

BIOGRAPHICAL SKETCH

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NAME: Schneider, Logan

eRA COMMONS USER NAME (credential, e.g., agency login): logands

POSITION TITLE: Clinical Instructor

EDUCATION/TRAINING (*Begin with baccalaureate or other initial professional education, such as nursing, include postdoctoral training and residency training if applicable.*)

INSTITUTION AND LOCATION	DEGREE (if applicable)	Completion Date MM/YYYY	FIELD OF STUDY
University of Florida, Warrington College of Business, Gainesville, FL	BSBA	05/2005	Management
University of Florida, College of Medicine, Gainesville, FL	MD	05/2010	Medicine
Howard Hughes Medical Institute, Bethesda, MD	Other training	07/2009	HHMI-NIH Medical Research Scholar
University of Florida, COM - Department of Medicine, Gainesville, FL	Resident	07/2011	PGY1 - Internal Medicine
Johns Hopkins Hospital and Bayview Medical Center, Baltimore, MD	Resident	06/2013	PGY2-3 - Neurology
Johns Hopkins Hospital and Bayview Medical Center, Baltimore, MD	Other training	06/2014	PGY4 - Neurology Chief Resident
Stanford University - Dept of Psychiatry and Behavioral Medicine, Sleep Medicine Division, Redwood City, CA	Fellow	06/2015	PGY5 - Sleep Medicine
Stanford University, Palo Alto, CA	NIH training grant	present	T32 Post-doctoral Fellow

A. Personal Statement

I am currently a T32 sleep and genetics research fellow in the lab of Dr. Emmanuel Mignot at Stanford University. Prior to this I completed clinical training in Neurology at Johns Hopkins in 2014 and Sleep Medicine at Stanford University in 2015. My research emphasis is on defining and refining sleep phenotypes. I have maintained clinical exposure through a weekly sleep clinic, beyond my full-time research, in order to keep my research efforts closely aligned with clinically relevant medicine. As such, I have first-hand knowledge of the breadth of sleep disorders and the diagnostic/therapeutic limitations as well as the potential of the field of sleep medicine.

From a research perspective, my long-term career plan is to refine the understanding of normal and dysfunctional sleep, much like the Epilepsy Phenome/Genome Project (EPGP) and Epi4K are doing for the enigmatic epilepsies. Insufficient sleep has been deemed a public health problem with poorly understood behavioral and physiologic sleep disorders lying at the core of the issue. I am currently using well-defined distinct and objective phenotypes (e.g. periodic limb movements, hypocretin-deficient narcolepsy) to acquire the analytic skills necessary to expand my knowledge of both signal processing and genetics with the former enhancing my ability to identify and/or refine sleep phenotypes, and the latter facilitating the pathophysiological understanding of these phenotypes. Going forward, the Sleep Center has just been awarded a large, multi-site collaborative grant to collect polysomnography, multiple biometrics, and genetics in 30,000 individuals, in order to gain a deeper understanding of normal and dysfunctional sleep, which is the perfect platform and environment in which to apply the skills I have outlined in my career development plan. As a consequence of a better link between symptoms/phenotypes, physiology, and genetic risks, more personally targeted and effective therapeutics can be developed to address the enriched spectrum of sleep disorders.

My prior, formal research training laid the groundwork for my applying clinical neuroscience to a genetic framework. During medical school I participated in the Howard Hughes Medical Institute-National Institutes of Health Medical Research Scholars Program, where I explored machine learning of real-time encephalography (EEG) during human motor activity in order to predict human voluntary movement, providing me competence

and interest in neurophysiology and signal processing as a means of understanding the brain. Additional exposure over the past 2 years of my T32 has highlighted that more in-depth knowledge in the algorithm development process will be essential for laying the foundation for my goal of achieving an independent research career in the field of sleep medicine. My proposed K will serve as the foundation for new skills in statistical machine learning applied to subphenotype identification, while also augmenting my understanding of automated signal analysis, algorithm development and validation, and next-generation genetic analyses.

B. Positions and Honors

Positions and Employment

2004 - 2006 MCAT Course Instructor, Kaplan Test Prep, Gainesville, FL
2015 - Clinical Instructor, Stanford University, Department of Psychiatry and Behavioral Medicine, Sleep Medicine Division, Redwood City, CA

Other Experience and Professional Memberships

2005 - Ethics Committee student advocate - selected by class to represent our views in the formulation of the class Code of Ethics, University of Florida, College of Medicine
2005 - 2007 Medecins Sans Frontiers (Doctors Without Borders) event coordinator - hosted Dr. Portnoy (MSF founder) for a student-developed international medicine event, University of Florida, College of Medicine
2005 - 2010 Co-director - student-run free clinic that was poorly managed and financially devastated; worked with colleague, Adam Mecca, for 5 years to overhaul organizational infrastructure expanding clinic to 3 sites, multiple nights with specialty services, and expand healthcare coverage through grant funding and sound financial management, University of Florida, College of Medicine, Equal Access Clinic
2006 - 2007 Clinical Neuroscience Pathway co-director - integrated Neurology clinical exposure into preclinical years for interested medical students, University of Florida, College of Medicine
2006 - 2007 Student Interest Group in Neurology Vice President, University of Florida, College of Medicine
2006 - 2007 Interviewee Hosting Program coordinator - because of inefficiencies in hand-offs and hosting communications, I developed a website to streamline interviewee hosting that was used for years to come, University of Florida, College of Medicine
2006 - 2009 Project HEAL volunteer - yearly, week-long health outreach trip to Ecuador to deliver care to indigent communities; I developed a form to allow more efficient patient care workflow (from screening/vitals to physician to pharmacist) and research on epidemiologic need and health outcomes for future trips, University of Florida, College of Medicine
2006 - 2010 Medical Figure/Life Drawing course creator and instructor, University of Florida, College of Medicine
2008 - 2009 Science Education Volunteers Program volunteer - mentored high school students in science projects (two of my students went on to win silver and bronze prizes in the health science categories), Howard Hughes Medical Institute
2008 - 2009 Journal Club founder - weekly journal club to discuss papers related to our speaker series, which became a program requirement in subsequent years, Howard Hughes Medical Institute - National Institutes of Health Research Scholars
2008 - 2010 Student Advisory Board on Community Service board member - selected to review senior medical student volunteer projects based on my extensive involvement in service activities, University of Florida, College of Medicine
2009 - 2010 Medical Student Selection Committee committee member, University of Florida, College of Medicine
2016 - [Manual of the Neurological Examination for Neurologists in Training eBook](#) October 2016, publisher European Academy of Neurology
2013 - 2014 Chair-elect, American Academy of Neurology - Consortium of Neurology Residents and Fellows
2014 - 2015 Chair, American Academy of Neurology - Consortium of Neurology Residents and Fellows
2015 - Graduate Education Subcommittee subcommittee member, American Academy of Neurology
2015 - Alliance Awards Workgroup workgroup member, American Academy of Neurology

- 2015 - Ad hoc reviewer, *Neurology, Mayo Clinic Proceedings, Sleep, Journal of Clinical Sleep Medicine, Sleep Medicine, Sleep Health, Sleep and Breathing*
- 2015 - 2016 Past Chair, American Academy of Neurology - Consortium of Neurology Residents and Fellows
- 2016 - Chair, American Academy of Neurology - Sleep Medicine Section
- 2016 - 2017 Mentor, Stanford Institutes of Medicine Summer Research Program
- 2016 - 2017 Team Leader & Category Judge, Synopsys Science & Technology Championship
- 2016 - Committee member, American Academy of Sleep Medicine, Educational Products subcommittee
- 2017 - Team Leader, American Academy of Neurology, New Program Offerings workgroup
- 2017 - Member, American Academy of Neurology, Annual Meeting Sleep Topic workgroup
- 2017 - Subcommittee member, American Academy of Sleep Medicine, Trainee Symposia Series subcommittee

Honors

- 2006 Exceptional Performance in Neuroscience Award, University of Florida, Department of Neurology, Gainesville, FL
- 2006 MSRP Summer Research Fellowship, University of Florida, College of Medicine, Gainesville, FL
- 2007 Clinical Neuroscience Service and Humanity Award, University of Florida, Department of Neurology, Gainesville, FL
- 2007 Addiction Medicine Book Award, University of Florida, Department of Psychiatry, Gainesville, FL
- 2008 Howard Hughes Medical Institute - National Institutes of Health Medical Research Scholar, Howard Hughes Medical Institute, Chevy Chase, MD
- 2010 AAN Medical Student Prize for Excellence in Neurology, American Academy of Neurology
- 2010 Gold Humanism Honor Society Membership, Gold Humanism Honor Society
- 2010 Graduation with Honors for Special Achievement, University of Florida, College of Medicine, Gainesville, FL
- 2010 Graduation with Honors in Research, University of Florida, College of Medicine, Gainesville, FL
- 2013 Chief Resident - Neurology, Johns Hopkins Neurology Residency Program, Baltimore, MD
- 2013 Housestaff Teaching Award, Johns Hopkins Medical Institute, Baltimore, MD
- 2014 AAN Resident Scholarship to the Annual Meeting, American Academy of Neurology
- 2014 Diplomate, Board Certified in Neurology, American Board of Psychiatry and Neurology
- 2015 AAN Fellow Scholarship to the Annual Meeting, American Academy of Neurology
- 2015 Sleep Research Network Travel Award, Sleep Research Network
- 2015 Diplomate, Board Certified in Sleep Medicine, American Board of Psychiatry and Neurology
- 2016 Young Investigators Research Forum attendance award, American Academy of Sleep Medicine
- 2017 Sleep Research Society Trainee Merit Award

C. Contribution to Science

1. Electrophysiology & signal processing

a: Developed and clinically validated a hard-coded sleep-breathing detection algorithm. As part of my T32 training, I used existing scoring guidelines to create an algorithm that detected breathing disturbances and oxyhemoglobin desaturations. After linking all associated breathing disturbances and desaturations, clinical outcomes were compared revealing clinically relevant associations for the 2 event subtypes: desaturating events were associated with hypertension, whereas non-desaturating events were associated with objective sleepiness.

b&c: Devised and implemented a novel algorithm of real-time EEG analysis to predict voluntary human movements. While in my year-long Howard Hughes Medical Institute-National Institutes of Health Medical Research Scholar fellowship, I developed a strategy to use a sliding window of analysis of real-time EEG. This innovative technique improved the existing EEG-feature-selecting algorithm's model formulation by

throwing out irrelevant data, thereby allowing for 82% accuracy and improved receiver operating characteristics curves when validating our model. This was the first time that real-time EEG was able to be effectively used to predict human motor activity, because prior methods relied upon back averaging of many trials of data to detect the electrophysiologic signals that pre-empted human motor movements. Because I had such a robustly accurate model, I then addressed the question “What are people thinking, when their brain is preparing a spontaneous movement?”. This study confirmed not only that the sense of self (i.e. agency) attributed to simple motor actions gradually rises to awareness over the seconds preceding a movement, but also that the sense of self is a perturbable, post-hoc phenomenon.

- a. Koch H*, **Schneider LD***, Finn LA, Leary EB, Peppard PE, Hagen E, Sorensen HBD, Jennum P, Mignot E; Breathing disturbances without hypoxia are associated with objective sleepiness in sleep apnea, *Sleep*, 2017 Sep 26. [Epub ahead of print] PubMed PMID: [29029253](#) (***co-first author**)
- b. Bai O, Rathi V, Lin P, Huang D, Battapady H, Fei DY, **Schneider L**, Houdayer E, Chen X, Hallett M. Prediction of human voluntary movement before it occurs. *Clin Neurophysiol*. 2011 Feb;122(2):364-72. PubMed PMID: [20675187](#).
- c. **Schneider L**, Houdayer E, Bai O, Hallett M. What we think before a voluntary movement. *J Cogn Neurosci*. 2013 Jun;25(6):822-9. PubMed PMID: [23363409](#); PubMed Central PMCID: [PMC4747632](#).

2. Statistical genetics

a: Conduct and interpretation of GWAS analysis. This project was collaborative effort with the other T32 fellows in my program. I conducted all analyses related to GWAS, including proper reporting of variants for consistent interpretation between studies, statistical power comparisons, and interpretation of findings in the context of the extant findings in the field of GWAS.

b: Contributed to genetic risk score analysis and GWAS analysis. I performed the analyses that determined the optimal cutpoint for the genetic risk score. I aided in the performance of the GWAS (QC, imputation, and analysis) and exploration of significant SNPs at the exploratory threshold of significance ($p < 10^{-5}$).

- a. Kalmbach DA, **Schneider LD**, Cheung J, Bertrand SJ, Kariharan T, Pack AI, Gehrman PR. Genetic Basis of Chronotype in Humans: Insights From Three Landmark GWAS. *Sleep*. 2017 Feb 1;40(2). PubMed PMID: [28364486](#)
- b. Ollila H, Wennerstrom A, Partinen M, Mignot E, Saarela J, Kirjavainen T, Hublin C, **Schneider L**, et al. Genetics of vaccine-related narcolepsy. *bioRxiv*: [169623](#); doi: <https://doi.org/10.1101/169623>

3. Clinical therapeutics

a: Conducted updated analysis on clinical diagnosis and management of narcolepsy type 1. Compiled data to provide guidance on interpretation (LR+ and LR-) of clinical symptoms and diagnostic tests used in the work up of narcolepsy type 1, as well as current FDA-approved treatment options. Included a state-of-the-science review of the immunogenetic basis of the disease.

b: Participated in the development, implementation, and assessment of a transcranial magnetic stimulation (TMS) protocol as a therapy for Parkinson disease.

- a. **Schneider L**, Mignot E. Diagnosis and Mangement of Narcolepsy. *Semin Neurol*. 2017 Aug;37(4):446-460. PubMed PMID: [28837992](#)
- b. Benninger DH, Berman BD, Houdayer E, Pal N, Luckenbaugh DA, **Schneider L**, Miranda S, Hallett M. Intermittent theta-burst transcranial magnetic stimulation for treatment of Parkinson disease. *Neurology*. 2011 Feb 15;76(7):601-9. PubMed PMID: [21321333](#); PubMed Central PMCID: [PMC3053339](#).

4. Clinical case reports

a&b: Devised and wrote clinical reasoning cases with literature reviews from unique patient encounters. Despite a lack of successful research projects during the intensive clinical Neurology training at Johns Hopkins, I developed case reports as a means of staying up to date with the latest clinical literature.

- a. Schreck KC, **Schneider L**, Geocadin RG. Clinical Reasoning: A 44-year-old woman with rapidly progressive weakness and ophthalmoplegia. *Neurology*. 2015 Jul 21;85(3):e22-7. PubMed PMID: [26195241](#)

- b. **Schneider L**, Probasco JC, Newsome SD. Clinical reasoning: A 68-year-old man with a first presentation of status epilepticus. *Neurology*. 2014 Apr 8;82(14):e116-21. PubMed PMID: [24711538](#)

5. Neurology clinical education

a: Devised, implemented, and analyzed a survey of all graduating Neurology residents resulting in the Graduate Education Subcommittee (GES) of the American Academy of Neurology (AAN) planning to develop new resident educational resources. As the Chair of the Consortium of Neurology Residents and Fellows (CNRF) at the AAN I developed the content for a graduating Neurology resident survey based on prior needs assessments. I aided in the analysis and interpretation of the survey results and presented the findings to the AAN GES. Based on these findings, the AAN GES is developing curricula geared to career preparation for residents and fellows. Furthermore, we are planning a 2017 follow-up survey of Neurology residents to assess the effects of these curricular offerings.

b&c: Coordinated collaborations with international neurology partners through the International Working Group of Young Neurologists in Training, to draft position papers and updates on the state of international neurology education.

d: Co-authored an internationally promoted manual for the neurologic exam. With my international collaborators, during residency I drafted and refined a free e-book for the training in the neurologic exam that has been adopted for promotion through the European Academy of Neurology, and is being translated into several languages for training neurologists throughout the world.

- a. Jordan JT, Mayans D, **Schneider L**, Adams N, Khawaja AM, Engstrom J. Education Research: Neurology resident education: Trending skills, confidence, and professional preparation. *Neurology*. 2016 Mar 15;86(11):e112-7. PubMed PMID: [26976522](#).
- b. Rakusa M, Struhal W, Gak S, Tanprawate S, Balicza P, Khawaja AM, **Schneider LD**. Voice of young neurologists around the world. *Neurology*. 2016 Jan 26;86(4):e40-1. PubMed PMID: [26810430](#)
- c. Jordan JT, Sellner J, Struhal W, **Schneider L**, Mayans D. International issues: Obtaining an adult neurology residency position in the United States: an overview. *Neurology*. 2014 Apr 8;82(14):e112-5. PubMed PMID: [24711537](#).
- d. Toyka KV, Claßen J, **Schneider L**, Saur D. Manual of the Neurological Examination for Neurologists in Training. October 2016

D. Additional Information: Research Support and/or Scholastic Performance

Ongoing Research Support

5T32HL110952-03, National Heart, Lung, and Blood Institute

Logan Schneider (Postdoctoral fellow)

07/01/15-06/30/18

MULTI-INSTITUTIONAL TRAINING IN GENETIC/GENOMIC APPROACHES TO SLEEP DISORDERS

Sleep physiology and pathophysiology elucidation via phenotype-genotype associations with next generation sequencing (NGS).

Role: Postdoctoral fellow