2020 NIH Pain Consortium Symposium on Advances in Pain Research Technologies for Improved Understanding and Management of Pain

June 3, 2020

All-Virtual Meeting

Hyochol Ahn, PhD

Hyochol Ahn received his BE in electrical engineering from the University of Seoul, South Korea, and MS in electrical and computer engineering from the University of Florida (UF). Then, he received his BS in nursing, MS in adult and elderly nursing, and PhD in nursing. During his postgraduate training at the UF Clinical and Translational Science Institute, he also earned an MS in clinical and translational science.

Currently, Dr. Anh is the Theodore J. and Mary E. Trumble Professor in Aging Research at The University of Texas Health Science Center at Houston Cizik School of Nursing. His program of research aims to enhance health and independence in older adults using innovative technologies to optimize pain management. His combined nursing and computer engineering expertise uniquely positions him to address critical gaps in research on pain-related brain mechanisms and to deliver cutting-edge brain stimulation to improve pain and symptom management. He is sought after for his expertise in identifying biopsychosocial determinants that influence pain and disability among older adults and developing innovative pain management interventions and assessments. He has been continuously funded since 2011 as a principal investigator (total > $ 3.5 million) and has produced more than 45 peer-reviewed publications (29 as first author).

He is the PI of an NIH/NINR R15 study (R15NR018050, 2019-2022) to test home-based noninvasive brain stimulation to treat chronic pain in older adults and an NIH/NINR R01 study (R01NR019051, 2020-2025) to test combination therapy with home-based transcranial direct current stimulation and mindfulness-based meditation.

Beth Darnall, PhD

Beth Darnall, PhD is Associate Professor at Stanford University School of Medicine, Department of Anesthesiology, Perioperative, and Pain Medicine. As Director of the Stanford Pain Relief Innovations Lab, she leads NIH and PCORI-funded clinical trials that broadly investigate behavioral medicine for acute and chronic pain, including a $9M multi-state trial on voluntary patient-centered prescription opioid reduction.

Her team develops and investigates novel pain treatments that are scalable, effective, and low burden. Her single-session skills-based pain class, Empowered ReliefTM is available in two languages and in healthcare systems throughout the U.S., and in Australia, U.K., Denmark and Canada. Digital therapeutic innovations include

on-demand, skills-based, self-regulatory treatment for perioperative patients, and virtual reality for acute and chronic pain.

She twice briefed the U.S. Congress on the opioid and pain crises and provided invited testimony to the FDA on iatrogenic harms associated with opioid tapering. She is an invited scientific member of the NIH Interagency Pain Research Coordinating Committee, a federal advisory committee created by the U.S. Department of Health and Human Services to enhance pain research efforts and collaboration across the government, and advance the fundamental understanding of pain and pain treatment. Her work has been featured in outlets such as Scientific American, NPR Radio, BBC Radio, and Nature. In 2018 she spoke on the psychology of pain relief at the World Economic Forum in Davos, Switzerland.

Jennifer Harrison, MS

Jennifer Harrison holds a Master of Science degree is Geosciences and a Bachelor of Arts degree in Mathematics. Born and raised in western Kentucky, Jenny spent her years immediately after college in Belmopan, Belize working with the Ministry of Natural Resources. She has spent the past 25 years in Houston, Texas, raising three wonderful humans and running a small business. Jenny owns TeachMeGIS, a GIS training center that, over the past 20 years, has taught the petroleum industry, local and state government, and public health professionals how to use Geographic Information Systems to map, and to spatially analyze their data. Her business has trained professionals in all parts of the world, including Japan, Bahrain, Thailand, and Angola.

George Lewis, PhD

Dr. George Lewis is the President of ZetrOZ Systems www.zetroz.com a global healthcare company developing and manufacturing non-invasive medical devices to accelerate tissue healing and relieve pain for chronic musculoskeletal conditions. ZetrOZ Systems is an FDA cGMP and ISO 13585 medical technology company headquartered on the Southern Coastal Region of Connecticut and has manufacturing facilities across the United States of America.

Over the last decade at ZetrOZ Systems, Dr. Lewis has commercialized three distinctly unique medical devices into the healthcare ecosystem (UltrOZ®, sam®Sport and sam®Pro 2.0) www.samrecover.com. Most notably, the sam® product has become broadly adopted across professional and college athletics and work-place injury patient care, and is approved by many insurance carriers in the USA including the US DOD and Veterans Administration for accelerating soft tissue healing and reducing pain without surgery and narcotic use. The company is working to provide safer and more effective treatment options for prevalent conditions such as arthritis pain: https://www.linkedin.com/pulse/management-osteoarthritis-over-30-million-americans-lewis-jr-ph-d-/

Prior to founding ZetrOZ Systems, Dr. Lewis was a Presidential Life Science Fellow, a National Science Foundation Fellow and United States Senate Page in Washington DC. He has authored more than 50 peer-reviewed publications and abstracts and has filed over 60 global patents. Dr. Lewis graduated summa cum laude in biomedical engineering from the University of Miami, FL and received his doctorate from Cornell University, NY. In his free time, Dr. Lewis enjoys boating, flying, carpentry, and camping with his wife and children. Connect with Dr. Lewis on LinkedIn: https://www.linkedin.com/in/george10/

Wenqin Luo, PhD

Dr. Wenqin Luo is interested at the organization, development, and function of mammalian somatosensory system, especially the neurons and pathways in sensing and mediating pain, itch, and touch. She did her medical training in Hunan Medical University, China, and Ph.D. research with Dr. Jeremy Nathans at the Johns Hopkins University from 1999-2005. After that, she conducted a short postdoc with Dr. Larry Katz at the Duke University in 2005 and completed her postdoc training with Dr. David Ginty's lab at the Johns Hopkins University from 2006-2011. There she focused on roles of Ret, the receptor tyrosine kinase for GDNF family ligands, in controlling the development of mammalian pain- and touch-sensing DRG neurons and pioneered molecular identification and genetic tracing of A beta low-threshold mechanoreceptors. Dr. Luo was recruited to the department of neuroscience, Perelman School of Medicine, University of Pennsylvania in 2011, and has been promoted as tenured associated professor in 2018. Her lab is using a combination of genetic, physiological, and behavior approaches to understand functional organization of touch-, pain-, and itch-sensing circuits, how they are established during development, how they crosstalk with each other, and various molecular mechanisms in mediating and modulating these sensations in normal and pathological conditions. Her lab is also interested at developing new methods for analyzing rodent pain and itch behaviors to improve specificity, sensitivity, rigor, and reproducibility.

Sean Mackey, MD, PhD

Sean Mackey, MD, PhD, is Chief of the Division of Pain Medicine and Redlich Professor of Anesthesiology, Perioperative and Pain Medicine at Stanford University. Dr. Mackey received his BSE and MSE in Bioengineering from University of Pennsylvania and his PhD in Electrical and Computer Engineering, as well as his MD, from University of Arizona. He completed his Anesthesiology residency and Pain Medicine fellowship at Stanford and then joined the faculty. Under Dr. Mackey's leadership, Stanford's Pain Management Center has been twice designated a Center of Excellence by the American Pain Society (APS) for the Center's innovative approach in comprehensive, interdisciplinary, and outcomes-based care. He has served as principle investigator on multiple NIH awards where he has overseen efforts to map specific regions of the brain and spinal cord that perceive and process pain. Dr. Mackey is author of over 200 journal articles and book chapters in addition to numerous national and international lectures. Currently, he is developer of a free, open-source learning health system—CHOIR (http://choir.stanford.edu)—to transform the care of people with pain, and serve as a platform for research in real-world clinic patients. Dr. Mackey is Past-President of the American Academy of Pain Medicine (AAPM). He co-authored the Institutes of Medicine's report on *Relieving Pain in America*. He was Co-Chair of the Oversight Committee for HHS/NIH *National Pain Strategy (NPS),* an effort to establish a national health strategy for pain care, education and research. He has received multiple awards for leadership, teaching, research, and clinical care. In the last few years, he has received the APS Wilbert E. Fordyce Clinical Investigator Award, AAPM's Pain Medicine Fellowship Award, Distinguished Service Award, and Robert G. Addison, MD Award, and NIH Directors' Award for his efforts on the NPS.

Ana Moreno, PhD – Mitchell Max Awardee

Ana Moreno received a bachelor's in Biosystems Engineering from the University of Arizona with a focus on biosensors; and a master's and doctorate in Bioengineering from the University of California San Diego, with a research focus on developing CRISPR-Cas9 platforms to broaden their applications to also include genome regulation. Her work included the first published work to demonstrate the in vivo use of a nuclease-null Cas9 (dCas9) that resulted in a phenotypic improvement, specifically in a mouse model of retinitis pigmentosa. In addition, Moreno also demonstrated the utility of dCas9 in prevention and amelioration of chronic pain. For her graduate work, Moreno received CONACYT and UCMEXUS fellowships and the Engelson PhD Thesis Award. In 2018, Moreno founded Navega Therapeutics, a startup tackling the opioid epidemic via gene therapies for chronic pain, where she is the CEO.

Kathi Mooney, PhD, RN, FAAN

Kathi Mooney is a Distinguished Professor in the College of Nursing at the University of Utah in Salt Lake City Utah where she holds a presidential endowed chair. She is the interim Senior Director for Populations Sciences and Co-leader of the Cancer Control and Population Sciences program at Huntsman Cancer Institute. She is nationally recognized as a leader in technology-aided symptom monitoring. She led the implementation of the routine collection of patient-reported outcomes (PROs) at the Huntsman Cancer Institute. Her research, with 19 years of continuous NCI funding, has pioneered novel development of remote monitoring and outreach approaches to cancer patients and family caregivers at home. She developed and tested Symptom Care at Home, a comprehensive system that remotely monitors cancer patient reported symptoms, including pain, and caregiver wellbeing, provides automated self-management coaching tailored to the specific symptoms reported and alerts oncology providers of poorly controlled symptoms so they can intensify symptom care utilizing a decision support system. Through several NCI funded R01 studies using this system, she has demonstrated significant symptom reduction and quality of life improvements for cancer patients and improved wellbeing for their family caregivers. Dr. Mooney also implements and evaluates models of care that improve access to symptom and supportive care for patients and their families in their homes and communities. Recently, at the ASCO annual conference, she reported significant reductions in health care utilization and charges for patients admitted to an oncology hospital at home program versus usual care.

Ted Price, PhD

Theodore (Ted) Price is the Eugene McDermott Professor and Director of the Systems Neuroscience Program in the School of Behavioral and Brain Sciences at University of Texas (UT) at Dallas. He is also the Director of the Center for Advanced Pain Studies at UT Dallas. He did his PhD work with Chris Flores and Ken Hargreaves at UT Health San Antonio and a postdoctoral fellowship at McGill University with Fernando Cervero. He started his independent laboratory in 2007 at University of Arizona School of Medicine and moved to UT Dallas in 2014. His lab is interested in molecular mechanisms driving the transition to chronic pain with a focus on drug development for chronic pain disease modification and on peripheral and central mechanisms of neuronal plasticity in response to injury. He has won numerous awards including The Patrick D. Wall Young Investigator Award from IASP. He is co-section editor for neurobiology for PAIN and is on the editorial board of Journal of Neuroscience. Ted has

published more than 125 peer reviewed studies, has been continuously funded by NIH for more than 10 years, and is a standing member of the Somatosensory and Pain Study Section for NIH.

Cary Reid, PhD, MD

Cary Reid, PhD, MD, is a graduate of the University of South Carolina School of Medicine. Dr. Reid completed his residency in Medicine at Dartmouth-Hitchcock Medical Center and fellowships in both Clinical Epidemiology and Geriatrics Medicine at Yale University. Dr. Reid has received many research awards over the years, including a Robert Wood Johnson Generalist Physician Scholar Award and a highly coveted Paul Beeson Faculty Scholar on Aging Research Award. He is also a section editor of the journal *Pain Medicine*. Dr. Reid's work at TRIPLL supports translational research on pain and aging in New York City. He joined the faculty of New York-Presbyterian Hospital/Weill Cornell Medical Center in January 2003.