

# 1st International Tremor Congress

May 11 & 12, 2018

## Program Description & Objectives

Tremor is the most common movement disorders and could be highly disabling. Despite recent advancements in the diagnosis and management, patients with tremor continue to live with tremor-related disability. Current technology has created an opportunity for new diagnostic approaches, surgical procedures, and pharmacologic innovations, which holds promise for treatment of tremor. In addition, the understanding of abnormalities of brain circuitry for tremor will guide us for the development of targeted therapy. Taken together, these advances in the clinical diagnosis and patient management and also the basic science of brain circuitry of tremor will synergistically bring us to the forefront of therapy development for tremor.

In addition, there are several tremor disorders. Essential tremor (ET) is characterized by kinetic tremor whereas Parkinson's disease (PD) tremor is classically tremor at rest. Dystonia tremor (DT) is less rhythmic and is usually associated with sustained muscle twisting movements. Tardive tremor is associated with anti-psychotic use and is part of the tardive syndrome. Therefore, the accurate diagnosis of tremor disorder also poses challenges to neurologists and movement disorders specialists. Neurologists must stay up-to-date on advances in all aspects of patient care, but, unfortunately, many rely on what they learned in medical school or residency.

Given these important challenges in the field, a need to bring together movement disorders specialists who diagnose and manage tremor patients and also basic scientists who study the abnormal brain circuits of tremor is critically important to advance the field. In other words, there is a knowledge gap among movement disorders clinicians in the understanding the brain circuitry of tremor and among basic scientists in the current diagnosis and management of clinical tremor disorders. Furthermore, recent surgical therapies and neuromodulations are developed for tremor disorders but is not well-known among the clinicians and scientists. In addition, there is a need to educate the next-generation clinicians and scientists in the knowledge of tremor.

To address these gaps, the Movement Disorders Division within the Department of Neurology of the College of Physicians & Surgeons of Columbia University will be conducting 1st International Tremor Congress, a comprehensive meeting on advances in the diagnosis and management of tremor and also the science of tremor disorders. The meeting addresses an important need for a comprehensive, academic educational program providing the latest information on innovations, insights on the latest science, and translation of the science to patient care. The conference is also consistent with the national call of the Precision Medicine Initiative for health care providers to pursue new approaches that tailor treatment to the individual patient's characteristics. Patient response to conventional treatments for tremor is often variable; therefore, education on new surgical and medical advancements that account for individual differences can optimize outcomes for patients with tremor.

At the conclusion of this activity, participants will be better able to:

- Formulate an evidence-based approach to optimize the treatment for tremor disorders.
- Develop evidence-based scientific knowledge for the future clinical study design in tremor disorders.
- Describe the up-do-date clinical diagnosis and treatment in each tremor disorder.
- Indicate the cutting-edge scientific discovery for tremor and also current tremor therapy development.

## Course Directors

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*None*

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*None*

### Lorraine Clark Ph.D.

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## May 11, 2018

- 8:20 a.m. *Registration; Continental Breakfast*
- 8:55 a.m. Welcome: 1st Tremor Congress: Focus on Circuitry  
**Sheng-Han Kuo, M.D.**
- Session 1: Tremor Overview Moderator:  
Sheng-Han Kuo, M.D.**
- 9:00 a.m. Tremor Research: From Phenomenology to Circuitry  
**Stanley Fahn, M.D.**
- 9:30 a.m. Overview of Brain Circuitry of Tremor  
**Mark Hallett, M.D.**
- Session 2: Synaptic Organization of the Cerebellum in Tremor Moderator:  
Elan D. Louis, M.D., M.S.**
- 10:00 a.m. Climbing Fiber Synaptic Organization in Tremor  
**Sheng-Han Kuo, M.D.**
- 10:30 a.m. Physiological Alterations in Tremor from Abnormal Synaptic Organization  
**Ming-Kai Pan, M.D., Ph.D.**
- 11:00 a.m. *Refreshment Break*
- Session 3: Axonal Re-organization of the Cerebellum in Tremor Moderator:  
Un Jung Kang, M.D.**
- 11:20 a.m. Purkinje Cell Axonal Pathology of Essential Tremor  
**Phyllis Faust, M.D., Ph.D.**
- 11:50 a.m. Circuitry Re-organization in the Presence of Purkinje Cell Axonal Pathology  
**Elan D. Louis, M.D., M.S.**
- 12:20 p.m. Altered Physiology in Deep Cerebellar Nuclei in Tremor  
**Stefan Pulst, M.D.**
- 12:50 p.m. Group Photo
- 1:00 p.m. *Lunch*
- Session 4: Network Alterations in Tremor Moderator:  
Ming-Kai Pan, M.D., Ph.D.**
- 2:00 p.m. Cerebellar Circuitry and Tremor  
**Mario Manto, M.D., Ph.D.**
- 2:30 p.m. Neuroimaging for Network Re-organization in Essential Tremor  
**David E. Valliancourt, Ph.D.**
- 3:00 p.m. Brain Network Alterations in Parkinson's Tremor  
**Rick C.G. Helmich, M.D., Ph.D.**
- 3:30 p.m. Brain Modulations to Probe Tremor Circuitry  
**Hayriye Cagnan, Ph.D.**
- 4:00 p.m. *Refreshment Break*
- Session 5: Tremor Research Moderator:  
Phyllis L. Faust, M.D., Ph.D.**
- 4:30 p.m. NINDS Program Perspectives  
**Daofen Chen, Ph.D. & Codrin Lungu, M.D.**
- 4:50 p.m. Genetics for Essential Tremor: How Do Genetic Mutations Influence the Circuitry  
**Lorraine Clark, Ph.D.**

**Poster Session Oral Abstracts (Non-CME Session)**

- 5:20 p.m. Deep Brain Stimulation in Early Stage Parkinson's Disease May Prevent Rest Tremor Spread  
**Mallory Hacker, PhD**
- 5:22 p.m. Proof-of-Principle Quantitative EEG Study of CX-8998, an Oral, Potent and Selective T-Type Calcium Modulator in Healthy Volunteers  
**Spyros Papapetropoulos MD, PhD**
- 5:24 p.m. CAD-1883, a clinical-stage positive allosteric modulator of the small conductance calcium-activated potassium (SK) channel, slows cerebellar Purkinje neuron firing and reduces tremor in the rat harmaline model  
**Gregg Keaney**
- 5:26 p.m. Differences in Brain Activity among Distinct Voice Tremor Phenotypes  
**Laura de Lima Xavier**
- 5:28 p.m. Longitudinal follow-up of dual-lead thalamic deep brain stimulation for patients with treatment refractory multiple sclerosis tremor  
**Bhavana Patel**
- 5:30 p.m. MRI guided Focused Ultrasound unilateral thalamotomy for the treatment of essential tremor: 1 year follow-up  
**Lydia Vela**
- 5:32 p.m. Non-Invasive Peripheral Nerve Stimulation for Symptomatic Relief of Hand Tremor in Essential Tremor  
**Erika Ross, Ph.D.**
- 5:34 p.m. Examining cerebellar-thalamo-cortical network dynamics in the harmaline rodent model of Essential Tremor  
**Kathryn Bennett**
- 5:36 p.m. Trifluridazole effectively suppresses tremor in two mouse models of tremor  
**Chun-Lun Ni**



**May 11, 2018** *(Continued)***Poster Session (Non-CME Session)**

- 1 Objective Predictors Of 'Early Tolerance' to Vim DBS In Essential Tremor Patients
- 2 Deep Brain Stimulation in Early Stage Parkinson's Disease May Prevent Rest Tremor Spread
- 3 Serum Anti-Gliadin Antibodies in Cerebellar Ataxias: A Systematic Review and Meta-analysis
- 4 Botulinum Toxin for the Treatment of Hand Tremor
- 5 Proof-of-Principle Quantitative EEG Study of CX-8998, an Oral, Potent and Selective T-Type Calcium Modulator in Healthy Volunteers
- 6 A Phase 2 Efficacy Study of an Oral, Potent and Selective T-Type Calcium (Cav3) Modulator in Essential Tremor Patients (T-CALM): Design and Dose Selection Rationale
- 7 A Phase 2 Efficacy Study of an Oral, Potent and Selective T-Type Calcium (Cav3) Modulator in Parkinson's disease Tremor (PDT) Patients: Design and Dose Selection Rationale
- 8 Therapeutic exposures of CX-8998, a potent, selective and state dependent Cav3 channel antagonist with dose dependent efficacy in Cav3 driven neurological models
- 9 CAD-1883, a clinical-stage positive allosteric modulator of the small conductance calcium-activated potassium (SK) channel, slows cerebellar Purkinje neuron firing and reduces tremor in the rat harmaline model
- 10 Differences in Brain Activity among Distinct Voice Tremor Phenotypes
- 11 Longitudinal follow-up of dual-lead thalamic deep brain stimulation for patients with treatment refractory multiple sclerosis tremor
- 12 Trigriluzole effectively suppresses tremor in two mouse models of tremor
- 13 MRI guided Focused Ultrasound unilateral thalamotomy for the treatment of essential tremor: 1 year follow-up
- 14 Non-Invasive Peripheral Nerve Stimulation for Symptomatic Relief of Hand Tremor in Essential Tremor
- 15 Spiral Initiation: Characterization Of Distinct Manifestations of Action Tremor
- 16 Examining cerebellar-thalamo-cortical network dynamics in the harmaline rodent model of Essential Tremor
- 17 Structural and functional connectivity of the nondecussating dentato-rubro-thalamic tract
- 18 Ablative neurosurgery of the posterior subthalamic prelemniscal radiations in Parkinson's disease: correlation between lesioned tracts and motor outcomes
- 19 Inferior olivary nucleus degeneration does not lessen tremor in essential tremor
- 20 Segmented versus Nonsegmented DBS Differs in Ataxic Side Effects When Implanting VIM Electrodes for Essential Tremor with Head Tremor

7:00 p.m. *Adjourn***May 12, 2018**8:00 a.m. *Registration; Continental Breakfast*

**Session 6: Novel Treatment and Device for Tremor Moderator:**  
**Nora Vanegas-Arroyave, M.D.**

- 9:00 a.m. Emerging Medical and Surgical Treatments for Tremor  
**William G. Ondo, M.D.**
- 9:30 a.m. Deep Brain Stimulation for the Treatment of Tremor: New Target and Controversy  
**Tao Xie, M.D., Ph.D.**
- 10:00 a.m. Botulinum Toxin Therapy for Tremor  
**Joseph Jankovic, M.D.**
- 10:30 a.m. Wearable Device for Tremor  
**Rodger J. Elble, M.D., Ph.D.**
- Session 7: Tremor Video Rounds**
- 11:00 a.m. *Refreshment Break*
- 11:15 a.m. Video Rounds Moderators  
**Sheng-Han Kuo, M.D. & Elan D. Louis, M.D., M.S.**
- 12:45 p.m. Closing Remarks  
**Ming-Kai Pan, M.D., Ph.D.**
- 12:50 p.m. *Adjourn*