabolic engineering. Formerly, she was the founder, president, and CEO of a successful venture-backed life science company, Gentra Systems, Inc., that developed, manufactured, and sold products for genetic testing and research to clinical and research laboratories worldwide. Following Gentra's acquisition by Qiagen, she held various consulting/advisory positions with start-up companies, and was CEO-In-Residence for Life Science with the University of Minnesota's Venture Center evaluating the business potential of University-developed technology. Ruth began her career as a faculty member at North Carolina State University, and was a pioneer in the development of gene transfer and genetic engineering technology. She holds a Ph.D. from the University of Minnesota in the area of Genetics and Cell Biology.



Lin He, Ph.D.
National Science Foundation/ North Carolina State University

Prof. Lin He is currently holding an Associate Professorship at the Department of Chemistry at the North Carolina State University and an Adjunct Professorship at Department of Biomedical Engineering, a joint program between UNC/NC State University. She is also a rotating Program Director in the Chemistry Division at the National Science Foundation.

Prof. He received her B.S degree from Peking University in China and her PhD from Penn State University in Analytical Chemistry. After graduation, she worked for Surromed, Inc, a biotech startup company in the bay area, before she joined NC State in 2003. Prof. He's research interests include development of new biosensing tools using radical polymerization and exploitation of Ordered Nanoarray-Assisted Laser Desorption/ Ionization Mass Spectrometry in metabolite profiling and chemical imaging. During the past year and half, Prof. He has been managing research portfolios within the Chemical Measurement and Imaging (CMI) program and the Macromolecular, Supramolecular, and Nanochemistry (MSN) program in the CHE division at NSF.



D. Marshall Porterfield, Ph.D.
NASA headquarters/Purdue University

Dr. D. Marshall Porterfield is Division Director for Space Life and Physical Sciences at NASA headquarters in Washington DC where he oversees the Human Research, Physical Sciences, and Space Biology Programs. The division includes the designee NASA liaison for the International Space Station National Lab, management of extramural grants and research, as well as the intramural research and engineering assets at six NASA centers. Currently the programmatic focus is on ISS utilization. At

Purdue University Dr. Porterfield is a Professor of Biological Engineering where he helped found the Physiological Sensing Facility at Discovery Park. His expertise is development of sensing technologies as tools for research in biology, agriculture, the environment, space, and medicine using scanning probe sensors, biosensors, bio-MEMS, bio-nanotechnology, biomimetics and lab-on-a-chip technologies. His work in gravitational and space biology includes cell signaling and biophysical phenomena. He has received numerous awards including the Halstead Young Investigator Award from the American Society for Gravitational and Space Biology and election to the College of Fellows for the American Institute for Medical and Biological Engineering for his work. His leadership includes service as President of the American Society for Gravitational and Space Biology, and recently was elected to serve as President for the IBE.



Seung Wook Kim, Ph.D.
Korea University, Korea

Dr. Seung Wook Kim is the president of Korean Society for Biotechnology and Bioengineering(KSBB) and the Professor in the Department of Chemical and Biological Engineering at Korea University. He earned his B. S. in Chemical Engineering from Korea University, Seoul, Korea, in 1980; and also his M. S. in Chemical Engineering from Korea University in 1984; and his Ph. D. in Chemical Engineering at the University of Birmingham, Birmingham, U. K. in 1989. Before joining the faculty at Korea University in 1996, he worked at the Department of Genetic Engineering, the University of Suwon. Dr. Kim's primary line of research is based on bioprocess engineering; bioreactor design and bioprocess optimization involving bioenergy production, biocatalysis, protein and DNA immobilization on nanomaterials, enzymatic biofuel cell, microchannel bioreactor, bioreactions with supercritical fluid, rheological study of various fungi, and strain development by genetic modification. Dr. Kim has over 110 publications in international refereed journals, and over 30 patents.



Ya-Ping Sun, Ph.D.
Clemson University

Prof. Ya-Ping Sun earned his Ph.D. at the Florida State University in 1989. After postdoctoral training at the University of Texas at Austin, he joined the Clemson faculty as an assistant professor in 1992 and was promoted to full professor in 1999. Since 2003, he has been the endowed Frank Henry Leslie Chair Professor of Natural and Physical Sciences. His research interest is in the development of nanomaterials and other novel materials for various technological applications. Dr. Sun has more than 280 publications in journals and books.



Gabriel P. López, Ph.D.
Duke University

Prof. Gabriel P. López is founding Director of the NSF's Research Triangle Materials Research Science and Engineering Center (MRSEC) and a Professor of Biomedical Engineering and Mechanical Engineering & Materials Science at Duke University. He is also Research Professor of Chemical Engineering and a member of the Center for Biomedical Engineering at the University of New Mexico. In 1991, he completed Ph.D. studies in chemical engineering at the University of Washington where he worked under the mentorship of Prof. Buddy D. Ratner as a Kaiser Aluminum Co. Graduate Fellow. From 1991-1993, he was an NIH and Ford Foundation Postdoctoral Fellow under the mentorship of Prof. George M. Whitesides in the Dept. of Chemistry at Harvard University. He was appointed Assistant Professor of Chemical Engineering and Chemistry at the University of New Mexico in 1993, promoted to Associate Professor in 1999, and promoted to the rank of Professor in 2004. He was the founding director (2005) of the UNM Center for Biomedical Engineering. His research is currently supported by several sources including the NSF, NIH, DOD, and DOE. His current research interests include biointerfacial phenomena,

bioinspired and biomimetic materials and bioanalytical microsystems to address problems in medicine, biotechnology and environmental quality.

Sponsored by

Army Research Office (ARO)



The Triangle Materials Research Science and Engineering Center (MRSEC), launched in September 2011, is a national resource for materials science and engineering research and education located in the Raleigh/Durham/Chapel Hill area of North Carolina. The MRSEC research team encompasses faculty and students at Duke University, North Carolina State University, North Carolina Central University and the University of North Carolina-Chapel Hill. The MRSEC will have a major national and international impact in soft matter materials science through generation of new fundamental insights and theoretical understanding, new design principles, and new applications and uses for colloidal and macromolecular materials and their higher order assemblies