VESTIBULAR CONTRIBUTIONS TO HEALTH AND DISEASE

Friday and Saturday, October 25-26, 2019

Course Director
BERNARD COHEN, MD
Professor Emeritus
Department of Neurology
Icahn School of Medicine at Mount Sinai

Course Co-Directors
RICHARD LEWIS, MD
Harvard Medical School
Boston, MA

JOSE ANTONIO LOPEZ-ESCAMEZ, MD, PhD
University of Granada
Granada, Spain

Annual YAHRL LECTURE

Meeting Location
Stern Auditorium
Icahn School of Medicine at Mount Sinai
1468 Madison Avenue
New York, NY

Jointly provided by:
Department of Neurology at the Icahn School of Medicine at Mount Sinai and Frontiers
The early development of the vestibular apparatus in fish, frogs, and other primordial vertebrates has persisted largely unchanged from fish to man. This system controls spatial orientation, perception of gravity and the spatial vertical, and locomotion in three-dimensional space. It also controls breathing, heart rate, and blood pressure, as well as other aspects of autonomic function. Because the control of these functions takes place largely out of consciousness, their actions can be frightening to those who experience their dysfunction and cause substantial difficulty to physicians trying to calm or modulate their activity. Although the basic structure of the semicircular canals and otolith organs is known, it is still not entirely clear how and where the perception is controlled in the brainstem, the cerebellum and the cerebral cortex.

This two-day CME live activity is divided into four parts each devoted to an important component of vestibular, vestibular autonomic, and vestibulo-cerebellar function. Frontiers, the open-access publisher based in Lausanne, Switzerland, has provided a generous grant to support this meeting as part of its annual Spotlight Conference Series. The grant was awarded to the scientific organizing committee on the basis of the success of their Frontiers Research Topic entitled Vestibular Contributions to Health and Disease (www.frontiersin.org/research-topics/4868/). The collection of articles was published as a freely downloadable e-book in June 2018 in the Neuro-Otology section of Frontiers in Neurology.

An international faculty of experts will share new and established data from experimental vestibular studies, including up-to-date appraisal of clinical and experimental studies of the Mal de Debarquement Syndrome, and studies of the neural basis for positional nystagmus and balance. The program will include the annual Mount Sinai Yahr Lecture which will be delivered by Charles Della Santina, MD, PhD, on the development of electrical activation of semicircular canal nerves to restore three-dimensional spatial orientation.

LEARNING OBJECTIVES
• Discuss the relationship between the vestibular, ocular motor, and cerebellar systems and neurological conditions and how they may facilitate differential diagnosis and management.
• Explain the impact of the vestibular system on sympathetic function.
• Describe a management plan for the patient with Mal de Debarquement Syndrome (MdDS) and/or motion sickness.

WHO SHOULD ATTEND?
This CME activity is designed for neurologists, neuro-otologists, neuro-ophthalmologists, otolaryngologists, and cardiologists, including residents and fellows, and other healthcare professionals (nurses, speech/language therapists, physician assistants, physical and occupational therapists).

ACCREDITATION
This activity has been planned and implemented in accordance with the accreditation requirements and policies of the Accreditation Council for Continuing Medical Education (ACCME) through the joint providership of Icahn School of Medicine at Mount Sinai and Frontiers. The Icahn School of Medicine at Mount Sinai is accredited by the ACCME to provide continuing medical education for physicians.

CREDIT DESIGNATION
The Icahn School of Medicine at Mount Sinai designates this live activity for a maximum of 14.0 AMA PRA Category 1 Credit(s)™. Physicians should claim only the credit commensurate with the extent of their participation in the activity.

VERIFICATION OF ATTENDANCE
Verification of attendance will be provided to all professionals.

SPECIAL NEEDS
The Icahn School of Medicine at Mount Sinai is in full compliance with provisions of the Americans with Disabilities Act (ADA) and is accessible for individuals with special needs. If you would like to attend this conference and require any special needs or accommodations please contact the Page and William Black Post-Graduate School of Medicine at 212-731-7950.

MEETING LOCATION
Icahn School of Medicine at Mount Sinai
Stern Auditorium
1468 Madison Avenue
New York, NY
PROGRAM
Stern Auditorium, Annenberg Building, 1468 Madison Avenue

Day One: Friday, October 25, 2019

7:00-8:30am
Registration and Breakfast

8:30-8:45
Opening Remarks
Barbara G. Vickrey, MD, MPH
Fred Fenter, Frontiers

8:45-9:30
Yahr Lecture: Restoring Vestibular Sensation Through Prosthetic Stimulation
Charles C. Della Santina, MD, PhD

9:30-9:55
Vestibular System in Fish and Frogs: Effects of Semicircular Canals on Otolith Function
Prof. Hans Straka, PhD

9:55-10:05
Eye Movements from the Semicircular Canals
Bernard Cohen, MD

10:05-10:30
Vestibular Hair Cell Regeneration: Lessons Learnt from Animal Studies
Alan Cheng, MD

10:30-10:50
BREAK

Session I: GENERAL VESTIBULAR
Moderator: G. Michael Halmagyi, BSC, MBBS, MD

8:45-9:30
Yahr Lecture: Restoring Vestibular Sensation Through Prosthetic Stimulation
Charles C. Della Santina, MD, PhD

9:30-9:55
Vestibular System in Fish and Frogs: Effects of Semicircular Canals on Otolith Function
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10:05-10:30
Vestibular Hair Cell Regeneration: Lessons Learnt from Animal Studies
Alan Cheng, MD

10:30-10:50
BREAK

10:50-11:15
Impulsive Testing of Semicircular Canal Function from 1892 to 2019: From Bench to Bedside and Back to Bench
G. Michael Halmagyi, BSC, MBBS, MD

11:15-11:40
Vestibular Responses to Sound and Vibration: Basic Results and Clinical Application
Ian Curthoys, PhD

11:40-12:05pm
Superior Canal Dehiscence
John Carey, MD

12:05-12:30
Genetics of Meniere’s Disease
Jose Antonio Lopez-Escamez, MD, PhD

12:30-12:55
Pharmacotherapy of Vestibular Disorders: A Quick Update
Michael Strupp, MD, FRCP, FANA, FEAN

12:55-1:40
LUNCH

Session II: CLINICAL VESTIBULAR
Moderator: Jose Antonio Lopez-Escamez, MD, PhD

10:50-11:15
Impulsive Testing of Semicircular Canal Function from 1892 to 2019: From Bench to Bedside and Back to Bench
G. Michael Halmagyi, BSC, MBBS, MD

11:15-11:40
Vestibular Responses to Sound and Vibration: Basic Results and Clinical Application
Ian Curthoys, PhD

11:40-12:05pm
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Genetics of Meniere’s Disease
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12:30-12:55
Pharmacotherapy of Vestibular Disorders: A Quick Update
Michael Strupp, MD, FRCP, FANA, FEAN

12:55-1:40
LUNCH

Session III: AUTONOMIC VESTIBULAR
Moderators: Gay Holstein, PhD and Vaughan Macefield, BSC (HONS I), PhD, DSC, FAAS

1:40-2:05
Learning Vestibulo-autonomic Transformation: Model Based and Machine Learning Approaches
Ted Raphan, PhD

2:05-2:30
Vestibular Changes in Microgravity
Laurence Retman Young, SCD

2:30-2:55
Neurotransmitters, Modulators, and Pathways Supporting Vestibular Influences on Heart Rate and Blood Pressure
Gay Holstein, PhD

2:55-3:20
Multisensory and Cognitive Control of Blood Pressure
Bill Yates, PhD

3:20-3:35
BREAK

3:35-4:00
Vestibular Modulation of Sympathetic Outflow to Muscle and Skin in Humans
Vaughan Macefield, BSC (HONS I), PhD, DSC, FAAS

4:00-4:25
Alternative Treatment of Orthostatic Intolerance
André Diedrich, MD, PhD

4:25-4:50
The Vestibular Cortex and Bodily Self-Consciousness
Christophe Lopez, PhD

4:50-5:00
Closing Remarks
Bernard Cohen, MD

5:00pm
Adjourn
7:15-8:45am
Registration and Breakfast

8:45-9:00
Opening Remarks
Dedication to Mingjia Dai, PhD
Bernard Cohen, MD

Session IV: MAL DE DEBARQUEMENT SYNDROME (MdDS)
Moderator: Richard F. Lewis, MD

9:00-9:25
Sensation of Gravitational Pull in MdDS Patients
Sergei Yakushin, PhD

9:25-9:50
Sham Control Study of the OKN Therapy for MdDS
Viviana Mucci, PhD, MSC, BSC HONS

9:50-10:15
Neuroimaging Markers of MdDS
Yoon-Hee Cha, MD

10:15-10:30  BREAK

10:30-10:55
The Physical Signs of MdDS
Richard F. Lewis, MD

10:55-11:20
Corticospinal Excitability and MdDS
Brian Clark, PhD

11:20-11:55
Chronic Stimulation of Visual and Vestibular Cerebellar Climbing Fiber Pathways Modifies the Discharge of Purkinje Cells for Minutes and Hours, Changes Purkinje Cell Protein Expression for Hours, and Possibly Accounts for MdDS
Neil H. Barmack, PhD

11:55-12:45pm  LUNCH

Session V: VESTIBULAR CEREBELLAR
Moderators: Catherine Cho, MD and James Lackner, PhD

12:45-1:10
Vestibular Readaptation in Motion Sickness and the Mal de Debarquement Syndrome
Catherine Cho, MD

1:10-1:35
Ataxia and Cerebellar Genetics
Joanna Jen, MD, PhD

1:35-2:00
Vestibular Cerebellum Correlates for Perception and Gaze
David Dickman, PhD

2:00-2:25
Vestibulocerebellar Nystagmus
Giovanni Bertolini, PhD

2:25-2:40  BREAK

2:40-3:05
Dynamic Balancing with and without Gravity-Dependent Position Cues
James Lackner, PhD

3:05-3:30
Quantifying the Links between Age, Vestibular Function, and Balance
Daniel Merfeld, PhD

3:30-3:55
Postural Instability and Motion Sickness Induced by Visual Motion Stimuli in Patients with Vestibular Migraine
Sung-Hee Kim, MD, PhD

3:55-4:20
Vestibular Loss and Cognitive Decline in Aging Adults
Yuri Agrawal, MD, MPH

4:20-4:40
Closing Remarks
David Zee, MD

4:40-5:00
Announcements
Bernard Cohen, MD
Fred Fenter, Frontiers

5:00pm
Adjourn
FACULTY - ICAHN SCHOOL OF MEDICINE AT MOUNT SINAI

BERNARD COHEN, MD
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BARBARA G. VICKREY, MD, MPH
Henry P. and Georgette Goldschmidt Professor of Neurology
System Chair, Department of Neurology

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Nashville, TN

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Hospital Universitario Virgen de las Nieves
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SUNG-HEE KIM, MD, PhD
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School of Medicine
Kyungpook National University
Daegu, Republic of Korea
# VISITING FACULTY

<table>
<thead>
<tr>
<th>Name</th>
<th>Title</th>
<th>Institution</th>
</tr>
</thead>
<tbody>
<tr>
<td>JAMES LACKNER, PhD</td>
<td>Riklis Professor of Physiology, Director, Ashton Graybiel Spatial Orientation Laboratory</td>
<td>Brandeis University, Waltham, MA</td>
</tr>
<tr>
<td>RICHARD F. LEWIS, MD</td>
<td>Associate Professor, Department of Otolaryngology, and Neurology, Co-Director, Jenks Vestibular Physiology and Diagnostic Laboratories</td>
<td>Harvard Medical School, Massachusetts Eye and Ear Infirmary, Boston, MA</td>
</tr>
<tr>
<td>CHRISTOPHE LOPEZ, PhD</td>
<td>Research Scientist, French National Center for Scientific Research, Laboratoire de Neurosciences Sensorielles et Cognitives</td>
<td>Aix Marseille Université, Marseille, France</td>
</tr>
<tr>
<td>VAUGHAN G. MACEFIELD, BSC (HONS I), PhD, DSC, FAAS</td>
<td>Professor, Head, Human Autonomic Neurophysiology, Senior Principal Research Fellow and Professorial Fellow, Department of Physiology</td>
<td>University of Melbourne, Melbourne, Australia</td>
</tr>
<tr>
<td>DANIEL MERFELD, PhD</td>
<td>Professor and Vice-Chair of Research, Department of Otolaryngology-Head &amp; Neck Surgery, Ohio State University</td>
<td>Columbus, OH</td>
</tr>
<tr>
<td>VIVIANA MUCCI, PhD</td>
<td>Department of Neurology, University Hospital Zurich Medizinbereich, Zurich, Switzerland</td>
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<tr>
<td>PROF. HANS STRAKA (PhD)</td>
<td>Department Biology II, Ludwig-Maximilians-University Munich, Planegg, Germany</td>
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<tr>
<td>MICHAEL STRUPP, MD, FRCP, FANA, FEAN</td>
<td>Professor, Department of Neurology, Hospital of the Ludwig-Maximilians University, Munich, Germany, Specialty Chief Editor, <em>Frontiers in Neurology - Neuro-Otology</em></td>
<td></td>
</tr>
<tr>
<td>BILL YATES, PhD</td>
<td>Professor, Otolaryngology, Neuroscience, and Clinical and Translational Science, Vice-Chair, School of Medicine Curriculum Committee, University of Pittsburgh, Pittsburgh, PA, Editor-in-Chief, Journal of Neurophysiology</td>
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</tr>
<tr>
<td>LAURENCE RETMAN YOUNG, SCD</td>
<td>Apollo Program Professor of Astronautics and Professor of Health Science and Technology</td>
<td>Massachusetts Institute of Technology, Boston, MA</td>
</tr>
<tr>
<td>DAVID ZEE, MD</td>
<td>Professor, Departments of Neurology, Ophthalmology, Otolaryngology-Head and Neck Surgery, and Neuroscience, Division of Neuro-Visual and Vestibular Disorders</td>
<td>Johns Hopkins School of Medicine, Baltimore, MD</td>
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### FACULTY DISCLOSURE

It is the policy of Icahn School of Medicine at Mount Sinai to ensure objectivity, balance, independence, transparency, and scientific rigor in all CME-sponsored educational activities. All faculty participating in the planning or implementation of a sponsored activity are expected to disclose to the audience any relevant financial relationships and to assist in resolving any conflict of interest that may arise from the relationship. Presenters must also make a meaningful disclosure to the audience of their discussions of unlabeled or unapproved drugs or devices. This information will be available as part of the course materials.
VESTIBULAR CONTRIBUTIONS TO HEALTH AND DISEASE

Friday and Saturday, October 25-26, 2019

Two Ways to Register:
- Online: https://mssm.cloud-cme.com
- Mail this form with check to:
  Icahn School of Medicine at Mount Sinai
  The Page and William Black Post-Graduate School
  One Gustave L. Levy Place, Box 1193
  New York, NY 10029

I will attend on this/these dates:
- Friday, October 25, 2019
- Saturday, October 26, 2019
- Both Days

Registration Fees:

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<tr>
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<th>One day</th>
<th>Two days</th>
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<tr>
<td>Physicians</td>
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<tr>
<td>Mount Sinai Neurology Alumni</td>
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<tr>
<td>Allied Health Professionals</td>
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<td>US$150</td>
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<tr>
<td>Residents/Fellows</td>
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<tr>
<td>MSHS Residents/Fellows</td>
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*Complimentary registration for MSHS Residents and Fellows must be done online.
Mount Sinai Health System (MSHS) Residents and Fellows must email cme@mssm.edu with a copy of their hospital ID to receive a Complimentary Online Registration Code. MSHS Residency and Fellowship will be verified.

Cancellation Policy: All cancellation requests must be emailed to the CME Office at cme@mssm.edu by October 6, 2019. Cancellations after this date are not eligible for a refund. An administrative fee of $50 will be deducted from your refund. No refunds will be issued for registration fees that are equal to or less than $50. For security purposes, credit card payments cannot be accepted by mail. Please visit http://mssm.cloud-cme.com to register and pay by credit card.

For Conference Information:
Email: cme@mssm.edu or call the Office of CME at 212-731-7950
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