

NO CME	8:00 AM	WELCOME & LOGISTICS • Hosted by Elliot Krames, MD, Eric Grigsby, MD, MBA, and Peter Staats, MD
2.25 CME	8:15 AM	SOLVING NEUROMODULATION PROBLEMS WITH BIOENGINEERING Moderated by Joseph Pancrazio, PhD
	8:20 AM	NIH STIMULATING PERIPHERAL ACTIVITY TO RELIEVE CONDITIONS (SPARC) PROGRAM Gene Civillico, PhD • <i>National Institutes of Health</i>
	8:40 AM	EXPLOITING POLYMERIC MATERIALS FOR NEURAL INTERFACE APPLICATIONS Joseph Pancrazio, PhD • <i>University of Texas at Dallas</i>
	9:00 AM	CHALLENGES IN MULTICHANNEL MICROSTIMULATION OF THE NERVOUS SYSTEM Robert Gaunt, PhD • <i>University of Pittsburgh</i>
	9:20 AM	INTERFACING WITH THE PERIPHERAL NERVOUS SYSTEM WITH CARBON NANOTUBE WIRES Dominique Durand, PhD • <i>Case Western Reserve University Department of Biomedical Engineering</i>
NO CME	9:40 AM	MODEL-BASED DESIGN OF OPTIMAL NEURAL INTERFACES Warren Grill, PhD • <i>Duke University</i>
NO CME	10:00 AM	THIN-FILM ELECTRODE TECHNOLOGIES FOR NEURAL STIMULATION AND RECORDING Daryl Kipke, PhD • <i>Neuronexis Corporation</i>
NO CME	10:20 AM	COFFEE BREAK • Networking or On Your Own
NO CME	10:30 AM	ELECTRICAL BLOCK OF NERVE CONDUCTION Kevin Kilgore, PhD • <i>Case Western Reserve University Department of Biomedical Engineering</i>
	10:50 AM	DRG STIMULATION FOR AMPUTEES Lee Fisher, PhD • <i>University of Pittsburgh</i>
	11:10 AM	BLOOD BRAIN BARRIER STATUS AS A MARKER OF INTRACORTICAL ELECTRODE SENSING RELIABILITY Ravi Bellamkonda, PhD • <i>Georgia Institute of Technology</i>
	11:30 AM	SENSORY STIMULATION FOR LIMB LOSS: IMPORTANCE OF FEEDBACK AND PATTERNED STIMULATION Dustin Tyler, PhD • <i>Case Western Reserve University Department of Biomedical Engineering</i>
NO CME	11:50 AM	QUESTIONS, ANSWERS & FUTURE DIRECTIONS
NO CME	12:10 PM	LUNCH BREAK • On Your Own
1.0 CME	1:15 PM	FUNCTIONAL ELECTRICAL STIMULATION (FES) Moderated by Hunter Peckham, PhD
	1:20 PM	FES: WHERE ARE WE TODAY & WHERE ARE WE GOING? Jennifer French, MBA • <i>Neurotech Reports</i>
	1:40 PM	A NOVEL TECHNOLOGY FOR ELECTRICAL ACTIVATION OF THE NERVOUS SYSTEM Hunter Peckham, PhD • <i>Case Western Reserve Department of Biomedical Engineering</i>
	2:00 PM	REANIMATION & USER CONTROL OF THE PARALYZED ARM Robert Kirsch, PhD • <i>Case Western Reserve University Department of Biomedical Engineering</i>
NO CME	2:20 PM	RESTORATION OF UPPER EXTREMITY FUNCTION Kevin Kilgore, PhD • <i>Case Western Reserve Department of Biomedical Engineering</i>
NO CME	2:40 PM	QUESTIONS, ANSWERS & FUTURE DIRECTIONS
NO CME	3:00 PM	COFFEE BREAK AND POSTER VIEWING
0.25 CME	3:25 PM	MOA OF SACRAL NERVE STIMULATION Moderated by Magdy Hassouna, MD, PhD
	3:30 PM	NEUROTRANSMITTER MECHANISMS UNDERLYING NEUROMODULATION OF REFLEX BLADDER ACTIVITY William "Chet" de Groat, PhD • <i>University of Pittsburgh</i>
NO CME	3:50 PM	NEUROANATOMY OF MICTURITION Alexandra Haessler, MD • <i>San Francisco Urogynecology, Inc.</i>
NO CME	4:10 PM	MECHANISMS OF EXCITATORY & INHIBITORY PUDENAL NEUROMODULATION Warren Grill, PhD • <i>Duke University Department of Biomedical Engineering</i>
NO CME	4:30 PM	SACRAL NEUROMODULATION IN PELVIC DISORDERS: A CRITICAL APPRAISAL Magdy Hassouna, MD, PhD • <i>University of Toronto</i>
NO CME	4:50 PM - 5:10 PM	QUESTIONS, ANSWERS & FUTURE DIRECTIONS
NO CME	5:45 PM - 7:00 PM	WELCOME RECEPTION • Location: Grand Ballroom Foyer

NO CME	8:00 AM	WELCOME & LOGISTICS • Hosted by Elliot Krames, MD, Eric Grigsby, MD, MBA, and Peter Staats, MD
NO CME	8:15 AM	THE SCIENCE OF BRAIN STIMULATION Moderated by Ali Rezai, MD
NO CME	8:20 AM	THE PRESENT STATE OF NEUROMODULATION OF THE BRAIN Ali Rezai, MD • <i>Ohio State University School of Medicine</i>
NO CME	8:40 AM	CONNECTOMIC NEUROMODULATION Cameron McIntyre, PhD • <i>Case Western Reserve University Department of Biomedical Engineering</i>
NO CME	9:00 AM	TEMPORAL PATTERN IS A NEW DIMENSION OF THERAPEUTIC BRAIN STIMULATION Warren Grill, PhD • <i>Duke University</i>
NO CME	9:20 AM	TREATING BRAIN CIRCUIT DYSFUNCTION IN ALZHEIMER'S DISEASE Andres Lozano, MD, PhD • <i>University of Toronto</i>
NO CME	9:40 AM	COFFEE BREAK • Networking or On Your Own
NO CME	10:10 AM	VAGAL NERVE STIMULATION FOR BRAIN PLASTICITY Michael Kilgard, PhD • <i>Univeristy of Texas at Dallas</i>
NO CME	10:30 AM	PRESENT STATE OF THE SCIENCE OF CORTICAL STIMULATION Brian Kopell, MD • <i>Mount Sinai Health Systems</i>
NO CME	10:50 AM	NEW STRATEGIES FOR TARGETED NEUROSTIMULATION IN DBS FOR PARKINSON'S DISEASE Stephen Carcier, PhD • <i>Boston Scientific</i>
NO CME	11:10 AM	QUESTIONS, ANSWERS & FUTURE DIRECTIONS
NO CME	11:40 AM - 1:05 PM	LUNCH BREAK On Your Own
0.75 CME	1:05 PM	OPTOGENETICS Moderated by Robert Gross, MD, PhD
NO CME	1:10 PM	LUMINOPSINS: COMBINING BIOLUMINESCENCE & OPTOGENETICS FOR HARDWARE INDEPENDENT NEUROMODULATION Robert Gross, MD, PhD • <i>Emory Healthcare</i>
	1:30 PM	OPTOGENETIC APPROACHES TO STUDY FUNCTIONAL RECOVERY IN STROKE Michelle Cheng, PhD • <i>Stanford University School of Medicine</i>
	1:50 PM	SWITCHES FOR LOCOMOTION, REWARD, & A VIRAL-BASED APPROACH TO NON-INVASIVE WHOLE-BRAIN CARGO DELIVERY Viviana Gradinaru, PhD • <i>Caltech</i>
NO CME	2:10 PM	ILLUMINATING BRAIN CIRCUIT MECHANISMS UNDERLYING NEUROMODULATION Jin Hyung Lee, PhD • <i>Stanford University</i>
NO CME	2:30 PM	QUESTIONS, ANSWERS & FUTURE DIRECTIONS
NO CME	2:50 PM	COFFEE BREAK AND POSTER VIEWING
0.75 CME	3:15 PM	BRAIN/MACHINE/COMPUTER INTERFACING Moderated by Chad Bouton, MS
	3:20 PM	ACHIEVEMENTS & REMAINING CHALLENGES IN BRAIN-MACHINE INTERFACES Chad Bouton, MS • <i>The Feinstein Institute for Medical Research, Noth Shore-LIJ Health System</i>
	3:40 PM	INTRACORTICAL MICROSTIMULATION IN HUMAN SOMATOSENSORY CORTEX: PERCEPTION & PROSTHETIC CONTROL Robert Gaunt, PhD • <i>University of Pittsburgh</i>
NO CME	4:00 PM	A NEURAL BRIDGING TECHNOLOGY FOR CORTICAL CONTROL OF DEXTEROUS MOVEMENTS IN A HUMAN WITH QUADRIPLÉGIA Gaurav Sharma, PhD • <i>Battelle Memorial Institute</i>
NO CME	4:20 PM	REVIEWING THE STATE OF THE ART IN BI-DIRECTIONAL BRAIN-MACHINE INTERFACES Jadin Jackson, PhD • <i>Medtronic</i>
NO CME	4:40 PM - 5:00 PM	QUESTIONS, ANSWERS & FUTURE DIRECTIONS

NO CME	8:00 AM	WELCOME & LOGISTICS • Hosted by Elliot Krames, MD, Eric Grigsby, MD, MBA, and Peter Staats, MD
0.5 CME	8:15 AM	KEYNOTE: THE ROLE OF NINDS IN THE DEVELOPMENT OF NEUROMODULATION Stephanie Fertig, MBA • <i>National Institutes of Health</i>
NO CME	8:45 AM	BREAK • Networking or On Your Own
1.0 CME	8:55 AM	TARGETED DRUG DELIVERY, PT. 1 Moderated by Tony Yaksh, PhD
	9:00 AM	SAFETY ASSESSMENT OF SPINAL THERAPEUTICS Tony Yaksh, PhD • <i>UC San Diego Moores Cancer Center</i>
	9:30 AM	DRUG DISTRIBUTION IN THE INTRATHECAL SPACE Andreas Linninger, PhD • <i>University of Illinois at Chicago</i>
NO CME	10:00 AM	IT GENE THERAPY-TARGETING IL-10 PRODUCTION John Forsayeth, PhD • <i>University of California San Francisco Department of Neurosurgery</i>
NO CME	10:30 AM	QUESTIONS, ANSWERS & FUTURE DIRECTIONS
NO CME	11:00 AM - 12:25 PM	LUNCH BREAK On Your Own
NO CME	12:25 PM	TARGETED DRUG DELIVERY, PT. 2 Moderated by Krystof Bankiewicz, MD, PhD
NO CME	12:30 PM	IT RESNIFERATOXIN Michael Leong, MD • <i>Stanford University School of Medicine</i>
NO CME	1:00 PM	SPINAL STEM CELL & GENE DELIVERY FOR MODULATION OF SPINAL INJURY-INDUCED MOTOR & SENSORY DEFICIT Martin Marsala, MD, PhD • <i>University of California San Diego School of Medicine</i>
NO CME	1:30 PM	INTRAPARENCHYMAL DELIVERY FOR PD Krystof Bankiewicz, MD, PhD • <i>University of California San Francisco</i>
NO CME	2:00 PM	INTRATHECAL SP-SAPORIN Doug Lappi, PhD • <i>Veivoe Animal Health</i>
NO CME	2:30 PM	QUESTIONS, ANSWERS & FUTURE DIRECTIONS
NO CME	3:00 PM	COFFEE BREAK AND POSTER VIEWING
1.0 CME	3:25 PM	STIMULATION FOR EPILEPSY Moderated by Dominique Durand, PhD
	3:30 PM	SEIZURE CONTROL WITH LOW FREQUENCY STIMULATION Dominique Durand, PhD • <i>Case Western Reserve University Department of Biomedical Engineering</i>
	4:00 PM	CLOSED-LOOP OPTOGENETIC CONTROL OF TEMPORAL LOBE EPILEPSY Ivan Soltesz, PhD • <i>Stanford University School of Medicine</i>
NO CME	4:30 PM	WHAT THE CLINICIAN WANTS TO KNOW FROM BASIC SCIENTISTS ABOUT DBS FOR EPILEPSY Robert Fisher, MD, PhD • <i>Stanford University School of Medicine</i>
NO CME	5:00 PM	NEUROSTIMULATION FOR EPILEPSY, AND OVERVIEW OF STRATEGIES TO INTERFERE WITH SEIZURES Kristl Vonck, PhD • <i>University of Ghent</i>
NO CME	5:30 PM - 6:00 PM	QUESTIONS, ANSWERS & FUTURE DIRECTIONS

NO CME	8:00 AM	WELCOME & LOGISTICS • Hosted by Elliot Krames, MD & Peter Staats, MD
NO CME	8:15 AM	KEYNOTE PRESENTATION Grégoire Courtine, PhD • <i>Center for Neuroprosthetics and Brain Mind Institute, Swiss Federal Institute of Technology (EPFL)</i>
NO CME	8:35 AM	BIOELECTRONIC MEDICINE Moderated by Peter Staats, MD
	8:50 AM	BIOELECTRONIC MEDICINE FOR RHEUMATOID ARTHRITIS Yaakov Levine, PhD • <i>SetPoint Medical</i>
	9:10 AM	THE NEURAL TOURNIQUET Jared Huston, MD • <i>The Feinstein Institute for Medical Research, Noth Shore-LIJ Health System</i>
	9:30 AM	VAGAL NERVE STIMULATION AND SNS FOR INFLAMMATORY DISEASE Jiande Chen, PhD • <i>Johns Hopkins University</i>
	9:50 AM	VAGAL NERVE STIMULATION FOR DISORDERS OF THE HEART Jeff Ardell, PhD • <i>University of California Los Angeles</i>
	10:10 AM	NON-INVASIVE VAGUS NERVE STIMULATION FOR THE TREATMENT OF HEADACHE DISORDERS Bruce Simon, PhD • <i>electroCore</i>
NO CME	10:30 AM	COFFEE BREAK • Networking or On Your Own
	10:50 AM	NON-INVASIVE VAGAL NERVE STIMULATION JP Errico, PhD • <i>electroCore</i>
	11:10 AM	TECHNOLOGY ADVANCES IN BIOELECTRONIC MEDICINE Chad Bouton, MS • <i>The Feinstein Institute for Medical Research, Noth Shore-LIJ Health System</i>
	11:30 AM	NON-INVASIVE VAGUS NERVE STIMULATION EFFECT ON PERIPHERAL INFLAMMATION Imanuel Lerman, MD • <i>University of California San Diego</i>
NO CME	11:50 AM	QUESTIONS, ANSWERS & FUTURE DIRECTIONS
NO CME	12:10 PM - 1:30 PM	LUNCH BREAK On Your Own
NO CME	1:35 PM	BASIC SCIENCE OF SPINAL CORD STIMULATION Moderated by Richard North, MD & Bengt Linderöth, MD, PhD
	1:40 PM	SPINAL CORD ANATOMY, PAIN, & THE BASICS OF SCS Lisa Johaneck, PhD • <i>Medtronic</i>
	2:00 PM	SCS MECHANISMS OF ACTION: SPATIAL & TEMPORAL DIMENSIONS Tianhe Zhang, PhD • <i>Boston Scientific</i>
	2:20 PM	NEUROCHEMISTRY OF SCS: WHAT IS PRESENTLY KNOWN? Bengt Linderöth, MD, PhD • <i>Karolinska Institute</i>
	2:40 PM	CLOSED LOOP SPINAL CORD STIMULATION: NEW INSIGHT INTO MECHANISMS OF ACTION John Parker, PhD • <i>Saluda, Inc.</i>
	3:00 PM	CONVENTIONAL SCS VERSUS HIGH-FREQUENCY SCS FOR PAIN INHIBITION Yun Guan, MD, PhD • <i>Johns Hopkins University</i>
NO CME	3:20 PM	COFFEE BREAK • Networking or On Your Own
	3:40 PM	EFFECTS OF 10KHZ SPINAL STIMULATION (I): INHIBITION OF OUTPUT NEURONS OF THE DORSAL HORN Stephen McMahon, PhD, MFedSci, FSB • <i>King's College London</i>
	4:10 PM	EFFECTS OF 10KHZ SPINAL STIMULATION (II): <i>IN VITRO</i> AND COMPUTATIONAL APPROACHES Dongchul Lee, PhD • <i>Nevro Corporation</i>
	4:30 PM	NEURAXIS MECHANISMS OF ANALGESIA WITH DORSAL ROOT GANGLION STIMULATION Jeff Kramer, PhD • <i>St. Jude Medical / Spinal Modulation</i>
NO CME	5:10 PM - 5:45 PM	QUESTIONS, ANSWERS & FUTURE DIRECTIONS
NO CME	6:15 PM - 7:00 PM	WINE & CHEESE CLOSING RECEPTION Location: Grand Ballroom Foyer

NO CME	8:00 AM	WELCOME & LOGISTICS • Hosted by Elliot Krames, MD & Eric Grigsby, MD, MBA
0.75 CME	8:15 AM	SPINAL CORD STIMULATION FOR VISCERAL DISEASE Moderated by Robert Foreman PhD & Michael De Jongste, MD, PhD
NO CME	8:20 AM	SPINAL CORD STIMULATION FOR ABDOMINAL DISORDERS Leo Kapural, MD, PhD • <i>Wake Forest University</i>
NO CME	8:40 AM	CARDIAC NEUROMODULATION: SPINAL MECHANISMS Robert Foreman, PhD • <i>University of Oklahoma College of Medicine</i>
NO CME	9:00 AM	MECHANISMS OF STIMULATION FOR GASTROPARESIS SYNDROMES Jeff Ardell, PhD • <i>University of California Los Angeles</i>
	9:20 AM	TRANSLATION OF CLINICAL NEUROMODULATION QUESTIONS INTO BASIC VISCERAL EXPERIMENTS Michael DeJongste, MD, PhD • <i>University of Groningen</i>
	9:40 AM	EFFECTS OF NEUROMODULATION ON VISCERAL PROCESSING Eric Beaumont, PhD • <i>East Tennessee University Quillen College of Medicine</i>
NO CME	10:00 AM	QUESTIONS, ANSWERS & FUTURE DIRECTIONS
NO CME	10:20 AM	COFFEE BREAK • Networking or On Your Own
0.75 CME	10:45 AM	GASTROESOPHAGEAL STIMULATION Moderated by Jiande Chen, PhD
	10:50 AM	MECHANISMS OF ACTION OF INTESTINAL NEUROMODULATION FOR OBESITY & DIABETES Jiande Chen, PhD • <i>Johns Hopkins University School of Medicine</i>
	11:10 AM	GASTRIC NEUROMODULATION IN PEDIATRIC PATIENTS Hayat Mousa, MD, MBA • <i>Rady Children's Hospital San Diego</i>
NO CME	11:30 AM	MECHANISMS OF ACTION OF GASTRIC NEUROMODULATION FOR FUNCTIONAL DISORDERS Thomas Abell, MD • <i>University of Louisville School of Medicine</i>
NO CME	11:50 AM - 12:15 PM	QUESTIONS, ANSWERS & FUTURE DIRECTIONS
NO CME	12:15 PM - 12:45 PM	CLOSING REMARKS & NEUROVATIONS SCIENTIFIC AWARDS Hosted by Elliot Krames, MD & Eric Grigsby, MD, MBA

This activity has been planned and implemented in accordance with the accreditation requirements and policies of the Accreditation Council for Continuing Medical Education (ACCME) through joint providership of SpectrumCare and Neurovations Education. SpectrumCare is accredited by the ACCME to provide continuing medical education for physicians.

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