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Honored Guest

Andres Lozano, MD, PhD
RR Tasker Professor and Chairman of Neurosurgery
University of Toronto and the
Toronto Western Hospital

Best known for his work in Deep Brain Stimulation (DBS), Dr. Andres Lozano received his MD degree at the University of Ottawa and his neurosurgical training and PhD degree in Neurobiology at McGill. He is the Professor and Chairman of Neurosurgery at the University of Toronto and holds both the RR Tasker Chair in Functional Neurosurgery and a Tier 1 Canada Research Chair in Neuroscience.

Dr. Lozano has an active laboratory dedicated to the study of neurodegeneration and functional neurosurgery. His team has mapped out cortical and subcortical structures in the human brain and have pioneered applications of DBS for various disorders including Parkinson’s disease, depression, dystonia, anorexia, Huntington’s and Alzheimer’s disease.

Mahlon DeLong, MD
Professor of Neurology
Emory University School of Medicine

In a series of pioneering physiologic studies of the basal ganglia, Dr. Mahlon DeLong’s research helped to clarify the organization of parallel brain circuits involving the cerebral cortex and the basal ganglia subserving movement, executive and mood/reward functions. His studies helped to characterize the circuit disturbances underlying parkinsonism in animal models and demonstrated the abolition of parkinsonism with focal inactivation of nodes of the basal ganglia motor circuit. These studies, which provided novel targets, physiologic guidance and a clear rational for surgical approaches contributed to the revival and development of neurosurgical treatments for Parkinson’s and other movement disorders.

DeLong is an elected member of the Johns Hopkins Society of Scholars, the IOM and the AAAS. He is the Scientific Director of the Dystonia Medical Research Foundation and Director of the APDA Advanced Center for Parkinson Research at Emory. Dr. DeLong is the W.P. Timmie Professor of Neurology at Emory University School of Medicine.
Welcome to the 2014 Biennial Meeting!

Dear Colleagues,

On behalf of the American Society for Stereotactic and Functional Neurosurgery, it is our great pleasure to welcome you to Washington, DC. The ASSFN Biennial Meeting will cover the latest clinical and research advances in epilepsy, movement disorders, chronic pain, behavioral and cognitive disorders, as well as neural engineering and emerging technologies. Our Scientific Program Committee has put together an outstanding program with an impressive list of internationally-acclaimed speakers and selected abstract presentations covering the latest in new clinical applications, emerging technologies and recent discoveries in basic science and mechanisms. With nearly 200 submitted abstracts, this meeting promises to be an exciting and thought-provoking venue for scientific exchange and innovation. The 2014 meeting will also feature our Honored Guest, Andres Lozano, as well as our first Roy A. Bakay Lecturer, Mahlon DeLong.

We look forward to welcoming you to this exciting event in our Nation’s capital.

Konstantin V. Slavin, MD
ASSFN President

Ali R. Rezai, MD
Annual Meeting Chairman

Ashwini D. Sharan, MD
Scientific Program Chairman

Robert E. Gross, MD, PhD
Scientific Program Vice-Chairman

Kendall H. Lee, MD, PhD
Scientific Program Vice-Chairman
Meeting Directors

**Konstantin V. Slavin, MD**  
ASSFN President  
University of Illinois at Chicago  
Chicago, IL

**Ali R. Rezai, MD**  
Annual Meeting Chairman  
The Ohio State University  
Wexner Medical Center  
Columbus, OH

**Ashwini D. Sharan, MD**  
Scientific Program Chairman  
Thomas Jefferson University  
Philadelphia, PA

**Robert E. Gross, MD, PhD**  
Scientific Program Vice-Chairman  
The Emory Clinic  
Atlanta, GA

**Kendall H. Lee, MD, PhD**  
Scientific Program Vice-Chairman  
Mayo Clinic  
Rochester, MN

Invited Speakers

**Aviva Abosch**  
University of Colorado  
Anschutz Medical Campus  
Aurora, CO

**Ron L. Alterman**  
Beth Israel Deaconess Medical Center  
Boston, MA

**Gene H. Barnett**  
Cleveland Clinic  
Cleveland, OH

**Gregory K. Bergey**  
Johns Hopkins Epilepsy Center  
Baltimore, MD

**Hagai Bergman**  
The Hebrew University - Hadassah Medical School  
Jerusalem, Israel

**Stephan Chabardes**  
University Hospital  
Grenoble, France

**Jin Woo Chang**  
Yonsei University, College of Medicine  
Seoul, South Korea

**David Charles**  
Vanderbilt University Medical Center  
Nashville, TN

**Zang-Hee Cho**  
Neuroscience Research Institute  
Incheon, South Korea

**Peter Como**  
U.S. Food and Drug Administration  
Silver Spring, MD

**Charles Conway**  
Washington University  
St. Louis, MO

**Nathan Crone**  
The Johns Hopkins Hospital  
Baltimore, MD
Invited Speakers (continued)

Daniel Curry
Texas Children’s Hospital
Houston, TX

Ted M. Dawson
Johns Hopkins University
Baltimore, MD

Mahlon DeLong
Emory University
Medical Center
Atlanta, GA

Tim Denison
Medtronic
Minneapolis, MN

Darrin D. Dougherty
Department of Psychiatry
Massachusetts General Hospital
Charlestown, MA

W. Jeffrey Elias
University of Virginia
Health Systems
Charlottesville, VA

Emad Eskandar
Massachusetts General Hospital
Boston, MA

Itzhak Fried
University of California
Los Angeles Medical Center
Los Angeles, CA

William Gaillard
Children’s National
Health System
Washington, DC

Jorge Alvaro Gonzalez-Martinez
Cleveland Clinic Foundation
Cleveland, OH

Ashok Gowda
Visualase, Inc.
Houston, TX

Ben Greenberg
Alpert Medical School of
Brown University
Providence, RI

Warren Grill
Duke University
Durham, PA

Robert E. Gross
The Emory Clinic
Atlanta, GA

Ryder Gwinn
Epilepsy and Functional Neurosurgery
Seattle, WA

Clement Hamani
University of Toronto
Western Hospital
Toronto, Ontario

Sara Inati
NINDS
Bethesda, MD

Michael Gordon Kaplitt
Weill Medical College of
Cornell University
New York, NY

Peter Konrad
Vanderbilt University
Nashville, TN

Brian Kopell
Mount Sinai Medical Center
New York, NY

Walter Koroshetz
NIH/NINDS
Bethesda, MD

Lothar Krinke
Medtronic
Minneapolis, MN

Jens Kuhn
University of Cologne
Cologne, Germany

Kendall H. Lee
Mayo Clinic
Rochester, MN

Robert Levy
University of Florida
Jacksonville, FL

Brian Litt
University of Pennsylvania
Philadelphia, PA

Charles Y. Liu
University of Southern California
Los Angeles, CA

Andres M. Lozano
Toronto Western Hospital
Toronto, Ontario

Kip Ludwig
NIH/NINDS
Bethesda, MD
Invited Speakers (continued)

Andre Machado  
Cleveland Clinic  
Cleveland, OH

Helen S. Mayberg  
Emory University  
Atlanta, GA

Guy M. McKhann  
Columbia University  
New York, NY

Alon Y. Mogilner  
New York University  
New York, NY

Joseph S. Neimat  
Vanderbilt University  
Nashville, TN

Satinderpall S. Pannu  
Lawrence Livermore National Laboratory  
Livermore, CA

John Pezaris  
Massachusetts General Hospital  
Boston, MA

Julie G. Pilitsis  
Albany Medical Center  
Albany, NY

Bruce E. Pollock  
Mayo Medical Center  
Rochester, MN

Nader Pouratian  
University of California  
Los Angeles  
Los Angeles, CA

Bhaskar Malla Rao  
National Institute of Mental Health & Neuro Sciences  
Bangalore, India

Ali R. Rezai  
The Ohio State University Wexner Medical Center  
Columbus, OH

Mark Richardson  
University of Pittsburgh Medical Center  
Pittsburgh, PA

David W. Roberts  
Dartmouth-Hitchcock Medical Center  
Lebanon, NH

Joshua M. Rosenow  
Northwestern University Medical School  
Chicago, IL

Justin Sanchez  
DARPA/DSO  
Arlington, VA

Michael Gordon Schulder  
North Shore University Hospital  
Manhattan, NY

Ashwini D. Sharan  
Thomas Jefferson University  
Philadelphia, PA

Karl Sillay  
Semmes-Murphey Neurologic & Spine Institute  
Memphis, TN

Christopher Skidmore  
Thomas Jefferson University  
Philadelphia, PA

Konstantin V. Slavin  
University of Illinois at Chicago  
Chicago, IL

Philip A. Starr  
University of California  
San Francisco  
San Francisco, CA

Steven Swanson  
Medtronic  
Minneapolis, MN

Nitin Tandon  
University of Texas Medical School at Houston  
Houston, TX

William Theodore  
NINDS  
Bethesda, MD

Joseph I. Tracy  
Thomas Jefferson University  
Philadelphia, PA

Elizabeth Tyler-Kabera  
Children's Hospital of Pittsburgh  
Pittsburgh, PA

Taufik Valiante  
University of Toronto Division of Fundamental Neurobiology, Toronto Western Hospital Research Institute  
Toronto, Ontario

Jerrold L. Vitek  
University of Minnesota  
Minneapolis, MN

Kareem A. Zaghloul  
NINDS  
Bethesda, MD
Learning Objectives

Upon completion of this educational activity, participants will be able to:

1. Describe the recent findings in the pathophysiology of neurologic and behavioral disorders.
2. Discuss surgical strategies for the treatment of movement disorders, chronic pain, epilepsy, psychiatric disorders, and Parkinson's disease.
3. Discuss new applications of deep brain stimulation and other forms of neuromodulation.
4. Discuss emerging neuro-ablation therapies, including radiosurgery and focused ultrasound.
5. Apply recent advances in research to the clinical practice of functional neurosurgery.
6. Discuss new methods of surgical navigation, including their benefits and shortcomings.

Program Schedule

SATURDAY, MAY 31, 2014

7:00 AM – 6:00 PM  Renaissance Ballroom Registration Desk
REGISTRATION

8:00 AM – 5:00 PM  Mount Vernon A

EPILEPSY: BASICS FOR THE NEUROSURGEON AND NEUROLOGIST
Course Directors: Robert E. Gross, Kareem A. Zaghloul
Faculty: Gregory K. Bergey, Daniel Curry, William Gaillard, Jorge Alvaro Gonzalez-Martinez, Ryder Gwinn, Sara Inati, Guy M. McKhann, Bhaskar Malla Rao, Mark Richardson, Ashwini D. Sharan, Christopher Skidmore, Joseph I. Tracy, Kareem A. Zaghloul

8:00 – 8:15 AM
Introduction
Robert E. Gross

8:15 – 8:45 AM
Medical Treatment of Epilepsy: Basics and the Progression to Surgical Evaluation
Gregory K. Bergey

8:45 – 9:15 AM
EEG: Basics
Sara Inati

9:15 – 9:45 AM
The Non-Invasive Work-Up of the Surgical Epilepsy Patient
Christopher Skidmore

9:45 – 10:15 AM
Beverage Break
10:15 – 10:45 AM  
**MR Imaging and MEG in the Diagnostic Work-Up and Planning for Epilepsy**  
*Mark Richardson*

10:45 – 11:15 AM  
**Metabolic Imaging in Epilepsy**  
*William Gaillard*

11:15 – 11:45 AM  
**Neuropsychological Evaluation of the Presurgical Epilepsy Patient**  
*Joseph I. Tracy*

11:45 AM – 12:15 PM  
**Intracranial Grid/Strip Monitoring: Clinical and Research Applications**  
*Kareem A. Zaghloul*

12:15 – 1:00 PM  
**Lunch**

1:00 – 1:30 PM  
**Stereo EEG: Indications, Procedure, Results**  
*Jorge Alvaro Gonzalez-Martinez*

1:30 – 2:00 PM  
**Anatomy and Standard Surgical Approaches to the Temporal Lobe**  
*Ryder Gwinn*

2:00 – 2:30 PM  
**Anatomy and Surgical Approaches for Extratemporal Lobe Epilepsy**  
*Guy M. McKhann*

2:30 – 3:00 PM  
**Beverage Break**

3:00 – 3:30 PM  
**Disconnection Procedures: Callosotomy and Hemispherotomy**  
*Daniel Curry*

3:30 – 4:00 PM  
**Laser Ablation in the Surgical Treatment of Epilepsy**  
*Robert E. Gross*

4:00 – 4:30 PM  
**VNS, RNS, DBS**  
*Ashwini D. Sharan*

4:30 – 4:45 PM  
**Epilepsy Surgery in the Developing World**  
*Bhaskar Malla Rao*

4:45 – 5:00 PM  
**Challenging Cases**  
*Faculty*

1:00 – 5:30 PM  
**Meeting Room 16**

**NEURAL ENGINEERING AND INNOVATION**

**Moderators:** Peter Konrad, Kendall H. Lee, Brian Litt  
**Faculty:** Hagai Bergman, Zang-Hee Cho, Ashok Gowda, Warren Grill, Kip Ludwig, Satinderpall S. Pannu, John Pezaris, Elizabeth C. Tyler-Kabara
<table>
<thead>
<tr>
<th>Time</th>
<th>Event</th>
<th>Speaker(s)</th>
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<tbody>
<tr>
<td>1:00 – 1:10 PM</td>
<td>Engineering to Develop Technologies for Neurosurgeons</td>
<td>Kendall H. Lee</td>
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<td>1:10 – 1:30 PM</td>
<td>Thalamic Stimulation for Visual Restoration</td>
<td>John Pezaris</td>
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<td>1:30 – 1:50 PM</td>
<td>Neural Engineering, Industry and Funding Mechanisms</td>
<td>Kip Ludwig</td>
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<td>1:50 – 2:10 PM</td>
<td>Development of Second Sight</td>
<td>Satinderpall S. Pannu</td>
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<td>2:10 – 2:30 PM</td>
<td>Development of 7T MRI and HRRT PET</td>
<td>Zang-Hee Cho</td>
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<td>2:30 – 2:45 PM</td>
<td>Panel Discussion</td>
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<td>2:45 – 3:00 PM</td>
<td>Break</td>
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<td>3:00 – 3:20 PM</td>
<td>Engineering Increased Efficiency of DBS Systems</td>
<td>Warren Grill</td>
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<td>3:20 – 3:40 PM</td>
<td>Spinal Cord Injury and Where Engineering Has Failed and Where it Has Succeeded</td>
<td>Peter Konrad</td>
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<td>3:40 – 4:00 PM</td>
<td>Successful Surgery for BMI Implantation: What Does it Take?</td>
<td>Elizabeth Tyler-Kabara</td>
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<td>4:00 – 4:20 PM</td>
<td>Laser Ablation</td>
<td>Ashok Gowda</td>
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<td>4:20 – 4:40 PM</td>
<td>Location, Location, Location: Improving DBS Outcome by Electrophysiological Navigation</td>
<td>Hagai Bergman</td>
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<td>4:40 – 5:30 PM</td>
<td>Discussion</td>
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<td>1:00 – 5:30 PM</td>
<td><strong>FUNCTIONAL NEUROSURGERY: ECONOMICS AND PRACTICE MANAGEMENT</strong></td>
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<td><strong>Moderators:</strong> Brian Kopell, Alon Y. Mogilner</td>
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<td><strong>Faculty:</strong> Joseph S. Neimat</td>
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<td>The DBS Practice: Economic, Regulatory and Practical Concerns</td>
<td>Brian Kopell</td>
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<td></td>
<td>The Pain Practice (Pumps, Stims, Lesions): Economic, Regulatory and Practical Concerns</td>
<td>Alon Y. Mogilner</td>
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<td></td>
<td>Building an Epilepsy Practice</td>
<td>Joseph S. Neimat</td>
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SUNDAY, JUNE 1, 2014

7:00 AM – 6:00 PM  Renaissance Ballroom Registration Desk
REGISTRATION

7:30 AM – 3:40 PM  Renaissance Ballroom East
EXHIBITS

7:30 – 8:00 AM  Renaissance Ballroom East
BREAKFAST WITH EXHIBITORS

8:00 AM – 12:00 PM  Renaissance Ballroom West
GENERAL SCIENTIFIC SESSION I
FUNCTIONAL NEUROSURGERY: PAST, PRESENT AND FUTURE

8:00 – 8:05 AM
Opening Ceremony
Ali R. Rezai, Ashwini D. Sharan

8:05 – 8:23 AM
BMI DARPA Perspective
Justin Sanchez

8:23 – 8:41 AM
Electrochemical Closed Loop Brain Sensing
Kendall H. Lee

8:41 – 8:59 AM
Closed-Loop DBS: Exploring Basal Ganglia Computational Strategies
Hagai Bergman

8:59 – 9:15 AM
MR Guided Focus Ultrasound – Future Applications
Jin Woo Chang

9:15 – 9:40 AM  Roy A. Bakay Lecture
Mahlon DeLong

9:40 – 10:10 AM  Renaissance Ballroom East
BEVERAGE BREAK WITH EXHIBITORS

10:10 – 11:04 AM
Movement Disorders Surgery
Moderators: Aviva Abosch, Peter Konrad

10:10 – 10:28 AM
DBS for Improvement of Gait
Stephen Chabardes

10:28 – 10:46 AM
DBS for Early Parkinson’s Disease
David Charles
10:46 – 11:04 AM
New Human and Animal Models of Parkinson’s Disease Provide Unique Insights for Therapies
Ted M. Dawson

11:04 – 11:34 AM
Open Papers

11:04 – 11:14 AM
100 Pallidal-Cortical Beta Coherence is Activity-Modulated But Not Causally Related in Parkinson’s Disease
Mahsa Malekohammadi, William Speier, Nader Pouratian

11:14 – 11:24 AM
101 Evolution of Microendoscopic-Guided Percutaneous Cordotomy for Intractable Pain: Case Series of 24 Patients
Erich Talamoni Fonoff, William Omar Contreras Lopez, Ywzhe Sifuentes Almeida de Oliveira, Manoel Jacobsen Almeida de Oliveira Teixeira

11:24 – 11:34 AM
102 Mapping Episodic Memory in the Medial Temporal Lobe
Maxwell B. Merkow, John Burke, Ashwin Rammaya, James J. Evans, Ashwini D. Sharan, Michael J. Kahana, Michael Sperling

11:34 AM – 12:00 PM
PRESIDENTIAL ADDRESS
Konstantin V. Slavin

12:00 – 1:40 PM
Lunch Break on Own

12:00 – 1:40 PM
Grand Ballroom North/Central
Medtronic Luncheon Session (Non-CME Industry Sponsored)
Space is Limited
Partnership Beyond the Technology

1:40 – 5:00 PM
Renaissance Ballroom West
PARALLEL SESSION 1
NEUROCOGNITION TARGETS:
FROM BASIC SCIENCE TO INTERVENTION
Moderators: Itzhak Fried, Clement Hamani

1:40 – 1:50 PM
103 Network Dynamics of Functional Connectivity in Category-Specific Visual Naming
Nitin Tandon, Cihan Kadipasaoglu, Baboyan Vatche, Christopher R. Conner

1:50 – 2:00 PM
104 Pre-Stimulus Oscillatory Activity Predicts Successful Memory Encoding in a Paired Associates Episodic Memory Task
Rafi Haque, Srikanth Damera, Sarah K. Inati, Kareem A. Zaghloul

2:00 – 2:10 PM
105 Learning in Primates is Associated with Prefrontal Cortex Network Destabilization
Benjamin L. Grannan, Wenhua Zhang, Ziv Williams

2:10 – 2:35 PM
Entorhinal Cortex
Itzhak Fried
2:35 – 3:00 PM  
Neurostimulation and TBI  
Ali R. Rezai

3:00 – 3:40 PM  
BEVERAGE BREAK WITH EXHIBITORS

3:40 – 4:10 PM  
Open Papers

3:40 – 3:50 PM  
106 Changes in GABA and Glutamate Concentrations in the GPi During Memory Tasks in Patients with Parkinson’s Disease During DBS Surgery  
David Patrick Darrow, Zoltan Nadasdy, Klevest Gjini, Robert J. Buchanan

3:50 – 4:00 PM  
107 Medial to Lateral Transfer of Feedback Learning Signals in Human Prefrontal Cortex  
Sameer A. Sheth, Garrett P. Banks, Matthew Kamal Mian, Shaun Patel, Emad N. Eskandar, Elliot H. Smith

4:00 – 4:10 PM  
108 Microstimulation of the Human Substantia Nigra Alters Reinforcement Learning  
Ashwin G. Ramayya, Gordon H. Baltuch, Michael J. Kahana

4:10 – 4:25 PM  
Fornix  
Clement Hamani

4:25 – 4:40 PM  
What Human Electrophysiology Can Tell Us About Cognition?  
Emad Eskander

4:40 – 4:55 PM  
Electrocorticography to Explore Language and Auditory Processing  
Nathan Crone

4:55 – 5:00 PM  
Discussion

1:40 – 2:10 PM  
Open Papers

1:40 – 1:50 PM  
109 Is Insertional Effect a Predictor of Long-term Success After Deep Brain Stimulation for Neuropathic Pain?  
Ido Strauss, Vibhor Krishna, Clement Hamani, Soha Abdu Alomar, Andres M. Lozano

1:50 – 2:00 PM  
110 Prospective Study of Patient Outcomes Following Spinal Cord Stimulation with Intraoperative Monitoring  
Steven G. Roth, Joannalee C. Campbell, Jessica Haller, Meghan Heran, Priscilla De La Cruz, Steven Paniccioli, Michael Briotte, M. Reid Gooch, Julie G. Pilitsis
2:00 – 2:10 PM

111 High Frequency Stimulation in the Dorsal Column Blockade of Na+ Conductance Related to Subtle Differences within the Subcomponents of the h Gate
Jeffrey E. Arle, Longzhi Mei, Kristen W. Carlson, Jay L. Shils

2:10 – 2:35 PM

Science of Spinal Cord Stimulation for Pain
Alon Y. Mogilner

2:35 – 3:00 PM

DRG and High Frequency Stimulation
Robert Levy

3:00 – 3:40 PM Renaissance Ballroom East

BEVERAGE BREAK WITH EXHIBITORS

3:40 – 4:10 PM

Open Papers

3:40 – 3:50 PM

112 Trigeminal Neuralgia from Multiple Sclerosis: Is Percutaneous Surgery Effective?
Imran Noorani, Girish Vajramani, Amanda Lodge, Owen Sparrow

3:50 – 4:00 PM

113 Epipulse-Retro; Retrospective Study on Epidural Pulsed High Frequency Stimulation (500 000 Hz) in Pain Therapy
Frank Hertel

4:00 – 4:10 PM

114 The Nucleus Accumbens as an Adjunctive Target for Deep Brain Stimulation in Central Post Stroke Pain
Prakriti Gaba, Grant William Mallory, Deborah A. Gorman, Squire M. Stead, Bryan T. Klassen, Paola Sandroni, James Watson, Kendall H. Lee

4:10 – 4:25 PM

Nucleus Accumbens for Pain
Andre Machado

4:25 – 4:40 PM

Burst Stimulation
Konstantin V. Slavin

4:40 – 5:00 PM

Discussion

5:00 – 5:30 PM Renaissance Ballroom West

AWARD CEREMONY AND ASSFN BUSINESS MEETING
Konstantin V. Slavin, Aviva Abosch

6:00 – 8:00 PM Grand Ballroom South

OPENING RECEPTION
**MONDAY, JUNE 2, 2014**

7:00 AM – 6:00 PM  Renaissance Ballroom Registration Desk  
REGISTRATION

7:30 AM – 6:00 PM  Renaissance Ballroom East  
EXHIBITS

7:30 – 8:00 AM  Renaissance Ballroom East  
BREAKFAST WITH EXHIBITORS

8:00 AM – 12:00 PM  Renaissance Ballroom West  
GENERAL SCIENTIFIC SESSION 2  
THE CONVERGENCE OF SEIZURE SURGERY AND STEREOTAXIS  
Moderators: Jorge Gonzalez-Martinez, David W. Roberts

8:00 – 8:05 AM  
Introduction  
Jorge Gonzalez-Martinez, David W. Roberts

8:05 – 8:25 AM  
Stereotactic Mapping of Epileptic Networks  
Jorge Gonzalez-Martinez

8:25 – 8:40 AM  
RNS for Epilepsy: Rationale, Indications and Future Directions  
David W. Roberts

8:40 – 9:05 AM  
Laser Ablation for Epilepsy  
Robert E. Gross

9:05 – 9:30 AM  
Advanced Neuroprosthetics Development – Critical Role for Epilepsy Surgery in Modern Research Partnerships  
Charles Y. Liu

9:30 – 10:00 AM  Renaissance Ballroom East  
BEVERAGE BREAK WITH EXHIBITORS

10:00 – 10:40 AM  
Open Papers  
Moderators: Aviva Abosch, Philip Starr

10:00 – 10:10 AM  
115 An Automated Technique for the Quantification of Cortical Susceptibility After Discharges  
Tyler Davis, Paul A. House, F. Edward Dudek

10:10 – 10:20 AM  
116 Laterlization of Temporal Lobe Epilepsy by Imaging-Based Response-Driven Multinomial Multivariate Models  

10:20 – 10:30 AM  
117 Outcomes of Stereotactic Laser Ablation for Treatment-Resistant Epilepsy in the Pediatric Population with 1 Year Follow-Up  
Daniel Curry, Anil Shetty, Angus A. Wilfong
10:30 – 10:40 AM
118 Modulation of Hippocampal Neural Activity via Optogenetic Stimulation of the Medial Septum
Nealen Laxpati, Megha Chiruvella, Jack Tung, Claire-Anne Gutekunst, Robert E. Gross

10:40 – 11:00 AM
Clinical Trials
Peter Como

11:00 – 11:35 AM
Panel Discussion on Clinical Trials
Moderator: Ali R. Rezai
Panelists: Walter Koroshetz, Lothar Krinke, Andres Lozano, Kip Ludwig, Philip Starr, Peter Como

11:35 AM – 12:00 PM
HONORED GUEST LECTURE I
THE NEUROSURGERY OF MEMORY
Andres M. Lozano

12:00 – 1:30 PM
Lunch Break on Own

12:00 – 1:30 PM
Congressional Hall C
NeuroPace Luncheon Session (Non-CME Industry Sponsored)
Space is Limited
The NeuroPace RNS System for Epilepsy: Technology, Implant Technique and Patient Selection and Outcome

1:30 – 5:00 PM
Renaissance Ballroom West
PARALLEL SESSION 3
MOVEMENT DISORDERS
Moderators: Peter Konrad, Parag G. Patil

1:30 – 1:55 PM
Targets for Dystonia
Jerrold L. Vitek

1:55 – 2:20 PM
Closed Loop Sensing for Parkinson’s Disease
Philip A. Starr

2:20 – 3:00 PM
Open Papers

2:20 – 2:30 PM
119 Real and Imagined Gait Modify Neural Network Dynamics in the Pedunculopontine Nucleus
Timothy Tattersall, Terence J. Coyne, Peter Silburn, Raymond Cook, Paul Silberstien, Francois Windels, Peter Stratton, Pankaj Sah

2:30 – 2:40 PM
120 Subthalamic Nucleus Deep Brain Stimulation Induces Motor Network BOLD Activation
Paul Hoon-Ki Min, Erika K. Ross, Kendall Dennis, Ju Ho Jeong, Bryan Strieter, Joel Felmlee, Su Youne Chang, Kevin Bennet, Kendall H. Lee

2:40 – 2:50 PM
121 Long-term Outcome of the Posterolateral Globus Pallidus Internus Deep Brain Stimulation in Patients with Tourette Syndrome
Jian-Guo Zhang, Wei Hu, Kai Zhang, Matt Stead, Fan-Gang Meng
2:50 – 3:00 PM
Patient-Specific Anatomical Model for DBS Surgery Derived by 7T MRI
Noam Harel, Yuval Duchin, Kenneth B. Baker, Jon I. McIver, Jerrold L. Vitek, Guillermo Sapiro

3:00 – 3:30 PM
BEVERAGE BREAK WITH EXHIBITORS

3:30 – 5:00
EPILEPSY
Moderator: Charles Y. Liu, Ashesh Mehta

3:30 – 3:45 PM
High Frequency Oscillations
Brian Litt

3:45 – 4:00 PM
Metabolic Imaging in the Evaluation of Epilepsy
William Theodore

4:00 – 4:15 PM
The Promise and Pitfalls of Optogentic Strategies for Seizure Control
Taufik Valliante

4:15 – 5:00 PM
Open Papers

4:15 – 4:25 PM
Anterior Thalamic Deep Brain Stimulation: BOLD Activation Patterns in a Large Animal Model
William Gibson, Seong Rok Han, Erika K. Ross, Ju Ho Jeong, Joo Pyung Kim, Jamie Joseph Van Gompel, Kevin Bennet, Kendall H. Lee, Paul Hoon-Ki Min

4:25 – 4:35 PM
The Effects of DBS at Multiple Targets on Network Activity within the Papez Circuit
Paul Stypulkowski, Scott Stanslaski, Timothy Denison, Jonathon Giftakis

4:35 – 4:45 PM
Chronic Unlimited Recording Electrocorticography (CURE) Guided Resective Epilepsy Surgery: Beyond Subacute Monitoring – Technology-Enabled Enhanced Fidelity in Seizure Focus Localization with Improved Surgical Efficacy
Daniel J. Di Lorenzo, Erwin Zeta Mangubat, Marvin A. Rossi, Richard W. Byrne

4:45 – 4:55 PM
Relationship Between Seizure Outcomes and MTLE Ablation Volumetrics for Stereotactic Laser Ablation
Anil Shetty, Chengyuan Wu, Brad Fernald, Ashesh Mehta, Michael Sperling, Ashwini D. Sharan

4:55 – 5:00 PM
Discussion

1:30 – 5:00 PM
PARALLEL SESSION 4
EMERGING TECHNOLOGIES/BMI
Moderators: Kendall H. Lee, Satinderpall Pannu

1:30 – 2:10 PM
Open Papers
Monitoring of Nerve Action Potentials (NAP) in Response to Transcranial Electrical Stimulation During Neurosurgical Procedures: A Pilot Study for Developing New Intraoperative Monitoring Technique
Alexander Ivanov, Ashley Selner, Faisal W. Waseem, John Fino, Guy Edelman, Konstantin V. Slavin, James L. Stone

Task Specific Interhemispheric Coupling in STN
Adam Olding Hebb, Sara Hanraham, Joshua Nedrud, Sooroush Niketeghad, Mohammad Mahoor, Jun Zhang, Felix Darvas

The Development of High-Performance Communication Neural Prostheses
Paul Nuyujukian, Vikash Gilja, Jonathan C. Kao, Joline M. Fan, Sergey D. Stavisky, Stephen In-Sun Ryu, Krishna V. Shenoy

High Performance Communication Using Neuronal Ensemble Recordings From the Motor Cortex of a Person with ALS
Chethan Pandarinath, Vikash Gilja, Christine Blabe, Beata Jarosiewicz, Janos A Perge, Leigh R. Hochberg, Krishna V. Shenoy, Jaimie M. Henderson

Next Generation of Electrodes
Satinderpall S. Pannu

Neurostimulation for Bladder Control
Warren Grill

Intraspinal Microstimulation Using MINCS to Evoke Hind Limb Movements in a Porcine Model of Spinal Stimulation
Peter J. Grahn, Grant William Mallory, Juho Jeong, Jan T. Hachmann, Darlene Angela Lobel, Allan J. Bieber, Kevin Bennet, Kendall H. Lee, J. Luis Lujan

Optogenetic Inhibition Using a Genetically Encoded Bioluminescent Light Source
Jack Tung, Nealen Laxpati, Robert E. Gross

Novel Percutaneous Scalp Mount Base for SmartFrame® Enables Minimally Invasive MR-Guided Stereotactic Laser Ablation and DBS Electrode Placement
David Lozada, Jon T. Willie, Robert E. Gross

Stereotactic Integration of 3D Photographic Texture-Encoded Stereovision Surfaces
David W. Roberts, Xiaoyao Fan, Songbai Ji, Alex Hartov, Keith Paulsen

Optogenetics-Clinical Applications
Michael Gordon Kaplitt
TUESDAY, JUNE 3, 2014

7:00 AM – 4:00 PM Renaissance Ballroom Registration Desk
REGISTRATION

7:30 AM – 3:30 PM Renaissance Ballroom East
EXHIBITS

7:30 – 8:00 AM Renaissance Ballroom East
BREAKFAST WITH EXHIBITORS

8:00 AM – 12:00 PM Renaissance Ballroom West
PARALLEL SESSION 5
NEUROSURGERY FOR BEHAVIORAL DISORDERS
Moderators: Emad N. Eskandar, Brian H. Kopell

8:00 – 8:05 AM
Introduction
Emad N. Eskandar, Brian H. Kopell

8:05 – 8:23 AM
Depression (AIC): Lessons Learned
Darrin D. Dougherty

8:23 – 8:41 AM
Depression (CG25): Lessons Learned
Helen S. Mayberg

8:41 – 8:59 AM
DBS for Alcoholism and Addictions
Jens Kuhn

8:59 – 9:17 AM
DBS for OCD, Current Status and Future Directions
Ben Greenberg

9:17 – 9:35 AM
Vagal Nerve Stimulation
Charles Conway

9:35 – 10:00 AM
Questions & Answers: Where Do We Go From Here?
Moderators: Gordon H. Baltuch, Ali R. Rezai
Speakers: Darrin D. Dougherty, Ben Greenberg, Jens Kuhn, Helen S. Mayberg, Charles Conway

10:00 – 10:33 AM Renaissance Ballroom East
BEVERAGE BREAK WITH EXHIBITORS

10:33 – 10:51 AM
VNS for Heart Failure
Hani Sabbah
10:51 AM – 12:00 PM
Oral Papers

10:51 – 11:06 AM
135 A Phase II Dose Escalation Study of Cervical Targeted Intraspinal Microinjection in ALS: Interim Peri-Operative Morbidity and Peri-Procedural Outcomes

11:06 – 11:16 AM
136 Use of the Human Connectome to Validate fMRI Changes in the Nucleus Accumbens Associated with Reward Cues During a Gambling Task
Ausaf A. Bari, Patrick Pezeshkian, Won Kim, Antonio DeSalles, Nader Pouratian

11:16 – 11:26 AM
137 Screening the Human Connectome for Potential DBS Targets for the Treatment of Drug Addiction
Ausaf A. Bari, Patrick Pezeshkian, Won Kim, Antonio DeSalles, Nader Pouratian

11:26 – 11:36 AM
138 Different Neuropsychiatric Outcomes in Long-term Pallidal Versus Subthalamic DBS for Parkinson’s Disease (PD)
Yarema Basil Bezchlibnyk, Angela Haffenden, Scott Kraft, Zelma H.T. Kiss

TOP ORAL POSTERS – RAPID COMMUNICATION

11:36 – 11:42 AM
139 Combined Occipital and Supraorbital Nerve Stimulation for Chronic Migraine
Shannon W. Hann, Chengyuan Wu, Ashwini D. Sharan

11:42 – 11:48 AM
140 MRI-Guided Stereotactic Laser Ablation of Presumed Cavernous Malformations in Drug-Resistant Epilepsy
David Jason McCracken, Robert E. Gross, Jon Timothy Willie, David Lozada

11:48 – 11:54 AM
141 Postoperative Plasticity After Cingulotomy in Patients with Obsessive-Compulsive Disorder
Garrett P. Banks, Charles Mikell, Emad N. Eskandar, Sameer A. Sheth

11:54 AM – 12:00 PM
142 Towards an Intelligent Neuroprosthetic System for Seizure Control: Hippocampal Dynamics in a Rodent Model of Focal Epilepsy
Babak Mahmoudi, Robert E. Gross

8:00 AM – 12:00 PM Congressional Hall A/B
PARALLEL SESSION 6
IMAGE GUIDED APPLICATIONS
Moderators: Michael Schulder, Nader Pouratian

8:00 – 8:05 AM
Introduction
Michael Schulder, Nader Pouratian

8:05 – 8:25 AM
Radiosurgery – 2014 and Beyond
Bruce E. Pollock
8:25 – 8:45 AM  
Neurosurgery in the MR Suite (Here and Now)  
Karl Sillay

8:45 – 9:05 AM  
Laser Ablation for Tumor  
Gene H. Barnett

9:05 – 9:25 AM  
The Science of Brain Shift  
Peter Konrad

9:25 – 9:45 AM  
Incorporation of Functional Imaging into Your Program  
Nader Pouratian

9:45 – 10:15 AM  
BEVERAGE BREAK WITH EXHIBITORS

10:15 AM – 12:00 PM  
Oral Papers

10:15 – 10:25 AM  
143  
Fornix High Frequency Stimulation Induces BOLD Change and DA Release in Hippocampal and Mesolimbic Circuitry  
Erika K. Ross, Paul Hoon-Ki Min, Joo Pyung Kim, Seong Rok Han, Kendall H. Lee

10:25 – 10:35 AM  
144  
Structural Changes in Brain Circuits of Patients with Alzheimer’s Disease Undergoing Deep Brain Stimulation  
Tejas Sankar, Mallar Chakravarty, Agustin Bescos, Monica Lara, Toshiki Obuchi, Adrian Walter Laxton, Mary Pat McAndrews, David Tang-Wai, Gwenn Smith, Clifford Workman, Andres M. Lozano

10:35 – 10:45 AM  
145  
Interventional Magnetic Resonance Imaging (iMRI) - Guided Delivery of Therapeutics into the Brain with Radially Branched Deployment (RBD)  
Matthew Silvestrini, Dali Yin, Alastair Martin, Valerie Coppes, Preeti Mann, Nalin Gupta, Scott Panter, Xiaomin Zeng, Paul Larson, Philip A. Starr, Tejal Desai, Daniel A. Lim

10:45 – 10:55 AM  
146  
Brain Edema Around DBS Leads and Ventricular Catheters: Clinical Characteristics, Radiological Similarities and Differences  
Kathryn L. Holloway, Viktoras Palys, Marie Bradley, Miniam L. Hirsch, Jackie Johnson

10:55 – 11:05 AM  
147  
Development of High Precision MRI Guided Stereotactic System for Nonhuman Primate  
Ju Ho Jeong, Paul Hoon-Ki Min, Erika K. Ross, Kendall H. Lee, Kendall Dennis, Seong Rok Han, Michael P. Marsh, Bryan Striemer, Joel Felmlee, Stephan Goerss, Su-Youne Chang, Kevin Bennet

11:05 – 11:15 AM  
148  
Stereotactic Technique Determines Accuracy and Efficiency in “Asleep” DBS  
Zaman Mirzadeh, Kristina Chapple, Meg Lambert, Rohit Dhall, Francisco A. Ponce
11:15 – 11:25 AM
149 Evaluation of Tumor Progression and Detection of New Tumors During Repeat Stereotactic Radiosurgery for Brain Metastases Utilizing a Co-registration Imaging Tool Edward A. Monaco III, Jagdish P. Bhatnagar, Yuanguang Xu, Yoshio Arai, M. Saiful Huq, L. Dade Lunsford

11:25 – 11:35 AM
150 Convection Enhanced Delivery Guided DBS Electrode Placement for Stereotactic Surgery to Improve Placement Accuracy Aaron E. Bond, Robert Dallapiazza, George Gillies, W. Jeffrey Elias

11:35 – 11:45 AM
151 Reliability of Diffusion-Tractography-Based Thalamic Segmentation for Identifying Targets for Noninvasive Neuromodulation Using MR-guided Focused Ultrasound Angela Elizabeth Downes, W. Jeffrey Elias, Nader Pouratian

12:00 – 1:00 PM Lunch on Own

1:00 – 4:30 PM Renaissance Ballroom West
GENERAL SCIENTIFIC SESSION 3
CONTROVERSIES
Moderators: Julie G. Pilitsis, Joshua M. Rosenow, Konstantin V. Slavin

1:00 – 1:25 PM
SCS Paddles Asleep vs. Awake
Julie G. Pilitsis vs. Joshua M. Rosenow

1:25 – 1:50 PM
Essential Tremor – Hifu vs. DBS
W. Jeffrey Elias vs. Ron L. Alterman

1:50 – 2:15 PM
Face-Off DBS Asleep vs. Awake
Philip A. Starr vs. Aviva Abosch

2:15 – 3:00 PM
State of Art in 7T MRI and HRRT PET
Zang-Hee Cho

3:00 – 3:30 PM Renaissance Ballroom East
BEVERAGE BREAK WITH EXHIBITORS

3:30 – 3:55 PM
Invasive Epilepsy Mapping – Grids/Strips vs. Stereo EEG
Joseph S. Neimat vs. Nitin Tandon

3:55 – 4:30 PM HONORED GUEST LECTURE II
The Philip L. Gildenberg Lecture
ADVANCES IN SURGERY FOR MOVEMENT DISORDERS
Andres M. Lozano
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<th>Company/Web</th>
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<td>Ad-Tech</td>
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<td>Alpha Omega</td>
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<td>102</td>
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<tr>
<td>Brainlab</td>
<td>708-409-1343</td>
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<td>Cosman Medical</td>
<td>781-272-6561</td>
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<tr>
<td>Cyberonics, Inc.</td>
<td>800-332-1375</td>
<td>205</td>
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<tr>
<td>Elekta</td>
<td>770-300-9725</td>
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<td>FHC, Inc.</td>
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<tr>
<td>InSightec Inc.</td>
<td>214-630-2000</td>
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<tr>
<td>Integra</td>
<td>609-275-0500</td>
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For over 25 years, Epilepsy Centers have made Ad-Tech their choice for invasive electrodes for brain mapping and epilepsy monitoring.

The global leader in Microelectrode recording. Our latest innovation in neuroscience is the Neuro Omega high channel closed loop technology.

Brainlab, headquartered in Munich, develops, manufactures and markets software-driven medical technology, enabling access to and consistency of advanced, less invasive patient treatment. Brainlab technology currently powers treatments for surgery and radiosurgery.

RF generators and electrodes for trigeminal neuralgia, DREZ, cordotomy, spinal pain and functional stereotaxy. With 50 year’s experience, Cosman provides technologically advanced and cost-effective solutions.

Cyberonics’ VNS Therapy® is the only FDA-approved device for the treatment of refractory epilepsy, with more than 70,000 patients implanted worldwide.

Elekta pioneers clinical solutions for treating brain disorders. With long-standing expertise in stereotaxy, Elekta created solutions that are accurate and non-invasive in treating brain targets.

FHC has served the neuroscience community with a commitment to innovate through collaboration. Featuring neurosurgical support solutions including Distance Expert® and no capital investment options.

InSightec is pioneering the technical and clinical development of transcranial, MR-guided, focused ultrasound to create ExAblate Neuro, an incision-less, neurosurgical operating room of the future.

Integra is a leader in neurosurgery, offering a vast portfolio of implants, devices, instruments and systems used in neurosurgery, neuromonitoring, neurotrauma and critical care.
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<tr>
<td><strong>International Neuromodulation Society (INS)</strong></td>
<td><a href="http://www.neuromodulation.com">www.neuromodulation.com</a>  415-683-3237</td>
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<tr>
<td>INS educates and promotes the field of neuromodulation through its biennial meetings, MEDLINE-indexed journal, Neuromodulation: Technology at the Neural Interface and website.</td>
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<tr>
<td><strong>Medtech</strong></td>
<td><a href="http://www.medtechsurgical.com">www.medtechsurgical.com</a>  33-467-107740</td>
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<td>Medtech - ROSA™ is FDA-approved Image Guided Robotic Stereotactic Assistant specifically designed for functional neurosurgery used in many large institutions in the US and worldwide.</td>
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<td><strong>Medtronic</strong></td>
<td><a href="http://www.medtronic.com">www.medtronic.com</a>  901-396-3133</td>
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<tr>
<td>At Medtronic, we're committed to innovating for life by pushing the boundaries of medical technology and changing the way the world treats chronic disease.</td>
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<td><strong>Monteris Medical, Inc.</strong></td>
<td><a href="http://www.monteris.com">www.monteris.com</a>  204-272-2220</td>
<td>202</td>
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<td>Monteris® Medical's MR-guided, minimally invasive NeuroBlate® System – the premium stereotactic neurosurgical ablation therapy, uses real-time imaging confirming lesion margins for optimal laser-based therapy.</td>
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<td><strong>MRI Interventions Inc.</strong></td>
<td><a href="http://www.mriinterventions.com">www.mriinterventions.com</a>  949-900-6833</td>
<td>104</td>
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<tr>
<td>MRI INTERVENTIONS INC., a leader in the field of MRI-guided interventions, creates innovative platforms for performing the next generation of interventional procedures in the brain.</td>
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<tr>
<td><strong>PMT Corporation</strong></td>
<td><a href="http://www.pmtcorp.com">www.pmtcorp.com</a>  952-470-0866</td>
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<tr>
<td>PMT® Corporation is the premier supplier of Cortac®, cortical surface electrodes, Depthalon®, depth electrodes and IOM Electrodes for epilepsy monitoring.</td>
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<tr>
<td><strong>Renishaw</strong></td>
<td><a href="http://www.renishaw.com/neuro">www.renishaw.com/neuro</a>  847-286-9953</td>
<td>106</td>
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<tr>
<td>Renishaw's neuromate® stereotactic robot provides a platform solution for functional neurosurgical procedures. It is used for DBS, SEEG, neuroendoscopy, biopsy, as well as R&amp;D applications.</td>
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<td><strong>St. Jude Medical</strong></td>
<td><a href="http://www.sjmneuro.com">www.sjmneuro.com</a>  972-309-8000</td>
<td>103</td>
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<tr>
<td><strong>Visualase, Inc.</strong></td>
<td><a href="http://www.visualase.net">www.visualase.net</a>  713-275-2063</td>
<td>101</td>
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<tr>
<td>The Visualase System is an MRI-guided, minimally invasive laser ablation system which allows for continuous monitoring in real-time. 40+ centers have performed more than 650 neuro procedures.</td>
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<td>Lippincott Williams &amp; Wilkins, a Wolters Kluwer Health company, is a leading international publisher of medical books, journals and electronic media.</td>
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Accreditation
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 the joint providership of the Congress of Neurological Surgeons and the American Society for Stereotactic and Functional Neurosurgery. The Congress of Neurological Surgeons is accredited by the ACCME to provide continuing medical education for physicians.

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The CNS designates this live activity for a maximum of 27.5 AMA PRA Category 1 Credits™. Physicians should claim only the credit commensurate with the extent of their participation in the activity.

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Attendees will receive a maximum of 4.25 AMA PRA Category 1 Credits™ for each eligible half-day Special Course or maximum of 7.5 AMA PRA Category 1 Credits™ for the full day Special Course. Physicians should claim only the credit commensurate with the extent of their participation in the activity.

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Physicians may claim AMA PRA Category 1 Credit™ directly from the AMA for preparing a poster presentation, which also includes the published abstracts. Physicians may claim them on their AMA PRA certificate application or apply directly to the AMA for an AMA PRA Category 1 Credit™ certificate. Physicians may claim AMA PRA Category 2 Credit™ for viewing scientific posters. Physicians should self-claim credit on their AMA PRA certificate application form.

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Disclosures
The Accreditation Council for Continuing Medical Education Updated Standards for Commercial Support requires that anyone in a position to control the content of the educational activity has disclosed all financial relationships with any commercial interest. Failure or refusal to disclose or the inability to satisfactorily resolve the identified conflict may result in the withdrawal of the invitation to participate in any of the CNS educational activities. The ACCME defines a “commercial interest” as any entity producing, marketing, re-selling or distributing healthcare goods or services consumed by, or used on, patients.

FDA Statement
Some drugs or medical devices demonstrated at the meeting have not been cleared by the FDA or have been cleared by the FDA for specific purposes only. The FDA has stated that it is the responsibility of the physician to determine the FDA clearance status of each drug or medical device he or she wishes to use in clinical practice. The CNS policy provides that “off label” uses of a drug or medical device may be described at the meeting so long as the “off label” use of the drug or medical device is also specifically disclosed. Any drug or medical device is “off label” if the described use is not set forth on the products approval label. It is also each speaker’s responsibility to include the FDA clearance status of any device or drug requiring FDA approval discussed or described in their presentation or to describe the lack of FDA clearance for any “off label” uses discussed. Speakers from the audience are also required, therefore, to indicate any relevant personal/professional relationships as they discuss a given topic.

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### Exhibit Hall

<table>
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<tr>
<td>Sunday, June 1</td>
<td>7:30 AM – 3:40 PM</td>
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<tr>
<td>Monday, June 2</td>
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<tr>
<td>Tuesday, June 3</td>
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### Registration

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<td>Tuesday, June 3</td>
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### No Smoking Policy

Smoking is not permitted at any official ASSFN Biennial Meeting events. The Renaissance Washington, DC Downtown Hotel is a non-smoking hotel.

### Disclaimer

The material presented at the 2014 ASSFN Biennial Meeting has been made available by the ASSFN for educational purposes only. These materials are not intended to represent the only, nor necessarily the best method or procedure appropriate for the medical situations discussed, but rather are intended to present an approach, view, statement or opinion of the faculty, which may be helpful to others who face similar situations.

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Neither the content (written or oral) of any course or presentation in the program, nor the use of a specific product in conjunction therewith, nor the exhibition of any materials by any parties coincident with the program, should be construed as indicating endorsement or approval of the views presented, the products used or the materials exhibited by the ASSFN jointly sponsored by the CNS, or its committees, commission or affiliates.

### Opening Reception

<table>
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<tr>
<td>Sunday, June 1</td>
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Enjoy a lavish array of food and refreshments while reconnecting with colleagues and meeting new contacts at the Opening Reception. Each medical attendee registered for the meeting will receive one complimentary ticket.

### Wine and Cheese Reception

<table>
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<tr>
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<tr>
<td>Monday, June 2</td>
<td>5:00 – 6:00 PM</td>
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Interact with colleagues and corporate contacts and take this time for uninterrupted viewing of the exhibits while enjoying a pre-dinner glass of wine.
The Congress of Neurological Surgeons controls the content and production of this CME activity and attempts to assure the presentation of balanced, objective information. In accordance with the Standards for Commercial Support established by the Accreditation Council for Continuing Medical Education, speakers are asked to disclose any relationship they have with commercial companies which may be related to the content of their lecture.

Speakers who have disclosed a relationship with commercial companies whose products may have a relevance to their presentation are listed below. Planners are designated by \(^{p}\) and Faculty by \(^{f}\). Disclosures are as of April 8, 2014.

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<tr>
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### Disclosures

**Aviva Abosch, MD, PhD\(^{f}\)**
Consulting Agreement—Medtronic (2)

**Ron Alterman, MD\(^{f}\)**
Consulting Agreement—Codman, Inc. (2), Medtronic, Inc. (2)

**Kenneth Baker, PhD\(^{f}\)**
Grants—Medtronic, St. Jude Medical (6); Ownership Interest—Cardionomics and ATI (6)

**Nicholas Boulis, MD\(^{f}\)**
Intellectual Fees—Neuralstem (6)

**Michael Briotte, CNIM\(^{f}\)**
Salary—Impulse Monitoring, Inc. (5)

**Richard Byrne, MD\(^{f}\)**
Consulting Agreement—Integra (2), Stryker (2)

**David Charles, MD\(^{f}\)**
Consulting Agreement—Allergan (2), Ipsen (2), Medtronic (2); Other—Allergan (6), Medtronic (6), Merz (6)

**Ted Dawson, MD\(^{f}\)**
Consulting Agreement—Merck KGAA (2); Grants—Merck KGAA (6)

**Tim Denison, MD\(^{f}\)**
Salary—Medtronic (5)

**Daniel DiLorenzo, MD, PhD, MBA\(^{f}\)**
Consulting Agreement—SHV NeuroNewCo (2); Ownership Interest—Barinetics Corp. (8), DiLorenzo Biomedical, LLC (8)

**Darin Dougherty, MD, MSc\(^{f}\)**
Grants—Cyberonics (6), Medtronic (6); Honoraria—Medtronic (6)

**Yuval Duchin, MD\(^{f}\)**
Consulting Agreement—Surgical Information Sciences (2)

**James Evans, MD\(^{f}\)**
Consulting Agreement—Stryker (2); Royalty—Mizuho (6)

**Eva Feldman, PhD\(^{f}\)**
Consulting Agreement—Novartis Pharmaceuticals (2)

**Brad Fernald, MD\(^{f}\)**
Salary—Visualase (5)

**Jonathon Giftakis, PhD\(^{f}\)**
Salary—Medtronic, Inc. (5)

**Jonathan Glass, MD\(^{f}\)**
Consulting Agreement—Neuralstem, Inc (2)

**Ashok Gowda, BE, PhD\(^{f}\)**
Ownership Interest—BasePair BioTechnologies, Inc. (3), BioTex, Inc. (1), Visualase, Inc. (7); Salary—BioTex, Inc. (1), Visualase, Inc. (7)
Benjamin Greenberg, MD
Other–Huffman La Roche (6)

Warren Grill, MD
Consulting Agreement–Circuit Therapeutics (2), NeuroAccess Technologies (2), NeuroTronik (2), SetPoint Medical (2); Ownership Interest–Deep Brain Innovations (3), NDI Medical (3), NeuroAccess Technologies (2); Other–Medtronic (6); Salary–NDI Medical (3), SPR Therapeutics (3); Grants–Styker (6)

Robert Gross, MD, PhD
Consulting Agreement–Deep Brain Innovations (2), Duke-International Stem Cell Corporation (2), Eli Lilly (2), Medtronic (2), Neuropace (2), St. Jude Medical Corporation (2), VisuSave (2)

Clement Hamani, MD
Consulting Agreement–St. Jude Medical (2)

Noam Harel, PhD
Ownership Interest–Surgical Information Sciences (6)

Jaimie M. Henderson, MD
Consulting Agreement – Circuit Therapeutics (2), Nevro Corporation (2), Proteus Biomedical (2)

Thomas Hazel, PhD
Other–Neuralstem, Inc (7)

Frank Hertel, MD
Grants–Author received a travel grant in 2013 from OMT, Minden, Germany (6)

Kathryn Holloway, MD
Other–Medtronic (6), St. Jude (6)

Karl Johe, MD
Other–Neuralstem, Inc (3)

Michael Kaplitt, MD, PhD
Salary–Circuit Therapeutics (7)

Peter Konrad, MD, PhD
Consulting Agreement–Medtronic (2); Ownership Interest–Neurotargeting (7)

Brian Kopell, MD
Consulting Agreement–Medtronic SNT (2), St. Jude Neuromodulation (2)

Lothar Krinke, MD
Other–Functional Neuromodulation, Inc. (6); Salary–Medtronic, Inc. (5)

Jens Kuhn, MD
Grants–Medtronic (6)

Robert Levy, MD, PhD
Consulting Agreement–Bioness Incorporated (6), Medtronic Neurological (6), Nevro, Incorporated (2), Spinal Modulation (6), St. Jude Medical Neuromodulation (6), Vertos Medical (6)

Brian Litt, MD
Ownership Interest–MC10, Inc. (6), NeuroPace, Inc. (6)

Andres Lozano, MD
Other–Alcyone (6), Aleva (6), Cerogene (6), Codman (6), Neurophage (6); Boston Scientific (6), Codman (6), Medtronic (6); Functional Neuromodulation, Inc. (3)

L. Dade Lunsford, MD
Other–Elekta (2)

Andre Machado, MD, PhD
Ownership Interest–Ensire, ATI and Cardionomics (6); Consulting Agreement–Spinal Modulation, Functional Neuromodulation and Deep Brain Innovation (2)

Helen Mayberg, MD, PhD, RN
Consulting Agreement–St. Jude Medical Neuromodulation (6); Intellectual Fees–St. Jude Medical Neuromodulation (6)

Alon Mogilner, MD
Grants–Boston Scientific (6), St. Jude (6); Consulting Agreement–Medtronic Neurological (2)
Joseph Neimat, MD, MS*F
Consulting Agreement–Medtronic Inc. (2), Monteris Medical Inc. (6)

Steven Paniccioli, MD*F
Salary–Impulse Monitoring, Inc. (5)

Parag Patil, MD, PhD*F
Consulting Agreement–Medtronic (6), Monteris (6)

Nader Pouratian, MD, PhD*F
Grants–Medtronic (6)

Ali Rezai, MD*F
Other–ASSFN (7), CNS (7), North American Neuromodulation Society (7); Ownership Interest–Autonomic Technologies (3)

David Roberts, MD*F
Consulting Agreement–Alycone, Inc. (6), CarThera (6); Other–Medtronic, Research Support (6), Zeiss, Research Support (6)

Joshua Rosenow, MD, FACS*F
Consulting Agreement–Boston Scientific Neuromodulation (2)

Guillermo Sapiro, MD*F
Ownership Interest–Surgical Information Sciences (6)

Michael Schulder, MD*F
Consulting Agreement–Varian (2)

Ashwini Sharan, MD*F
Ownership Interest–ICP (3), ICVRX (8); Consulting Agreement–Medtronic (6); Grants–SJM (6); Honoraria–SJM (6)

Anil Shetty, PhD*F
Salary–Visualase (5)

Jay Shils, PhD*F
Consulting Agreement–Biotronic (6)

Karl Sillay, MD*
Ownership Interest–Health Data Valet (7), InseRT, Inc. (7), Navigated Technologies (8); Other–Restorative Neurosciences Foundation (7)

Christopher Skidmore, MD*F
Honoraria–Supernus (2); Consulting Agreement–Upsher-Smith Pharmaceuticals (2)

Scott Stanslaski, MD*F
Salary–Medtronic, Inc. (5)

Philip Starr, MD, PhD*F
Consulting Agreement–Boston Scientific (2); Grants–Medtronic (6)

Paul Stypulkowski, PhD*F
Salary–Medtronic, Inc. (5)

Steven E. Swanson, MD*F
Salary–Medtronic (5)

Nitin Tandon, MD, FAANS*F
Consulting Agreement–MedTech (2)

Jerrold Vitek, MD*F
Consulting Agreement–Boston Scientific (2), Ceregene (2), Medtronic (2), St. Jude (2)

Jon Willie, MD, PhD*F
Consulting Agreement–Monteris Medical (2)
The following individuals have disclosed that they do not have a relationship with commercial companies whose products may have a relevance to their participation in the Annual Meeting. Planners are designated by P and Faculty by F. Disclosures are as of April 8, 2014.