May 31 - June 1 | 2017
The University of Tennessee, Knoxville

21ST CENTURY CURES: SOUTHEAST CONFERENCE
WELCOME MESSAGE

Taylor Eighmy
Vice Chancellor for Research and Engagement
University of Tennessee, Knoxville

It is a privilege to welcome you to the 21st Century Cures: Southeast Conference.

The Southeast is disproportionately affected by chronic diseases and preventable deaths. According to the Centers for Disease Control and Prevention, compared to other regions in the US, citizens in our region face a greater risk of Alzheimer’s disease, adult obesity, stroke, cardiovascular disease, and breast, lung, and colon cancer. Compounding the issue are prescription drug abuse in some areas and a lack of access to health care in others.

Fortunately, this region is also host to academic, not-for-profit, and federal research institutions, many of which are represented here today, which are well prepared to pursue new knowledge and create solutions to overcome these challenges. In particular, we have an opportunity to collaborate regionally around solutions to these grand challenges.

The sessions you will attend as a part of this event focus on the intersections of precision medicine, the BRAIN Initiative, and cancer research with computational approaches and data analytics, basic biology, and materials science. The agenda features the work of prestigious scientists in these fields and provides opportunities to learn from leaders within the National Institutes of Health.

After this event, you will have greater knowledge and scientific insight into the health issues facing the people of our region. During this conference, you will make connections with researchers from institutions across the Southeast that will lead to shared knowledge and strategic partnerships that will produce innovative research to address the challenges in the 21st Century Cures Act.

Thank you for joining us.
Knoxville, Tennessee, is served by McGhee Tyson Airport (TYS), approximately 20 minutes from the University of Tennessee campus.

TRANSPORTATION
Rental car services and taxis are available at the airport. Uber and Lyft are often available.

CONFERENCE HOTEL
Four Points by Sheraton Knoxville Cumberland House Hotel
1109 White Avenue, Knoxville

EVENT LOCATION
The University of Tennessee
Howard H. Baker Jr. Center for Public Policy
1640 Cumberland Avenue, Knoxville
WEDNESDAY | MAY 31

3:30 - 5:00 PM  Check-in for Conference Attendees in the Rotunda
5:00 - 5:10 PM  Keynote Introduction, Toyota Auditorium
   Dr. Kimberly Eck, Director of Research Development, University of Tennessee, Knoxville
5:10 - 6:00 PM  Evening Keynote Address, Toyota Auditorium
   Being a Dataologist: Data Will See You Now
   Dr. Nitesh Chawla, Frank M. Freimann Professor of Computer Science & Engineering and Director of the Interdisciplinary Center for Network Science and Applications (iCeNSA), University of Notre Dame
6:00 - 8:00 PM  Welcome Reception with Refreshments in the Rotunda

THURSDAY | JUNE 1

8:00 - 8:45 AM  Breakfast in the Rotunda
8:45 - 9:00 AM  Welcome Remarks, Toyota Auditorium
   Dr. Taylor Eighmy, Vice Chancellor for Research and Engagement, University of Tennessee, Knoxville
9:00 - 9:45 AM  Morning Keynote Address, Toyota Auditorium
   Supercomputer-Driven Drug Discovery
   Dr. Jeremy Smith, Governor’s Chair Professor of Biochemistry and Cellular and Molecular Biology, University of Tennessee, Knoxville, and Director of the UT/ORNL Center for Molecular Biophysics
9:55 - 10:50 AM  Concurrent Session I
   Deep Learning Enabled National Cancer Surveillance to Support Precision Oncology
   Dr. Georgia Tourassi, Director of the Biomedical Science and Engineering Center at Oak Ridge National Laboratory and Joint Professor in the Department of Mechanical, Aerospace, and Biomedical Engineering, University of Tennessee, Knoxville
   Toyota Auditorium
   Towards New Strategies in the Study of Addiction Neuroscience
   Dr. Danny Winder, Professor of Molecular Physiology and Biophysics, Vanderbilt University
   Room 204/205
   Overview of the NIH Peer Review Process
   Dr. René Etcheberrigaray, Deputy Director of the NIH Center for Scientific Review
   Room 207/208

11:00 - 11:55 AM  Concurrent Session II
   The BRAIN Initiative at NIH
   Dr. Edmund (Ned) Talley, Program Director of Channels, Synapses, and Circuits at the National Institute of Neurological Disorders and Stroke
   Toyota Auditorium
   Resources for Cancer Nanotechnology Research at the National Cancer Institute
   Dr. Stephanie Morris, Program Officer for the Alliance for Nanotechnology in Cancer at the National Cancer Institute
   Room 204/205
   Genomes to Phenomes: Systems Biology and Supercomputing
   Dr. Daniel Jacobson, Computational Biologist, Oak Ridge National Laboratory
   Room 207/208

12:00 - 1:00 PM  Lunch in the Rotunda
1:00 - 2:00 PM  Discussion Panel: Multiagency Partnerships to Advance Discovery, Toyota Auditorium
2:10 - 3:05 PM  Concurrent Session III
   Advancing Innovation and Technology in Cancer Research
   Dr. Sean Hanlon, Associate Director of the Center for Strategic Scientific Initiatives at the National Cancer Institute
   Toyota Auditorium
   Toward Controlled Membrane Fusion and Adhesion via Engineered Proteins
   Dr. Eric Boder, Career Development Associate Professor in the Department of Chemical and Biomolecular Engineering, University of Tennessee, Knoxville
   Room 204/205
   NIH Policies on Rigor and Reproducibility
   Dr. René Etcheberrigaray, Deputy Director of the NIH Center for Scientific Review
   Room 207/208

3:15 - 4:10 PM  Concurrent Session IV
   Precision Targeting of Gap Junction Connexins for Clinical Indications in Wound Healing, Heart Disease, and Brain Tumors
   Dr. Robert Gourdie, Virginia Tech Carilion Research Institute
   Toyota Auditorium
   Electronic Medical Records and Genomics (eMERGE) Network
   Dr. Rongling Li, Epidemiologist and Program Director for eMERGE at the National Human Genome Research Institute
   Room 204/205

4:20 - 4:30 PM  Closing Remarks, Toyota Auditorium
Nitesh Chawla started his tenure-track career at Notre Dame in 2007 and quickly advanced from assistant professor to hold a chaired full professor position in 2016. A driving theme of his research program is the interdisciplinary applications of data science - innovating to advance the common good. He has received numerous awards for research, scholarship, and teaching. He is the recipient of the 2005 IEEE CIS Outstanding Early Career Award, the IBM Watson Faculty Award, the IBM Big Data and Analytics Faculty Award, and the National Academy of Engineering New Faculty Fellowship, and his PhD dissertation received the Outstanding Dissertation Award.

In recognition of the societal and community-driven impact of his research, he was recognized with the Rodney Ganey Award and Michiana 40 Under 40. He is a two-time recipient of Outstanding Teaching Award at Notre Dame. He is a Fellow of the Reilly Center for Science, Technology, and Values; Fellow of the Institute of Asia and Asian Studies; and Fellow of the Kroc Institute for International Peace Studies at Notre Dame. He is the founder of Aunalytics, a data science company.

Jeremy C. Smith has led research groups in France, Germany, and the United States. After postdoctoral work at Harvard with Nobel Laureate Martin Karplus, in 1989 he established a biomolecular simulation group at the Commissariat à l’Énergie Atomique in Saclay, near Paris.

In 1998 he became the first chair in computational biology in Germany, at the University of Heidelberg, and in 2006 became the first University of Tennessee–Oak Ridge National Laboratory Governor’s Chair and also founding director of the UT/ORNL Center for Molecular Biophysics. He has supervised more than 100 staff, students, and postdoctoral fellows.

As of 2017 Smith has published close to 400 peer-reviewed scientific articles that together have been cited more than 25,000 times. Smith’s interests include the high-performance computer simulation of biological macromolecules in health, energy, and neutron and environmental sciences. In collaboration with Professor Jerome Baudry of UT, scientists at ORNL, and a number of medical research groups, his supercomputer-based computational drug discovery efforts have led to experimentally validated lead compounds for many targets of importance in a variety of diseases.
Deep Learning Enabled National Cancer Surveillance to Support Precision Oncology

GEORGIA TOURASSI
Director of the Biomedical Science and Engineering Center at Oak Ridge National Laboratory and Joint Professor in the Department of Mechanical, Aerospace, and Biomedical Engineering, University of Tennessee, Knoxville

Georgia Tourassi holds a B.S. in physics from the University of Thessaloniki, Greece, and a Ph.D. in biomedical engineering from Duke University. She received the Young Investigator’s Award from NIH and the Whitaker Foundation. Before joining ORNL, Dr. Tourassi was Professor of Radiology and the Medical Physics Graduate Program at Duke University Medical Center, where she currently holds an adjunct professor position.

Her research interests include biomedical informatics, medical imaging, and computer-aided decision support. Her medical imaging research has been featured in several publications including *The Economist*, and won an R&D 100 award in 2014. Her latest research work is focused on the use of cyber-informatics for cancer-related epidemiological discovery, and she was selected as finalist for an R&D 100 award in 2015.

She has authored over 250 peer-reviewed journals, conference proceedings papers, and book chapters. She serves regularly on NIH grant review study sections (charter member for BMIT 2007-2011 and BCHI 2014-now). She also serves on the FDA advisory committee on computer-aided diagnosis devices. She is a senior member of IEEE, INNS, and SPIE. In 2015 she was elected Fellow of the American Institute of Medical and Biological Engineering and the American Association of Physicists in Medicine.

Towards New Strategies in the Study of Addiction Neuroscience

DANNY G. WINDER
Professor of Molecular Physiology and Biophysics, Psychiatry and Behavioral Sciences and Pharmacology Director, Vanderbilt Center for Addiction Research

Winder received his B.S. from North Georgia College and his Ph.D. in neuroscience from Emory University in 1995. After completing a postdoctoral fellowship with Nobel Laureate Eric Kandel, M.D., at Columbia University College of Physicians and Surgeons, he joined the Vanderbilt faculty in 1999 as assistant professor of molecular physiology and biophysics. He was promoted to full professor in 2010.

A neuroscientist focused on addiction, Dr. Winder has been particularly interested in determining mechanisms that modulate synaptic plasticity, and how and when these processes are disrupted in alcoholism and addiction. To accomplish these goals, he and his colleagues have pioneered the use of whole cell patch clamp and extracellular recordings in ex vivo brain slice preparations containing key stress circuits.

In 2013, Dr. Winder received a NARSAD Distinguished Investigator Award and in 2016 a MERIT Award from NIAAA. He is founding director of the Vanderbilt Center for Addiction Research, which was established in 2016 to define events that drive addictive behavior and develop new treatments to sustain recovery. At the national level, he is associate editor of *The Journal of Neuroscience*, section editor of *Neuropharmacology*, and a member of the editorial board of *Molecular Pharmacology*.

Overview of the NIH Peer Review Process

RENAÉ ETCHEBERRIGARAY
Deputy Director of the NIH Center for Scientific Review

René Etcheberrigaray served as director of the Division of Neuroscience, Development, and Aging from December 2008 to June 2014. He was previously chief and scientific review officer (SRO) of the Brain Disorders and Clinical Neuroscience Integrated Review Group.

Dr. Etcheberrigaray obtained his M.D. degree from the University of Chile in 1987 and later that year came to the NINDS intramural research program as a postdoctoral fellow. He continued in the intramural program as visiting associate and then visiting scientist. Subsequently, Dr. Etcheberrigaray joined the faculty of Georgetown University’s Department of Neurology. Prior to becoming an SRO in 2002, Dr. Etcheberrigaray was the laboratory director of a biotechnology company in Rockville, Maryland. His research focused on the molecular and cellular mechanisms of memory and Alzheimer’s disease.
The BRAIN Initiative at NIH

EDMUND (NED) TALLEY
Program Director of Channels, Synapses, and Circuits at the National Institute of Neurological Disorders and Stroke

Edmund (Ned) Talley is a program director at the National Institute of Neurological Disorders and Stroke, where he co-leads the group overseeing the NIH component of the BRAIN Initiative, a multi-US government agency effort. He is project officer for technology development in optical methods and optical probes for recording and modulating neural activity. In addition, he oversees a portfolio of research projects focused on basic mechanisms of communication between neurons. Prior to joining NINDS, Dr. Talley studied contributions of ion channels to the dynamics of neural activity and modulation at the University of Virginia.

Genomes to Phenomes: Systems Biology and Supercomputing

DANIEL JACOBSON
Computational Biologist, Oak Ridge National Laboratory

Dan Jacobson’s career as a computational/systems biologist has included leadership roles in academic, corporate, and national lab settings. His lab focuses on the development and subsequent application of mathematical, statistical, and computational methods to biological datasets in order to yield new insights into complex biological systems. His lab’s approaches include the use of network theory and topology discovery/clustering, wavelet theory, machine learning (among others: random forests, support vector machines, etc.) and linear algebra (primarily as applied to large-scale multivariate modeling, together with traditional and more advanced supercomputing architectures.

Areas of statistics of particular interest to his lab include the use of both frequentist (parametric and non-parametric) and Bayesian methods as well as the development of new methods for Genome-Wide Association Studies (GWAS) and Phenome-Wide Association Studies (PheWAS). These mathematical and statistical methods are applied to various population and (meta) multiomics data sets (genomics, phylogenomics, transcriptomics, proteomics, metabolomics, microbiomics, viriomics, phytomics, chemiomics, etc.) individually as well as in combination in an attempt to better understand the functional relationships as well as biosynthesis, signaling, transcriptional, translational, degradation, and kinetic regulatory networks at play in biological organisms and communities.

His group takes a broad view of biological complexity and evolution that stretches from viruses to microbes to plants to humans (including cancer and neuroscience). ORNL is home to some of the world’s largest supercomputers and thus his lab uses petascale computing to analyze and model complex biological systems and is actively involved in the development of exascale applications for biology.

Resources for Cancer Nanotechnology Research at the National Cancer Institute

STEPHANIE MORRIS
Program Officer for the Alliance for Nanotechnology in Cancer at the National Cancer Institute

Stephanie Morris is a program director in the National Cancer Institute (NCI) Office of Cancer Nanotechnology Research (OCNR) within the Center for Strategic Scientific Initiatives. She joined OCNR in 2012 and manages nanotechnology research awards that are part of the Alliance for Nanotechnology in Cancer program. She also participates in the development of new NCI research initiatives and is a member of several NIH/interagency committees and working groups, especially those focused on nanoinformatics.

Prior to joining OCNR, Dr. Morris performed her postdoctoral work at NCI in the Laboratory of Receptor Biology and Gene Expression, where she focused on the genome-wide activity of chromatin remodeling enzymes involved in nuclear receptor function and oncogenesis, and was funded by a UNCF-Merck Postdoctoral Fellowship. She was a Ford Predoctoral Fellow and received her Ph.D. in biochemistry and biophysics from the University of North Carolina at Chapel Hill, where she studied the transcriptional role of histone-modifying enzymes. Before pursuing her graduate studies, Dr. Morris worked at the Albert Einstein College of Medicine, where she directed an Analytical Ultracentrifugation Facility in the Laboratory of Macromolecular Analysis and Proteomics. She graduated from Wesleyan University in Middletown, Connecticut, with a B.A. in biology, and in neuroscience and behavior.

Genomes to Phenomes: Systems Biology and Supercomputing

DANIEL JACOBSON
Computational Biologist, Oak Ridge National Laboratory

Dan Jacobson’s career as a computational/systems biologist has included leadership roles in academic, corporate, and national lab settings. His lab focuses on the development and subsequent application of mathematical, statistical, and computational methods to biological datasets in order to yield new insights into complex biological systems. His lab’s approaches include the use of network theory and topology discovery/clustering, wavelet theory, machine learning (among others: random forests, support vector machines, etc.) and linear algebra (primarily as applied to large-scale multivariate modeling, together with traditional and more advanced supercomputing architectures.

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CONCURRENT SESSION III

Advancing Innovation and Technology in Cancer Research
SEAN HANLON
Associate Director of the Center for Strategic Scientific Initiatives at the National Cancer Institute

Sean E. Hanlon is associate director of the Center for Strategic Scientific Initiatives (CSSI) at the NCI, where he contributes to the vision and strategic plans of the center, provides leadership in identifying emerging fields, and develops and implements new initiatives. Additionally, Dr. Hanlon serves as a CSSI/NCI representative on NCI, NIH, and inter-agency working groups and committees, including Cancer Moonshot Implementation teams and the trans-NCI Data Sharing working group. He also provides strategic and scientific leadership to collaborative transdisciplinary programs, including the NIH Common Fund’s qD Nucleome program.

Prior to joining CSSI, Dr. Hanlon served as program director within the NCI Division of Cancer Biology, where he was director of the Physical Sciences-Oncology Network (PS-ON). In this role, he led the scientific management and oversight of the PS-ON and worked to identify synergistic opportunities and foster new collaborations. Dr. Hanlon is a molecular biologist and genomicist by training with a focus on fundamental problems in chromatin organization, epigenetics, and transcriptional regulation. He came to the NCI in 2009 through the AAAS Science and Technology Policy Fellowship program. Prior to his selection as an AAAS Fellow, Dr. Hanlon was a postdoctoral fellow at the University of North Carolina at Chapel Hill, where he used genomics and bioinformatics approaches to address problems in transcriptional regulation on a genome-wide scale. Dr. Hanlon received his Ph.D. in molecular biology and biochemistry in 2003 from Rutgers University, where his work focused on understanding how chromatin structure influences transcription and cell-cycle progression.

Toward Controlled Membrane Fusion and Adhesion via Engineered Proteins
ERIC BODER
Career Development Associate Professor in the Department of Chemical and Biomedical Engineering, University of Tennessee, Knoxville

Eric Boder is the Career Development Associate Professor of Chemical and Biomolecular Engineering, an adjunct associate professor of biochemistry, cellular, and molecular biology, and a member of the Executive Committee of the Institute of Biomedical Engineering at the University of Tennessee. He received his doctorate in chemical engineering from the University of Illinois in 1999. He completed postdoctoral training in molecular immunology at the National Jewish Medical and Research Center in Denver, Colorado, and was previously an assistant professor of chemical engineering and bioengineering at the University of Pennsylvania.

Dr. Boder leads a research group in the field of protein engineering, primarily targeting applications in conformationally regulated proteins, cell adhesion, membrane fusion, MHC antigen presentation, and enzymatic protein ligation.

NIH Policies on Rigor and Reproducibility
RENÉ ETCHEBERRIGARAY
Deputy Director of the NIH Center for Scientific Review

Rene Etcheberrigaray served as director of the Division of Neuroscience, Development, and Aging from December 2008 to June 2014. He was previously chief and scientific review officer (SRO) of the Brain Disorders and Clinical Neuroscience Integrated Review Group.

Dr. Etcheberrigaray obtained his M.D. degree from the University of Chile in 1987 and later that year came to the NINDS intramural research program as a postdoctoral fellow. He continued in the intramural program as visiting associate and then visiting scientist. Subsequently, Dr. Etcheberrigaray joined the faculty of Georgetown University, Department of Neurology. Prior to becoming an SRO in 2002, Dr. Etcheberrigaray was the laboratory director of a biotechnology company in Rockville, Maryland. His research focused on the molecular and cellular mechanisms of memory and Alzheimer’s disease.
Robert Gourdie, has been director of the Center for Heart and Regenerative Medicine (CHARM) at the Virginia Tech Carilion Research Institute since 2012. He is also a professor in the Department of Biomedical Engineering and Mechanics at Virginia Tech. Together with its five team leaders, CHARM numbers around 25 postdocs, graduate students, and staff. Gourdie is co-founder of FirstString Research Inc., a clinical-stage biotech company, now in Phase III clinical trials on its lead drug developed in Gourdie’s lab. In 2016, he spun out a new biotech company from his VTCRI lab, Acomhal, which is undertaking preclinical development of a novel drug that targets cancer stem cells.

The NIH has continuously funded Gourdie since 1997, including as program director of a NICHD program project grant. He has authored 150+ peer-reviewed publications (H index = 47) on heart development and function, wound healing, and cancer. He holds more than a dozen issued patents, with another 50 patent applications pending. His research is on the connexins—proteins key to intercellular communication. This includes basic mechanisms of cardiac bio-electricity, and translational research on drugs targeting connexin function in heart disease, wound healing, and oncology. Gourdie received his Ph.D. (1990) from the University of Canterbury, New Zealand, and did postdoc training at University College London, United Kingdom. Prior to joining Virginia Tech, Gourdie was professor at the Medical University of South Carolina in Charleston, South Carolina, from 1995 to 2012.

Rongling Li is a genetic epidemiologist and has been serving as the program director for the electronic Medical Records and Genomics (eMERGE) Network. She has a longstanding interest in genetic/genomic discovery research including phenotype identification, gene-gene, gene-environment, and gene-drug interactions. She is also interested in clinical implementations of genetic/genomic variants.

Before Dr. Li came to the United States in 1991, she was working at the Chinese Academy of Medical Sciences (Beijing) and the Chinese Academy of Preventive Medicine (Beijing). She completed her postdoctoral training at Glaxo and her residency at Glaxo-Wellcome. She worked at Rho, a biostatistics consulting firm/contract research organization in Chapel Hill, North Carolina.

Dr. Li was on the faculty of Morehouse School of Medicine in Atlanta and was a tenured professor at the University of Tennessee Health Science Center within the Department of Preventive Medicine and Center for Genomics and Bioinformatics (Memphis, Tennessee) before joining the National Human Genome Research Institute (NHGRI) in 2009.

Dr. Li taught genetic epidemiology and was a mentor to graduate students, junior faculty members, and clinicians. Dr. Li has published more than 100 peer-reviewed journal articles. She is also an associate editor of the American Journal of Epidemiology.
21ST CENTURY CURES: SOUTHEAST CONFERENCE ADVISORY COMMITTEE

SPECIAL THANKS

Georgia Tourassi
Oak Ridge National Laboratory

Lonnie Crosby
University of Tennessee, Knoxville

Jeremy Smith
Oak Ridge National Laboratory and the University of Tennessee, Knoxville

Uday Vaidya
University of Tennessee, Knoxville

Reinhold Mann
Oak Ridge National Laboratory and the University of Tennessee, Chattanooga

Michael Simpson
Oak Ridge National Laboratory and the University of Tennessee, Knoxville

Andy Sarles
University of Tennessee, Knoxville