Cancer Center Annual Meeting
November 9, 2017

8:30 a.m.  Registration

9 a.m.  Opening Remarks

Rex Gaskins
Chair, Cancer Center at Illinois Steering Committee

9:05 a.m.  NCI Cancer Center Support Grant: Report on External Advisory Committee Site Visit and Next Steps

Rohit Bhargava
Director, Cancer Center at Illinois

10 a.m.  Break

10:10 a.m.  New Member Tech Talks:

Liang Gao, Ph.D.
Anna Arthur, Ph.D.
Viktor Gruev, Ph.D.

11:15 a.m.  Social and Behavioral Sciences Research Initiative (SBSRI)

Brent Roberts
Chair, SBSRI

11:45 a.m.  Health Sciences Strategy Task Force

Neal Cohen
Director, Interdisciplinary Health Sciences Institute (IHSI)

12:20 p.m.  Lunch Discussion: Beckman Investment in the Cancer Center

Jeff Moore
Director, Beckman Institute

12:50 p.m.  Closing Remarks

Rohit Bhargava
Director, Cancer Center at Illinois
H. Rex Gaskins obtained his Ph.D. in cell biology from The University of Georgia in 1989. From 1989-92, he completed postdoctoral studies in immunology and genetics at The Jackson Laboratory in Bar Harbor, Maine. He joined the faculty at the University of Illinois at Urbana-Champaign in 1992 and is a professor with appointments in the Departments of Animal Sciences and Pathobiology, the Division of Nutritional Sciences and the Carl R. Woese Institute for Genomic Biology. Research in his laboratory focuses on host-intestinal microbe interactions relevant to colorectal cancer with a particular interest in microbial sulfur metabolism. Efforts to understand colonic mucosal responses to hydrogen sulfide led to further interest in redox regulation of tumorigenesis resulting in a long-time collaboration with bioengineering faculty at Illinois to create genetically-encoded biosensors and engineered platforms for the study of redox poise in subcellular compartments in live cells.

Professor Gaskins also serves as Deputy Director of the NIH-supported Tissue Microenvironment Training Program and chairs the Steering Committee of the Cancer Center at Illinois.
Prof. Rohit Bhargava is Bliss Faculty Scholar and professor in the Department of Bioengineering. He received his Ph.D. from Case Western Reserve University and undergraduate degree from the Indian Institute of Technology, New Delhi. Following a stint at the National Institutes of Health, Bhargava came to Illinois in 2005. A cutting-edge researcher, Bhargava has pioneered the development of infrared spectroscopic imaging, starting from his doctoral thesis that was the first in this field. Fundamental work in theory and numerical methods in his laboratory directly leads to new instrumentation and technologies. Instruments developed in his laboratory have been used to provide new means to characterize and define cancer using chemical imaging that are leading to the emergence of the field of digital molecular pathology. Using 3D-printing and engineered tumor models, his most recent research seeks to create designer cancers in the laboratory. Using real-world problems to inspire education and student development, among his recent educational innovations are the development of the Cancer Scholars Program—a challenge-inspired model for undergraduate education—and a NIH-funded graduate training program focusing on the tissue microenvironment.
New Member Tech Talks

Liang Gao  
Assistant Professor, Electrical & Computer Engineering  

Ultrafast Biophotonics  

Space and time, two key physical dimensions, constitute the basis of modern metrology. In bio-imaging, as recognized by the 2014 Nobel Prize in chemistry, there have been breathtaking advances in improving the spatial resolution of microscopic imaging, resulting in an impressive arsenal of nanoscopy tools that can break the diffraction limit of light. Despite equally important, the pursuit of a high-temporal resolution has only recently caught attention thanks to the emergence of several enabling technologies. The motivation to develop these ultrafast imagers originates from the landscape shift of the contemporary biology from morphological explorations and phenotypic probing of organisms to seeking quantitative insights into underlying mechanisms at molecular levels. The transient molecular events occur at a timescale varying from tens and hundreds of microseconds that ligands take to bind, to tens of femtoseconds that molecules take to vibrate. Ultrafast imaging, therefore, is essential for observation and characterization of such dynamic events. In this presentation, Prof. Gao will give an overview of ultrafast bioimaging techniques developed in his research lab. The Intelligent Optics Laboratory research program will ultimately lead to a new generation of ultrafast bioimagers and make transformative advancements to the state-of-the-art methods.

Anna Arthur  
Assistant Professor, Food Science & Human Nutrition  

The Role of Nutrition in Determining Cancer Outcomes and Survivorship  

Dr. Arthur’s lab is working to improve the quality of life, overall health and longevity of adults diagnosed with cancer through nutrition. Her research focuses on the role of nutrition in determining health outcomes after cancer diagnosis and to elucidate the underlying biological mechanisms. Her ultimate goal is to develop new and beneficial dietary recommendations and medical nutrition therapies for cancer patients and survivors. Dr. Arthur takes a transdisciplinary approach to her research, collaborating with multidisciplinary teams including physicians, population scientists, basic scientists and biostatisticians, and integrating methods in nutritional sciences, behavioral science and cancer molecular epidemiology. Dr. Arthur’s research has primarily specialized in head and neck cancers, but she is actively working to extend her work to other cancer populations including breast, gastrointestinal and other cancer groups at high nutritional risk.
Bio-inspired Sensors for Image-Guided Surgery

Image-guided surgery (IGS) can enhance cancer treatment by decreasing, and ideally eliminating, positive tumor margins and iatrogenic damage to healthy tissue. Current state-of-the-art near-infrared fluorescence imaging systems are bulky, costly, lack sensitivity under surgical illumination, and lack co-registration accuracy between multimodal images. As a result, an overwhelming majority of physicians still rely on their unaided eyes and palpation as the primary sensing modalities to distinguish cancerous from healthy tissue. In this talk, Prof. Gruev will describe his efforts in designing image sensors for IGC by mimicking the visual systems of the mantis shrimp to construct low power, compact and highly sensitive multispectral sensors. Preclinical and clinical data demonstrate seamless integration of these technologies in the surgical work flow while providing surgeons with real-time information on the location of cancerous tissue and sentinel lymph nodes, respectively. Due to its low cost, the bio-inspired sensors will provide resource-limited hospitals with much-needed technology to enable more accurate value-based health care.
Social and Behavioral Sciences Research Initiative (SBSRI)

Brent W. Roberts

Chair, Social and Behavioral Sciences Research Initiative
Professor, Psychology

Prof. Roberts will introduce the role of SBSRI and discuss opportunities for research collaboration with cancer center members.

Brent Roberts is a Professor of Psychology in the Department of Psychology at the University of Illinois, in the Social-Personality-Organizational Division. Roberts received his Ph.D. from Berkeley in 1994 in Personality Psychology and worked at the University of Tulsa until 1999, when he joined the faculty at the University of Illinois, Urbana-Champaign. He received the J. S. Tanaka Dissertation Award for methodological and substantive contributions to the field of personality psychology in 1995. He has since been awarded the Carol and Ed Diener Mid-Career award in Personality Psychology, The Theodore Millon Mid-Career award in Personality Psychology, the Henry Murray Award, and was recently acknowledged by Thomson Reuters as a highly cited researcher for 2016.

Roberts has served as the Associate Editor for the Journal of Research in Personality, and Psychological Science, as a member-at-large and Executive Officer for the Association for Research in Personality, as a member of the Data Monitoring Committee of the Health and Retirement Study, and on the Editorial Boards of the Journal of Personality and Social Psychology, Personality and Social Psychology Review, and Perspectives on Psychological Science. He is currently the Chair of the Social and Behavioral Sciences Research Initiative at the University of Illinois at Urbana-Champaign.
Health Sciences Strategy Task Force

Neal J. Cohen

Director, Interdisciplinary Health Sciences Institute (IHSI)
Professor, Department of Psychology, the Neuroscience Program, and the Beckman Institute

Neal Cohen, IHSI Director, will speak briefly about the Health Sciences Strategy Task Force, which he is chairing as part of the campus-wide strategic planning process. The 30-minute presentation and discussion will cover general information and background of the committee (the charge, membership, and overall process/timeline); and explain the impact areas around which the committee will be making recommendations. Cancer is one of the major impact areas for which the Task Force will be advocating, and thus any input from the cancer community during this discussion will help strengthen the Task Force’s recommendations as they finalize the report to the Chancellor and Interim Provost, due December 1, 2017.

Cohen is Professor in the Department of Psychology, the Neuroscience Program, and the Beckman Institute, at the University of Illinois at Urbana-Champaign. He serves as founding Director of the Center for Nutrition, Learning, and Memory (CNLM), a public-private partnership between the University of Illinois and Abbott Laboratories that is the nation’s first nutritional neuroscience research center, in addition to his role as founding Director of the Interdisciplinary Health Sciences Initiative (IHSI), supporting efforts to catalyze, connect, support, and engage health sciences-related research activities at Illinois.
Beckman Institute Investment in the Cancer Center

In this 30-minute discussion session, Prof. Moore will highlight the role of the Beckman Institute team in supporting the Cancer Center at Illinois and its commitment to getting the center established and branded as a NCI-designated cancer center.

Jeff Moore is director of the Beckman Institute, after serving as interim director for a year. He received his Ph.D. in Materials Science and Engineering from the University of Illinois in 1989. He is the Murchison-Mallory Professor of Chemistry and a professor of Materials Science and Engineering at the University of Illinois at Urbana-Champaign and a part-time Beckman Institute faculty member for the Autonomous Materials Systems group. His fields of professional interest are molecular self-assembly, structure-controlled macromolecules, stimuli-responsive materials, single-molecule lithography, self-healing polymers, and materials and methods for nano- and meso-scale devices.