144TH ANNUAL MEETING OF THE AMERICAN NEUROLOGICAL ASSOCIATION

ANA 2019

OCTOBER 13–15, 2019

MARRIOTT ST. LOUIS GRAND • ST. LOUIS, MO

PRE-MEETING SYMPOSIUM: OCTOBER 12, 2019

Final Program

AMERICAN NEUROLOGICAL ASSOCIATION
INNOVATORS IN DISCOVERY, EDUCATION, AND CARE

2019.mywana.org

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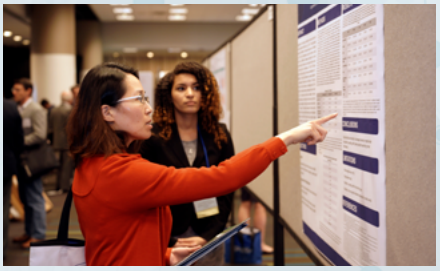

OFFICE OF THE MAYOR
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October 13, 2019

American Neurological Association
ANA2019
St. Louis, Missouri

Dear ANA2019 Attendees:

It is my pleasure to welcome the American Neurological Association to St. Louis for its 144th Annual Meeting! We are honored to host such a distinguished group of academic neurologists and neuroscientists from across the United States and abroad, including our visitors from the Korean Neurological Association.

We think you'll feel at home in St. Louis, where we are fortunate to have some of the world's leading research institutions, including Washington University in St. Louis, Saint Louis University, and the University of Missouri St. Louis.

With our world-renowned scientists, research institutions, and bioscience companies, St. Louis is a center of innovation. In fact, the single biggest driver of our regional economy is health care, and St. Louis' long history of achievements includes medical breakthroughs in neurosciences, human genomics and vaccines.

I'm glad that you'll have a chance to experience St. Louis' iconic Gateway Arch, and hope you'll get to explore other celebrated St. Louis sights, whether strolling through Forest Park — home of the 1904 World's Fair — doing a taste test at one of our celebrated local breweries, or exploring the oldest continuously running botanical garden in the United States.

Fall is a beautiful time of year in St. Louis. We hope you enjoy your stay and have the opportunity to visit us again on future occasions.

Sincerely,

Lyda Krewson

Lyda Krewson
Mayor, City of St. Louis

Dear Colleagues,

M. Elizabeth Ross, MD, PhD Chair, Scientific Program Advisory Committee

Welcome to the 144th Annual Meeting of the American Neurological Association (ANA). On behalf of the Board of Directors, Scientific Program Advisory Committee (SPAC), ANA President David Holtzman, and the Local Arrangements Subcommittee here in St. Louis, we're delighted that you have come to share in the exceptional program that we, in concert with our colleagues throughout the academic community, have worked tirelessly (but enthusiastically!) to produce.

In this exciting year for the neurological sciences, you'll find outstanding talks and poster presentations that represent the latest advances in translational neuroscience, neurobiology of disease, and academic and global neurology. A recurring theme in this year's symposia is the science behind recent breakthroughs in our understanding and treatment of neurological disorders across a broad etiological spectrum. Subjects include the emerging recognition of the microbiome's impact on neurological disorders from Stroke to MS to neurodegenerative disease; advances in regenerative medicine with a focus on synaptic plasticity and neural repair after injury; language development and dysfunction as a component of many neurological diseases and the latest therapeutic approaches spanning neurobehavioral interventions to non-invasive brain stimulation; and strategies for optimizing clinical trials including cutting edge methods for trial design and measuring outcomes. Each of the plenary sessions is interlaced with poster blitz-talks that highlight the scientific contributions of young investigators, selected from submitted abstracts, while the Derek Denny-Brown symposium showcases ground-breaking research from the emerging generation of leaders in neurology.

Don't miss the Presidential Symposium that features the latest research into risks, diagnosis and treatment of inherited and late onset Alzheimer's Disease. During the session, our keynote speaker Kim Campbell, widow of musician, songwriter and actor Glen Campbell, will share her insights into the profound toll this disorder takes on patients and family.

The Pre-Meeting Symposium on October 12th offers a unique view from academic and industry leaders in the field of Brain-Computer Interfaces toward the creation of prosthetics to serve speech, vision processing, and motor control.

This year's meeting is packed with opportunities for professional networking and education through lively poster sessions, breakout Special Interest Group (SIG) Sessions across 17 disciplines, and Interactive Lunch Workshops (ILWs). These are designed to provide the latest emerging information affecting neurological care and education. Additional sessions offer insights from leaders in the field regarding career development issues at all levels of academic neurology, especially those encountered early in the profession.

Finally, the ANA continues its dedication to welcoming our international colleagues, this year from the Korean Neurological Society. Our intent is to promote and extend collaborations in neurological education and research among academic neurologists across the globe. I join the ANA members of the Board of Directors, SPAC, ILW and Career Development and Awards Committees in inviting you to take advantage of all this vibrant meeting and Association have to offer.

Welcome to St. Louis!

With warmest wishes,

M. Elizabeth Ross, MD, PhD

Chair, Scientific Program Advisory Committee (SPAC)

Nathan Cummings Professor and Head, Laboratory of Neurogenetics and Development

Director, Center for Neurogenetics

Chair, Neuroscience Graduate Program, Weill Cornell Medicine

ANA 2019

OCTOBER 13–15, 2019

MARRIOTT ST. LOUIS GRAND • ST. LOUIS, MO

PRE-MEETING SYMPOSIUM: OCTOBER 12, 2019

SCHEDULE AT A GLANCE

FRIDAY, OCTOBER 11, 2019

7:15 AM – 8:45 PM	**NINDS** *(by invitation only)* ANA-NINDS Career Development Symposium

SATURDAY, OCTOBER 12, 2019

7:15 AM – 5:15 PM	**NINDS** *(by invitation only)* ANA-NINDS Career Development Symposium
3:00 PM – 7:00 PM	**Registration**
5:00 PM – 6:30 PM	**Junior Membership** *(non-CME activity)* Junior Members Reception & Dinner
6:00 PM – 9:00 PM	**Pre-Meeting Symposium**
6:00 PM – 6:30 PM	Reception & Buffet Dinner *(non-CME activity)*
6:30 PM – 9:00 PM	Brain-Computer Interfaces in Neurological Disease *(non-CME activity)*

SUNDAY, OCTOBER 13, 2019

6:00 AM – 5:45 PM	**Registration**
7:00 AM – 8:00 AM	**Breakfast**
7:00 AM – 7:30 AM	**Trainee Breakfast with ANA Board of Directors**
7:30 AM – 9:00 AM	**Professional Development Courses** Course 1: Students, Residents, Trainees, PostDoc Fellows Landing Your First Faculty Position Course 1: Early to Mid-Career Building Public-Private Partnerships, Public Policy Partnerships For Translational Research and Innovation Course 1: Chair Career Level Difficult Conversations
9:00 AM – 9:15 AM	**Break**
9:15 AM – 11:30 AM	**Plenary Session** Presidential Symposium: Dominantly Inherited and Late-Onset Alzheimer's Disease: Genetics, Biomarkers, Timecourse, and Treatments
11:30 AM – 12:30 PM	**Lunch**
12:00 PM – 7:00 PM	**Poster Viewing** *(non-CME activity)*
11:45 AM – 1:00 PM	**Satellite Symposium** *(non-CME activity)* A Case Study: Progressive Muscle Weakness in a 31-Year-Old Female

SUNDAY, OCTOBER 13, 2019 *CONTINUED*

11:45 AM – 1:00 PM	**Interactive Lunch Workshops** *(These workshops are "Lunch and Learns")* Meet the Editors * Sleep Clocks, Disorders and Neurodegenerative Disease An Update on Migraine Pathophysiological Mechanisms and Emerging Treatments Precision Medicine in Neurology
11:45 AM – 1:00 PM	**Additional Lunch Workshops** 19th Annual Women of the ANA Lunch Program *
1:00 PM – 1:15 PM	**Break**
1:15 PM – 3:15 PM	**Plenary Session** Derek Denny-Brown Young Neurological Scholar Symposium
3:15 PM – 3:30 PM	**Break**
3:30 PM – 5:30 PM	**Special Interest Groups** Autoimmune Neurology Clinical Logic Dementia and Aging Epilepsy Health Services Research Neurocritical Care Recent Randomized Clinical Trials in Neurocritical Care: Lesson Learned Neuromuscular Disease Traumatic Brain Injury
5:30 PM – 7:00 PM	**Poster Presentations & Reception** * *(non-CME activity)*
6:30 PM – 8:30 PM	**Career Fair** * *(non-CME activity)*

MONDAY, OCTOBER 14, 2019

6:00 AM – 7:30 AM	**Satellite Symposium** *(non-CME activity)* Exploring the Science and Appreciating the Patient Experience: Early, Individualized Therapy to Optimize Outcomes in Multiple Sclerosis*
6:30 AM – 5:45 PM	**Registration**
6:30 AM – 7:00 AM	**Mentor-Mentee Breakfast** *(by invitation only)*

Note: The American Board of Psychiatry and Neurology has reviewed the 144th Annual Meeting of the American Neurological Association and has approved this program as part of a comprehensive CME program, which is mandated by the ABMS as a necessary component of Maintenance of Certification.

* This session is not available for AMA PRA Category I Credit(s)™

MONDAY, OCTOBER 14, 2019 *CONTINUED*

7:00 AM – 8:00 AM	**Breakfast**
7:00 AM – 8:30 AM	**Professional Development Courses** Course 2: Students, Residents, Trainees, PostDoc Fellows Setting Yourself Up for Research Success: T to K Transition and Preparing For Your K Application
	Course 2: Early to Mid-Career Quantifying Your Success for Promotion: Advice for both Clinician-Educators and Researchers at the K to R Transition
	Course 2: Chair Career Level Immigration Law
8:30 AM – 8:45 AM	**Break**
8:45 AM – 10:45 AM	**Plenary Session** Advances in Regenerative Medicine: Cellular Memory Systems in Brain Repair
10:45 AM – 11:25 AM	**Executive Session of Membership*** *(non-CME activity)*
11:15 AM – 12:00 PM	**Lunch**
11:30 AM – 12:30 PM	**Interactive Lunch Workshop***s* *(These workshops are "Lunch and Learns")* Neurological Rare Diseases & Neglected Tropical Diseases: Can Shared Challenges Inform Common Solutions?
	Meet the Chairs *
	Small-Fiber Polyneuropathy: A Growing Neurological Problem
	Neuro-Ophthalmological Features of Neurodegenerative Diseases
11:30 AM – 12:30 PM	**Additional Lunch Workshops** *(non-CME activity)* American Board of Psychiatry and Neurology (ABPN) Maintenance of Certification (MOC) *
12:00 PM – 6:30 PM	**Poster Viewing** *(non-CME activity)*
12:30 PM – 12:45 PM	**Break**
12:45 PM – 2:45 PM	**Plenary Session** Language Disorders Across the Lifespan
2:45 PM – 3:00 PM	**Break**
3:00 PM – 5:00 PM	**Special Interest Groups** Behavioral Neurology Lesion Analysis Meets Systems Neuroscience
	Cerebrovascular Disease & Interventional Neurology
	Education Burnout in Academic Neurology: What are we Doing to Avoid it?
	Global Neurology Sustainable Partnerships and Equity in Global Health
	ANA-AHS Headache (Sponsored by the American Headache Society)
	Movement Disorders
	Multiple Sclerosis MS Treatment Across the Lifespan
	Neuro-Oncology Immunotherapy: The Neuro-Oncologist's Friend or Foe?
	Sleep Disorders and Circadian Rhythms
5:00 PM – 6:30 PM	**Poster Presentations & Reception** * *(non-CME activity)*
7:00 PM – 7:30 PM	**New Member Meet & Greet** * *(non-CME activity)*
7:30 PM – 9:00 PM	**President's Reception** * *(non-CME activity)*

TUESDAY, OCTOBER 15, 2019

6:30 AM – 2:00 PM	**Registration**
6:30 AM – 7:30 AM	**Breakfast**
7:00 AM – 8:30 AM	**Professional Development Courses** Course 3: Students, Residents, Trainees, Post-Doc Fellows Meet the NIH, NIA and NICHD
	Course 3: Early to Mid-Career Meet the NIH, NIA and NICHD
	Course 3: Chair Career Level Philanthropy - Lessons Learned
8:30 AM – 8:45 AM	**Break**
8:45 AM – 10:45 AM	**Plenary Session** Emerging Role of Microbiome in Neurological Disease
10:45 AM – 12:00 PM	**Lunch**
11:00 AM – 12:00 PM	**Interactive Lunch Workshops (These workshops are "Lunch and Learns")** Recent Advances in SUDEP
	Advocacy in Action: The Role of Academic Neurologists and Neuroscientists
	Functional Neurologic Disorders
11:00 AM – 12:00 PM	**Additional Lunch Workshops** *(non-CME activity)* Media Roundtable *
	AUPN's Networking Lunch for Small Academic Departments * *(non-CME activity)*
12:00 PM – 12:15 PM	**Break**
12:15 PM – 2:15 PM	**Plenary Session** Optimizing Clinical Trial Design
2:15 PM	**Meeting Adjourns**

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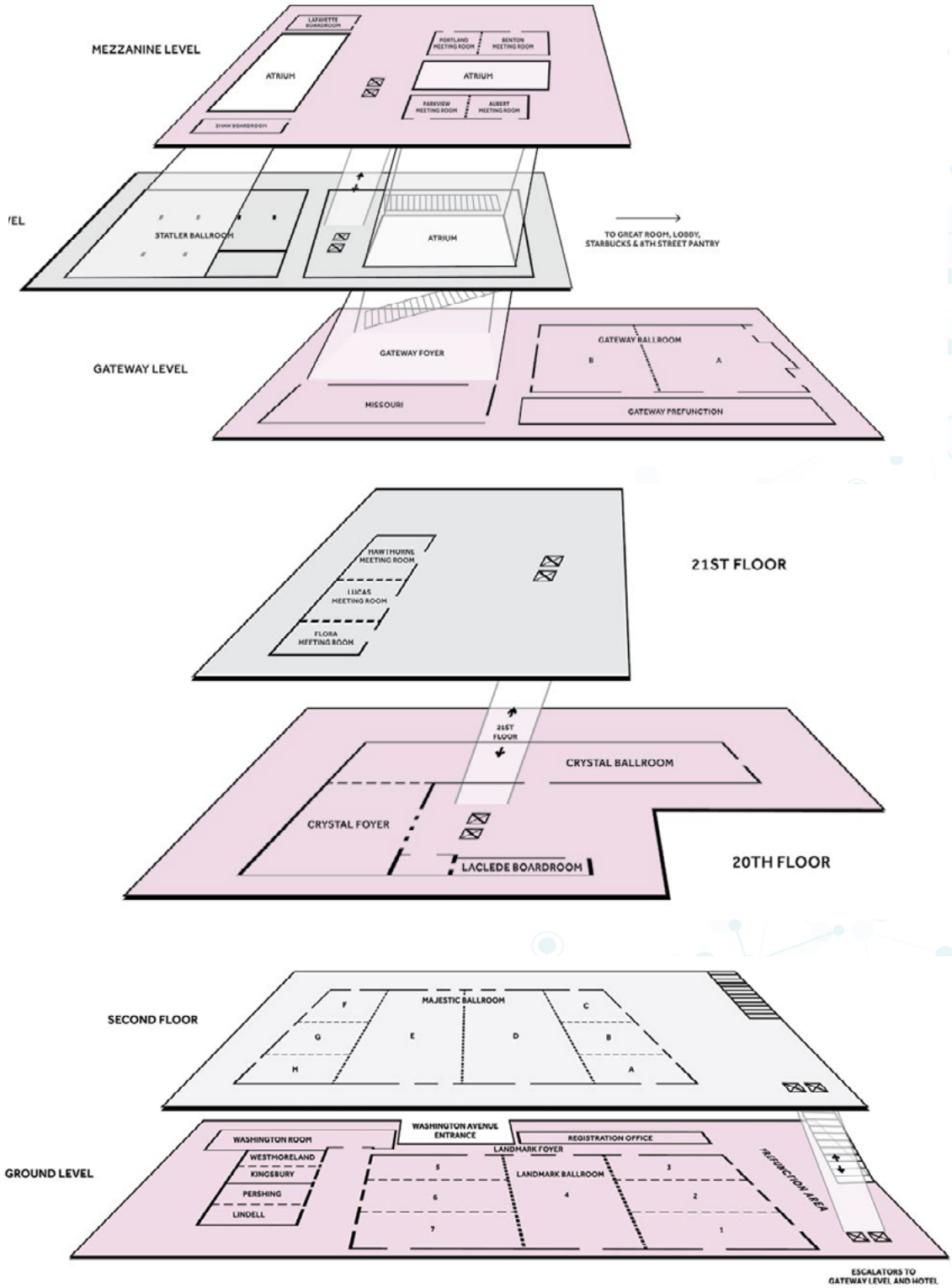
* This session is not available for AMA PRA Category I Credit(s)™

Floorplan



MARRIOTT
ST LOUIS GRAND

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General Information

On-Site Registration Hours: Landmark Foyer

Saturday, October 12	3:00 PM–7:00 PM
Sunday, October 13	6:00 AM–5:45 PM
Monday, October 14	6:30 AM–5:45 PM
Tuesday, October 15	6:30 AM–2:00 PM

Poster Hours: Majestic E–H

Sunday, October 13	12:00 PM–7:00 PM

Poster presenters and poster judges will be in attendance from 5:30 PM–7:00 PM

Monday, October 14	12:00 PM–6:30 PM

Poster presenters and poster judges will be in attendance from 5:00 PM–6:30 PM

Speaker Ready Room Hours: Kingsbury

Saturday, October 12	3:00 PM–7:00 PM
Sunday, October 13	6:00 AM–5:45 PM
Monday, October 14	6:30 AM 5:45 PM
Tuesday, October 15	6:30 AM–2:00 PM

Breakfast: Landmark Foyer

Sunday, October 13	7:00 AM–8:00 AM
Monday, October 14	7:00 AM–8:00 AM
Tuesday, October 15	6:30 AM–7:30 AM

Lunch: Landmark Foyer

Boxed Lunches will be distributed in the foyer and attendees are encouraged to bring them to the Interactive Lunch Workshops. Additional seating is available in the Washington Room if you are not attending an Interactive Lunch Workshop.

Sunday, October 13	11:30 AM–12:30 PM
Monday, October 14	11:15 AM–12:00 PM
Tuesday, October 15	10:45 AM–12:00 PM

Press Room Hours: Pershing

Sunday, October 13	8:30 AM–5:30 PM
Monday, October 14	8:30 AM–5:30 PM
Tuesday, October 15	8:30 AM–2:00 PM

Wireless Connection

All Marriott St. Louis Grand guest rooms booked under the ANA block will be equipped with complimentary high-speed wireless internet access during the official meeting dates (Saturday to Tuesday). To connect, enable WiFi on the device. While in the designated ANA meeting rooms at the Marriott St. Louis Grand, look for the network SSID: **Marriott_Conference**. When prompted, enter the passcode **ANA2019** (*Please note that the password is case sensitive*). Proceed to the internet as normal.

Disclaimer

Please note that some session titles may have changed since this program was posted online. Please refer to the ANA Mobile App for the most current information.

Continuing Medical Education: Accreditation & Designation Statement(s)

The American Neurological Association is accredited by the Accreditation Council for Continuing Medical Education (ACCME) to provide continuing medical education for physicians. The Annual Meeting offers CME to eligible participants. Detailed information pertaining to CME can be found in your conference bag and at the following website: **2019.myana.org/continuing-medical-education**

Annual Meeting Evaluations

Within a week following the event, you will receive an email containing a link to the evaluation. Please complete the online evaluation within a week of receipt in order to obtain any CME credit. You will be provided with a certificate within three weeks following completion of the evaluation. If you have any questions, please contact the ANA Meeting Coordinator at: **meetings@myana.org**

Consent to Use of Photographic Images

Registration and attendance at, or participation in ANA meetings and other related activities constitutes attendee's authorization to ANA's use and distribution (both now and in the future) of the attendee's image or voice in photographs, video recordings, electronic reproductions, audio recordings, and other media throughout the world and royalty free.

Photography

Photography in the Annual Meeting Poster Area and Exhibit Area is restricted to the official conference photographer.

Language

The official language of the Annual Meeting is English. No simultaneous translation is available.

ADA

ANA fully complies with the legal requirements of the Americans with Disabilities Act rules and regulations. If any participant is in need of special accommodations, they should notify the hotel and indicate the type of assistance needed. ANA cannot ensure the availability of appropriate assistance without advance notice.

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#ANA2019

ANA ANNUAL MEETING MOBILE APP

DOWNLOADING THE APP IS EASY!

- While on your smartphone or hand-held device, open your app store and SEARCH for "ANA Meetings."
- While on your smartphone or hand-held device, point your mobile browser to **https://www.core-apps.com/dl/ana_annual2019** to be directed to the appropriate download version for your phone.
- While on your desktop or laptop computer, open your browser to this URL **https://www.core-apps.com/dl/ana_annual2019** to be directed to the appropriate download version for your phone.

The ANA Annual Meeting mobile application is a native app on both Apple and Android platforms. This design allows a majority of the app features to function without Wi-Fi or connectivity including interactive scheduling, maps, exhibitors, sessions, and speaker information.

The ANA Annual Meeting application is available on all Apple and Android devices and is optimized for the iPhone 7, the iPad and iPad mini, and all other Android devices and tablets.


At Adamas our purpose is to make everyday life significantly better for people affected by neurological disorders.
ADAMAS ™
For more information, please visit our website at www.adamaspharma.com

PROGRAM BY DAY

Friday, October 11, 2019

3:30 PM–8:45 PM — **LANDMARK 4**

NINDS

ANA-NINDS Career Development Symposium

(by invitation only)

This symposium is a joint collaborative effort between ANA and NINDS which is designed for clinician-scientists with NIH career development awards (K08 and K23) and is chaired by senior neurologists and neuroscientists who have proven success in career building and navigation, scientific grant writing, networking, and balancing clinical and research efforts.

Saturday, October 12, 2019

7:15 AM–5:15 PM — **LANDMARK 4**

NINDS

ANA-NINDS Career Development Symposium

(by invitation only)

This symposium is a joint collaborative effort between ANA and NINDS which is designed for clinician-scientists with NIH career development awards (K08 and K23) and is chaired by senior neurologists and neuroscientists who have proven success in career building and navigation, scientific grant writing, networking, and balancing clinical and research efforts.

3:00 PM–7:00 PM — **LANDMARK FOYER**

Registration

5:00 PM–6:30 PM — **WASHINGTON ROOM**

Junior Membership Meeting

Junior Members Reception & Dinner*

CHAIR: *Jennifer Orthmann Murphy, MD, PhD, University of Pennsylvania*

Learn how to make the most of your ANA Meeting. Join the members of the Junior Membership Task Force for a reception and dinner to discuss how to take advantage of the ANA, identify mentors and discuss career tracks in academic neurology.

6:00 PM–9:00 PM

Pre-Meeting Symposium

6:00 PM–6:30 PM — **MAJESTIC FOYER**

Reception & Buffet Dinner*

6:30 PM–9:00 PM — **MAJESTIC D**

Brain-Computer Interfaces in Neurological Disease*

CHAIR: *Steven Small, MD, PhD, University of California, Irvine*

CO-CHAIR: *An Do, MD, University of California, Irvine*

Brain-computer interfaces (BCI) are an emerging class of medical devices that translate brain signals into the control of external devices or convert external stimuli into the activation of brain areas. As such, they carry the potential to replace lost motor and sensory functions due to neurological injuries either by enabling direct brain control of prostheses or by delivering artificial sensation. After decades of research and development in neuroscience and biomedical engineering labs around the world, BCI technology is maturing and such devices have started to enter human clinical studies and clinical trials as a novel means to address neurological deficits. Examples of clinical BCI applications have included the replacement or augmentation of arm, leg, and speech function, as well as of vision and tactile sensation. This symposium will discuss brain-computer interfaces in neurological therapeutics, with examples including remediating sight in people with visual impairment and restoring hand/arm function and gait in people with stroke or spinal cord injury.

LEARNING OBJECTIVES:

1. **Participants will understand the physiological basis of BCI devices.**
2. **Participants will become familiar with how BCI systems can potentially help replace lost motor and sensory functions.**
3. **Participants will become familiar with how BCI systems may augment residual function in those with partial neurological deficits.**

6:30 PM–6:40 PM

Introduction

Steven Small, MD, PhD, University of California, Irvine

6:40 PM–7:00 PM

A Systems Neuroscience Approach to Motor Recovery After Stroke

Karunesh Ganguly, MD, PhD, University of California, San Francisco

7:00 PM–7:03 PM

Q&A and Discussion

* This session is not available for AMA PRA Category I Credit(s)™

7:03 PM–7:23 PM
Talking to The Brain in Its Own Language
Sheila Nirenberg, PhD, Weill Cornell Medical College

7:23 PM–7:26 PM
Q&A and Discussion

7:26 PM–7:41 PM
Coffee and Dessert Break

7:41 PM–7:46 PM
DATA BLITZ PRESENTATION
Optogenetic Modulation And Functional Mapping For Neuronal Circuitry In-vivo Using Bioluminescent Multi-characteristic Opsin
Sourajit Mustafi, PhD, Nanoscope Technologies LLC

7:46 PM–7:49 PM
Q&A and Discussion

7:49 PM–7:54 PM
DATA BLITZ PRESENTATION
An 8-channel Morse Code BCI Speller
Ravi Rajmohan, MD, PhD, University of California, Irvine

7:54 PM–7:57 PM
Q&A and Discussion

7:57 PM–8:17 PM
Brain-Computer Interface in Lower Extremity Rehabilitation
An Do, MD, University of California, Irvine

8:17 PM–8:20 PM
Q&A and Discussion

8:20 PM–8:40 PM
Intracortical Brain-Computer Interfaces: Toward the Restoration of Communication and Mobility
Leigh Hochberg, MD, PhD, FAAN, FANA, Brown University

8:40 PM–9:00 PM
Q&A, Discussion & Wrap Up

Sunday, October 13, 2019

6:00 AM–5:45 PM LANDMARK FOYER
Registration

7:00 AM–8:00 AM LANDMARK FOYER
Breakfast

Overflow seating available in the Washington Room

7:00 AM–7:30 AM MAJESTIC C

Trainee Breakfast

Trainee Breakfast with ANA Board of Directors*

The ANA Board of Directors is composed of academic neurologists at every level, representing all subspecialties from every region of the country. Join the Board for breakfast and an informal discussion on preparing for, entering, and succeeding in a career in academic neurology. This is a wonderful opportunity to interact with leading academics and discuss the selection of an academic path, areas of research focus, or how to navigate the faculty position seeking process.

7:30 AM–9:00 AM LANDMARK 3

Professional Development Courses

Course 1: Students, Residents, Trainees, PostDoc Fellows
Landing Your First Faculty Position

MODERATOR: *Mary Alissa Willis, MD, University of Mississippi*
MODERATOR: *Caitlin Loomis, MD, Yale University*

Successfully navigating the search for a faculty position is a critical step in launching and advancing your career. In this session, three academic leaders and Chairs of Neurology departments will share their advice from beginning the search through choosing the right position. Their talks will be followed by an interactive panel discussion with questions from the audience.

LEARNING OBJECTIVES:

1. **Identify sources of opportunities and how to find them.**
2. **Learn how to determine a "good fit" with a department.**
3. **Discuss common pitfalls and missed opportunities when looking for a position.**

Finding Opportunities and Getting Your Foot in the Door
S. Thomas Carmichael, MD, PhD, University of California, Los Angeles

How Do I Weigh Opportunities and Find the Right Fit?
David Gordon, MD, University of Oklahoma Health Sciences Center

Sell Yourself: Interviewing Skills, Elevator Pitches, and the Other Ways to Verbalize Your Vision
Mary Alissa Willis, MD, University of Mississippi

* This session is not available for AMA PRA Category I Credit(s)™

7:30 AM–9:00 AM LANDMARK 2

Professional Development Courses

Course 1: Early to Mid-Career

Building Public-Private Partnerships, Public Policy Partnerships For Translational Research and Innovation

MODERATOR: *Lauren Sansing, MD, MS, Yale University*

MODERATOR: *Toby Ferguson, MD, PhD, Biogen, Inc.*

In order to be successful, translational research requires interdisciplinary collaborations, bridging basic scientists, clinical researchers, academia, industry, and policy makers. Tremendous opportunities exist for growth of research that bridges the gaps between groups and inspires innovative and creative thinking to move therapies forward. In this session, leaders from the private and academic sectors will share their experiences with creating transformative research, identifying opportunities for collaborations, and the various career opportunities in translational medicine and how to explore them.

LEARNING OBJECTIVES:

1. **To offer an interactive discussion with leaders in industry for participants to fully explore the career opportunities in research in industry.**
2. **To explore how job opportunities in industry are identified and obtained.**
3. **To understand the day to day differences between academics and industry.**

Translational Research in the Private Sector

Jang-Ho Cha, MD, PhD, Novartis

Careers at the Intersection of Industry and Academics

Andrew Siderowf, MD, Perelman School of Medicine at the University of Pennsylvania

Patient Driven, Open Access Collaborations for Research Innovation

Manish Raisinghani, MBBS, PhD, Target ALS

7:30 AM–9:00 AM LANDMARK 1

Professional Development Courses

Course 1: Chair Career Level

Difficult Conversations

MODERATOR: *L. John Greenfield, MD, PhD, UConn Health*

As Neurology Chairs, we frequently need to tell a faculty member, trainee, or staff member that their work is inadequate, that they have done something wrong, or that their services are no longer needed. We are called on to investigate real or imagined infractions, or mediate between conflicting personnel. These interactions are collectively known as "Difficult Conversations." Despite years of medical and research training, we get no training in how to do manage these interactions effectively. This session will provide guidance from Dr. Henry Kaminski, a senior Neurology chair who will share what he has learned about how to approach a difficult or contentious topic, how to mediate between warring parties, when to take sides, how to fire an employee, and other challenging topics. We recommend several good books on the topic, including "Difficult Conversations" by Douglas Stone and Bruce Patton, and "Crucial Conversations" by Kerry Patterson et al.

LEARNING OBJECTIVES:

1. **Discuss strategies for conveying unpleasant information without injuring the person or the relationship.**
2. **List several approaches to diffuse contentious situations, and describe why it is important to listen to all sides of an argument before making a judgment.**
3. **Discuss why honesty and integrity are the most important things you bring to a difficult conversation.**

Difficult Conversations

Henry Kaminski, MD, George Washington University

9:00 AM–9:15 AM MAJESTIC FOYER

Coffee Break

* This session is not available for AMA PRA Category I Credit(s)™

9:15 AM–11:30 AM MAJESTIC D

Plenary Session

Presidential Symposium: Dominantly Inherited and Late-Onset Alzheimer's Disease: Genetics, Biomarkers, Timecourse, and Treatments

CHAIR: *David Holtzman, MD, Washington University in St. Louis*

CO-CHAIR: *John Morris, MD, Washington University in St. Louis*

Alzheimer's disease (AD) is the most common cause of dementia. Age and genetics are the two most important risk factors. There have been tremendous advances in our understanding of the key molecules and genes that contribute to the pathogenesis of both dominantly inherited as well as late onset-Alzheimer's disease. In this symposium, the genetics that underlie both forms of the disease will be reviewed and the latest advances in fluid and neuroimaging related biomarkers will be described. The biomarkers, pathology, and clinical features that characterize both forms of AD will be compared. AD pathological changes begin to occur in the brain about 20 years prior to symptom onset in both dominantly inherited and late-onset AD with many similarities and a few differences. These changes have facilitated the design of novel prevention trials in dominantly inherited AD that will be described and discussed.

LEARNING OBJECTIVES:

1. **To understand the clinical similarities and differences between early and late onset AD.**
2. **To understand the biomarker and pathological differences between early and late-onset AD.**
3. **To understand the genetic differences between early and late-onset AD.**

9:15 AM–9:20 AM

Introduction

David Holtzman, MD, Washington University in St. Louis

9:20 AM–9:40 AM

PRESENTATION OF THE 2019 F.E. BENNETT MEMORIAL LECTURE AWARD

Genetics of Alzheimer's Disease: Similarities and Differences Between Dominantly Inherited and Late Onset Alzheimer's Disease

Alison Goate, MD, DPhil, Icahn School of Medicine at Mount Sinai

9:40 AM–9:43 AM

Q&A and Discussion

9:43 AM–10:03 AM

Molecular Imaging in Alzheimer's Disease: Insights into Disease Pathogenesis

Gil Rabinovici, MD, University of California, San Francisco

10:03 AM–10:06 AM

Q&A and Discussion

10:06 AM–10:26 AM

Biomarker and Clinical Characterization of Dominantly Inherited Alzheimer's Disease

Yakeel Quiroz, PhD, Massachusetts General Hospital

10:26 AM–10:29 AM

Q&A and Discussion

10:29 AM–10:49 AM

Primary and Secondary Prevention Trials in Dominantly Inherited Alzheimer's disease

Randall Bateman, MD, Washington University in St. Louis

10:49 AM–10:52 AM

Q&A and Discussion

10:52 AM–10:57 AM

DATA BLITZ PRESENTATION

Association between Serum Neurofilament Light and Established White Matter Neuroimaging Markers in Autosomal Dominant Alzheimer's Disease

Stephanie Schultz, BS, Washington University in St. Louis

10:57 AM–11:02 AM

DATA BLITZ PRESENTATION

Plasma Aβ42/Aβ40 Measured with a High Precision Assay Predicts Current and Future Brain Amyloidosis

Suzanne Schindler, MD, PhD, Washington University in St. Louis

11:02 AM–11:20 AM

A Musical Journey with Alzheimer's: Glen Campbell I'll Be Me

Kim Campbell, Widow of Grammy Hall of Fame & Award-Winning Music Artist Glen Campbell, Alzheimer's Advocate

11:20 AM–11:25 AM

Q&A and Discussion

11:25 AM–11:30 AM

Closing Remarks

David Holtzman, MD, Washington University in St. Louis

11:30 AM–12:30 PM LANDMARK FOYER

Lunch

Boxed lunches will be available to take into the Interactive and Additional Lunch Workshops

12:00 PM–7:00 PM MAJESTIC E-H

Poster Viewing

Poster Viewing*

Poster presenters will be in attendance from 5:30 PM - 7:00 PM

* This session is not available for AMA PRA Category I Credit(s)™

11:45 AM–1:00 PM **LANDMARK 5**

Satellite Symposium

A Case Study: Progressive Muscle Weakness in a 31-Year-Old Female*

Participants are invited to work with us to uncover the cause of a patient's symptoms in this interactive case study.

Margaret Frey, DO, Memorial Healthcare-Owosso

11:45 AM–1:00 PM **MAJESTIC B**

Interactive Lunch Workshops

(These workshops are "Lunch and Learns")

Meet the Editors *

Editors from the named journals will be available to discuss the submission process, publishing, tips, and other key topics of interest.

Editor-in-Chief, Annals of Neurology
Clifford B. Saper, MD, PhD, Harvard Medical School

Editor-in-Chief, ACTN
Jack Kessler, MD, Northwestern University

Editor-in-Chief, BRAIN
Dimitri Kullmann, MA, DPhil, MBBS, FRCP, FANA, University College London

Editor-in-Chief, JAMA Neurology
Andrew Josephson, MD, FAAN, FANA, University of California, San Francisco

11:45 AM–1:00 PM **PORTLAND**

Interactive Lunch Workshops

Sleep Clocks, Disorders and Neurodegenerative Disease

CHAIR: *Raman Malhotra, MD, Washington University in St. Louis*

CO-CHAIR: *Lana Chahine, MD, University of Pittsburgh*

A strong association exists between disorders of sleep (e.g., REM-behavior disorder) and neurodegenerative conditions, particularly synucleinopathies. The appearance of sleep disturbances may precede other symptoms by decades. Recognition of this connection is important in patient care for management, surveillance, and future research.

LEARNING OBJECTIVES:

1. **Understand recent advances on animal research linking sleep regulation and human disease.**
2. **Recognize the connection between sleep disorders and neurodegenerative disease.**
3. **Discuss long term patient treatment/management in the context of both sleep and neurodegenerative disorders.**

11:45 AM–11:50 AM
Introduction
Raman Malhotra, MD, Washington University in St. Louis

11:50 AM–12:05 PM
REM-Behavior Disorder and Synucleinopathies
Lana Chahine, MD, University of Pittsburgh

12:05 PM–12:20 PM
Sleep, Circadian Rhythms and Alzheimer's Disease
Yo-El Ju, MD, Washington University in St. Louis

12:20 PM–12:35 PM
Unraveling the Mechanism of Altered Sleep During Sickness
David Raizen, MD, PhD, University of Pennsylvania

12:35 PM–1:00 PM
Q&A and Discussion

* This session is not available for AMA PRA Category I Credit(s)™

11:45 AM–1:00 PM PARKVIEW

Interactive Lunch Workshops

An Update on Migraine Pathophysiological Mechanisms and Emerging Treatments

CHAIR: *Todd Schwedt, MD, MS, Mayo Clinic*

Recent advances in our understanding of the pathophysiology of migraine have translated into successful clinical trials and clinical availability of new treatments. The goal of this session is to provide attendees with an overview and update of recent preclinical and clinical advances in the understanding of the neurobiology of migraine and novel therapeutic interventions.

LEARNING OBJECTIVES:

1. **To understand the preclinical evidence supporting the development on new treatments for migraine and related disorders.**
2. **To understand the results of recently concluded and description of ongoing clinical trials.**
3. **To understand the Indication, performance and challenges of new therapies in clinical practice**

11:45 AM–11:50 AM

Introduction

Todd Schwedt, MD, MS, Mayo Clinic

11:50 AM–12:05 PM

CGRP and its Role in Migraine

Todd Schwedt, MD, MS, Mayo Clinic

12:05 PM–12:10 PM

Q&A and Discussion

12:10 PM–12:35 PM

Clinical Trials of CGRP mAbs and Small Molecule CGRP Receptor Antagonists for Migraine

Juliana VanderPluym, MD, Mayo Clinic

12:35 PM–12:50 PM

Practical Use of CGRP mAbs in Clinical Practice

Sylvia Awadalla, MD, Washington University in St. Louis

12:50 PM–1:00 PM

Q&A and Discussion

11:45 AM–1:00 PM AUBERT

Interactive Lunch Workshops

Precision Medicine in Neurology

CHAIR: *Jun Li, MD, PhD, FAAN, FANA, Wayne State University School of Medicine*

CO-CHAIR: *Katherine Rankin, MD, University of California, San Francisco*

NIH Precision Medicine program (ALL of US) has launched since May 2018. It has stimulated a strong wave of phenotypic and genotypic data collection across the nation. While this effort may bring exciting findings, the following questions have been raised:

- What is the definition of Precision Medicine?
- How should the quality of phenotypic data be well guarded? What would the best way for neurologists to be a part of the endeavor?
- How can we prepare our next generation neurologists to utilize and interpret the data to be available from ALL of US?

During this workshop, attendees will utilize this platform to discuss these critical issues.

LEARNING OBJECTIVES:

1. **Discuss and define Precision Medicine, and formulate practical ways to implement the definition in the field of neurology.**
2. **To update the latest progresses in the ongoing NIH program of All of US.**
3. **Bioinformatics approaches in understanding human diseases.**

11:45 AM–11:50 AM

Introduction

Jun Li, MD, PhD, FAAN, FANA, Wayne State University School of Medicine

11:45 AM–11:50 AM

Introduction

Katherine Rankin, MD, University of California, San Francisco

11:50 AM–12:05 PM

Definition and Implementation of Precision Medicine in Neurology

Katherine Rankin, MD, University of California, San Francisco

12:05 PM–12:20 PM

Data Collection in NIH Precision Medicine Project

Stephan Zuchner, MD, PhD, FAAN, University of Miami

12:20 PM–12:35 PM

Precision Medicine in Neuro-Oncology

Tom Mikkelsen, MD, FRCP, Henry Ford Cancer Institute

12:35 PM–1:00 PM

Q&A and Discussion

* This session is not available for AMA PRA Category I Credit(s)™

11:45 AM–1:00 PM MAJESTIC C

Additional Lunch Workshops

19th Annual Women of the ANA Lunch Program *

CHAIR: *Lesli E. Skolarus, MD, MS, University of Michigan*

CO-CHAIR: *Karen C. Albright, PhD, DO, MPH, SUNY Upstate Medical University*

Opportunities and challenges vary by career stage. In order to capture this variation this year's Women of the ANA will feature speakers across the career spectrum. Speakers include: Assistant Professor, Dr. Nicole Chiota-McCollum; Assistant Professor, Dr. Mollie McDermott; Associate Professor, Dr. Karen Albright; Professor, Associate Vice President for Clinical and Translational Research and Immediate Past Chair, Dr. Karen Johnston. The session will be moderated by Associate Professor, Dr. Lesli Skolarus. After the brief formal talks, the attendees will break up into small groups to discuss their experiences with ample time devoted to peer-mentoring and networking.

FACULTY: *Mollie McDermott, MD, MS, University of Michigan*

FACULTY: *Karen C. Johnston, MD, MSc, University of Virginia*

FACULTY: *Nicole Chiota-McCollum, MD, University of Virginia*

1:00 PM–1:15 PM

Break

1:15 PM–3:15 PM MAJESTIC D

Plenary Session

Derek Denny-Brown Young Neurological Scholar Symposium

CHAIR: *Allison Brashear, MD, PhD, Wake Forest University*

CO-CHAIR: *Andrew J. Cole, MD, FRCP, Massachusetts General Hospital and Harvard Medical School*

The Derek Denny-Brown Young Neurological Scholar Symposium is an opportunity for young researchers to share groundbreaking research in the field of Neurology. This symposium will feature presentations from the 2019 Derek Denny-Brown awardees, the Wolfe Neuropathy Research Prize and the Grass Foundation-ANA Award in Neuroscience recipients.

The Derek Denny-Brown Young Neurological Scholar Award recognizes early- to mid-career neurologists and neuroscientists. This award honors those neurologists and neuroscientists in the first 10 years of their career at the assistant/associate faculty (equivalent) level who have made outstanding basic and clinical scientific advances toward the prevention, diagnosis, treatment and cure of neurological diseases. The Membership, Honorary and Awards Committee can designate up to a total of three (3) awards in any of the following three areas: Physician Scientist-Basic, physician Scientist-Clinical, Neuroscientist-relevant to disease.

The Distinguished Neurology Teacher Award was established in 1996 to recognize outstanding accomplishments in teaching neurology to residents and medical students. The purpose is to encourage efforts to recognize and reward contributions by gifted and talented teachers in neurology. Each Neurology Department in the U.S. and Canada is encouraged to nominate one individual from the entire field of neurology each year.

The 2019 Grass Foundation-ANA Award in Neuroscience was established in 2007 to recognize outstanding young physician scientists conducting research in basic and clinical neuroscience. The Grass Foundation was established in 1955 by Albert and Ellen Grass to advance research and education in neuroscience, with a special focus on investigators early in their careers.

The Wolfe Neuropathy Research Prize for Investigators Identifying New Causes or Novel Treatments of Axonal Peripheral Neuropathy was established to honor outstanding investigators who identify a new cause or treatment of axonal peripheral neuropathy. Eligible candidates include faculty members at any stage in their career (MD, MD/PhD, or PhD) who identify either a new cause or treatment of axonal peripheral neuropathy. The same researcher can qualify for this award annually if he/she can demonstrate evidence of repeated success in identifying new causes or treatments for axonal peripheral neuropathy.

1:15 PM–1:17 PM

Introduction

Allison Brashear, MD, PhD, Wake Forest University

* This session is not available for AMA PRA Category I Credit(s)™

1:15 PM–1:17 PM

Introduction

Andrew J. Cole, MD, FRCP, Massachusetts General Hospital and Harvard Medical School

1:17 PM–1:20 PM

DISTINGUISHED NEUROLOGY TEACHER AWARD

John C. Kincaid, MD, PhD, Indiana University

1:20 PM–1:40 PM

THE DEREK DENNY-BROWN YOUNG NEUROLOGICAL SCHOLAR AWARD - BASIC

Mapping and Treating Neuropsychiatric Symptoms Using The Human Brain Connectome

Michael Fox, MD, PhD, Harvard Medical School

1:40 PM–1:43 PM

Q&A and Discussion

1:43 PM–2:03 PM

THE DEREK DENNY-BROWN YOUNG NEUROLOGICAL SCHOLAR AWARD - NEUROSCIENCE

Literature-Based Discovery Facilitates Predictive Medicine for Neurological Disease

Cassie S. Mitchell, PhD, Georgia Institute of Technology & Emory University

2:03 PM–2:06 PM

Q&A and Discussion

2:06 PM–2:26 PM

THE DEREK DENNY-BROWN YOUNG NEUROLOGICAL SCHOLAR AWARD - CLINICAL

Enabling Computers to Detect Epileptiform Discharges as Well as Clinical Neurophysiologists

M. Brandon Westover, MD, PhD, Massachusetts General Hospital and Harvard Medical School

2:26 PM–2:29 PM

Q&A and Discussion

2:29 PM–2:49 PM

THE GRASS FOUNDATION - ANA AWARD IN NEUROSCIENCE

SCN3A-Related Neurodevelopmental Disorder: A Disease Spectrum Including Epilepsy With Or Without Brain Malformation

Ethan Goldberg, MD, PhD, Children's Hospital of Philadelphia

2:49 PM–2:52 PM

Q&A and Discussion

2:52 PM–3:12 PM

WOLFE NEUROPATHY RESEARCH PRIZE

Nociceptor Excitability Underlies Axon Loss in Diabetic Neuropathy: A New Disease Modifying Target

Daniela Maria Menichella, MD, PhD, Northwestern University

3:12 PM–3:15 PM

Q&A and Discussion

3:15 PM–3:30 PM LANDMARK FOYER

Coffee Break

3:30 PM–5:30 PM LANDMARK 1

Special Interest Groups

Autoimmune Neurology

CHAIR: *Eric Lancaster, MD, PhD, University of Pennsylvania*

CO-CHAIR: *Anusha Yeshokumar, MD, Icahn School of Medicine at Mount Sinai*

Autoimmune Neurology encompasses the diagnosis and treatment of neurological disorders with an autoimmune basis. The last decade has seen a dramatic increase in the discovery of neural-specific autoantibodies and their target antigens. This SIG will explore advances in the field ranging from clinical practice to novel insights and immunologic mechanisms of injury.

LEARNING OBJECTIVES:

1. **Understand the pitfalls and limitations of paraneoplastic antibody testing and how inappropriate use of tests may harm patients.**
2. **Learn the design of upcoming trials to treat autoimmune encephalitis.**
3. **Learn to use advanced brain imaging effectively in the diagnosis of autoimmune encephalitis.**
4. **Appreciate the implications of the latest research on autoimmune encephalitis.**

3:30 PM–3:34 PM

Introduction

Eric Lancaster, MD, PhD, University of Pennsylvania

3:30 PM–3:34 PM

Introduction

Anusha Yeshokumar, MD, Icahn School of Medicine at Mount Sinai

3:34 PM–3:54 PM

LEADER IN THE FIELD PRESENTATION

The Value of Neurologists

Brian Callaghan, MD, MS, University of Michigan

3:54 PM–3:58 PM

Q&A and Discussion

3:58 PM–4:18 PM

LEADER IN THE FIELD PRESENTATION

The Urgent Need for Evidence: Designing Clinical Trials in Autoimmune Encephalitis

Stacey Clardy, MD, University of Utah

4:18 PM–4:22 PM

Q&A and Discussion

4:22 PM–4:42 PM

LEADER IN THE FIELD PRESENTATION

Brain FDG-PET Imaging in Autoimmune Encephalitis

John Probasco, MD, Johns Hopkins University

4:42 PM–4:46 PM

Q&A and Discussion

* This session is not available for AMA PRA Category I Credit(s)™

4:46 PM–4:56 PM
DATA BLITZ PRESENTATION

Tocilizumab versus Azathioprine in Highly Relapsing Neuromyelitis Optica Spectrum Disorders (TANGO): A Head-to-Head Comparative Study
Fu-Dong Shi, MD, PhD, Tianjin General Hospital

4:56 PM–5:00 PM

Q&A and Discussion

5:00 PM–5:10 PM
DATA BLITZ PRESENTATION

Neurochondrin Neurological Autoimmunity
Shahar Shelly, MD, Mayo Clinic

5:10 PM–5:14 PM

Q&A and Discussion

5:14 PM–5:24 PM
DATA BLITZ PRESENTATION

Multimodal Investigation of the Etiology for Acute Flaccid Myelitis
Ryan Schubert, MD, University of California, San Francisco

5:24 PM–5:30 PM

Q&A and Discussion

3:30 PM–5:30 PM LANDMARK 2

Special Interest Groups

Clinical Logic

CHAIR: *Raymond Price, MD, University of Pennsylvania*
CO-CHAIR: *Steven Galetta, MD, NYU Langone Medical Center*

This case based SIG will emphasize general neurology and neuro-ophthalmology. The clinical evaluations will be selected from patients seen in consultation. The cases will be presented as unknowns to the audience including their history, examination and the diagnostic testing that was performed. Attendees will be encouraged to participate in the case discussions as they unravel. Lessons learned and the sources of diagnostic and management error will be emphasized.

LEARNING OBJECTIVES:

1. **Discuss challenging cases in neurology both in terms of diagnosis and management.**
2. **Learn new concepts of neurologic illness.**
3. **Discuss advanced testing for complex neurologic cases.**

3:30 PM–3:50 PM

Interesting Cases
Steven Galetta, MD, NYU Langone Medical Center

3:50 PM–4:10 PM

Interesting Cases
Megan Richie, MD, University of California, San Francisco

4:10 PM–4:30 PM

Interesting Cases
Raymond Price, MD, University of Pennsylvania

4:30 PM–4:50 PM

Interesting Cases
Megan Richie, MD, University of California, San Francisco

4:50 PM–5:10 PM

Interesting Cases
Raymond Price, MD, University of Pennsylvania

5:10 PM–5:30 PM

Interesting Cases
Steven Galetta, MD, NYU Langone Medical Center

3:30 PM–5:30 PM LANDMARK 4

Special Interest Groups

Dementia and Aging

CHAIR: *Eric McDade, DO, Washington University in St. Louis*
CO-CHAIR: *Jasmeer Chhatwal, MD, PhD, Massachusetts General Hospital*

Although Alzheimer and related dementias of aging have signature, misfolded proteins that distinguish the pathologic hallmarks of the diseases there remain no disease modifying therapies for most. Increasingly, it is recognized that there are multiple potential modulators of the disease expression that may hold promise as therapeutic targets. During this session the presenters will explore how the study of vascular mechanisms, sleep and genetic-proteomic pathway analysis studies of richly phenotyped populations are identifying important contributors to disease risk and expression. These modulators will be discussed in relation to how they affect amyloid and tau as well as the clinical expression of the disease.

LEARNING OBJECTIVES:

1. **Identify the role of sleep in the AD pathology and progression.**
2. **Understand the role of brain imaging in discriminating vascular and neurodegenerative contributors to white matter hyperintensities.**
3. **Assess the ways that genetic and -omic studies in AD can identify critical pathways of disease progression.**

3:30 PM–3:32 PM

Introduction
Eric McDade, DO, Washington University in St. Louis

3:32 PM–3:34 PM

Introduction
Jasmeer Chhatwal, MD, PhD, Massachusetts General Hospital

* This session is not available for AMA PRA Category I Credit(s)™

3:34 PM–3:54 PM
LEADER IN THE FIELD PRESENTATION

Role Of TREM2 And Microglia In Amyloid-Mediated Tau Seeding and Spreading

David Holtzman, MD, Washington University in St. Louis

3:54 PM–3:59 PM

Q&A and Discussion

3:59 PM–4:19 PM
LEADER IN THE FIELD PRESENTATION

A Single Cell Level Network Map Of The Aging Frontal Cortex and Alzheimer's Disease

Philip DeJager, MD, PhD, Columbia University

4:19 PM–4:24 PM

Q&A and Discussion

4:24 PM–4:44 PM
LEADER IN THE FIELD PRESENTATION

Alzheimer's Pathologic Biomarkers in Subcortical Vascular Cognitive Impairments

Sang Won Seo, MD, PhD, Sungkyunkwan University School of Medicine, Samsung Medical Center

4:44 PM–4:49 PM

Q&A and Discussion

4:49 PM–4:59 PM
DATA BLITZ PRESENTATION

Tau Disrupts Neurovascular Function by Uncoupling NMDA Receptor Activity from Nitric Oxide Production

Costantino Iadecola, MD, Weill Cornell Medicine

4:59 PM–5:04 PM

Q&A and Discussion

5:04 PM–5:14 PM
DATA BLITZ PRESENTATION

Differences between TDP-43 Types in Subjects with Alzheimer's Spectrum Pathology

Marina Buciuc, MD, MS, Mayo Clinic

5:14 PM–5:30 PM

Q&A and Discussion

3:30 PM–5:30 PM LANDMARK 3

Special Interest Groups

Epilepsy

CHAIR: *Frances E. Jensen, MD, FACP, University of Pennsylvania*

CO-CHAIR: *Jae-Moon Kim, MD, PhD, Chungnam National University*

There has been significant advancement in the treatment of drug resistant epilepsy in the last 5 years with multiple new devices and surgical approaches in development. In addition, there has been increasing insight into epilepsy networks and seizure patterns leveraging network neuroscience and quantitative approaches. This SIG will feature talks on the the use of noninvasive neuromodulation, implementing wearables to predict seizures, imaging connectomics in epilepsy surgical evaluation, implementing the expanding number of surgical approaches and devices in clinical practice with a focus on how network neuroscience and bioengineering will influence epilepsy treatment in the future.

LEARNING OBJECTIVES:

1. **Obtain knowledge regarding new devices in development for epilepsy**
2. **Exposure to imaging modalities to visualize the epilepsy connectome**
3. **Understand advances in wearables and seizure prediction**
4. **Exposure to novel biomaterials in development for epilepsy**
5. **Understand how new epilepsy surgical approaches are changing practice**

MODERATOR: *Kathryn Davis, MD, MS,, University of Pennsylvania*

3:32 PM–3:50 PM
LEADER IN THE FIELD PRESENTATION

Current Status of VNS and DBS in Korea

Jae-Moon Kim, MD, PhD, Chungnam National University Hospital

3:50 PM–4:10 PM
LEADER IN THE FIELD PRESENTATION

Measures and Modulation if Cortical Excitability by TMS and tDCS

Alexander Rotenberg, MD, PhD, Boston Children's Hospital, Harvard Medical School

4:10 PM–4:30 PM
LEADER IN THE FIELD PRESENTATION

Epilepsy Monitoring Outside the Clinic- Seizure Detection and Prediction with Wearable Biosensors

Ben Brinkmann, PhD, Mayo Clinic

4:30 PM–4:50 PM
LEADER IN THE FIELD PRESENTATION

Imaging Connectomics in Epilepsy Surgical Evaluation

Leonardo Bonhila, MD, PhD, The Medical University of South Carolina

* This session is not available for AMA PRA Category I Credit(s)™

4:50 PM–5:10 PM
LEADER IN THE FIELD PRESENTATION

When Nano Meets Neuro: High Resolution, Multimodal Neural Interfaces for Mapping Epileptic Network Dynamics

Flavia Vitale, PhD, University of Pennsylvania

5:10 PM–5:30 PM
LEADER IN THE FIELD PRESENTATION

Implementation of the Expanding Number of Surgical Approaches and Devices in Clinical Practice; How to Leverage Network Neuroscience and Bioengineering at the Bedside

Timothy Lucas, MD, PhD, University of Pennsylvania

5:30 PM–5:35 PM

Q&A and Discussion

3:30 PM–5:30 PM LANDMARK 7

Special Interest Groups

Health Services Research

CHAIR: *Nabila Dahodwala, MD, MS, University of Pennsylvania*

CO-CHAIR: *Benzi Kluger, MD, MS, FAAN, University of Colorado*

To increase understanding of health services research methodology and, in turn, change clinical practice and health policy to improve the value of neurological care.

The session will cover the latest in health services research including topics such as global health, value of neurologist in epilepsy care and implementation science in practice, and the best abstracts in the field.

LEARNING OBJECTIVES:

1. **Describe the health services research methodology for implementation science.**
2. **Understand neurology research priorities in resource poor settings.**
3. **Understand value of neurologists in providing specialized care.**

3:30 PM–3:34 PM

Introduction

Nabila Dahodwala, MD, MS, University of Pennsylvania

3:34 PM–3:54 PM
LEADER IN THE FIELD PRESENTATION

Value of Neurologists

Brian Callaghan, MD, University of Michigan Medical School

3:54 PM–4:04 PM
DATA BLITZ PRESENTATION

Geographic Variation in Neurologists and Neurologic Care

Chun Chieh Lin, PhD, University of Michigan Medical School

4:04 PM–4:24 PM
LEADER IN THE FIELD PRESENTATION

Underutilization of Lumbar Puncture in Africa: Studying the 'Tap Gap' Across Different Systems in Zambia

Gretchen I. Birbeck, MD, MPH, DTMH, University of Rochester

4:24 PM–4:34 PM
DATA BLITZ PRESENTATION

Evaluation of Stroke Care Metrics in Safety Net Hospitals Across United States

Deep Pujara, MBBS, MPH, University of Texas, McGovern Medical School

4:34 PM–4:54 PM
LEADER IN THE FIELD PRESENTATION

Implementation Science in Action: from Global Health to the Department of Defense

Ana-Claire Meyer, MD, MSHS, Yale University

4:54 PM–5:04 PM
DATA BLITZ PRESENTATION

Examining Medication Adherence in a Multidisciplinary Parkinson's Disease Clinic

Andrew Wilson, MD, MS, MBA, University of California, Los Angeles

5:04 PM–5:30 PM

Q&A and Introduction

* This session is not available for AMA PRA Category I Credit(s)™

3:30 PM–5:30 PM MAJESTIC A

Special Interest Groups

Neurocritical Care

Recent Randomized Clinical Trials in Neurocritical Care: Lesson Learned

Lessons Learned from Recent Neuro-ICU Trials

CHAIR: *Romergryko G. Geocadin, MD, Johns Hopkins University*

CO-CHAIR: *Nerissa Ko, MD, MAS, University of California, San Francisco*

The most common conditions requiring neurocritical care are intracerebral hemorrhage, aneurysmal subarachnoid hemorrhage and ICU-encephalopathy (delirium) but the wide practice variability exist in the care these patients in the Neurocritical care units. Recent randomized clinical trials addressing key management questions have been completed in these areas. While the results of these trials were negative or inconclusive much can be learned from them. What can be learned from these trials to inform our current management strategies? How can we use the evidence from clinical trials and other standards to improve patient care and outcomes? What are the challenges and approaches to clinical research trials in the ICU population?

3:30 PM–3:34 PM

Introduction

Romergryko G. Geocadin, MD, Johns Hopkins University

3:30 PM–3:34 PM

Introduction

Nerissa Ko, MD, MAS, University of California, San Francisco

3:34 PM–4:04 PM

LEADER IN THE FIELD PRESENTATION

Putting MISTIE III in Context

Daniel Hanley, MD, Johns Hopkins University

4:04 PM–4:34 PM

LEADER IN THE FIELD PRESENTATION

Lessons Learned from CONSCIOUS Studies: The Future of Clinical Research in Subarachnoid Hemorrhage

R. Loch MacDonald, MD, PhD, University of Toronto

4:34 PM–5:04 PM

LEADER IN THE FIELD PRESENTATION

Lessons Learned from the SHINE Trial—Stroke Hyperglycemia Insulin Network Effort: The Future of Glucose Management in Stroke Patients in the ICU

Karen C. Johnston, MD, MSc, University of Virginia

5:04 PM–5:30 PM

Q&A and Discussion

3:30 PM–5:30 PM LANDMARK 5

Special Interest Groups

Neuromuscular Disease

CHAIR: *Margherita Milone, MD, PhD, Mayo Clinic*

CO-CHAIR: *Vern Juel, MD, Duke University*

This session will cover the latest development in key areas of research, diagnostics and treatment in the field of neuromuscular diseases to highlight the latest developments. The field of neuromuscular medicine has witnessed a remarkable advance in knowledge, diagnostics and therapeutics, in both genetic and autoimmune disorders, leading to individualized patient care. Gene therapy targeting not only specific genes, but even specific mutations (e.g. Duchenne muscular dystrophy), has become a reality. This has resulted in the survival of patients affected by disabling disorders who in the past would have died in infancy. Such novel treatments have improved quality of life of many patients with hereditary neuromuscular diseases. In the arena of immune-mediated neuromuscular disorders, immunotherapy targeting the disease mechanism underlying a specific autoimmune neuromuscular disease has allowed to optimize the treatment of pharmacologically-resistant patients. For example, drugs designed to inhibit complement are now available to treat myasthenia gravis, a disease in which complement plays a crucial role in the pathogenesis of the weakness and fatigability. Now, much more than before, the full characterization of a specific neuromuscular disease is necessary to offer up-to-date treatment.

LEARNING OBJECTIVES:

1. **Highlight recently developed monoclonal antibody (mAb) therapies for autoimmune myasthenia gravis (MG) and review clinical trial findings supporting therapeutic use of mAb in MG.**
2. **Discuss mechanisms of therapeutic mAb activity in MG including B-cell depletion, complement inhibition, and neonatal Fc receptor blocking.**
3. **Describe the spectrum of amyloid myopathies, from acquired to hereditary.**
4. **Distinguish amyloid myopathies from myopathies with sarcoplasmic amyloid deposition.**
5. **To discuss recent advances in CMT genetics including identification of modifier genes**
6. **To review therapeutics development efforts for CMT.**

3:30 PM–3:34 PM

Introduction

Margherita Milone, MD, PhD, Mayo Clinic

3:30 PM–3:34 PM

Introduction

Vern Juel, MD, Duke University

3:34 PM–3:54 PM

LEADER IN THE FIELD PRESENTATION

Monoclonal Anitbody Therapy in Myasthenia Gravis

Vern Juel, MD, Duke University

* This session is not available for AMA PRA Category I Credit(s)™

3:54 PM–3:59 PM

Q&A and Discussion

3:59 PM–4:19 PM

LEADER IN THE FIELD PRESENTATION

Amyloidosis: Putting Myopathy on the Map

Teerin Liewluck, MD, Mayo Clinic

4:19 PM–4:24 PM

Q&A and Discussion

4:24 PM–4:44 PM

LEADER IN THE FIELD PRESENTATION

Update on CMTs: Genetic and Therapeutic Advances

Charlotte J. Sumner, MD, Johns Hopkins University

4:44 PM–4:49 PM

Q&A and Discussion

4:49 PM–4:59 PM

DATA BLITZ PRESENTATION

Evaluating Cell Autonomous and Non-Cell Autonomous Mechanisms in TBK1-Associated ALS

Cindy Ly, MD, PhD, Washington University in St. Louis

4:59 PM–5:04 PM

Q&A and Discussion

5:04 PM–5:14 PM

DATA BLITZ PRESENTATION

The RNA-Binding Domains of TDP-43 are Crucial for Aggregation, Which Can Be Modulated by Specific RNAs

Zachary Grese, BA, St. Louis University School of Medicine

5:14 PM–5:30 PM

Q&A and Discussion

3:30 PM–5:30 PM LANDMARK 6

Special Interest Groups

Traumatic Brain Injury

CHAIR: *Dongming Cai, MD, PhD, Icahn School of Medicine at Mount Sinai*

CO-CHAIR: *David Brody, MD, PhD, Center for Neuroscience and Regenerative Medicine, Uniformed Services University*

Traumatic brain injury (TBI) affects 1-2 million people in US each year, causing lifelong functional deficits in cognition and behavior. TBI is a series of different pathophysiological disorders that strikes across all demographics with a broad range of injury severities. This session will cover topics in basic, translational and clinical perspectives on this complex problem.

LEARNING OBJECTIVES:

1. **To better understand the molecular pathophysiology of TBI.**
2. **To update development of innovative biomarkers for detection and clinical assessment of TBI.**
3. **To gain insight into novel therapeutic approaches and prevention strategies for TBI.**

3:30 PM–3:34 PM

Introduction

Dongming Cai, MD, PhD, Icahn School of Medicine at Mount Sinai

3:34 PM–3:54 PM

LEADER IN THE FIELD PRESENTATION

Repetitive Transcranial Magnetic Stimulation with Resting State Network Targeting for Treatment-Resistant Depression in Traumatic Brain Injury

David Brody, MD, PhD, Center for Neuroscience and Regenerative Medicine, Uniformed Services University

3:54 PM–4:14 PM

LEADER IN THE FIELD PRESENTATION

Delayed Hypoxemia Following Traumatic Brain Injury: a New Target for Neuroprotective Therapeutics

Stuart Friess, MD, Washington University in St. Louis

4:14 PM–4:34 PM

LEADER IN THE FIELD PRESENTATION

Imaging Synaptic Injury in TBI with AirySynapse

Terrance Kummer, MD, PhD, Washington University in St. Louis

4:34 PM–4:44 PM

DATA BLITZ PRESENTATION

Evaluating the Influence of Pre-Hospital Characteristics of Traumatic Brain Injury on Race-Ethnic Differences in Mortality

Sai Polineni, MPH, University of Miami Miller School of Medicine

4:44 PM–4:54 PM

DATA BLITZ PRESENTATION

Sleep in Patients with Severe Disorders of Consciousness: Behavioral and Physiological Perspective

Yuri Pavlov, MSc, University of Tuebingen

4:54 PM–5:30 PM

Q&A and Presentation

5:30 PM–7:00 PM MAJESTIC E-H

Poster Presentations & Reception*

Poster presenters will be in attendance from 5:30 PM - 7:00 PM.

* This session is not available for AMA PRA Category I Credit(s)™

6:30 PM–8:30 PM MAJESTIC B&C

Career Fair*

The ANA-AUPN Career Fair is an opportunity for residents, post-doc fellows and graduate students to interact with academic neurology departments at a designated time and place to discuss career opportunities at the institutions in attendance.

In its second year, the ANA-AUPN Career Fair will take place during its own dedicated hours at ANA2019, and feature a reception and refreshments—the perfect atmosphere for making connections. Neurology residents, post-doc fellows and graduate students can present their CVs and have brief discussions with institutions regarding open positions. Last year, Career Fair attendees met with department chairs from 28 prominent universities.

Monday, October 14, 2019

6:00 AM–7:30 AM LANDMARK 5

Satellite Symposium

Exploring the Science and Appreciating the Patient Experience: Early, Individualized Therapy to Optimize Outcomes in Multiple Sclerosis*

Multiple sclerosis (MS) is a progressive, immune-mediated, neurodegenerative disease that is associated with irreversible physical disability and functional impairment. Due to its heterogeneity, treatment of patients with MS is highly individualized. This activity is designed to help neurologists integrate the latest clinical evidence on disease-modifying therapies (DMTs) with patient needs and preferences to develop effective, individualized treatment plans. During this interactive case-based activity, learners will balance the benefits and risks of MS treatment options to optimize patient management through shared decision-making. Please go to https://integrityce.com/ana for more information and to register for free for this symposium.

FACULTY: *Aaron L Boster, MD, OhioHealth Neurological Physicians*

FACULTY: *Claire S Riley, MD, Columbia University Medical Center*

6:30 AM–5:45 PM LANDMARK FOYER

Registration

6:30 AM–7:00 AM WASHINGTON ROOM

Mentor-Mentee Breakfast

Mentor-Mentee Breakfast*

(by invitation only)

7:00 AM–8:00 AM LANDMARK FOYER

Breakfast

Overflow seating available in the Washington Room

* This session is not available for AMA PRA Category I Credit(s)™

7:00 AM–8:30 AM LANDMARK 3

Professional Development Courses

Course 2: Students, Residents, Trainees, PostDoc Fellows

Setting Yourself Up for Research Success: T to K Transition and Preparing For Your K Application

MODERATOR: *Jonathan Rosand, MD, MSc, Harvard University*

MODERATOR: *Ellen Mowry, MD, MSc, Johns Hopkins University*

Getting started in a successful research career is an exciting endeavor that can seem daunting. What type of research do I want to do? How do I know if this is a project with legs? What are the qualities of a good mentor? What kind of training do I need? In this session, academic leaders will discuss topics important for burgeoning researchers and share their experiences on how they navigated the path towards success. There will then be an interactive panel discussion with questions from the audience.

LEARNING OBJECTIVES:

1. **Learn the components of a K award and how they differ from other types of grant applications.**
2. **Gain an understanding of the qualities the study section are looking for in your K application.**
3. **Be able to discuss the path forward from idea to K award and what hurdles to expect.**

Setting Yourself Up For a Successful Research Career

David Hafler, MD, MS, Yale School of Medicine

How Do I Get the Training I Need to be Successful?

Louise D McCullough, MD, PhD, University of Texas Health Science Center at Houston

How I Did It

Cassie S Mitchell, PhD, Georgia Institute of Technology and Emory University School of Medicine

How I Did It

Michael Fox, MD, PhD, Beth Israel Deaconess Medical Center and Harvard Medical School

7:00 AM–8:30 AM LANDMARK 2

Professional Development Courses

Course 2: Early to Mid-Career

Quantifying Your Success for Promotion: Advice for both Clinician-Educators and Researchers at the K to R Transition

MODERATOR: *Lauren Sansing, MD, MS, Yale University*

MODERATOR: *Tracey Cho, MD, University of Iowa*

Preparing for promotion takes planning. This will be an interactive session discussing strategies for promotion for physicians in academic medical centers, with an emphasis on less clear-cut metrics such as quantifying productivity in education and clinical care and demonstrating a national reputation.

LEARNING OBJECTIVES:

1. **Identify key metrics used at institutions for promotion on the clinician-educator track.**
2. **Learn strategies for quantifying clinical and education success.**
3. **Understand the details for investigators as it relates to grants, papers, and "national reputation".**

How Do I Assess a Faculty Member's Readiness for Promotion? What Do They Need to Demonstrate?

Steven Galetta, MD, NYU Langone Medical Center

K to R? National Reputation? What Do You Really Need To Do as a Researcher?

David Standaert, MD, PhD, University of Alabama at Birmingham

Building Your Dossier as a Clinician-Educator

Tracey Cho, MD, University of Iowa

* This session is not available for AMA PRA Category I Credit(s)™

7:00 AM–8:30 AM **LANDMARK 1**

Professional Development Courses

Course 2: Chair Career Level

Immigration Law

MODERATOR: *L. John Greenfield, MD, PhD, UConn Health*

Our Neurology workforce depends heavily on the recruitment and retention of physicians from outside the continental US, who train in our residency programs and join our faculties under the auspices of a variety of visa programs. Understanding how these programs work is vitally important to Chairs who need to navigate the legal, social and financial issues raised by immigration. Dr. Erica Schuyler, residency program Director at the UConn/Hartford Healthcare program and President-elect of the Consortium of Program Directors, will provide an overview of how the various visa programs, Conrad waivers, and other immigration mechanisms can be used to facilitate recruitment and retention of residents and faculty from abroad. She will also discuss some of the problems that trainees and new faculty face when integrating into medical and social systems that are often significantly different than the ones in which they were born and raised.

LEARNING OBJECTIVES:

1. **Describe the features of J1, H1B, O1, Conrad waiver, and permanent resident ("Green card") visas.**
2. **Discuss some of the problems faced by foreign physicians as they integrate into the US medical system and society.**

Erica Schuyler, MD, UConn Health

8:30 AM–8:45 AM **LANDMARK FOYER**

Coffee Break

8:45 AM–10:45 AM **MAJESTIC D**

Plenary Session

Advances in Regenerative Medicine: Cellular Memory Systems in Brain Repair

CHAIR: *S. Thomas Carmichael, MD, PhD, University of California, Los Angeles*

CO-CHAIR: *Lauren Sansing, MD, MS, Yale University*

Recovery after acute brain injury involves adaptation, plasticity and change in spared neural circuits. The mechanisms of plasticity in the brain after injuries such as stroke and head trauma are not well defined, and represent a significant unmet need in neurology. Recent evidence indicates that the cellular mechanisms that mediate synaptic plasticity in learning and memory formation may play a role in neural repair and recovery in stroke and TBI. These provide drug targets for clinical trial in these two diseases, with several underway at present. This symposium will discuss cellular systems involved in learning and memory and how these have been identified as having roles in recovery in stroke and TBI. Dr. Alcino Silva will review molecular memory systems, their common signaling pathways and effects and how these relate to neurodevelopmental and adult neurological diseases. Dr. S. Thomas Carmichael will review three molecular systems originally identified in memory formation, which have been now also shown to play a role in stroke and TBI recovery: CREB, CCR5 and tonic GABA signaling. Dr. Mark Tuszynski will describe molecular and cellular changes that underlie learning in motor and premotor cortex and how these changes can be targeted for therapies in brain injury. Dr. Nicole Calakos will discuss mechanism of synaptic plasticity in the striatum and how these influence habit behaviors and lead to disorders, such as obsessive compulsive disease.

LEARNING OBJECTIVES:

1. **Understand the normal process of recovery after stroke.**
2. **Understand the mechanisms of learning and memory in the brain.**
3. **Identify mechanisms in the brain that lead to improved recovery after stroke.**

8:45 AM–8:50 AM

Introduction

S. Thomas Carmichael, MD, PhD, University of California, Los Angeles

8:50 AM–9:10 AM

Genetic Manipulations of CCR5 and the Multifaceted Molecular Cellular and Circuit Mechanisms of Cognitive Enhancement: A Caution

Alcino J. Silva, PhD, University of California, Los Angeles

9:10 AM–9:13 AM

Q&A and Discussion

9:13 AM–9:33 AM

Molecular Memory Systems in Recovery after Stroke

S. Thomas Carmichael, MD, PhD, University of California, Los Angeles

* This session is not available for AMA PRA Category I Credit(s)™

9:33 AM–9:36 AM

Q&A and Discussion

9:36 AM–9:56 AM

Common Molecular Mechanisms in Learning and Cortical Repair

Mark Tuszynski, MD, PhD, University of California, San Diego

9:56AM–9:59 AM

Q&A and Discussion

9:59 AM–10:19 AM

Pathways Regulating Synaptic Plasticity as Targets for Neurological Disease – Too Much of a Good Thing?

Nicole Calakos, MD, PhD, Duke University

10:19 AM–10:22 AM

Q&A and Discussion

10:22 AM–10:27 AM

DATA BLITZ PRESENTATION

Absence Of Sarm1 Promotes Axonal And Neuronal Survival After Stroke

Jason Hinman, MD, PhD, University of California, Los Angeles

10:27 AM–10:30 AM

Q&A and Discussion

10:30 AM–10:35 AM

DATA BLITZ PRESENTATION

Late Effects Of Bilateral Carotid Artery Stenosis In An Aged Mouse Model

Michael Maniskas, PhD, University of Texas Health Science Center

10:35 AM–10:45 AM

Q&A and Discussion

10:45 AM–11:20 AM MAJESTIC D

Executive Session of Membership*

All ANA members are encouraged to attend this session where new officers and directors will be elected to the ANA Board of Directors.

11:15 AM–12:00 PM LANDMARK FOYER

Lunch

Sponsored by Winchester Neurological Consultants.
Boxed lunches will be available to take into the Interactive and Additional Lunch Workshops.

11:30 AM–12:30 PM PORTLAND

Interactive Lunch Workshops

(These workshops are "Lunch and Learns")

Neurological Rare Diseases & Neglected Tropical Diseases: Can Shared Challenges Inform Common Solutions?

CHAIR: *Michelle Kvalsund, DO, MS, Michigan State University*

CO-CHAIR: *Jonathan Mink, MD, PhD, FAAN, FANA, FAAP, University of Rochester*

The neurological burden of disease due to rare diseases (aggregated) and neglected tropical diseases (NTDs) affect millions globally yet both entities are largely grossly under-resourced in terms of the capacity for reasonable clinical care provision proximate to the patients and funding to improve diagnostics, delineate optimal care models and drive the development of much-needed therapies. The US Food and Drug Administration has special programs aimed at stimulating/facilitating treatments for rare diseases and NTDs that have already yielded benefits. Shared challenges in our efforts to advance the understanding of and care for these conditions include the imperative to engage a broad group of stakeholders, including other scientists, regarding the associated neurological burdens and the need to stimulate investment in discovery where traditional market forces fail. In this session we will explore the burdens associated with rare diseases and NTDs with a special emphasis on shared challenges and possible common solutions.

LEARNING OBJECTIVES:

1. **To understand the aggregate neurological burden of rare diseases.**
2. **To appreciate the neurological burden encompassed within the Neglected Tropical Diseases, within the World Health Organization's framework of NTDs.**
3. **To learn about the challenges in care delivery and research for each.**

11:30 AM–11:34 AM

Introduction

Michelle Kvalsund, DO, MS, Michigan State University

11:30 AM–11:34 AM

Introduction

Jonathan Mink, MD, PhD, FAAN, FANA, FAAP, University of Rochester

11:34 AM–11:49 AM

The Neurological Burden of Neglected Tropical Diseases

Joseph Zunt, MD, MPH, University of Washington

11:49 AM–12:04 PM

The Neurological Burden of Rare Diseases

Florian Eichler, MD, Massachusetts General Hospital

* This session is not available for AMA PRA Category I Credit(s)™

12:04 PM–12:19 PM

Common Challenges and Possible Solutions to Addressing Discovery and Clinical Care for Rare Diseases and Tropical Diseases

Ana-Claire Meyer, MD, MSHS, Yale University

12:19 PM–12:30 PM

Q&A and Discussion

11:30 AM–12:30 PM MAJESTIC C

Interactive Lunch Workshops

Meet the Chairs *

Prominent chairs of neurology will discuss how they handle their position, including what's involved with being a chair; what the process is for attaining their position, and how to interact with chairs.

PANELIST: *Dimitri Krainc, MD, PhD, Northwestern University*

PANELIST: *Andrew Josephson, MD, FAAN, University of California, San Francisco*

PANELIST: *David Holtzman, MD, Washington University in St. Louis*

PANELIST: *George Richerson, MD, PhD, University of Iowa*

PANELIST: *Kathleen Shannon, MD, University of Wisconsin*

PANELIST: *Merit E. Cudkowicz, MD, Massachusetts General Hospital*

11:30 AM–12:30 PM BENTON

Interactive Lunch Workshops

Small-Fiber Polyneuropathy: A Growing Neurological Problem

CHAIR: *Anne Louise Oaklander, MD, PhD, Harvard Medical School*

CO-CHAIR: *Steven Scherer, MD, PhD, University of Pennsylvania*

Recent studies suggest that small-fiber polyneuropathy may be one of the most common neurological conditions. More and more of its medical causes are treatable with targeted therapies that surpass mere symptom palliation. This session reviews the latest studies, and diagnostic and treatment implications.

LEARNING OBJECTIVES:

1. **To familiarize neurologists with presentations, diagnosis, and disease-modifying treatments for SFN in adults and children.**
2. **To update on the first consensus case definition and diagnostic recommendation for SFN.**
3. **To update on currently treatable genetic causes of SFN including variants in transthyretin amyloid, Fabry, HSN1 and ion-channel variants.**
4. **To update on SFN apparently caused by inflammation/dysimmunity; how to identify underlying medical conditions and decide treatment without trials.**

11:30 AM–11:34 AM

Introduction

Anne Louise Oaklander, MD, PhD, Harvard Medical School

11:34 AM–11:49 AM

Diagnosing SFN: The New ACTTION Criteria

A. Gordon Smith, MD, FAAN, FANA, Virginia Commonwealth University

11:49 AM–12:04 PM

Treatable Genetic Causes-Focus on hATTR

James B. Dyck, MD, Mayo Clinic

12:04 PM–12:19 PM

Other Disease-Modifying Treatment Options

Anne Louise Oaklander, MD, PhD, Harvard Medical School

12:19 PM–12:30 PM

Q&A and Discussion

11:30 AM–12:30 PM PARKVIEW

Interactive Lunch Workshops

Neuro-Ophthalmological Features of Neurodegenerative Diseases

CHAIR: *Laura Balcer, MD, NYU Langone Medical Center*

CO-CHAIR: *Greg van Stavern, MD, Washington University in St. Louis*

The presence of different forms of eye involvement guides neurologists in the diagnosis of many neurodegenerative disorders, significantly affecting quality of life and being often including in clinical rating scales. The goal of this session is to provide an update on the neuro-ophthalmological features and ongoing research efforts in this field for various neurodegenerative conditions.

LEARNING OBJECTIVES:

1. **Clinical characteristics and methods for evaluation of neuro-ophthalmological features in Huntington's disease.**
2. **How neurobiological features of mitochondrial disorders translate to retinal dysfunction and aid in genetic diagnosis.**
3. **How neuro-ophthalmological features of parkinsonian syndromes aid in diagnosis and therapeutics.**

11:30 AM–11:34 AM

Introduction

Laura Balcer, MD, NYU Langone Medical Center

11:34 AM–11:49 AM

Neuro-ophthalmology of Parkinsonian Disorders: Recent Advances

Aasef Shaikh, MD, Case Western Reserve University

11:49 AM–12:04 PM

Neuro-ophthalmological Features in SCA7

Laryssa Huryn, MD, National Institutes of Health

12:04 PM–12:19 PM

Neuro-ophthalmological features of Huntington's Disease

Ali Hamedani, MD, University of Pennsylvania

* This session is not available for AMA PRA Category I Credit(s)™

12:19 PM–12:30 PM

Q&A and Discussion

11:30 AM–12:30 PM AUBERT

Additional Lunch Workshops

American Board of Psychiatry and Neurology (ABPN) Maintenance of Certification (MOC) *

FACULTY: *Imran I Ali, MD, FAAN, University of Toledo*

Dr. Ali will lead the session by providing background on the ABMS MOC program, recent changes to the MOC program, and perspective on the future of MOC. Dr. Ali will detail the four-part ABPN MOC Program, giving specific requirements related to self-assessment, CME, and performance in practice components.

LEARNING OBJECTIVES:

1. **To become familiar with the rationale and background of MOC.**
2. **To learn the 4-part ABPN MOC Program components.**
3. **To become familiar with the online ABPN personalized physician Folios system.**
4. **To learn about the future direction for the ABPN MOC Program.**

12:00 PM–6:30 PM MAJESTIC E-H

Poster Viewing

Poster Viewing*

Poster presenters will be in attendance from 5:00 PM - 6:30 PM.

12:30 PM–12:45 PM

Break

12:45 PM–2:45 PM MAJESTIC D

Plenary Session

Language Disorders Across the Lifespan

CHAIR: *Gil Rabinovici, MD, University of California, San Francisco*

CO-CHAIR: *Argye Hillis, MD, Johns Hopkins University*

Language disorders can arise during development or can be acquired after development of normal language, due to neurodegenerative disease, stroke, or other brain injury. Recent advances in imaging, genetics, and clinical assessment have provided new insights into the nature of these disorders and their association. Dr. Yeatman will describe how structural and functional neuroimaging studies of developmental dyslexia have led to a greater understanding of the nature of the disorder, and plasticity associated with a successful intervention. Dr. Gorno-Tempini will provide evidence that developmental dyslexia and Primary Progressive Aphasia may reflect shared vulnerabilities. Dr. Mesulam will report on new insights related to language and dementia that have come out of research on Primary Progressive Aphasia. Dr. Hillis will then discuss novel treatment strategies to improve language and communication in Primary Progressive Aphasia and post-stroke aphasia.

LEARNING OBJECTIVES:

1. **Describe the neurobiological underpinnings of developmental dyslexia and how an intervention can modify brain circuits.**
2. **Describe clinical manifestations of Primary Progressive Aphasia and impact of learning differences across ages.**
3. **Present results of recent trials showing the effects of various interventions for improving language in aphasia.**

12:45 PM–12:49 PM

Introduction

Gil Rabinovici, MD, University of California, San Francisco

12:49 PM–1:09 PM

Recent Advances in PPA

Marsel Mesulam, MD, Northwestern University

1:09 PM–1:11 PM

Q&A and Discussion

1:11 PM–1:31 PM

Novel Treatments for Primary Progressive Aphasia and Post-Stroke Aphasia

Argye Hillis, MD, Johns Hopkins University

1:31 PM–1:33 PM

Q&A and Discussion

1:33 PM–1:53 PM

Developmental Language Disorders and Primary Progressive Aphasia: Associations and Implications

Maria Luisa Gorno-Tempini, MD, PhD, University of California, San Francisco

* This session is not available for AMA PRA Category I Credit(s)™

1:53 PM–1:55 PM
Q&A and Discussion

1:55 PM–2:15 PM
Neural Plasticity in Developmental Dyslexia
Jason Yeatman, PhD, University of Washington

2:15 PM–2:17 PM
Q&A and Discussion

2:17 PM–2:22 PM
DATA BLITZ PRESENTATION
Patterns of Decline in Spoken Word Recognition and Object Knowledge in Primary Progressive Aphasia
Jonathan Sikora, Johns Hopkins University

2:22 PM–2:24 PM
Q&A and Discussion

2:24 PM–2:29 PM
DATA BLITZ PRESENTATION
Cues to Improve Emotional Prosody after Right Frontal Strokes
Shannon Sheppard, PhD, Johns Hopkins University

2:29 PM–2:31 PM
Q&A and Discussion

2:31 PM–2:36 PM
DATA BLITZ PRESENTATION
Local Perturbations in Cortical Excitability Propagate Differentially through Large-Scale Functional Networks
Zachary Rosenthal, BS, Washington University in St. Louis

2:36 PM–2:38 PM
Q&A and Discussion

2:38 PM–2:43 PM
DATA BLITZ PRESENTATION
Focal Cortical Dysplasia in Logopenic Variant Primary Progressive Aphasia with Developmental Dyslexia
Zachary Miller, MD, University of California, San Francisco

2:43 PM–2:45 PM
Q&A and Discussion

2:45 PM–3:00 PM LANDMARK FOYER
Coffee Break

3:00 PM–5:00 PM MAJESTIC B

Special Interest Groups

Behavioral Neurology

Lesion Analysis Meets Systems Neuroscience

CHAIR: *William Seeley, MD, University of California, San Francisco*
CO-CHAIR: *Joel Geerling, MD, PhD, University of Iowa*

Focal lesions studies have long played a central role in our understanding of the human brain by revealing which structures are critical for specific functions. But focal lesion studies have important limitations, including remote effects of a lesion on other brain regions, compensation during the chronic phase, and injuries to fibers passing through the lesion boundaries. In recent years, new approaches to understanding distributed and complex brain functions and neurological symptoms have emerged, providing exciting new insights and avenues for future research. In this session, speakers will discuss modern lesion analyses, which integrate multimodal structural and functional brain imaging with other physiological approaches and leverage emerging frameworks from systems neuroscience. Domains of cognitive function discussed will include arousal/consciousness, language, emotion, and others.

LEARNING OBJECTIVES:

1. **Understand new findings in behavioral neurology literature.**
2. **Learn how to design studies using methods and frameworks that reflect contemporary understanding.**
3. **Understand how to localize complex neurological functions and symptoms using a network-based approach.**

3:00 PM–3:04 PM
Introduction
William Seeley, MD, University of California, San Francisco

3:04 PM–3:24 PM
LEADER IN THE FIELD PRESENTATION
Language From Molecules to Behavior
Maria Luisa Gorno-Tempini, MD, PhD, University of California, San Francisco

3:24 PM–3:34 PM
DATA BLITZ PRESENTATION
Early Network Dysfunction in *APOE* ε4 Carriers without Biomarker Evidence of Alzheimer's Disease is Related to Subclinical Tau Changes
Omar Butt, MD, PhD, Washington University in St. Louis

3:34 PM–3:54 PM
LEADER IN THE FIELD PRESENTATION
Mapping and Treating Neuropsychiatric Symptoms Using the Human Brain Connectome
Michael Fox, MD, PhD, Harvard Medical School

3:54 PM–4:04 PM
DATA BLITZ PRESENTATION
Parabrachial-Cortical Connectivity
Joel Geerling, MD, PhD, University of Iowa

* This session is not available for AMA PRA Category I Credit(s)™

4:04 PM–4:24 PM
LEADER IN THE FIELD PRESENTATION

Cognitive and Behavioral Neurophysiology: Intracranial Electrical Stimulation and Intracranial Recording in the Human Brain

Joseph Parvizi, MD, PhD, Stanford University

4:24 PM–5:00 PM

Q&A and Discussion

3:00 PM–5:00 PM **LANDMARK 1**

Special Interest Groups

Cerebrovascular Disease & Interventional Neurology

CHAIR: *Magdy Selim, MD, PhD, Harvard Medical School*

CO-CHAIR: *Diogo C. Haussen, MD, Emory University*

Each year, more than 795,000 people in the United States have a stroke. Stroke is the fifth leading cause of death for Americans, and the leading cause of permanent disability. About 85% of all strokes are ischemic, and 15% are hemorrhagic. Recent years have witnessed significant progress in our understanding of the mechanisms underlying injury and recovery after stroke, sex differences in stroke outcome, and the development of innovative endovascular and surgical treatments for this devastating condition. This session will cover important up-to-date and timely topics in stroke research, endovascular management of acute ischemic stroke, role of minimally invasive surgery for intracerebral hemorrhage, sex differences in stroke management, and brain networks implicated in recovery after stroke.

LEARNING OBJECTIVES:

1. **Understand how sex can influence the evaluation and treatment of stroke.**
2. **Review of evolving indications for endovascular therapy and supporting data.**
3. **Understand the current status and ongoing efforts for minimally invasive evacuation of intracerebral hemorrhage.**
4. **Learn about the link between behavioral Clusters and Brain Network Mechanisms of Impairment and Recovery after stroke.**

3:00 PM–3:05 PM

Introduction

Magdy Selim, MD, PhD, Harvard Medical School

3:05 PM–3:25 PM
LEADER IN THE FIELD PRESENTATION

Next Frontiers in the Endovascular Treatment of Acute Ischemic Stroke

Sunil A. Sheth, MD, University of Texas, Health and Science Center Houston

3:25 PM–3:32 PM

Q&A and Discussion

3:32 PM–3:52 PM
LEADER IN THE FIELD PRESENTATION

Middle Meningeal Artery Embolization for Chronic Subdural Hemorrhage

Ajith Thomas, MD, Harvard Medical School

3:52 PM–3:59 PM

Q&A and Discussion

3:59 PM–4:19 PM
LEADER IN THE FIELD PRESENTATION

Stroke, Brain Networks, and Behavior

Maurizio Corbetta, MD, University of Padova & Washington University in St. Louis

4:19 PM–4:26 PM

Q&A and Discussion

4:26 PM–4:36 PM
DATA BLITZ PRESENTATION

Longitudinal Deep-Brain Imaging in Mouse Using Visible-Light Optical Coherence Tomography to Study Ischemic Stroke

Neil Nadkarni, MD, McGaw Northwestern Memorial Hospital

4:36 PM–4:43 PM

Q&A and Discussion

4:43 PM–4:53 PM
DATA BLITZ PRESENTATION

Corneal Confocal Microscopy: An Imaging Endpoint for Neuro-Immune Alterations in Acute Stroke

Adeeb Narangoli, MD, Weill Cornell Medical College

4:53 PM–5:00 PM

Q&A and Discussion

* This session is not available for AMA PRA Category I Credit(s)™

3:00 PM–5:00 PM LANDMARK 5

Special Interest Groups

Education

Burnout in Academic Neurology: What are we Doing to Avoid it?

CHAIR: *Guillermo E. Solorzano, MD, MSc, University of Virginia*

CO-CHAIR: *Kathryn Nevel, MD, Memorial Sloan Kettering*

Burnout amongst physicians is a major issue today. Neurologists, both practicing and those in training, are at risk. A recent survey demonstrated that approximately 73% of neurology residents had one symptom of burnout. Over the last few years, medical governing bodies have developed guidelines to help recognize and mitigate burnout. This SIG will explore the current state of where we are in avoiding burnout in our trainees and discuss possible future interventions.

LEARNING OBJECTIVES:

1. **Describe the current state of burnout amongst academic neurologists and neurology trainees.**
2. **Identify potential burnout mitigation strategies for neurology trainees.**
3. **Discuss ways in which burnout mitigation strategies could be applied at their individual institutions.**

3:00 PM–3:04 PM

Introduction

Guillermo E. Solorzano, MD, MSc, University of Virginia

3:04 PM–3:24 PM

LEADER IN THE FIELD PRESENTATION

"Vaccinating" Against Burnout: Skills-Building at the Student Level

Sneha Mantri, MD, MS, Duke University

3:24 PM–3:27 PM

Q&A and Discussion

3:27 PM–3:47 PM

LEADER IN THE FIELD PRESENTATION

Burning the Candle at Both Ends: Moral Injury During Residency Training

Kathryn Nevel, MD, Memorial Sloan Kettering

3:47 PM–3:50 PM

Q&A and Discussion

3:50 PM–4:10 PM

LEADER IN THE FIELD PRESENTATION

Burnout in Attending Physicians: Are We the Best Role Models?

Guillermo E. Solorzano, MD, MSc, University of Virginia

4:10 PM–4:13 PM

Q&A and Discussion

4:13 PM–5:00 PM

Audience Participation Exercise

Sneha Mantri, MD, MS, Duke University

3:00 PM–5:00 PM LANDMARK 2

Special Interest Groups

Global Neurology

Sustainable Partnerships and Equity in Global Health

CHAIR: *Ana-Claire Meyer, MD, MSHS, Yale University*

CO-CHAIR: *Aaron Berkowitz, MD, PhD, Brigham and Women's Hospital*

Sustainable and equitable partnerships are the most critical feature of the highest quality global health programs, whether education or research focused. While many well-meaning students, faculty and researchers frequently engage in short-term projects in resource-limited settings, there is a limited understanding of the minimal value and even burden these efforts often pose for the receiving institution and partnering faculty. This problem is compounded because the voices of collaborators in resource-limited settings are not often heard directly by senior academic leaders in neurology. This session will bring together a diverse group of experienced and emerging leaders in global health and neurology.

LEARNING OBJECTIVES:

1. **Describe the key features of a sustainable and equitable partnership.**
2. **Give examples of the needs of partnering institutions and faculty in resource-limited settings.**
2. **Identify strategies that some programs/individuals employed to obtain support for their efforts (from international funding bodies, local and regional governments and institutions).**
3. **Express how sustainable and equitable partnerships lead to improvements in research, education and care for patients with neurological disorders in resource limited settings.**

3:00 PM–3:05 PM

Introduction

Ana-Claire Meyer, MD, MSHS, Yale University

3:05 PM–3:17 PM

LEADER IN THE FIELD PRESENTATION

Sustainable Long-Term Research Partnerships: Experiences in Peru

Silvia Montano, MD, MPH, Universidad Nacional de San Marcos

3:17 PM–3:30 PM

LEADER IN THE FIELD PRESENTATION

Sustainable Long-Term Research Partnerships: Experiences in Peru

Joeseph Zunt, MD, MPH, University of Washington

3:30 PM–3:42 PM

LEADER IN THE FIELD PRESENTATION

Building Neurology Training: Experiences from Haiti

Kerling Israel, MD, MPH, Zanmi Lasante/Partners in Health

3:42 PM–3:55 PM

LEADER IN THE FIELD PRESENTATION

Building Neurology Training: Experiences from Haiti

Aaron Berkowitz, MD, PhD, Brigham and Women's Hospital

* This session is not available for AMA PRA Category I Credit(s)™

3:55 PM–4:05 PM
LEADER IN THE FIELD PRESENTATION
Health Equity and Global Health
Ana-Claire Meyer, MD, MSHS, Yale University

4:05 PM–4:30 PM
Panel Discussion

4:30 PM–4:40 PM
DATA BLITZ PRESENTATION
Neurophysiological Profiles of Children with Nodding Syndrome and Their Sibling
Rajarshi Mazumder, MD, MPH, University of California, Los Angeles

4:40 PM–4:50 PM
DATA BLITZ PRESENTATION
Race Differences in Post-Stroke Disability Emerge at the Time of Stroke and Persist among Older Americans: Results from a National Sample Linked to Medicare
Lesli Skolarus, MD, MS, University of Michigan

4:50 PM–5:00 PM
DATA BLITZ PRESENTATION
Ankyrin G Autoantibodies in a Well-Controlled HIV Patient with Steroid-Responsive Meningioencephalitis
Ryan Schubert, MD, University of California, San Francisco

3:00 PM–5:00 PM **LANDMARK 3**

Special Interest Groups

ANA-AHS Headache (Sponsored by the American Headache Society)

CHAIR: *Todd Schwedt, MD, MS, Mayo Clinic*

LEARNING OBJECTIVES:

1. **Review new and emerging pharmacologic treatment targets for migraine.**
2. **Identify neuromodulation techniques for migraine treatment.**
3. **Discuss new and emerging treatments for cluster headache.**

3:00 PM–3:05 PM
Introduction
Todd Schwedt, MD, MS, Mayo Clinic

3:05 PM–3:25 PM
LEADER IN THE FIELD PRESENTATION
Emerging Treatment Targets for Migraine
Amynah Pradhan, PhD, University of Illinois

3:25 PM–3:35 PM
DATA BLITZ PRESENTATION
Correlation of Intracranial Elastance with Venous Sinus Stenosis in Idiopathic Intracranial Hypertension
Jason Chisholm, MD, University of Kentucky

3:35 PM–3:55 PM
LEADER IN THE FIELD PRESENTATION
New Therapeutics Targeting CGRP or 5HT-1F for Migraine Treatment
Peter J. Goadsby, MD, PhD, University of California, San Francisco

3:55 PM–4:05 PM
DATA BLITZ PRESENTATION
Clinically Meaningful Responses to Fremanezumab in Patients with Migraine and Documented Inadequate Response to 2-4 Classes of Migraine Preventive Medications in the Randomized, Placebo-Controlled FOCUS Study
Egilius L.H. Spierings, PhD, Boston Headache Institute

4:05 PM–4:25 PM
LEADER IN THE FIELD PRESENTATION
Non-invasive Neuromodulation for Treatment of Migraine
Matthew Robbins, MD, Weill Cornell Medical College

4:25 PM–4:35 PM
DATA BLITZ PRESENTATION
Development of a Text Message-Based Headache Diary In Adolescents And Children
Christina L Szperka, MD, MSCE, Children's Hospital of Philadelphia

4:35 PM–4:55 PM
LEADER IN THE FIELD PRESENTATION
New and Emerging Treatments for Cluster Headache
Chin-Sang Chung, MD, PhD, Samsung Medical Center

4:55 PM–5:00 PM
Q&A and Discussion

* This session is not available for AMA PRA Category I Credit(s)™

3:00 PM–5:00 PM **LANDMARK 4**

Special Interest Groups

Movement Disorders

CHAIR: *Alexander Pantelyat, MD, Johns Hopkins University*
CO-CHAIR: *Anne-Marie Willis, MD, MPH, Massachusetts General Hospital & Harvard Medical School*

Movement Disorders is a rapidly developing subspecialty of Neurology, with a number of recent exciting developments in diagnostic biomarkers, genetic characterization, and novel therapies. This SIG will focus on neurodegenerative movement disorders, particularly the atypical parkinsonian disorders (Lewy Body Disease, Progressive Supranuclear Palsy, Corticobasal syndrome/degeneration, and Multiple System Atrophy). The prevalence of these disorders is expected to rise as the general population ages. Several recent lines of evidence suggest that the spread of proteinopathy in several of these disorders may occur in a prion-like manner. The attendees will be updated on recent developments in basic research, diagnostic techniques, and management of these diseases.

LEARNING OBJECTIVES:

1. **Identify and differentiate among neurodegenerative disorders affecting movement (Lewy Body Disease, Progressive Supranuclear Palsy, Corticobasal syndrome/degeneration, and Multiple System Atrophy) through medical history, examination, and appropriate ancillary testing.**
2. **Recognize appropriate reasons to refer patients to tertiary research centers.**
3. **Identify how to manage patients with these conditions.**

3:00 PM–3:04 PM

Introduction

Alexander Pantelyat, MD, John Hopkins University

3:04 PM–3:24 PM
LEADER IN THE FIELD PRESENTATION

Update on Neurodegenerative Tauopathies (PSP and CBS/CBD)

Irene Litvan, MD, University of California, San Diego

3:24 PM–3:44 PM
LEADER IN THE FIELD PRESENTATION

Update on Lewy Body Disease

David J. Irwin, MD, University of Pennsylvania

3:44 PM–4:04 PM
LEADER IN THE FIELD PRESENTATION

Multiple System Atrophy: Collaborating for a Cure

Vikram Khurana, MD, PhD, MSc, Brigham and Women's Hospital

4:04 PM–4:14 PM
DATA BLITZ PRESENTATION

Clinicopathologic Features and Antemortem Diagnoses of Multiple System Atrophy: Review of 169 Autopsy-Confirmed Patients with MSA

Shunsuke Koga, MD, PhD, Mayo Clinic

4:14 PM–4:24 PM
DATA BLITZ PRESENTATION

Early Spinal Cord Vulnerability in CLN1 Disease

Hemanth Nelvagal, MBBS, PhD, Washington University in St. Louis

4:24 PM–4:34 PM
DATA BLITZ PRESENTATION

Does Team-Based Outpatient Palliative Care Improve Patient or Care Partner-Centered Outcomes in Parkinson's Disease and Related Disorders?

Benzi Kluger, MD, University of Colorado

4:34 PM–5:00 PM

Q&A and Discussion

3:00 PM–5:00 PM **LANDMARK 6**

Special Interest Groups

Multiple Sclerosis

MS Treatment Across the Lifespan

CHAIR: *Justin McArthur, MD, MPH, FANA, FAAN, Johns Hopkins University*
CO-CHAIR: *Ellen Mowry, MD, MCR, Johns Hopkins University*

This SIG will focus on MS in aging patients, pregnancy, and pediatric MS; in addition to epidemiologic evidence regarding the use of DMTs and overall clinical management across the lifespan. Data from randomized controlled trials in MS will be presented.

LEARNING OBJECTIVES:

1. **Describe the clinical and epidemiological evidence supporting the use of DMTs across the lifespan focusing on aging patients and pediatric population.**
2. **Describe the clinical and epidemiological evidence for management of MS during conception, breast-feeding and pregnancy.**

3:00 PM–3:04 PM

Introduction

Justin McArthur, MD, MPH, FANA, FAAN, Johns Hopkins University

3:04 PM–3:24 PM
LEADER IN THE FIELD PRESENTATION

Pediatric Multiple Sclerosis Research Including Safety, Efficacy, Treatment Targets and Logistics of Monitoring Imaging

Emmanuelle Waubant, MD, PhD, University of California, San Francisco

3:24 PM–3:44 PM
LEADER IN THE FIELD PRESENTATION

Biological Age and MS Phenotype

Jennifer Graves, MD, PhD, MAS, University of California, San Diego

3:44 PM–4:04 PM
LEADER IN THE FIELD PRESENTATION

Multiple Sclerosis Treatment Across the Lifespan

John Corboy, MD, University of Colorado

* This session is not available for AMA PRA Category I Credit(s)™

4:04 PM–4:14 PM
DATA BLITZ PRESENTATION
The Aging Face of Multiple Sclerosis: A Comparative Analysis of Young-Onset versus Late-Onset Multiple Sclerosis
Mattia Wruble, BA, University of Virginia

4:14 PM–4:24 PM
DATA BLITZ PRESENTATION
Oligodendroglia-Specific Connexin 47 Deletion Induces Relapsing-Remitting Experimental Autoimmune Encephalomyelitis
Ryo Yamasaki, MD, PhD, Kyushu University

4:24 PM–4:34 PM
DATA BLITZ PRESENTATION
The Transient Receptor Potential Vanilloid 4 (TRPV4) Channels are Expressed by Microglia and Modulate Neuroinflammation
Gregory Wu, MD, PhD, Washington University in St. Louis

4:34 PM–5:00 PM
Q&A and Discussion

3:00 PM–5:00 PM MAJESTIC A

Special Interest Groups

Neuro-Oncology

Immunotherapy: The Neuro-Oncologist's Friend or Foe?

CHAIR: *Santosh Kesari, MD, PhD, Pacific Neuroscience Institute*
CO-CHAIR: *Jan Drappatz, MD, University of Pittsburgh*

The use of anti-cancer immunotherapies has dramatically increased and is an area of active investigation in patients with primary brain tumors. Agents span immune checkpoint inhibitors, CAR-T cells and vaccines. Some of these agents interrupt mechanisms involved in prevention of auto-immunity or have pro-inflammatory properties. As a result, a wide-ranging spectrum of neurologic inflammatory adverse events have emerged posing diagnostic and therapeutic challenges that neurologists need to address. This session will review advances in immunotherapy of primary brain tumors and discuss neurologic complications of immunotherapy including encephalitis, myelitis, peripheral neuropathies, radiculopathies, neuro-muscular junction disorders and myositis. The rationale for targeting the immune system in brain tumor therapy and the results of ongoing trials will be discussed. The mechanisms underlying neurologic adverse effects, and their diagnosis and management will be reviewed.

LEARNING OBJECTIVES:

1. **Recognize strategies to manage the unique adverse events related to use of anti-CTLA-4, anti-PD-1, anti-PD-L1 antibodies and CAR-T cell therapies.**
2. **Describe the rationale for targeting the immune system in the treatment of brain tumors.**
3. **Evaluate results of ongoing clinical trials examining immunotherapy agents as part of treatment paradigms.**

3:00 PM–3:04 PM
Introduction
Santosh Kesari, MD, PhD, Pacific Neuroscience Institute

3:04 PM–3:34 PM
LEADER IN THE FIELD PRESENTATION
Brain Tumor Immunotherapy
David Reardon, MD, Dana-Farber Cancer Institute

3:34 PM–4:04 PM
LEADER IN THE FIELD PRESENTATION
Neurologic Complications of Immune Checkpoint Inhibition
Sasha Zivkovic, MD, PhD, University of Pittsburgh Medical Center

4:04 PM–4:34 PM
LEADER IN THE FIELD PRESENTATION
Clinical Spectrum and Mechanisms of Car T Cell Neurotoxicity
Jorg Dietrich, MD, PhD, MBA, MMSc, Massachusetts General Hospital

4:34 PM–4:44 PM
DATA BLITZ PRESENTATION
Case Series of Checkpoint-inhibitor Associated Meningoencephalomyelitis and Polyradiculitis
Megan Mantica, MD, University of Pittsburgh

4:44 PM–5:00 PM
Q&A and Discussion

3:00 PM–5:00 PM LANDMARK 7

Special Interest Groups

Sleep Disorders and Circadian Rhythms

CHAIR: *David Raizen, MD, PhD, University of Pennslyvania*
CO-CHAIR: *Yo-El Ju, MD, Washington University in St. Louis*

Sleep and circadian biology plays an integral, and often critical, role in the pathogenesis, manifestation, and treatment of neurological disorders. This SIG will feature both junior and senior clinician-scientists at the forefront of sleep and circadian rhythms research. The session will highlight new advances in the field, spanning from basic neurobiology to clinical management of sleep and circadian rhythm disorders.

LEARNING OBJECTIVES:

1. **Recognize the relationship between Alzheimer's disease biomarkers and sleep.**
2. **Describe basic mechanisms of circadian rhythms.**
3. **Identify how to better recognize and treat circadian rhythm sleep disorders.**

3:00 PM–3:01 PM
Introdcution
David Raizen, MD, PhD, University of Pennslyvania

3:01 PM–3:21 PM
LEADER IN THE FIELD PRESENTATION
Circadian Medicine
Sabra M. Abbott, MD, PhD, Nowrthwestern University

* This session is not available for AMA PRA Category I Credit(s)™

3:21 PM–3:26 PM
Q&A and Discussion

3:26 PM–3:46 PM
LEADER IN THE FIELD PRESENTATION
The Function of Early Life Sleep in Brain Development: Using the Prairie Vole to Generate Insights Into Autism Spectrum Disorder
Miranda Lim, MD, PhD, Oregon Health & Science University

3:46 PM–3:51 PM
Q&A and Discussion

3:51 PM–4:11 PM
LEADER IN THE FIELD PRESENTATION
Effect of Sleep on CSF Tau and P-Tau
Brendan Lucey, MD, MSCI, Washington University in St. Louis

4:11 PM–4:16 PM
Q&A and Discussion

4:16 PM–4:25 PM
DATA BLITZ PRESENTATION
Chi3l1/YKL-40 is a Modulator of Glial Activation and Amyloid Plaque Deposition in Alzheimer Disease Which is Controlled by the Circadian Clock
Erik Musiek, MD, PhD, Washington University in St. Louis

4:25 PM–4:27 PM
Q&A and Discussion

4:27 PM–4:36 PM
DATA BLITZ PRESENTATION
Sleep Spindle Activity Correlates with Cognition in Patients with Early Alzheimer Disease
Margaret Blattner, MD, PhD, Washington University in St. Louis

4:36 PM–4:38 PM
Q&A and Discussion

4:38 PM–4:47 PM
DATA BLITZ PRESENTATION
Circadian Modulation of Hippocampal Function during Alzheimer's Disease Pathogenesis
Geraldine Kress, PhD, Washington University in St. Louis

4:47 PM–4:49 PM
Q&A and Discussion

4:49 PM–4:58 PM
DATA BLITZ PRESENTATION
Post-Traumatic Stress Disorder, with and without Comorbid Traumatic Brain Injury, Increases the Odds of Rapid Eye Movement Sleep Behavior Disorder in Veterans
Miranda Lim, MD, PhD, Oregon Health & Science University

4:58 PM–5:00 PM
Q&A and Discussion

5:00 PM–6:30 PM MAJESTIC E-H

Poster Presentations & Reception*

7:00 PM–7:30 PM GATEWAY ARCH

New Member Meet & Greet*

This will be held at the iconic St. Louis Gateway Arch.
Buses will depart from the hotel lobby at 6:45 PM.

7:30 PM–9:00 PM GATEWAY ARCH

President's Reception*

This will be held at the iconic St. Louis Gateway Arch.
Buses will depart from the hotel lobby starting at 7:15 PM.
You must bring your meeting badge for entry to the event.

* This session is not available for AMA PRA Category I Credit(s)™

Tuesday, October 15, 2019

6:30 AM–2:00 PM LANDMARK FOYER

Registration

6:30 AM–7:30 AM LANDMARK FOYER

Breakfast

Overflow seating available in the Washington Room

7:00 AM–8:30 AM LANDMARK 4

Professional Development Courses

Course 3: Students, Residents, Trainees, Post-Doc Fellows & Early to Mid-Career

Meet the NIH, NIA and NICHD

MODERATOR: *Lauren Sansing, MD, Yale University*

MODERATOR: *Gregory Wu, MD, PhD, Washington University in St. Louis*

Federal funding agencies support the majority of research in neurological diseases across the lifespan. Leaders from the National Institute of Neurological Disorders and Stroke, the National Institute on Aging, the Eunice Kennedy Shriver National Institute of Child Health and Human Development, and the Department of Defense will share the visions, advances, and priorities in neurological research from the view of the institutions. There will then be an interactive panel discussion with questions from the audience.

LEARNING OBJECTIVES:

1. **Discuss the visions from the view of the NIH.**
2. **Discuss the advances in neurological research.**
3. **Understand the funding priorities for the near future.**

7:00 AM–7:10 AM

Introduction

Lauren Sansing, MD, Yale University

7:10 AM–7:25 AM

DoD Research Support

Ana-Claire Meyer, MD, PhD, US Army Medical Research and Development Command

7:25 AM–7:55 AM

Research Opportunities at the NINDS

Nina Schor, MD, PhD, National Institute of Neurological Disorders and Stroke (NINDS)

7:55 AM–8:05 AM

Research Opportunities at the NIA

Eliezer Masliah, MD, PhD, National Institute on Aging (NIA)

8:05 AM–8:15 AM

Research Opportunities at the NICHD

Ralph Nitkin, PhD, National Center for Medical Rehabilitation Research (NICHD)

8:15 AM–8:30 AM

Q&A and Discussion

* This session is not available for AMA PRA Category I Credit(s)™

7:00 AM–8:30 AM **LANDMARK 1**

Professional Development Courses

Course 3: Chair Career Level

Philanthropy - Lessons Learned

MODERATOR: *L. John Greenfield, MD, PhD, UConn Health*

Our Neurology Departments are increasingly dependent on alternative sources of revenue to support research, education and other "unfunded missions." For many, philanthropy plays an increasingly important role in providing such support. This session will tap the collective wisdom of department chairs who have been successful in obtaining support for their programs through private or public donations. This session will take a "data blitz" approach to address a variety of questions. How do you identify patients who might have the resources to give to your department? How have you approached donors, and what strategies do you find successful? Do you have "war stories" of what has or has not worked? How do you use philanthropic contributions to subsidize your clinical, education or research programs? Do you find that your foundation officers are helpful or do they poach prospective donors for other projects?

LEARNING OBJECTIVES:

1. **Describe successful approaches to identifying and obtaining philanthropic contributions.**
2. **Discuss how to utilize philanthropic donations to protect faculty effort, fund research or education, or other goals.**
3. **Describe ways that recruiting donations can improve a department's involvement in the community.**

PANELIST: *S. Thomas Carmichael, MD, PhD, University of California, Los Angeles*

PANELIST: *David Standaert, MD, PhD, University of Alabama at Birmingham*

PANELIST: *David Holtzman, MD, Washington University in St. Louis*

8:30 AM–8:45 AM **LANDMARK FOYER**

Coffee Break

8:45 AM–10:45 AM **MAJESTIC D**

Plenary Session

Emerging Role of Microbiome in Neurological Disease

CHAIR: *Rachel Saunders-Pullman, MD, MPH, Ichan School of Medicine at Mount Sinai*

CO-CHAIR: *Robert Friedland, MD, University of Louisville*

The last 10 years has seen a rapid advance in our knowledge of our partner organisms, the microbiome. The microbiome is now emerging as an important player across a range of human diseases, especially in neurological disease. Thus clinicians, researchers and patients are motivated to understand the complex nature of the microbiota, and its influence on human metabolism and immunity.

Several lines of evidence indicate that gut bacteria play a role in age-related neurodegeneration: the early onset of constipation in Parkinson's disease (PD), the early onset of olfactory dysfunction in both PD and Alzheimer's (AD), the occurrence of Lewy body pathology in gut neurons, the early involvement of the dorsal motor nucleus of the vagus in PD, the influence of bacterial amyloid on Alpha synuclein (AS) aggregation and neuroinflammation, the presence of AS aggregates in the appendix, the protective effect of antibiotics on AD phenotype in transgenic mice, the diminished disease presentation in germ-free animals bearing pathogenic PD and AD mutations, and evidence that amyloid beta is an highly conserved effector molecule of innate immunity.

This session will present data suggesting the molecular mechanisms of these effects not only in neurodegeneration, but in multiple sclerosis and stroke. We will review the gut-brain microbiome axis and present evidence demonstrating the molecular mechanisms of these effects. The diverse approaches which are being explored for prevention and treatment based on bacterial influences on the brain will be discussed.

LEARNING OBJECTIVES:

1. **Understand the complex nature of the microbiota, and its influence on human metabolism and immunity.**
2. **Understand leading research in the microbiome in neurodegenerative disease (especially PD and AD), multiple sclerosis and stroke.**
3. **Become familiar with diverse approaches being explored for prevention and treatment based on bacterial influences on the brain.**

8:45 AM–8:49 AM

Introduction

Rachel Saunders-Pullman, MD, MPH, Ichan School of Medicine at Mount Sinai

8:49 AM–8:09 AM

Microbes Modulate Host Oxytocin and Multigenerational Health

Susan Erdman, DVM, MPH, Massachusetts Institute of Technology

* This session is not available for AMA PRA Category I Credit(s)™

9:09 AM–9:12 AM
Q&A and Discussion

9:12 AM–9:32 AM
A Role for Gut Microbes in Neurodegenerative Disease
Timothy Sampson, PhD, Emory University

9:32 AM–9:35 AM
Q&A and Discussion

9:35 AM–9:55 AM
Gut Microbiota and Inflammatory CNS Diseases
Emmanuelle Waubant, MD, PhD, University of California, San Francisco

9:55 AM–9:58 AM
Q&A and Discussion

9:58 AM–10:18 AM
PRESENTATION OF THE 2019 SORIANO LECTURESHIP AWARD
Microbiome and Stroke: The Hidden Factor
Louise McCullough, MD, PhD, University of Texas Health

10:18 AM–10:21 AM
Q&A and Discussion

10:21 AM–10:26 AM
DATA BLITZ PRESENTATION
Human GI-Tract Microbiome-Derived *Bacteroides fragilis* Lipopolysaccharide (BF-LPS) Up-Regulates a Pro-Inflammatory miRNA-146a in Alzheimer's Disease (AD) Brain
Walter Lukiw, BS, MS, PhD, Louisiana State University, Neuroscience Center

10:26 AM–10:29 AM
Q&A and Discussion

10:29 AM–10:34 AM
DATA BLITZ PRESENTATION
Antigen-Specific B Cell Depletion for Myasthenia Gravis with Chimeric Autoantibody Receptor (CAAR) T Cells
Sangwook Oh, PhD, University of Pennsylvania

10:34 AM–10:37 AM
Q&A and Discussion

10:37 AM–10:42 AM
DATA BLITZ PRESENTATION
Radiological Progression on Contrast and Non-Contrast MRI in Patients with Multiple Sclerosis: Findings from MS PATHS
Afsaneh Shirani, MD, MSCI, University of Nebraska Medical School

10:42 AM–10:45 AM
Q&A and Discussion

10:45 AM–12:00 PM LANDMARK FOYER

Lunch

Boxed lunches will be available to take into the Interactive and Additional Lunch Workshops.

11:00 AM–12:00 PM PORTLAND

Interactive Lunch Workshops

(These workshops are "Lunch and Learns")

Recent Advances in SUDEP

CHAIR: *Mark Wainwright, MD, PhD, Seattle Children's Hospital*
CO-CHAIR: *George Richerson, MD, PhD, University of Iowa*

Significant progress has been made in our understanding of the mechanisms underlying SUDEP and its epidemiology, leading to ongoing changes in clinical practice. This session aims to update neurologists and neuroscientists on the current hypothesis of the basic mechanisms underlying SUDEP, its prevalence, risk factors, prevention strategies and topics of current basic and clinical research.

LEARNING OBJECTIVES:

1. **Understand the current hypothesis on the neurobiological mechanisms underlying SUDEP.**
2. **Learn the prevalence and risk factors of SUDEP.**
3. **Discuss the clinical features of SUDEP and identify preventive strategies.**
4. **Describe areas of basic and clinical research in SUDEP.**

11:00 AM–11:04 AM
Introduction
Mark Wainwright, MD, PhD, Seattle Children's Hospital

11:04 AM–11:19 AM
Making Sense of SUDEP: Epidemiology and Risk Factors
Elizabeth Donner, MD, MSc, FRCPC, The Hospital for Sick Children

11:19 AM–11:34 AM
Basic Mechanisms Underlying SUDEP: Lessons from Animal Models
Carl Faingold, PhD, Southern Illinois University

11:34 AM–11:49 AM
Recent Advances on Clinical Aspects of SUDEP: from Prevention to Treatment
Alison Pack, MD, Columbia University

11:49 AM–12:00 PM
Q&A and Discussion

* This session is not available for AMA PRA Category I Credit(s)™

11:00 AM–12:00 PM **LANDMARK 6**

Interactive Lunch Workshops

Advocacy in Action: The Role of Academic Neurologists and Neuroscientists

CHAIR: *Barbara Giesser, MD, University of California, Los Angeles*

The participation of neurologists and neuroscientists in advocacy has become crucial. During this workshop, attendees will learn how they can impact legislation from the perspective of an academic neurologist, patient advocate and lobbyist.

LEARNING OBJECTIVES:

1. **Understand how academic neurologists and neuroscientists can impact legislation.**
2. **Discuss strategies to participate in advocacy efforts.**
3. **Explore opportunities to engage in advocacy at the local, state and national levels.**

11:00 AM–11:04 AM

Introduction

Barbara Giesser, MD, University of California, Los Angeles

11:04 AM–11:19 AM

Advocacy in Action: The Perspective of an Academic Neurologist on the Hill

Elias Giraldo, MD, MS, California University of Science and Medicine

11:19 AM–11:36 AM

Advocacy in Action: The Perspective of an Academic Neurologist on the Hill

Monica Weldon, BS, Bridge the Gap - SYNGAP Education and Research Foundation

11:36 AM–11:51 AM

From Advocacy to Lobbying

Cecilia Hagan, MPH, CRD Associates

11:51 AM–12:00 PM

Q&A and Introduction

11:00 AM–12:00 PM **PARKVIEW**

Interactive Lunch Workshops

Functional Neurologic Disorders

CHAIR: *Mark Hallett, MD, FAAN, FANA, National Institutes of Health*

CO-CHAIR: *Barbara Dworetzky, MD, FAAN, FAES, Brigham and Women's Hospital*

An update on functional neurologic disorders, FND, which would include a review of their pathophysiology, diagnostic criteria and an approach to treatment of these common disorders. The interactive session will also include how experts deliver the diagnosis, engage the patient in treatment and their approach to integration of care.

LEARNING OBJECTIVES:

1. **To understand the pathophysiology of FND.**
   To recognize the new diagnostic criteria for FND.
   To learn what are the appropriate treatments for different types of FNDs.

11:00 AM–11:02 AM

Introduction

Mark Hallett, MD, FAAN, FANA, National Institutes of Health

11:02 AM–11:05 AM

Case Presentation

Mary O'Neal, MD, Brigham and Women's Hospital

11:05 AM–11:17 AM

Essentials of Diagnosis

Alberto Espay, MD, MSc, FAAN, FANA, University of Cincinnati

11:17 AM–11:29 AM

The How and The Why

Mark Hallett, MD, FAAN, FANA, National Institutes of Health

11:29 AM–11:41 AM

Treatments and Challenges

Barbara Dworetzky, MD, FAAN, FAES, Brigham and Women's Hospital

11:41 AM–12:00 PM

Q&A and Discussion

11:00 AM–12:00 PM **BENTON**

Additional Lunch Workshops

Media Roundtable *

ANA will host an interactive panel for members of the press to discuss highlights of the key science being presented at the meeting.

11:00 AM–12:00 PM **LANDMARK 5**

Additional Lunch Workshops

AUPN's Networking Lunch for Small Academic Departments *

MODERATOR: *Gretchen E. Tietjen, MD, University of Toledo*

While all Neurology departments share some common attributes, there are challenges unique to smaller academic departments, including handling teaching and clinical service responsibilities, while protecting time for research and faculty development. This lunch, sponsored by the AUPN and hosted by Gretchen E. Tietjen, MD, Chair of Neurology at the University of Toledo since 1998, provides an opportunity for chairs of smaller departments to meet, discuss issues and share strategies.

12:00 PM–12:15 PM

Break

12:15 PM–2:15 PM **MAJESTIC D**

Plenary Session

Optimizing Clinical Trial Design

CHAIR: *Conrad Weihl, MD, PhD, Washington University in St. Louis*

CO-CHAIR: *Craig Zaidman, MD, Washington University in St. Louis*

Clinical trials are designed to detect a therapeutic effect in a specific patient population. However, it has become clear that careful assessment of the clinical trial design is as important as the therapeutic intervention. Specifically, identifying an appropriate outcome measure or utilizing an adaptive trial design may improve the likelihood of trial success. Moreover, understanding the heterogeneity of your trial population with regard to factors such as gender, ethnicity and even genetic background should be explored prior to trial enrollment. As the pace of neurotherapeutics increases, creative and innovative clinical trials with regard to enrollment, design and outcomes are necessary.

1. **Recognize the use of patient reported outcomes, novel clinical outcome measures and adaptive trial design.**
2. **Judge the limitations of clinical trial data with regard to efficacy.**
3. **Compare the benefits and pitfalls of adaptive trial design, patient reported outcomes and novel clinical outcomes.**

12:15 PM–12:21 PM

Introduction

Conrad Weihl, MD, PhD, Washington University in St. Louis

12:21 PM–12:41 PM

PRESENTATION OF THE 2019 RAYMOND D. ADAMS LECTURESHIP AWARD

Accelerating ALS Development: First ALS Platform Trial

Merit E. Cudkowicz, MD, Massachusetts General Hospital

12:41 PM–12:44 PM

Q&A and Discussion

12:44 PM–1:04 PM

Design of Patient Reported Outcomes in Neurological Disease

Nicholas Johnson, MD, MSCI, Virginia Commonwealth University

1:04 PM–1:07 PM

Q&A and Discussion

1:07 PM–1:27 PM

Designing Novel Functional Outcomes for Clinical Trials

Lindsay Alfano, DPT, PCS, The Research Institute at Nationwide Children's Hospital

1:27 PM–1:30 PM

Q&A and Discussion

1:30 PM–1:35 PM

DATA BLITZ PRESENTATION

GNAO1 Associated Neurologic Disease: Results from the 1st Annual Research Clinic

Amy Viehoever, MD, PhD, Washington University in St. Louis

1:35 PM–1:38 PM

Q&A and Discussion

1:38 PM–1:58 PM

Why Me?! Why Not?! Drivers of Research Participation in a Diverse Parkinson Disease Cohort

Allison Willis, MD, MS, University of Pennsylvania

1:58 PM–2:01 PM

Q&A and Discussion

2:01 PM–2:06 PM

DATA BLITZ PRESENTATION

Machine Learning Classification of Parkinson's Disease with Neuromelanin-Sensitive MRI and Clinical Features

Daniel Huddleston, MD, PhD, Emory University

2:06 PM–2:15 PM

Q&A and Discussion

2:15 PM

Meeting Adjourns

* This session is not available for AMA PRA Category I Credit(s)™

Note: The American Board of Psychiatry and Neurology has reviewed the 144th Annual Meeting of the American Neurological Association and has approved this program as part of a comprehensive CME program, which is mandated by the ABMS as a necessary component of Maintenance of Certification.

SPEAKER ABSTRACTS

All abstract information listed below has been provided to the ANA by plenary session speakers.

Saturday, October 12, 2019

Plenary Session

PRE-MEETING SYMPOSIUM—BRAIN-COMPUTER INTERFACES IN NEUROLOGICAL DISEASE

A Systems Neuroscience Approach to Motor Recovery After Stroke

Karunesh Ganguly, MD, PhD, University of California, San Francisco

It is commonly hypothesized that restoration of normal neural dynamics in the injured brain can improve function. However, we lack a precise neurophysiological framework for such an approach. Here we show that low-frequency oscillatory (LFO) dynamics play a critical role in the execution of skilled behaviors in both the intact and injured brain. We chronically recorded local field potentials and spiking during motor training in both healthy and post-stroke animals. Interestingly, we found that task-related LFOs emerged with skilled performance under both conditions and were a robust predictor of recovery. We further hypothesized that boosting LFOs might improve function in animals with persistent deficits. Strikingly, we found that direct current stimulation could boost LFOs, and when applied in a novel, task-dependent manner, significantly improved function in those with chronic deficits. Together, our results demonstrate that LFOs are essential for skilled controlled and represent a novel target for modulation after injury.

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Talking to The Brain in Its Own Language

Sheila Nirenberg, PhD, Weill Cornell Medical College

Neuroscience research has focused largely on listening to the brain—on taking recordings, analyzing responses, and trying to extract meaning from them. But now we're entering a new phase where we can go beyond listening and can start talking back to the brain, and we can do it in its own language. This opens the door to new technologies for treating disease. Here we present the development of one such technology: a new kind of neuro-prosthetic for treating blindness. Briefly, it works by converting visual images into meaningful neural signals in real time and then sending the signals on to the brain using an optogenetic interface.

References:

1. S. Nirenberg and C. Pandarinath. A retinal prosthetic with the capacity to restore normal vision. Proc Natl Acad Sci USA (2012).
2. B. Yan, M. Vakulenko, S.H. Min, W.W. Hauswirth, and S. Nirenberg. Maintaining ocular safety with light exposure, focusing on devices for optogenetic stimulation. Vision Research 121: 57-71 (2016).
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Brain-Computer Interface in Lower Extremity Rehabilitation

An Do, MD, University of California, Irvine

There are currently no proven methods that can restore walking and lower extremity sensation after spinal cord injury (SCI). Brain-computer interfaces (BCIs) may be one novel technology that can be used to "restore" brain-controlled ambulation and lower extremity sensation after SCI. It can be envisioned that such a BCI will record and decode brain motor area signals underlying walking intention, and send commands to a lower extremity prosthesis to actuate walking. Sensors worn on the lower extremities can detect leg movements, which will be used to stimulate the sensory cortex to elicit artificial sensation of the lower extremities while walking. The presentation will review the current technology in

BCI-controlled walking, the neurophysiological basis of such a system, and the ongoing technology development and scientific research in the area. It will discuss such BCI systems in context of complementary and alternative approaches that are being investigated to restore walking after SCI. Finally, it will also explore the potential significance and clinical impact that such BCI systems can have on the rehabilitation of SCI, as well as other neurological conditions (e.g. stroke or traumatic brain injury).

References:

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Intracortical Brain-Computer Interfaces: Toward the Restoration of Communication and Mobility

Leigh Hochberg, MD, PhD, FAAN, FANA, Brown University

For people with cervical spinal cord injury, pontine stroke, neuromuscular disease including amyotrophic lateral sclerosis, and other neurologic illnesses, currently available assistive and rehabilitation technologies are inadequate. In severe brainstem stroke and advanced ALS, patients may suddenly or progressively enter a locked-in state of being awake and alert but unable to move or communicate. Clinical translation based on decades of fundamental neuroscience research have yielded intracortical "brain-computer interfaces" (iBCIs) which are poised to revolutionize our ability to restore lost function. Over the past 20 years, neurotechnologies to record the individual and simultaneous activities (action potentials, multi-unit activity, and local field potentials) of dozens to hundreds of cortical neurons have yielded new understandings of cortical function in movement, vision, cognition, and memory. The first, ongoing pilot clinical trials (IDE) of an iBCI system—BrainGate (www.braingate.org)—seek to determine the feasibility of persons with tetraplegia controlling a computer cursor or other devices simply by 'intending' the movement of their own hand. Through the ongoing multi-institutional BrainGate collaboration, a variety of methods for decoding brain signals are being tested with the hope of not only restoring communication, but also providing a robust, intuitive signal for the long-term control of assistive robotic and prosthetic arms and hands, and the reanimation of paralyzed limbs. The platform approach of decoding high resolution neuronal ensemble activity and acting on that information in real-time now supports a wide range of research, particularly toward closed-loop neuromodulation for better and highly personalized management of both neurologic and neuropsychiatric disorders.

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Sunday, October 13, 2019

Presidential Symposium

DOMINANTLY INHERITED AND LATE-ONSET ALZHEIMER'S DISEASE: GENETICS, BIOMARKERS, TIMECOURSE, AND TREATMENTS

Genetics of Alzheimer's Disease: Similarities and Differences Between Dominantly Inherited and Late Onset Alzheimer's Disease

Alison Goate, MD, DPhil, Icahn School of Medicine at Mt. Sinai

Dominantly inherited Alzheimer's disease (DIAD) is a rare form of Alzheimer's disease caused by mutations in one of three genes: *amyloid precursor protein (APP), presenilin 1 (PSEN1*) or *presenilin 2 (PSEN2*). Approximately 70% of DIAD is caused by mutations in *PSEN1*, with an age of onset of clinical symptoms <50 yrs. Large-scale sequencing in other forms of AD has identified mutations in these genes as a rare cause of early onset sporadic AD, late onset familial AD and sporadic late onset AD. In sporadic early onset cases these mutations are thought to represent de novo mutations. In sporadic late onset cases it is unclear whether these mutations are de novo mutations, exhibit incomplete penetrance or represent non-paternity.

The most common risk factor for both early and late onset AD is *apolipoprotein E* (*APOE*) genotype. *APOE-e4* increases risk and is associated with earlier onset, whereas *APOE-e2* decreases risk and is associated with later age at onset. In DIAD families *APOE* genotype modulates age at onset, the most striking observation being a later age at onset in DIAD mutation carriers who also carry an *APOE-e2* allele. Genome-wide association studies (GWAS) in late onset AD cases and controls have identified more that 30 loci associated with AD risk. These loci are enriched for genes involved in Aß metabolism, innate immunity, lipid metabolism and endocytic trafficking pathways. Some loci such as *TREM2, ABCA7* and *SORL1* carry both rare and common variation associated with AD risk. Polygenic risk scores derived from GWAS in sporadic late onset AD risk are also associated with sporadic early onset AD and familial late onset AD suggesting a common etiology. This polygenic risk is highly enriched for myeloid expressed genes suggesting that both Aß metabolism and/or immune response to Aß induced damage are strong genetic determinants of risk for all forms of AD.

References:

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2. Cruchaga C., et al., Polygenic risk score of sporadic late onset Alzheimer's disease reveals shared architecture with the familial and early onset forms. Alzheimers Dement (2018) DOI: 10.1016/j.jalz.2017.08.013
3. Kunkle BW et al., Genetic meta-analysis of diagnosed Alzheimer's disease identifies new risk loci and implicates Aß, tau, immunity and lipid processing. Nature Genetics 51, 414-430 (2019) https://www.nature.com/articles/s41588-019-0358-2

Molecular Imaging in Alzheimer's Disease: Insights into Disease Pathogenesis

Gil Rabinovici, MD, University of California, San Francisco

Advances in PET imaging over the past decade have transformed our ability to study Alzheimer's disease (AD) in living people. PET provides a window into the molecular changes of AD that take place over decades, along the continuum between normal aging to dementia. This talk will describe developments in PET imaging of amyloid plaques and neurofibrillary tangles, the core neuropathological lesions that define AD. We will explore what amyloid and tau PET, in conjunction with other neuroimaging modalities such as structural and functional MRI, have taught us about the early evolution and progression of AD. We will discuss the potential impact of amyloid PET on clinical diagnosis and patient management, summarizing results from the Imaging Dementia-Evidence for Amyloid Scanning (IDEAS) study which assessed the utility of amyloid PET in ~18,200 Medicare beneficiaries with mild cognitive impairment or dementia of uncertain etiology. Finally, we will describe how advances in imaging are leading to a paradigm shift in the core definition of AD and approaches to drug development.

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Association of Amyloid Positron Emission Tomography With Subsequent Change in Clinical Management Among Medicare Beneficiaries With Mild Cognitive Impairment or Dementia. JAMA. 2019 Apr 2;321(13):1286-1294.

Biomarker and Clinical Characterization of Dominantly Inherited Alzheimer's Disease

Yakeel Quiroz, PhD, Massachusetts General Hospital

Background: Age-associated changes in biomarkers are characterized and compared in Presenilin-1 (*PSEN1*) E280A mutation carriers and non-carriers from the world's largest extended family with early onset autosomal dominant Alzheimer's disease (ADAD). We leveraged data from a very homogeneous ADAD kindred, which allowed us to examine measurable biomarkers as a function of individuals' proximity to the expected onset of dementia. We further characterized the relationships between amyloid and tau deposits in the brains of cognitively unimpaired and impaired *PSEN1* E280A mutation carriers.

Methods: Cross-sectional measures of [C11] PiB PET, [F18] Flortaucipir (FTP) PET, structural MRI, cerebrospinal fluid (CSF), and plasma biomarkers of AD were assessed in 55 *PSEN1* E280A kindred members (age range, 28–55 years); twenty-three carriers, eighteen of whom were cognitively unimpaired and five of whom had mild cognitive impairment (MCI), and thirty-two cognitively unimpaired non-carrier family members. We used regression analyses to characterize associations between age and hippocampal gray matter volume, CSF Aβ1-42, total tau and phosphorylated tau181, and plasma Aβ, as well as PiB cerebral-to cerebellar DVRs and FTP cerebral-to-cerebellar SUVRs in mutation carriers and non-carriers.

Results: Compared with non-carriers, mutation carriers had smaller hippocampal volume, lower CSF Aβ1-42, higher CSF total tau and phosphorylated tau181, and higher plasma Aβ1-42 measurements. They also had elevated mean cortical PiB DVRs levels in their late 20s, and reached the threshold for amyloidosis (DVR >1.2) in most carriers who were over age 30. Elevated levels of tau deposition were seen within medial temporal lobe regions in amyloid positive mutation carriers, 6 years before clinical onset. Beta-amyloid uptake levels were diffusely elevated in unimpaired carriers approximately 15 years prior to expected onset of MCI. In the carriers, higher levels of tau deposition were related to worse performance on MMSE and the CERAD Word List Delayed Recall.

Conclusions: This study provides additional information about the course of different AD biomarkers in the preclinical and clinical stages of autosomal dominant AD. The present findings add to the growing evidence that molecular markers can characterize biological changes related to AD in individuals who are still cognitively unimpaired. They also suggest that tau PET imaging may be useful as a biomarker to distinguish individuals at high risk to develop the clinical symptoms of AD, and to track disease progression.

References:

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Primary and Secondary Prevention Trials in Dominantly Inherited Alzheimer's Disease

Randall Bateman, MD, Washington University School of Medicine in St. Louis

Background: Alzheimer's disease (AD) prevention trials target early asymptomatic stages of the disease based on the idea that intervention prior to significant neuronal loss, brain damage, and symptom onset would lead to improved outcomes. In early 2020, we will announce results from the first secondary prevention trial (NCT01760005) of the Dominantly Inherited Alzheimer Network Trials Unit (DIAN-TU) treating a rare population of dominantly inherited AD mutation carriers who develop symptomatic AD with near 100% penetrance. In 2015, recruitment was completed in the DIAN-TU Adaptive Prevention Trial (DIAN-TU APT) platform with two parallel drug arms of anti-amyloid monoclonal antibodies gantenerumab and solanezumab, and a treatment duration that will result in 4+ years of exposure. A primary prevention trial is also being planned.

Methods: To explore secondary prevention, 194 participants at risk for dominantly inherited AD in the DIAN-TU were enrolled in a phase 2/3 trial testing the effects of the two treatments on cognitive measures and corresponding effects on biological markers of AD. Baseline demographic, clinical, cognitive, genetic, imaging (including MRI, amyloid PiB PET, amyloid

florbetapir PET, tau flortaucipir PET), and CSF biomarker results are being analyzed according to the protocol and pre-specified statistical analysis plan. Baseline measures are being compared to prior findings in the DIAN observational study. A process for requests for DIAN-TU baseline data was developed, approved, and activated in 2017. We also plan to present the design of an upcoming Primary Prevention trial in the DIAN-TU.

Results: High visit completion rates of clinical, cognitive, imaging, blood and CSF collection of nearly 100%, demonstrate the feasibility of comprehensive, long duration prevention studies in this population. Many global partners, including public, philanthropic, academic and pharmaceutical groups, have enabled launch, enrollment, and now completion of this global trial. We have obtained funding for and are preparing to launch our next wave of trials, including a primary prevention trial in individuals who are more than 15 years before their expected age of symptom onset and mostly amyloid negative. These data will be made available to qualified researchers following trial completion.

Conclusions: Clinical prevention trials with extensive biomarker assessments in dominantly inherited AD are feasible and can have high adherence and completion rates even in this rare population. Results from comprehensive evaluations during such trials can provide unique insights into the natural history of the disease as well as effects of interventions, and may accelerate highly effective treatments and preventions for AD in general.

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Plenary Session

DEREK DENNY-BROWN YOUNG NEUROLOGICAL SCHOLAR

The Derek Denny-Brown Young Neurological Scholar Award - Basic Science

Michael Fox, MD, PhD, Harvard Medical School

Mapping and Treating Neuropsychiatric Symptoms Using the Human Brain Connectome

We now have a wiring diagram of the human brain, called the human connectome, which allows us to map symptoms to brain circuits rather than single brain regions. This has proven useful for understanding focal brain damage and focal brain stimulation. In both cases, there is a causal link between the location of the brain damage or stimulation and the change in neuropsychiatric symptoms. By combining these brain locations with the human connectome, we can map symptoms to brain circuits in a causal way. These circuit mappings show promise as therapeutic targets for a wide range of brain disorders, from Parkinson's disease to depression.

References:

1. Fox MD. Mapping symptoms to brain networks with the human connectome. N Engl J Med 2018; 379:2237-2245. PMID: 30575457
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The Derek Denny-Brown Young Neurological Scholar Award - Neuroscience

Cassie S Mitchell, PhD, Georgia Institute of Technology & Emory University

Literature-Based Discovery Facilitates Predictive Medicine for Neurological Disease

Practically everyone checks the weather app to decide if they need a jacket or umbrella. What if "predictive medicine" apps were just as ubiquitous, where neuroscientists or neurologists could punch in a few key parameters and get instantaneous,

individualized disease and treatment response predictions? The age of big data makes this next frontier of predictive medicine a realistic goal. Nonetheless, predictive medicine for neurological disease has comparatively lagged. This lag is largely attributed to neurological diseases being inherently multi-factorial and highly heterogeneous, making them much more difficult to predict. A key research thrust for ultimately successful predictive medicine for multi-factorial neurological disease is literature based discovery. Biomedical literature, and especially "neuro" literature, has becoming increasingly complex, necessitating the formation of distinct silos that make the required knowledge sets for any given subject area more manageable. Literature-Based Discovery (LBD) aims to connect scientists across silos by assembling network models of the literature that reveal previously hidden connections. Unfortunately, LBD systems have not yet been widely adopted. Our goal was to develop a tool that integrates all of PubMed's 29+ million abstracts into an analyzable semantic inference network capable of deducing novel insight from multi-factorial, highly interconnected domains—namely neurology and neuroscience. The software developed in Python, named SemNet, queries a modified version of the National Institute of Health - National Library of Medicine's SemMedDB and computes feature vectors on source-target pairs. Examples of user-specified targets include "Alzheimer's Disease", "Alzheimer's Disease AND Aging", or "Alzheimer's Disease AND Cognition," etc. Each unique United Medical Language System (UMLS) concept is represented as a node and each predication as an edge. Each node is assigned one of 132 node labels (e.g. Amino Acid, Peptide, or Protein; Gene or Genome; Disease or Syndrome; Pharmaceutical Substance, etc.) and each edge is labeled with one of the 58 predications (e.g. treats, causes, inhibits, etc.). SemNet computes a single feature value for each metapath, or sequence of node types, between a source node and user-specified target node(s). Several different types of metapath-based features are computed using the patterns and frequencies of node and edge type and used to vectorize concepts of interest (amyloid cascade, tauopathy, etc.) in a graphical database in Neo4j. An unsupervised learning aggregate ranking algorithm uses metapath features to rank source nodes most relevant to the user-specified target(s). SemNet is a cutting edge literature mining tool that can assess etiological, prognostic, and therapeutic overlap in complex neuropathological spectrums (e.g. Alzheimer's, Amyotrophic Lateral Sclerosis, Frontotemporal Dementia, and ALS-FTD, etc.), including biomarkers, treatment profiles, drug repurposing, patient/cohort epidemiological risk factors, and much more. In summary, SemNet enables the multi-factorial and multi-scalar relationship identification and prioritization necessary to ultimately construct predictive medicine models of neurological disease.

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The Derek Denny-Brown Young Neurological Scholar Award - Clinical

M. Brandon Westover, MD, PhD, Massachusetts General Hospital and Harvard Medical School

Enabling Computers to Detect Epileptiform Discharges As Well as Clinical Neurophysiologists

Importance: Interictal epileptiform discharges (IED) on EEG are a biomarker of epilepsy, seizure risk and clinical decline. However, there is a scarcity of experts qualified to interpret EEGs. Prior attempts to automate IED detection have been limited by small samples and have not demonstrated expert-level performance. There exists a critical unmet need for a validated automated method to detect IEDs with expert-level reliability.

Objective: To develop and validate a computer algorithm with the ability to identify IEDs as reliably as experts and to classify an EEG recording as containing IEDs vs. no IEDs.

Design, Setting and Participants: We used 9,583 scalp EEG records with and without IEDs to train a deep neural network,

SpikeNet, to perform IED detection. Independent training and testing data sets were generated from (1) 13,262 IED candidates (derived by clustering a set of 87,636 candidate IEDs), independently annotated by eight fellowship-trained neurophysiologists; and (2) 6,899,621 1-second EEG segments selected from EEGs containing no IED based on clinical EEG reports. Using the predicted "spike probability", we also build a classifier designating the whole EEG recording as positive or negative.

Main Outcomes and Measures: SpikeNet has the ability to perform at or above the accuracy, sensitivity and specificity of fellowship-trained neurophysiology experts for identifying IEDs and classifying an EEG as positive or negative. Statistical performance was assessed via calibration error and area under the receiver operation curves (AUC). All performance statistics were estimated using 10-fold cross validation.

Results: SpikeNet surpasses both expert and a leading commercial IED detector (Persyst 13, P13) based on calibration error (SpikeNet 0.04 vs. P13 0.07 vs. experts 0.08 – 0.36) and binary classification performance based on area under the AUC (SpikeNet 0.98 vs. P13 0.88). Whole EEG classification has a calibration error of 0.10 (0.08 – 0.12) (vs. expert 0.10 – 0.37; and AUC 0.872 (0.86 – 0.89).

Conclusions and Relevance: SpikeNet automatically detects IEDs and classifies whole EEGs as IED positive or negative. This is the first algorithm shown to exceed expert performance in a representative sample of EEGs, and may thus be a valuable tool for expedited review of EEGs.

The Grass Foundation - ANA Award in Neuroscience

Ethan Goldberg, MD, PhD, Children's Hospital of Philadelphia

SCN3A-related Neurodevelopmental Disorder: A Disease Spectrum Including Epilepsy with or without Brain Malformation

Epilepsy is defined by recurrent seizures and various associated comorbid conditions and exists across the lifespan. The most severe type of childhood-onset epilepsy, the developmental and epileptic encephalopathies, are due to variation in genes critical for brain function, including those encoding ion channels, synaptic molecules, and transcriptional regulators. Pathogenic variants in genes encoding voltage-gated sodium (Na+) channel subunits, which underlie action potential generation and propagation, are well-known causes of neurological disease including epilepsy. We recently showed that heterozygous *de novo* pathogenic variants in *SCN3A* encoding the Na+ channel subunit Nav1.3 is a cause of very early onset epileptic encephalopathy; such variants produce increased slowly-inactivating/"persistent" current and a left-shift in the voltage dependence of activation to more hyperpolarized potentials. Here, we present clinical and genetic data on a novel cohort of over 20 patients with epilepsy and/or malformation of cortical development, along with detailed electrophysiological and pharmacological characterization. We then express wild-type and variant human Nav1.3 (Nav1.3-WT, Nav1.3-p.Ile875Thr, and Nav1.3-p.Val1769Ala) in cultured rat hippocampal pyramidal neurons via transient transfection, and in layer 2/3 pyramidal neurons in acute brain slices of mouse neocortex after *in utero* electroporation. Current clamp recordings revealed spontaneous bursting from resting membrane potential with transition to depolarization block in cells expressing mutant hNav1.3, but not in cells overexpressing hNav1.3-WT or in untransfected cultured neurons, or in neighboring non-electroporated cells in brain slices. Such results support the pathogenic nature of the identified epilepsy-associated Nav1.3 variants yet indicates complex effects on neuronal function that may underlie the pathomechanisms of *SCN3A*-related neurodevelopmental disorder.

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Wolfe Neuropathy Research Prize

Daniela Maria Menichella, MD, PhD, Northwestern University

Painful diabetic neuropathy (PDN) is one of the most common and intractable symptoms of diabetes and lacks causative treatment options. The hallmarks of PDN are neuropathic

pain and small-fiber degeneration, manifested by the loss of dorsal root ganglion (DRG) nociceptor axons. Using the high fat diet (HFD) model of PDN, our lab has shown previously that chemokine receptor CXCR4 is necessary for the development of neuropathic pain, DRG neuron hyperexcitability, and small-fiber degeneration. However, the mechanisms of CXCR4 mediated DRG neuron pathology are unknown. Our hypothesis is that CXCR4 signaling induces calcium overload and mitochondrial dysfunction, ultimately leading to axonal degeneration. The aim of our study is to examine alterations to calcium signaling as well as mitochondrial homeostasis and mobility in the High Fat Diet (HFD) mouse model of painful diabetic neuropathy (PDN). To examine DRG neuron calcium signaling, we utilized transgenic mice expressing the genetically encoded calcium sensor GCaMP6. To specifically study changes in the nociceptor population, we crossed Nav1. 8-cre mice with an inducible GCaMP6 mouse line and compared the results to parvalbumin-cre-GCaMp6 mice. Changes in mitochondrial physiology and motility were studied using a combination of antibody staining, fluorescent dyes, and biosensors such as redox-sensitive Mito-roGFP. We find that HFD DRG neurons show increased calcium responses to both CXCR4 signaling and excitatory stimuli which coincidence with the onset of hyperexcitability and mechanical allodynia. Our results indicate that the increased calcium responsiveness is specific to Nav1. 8-positive neurons and thus predominantly nociceptors. Additionally, we demonstrated alterations in mitochondria oxidative homeostasis and motility in HFD DRG neurons. Our results support a pivotal role of calcium signaling and consequent mitochondria abnormalities in the pathogenesis of neuropathic pain and fiber degeneration in the HFD mouse model of PDN. This contribution is expected to be significant because it identifies novel targets essential to the development of disease-modifying therapeutic for PDN.

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Monday, October 14, 2019

Plenary Session

ADVANCES IN REGENERATIVE MEDICINE: CELLULAR MEMORY SYSTEMS IN BRAIN REPAIR

Genetic Manipulations of CCR5 and the Multifaceted Molecular Cellular and Circuit Mechanisms of Cognitive Enhancement: A Caution

Alcino J. Silva, PhD, University of California, Los Angeles

Molecular genetic studies in mice showed that CCR5 is a memory suppressor: genetic, viral and pharmacological manipulations of this receptor result in enhancements in a) molecular mechanisms of memory, b) LTP and, c) hippocampal dependent memory. Additionally, these same CCR5 manipulations result in enhancements in recovery after stroke and traumatic brain injury in mice. Human studies showed that a relatively common null allele of CCR5 in the human population is also associated with higher recovery rates of cognitive and motor function after stroke. However, circuit studies showed that CCR5 plays a key role in closing the temporal window for contextual memory linking. Our studies of memory linking and associated hippocampal ensemble mechanisms demonstrated that following contextual learning increases in CCR5 and its ligand CCL5 close the window for memory linking, an important function that regulates how time regulates the linking of information. Importantly, aging increases the levels of Ccl5 and Ccr5, and thus impairs memory linking, while manipulations that decrease this receptor rescue memory linking in aged mice. These results demonstrate the perils and complexities of manipulations designed to enhance cognitive function: Our results show that while certain cognitive functions are enhanced, others are likely to be compromised. These results argue that for the foreseeable future, efforts directed at cognitive enhancement should be focused on conditions that compromise cognitive function.

Molecular Memory Systems in Recovery after Stroke

S. Thomas Carmichael MD, PhD, University of California, Los Angeles

The processes of spontaneous recovery after stroke share similarities to normal mechanisms of learning and memory in the brain. We have studied the molecular memory systems for their role and possible drug targets in stroke recovery. These studies have shown that four molecular systems or drug

targets play a role in stroke recovery: tonic GABA signaling, positive allosteric modulators at the AMPA receptor, isoform-specific phosphodiesterase inhibitors and antagonists of the chemokine receptor CCR5. This talk will review the data behind these targets, and specifically focus on the role of CCR5 in stroke recovery in pre-clinical models and in human stroke.

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Common Molecular Mechanisms in Learning and Cortical Repair

Mark Tuszynski, MD, PhD, University of California, San Diego

The molecular era of neuroscience provides new opportunities to understand genetic and epigenetic mechanisms that are associated with CNS injury and *recovery* from injury. Moreover, *learning* in the adult brain is also a dynamic process, and we now have the tools to probe the genetic and epigenetic mechanisms associated with learning.

We have performed RNA sequencing (RNAseq) of corticospinal motor neurons in adult rats that are learning new, dextrous forelimb grasping tasks. We have also performed RNAseq of these same motor cortex neuronal populations after spinal cord injury, and when these neurons regenerate (into a stem cell graft) after spinal cord injury. Thus, we have identified the transcriptome of adult corticospinal motor neuron in the following states:

1. Intact
2. Skilled Motor Learning
3. After Axonal Injury
4. While Regenerating

Notably, a number of key molecular "hubs" become activated *in common* with some of these processes: these include an increase in expression of the CNS neurotrophic factor BDNF, the mTOR pathway, and histone deactylases (HDACs), and reductions in NFkB signaling.

Moreover, we can compare the transcriptional patterns that are associated with motor cortex learning, injury and repair to known effects of thousands of drugs and small molecules on cellular transcription; this allows the *in silico* identification of new potential drug candidates for enhancing neural recovery from brain and spinal cord damage. We are now systematically screening these new candidate therapies through *in vitro* screens and *in vivo* CNS injury models of stroke and spinal cord injury. In the future, this can lead to the identification of novel drug and small molecule-based therapies for neural repair.

Pathways Regulating Synaptic Plasticity as Targets for Neurological Disease – Too Much of a Good Thing?

Nicole Calakos, MD, PhD, Duke University

Throughout the body, pathways that conditionally regulate protein synthesis are involved in responding to cell stress to regain homeostasis. In the brain, conditional regulation of protein synthesis is also a mechanism for experience-dependent adaptations that are necessary for learning and memory. In this setting, protein synthesis regulatory pathways are required for inducing long-lasting forms of synaptic plasticity. Targeting the processes of proteostasis and plasticity for neurotherapeutics is attractive because of the potential to impact a wide range of neurological diseases - such as autism, epilepsy, OCD, addiction, neurodegenerative disease and traumatic brain injury.

In this talk, I will present a perspective on the promise, and perils, of targeting plasticity pathways for brain disorders. The talk will highlight one particular pathway that is responsible for the "integrated stress response". The integrated stress response is activated by phosphorylation of the translation initiation factor, eIF2alpha. eIF2alpha phosphorylation is also required for forms of long-lasting synaptic plasticity in the brain, such as mGluR5-LTD in the hippocampus and striatum. Rare inherited diseases involving components of the eIF2alpha pathway provide further insights into vulnerable roles of this pathway in the brain and suggest novel therapeutic opportunities.

Small molecules are available that target components of the eIF2alpha pathway. Using them, promising results in preclinical mouse models have been reported for a number of brain diseases, including epilepsy, ALS, leukodystrophy, dystonia, and traumatic brain injury. Interestingly, the direction of pathway manipulation differs across these diseases. These observations highlight the potential for plasticity modulators as therapeutics, as well as the need to understand brain-wide effects in order to anticipate needs for specificity in exposure with respect to developmental timing and cellular targets.

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Plenary Session

LANGUAGE DISORDERS ACROSS THE LIFESPAN

Recent Advances in PPA

Marsel Mesulam, MD, Northwestern University

Research on PPA has helped to show that the same neuropathologic entity can yield different clinical phenotypes while the same clinical phenotype can be caused by multiple neuropathologic entities. For example, PPA can be caused by AD pathology as well as the pathology of FTLD-TAU and FTLD-TDP. Furthermore, AD causes not only PPA but also PCA, FTD and, most frequently, amnestic multidomain dementias. The root of this heterogeneity lies in subject-specific variations in the anatomical patterns of selective vulnerability. Correlations of these anatomical neurodegeneration patterns with specific language impairments in individual patients with PPA are also showing that cherished classic concepts of Wernicke's area and the anterior temporal lobe need to be revised. Through these developments, PPA offers a unique paradigm for exploring the heterogeneity of neurodegenerative dementias and the organization of cognitive networks in the human brain.

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Novel Treatments for Primary Progressive Aphasia and Post-Stroke Aphasia

Argye Hillis, MD, Johns Hopkins University

The mainstay of intervention to improve language in individuals with neurogenic communication disorders is speech and language therapy. However, many hours of therapy are required to have a significant effect. Recent developments have focused on augmenting the effectiveness of speech and language therapy with transcranial direct current stimulation, transcranial magnetic stimulation, or medications. Others have focused on increasing the hours of treatment through

innovative mobile technology apps and telerehabilitation. I will review recent advances in augmenting speech and language therapy, as well as innovations in approaches to language therapy for both post-stroke aphasia and primary progressive aphasia, focusing on randomized controlled trials.

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Developmental Language Disorders and Primary Progressive Aphasia: Associations and Implications

Maria Luisa Gorno-Tempini, MD, PhD, University of California, San Francisco

Phenotype and vulnerability to adult-onset neurodegenerative diseases may be influenced by neurodevelopmental differences. Within primary progressive aphasia (PPA), studies have shown an increased prevalence of language-

based learning disabilities (LD), perhaps most frequent within the logopenic variant PPA (lvPPA). A disorder of the phonological system, with degeneration of the left posterior temporal and inferior parietal regions, lvPPA possesses similar cognitive and anatomical localization to the most common language-based LD observed in the general population, developmental dyslexia. This correspondence suggests that the presence of language-based LD might alter the neuroanatomical reserve of the phonological language network, effecting both the presentation and clinical course of neurodegenerative disease in susceptible individuals. The observations of increased prevalence of mathematical/visuospatial-based LD in individuals with posterior cortical atrophy (PCA) and decreased age of onset within amnestic presentations of Alzheimer's disease suggests that susceptibility associated with neurodevelopmental changes might also occur in non-language-based domains. Finally, we have observed histopathological features of Alzheimer's disease and neuronal migratory changes within language-related regions in three lvPPA subjects with history of developmental dyslexia. This type of migratory changes have been associated with seizure and focal tau pathology providing clues towards a possible pathophysiological mechanism for these epidemiological observations. Taken together, these early findings suggest that neurodevelopment changes may have a greater than previously recognized impact on aging and neurodegenerative disorders.

Neural Plasticity in Developmental Dyslexia

Jason Yeatman, PhD, University of Washington

Dyslexia is a developmental disorder characterized by difficulties with accurate and/or fluent word recognition. Even though dyslexia is not diagnosed until elementary school when children present difficulties learning to read, the causes of the reading disability can be traced back to atypical development of language systems (most notably phonological processing) and sensory systems (visual and auditory systems). Research on individual differences in learning has led to the development of intervention programs to improve reading skills in young, struggling readers. However, a concern that remains is the extent to which short-term intervention programs are capable of changing the developmental trajectory of the brain's reading circuitry. In this talk I will first give an overview of neurobiological underpinnings of developmental dyslexia. Then I will present new data demonstrating that altering a child's educational environment through a targeted intervention program can dramatically change the structure of a child's white matter connections, the function of relevant brain circuits and, ultimately, their reading skills. These findings underscore the brain's impressive capacity for plasticity when children are provided with instruction that is tailored to their needs. I will conclude by discussing implications for the treatment of other language disorders across the lifespan.

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Tuesday, October 15, 2019

Plenary Session

EMERGING ROLE OF MICROBIOME IN NEUROLOGICAL DISEASE

Microbes Modulate Host Oxytocin and Multigenerational Health

Susan Erdman, DVM, MPH, Massachusetts Institute of Technology

Neuropeptide hormone oxytocin has roles in social bonding, energy metabolism, and wound healing capacity contributing to good physical, mental and social health. It was previously shown that feeding of a human commensal microbe Lactobacillus reuteri (L. reuteri) is sufficient to up-regulate endogenous oxytocin levels in mice. Oxytocin-producing cells were found to be increased in the caudal paraventricular nucleus [PVN] of the hypothalamus after feeding of a sterile lysed preparation of L. reuteri, coincident with lowered blood levels of stress hormone corticosterone in mouse models. Here we show that dietary supplementation of mouse moms with a sterile lysate of L. reuteri alone is sufficient to boost systemic oxytocin levels and convey health benefits, including reduced risk of cancer, obesity, and infertility, in offspring animals. We conclude that microbe viability is not essential for regulating host oxytocin levels or infant health. The results suggest that a microbial peptide or metabolite produced by bacteria may modulate host oxytocin secretion for potential public or personalized health goals.

A Role for Gut Microbes in Neurodegenerative Disease

Timothy Sampson, PhD, Emory University

The gastrointestinal tract is inhabited by trillions of individual microbes, representing hundreds to thousands of distinct species. These indigenous microorganisms are not simply spectators to host activity, but instead actively modulate critical aspects of our physiology. Growing experimental evidence demonstrates microbial influence on neurological function in both health and disease. While Parkinson's disease has been historically studied as a disease of the central nervous system, there is increased appreciation for the roles of both gastrointestinal function and its resident microbes on etiopathogenesis. Altered intestinal microbiome communities are described in persons with PD, suggesting potential peripheral contributions to disease. Here, we provide experimental evidence for the influence of the intestinal microbiome in modulating Parkinson's disease-relevant pathologies. Leveraging microbial genetics, in conjunction with a gnotobiotic system, we have identified gut microbiome-derived factors that are sufficient to potentiate neuroinflammation, amyloid pathology, and motor dysfunction in a mouse model. Our findings reveal a functional consequence of altered microbiomes, and provide support for the ability to target peripheral influences to modulate the outcome of a neurodegenerative disease.

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Gut Microbiota and Inflammatory CNS Diseases

Emmanuelle Waubant, MD, PhD, University of California, San Francisco

Following upon the discoveries that specific bacteria in the gut may modulate the onset of experimental autoimmune encephalomyelitis, an animal model for MS, the human gut microbiota has been investigated in multiple sclerosis (MS), neuromyelitis optica spectrum disorders (NMOSD) and autoimmune encephalitis. Data have been mostly generated from small to moderate size studies using stool samples from patients with relatively long disease duration and often receiving disease-modifying therapies that can affect microbial communities. The alpha and beta diversity of these microbial communities appears overall similar in patients and controls. In contrast, increased or decreased abundance of various taxa have been reported in cases, some of which are consistent across studies. Very few publications have addressed so far the association between the gut microbiome characteristics and the risk of relapse or disability progression. The change in gut microbiome function resulting from alterations in microbial communities (i.e. the dysregulation of specific metabolic pathways due to variation in the presence or abundance of specific taxa) is now more actively studied in inflammatory CNS disorders. Immune changes in relation to Phylum alterations have been reported in MS. Ongoing pilot trials of probiotic

supplementation or microbiome transplant will determine the feasibility of these interventions and their effect on disease course.

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Microbiome and Stroke: The Hidden Factor

Louise McCullough, MD, PhD, University of Texas Health

Recent studies have revealed an important role of the gut microbiome in the response to stroke1-6. This finding is especially significant in the aged, a population that is particularly prone to stroke1,6. This talk will discuss recent findings on the contribution of the microbiome to stroke recovery. Using several different approaches, we have found that aging changes the biome, as well as the host gut environment1. We have altered the gut microbiome through fecal transplant gavage (FTG) in mice both prior to stroke (in young and aged mice) and in aged mice after experimental stroke. FTG with microbiome from young mice significantly improved recovery from stroke, even when the transplant was performed days after the ischemic injury. Furthermore, increasing protective short-chain fatty acids (SCFAs)7, using selective SCFA-producing bacteria similarly improved stroke recovery8. Recent findings using young germ free mice have also found that FTG of aged "dysbiotic" microbiome led to cognitive deficits even in the absence of injury. This was mediated by an increase in both gut and brain inflammation in the host. These findings suggest that manipulations of the gut microbiome may have therapeutic potential.

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Plenary Session

OPTIMIZING CLINICAL TRIAL DESIGN

Accelerating ALS Development: First ALS Platform Trial

Merit E. Cudkowicz, MD, Massachusetts General Hospital

The tremendous progress in our understanding of ALS has led to large pipeline of therapeutic candidates ready for testing in people. The traditional clinical trial approach of testing one drug at a time in independent trials is inefficient and expensive. the ALS Platform Trial is to accelerate the path to effective treatments by establishing the infrastructure to test multiple therapeutic agents in an informative and time and cost-efficient manner.

Platform trials are a transformative approach that have already proven successful in oncology and are rapidly being adopted in several fields of medicine, including the neurosciences.

In collaboration with Berry Consultants and members of the Northeast ALS Consortium, investigators at the Healey Center for ALS at Mass General designed the first Platform Trial for ALS. Input from key stakeholders including the FDA, potential industry partners, people with ALS and ALS clinicians and trialists help shape the design of this first ALS Platform trial. In addition to accelerating the development of new treatments, this Platform Trial initiative in ALS will also be a source of data and samples that will contribute to our understanding of ALS and inform the design of future research projects and trials. Successes from this approach will catalyze the clinical trial community and facilitate the establishment of similar networks to develop new treatments for other neurological disorders.

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Design of Patient Reported Outcomes in Neurological Disease

Nicholas Johnson, MD, MSCI, Virginia Commonwealth University

Patient Reported Outcomes (PROs) are broadly defined as instruments designed to capture the patient's perspective. These may be used clinically and as outcome measures during clinical trials. Generic PROs are often not designed to capture the full extent of symptoms associated with neurological disease, and may not be sensitive to detect change during clinical trials. This presentation will review two broad approaches to design of PROs in neurological disease, including simple symptom-based PROs and more extensive health related quality of life instruments. PRO considerations during clinical trial design will also be reviewed.

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Designing Novel Functional Outcomes for Clinical Trials

Lindsay Alfano, DPT, PCS, The Research Institute at Nationwide Children's Hospital

Selection of appropriate outcome measures is a critical factor to the success of a clinical trial but can often be an afterthought. The decision behind the ideal outcome for any given compound is multifaceted and may require extensive study. Consideration of the compound's mechanism of action, predicted effect size, characteristics of the proposed subject pool, measurement constructs of outcomes and their sensitivity to change, among other factors, is vital. Oftentimes, existing outcomes validated in other patient groups or designed to measure disease natural history, cannot simply be assumed to work with a new study cohort. Similarly, as treatments become available and new natural histories are identified, existing outcomes need to be reviewed and modified, or new outcomes generated. Discussions of our experience in developing novel functional outcome measures for diverse patient groups will be presented.

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Why MeData-informed Why Not?! Drivers of Research Participation in a Diverse Parkinson Disease Cohort

Allison Willis, MD, MS, University of Pennsylvania

Less is known about the pathophysiology, risk factor profile, and disease trajectory of Parkinson disease (PD) in women, minorities, and adults greater than 70 years at disease onset,

other than these groups have lower use of basic and advanced treatments for PD in the United States. At the root of this knowledge gap is the fact that women, minorities and older adults are highly underrepresented in Parkinson disease research. Should PD research continue to include inadequate numbers of these groups, disparities in our understanding of Parkinson disease burden and best clinical practices will worsen, and the potential for novel and fundamental scientific discovery that is driven by study of more diverse disease populations will remain unfulfilled.

Current and forthcoming PD research is focused on preclinical diagnosis, identifying new genetic variances and biomarkers, and neuroprotective therapies. Neuroprotective trials in Parkinson disease are particularly challenging from a recruitment perspective, as most require enrollment very soon after symptom onset or very early in the disease course. Women and minorities are more likely to experience avoidable delays in diagnosis, which would jeopardize neuroprotective trial eligibility. Women, minorities, and older adults are also less likely to receive specialist care at academic research centers, where clinical trial recruitment generally occurs. The other major trial types- symptomatic treatment and observational/ biomarker- may limit population-representative enrollment by excluding individuals with comorbid conditions that are more common in particular demographic groups or having study visit requirements that are viewed as burdensome.

Data-informed understanding of the factors which drive participation in Parkinson disease research is needed to develop interventions or modify study designs in a manner that will result in equal research participation across sociodemographic groups. In this session, Dr. Willis will present data on the relative effects patient, clinical, functional, trial and provider factors on participation in each of three theoretical PD research studies—a prodromal pre-diagnosis trial, a longitudinal observational cohort study, and a phase 2/3 neuroprotective drug trial—from a nationally drawn, diverse cohort of individuals with PD.

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ANA2019 AWARDEES

RAYMOND D. ADAMS LECTURESHIP AWARD

This award honors Dr. Raymond D. Adams, emeritus Bullard Professor of Neurology Service at the Massachusetts General Hospital.

TUESDAY, OCTOBER 15

Merit Cudkowicz, MD
MASSACHUSETTS GENERAL HOSPITAL

Presentation Title: Accelerating ALS Therapeutics: Master Platform Trials and Other Approaches

This award will be presented at the Optimizing Clinical Trials Symposium.

Dr. Merit Cudkowicz is the Julieanne Dorn Professor of Neurology at Harvard Medical School, Chief of Neurology Service at Mass General Hospital. Dr. Cudkowicz's research and clinical activities are dedicated to the study and treatment of people with amyotrophic lateral sclerosis (ALS). Dr. Cudkowicz directs the Sean M. Healey & AMG Center for ALS Neurological Clinical Research Institute at Mass General Hospital. She is one of the founders and former co-directors of the Northeast ALS Consortium (NEALS), a group of over 130 clinical sites in the United States, Canada, Europe and the Middle East dedicated to performing collaborative academic led clinical trials and research studies in ALS. In conjunction with the NEALS consortium, she planned and completed several multi-center clinical research studies in ALS. She is Principal Investigator of the Clinical Coordination Center for the National Institute of Neurological Disorders and Stroke's Neurology Network of Excellence in Clinical Trials (NeuroNEXT). With her colleagues at Mass General and NEALS, she is currently developing the first ALS Platform Trial initiative to greatly accelerate therapy development.

Dr. Cudkowicz received the American Academy of Neurology 2009 Sheila Essay ALS award and the 2018 Boston Chamber of Commerce Pinnacle Award. She is a pioneer in promoting and developing more efficient methods of developing new therapies for people with ALS. A dedicated educator, Dr. Cudkowicz mentors many young neurologists in clinical investigation of ALS and related neurodegenerative disorders.

DEREK DENNY-BROWN YOUNG NEUROLOGICAL SCHOLAR AWARD IN BASIC SCIENCE

A basic and a clinical award is given each year during the Annual Meeting to new members of the association who have achieved significant stature in neurological research and who show promise as one who will continue making major contributions to the field of neurology.

SUNDAY, OCTOBER 13

Michael Fox, MD, PhD
HARVARD MEDICAL SCHOOL

Presentation Title: Mapping and Treating Neuropsychiatric Symptoms Using the Human Brain Connectome

Michael Fox, MD, PhD, is an Associate Professor of Neurology at Harvard Medical School and Director of the Laboratory for Brain Network Imaging and Modulation. He is Co-Director of the Beth Israel Deep Brain Stimulation Program, Associate Director of the Berenson-Allen Center for Noninvasive Brain Stimulation, Assistant Neuroscientist at Massachusetts General Hospital, and a practicing clinical neurologist at Beth Israel Deaconess Medical Center. Dr. Fox specializes in the development of new and improved treatments for neuropsychiatric diseases based on understanding brain circuits and the effects of brain stimulation.

F.E. BENNETT MEMORIAL LECTURESHIP AWARD

The F.E. Bennett Memorial Lectureship began in 1979 to recognize outstanding neuroscientists.

SUNDAY, OCTOBER 13

Alison Goate, DPhil
ICAHN SCHOOL OF MEDICINE AT MOUNT SINAI

Presentation Title: Genetics of Alzheimer's Disease: Similarities and Differences between Dominantly Inherited and Late Onset Alzheimer's Disease

This award will be presented at the Presidential Symposium: Dominantly Inherited and Late-Onset Alzheimer's Disease: Genetics, Biomarkers, Timecourse, and Treatments

Dr. Alison Goate has worked on Alzheimer's disease genetics since 1987 as a postdoctoral fellow with Dr. John Hardy —at Imperial College, London. In 1992 she moved to Washington University in St. Louis, where she stayed until 2014, when she moved to the Icahn School of Medicine at Mount Sinai as the founding director of the Ronald M. Loeb Center for Alzheimer's disease. She has been part of many gene finding teams that have successfully identified disease causing variants for both AD and FTD. Whilst working with Dr. Hardy she reported the first mutation to cause familial Alzheimer's disease and early studies at Washington University identified the mutation in the Colombian families that are now part of the API clinical trial.

Dr. Goate is also a leader in the study of late onset AD genetics using both GWAS and sequencing approaches. She has demonstrated that LOAD families can carry *PSEN* mutations with reduced penetrance. Her team led the identification of rare variants in *PLD3* as a risk factor for AD and collaborated with John Hardy in the identification of *Trem2* as an AD risk factor. More recently her work on common variants has highlighted the importance of microglial expressed genes in AD risk, identifying *SPI1*/Pu.1 as an important regulator of AD risk genes. Fine mapping of AD risk loci has identified causal genes/variants in many loci and further emphasized the importance microglial gene expression and function to AD risk. Dr. Goate has received the Potamkin Award and the MetLife Award for her research on AD and was elected a fellow of AAAS in 2012 and a fellow of the National Academy of Medicine in 2016.

THE GRASS FOUNDATION - ANA AWARD IN NEUROSCIENCE

Established in 2007, the award honors outstanding young investigators conducting research in basic or clinical neuroscience.

SUNDAY, OCTOBER 13

Ethan Goldberg, MD, PhD
CHILDREN'S HOSPITAL OF PHILADELPHIA

Presentation Title: SCN3A-related Neurodevelopmental Disorder: A Disease Spectrum Including Epilepsy with or without Brain Malformation

This award will be presented during the Derek Denny-Brown Young Neurological Scholar Symposium.

Dr. Goldberg is an attending physician and Assistant Professor in the Division of Neurology at Children's Hospital of Philadelphia (CHOP) and the Departments of Neurology and Neuroscience at the Perelman School of Medicine at the University of Pennsylvania, and Director of the Epilepsy Neurogenetics Initiative (ENGIN). He sees patients in the Neurogenetics Clinic.

Dr. Goldberg has a particular interest in epilepsy, developmental delay/intellectual disability, autism, schizophrenia, and the genetic basis of these disorders/diseases. He has specific expertise in the evaluation and care of patients with epilepsy due to ion channelopathy.

In the laboratory, Dr. Goldberg studies mechanisms of brain circuit function and of circuit dysfunction in epilepsy, with the goal of translating these insights into the preclinical development of novel anti-epileptogenic and anti-epileptic treatment strategies. Dr. Goldberg employs electrophysiology, large-scale dynamic imaging of neuronal circuits, and optogenetics to answer epilepsy-related questions in experimental systems, including in animal models of acquired and genetic epilepsies.

DISTINGUISHED NEUROLOGY TEACHER AWARD

The award recognizes and rewards contributions by gifted and talented teachers of neurology. Nominees come from the entire field of clinical neurology or neuroscience.

SUNDAY, OCTOBER 13

John C. Kincaid, MD
INDIANA UNIVERSITY

This award will be presented during the Derek Denny-Brown Young Neurological Scholar Symposium.

SORIANO LECTURESHIP AWARD

This award was established in 1987 by ANA member Dr. Victor Soriano and his wife to provide a "brilliant lecture delivered by an outstanding scientist" who is a member of the Association.

TUESDAY, OCTOBER 15

Louise McCullough, MD, PhD
UNIVERSITY OF TEXAS HEALTH

Presentation Title: Microbiome and Stroke: The Hidden Factor

This award will be presented during the Emerging Role of Microbiome in Neurological Disease Symposium.

Dr. McCullough is the Roy M. and Phyllis Gough Huffington Distinguished Chair and Chief of Neurology at Memorial Herman Hospital – Texas Medical Center. She is a physician-scientist and a practicing vascular neurologist with clinical expertise in sex/gender disparities, stroke prevention, stroke and aging, acute stroke treatments and outcome assessment. Louise is well recognized for her work in cerebral vascular disease and is known for her research identifying sex differences in cell death pathways during stroke, which have now been shown to be a major factor in the response to ischemic insult. Working closely with the Society for Women's Health Research (SWHR) and the Office of Research on Women's Health (ORWH), she was instrumental in the National Institute of Health's requirement to include female animals in basic and translational studies.

WOLFE NEUROPATHY RESEARCH PRIZE

The Wolfe Research Prize was established in 2009 by Mr. Winston Wolfe and the ANA to honor outstanding investigators who identify a new cause or novel treatment of axonal peripheral neuropathy.

SUNDAY, OCTOBER 13

Daniela Menichella, MD, PhD
NORTHWESTERN UNIVERSITY

Presentation Title: Nociceptor Excitability Underlies Axon Loss in Diabetic Neuropathy: A New Disease Modifying Target

This award will be presented during the Derek Denny-Brown Young Neurological Scholar Symposium.

Dr. Menichella. Daniela Maria received her MD and Ph.D. from the University of Milan, Italy. She graduated from the Neurology Residency Program at Northwestern University in Chicago and she is an Assistant Professor of Neurology and Pharmacology at Northwestern University. She is the director of the Peripheral Neuropathy Multidisciplinary Clinic and Director of the Charcot-Marie-Tooth Association Center for Excellence. She is actively engaged in basic science and translational research, including NIH NeuroNext Clinical trials.

Dr. Menichella is the Principal Investigator of an NIH funded laboratory that investigates the molecular and cellular mechanisms underlying axonal degeneration in hereditary and acquired peripheral neuropathies with a particular focus on Painful Diabetic Neuropathy. Towards designing more effective therapeutics, Dr. Menichella's laboratory takes advantage of an integrated approach combining pain behavioral tests, electrophysiology studies including current clamp recordings, in vitro and in vivo calcium imaging studies, confocal studies, chemogenetics and single cell RNA sequencing with conditional and transgenic mouse models.

DEREK DENNY-B N YOUNG NEUROLOGICAL SCHOLAR AWARD IN NEUROSCIENCE

SUNDAY, OCTOBER 13

Cassie S. Mitchell, PhD
GEORGIA INSTITUTE OF TECHNOLOGY

Presentation Title: Literature-Based Discovery Facilitates Predictive Medicine for Neurological Disease

Cassie S. Mitchell, PhD, is an assistant professor in Biomedical Engineering at Georgia Institute of Technology and Emory University School of Medicine. She founded the Laboratory for Pathology Dynamics, which specializes in predictive medicine to identify causes, develop cures, and optimize care. Dr. Mitchell combines big data, statistics, machine learning, and computational neuroscience to tackle neuropathology. She has >100 peer-reviewed publications but is most known for data-enabled prediction of Amyotrophic Lateral Sclerosis and Alzheimer's Disease. When Dr. Mitchell is not researching neurological disease, she is racing it as a Team USA Track & Field athlete, world record holder, and Paralympic Games medalist.

DEREK DENNY-BROWN YOUNG NEUROLOGICAL SCHOLAR AWARD IN CLINICAL SCIENCE

SUNDAY, OCTOBER 13

M. Brandon Westover, MD, PhD
MASSACHUSETTS GENERAL HOSPITAL AND HARVARD MEDICAL SCHOOL

Presentation Title: Enabling Computers to Detect Epileptiform Discharges As Well as Clinical Neurophysiologists

M. Brandon Westover, MD, PhD obtained his PhD working in the field of Artificial Intelligence (information theory and computer vision), and is a board certified practicing Neurologist and Clinical Neurophysiologist at Massachusetts General Hospital (MGH). He directs the MGH Critical Care EEG Monitoring Service and the MGH Clinical Data Animation Center (CDAC). His research uses Big Data and artificial intelligence to improve medical care for patients with anoxic brain injury, seizures and seizure-like brain states, cerebral ischemia, delirium, and sleep disorders, and to develop closed-loop control technology for precision control of anesthesia in the ICU.

TRAVEL AWARDEES

Each year the ANA selects the top abstracts submitted by Fellow, Residents, Students, or Junior Faculty to receive a travel award to attend the Annual Meeting and present their work. For more information please visit the main ANA website.

- Poster numbers listed with an "**S**" will be presented on **Sunday, October 13**
- Poster numbers listed with an "**M**" will be presented on **Monday, October 14**

Emily Acton, BS, *Department of Biostatistics and Epidemiology, Center for Clinical Epidemiology and Biostatistics, University of Pennsylvania*
S182 Prescribing Hormonal Contraceptives to Women on Antiepileptic Drugs: Assessing Compendia Reporting of Drug-Drug Interactions

Luke Adams, BA, *Johns Hopkins University*
S117 Dissociable Deficits in Morphosyntactic Production in Post-Stroke Aphasia and Primary Progressive Aphasia

Mohammad Aladwan, Doctorate, *University of Massachusetts Lowel*
M160 Exosomal Proteome Changes Induced by Human Tau Expression are Modulated by the Presence of the Microtubule-Binding Domain and Alternatively Spliced Exons 2-3 in SH-SY5Y Neuroblastoma Cells

Asher Albertson, MD, PhD, *Washington University School of Medicine*
S159 Selective Deterioration of Network Connectivity in Aging Mice

Enrique Alvarez, MD, PhD, *University of Colorado*
M235 Cytokine Changes Induced by antiCD20 Infusions: A Comparison of Rituximab versus Ocrelizumab

Bhooma Aravamutha, MD DPhil, *Washington University in St. Louis*
M226 Striatal Cholinergic Interneurons May Play Different Roles in Dystonia Pathogenesis across Development

Konstantinos Avgerinos, MD, MSc, *National Institute on Aging*
S171 Medium Chain Triglycerides Induce Ketosis and Improve Cognition in Alzheimer's Disease. A Systematic Review and Meta-Analysis of Human Studies

Maurie Balch, PhD, *Washington University*
M281 A Yeast Model for Investigating αB-Crystallin Function

Christopher Bartley, MD, PhD, *University of California, San Francisco*
M103 Ankyrin G Autoantibodies in a Well-Controlled HIV Patient with Steroid-Responsive Meningioencephalitis

Camilo Bermudez, BSE, *Vanderbilt University*
M209 Automated Dentate Nucleus Segmentation and Its Clinical Application in Movement Disorders

Margaret Blattner, MD, PhD, *Washington University in St. Louis*
M286 Sleep Spindle Activity Correlates with Cognition in Patients with Early Alzheimer Disease

Carmen Boessen, Bachelor of Science, *University of Missouri*
S263 Charcot Marie Tooth Disease Type 2A with a Novel K1F1B Mutation

Marina Buciuc, MD, MS, *Mayo Clinic*
S164 Differences between TDP-43 Types in Subjects with Alzheimer's Spectrum Pathology

Omar Butt, MD, PhD, *Washington University in Saint Louis*
M170 Early Network Dysfunction in *APOE* ε4 Carriers without Biomarker Evidence of Alzheimer's Disease is Related to Subclinical Tau Changes

Linda Cai, MPH, BA, *University of Toledo College of Medicine and Life Sciences*
M119 Complex Visual and Tactile Hallucinations: Atypical Presentation of Charles Bonnet Syndrome

Claudia Cantoni, PhD, *Washington University in St. Louis*
M233 Protective Effects of Mir-223 in Cuprizone-Induced Demyelination in the Mouse Corpus Callosum

Marc Casale, Bachelor of Science, *Icahn School of Medicine at Mount Sinai*
M180 A Comparison of Simultaneous Scalp and Stereo Electroencephalographic Seizure Recordings

Xu-Qiao Chen, PhD, *UCSD/Neuroscience*
M165 Dysregulation of the Endosomal/Lysosomal Pathway in a Mouse Model of Down Syndrome

Jason Chisholm, MD, *University of Kentucky*
M280 Correlation of Intracranial Elastance with Venous Sinus Stenosis in Idiopathic Intracranial Hypertension

Ravi Chopra, BA, *University of Michigan*
S212 Regional Differences in Purkinje Neuron Degeneration Reveal a Region-Specific Dysregulated Ion Channel Module in Spinocerebellar Ataxia Type 1

Gregory Day, MD MSc, *Washington University in St. Louis*
M106 Tau PET Imaging in LGI1 Encephalitis

Angela Deutschlander, MD, *Mayo Clinic*
S215 Microtubule Associated Protein Tau H1 Subhaplotypes and the H2 Haplotype and Their Associations with Clinical Features in Parkinson's Disease

Amar Dhand, MD, DPhil, *Brigham and Women's Hospital/ Harvard Medical School*
S116 Social Networks of Retired NFL Football Players and Neuropsychiatric Outcomes

Dhruva Dhavale, PhD, *Washington University in St. Louis*
M163 Regional Distribution of Fibrillar Alpha-Synuclein, Amyloid-beta and Tau in Lewy Body Dementia

Kalen Dionne, MD, PhD, *Washington University*
M275 Bypassing the Blood Brain Barrier (BBB) with Intranasally Delivered Nanoparticles

Umber Dube, BSc, *Washington University School of Medicine*
M246 Brain Circular RNAs are Significantly Associated with Alzheimer Disease

Jeffrey Ehmsen MD, PhD, *Johns Hopkins School of Medicine*
M260 Gadd45a is a Protective Modifier of Neurogenic Skeletal Muscle Atrophy

Nader El Seblani, MD, PhD Candidate, *Department of Neurosurgery*
S207 Investigating Cell Therapy with Deep Brain Stimulation as an Approach to Alter the Progression of Parkinson's Disease

Colin Ellis, MD, *University of Pennsylvania Perelman School of Medicine*
S250 Genetic Testing in Adults with Epilepsy Reveals a Heterogeneous Landscape and a Substantial Diagnostic Yield

Lubov Ezerskiy, BA, *Washington University in St. Louis*
S165 An Increase in 4R Tau Levels in Astrocytes Leads to Dysregulation of Function

Giuseppe Faraco, MD, PhD, *Feil Family Brain and Mind Research Institute—Weill Cornell Medicine*
M125 Dietary Salt Induces Cognitive Impairment by Promoting Tau Pathology

Brandon Farmer, BS, *University of Kentucky*
M172 Indirect Calorimetry as a Novel Method to Study *APOE*'s Role in Cerebral Metabolism and Alzheimer's Disease Risk

Salman Farooq, MBBS, *Aga Khan University Hospital*
S126 New Oral Anticoagulants versus Warfarin for Cerebral Venous Thrombosis: A Multi-Center, Observational Study

Fabia Filipello, PhD, *Washington University*
S170 The *MS4A* Gene Cluster is a Key Modulator of Soluble TREM2 and Alzheimer Disease Risk

Andrew Findlay, MD, *Washington University School of Medicine*
M259 Lithium Chloride Corrects Weakness and Myopathology in a Preclinical Model of LGMD1D

Rachel French, PhD, *Saint Louis University*
S158 Detection of TAR DNA-Binding Protein 43 (TDP-43) Oligomers as Initial Intermediates Species during Aggregate Formation

Mehraveh Garjani, MD, *Northwestern University Feinberg School of Medicine*
M249 Ceramide Synthesis Pathway Regulates the Sensitivity of Developing C. elegans to Hypoxia

Joel Geerling, MD, PhD, *University of Iowa*
M114 Parabrachial-Cortical Connectivity

Alexander Gill, MD, PhD, *University of Pennsylvania*
S248 Heme Oxygenase-1 Promoter $(GT)_n$ Polymorphism Predicts Risk for Neurocognitive Impairment in HIV-Infected Individuals with Higher-Risk Genotypes in African-Americans

Zachary Grese, BA, *Saint Louis University School of Medicine*
S258 The RNA-Binding Domains of TDP-43 are Crucial for Aggregation, Which Can Be Modulated by Specific RNAs

Henrike Grosshans, MS, *Yale School of Medicine*
S278 Primary Melanotic Tumors of the Nervous System

Jorge Jesus Guerra, MD, *Washington University School of Medicine*
M113 Longitudinal Changes in Soluble Tau, P-tau and Brain Atrophy Diverge with Disease Progression in Alzheimer Disease

Mallory Hacker, PhD, *Vanderbilt University Medical Center*
208 A Novel Bedside Tool for Spasticity Referral

Ali Hamedani, MD, MHS, *University of Pennsylvania*
S282 Self-Reported Vision and Hallucinations in Older Adults: Results from Two Longitudinal Aging Cohort Studies

Ali Hamedani, MD, MHS, *University of Pennsylvania*
M221 Blindness and Visual Impairment in Parkinson's Disease: Prevalence and Association with Hip Fracture and Neuropsychiatric Outcomes among U.S. Medicare Beneficiaries

L. Hickman, BA, *Washington University in St. Louis*
S181 Anesthetic Regimen Impacts Duration of Post-Ictal Generalized Electroencephalographic Suppression Following Electroconvulsive Therapy-Induced Seizures

L. Hickman, BA, *Washington University in St. Louis*
M182 Central-Positive EEG Complexes during Electroconvulsive Therapy-Induced Seizures Exhibit Consistent Temporal Dynamics and Spatial Characteristics

Karin Hochrainer, PhD, *Weill Cornell Medicine*
S127 Post-Ischemic Ubiquitination Targets Postsynaptic Kinases in Excitatory Neurons

Bo Hu, PhD, *Wayne State University School of Medicine*
M252 Consequences of *Sac3/fig4* Deficiency to Phosphoinositides in Fibroblasts of Patients with CMT4J

Hope Hua, BS, *University of Miami*
M130 Low Utilization of Anticoagulants among Elderly Patients with Atrial Fibrillation Seen in the Emergency Department

Daniel Huddleston, MD, *Emory University*
M216 Machine Learning Classification of Parkinson's Disease with Neuromelanin-Sensitive MRI and Clinical Features

Helen Hwang, MD, PhD, *Washington University*
S221 A Single Molecule Assay for Detection and Characterization of Alpha-Synuclein Oligomers

Sarah Irvin, BS, *West Virginia University*
M253 Acute Diagnosis of Wilson's Disease in a Teenage Patient

Makoto Ishii, MD, PhD, *Weill Cornell Medicine*
S154 Hypothalamic Atrophy and Third Ventricular Enlargement in the Preclinical Stage of Alzheimer's Disease

Monica Javidnia, PhD, *University of Rochester Medical Center*
S222 Autoimmune Disorders among Parkinson Disease PPMI Subjects

Dinesh Jillella, MD, *Cleveland Clinic*
M127 Blood Pressure and Hospital Discharge Outcomes in Acute Ischemic Stroke Patients Undergoing Reperfusion Therapy

Celeste Karch, PhD, *Washington University in St Louis*
M152 Lysosomal Dysfunction in Stem Cell Models of Tauopathy

Marina Khodanovich, PhD, *Tomsk State University*
M126 Macromolecular Proton Fraction (MPF) Mapping as a Marker of Recovery Processes in the Model of Ischemic Stroke in Rats

Eva Klinman, MD, PhD, *Washington University in St Louis*
M257 Elevated CDK5 Activity Leads to Dysregulation of Axonal Transport in Neurons

Shunsuke Koga, MD, PhD, *Mayo Clinic*
M208 Clinicopathologic Features and Antemortem Diagnoses of Multiple System Atrophy: Review of 169 Autopsy-Confirmed Patients with MSA

Geraldine Kress, PhD, *Washington University*
S287 Circadian Modulation of Hippocampal Function during Alzheimer's Disease Pathogenesis

Sara LaHue, MD, *University of California, San Francisco*
S239 Differences in Clinical Characteristics of Patients with Brain Abscesses Due to *Nocardia* versus Pyogenic Bacteria

Deepti Lall, PhD, *Center of Neural Science and Medicine, Cedars-Sinai Medical Center*
M150 *C9orf72* Deficiency Alters Innate Immune Response and Promotes Amyloid Clearance but Also Induces Synapse Loss

Eric Landsness, MD, PhD, *Washington University*
M288 Local Slow Wave Sleep and Post-Stroke Brain Repair

Erin Langton, MD, *Washington University in St. Louis*
S261 Safety and Efficacy of Nusinersen in Adult and Adolescent Patients with Spinal Muscular Atrophy: A Retrospective Case Series

Tiffany Lee, BA, *Oregon Health and Science University*
S220 Multisensory Synchrony in Individuals with Parkinson's Disease

Zeran Li, PhD, *Washington University School of Medicine*
M247 *TMEM106B* Protective Variant Associated with Increased Neuronal Proportion

Stephanie Liang, BA, *Boston University School of Medicine*
S240 SAPS II Scores Underestimate In-Hospital Death in Cardiac Arrest Patients from Drug Overdose: A Single-Institution Retrospective Analysis

Miranda Lim, MD, PhD, *Oregon Health & Science University*
M287 Post-Traumatic Stress Disorder, with and without Comorbid Traumatic Brain Injury, Increases the Odds of Rapid Eye Movement Sleep Behavior Disorder in Veterans

Miranda Lim, MD, PhD, *Oregon Health & Science University*
M291 Early Life Sleep Disruption Alters the Balance of Neural Excitation: Inhibition and Impairs Social Behavior in Prairie Voles

Maren Loe, BS, *Washington University in St. Louis*
S177 Spatially Widespread Macroperiodic Oscillations Revealed through Bilevel Spectral Analysis of the EEG of Young Children

Johnny Chuieng Lu, MD, *Washington University in St. Louis*
M263 VEGF-A Receptor Inhibitor Impedes Reinnervation at the End Target Muscle after Nerve Injury

Xinguo Lu, PhD, *Washington University in St Louis*
S180 Neurosteroids, $GABA_A$ Receptors, and Neuronal Synchrony

Manish Kumar Madasu, PhD, *Washington University in St Louis*
S284 Activation of Kappa Opioid Receptors Potentiates Cold Sensation

Megan Mantica, MD, *University of Pittsburgh*
M278 Case Series of Checkpoint-Inhibitor Associated Meningoencephalomyelitis and Polyradiculitis

Katsuhisa Masaki, MD, PhD, *Kyushu University*
S235 Predilection of TMEM119- and GLUT5-Positive Microglia to the Leading Edge of Concentric Lesions of Balo's Disease and Neuromyelitis Optica Spectrum Disorders

Daniela Mattos, PT, PhD, *Washington University School of Medicine*
M128 Contralesional White Matter Integrity May Predict Response to Upper Limb Task-Specific Training in Chronic Stroke

Rajarshi Mazumder, MD, MPH, *University of California, Los Angeles*
M190 Neurophysiological Profiles of Children with Nodding Syndrome and Their Sibling

Erin Meier, PhD, *Johns Hopkins University*
M169 Comparison of Qualitative and Quantitative Measures of Leukoaraiosis in Primary Progressive Aphasia

Daniela Menichella, MD, PhD, *Northwestern University*
S283 Nociceptor Excitability Underlies Axon Loss in Diabetic Neuropathy: A New Disease Modifying Target

Jacqueline Meystedt, BA (in progress), *Vanderbilt University Medical Center*
S218 Spasticity is Associated with Activities of Daily Living Dependency in the Nursing Home Setting

Shahnaz Miri, MD, MBA, *Human Motor Control Section, National Institute of Neurological Disorders and Stroke, NIH*
S153 Muller Cell Reactivation and Retinal Glial Fibrillary Acidic Protein Overexpression in Diffuse Lewy Body Disease and Alzheimer's Disease

Erik Musiek, MD, PhD, *Washington University School of Medicine*
S289 Chi3l1/YKL-40 is a Modulator of Glial Activation and Amyloid Plaque Deposition in Alzheimer Disease Which is Controlled by the Circadian Clock

Neil Nadkarni, MD, *McGaw Northwestern Memorial Hospital*
S124 Longitudinal Deep-Brain Imaging in Mouse Using Visible-Light Optical Coherence Tomography to Study Ischemic Stroke

Adeeb Narangoli, MD, *Weill Cornell Medicine, Qatar*
S128 Corneal Confocal Microscopy: An Imaging Endpoint for Neuro-Immune Alterations in Acute Stroke

Hemanth Nelvagal, MBBS, PhD, *Washington University in St. Louis School of Medicine*
S245 Early Spinal Cord Vulnerability in CLN1 Disease

Aaron Noles, MD, *University of Maryland Medical Center*
S129 Comparing Thrombectomy Outcomes for Acute Stroke amongst Elderly and Younger Patients

Derek Notch, MD, *Saint Louis University*
S264 Edaravone: Extended Outcomes and Response to Treatment by Phenotype

Kayla Nygaard, PhD (student), *Washington University School of Medicine*
S119 Investigating the Role of Oxytocin in Behavioral Phenotypes of a Complete Deletion Mouse Model of Williams Syndrome

Sangwook Oh, PhD, *University of Pennsylvania*
M101 Antigen-Specific B Cell Depletion for Myasthenia Gravis with Chimeric Autoantibody Receptor (CAAR) T Cells

Abby Olsen, MD, PhD, *Brigham and Women's Hospital*
S210 Using Drosophila to Identify Novel Glial Modifiers of Neuronal Alpha-Synuclein Toxicity

Charlene Ong, MD, MPHS, *Boston University*
M239 Quantitative Pupillometry and Radiographic Midbrain Compression by Cerebral Edema

Sabrina Paganoni, MD, PhD, *Healey Center for ALS at Mass General/Harvard Medical School*
S260 A Platform Trial for ALS: Leveraging Innovative Trial Designs to Accelerate Drug Development

Tirth Patel, BS, *Washington University in St. Louis, Department of Neurology, Hope Center for Neurological Disorders, Knight Alzheimer's Disease Research Center*
S157 Dural Lymphatics Regulate Clearance of Extracellular Tau from the CNS

Urvish Patel, MD, MPH, *Icahn School of Medicine at Mount Sinai*
M197 Opioid Epidemic and Headache Disorders

Kristina Patterson, MD, PhD, *University of Pennsylvania*
S102 Mechanisms of IgG4 Autoantibodies to Neurofascins in Autoimmune Demyelinating Neuropathies

Yuri Pavlov, MSc, *Ural Federal University*
S290 Sleep in Patients with Severe Disorders of Consciousness: Behavioral and Physiological Perspective

Yuri Pavlov, MSc, *Ural Federal University*
S115 Wakefulness Rather Than Sleep Supports Fear Memory Consolidation

Yuri Pavlov, MSc, *Ural Federal University*
M120 A Comprehensive Approach to the Brain Responses in Minimal Conscious State Patients

Elizabeth Perelstein, MD, *Washington University in St. Louis*
S202 A Proposed Methodology for Describing Neurology Inpatient Readmissions

Sai Polineni, MPH, *University of Miami Miller School of Medicine*
M293 Evaluating the Influence of Pre-Hospital Characteristics of Traumatic Brain Injury on Race-Ethnic Differences in Mortality

Subrata Pradhan, PhD, *The University of Texas Medical Branch*
M214 Mutant Huntingtin Synchronously Impairs Mitochondrial DNA Repair and Transcription

Deep Pujara, MBBS, MPH, *University of Texas McGovern Medical School*
M201 Evaluation of Stroke Care Metrics in Safety Net Hospitals across United States

Taha Qarni, BHSc, *Yale School of Medicine*
S120 Preliminary Characterization of a Common Benign Clinical Syndrome Which Presents as Subjective Cognitive Impairment or Early Mild Cognitive Impairment - Introducing Hyperarousal Amnestic Dysexecutive Syndrome

Prashanth Ramachandran, MBBS, BMedSci, *University of California, San Francisco*
S190 Illuminating Tuberculosis Meningitis with Metagenomics and FLASH Enrichment

Akshaya Ramesh, PhD, *University of California, San Francisco*
M236 CSF B Cells in Relapsing Multiple Sclerosis are Driven towards an Antigen-Experienced, Inflammatory Fate

Supriya Ramesha, MBBS, *Emory University*
S155 Kv1.3-Positive Brain Macrophages are Distinct Pro-Inflammatory Microglia Involved in Glutamatergic Synaptic Pruning in AD

Srikant Rangaraju, MD, MS, *Emory University*
M156 Quantitative Proteomics of Mouse CSF Identifies Novel Human-Relevant Biomarkers of Alzheimer's Disease Pathology

Tracy Rappai, BSc, *Washington University in St. Louis*
S163 Identifying Factors That Predict Lumbar Puncture Complications and Promote Participation in Longitudinal Research Requiring Serial CSF Sampling

Christopher Ray, MD, *Washington University in St. Louis*
M168 Cortical Thickness Signature of Familial Creutzfeldt-Jakob Disease

Christopher Rich, BSE, *Emory University*
M178 Stereoelectroencephalography-Guided Laser Interstitial Thermal Therapy (SEEGgLITT) for Temporal Lobe Epilepsy Associated with Encephaloceles

Cory Riecken, MS, *University of Missouri*
S118 Effects of Stress on Functional Connectivity during Problem Solving

Tina Roostaei, MD, MPH, *Columbia University Medical Center*
S233 Insights from Gene Expression Profiling of Six Immune Cell-Type-States in Multiple Sclerosis

Sarah Rosen, PhD, *Washington University*
S103 Sexually Dimorphic Immune Responses during West Nile Virus Neuroinvasive Disease

Zachary Rosenthal, BS, *Washington University in St. Louis School of Medicine*
S123 Local Perturbations in Cortical Excitability Propagate Differentially through Large-Scale Functional Networks

Behnam Sabayan, MD, PhD, *Northwestern University*
M124 Natriuretic Peptides and Cerebrovascular Autoregulation in Middle Age Adults

Andrew Sauerbeck, PhD, *Washington University*
S169 AirySynapse—A Simple, Robust Super-Resolution Imaging Technique to Quantify Synaptic Loci

Ryan Schubert, MD, *University of California, San Francisco*
M102 Multimodal Investigation of the Etiology for Acute Flaccid Myelitis

Stephanie Schultz, BS, *Washington University School of Medicine*
M148 Association between Serum Neurofilament Light and Established White Matter Neuroimaging Markers in Autosomal Dominant Alzheimer Disease

Rafia Shafqat, MD, *Westchester Medical Center*
M184 Recurrent Episode of Cefepime-Induced Non-Convulsive Status Epilepticus (NCSE) in End Stage Renal Disease (ESRD) Patient

Rishi Sharma, PhD, *HSTMV Hospital/University of Missouri-School of Medicine*
M289 Melanin Concentrating Hormone Contributes to Gender Differences Observed in Sleep Homeostasis

Shahar Shelly, MD, *Mayo Clinic*
S104 Neurochondrin Neurological Autoimmunity

Shannon Sheppard, PhD, *Johns Hopkins University*
M115 Cues to Improve Emotional Prosody after Right Frontal Strokes

Emily Sherry, BA, *Johns Hopkins University*
M123 Cost of Initial CT vs MRI as Initial Scan for Stroke

Yang Shi, PhD, *Washington University in St. Louis*
M159 Overexpression of Low-Density Lipoprotein Receptor Markedly Reduces Tau Phosphorylation and Attenuates Tau-Mediated Neurodegeneration via APOE-Mediated Mechanisms

Afsaneh Shirani, MD, *Washington University School of Medicine*
M231 Radiological Progression on Contrast and Non-Contrast MRI in Patients with Multiple Sclerosis: Findings from MS PATHS

Jonathan Sikora, High School Diploma, *Johns Hopkins University Department of Neurology*
M117 Patterns of Decline in Spoken Word Recognition and Object Knowledge in Primary Progressive Aphasia

Ayush Singh, MD, *University of Texas Medical Branch Galveston*
M166 Decreased Presence of Tau Oligomers in the CNS is Associated with Preserved Cognition in Non-Demented Individuals with Alzheimer's Diseases Neuropathology

Kelsey Smith, MD, *Mayo Clinic*
M183 EEG Pattern in Cheyne-Stokes Respiration

Macy Sprunger, BS, *Washington University in St. Louis*
S256 Countering *C9ORF72* Dipeptide Repeat Protein Toxicity Implicated in ALS/FTD

Roshan Srinivasan, MD, *University of Illinois at Chicago*
S114 Role of Serotonin Signaling on Synaptic Plasticity in Tuberous Sclerosis Complex

Min-Yu Sun, PhD, *Washington University in St. Louis*
S179 Characteristics of δ-Subunit Containing GABAA IPSCs in Mouse Dentate Granule Neurons

Yearam Tak, HS, *St. Louis College of Pharmacy*
S213 Striatal Interneurons are Increased or Selectively Preserved in Dystonic Rats Following Neonatal Brain Injury

Rawan Tarawneh, MD, *The Ohio State University*
M167 Differences in Hippocampal Brain Connectivity between *APOE4* Carriers and Non-Carriers among Healthy Older Adults

Loc Thang, MD, PhD, *Washington University in Saint Louis*
S285 Social Isolation Stress Blunts TRPV1 Activation in Mouse Sensory Neurons

Philip Tipton, MD, *Mayo Clinic*
S217 Multiple System Atrophy Patients with Hyposmia Do Not Have Increased Olfactory Bulb Synuclein Pathology or Dopaminergic Deficiency Compared to Those without Hyposmia

Adaku Uzo-Okereke, MD, *Washington University School in St. Louis*
471 FDG-PET Hypometabolism Changes after Intracranial Grid and Strip Placement

Anil Wadhwani, PhD, *Northwestern University The Feinberg School of Medicine*
M181 APOE Increases Cell Death and P-Tau Release in Stem-Cell Derived Neurons

Yan Wang, MD, *Washington University in St. Louis*
M240 Rate of Progression in CT-Defined Edema is Associated with Increased Likelihood of Intervention in Acute Cerebellar Infarction

Michelle Wegscheid, BS, *Washington University in St. Louis*
M250Human iPSC-Derived Cerebral Organoids Establish Mutational Specificity in NF1

Robert White, MD, PhD, *Washington University in St. Louis*
S214 Functional Networks Effects of Levodopa in Drug-Naïve Parkinson Disease

Norelle Wildburger, PhD, *Washington University in St. Louis*
M154 Aβ Structural Diversity to Enhance Diagnostic and Prognostic CSF Biomarkers of Alzheimer's Disease

Andrew Wilson, MD, MS, MBA, *Greater Los Angeles VA / UCLA*
M202 Examining Medication Adherence in a Multidisciplinary Parkinson's Disease Clinic

Julie Wisch, PhD, *Washington University in St. Louis*
M157 Sex-Linked Tau Differences Do Not Appear in CSF

Mattia Wruble, BA, *University of Virginia*
S234 The Aging Face of Multiple Sclerosis: A Comparative Analysis of Young-Onset versus Late-Onset Multiple Sclerosis

Biao Xiang, MS, *Washington University in St. Louis*
M232 Evaluation of Myelin Damage in Multiple Sclerosis with SMART MRI

Alexander Yahanda, MS, *Washington University School of Medicine*
M276 Impact of 2D versus 3D Image Distortion Correction on Stereotactic Surgical Navigation Auto-Merge Image Fusion Reliability for Images Acquired with a Movable Intraoperative MRI

Shaul Yahil, BS, BA, *Washington University in St. Louis*
S113 Altered Hippocampal LTP and Cognitive Dysfunction in Developmental Delay, Epilepsy, and Neonatal Diabetes (DEND)

Tritia Yamasaki, MD, PhD, *University of Kentucky*
S219 Red Blood Cell-Derived alpha-Synuclein Aggregation in Parkinson's Disease and Multiple System Atrophy

Chengran Yang, MS, *Washington University in St. Louis*
S251 Discovery of Biomarkers and Identification of Protein QTLs for Alzheimer's Disease

Zezhong Ye, PhD, *Washington University in St. Louis*
S231 Diffusion Histology Imaging to Improves Multiple Sclerosis Lesion Detection and Classification

Mitsukuni Yoshida, BS, *Washington University in St. Louis*
S162 Extracellular Vesicle-Mediated Systemic Delivery of eNAMPT Delays Aging and Extends Lifespan through the Enhancement of Hypothalamic Function

John Younce, MD, *Washington University in St. Louis*
M210 Multimodal PET and fcMRI Reveals Regional Modulation by STN DBS Correlating to Motor Outcomes

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We want to thank the experts who reviewed the 435 abstracts submitted in 21 categories for selection for inclusion in this year's Poster Presentations. They performed an outstanding service for ANA. Based on these ratings and comments, authors of 48 impressive studies were selected to give short oral presentations of their abstracts named, "Data Blitz Presentations", during both plenary and special interest group sessions.

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