



## Emmanuel During, MD

Clinical Associate Professor, Neurology & Neurological Sciences

### Bio

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#### BIO

Emmanuel During, MD, is a psychiatrist and neurologist with board certification in sleep medicine, Clinical Associate Professor at Stanford University in the Department of Psychiatry – Division of Sleep Medicine, and Department of Neurology. He directs the Stanford Parasomnia Clinic where he evaluates the broad spectrum of parasomnias, including REM sleep behavior disorder (RBD, abnormal dream-enactment) and other parasomnias such as sleepwalking, sleep talking, sleep terrors and confusional arousals. Lying at the interface of psychiatry, neurology and sleep, the Parasomnia Clinic functions as a platform for high-level specialized clinical care and direct enrollment into clinical trials, particularly for patients with RBD, which in a number of cases is an early sign of neurodegeneration such as Parkinson's disease or dementia with Lewy bodies.

Dr. During is receiving federal and industry grant support for conducting research on RBD. He is currently the PI of an investigator-initiated sponsored trial investigating a new drug in treatment-refractory RBD (NCT04006925), and serves as site PI for a NIA grant supporting a nation-wide consortium, the North American Prodromal Synucleinopathy Consortium (NAPS), laying the groundwork for a first neuroprotective trial in the pre-Parkinson's stage of RBD, (NCT03623672). In 2018, he was invited to join a task force group of experts in RBD commissioned by the American Academy of Sleep Medicine (AASM) to issue the upcoming 2022 Clinical Guidelines for the management of RBD. He was invited the same year to join the International RBD Study Group (IRBD-SG), a group of world-experts in RBD ranging from clinicians to basic scientists. His most recent research interest pertains to wearable sleep devices that can potentially monitor RBD activity in patients home environment and facilitate early diagnosis.

#### ACADEMIC APPOINTMENTS

- Clinical Associate Professor, Neurology & Neurological Sciences
- Member, Wu Tsai Neurosciences Institute

#### HONORS AND AWARDS

- Neurology Clerkship Teaching Award 2018-2019, Stanford University (2019)
- Resident Best Teaching Award, Cedars-Sinai Medical Center, CA (2015)
- Medal Award for best Doctoral Thesis defense, Paris 7 University, France (2008)
- Psychiatry Resident of the Year Award, Paris 7 University, France (2008)

#### BOARDS, ADVISORY COMMITTEES, PROFESSIONAL ORGANIZATIONS

- Member, International RBD Study Group (IRBD SG) (2018 - present)
- Member, American Academy of Sleep Medicine (AASM) REM sleep Behavior Disorder (RBD) Task Force (2018 - present)
- Board Member, California Sleep Society (2019 - present)
- Member, American Academy of Sleep Medicine (2016 - present)

- Member, American Academy of Neurology (2015 - present)
- Member, Conseil National de l'Ordre des Medecins - France (2008 - present)

## PROFESSIONAL EDUCATION

- Fellowship, Stanford University , Sleep Medicine (2016)
- Residency, Cedars-Sinai Medical Center, CA , Neurology (2015)
- Internship, Banner Good Samaritan Hospital, AZ , Internal Medicine (2012)
- Board Certification, Psychiatry , Paris Diderot University, France (2008)
- MD, Louis Pasteur University , Medical School, France (2003)

## LINKS

- Get a Second Opinion: <https://stanfordhealthcare.org/second-opinion/overview.html>

## Research & Scholarship

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### CURRENT RESEARCH AND SCHOLARLY INTERESTS

Improving diagnostics and therapeutics in RBD, using home ambulatory devices including wearable actigraphy, dry-EEG, to power clinical trials based on objective outcomes of RBD activity.

Controlling symptoms of RBD testing drugs rigorously.

Predicting the course of neurodegeneration using deep phenotyping using clinical and serum biomarkers, measures of autonomic impairment, skin biopsy, microbiome

### CLINICAL TRIALS

- Natural History Study of Synucleinopathies, Recruiting
- North American Prodromal Synucleinopathy Consortium, Recruiting
- Once-Nightly Sodium Oxybate for Treatment of Excessive Daytime Sleepiness and Cataplexy in Narcolepsy, Recruiting
- SAR231893-LPS15497- "Dupilumab Effect on Sleep in AD Patients", Recruiting
- Treatment of REM Sleep Behavior Disorder (RBD) With Sodium Oxybate, Not Recruiting

## Publications

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### PUBLICATIONS

- **AUTOMATED DETECTION OF ISOLATED REM SLEEP BEHAVIOR DISORDER (IRBD) DURING SINGLE NIGHT IN-LAB VIDEO-POLYSOMNOGRAPHY (PSG) USING COMPUTER VISION**  
Adaimi, G., Gupta, N., Mottaghi, A., Yeung, S., Mignot, E., Alahi, A., During, E.  
OXFORD UNIV PRESS INC.2022: A282
- **ISOLATED REM SLEEP BEHAVIOR DISORDER IS ASSOCIATED WITH 24-HOUR RHYTHM DISRUPTION**  
Winer, J., Lok, R., Cahuas, A., Bueno, F., Poston, K., Mormino, E., Zeitzer, J., During, E.  
OXFORD UNIV PRESS INC.2022: A125
- **AT-HOME DETECTION OF REM SLEEP BEHAVIOR DISORDER USING A MACHINE LEARNING APPROACH AND WRIST ACTIGRAPHY**  
Brink-Kjaer, A., Gupta, N., Marin, E., Zitser, J., Sum-Ping, O., Hekmat, A., Bueno, F., Cahuas, A., Jennum, P., Sorensen, H., Mignot, E., During, E.  
OXFORD UNIV PRESS INC.2022: A243-A244
- **Cutaneous Alpha-Synuclein is Correlated with Autonomic Impairment in Isolated REM Sleep Behavior Disorder.** *Sleep*  
Miglis, M. G., Zitser, J., Schneider, L., During, E., Jaradeh, S., Freeman, R., Gibbons, C. H.

2021

- **Cutaneous Alpha-Synuclein is Correlated with Autonomic Impairment in Isolated REM Sleep Behavior Disorder**  
Miglis, M., Zitser-Koren, J., Rajan, S., During, E., Schneider, L., Jaradeh, S., Freeman, R., Gibbons, C.  
LIPPINCOTT WILLIAMS & WILKINS.2021
- **Kleine-Levin syndrome is associated with birth difficulties and genetic variants in the TRANK1 gene loci.** *Proceedings of the National Academy of Sciences of the United States of America*  
Ambati, A., Hillary, R., Leu-Semenescu, S., Ollila, H. M., Lin, L., During, E. H., Farber, N., Rico, T. J., Faraco, J., Leary, E., Goldstein-Piekarski, A. N., Huang, Y., Han, et al  
2021; 118 (12)
- **Dreem Open Datasets: Multi-Scored Sleep Datasets to Compare Human and Automated Sleep Staging** *IEEE TRANSACTIONS ON NEURAL SYSTEMS AND REHABILITATION ENGINEERING*  
Guillot, A., Sauvet, F., During, E. H., Thorey, V.  
2020; 28 (9): 1955–65
- **Sleep Issues in Parkinson's Disease and Their Management.** *Neurotherapeutics : the journal of the American Society for Experimental NeuroTherapeutics*  
Zuzuáregui, J. R., During, E. H.  
2020
- **Factors Hampering the Discovery of New Therapeutics for Rapid Eye Movement Sleep Behavior Disorder.** *JAMA neurology*  
During, E. H., Schenck, C. H.  
2019
- **AI vs Humans for the diagnosis of sleep apnea.** *Conference proceedings : ... Annual International Conference of the IEEE Engineering in Medicine and Biology Society. IEEE Engineering in Medicine and Biology Society. Annual Conference*  
Thorey, V., Hernandez, A. B., Arnal, P. J., During, E. H.  
2019; 2019: 1596–1600
- **Autonomic impairment as a potential biomarker in idiopathic REM-sleep-behavior disorder.** *Autonomic neuroscience : basic & clinical*  
Zitser, J., During, E. H., Chiaro, G., Miglis, M. G.  
2019; 220: 102553
- **RESTLESS LEG SYNDROME: DOES IT START WITH A GUT FEELING?**  
Blum, D. J., During, E., Barwick, F., Davidenko, P., Zeitzer, J. M.  
OXFORD UNIV PRESS INC.2019
- **UPPER AIRWAY STIMULATION: TITRATION BEYOND THE ATTENDED POLYSOMNOGRAPHY**  
Liu, S., Poomkonsarn, S., Chou, C., During, E.  
OXFORD UNIV PRESS INC.2019
- **THE EFFECT OF SLEEPING POSITION ON THE EFFICACY OF HYPOGLOSSAL NERVE STIMULATION**  
Chou, C., Poomkonsarn, S., Liu, S. Y., Capasso, R., During, E.  
OXFORD UNIV PRESS INC.2019
- **Clinical trials in REM sleep behavior disorder: an urgent need for better evidence.** *Sleep medicine*  
During, E. H., Miglis, M. G.  
2019; 63: 1–2
- **AI vs Humans for the diagnosis of sleep apnea**  
Thorey, V., Hernandez, A., Arnal, P. J., During, E. H., IEEE  
IEEE.2019: 1596–1600
- **Drug Treatment of Restless Legs Syndrome in Older Adults.** *Drugs & aging*  
During, E. H., Winkelman, J. W.  
2019
- **A Case of Narcolepsy Type 2 and Postural Tachycardia Syndrome Secondary to Lesions of the Thalamus and Amygdala** *JOURNAL OF CLINICAL SLEEP MEDICINE*  
Kim, P., During, E., Miglis, M.

2018; 14 (3): 479–81

- **Sustained quality-of-life improvements over 10 years after deep brain stimulation for dystonia** *Movement Disorders*  
Hogg, E., During, E., Tan, E., Athreya, K., Eskenazi, J., Wetheimer, J., Mamelak, A., Alterman, R., Tagliati, M.  
2018; 33 (7): 1160-1167
- **A case series of REM sleep behavior disorder in pure autonomic failure** *Clin Auton Res*  
Miglis, M., Muppidi, S., During, E., Jaradeh, J.  
2017; 27 (1)
- **The Epidemic of Sleep Deprivation: A Modern Curse** *Huffington Post*  
During, E.  
2017
- **Hypersomnia: Etiologies** *Encyclopedia of Sleep*  
During, E., Dimitriu, A., Guilleminault, C.  
2017; 2nd
- **Sleep and Movement Disorders** *Sleep and Neurologic Disease*  
Ashbrook, L., During, E.  
Elsevier.2017; 1st
- **The Functions of Sleep** *Sleep and Neurologic Disease*  
During, E., Kawai, M.  
Elsevier.2017; 1st
- **Central Disorders of Hypersomnolence** *Review of Sleep Medicine*  
During, E., Sullivan, S., Mignot, E.  
2017; 4th
- **Parasomnias** *Sleepy or Sleepless: A Clinical Approach to the Sleep Patient*  
During, E., Avidan, A.  
Springer .2015; 1st
- **The interaction between sleep-disordered breathing and apolipoprotein E genotype on cerebrospinal fluid biomarkers for Alzheimer's disease in cognitively normal elderly individuals** *NEUROBIOLOGY OF AGING*  
Osorio, R. S., Ayappa, I., Mantua, J., Gumb, T., Varga, A., Mooney, A. M., Burschtin, O. E., Taxin, Z., During, E., Spector, N., Biagioni, M., Pirraglia, E., Lau, et al  
2014; 35 (6): 1318-1324
- **The concept of FDG-PET endophenotype in Alzheimer's disease** *NEUROLOGICAL SCIENCES*  
During, E. H., Osorio, R. S., Elahi, F. M., Mosconi, L., de Leon, M. J.  
2011; 32 (4): 559-569
- **A Critical Review of Dissociative Trance and Possession Disorders: Etiological, Diagnostic, Therapeutic, and Nosological Issues** *CANADIAN JOURNAL OF PSYCHIATRY-REVUE CANADIENNE DE PSYCHIATRIE*  
During, E. H., Elahi, F. M., Taieb, O., Moro, M., Baubet, T.  
2011; 56 (4): 235-242
- **GREATER RISK OF ALZHEIMER'S DISEASE IN OLDER ADULTS WITH INSOMNIA** *JOURNAL OF THE AMERICAN GERIATRICS SOCIETY*  
Osorio, R. S., Pirraglia, E., Agueera-Ortiz, L. F., During, E. H., Sacks, H., Ayappa, I., Walsleben, J., Mooney, A., Hussain, A., Glodzik, L., Frangione, B., Martinez-Martin, P., de Leon, et al  
2011; 59 (3): 559-562