Global Impact of Neuroscience Disorders and Opportunities for Convergence Discoveries

CME Course Co-Directors: Kevin Bennet, PhD, MBA, W. David Freeman, MD; Kevin Barrett, MD, MSc; Leonard Petrucelli PhD, Michael Pizzi, DO, PhD; Alejandro Rabinstein, MD; Alfredo Quinones-Hinojosa, MD

7:15 a.m. Registration and Continental Breakfast

Thematic Global Challenges in Human Neurosciences - Diseases, Cognitive, Artificial Intelligence and Bioinformatics

8:00 Introduction and Welcome
Moderator: W. David Freeman, MD

8:30 History of Neurosciences Evolution and Global Neuroscience Challenges
W. David Freeman, MD

8:35 Scientific Breakthroughs Coming for Lou Gehrig's Disease (Amyotrophic Lateral Sclerosis)
Leonard Petrucelli, PhD, Neuroscience

9:00 Global Epilepsy: Current Challenges and Potential Future Solutions
Greg Worrell, MD

9:30 Advancing Global Health through Patient Centered Outcomes: ICHOM
Ryan Uitti, MD

10:00 Global Impact of Spine Disorders on Human Population by 2050
H. Gordon Deen, MD

10:30 Speaker Q&A Panel

10:45 Break

11:00 Global Impact of Stroke and Cerebrovascular Disorders: World Health Organization and Advances
Thomas G. Brott, MD

11:30 NINDS-Update on BRAIN Initiative & Neural Engineering
Nick Langhals, PhD

12:00 pm Lunch and Networking Tracks and Meetings

1:00 The Future of Health Care: the US $300 Billion Pendulum Swing from Sick Care to Wellness Care and Monitoring Patients at Home and Beyond, a UK Perspective in Your Home
Hugh Lloyd Jukes

1:30 Alzheimer’s Disease- Future Therapies
Neil Graff-Radford, MD

2:00 Machine Learning
David E. Albert, MD

2:30
**Theme #1** - Engineering New Convergences in Public Health and Policy
Guru Madhavan, PhD
Moderator: Alejandro Rabinstein, MD and Michael Pizzi, DO, PhD

3:00
**Theme #2** - Translating Big Data to Action and Future of Big Data and the Precision Medicine Initiative - Q&A
Dennis Murphree, Jr., Ph.D., Jason Hallstrom, PhD, Stephen Hart, PhD, *Mike Huerta PhD*
Moderator: W. David Freeman, MD

3:30
**Theme #3** - NINDS BRAIN initiative and Neural Engineering Challenges - Nick Langhals, PhD, Betty Kim, MD, PhD, Babek Kateb MD, Society for Brain Mapping and Therapeutics (SBMT)/Brain Mapping, Jin Hyung Lee, PhD, Kevin Bennet, PhD, Chair Division of Engineering, Co-director Mayo Neural Engineering Labs, Mayo Clinic
Moderator: Kevin Bennet, MD

4:00
e-Posters

4:30
Adjourn

**Wednesday, October 25, 2017**

**Neuroscience & Convergence of Other Science Disciplines**
**Day #2: Neuroscience, Physical, Engineering, and Cognitive Computing Science Challenges & Discoveries**

**Moderator:** W. David Freeman, MD, Mike Pizzi, DO, PhD

8:00
Registration and Continental Breakfast
**Thematic Global Challenges Facing Basic, Translational, and Materials Neuroscience**

8:30
Introduction and Welcome
Moderator: W. David Freeman, M.D.

8:35
**Convergence Keynote:**
History of the National Academy of Medicine and Facilitating Neuroscience Convergence
Victor J. Dzau, MD

9:00
3-D Brain Tissue Visualization Technique
Betty Kim, MD, PhD

9:30
Ontogenetic fMRI and the Investigation of Global Brain Circuit Mechanisms
Jin Hyung Lee, PhD

10:00
Genome Editing- CRISPr-Cas9 Challenges in Treating Neurological Diseases
David Deyle, MD

10:30
Q&A
10:45  Break

11:00  Neuroregeneration using Mesenchymal Stem Cells-Mayo Regenerative Update
       Abba Zubair, MD, PhD

11:40  Break/Speaker Q&A

12:00 p.m.  Lunch and Networking

1:00  Neuroscience Organ on a Chip Design for Rapid Phase I Drug Discovery
       James Hickman, PhD

1:30  Neural Circuits and Mayo Neural Engineering Research
       Kevin Benet, PhD, MBA Mayo Clinic

2:00  Theme #4 – Artificial Intelligence and Machine Learning CEOs and Scientists: AI Experiments with Google – Machine Learning and Drawing Art
       David Albert, MD; Matt Berseth; Jason Hallstrom, PhD; Che Ngufor, Ph.D.; Ted Willich
       Moderator: W. David Freeman, MD

2:30  Theme #5 - Mobile Health: The US $300Billion Pendulum Swing from Sick care to Wellness Care and Monitoring Patients at Home
       David Albert, MD; Hugh Lloyd Jukes, Ravinder Sajwan
       panelists TBA
       Moderator: W. David Freeman, MD

3:00  Theme #6 - Bench to Bedside Translation: What is the Next Quantum Jump? Q&A Session
       Panelists- CRISPR—David Deyle MD, James Hickman, PhD, Brad Rabinovitz,
       Moderators: W. David Freeman, MD and Mike Pizzi, DO, PhD

3:30  Questions and Answers/ Online Examination /Adjourn