



## Departmental Seminar

# Personalized and Adaptive Cortico Electro Stimulation (PACE) for Treatment Resistant Depression



### Prof. Ziad Nahas

Department of Psychiatry & Behavioral  
Sciences, Medical School  
University of Minnesota

**11:00a.m. – 12:00noon**

Room 1103-04, 11/F  
The Jockey Club Tower  
Centennial Campus  
The University of Hong Kong

### About the talk:

Treatment-resistant depression (TRD) is a leading cause of premature death. For decades investigators have assessed the clinical efficacy of direct brain stimulation for TRD. Outcomes have been inconsistent due to imprecise brain targeting. Minimally invasive Personalized Adaptive Cortical Electro-stimulation (PACE) uses fMRI-based precision functional mapping (PFM) to target patient-specific network anomalies with brain surface electrodes.

We utilized this novel technology in an n-of-1 study to treat a 44-year-old man (TRD-1) with over 30 years of severe unipolar depression. PFM revealed a 400% expansion in cortical area of the Salience Network (SN) and a 25% reduction in default mode (DMN) and frontoparietal (FP) networks compared to a group average control. Stimulation paddles were implanted targeting patient-specific SN, DMN, and FP networks. Postoperative stimulation testing (within 24h) revealed immediate electrode-specific mood and cognition responses that matched the underlying functional networks. Stimulation parameters were iteratively optimized using 'Bayes Tuning' based on patient feedback. TRD-1's suicidal ideations ceased within 7 weeks. Full remission of symptoms was achieved within 9 months and maintained at 30 months.

In conclusion, PACE therapy appears to be a scalable, safe, and cost-effective approach to treat TRD.

### About the speaker:

Professor Ziad Nahas is a Professor and Executive Vice Chair of the Department of Psychiatry and Behavioral Sciences at the University of Minnesota. His scientific interests lie in translational research of mood dysregulation and depressive disorders. He has a unique expertise in functional neuroimaging and brain stimulation across various modalities [Transcranial Magnetic Stimulation (TMS), Vagus Nerve Stimulation (VNS), Prefrontal Cortical Stimulation (PCS), Deep Brain Stimulation (DBS), Electroconvulsive Therapy (ECT) and Focally Electrically Administered Seizure Therapy (FEAST)]. He conducted basic research and collaborated on health economic studies.

### Zoom Meeting (For participants who couldn't attend the Seminar in person)

<https://hku.zoom.us/j/6985555998?pwd=V05yTGJWNTIzazd2OFZ0Q3FReHVkdz09>

Meeting ID: 698 555 5998 | Password: Psyc

~ All are Welcome ~

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