EXHIBIT A18

BEFORE THE PUBLIC UTILITIES COMMISSION
OF THE STATE OF SOUTH DAKOTA

IN THE MATTER OF THE APPLICATION BY PREVAILING WIND PARK, LLC FOR A PERMIT FOR A WIND ENERGY FACILITY IN BON HOMME, CHARLES MIX, AND HUTCHINSON COUNTIES, SOUTH DAKOTA, FOR PREVAILING WIND PARK ENERGY FACILITY

SD PUC DOCKET EL-18-026

PREFILED REBUTTAL TESTIMONY OF DR. JEFFREY ELLENBOGEN ON BEHALF OF PREVAILING WIND PARK, LLC

September 26, 2018

I. INTRODUCTION

Q. Please state your name and business address.

A. My name is Dr. Jeffrey Ellenbogen. My business address is 906 Dogwood Hill Court, Towson, Maryland 21286.

Q. Did you provide Direct Testimony in this Docket?

A. No.

Q. Please describe your background and current employment.

A. I am a medical physician with a license to practice medicine in Maryland. I have a bachelor's degree from the University of Michigan, a medical degree from Tufts University, and a master's in medical science from Harvard Medical School. I finished my medical doctorate in 2000, received my medical license in 2001, and have been practicing medicine since that time. Between 2013 and 2018, I served as a practicing attending physician at Johns-Hopkins Hospital, specializing in neurology and sleep medicine. In January 2018 I resigned from Johns-Hopkins Hospital to dedicate myself full-time to my consulting business, Ellenbogen Consulting, LLC, which focuses on sleep and brain health.

I am providing testimony on behalf of Prevailing Wind Park, LLC ("Prevailing Wind Park"). My qualifications are attached as **Exhibit 1**.

Q. What is the purpose of your Rebuttal Testimony?

A. The purpose of my Rebuttal Testimony is to respond to intervenor testimony regarding the impacts of wind turbines on human health, particularly with respect to sleep. I provide testimony regarding my participation in an evaluation of the potential health impacts of wind turbines on humans sponsored by the Massachusetts Department of Environmental Protection and the Massachusetts Department of Public Health (together, the "Massachusetts Agencies"). I also discuss how I had the opportunity to test the findings of the study through

independent medical exams I performed on four individuals who alleged health impacts from wind turbines.

II. WIND TURBINE HEALTH IMPACT STUDY

Q. In the course of your work, have you had the opportunity to study the alleged health impacts of wind turbines?

A. Yes. In 2011, I was approached by the Massachusetts Agencies and asked to join a group of people to evaluate the potential health impacts of wind turbines on humans. As a result of that evaluation, the document attached as Exhibit 7 to Dr. Mark Roberts' Supplemental Direct Testimony, titled *Wind Turbine Health Impact Study: Report of Independent Expert Panel* (January 2012) ("Massachusetts Study" or "Study"), was released.

Q. Please describe the purpose of the Massachusetts Study.

A. The Massachusetts Agencies charged us with bringing together a group of experts to perform an independent evaluation of the scientific and medical literature regarding wind turbines and their potential impact on human health, as well as to solicit information from the public to hear about any potential issues not already reflected in the literature. The Massachusetts Agencies asked us to ensure that we did not leave any stones unturned with respect to potential plausible medical problems that could be a consequence of wind turbines. Specifically, we were charged with the following tasks:

- Identify and characterize attributes of concern and identify any scientifically documented or potential connection between health impacts and wind energy turbines;
- Evaluate and discuss information from peer-reviewed scientific studies, other reports, popular media, and public comments received by the Massachusetts Agencies concerning the nature and type of health complaints commonly reported by individuals who reside near existing wind farms;

- Assess the magnitude and frequency of any potential impacts and risks to human health associated with the design and operation of wind energy turbines based on existing data;
- For the attributes of concern, identify best practices that could reduce potential human health impacts; and
- Issue a report summarizing findings.

Q. Who else served on the panel that prepared the Study?

A. In addition to myself, the following individuals served on the Study panel ("Panel"):[1]

- Sheryl Grace, PhD; MS Aerospace & Mechanical Engineering, Associate Professor of Mechanical Engineering, Boston University;
- Wendy J. Heiger-Bernays, PhD; Associate Professor of Environmental Health, Department of Environmental Health, Boston University School of Public Health; Chair, Lexington Board of Health;
- James F. Manwell, PhD Mechanical Engineering; MS Electrical & Computer Engineering; BA Biophysics; Professor and Director of the Wind Energy Center, Department of Mechanical & Industrial Engineering University of Massachusetts, Amherst;
- Dora Ann Mills, MD, MPH, FAAP; State Health Officer, Maine 1996-2011; Vice President for Clinical Affairs, University of New England;
- Kimberly Sullivan, PhD; Research Assistant Professor of Environmental Health, Department of Environmental Health, Boston University School of Public Health; and
- Marc G. Weisskopf, ScD Epidemiology; PhD Neuroscience; Associate Professor of Environmental Health and Epidemiology, Department of Environmental Health & Epidemiology, Harvard School of Public Health.

[1] The qualifications and affiliations are as of the date of the Massachusetts Study.

Q. What methodology did the Panel employ to prepare the Study?

A. We conducted an extensive review of the scientific literature, as well as other reports, popular media, and public comments received by the Massachusetts Agencies. We met three times as a group and held additional conference calls to clarify points of discussion. An independent facilitator supported these discussions. Each Panel member provided written text based on the literature review and analyses, and draft versions of the report were reviewed by each Panel member. The Panel reached consensus for the final report and its findings.

Q. Did the Massachusetts Agencies direct you to arrive at a particular conclusion as a result of the Massachusetts Study?

A. Absolutely not. Indeed, one of the commissioners directed us to be very broad in our approach. If there was a problem, he wanted to know about it. We understood that our purpose was to seriously consider and examine each of the potential concerns raised by the public as part of the Study.

Q. Please summarize the conclusion of the Massachusetts Study.

A. Overall, the Study concluded that wind turbines do not pose a risk to human health. The Study included specific findings related to several topics, including, but not limited to, noise and shadow flicker.

Q. Please explain the Study's key finding with respect to noise.

A. We concluded that there is insufficient evidence that noise from wind turbines is directly causing health problems or disease. Most epidemiological literature on human response to wind turbines relates to self-reported annoyance, and this response appears to be a function of some combination of the sound itself, the sight of the turbine, and attitude towards the wind turbine project. We recognize that, for some people, wind turbines annoy them, be it the sound, sight, presence, or complex notions of economics, but there were no direct physiological effects on health in humans from wind turbines. None of the limited epidemiological evidence reviewed suggested an association between noise from wind turbines and a wide

range of topics we considered: pain, stiffness, diabetes, high blood pressure, tinnitus, hearing impairment, cardiovascular disease, and/or headache/migraine.

In addition, claims that infrasound from wind turbines directly impacts the vestibular system have not been demonstrated scientifically. The vestibular system is a physical system that is responsible for helping a person figure out where he or she is in space – *i.e.*, balance and position sense. There was concern among people that this system could be affected by the vibrations produced by a wind turbine. We did not find evidence in the human or animal literature to support that vibrations of the kind produced by a wind turbine could influence the vestibular system.

The study also specifically evaluated the merits of "wind turbine syndrome," and found no basis for a set of health effects from wind turbines.

Q. Please explain the Study's finding with respect to shadow flicker.

A. Scientific evidence suggests that shadow flicker does not pose a risk for eliciting seizure as a result of photic stimulation. To explain in more detail, what is known about photic-stimulated epilepsy (in other words, seizures as a result of flashes of light) is that they happen as a result of frequencies greater than 5 hertz ("Hz"), usually substantially higher. Because of the nature of the speed and size of wind turbines, the frequency of any shadow flicker will be about 0.5-1 Hz, which is well below the range that would elicit a seizure even in someone who is vulnerable to photic stimulation seizures. I feel very comfortable that shadow flicker from wind turbines does not cause seizures for several reasons. First, flicker of any kind does not cause seizures in the general population, And it only causes seizures in the minority of people who have epilepsy. Further, even among those who have epilepsy for which their seizures are sensitive to photic stimulation, the frequency of shadow flicker from wind turbines is not at the frequency that induces seizures.

Q. Have other studies since the Massachusetts Study reached similar conclusions?

A. Yes. As Dr. Mark Roberts testified in his Supplemental Direct Testimony, repeated, peer-reviewed scientific studies from numerous organizations and agencies across numerous countries around the world have similarly found no association between wind turbines and health effects. For example, a very large study, "Health Canada," was published in 2016.[2] In it, researchers examined self-reported and objective measures of stress associated with wind turbine noise ("WTN") of more than one thousand people "exposed to outdoor calculated WTN levels up to 46 dBA." They concluded that this exposure to noise from wind turbines "had no apparent influence on any of these endpoints" [of stress].

III. INDEPENDENT MEDICAL CLAIMS

Q. Since the Study was released, have you had the opportunity to test the Study's conclusions?

A. Yes. From a medical and scientific point of view, wind turbine-caused illness, or what has been called "wind turbine syndrome," does not exist. This Massachusetts panel of experts and many other experts around the world have made the same conclusion. However, some people in the community feel that it does, likely due to its promotion by a book called *Wind Turbine Syndrome*. As a result, there are people who have raised concerns, despite expert opinion to the contrary. There was a group of people who raised such a concern with a wind farm in Michigan and brought a lawsuit against the owner, and I had the opportunity to collect a full history and perform a full examination of two couples. I also had the opportunity to view their neighborhoods.

[2] Michaud, David S., et. al. "Personal and situational variables associated with wind turbine noise annoyance." J. Acoust. Soc. Am. 139 (3), March 2016.

Q. Please describe the results of these independent medical examinations.

A. I examined four individuals. In all four instances, I concluded that these people were not getting the medical treatment they needed because they were incorrectly assigning the cause of their health problems to wind turbines.

The first individual was a 53-year old industrial designer who complained of insomnia and palpitations in his chest at night and was convinced that the wind turbine near his house was causing these problems. In examining and talking with him, I understood that in recent years, he had gained a substantial amount of weight and experienced snoring and sleep apnea. As it turned out, this gentleman almost certainly had obstructive sleep apnea. In addition, I understand that this person wound up later having medical tests that showed an abnormal heart rhythm unrelated to the wind farm.

The second individual was a 45-year-old science teacher at a junior high school who was worried about wind turbine syndrome, so she left her job in her home neighborhood and took a new job that required a substantial commute, resulting in her waking up at approximately 4:30 a.m., a full two hours earlier than her typical pattern. Her ensuing sleepiness, anxiety, and forgetfulness were most likely attributable to her substantial sleep deprivation, not the wind turbines.

The third individual was a 52-year-old bookkeeper who complained of headaches. I measured her blood pressure, and it was very high. Untreated high blood pressure often causes headaches. She had a history of depression that was untreated at the time of my evaluation and she more recently had substantial snoring at night which could easily have been untreated, obstructive sleep apnea which she acknowledged, but did not pursue because of the focused assumption that she had wind turbine syndrome.

Finally, the fourth individual was a 60-year-old farmer with balance problems and sleep problems. Regarding his balance, upon examination, I determined that he had a serious neuropathy. This resulted in an inability to feel his feet which was causing

his difficulty with balance. In addition, this individual acknowledged he had a substantial alcohol problem, which is one of the leading causes of neuropathy. Alcohol can also impact balance by causing degeneration of the cerebellum, an area of the brain that helps with balance and coordination. Regarding his sleep, the issues he was experiencing were no different than those diagnosed several decades earlier for which he was given antidepressant medication and sedatives, both of which he stopped taking more recently. That sleep problem was recently made worse by an increase in his alcohol consumption at night, which caused him to need to urinate in the middle of the night. Further, he had pain in his shoulders which he described as disruptive to his sleep. Taken together, there was no worsening of his chronic sleep problem after the wind turbines were installed in his neighborhood, and there were compelling reasons for his disrupted sleep that did not involve wind turbines.

Q. What did you conclude from these independent medical exams?

A. Each of these individuals attributed their health problems to wind turbines. However, wind turbines were not the cause of the identified health issues, and in my opinion, the misapplied blame to wind turbines prevented these individuals from seeking and obtaining much-needed medical treatment for their underlying conditions.

Q. Did you provide testimony in the lawsuit that these individuals brought?

A. No. The case settled soon after I completed the independent medical examinations.

IV. RESPONSE TO INTERVENOR TESTIMONY

A. Response to Prof. Alves-Pereira.

Q. Prof. Alves-Pereira states that, "perhaps more worrisome, families in ILFN-contaminated homes *are sleeping* while enveloped within an environment that is bombarding their bodies with mechanical agents of disease." (Alves-Pereira Direct, lines 374-375) (emphasis in original). How does this relate to the Project?

A. I have reviewed Prof. Alves-Pereira's testimony and there is no reasonable basis to presume that infrasound from the wind turbines in the Prevailing Wind Park Project ("Project") will pose any risk to human health.

B. Response to Dr. Punch.

Q. Dr. Punch asserts that "a substantial proportion of people living in the vicinity of the proposed Project can be expected to experience not only annoyance, but also a variety of adverse health effects" including, among other things, sleep disturbance. (Punch Direct, lines 100-08). What is your response?

A. Based on the sound levels proposed for the Project (below 45 dBA), it is my expert opinion that such sound levels will neither interfere with sleep nor pose a risk to human health. Dr. Punch's statement misrepresents the facts and is the kind of statement that may have the effect of causing people to be annoyed by wind turbines.

Q. Dr. Punch further asserts that he estimates that "around 15%-25% of exposed residents" will experience extreme annoyance and sleep disturbance because of the Project. (Punch Direct, lines 124-26). Is that a reasonable estimate of the problem?

A. This estimate is a gross exaggeration, both in the number of people affected and the degree of the effect. The experience of annoyance to wind turbines is highly

subjective and personal. As noted in the Massachusetts Study (p. 54), annoyance appears to be coupled to many factors, including sound, site and the attitude toward turbines If residents are misinformed that the turbines will cause negative health effects, or if they are told, as they are here by Dr. Punch, that 1 in 5 people will "experience extreme annoyance and sleep disturbance because of the Project," then they are more likely to find the turbines of the Project annoying.

Q. Dr. Punch states that studies "have established a closer relationship between subjective responses to community noise and cardiovascular outcomes when the annoyance is sleep-related than when it is non-sleep-related." (Punch Direct, lines 135-38). What is your response?

A. Dr. Punch relies a 2009 World Health Organization ("WHO") report. In the same paragraph of the WHO report, which he misquotes, it also says "[w]ith respect to night noise exposure, nearly no information is available from epidemiological studies on the cardiovascular effects of long-term noise exposure of the bedroom during the night." (p. 74). More relevant to this Project, there is no data to link cardiovascular disease outcomes related to sleep with wind turbines. It is my expert opinion that noise at the levels proposed for the Project will not lead to adverse health outcomes or sleep disturbance.

Q. Dr. Punch asserts that "[w]ind turbine noise is a significant disruptor of sleep." (Punch Direct, line 288). Do you agree?

A. I disagree. I am not aware of any study demonstrating objective findings that support a claim that wind turbine noise significantly disrupts sleep, particularly at the levels of the Project. It makes reasonable sense that, if the noise were to be very high, then sleep might be disrupted. But the levels for the Project below 50 dBA are well within my expectation that sleep will not be disturbed.

Q. Relying on Dr. Schomer, Dr. Punch asserts that "wind turbine noise should be limited to an average level of 36-38 dBA, based on a 24-hour measurement period" to minimize or avoid sleep disturbance. (Punch Direct, lines 317-18).

Is it your opinion that noise requirements less than 45 dBA are necessary to avoid impacts to sleep?

A. No. Noises in the mid-40s dBA represent reasonable levels that are not of substantial concern for sleep.

C. Response to Mr. James.

Q. Mr. James asserts that the project "has a significant potential to cause adverse health effects related to sleep disturbance." Do you agree?

A. No, I do not agree. The sound level for the proposed Project is well within reasonable limits that I expect will neither cause adverse health effects nor sleep disturbance.

Q. Mr. James attaches a document titled *Noise: Windfarms* to his testimony as Exhibit 2 (the "Shepherd Paper"). Are you familiar with the Shepherd Paper?

A. Yes. The paper makes inaccurate, unsubstantiated claims and relies heavily on data of limited quality, including individual claims "reported in the press and on the internet…." (p. 7). Many of the claims have been criticized or shown to be unsubstantiated by expert panels and data elsewhere.

Q. Please discuss your thoughts on the sections of the Shepherd Paper which address sleep.

A. I agree with their comment in figure 1, that "fear of noise-induced annoyance and sleep disruption" is a "barrier to social acceptance" of wind turbines. However, I believe that the basis for this fear is not founded on fact, and is more a function of unsubstantiated or exaggerated claims of annoyance, health problems, or problems with sleep. This is partly a function of relying on statements such as the following, made by Shepherd et al: "…there is little research on the effects of wind turbine noise on sleep. However, there is no doubt that wind turbine noise can and does disturb the sleep of those living nearby." (p. 7).

Q. The Shepherd Paper contains various references to "correlation" and "causation." What is the difference between correlation and causation?

A. Correlation and causation are not synonymous. The blurring of the line between these two words can often leave people confused about what action to take to avoid an undesirable outcome. For example, wearing bifocals is correlated with heart disease. Wearing bifocals, however, is not causal to heart disease. And fixing eye problems will in no way reduce heart disease. The correlation does exists, but not because eye disease results in heart disease, but rather, because individuals who wear bifocals tend to be older and being older poses a greater risk of having heart disease. Mr. James and his colleagues appear to blur the line between correlation and causation, but it is essential to understand and acknowledge this important distinction.

V. CONCLUSION

Q. Please summarize your testimony.

A. The testimony Prof. Alves-Pereira, Mr. James and Dr. Punch provide raises illegitimate claims of adverse health impacts associated with wind turbines. Their testimony is not supported by science and, in my view, does not help inform this process.

Based on my medical experience in neurology and sleep medicine, and knowledge of the scientific literature, the Project, as proposed, will not impact health or affect sleep.

Q. Does this conclude your Rebuttal Testimony?

A. Yes.

Dated this 26th day of September, 2018.

Dr. Jeffrey Ellenbogen

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CURRICULUM VITAE

Jeffrey M. Ellenbogen, MMSc, MD

September 24, 2018

CURRENT ACTIVITIES

2013 – present Director
The Sound Sleep Project™

2016 – present Firefighter
Providence Volunteer Fire Co (Station 29, Baltimore County)

DEMOGRAPHIC INFORMATION

e-mail:
jeffrey.ellenbogen@gmail.com

website:
www.jeffreyellenbogen.com

EDUCATION & TRAINING

- Undergraduate

  1994 University of Michigan, Ann Arbor, MI
  B.A., History of Art (with High Distinction)

- Doctoral/graduate

  2000 Tufts University School of Medicine, Boston, MA
  M.D. (Doctor of Medicine)

  2007 Harvard Medical School, Boston, MA
  M.M.Sc. (Masters in Medical Science)

- Postdoctoral

  2000-2001 University of Pennsylvania, Philadelphia, PA
  Intern, Internal Medicine

  2001-2004 University of Pennsylvania, Philadelphia, PA
  Resident, Neurology

  2004-2005 University of Pennsylvania, Philadelphia, PA
  Fellow, Clinical Electrophysiology

  2005-2007 Harvard Medical School, Boston, MA
  Postdoctoral Fellow in Sleep, Circadian and Respiratory Neurobiology

  2016-2017 Maryland Fire and Rescue Institute (MFRI)
  Firefighter 1

PROFESSIONAL EXPERIENCE

2007-2012 Massachusetts General Hospital, Boston, MA
Director, Sleep Division
Director, Sleep Laboratory
Staff Neurologist

2007-2009 Harvard Medical School, Boston, MA
Instructor, Neurology

2009-2012 Harvard Medical School, Boston, MA
Assistant Professor, Neurology and Sleep Medicine

2013-2018: The Johns Hopkins University School of Medicine
Assistant Professor, Neurology Sleep Medicine Specialist

RESEARCH ACTIVITIES

- **Peer Reviewed Original Science Publications**

1. Soutter AD, **Ellenbogen J**, Folkman J. Splenosis is regulated by a circulating factor. *Journal of Pediatric Surgery.* 1994;29:1076-9.

2. Wolfe J, Grier HE, Klar N, Levin SB, **Ellenbogen JM**, Salem-Schatz S, Emanuel EJ, Weeks JC. Symptoms and suffering at the end of life in children with cancer. *New England Journal of Medicine.* 2000;342:326-33.

3. Kolb SJ, Costello F, Lee AG, White M, Wong S, Schwartz ED, Messe SR, **Ellenbogen J**, Kasner SE, Galetta SL. Distinguishing ischemic stroke from the stroke-like lesions of MELAS using apparent diffusion coefficient mapping. *Journal of Neurological Sciences.* 2003;216:11-15.

4. **Ellenbogen JM**, Hulbert JC, Stickgold R, Dinges DF, Stickgold R, Thompson-Schill SL. Interfering with theories of sleep and memory: Sleep, declarative memory and associative interference. *Current Biology.* 2006;16:1290-1294

5. **Ellenbogen JM**, Hu PT, Payne JD, Titone D, Walker MP. Human relational memory requires time and sleep. *Proceedings of the National Academy of Science, U S A (PNAS).* 2007;104:7723-8.

6. **Ellenbogen JM**, Hulbert JC, Jiang Y, Stickgold R. The Sleeping Brain's Influence on Verbal Memory: Boosting Resistance to Interference. *PLoS One.* 2009;4:e4117.

7. Dang-Vu TT, McKinney SM, Buxton OM, Solet JM, **Ellenbogen JM**. Spontaneous brain rhythms predict sleep stability in the face of noise. *Current Biology.* 2010;20:R626-R627.

8. McKinney SM, Dang-Vu TT, Buxton OM, Solet JM, **Ellenbogen JM**. Covert waking brain activity reveals instantaneous sleep depth. *PLoS One.* 2011;6:e17351.

9. Babadi B*, McKinney SM*, Tarokh V, **Ellenbogen JM**. Data-Driven Bayesian Algorithm for Sleep Spindle Detection (DiBa). *IEEE Transactions in Biomedical Engineering.* 2012;59(2):483-93.

10. Payne JD Payne JD, Tucker MA, **Ellenbogen JM**, Wamsley EJ, Walker MP, Schacter DL, Stickgold R. Memory for Semantically Related and Unrelated Declarative Information: The Benefit of Sleep, the Cost of Wake. *PLoS One.* 2012;7:e33079

11. Buxton OM*, **Ellenbogen JM*** (co-first author), Wang W, Carballeira A, O'Connor S, Cooper D, Gordhandas

AJ, McKinney SM, Solet JM. Sleep Disruption Due to Hospital Noises: A Prospective Evaluation. *Annals of Internal Medicine.* 2012; 157:170-179.

12. Shaw ND, Butler JP, McKinney SM, Nelson SA, **Ellenbogen JM**, Hall JE. Insights into Puberty: The Relationship Between Sleep Stages and Pulsatile LH Secretion. *The Journal of Clinical Endocrinology and Metabolism.* 2012;97:E2055-62.

13. Fellin T, **Ellenbogen JM**, De Pitta M, Ben-Jacob E, Halassa M. Astrocyte Regulation of Sleep Circuits: Experimental and Modeling Perspectives. *Frontiers in Computational Neuroscience.* 2012;6:65.

14. Eiseman NA, Westover MB, **Ellenbogen JM**, Bianchi MT. The impact of body posture and sleep stages on sleep apnea severity in adults. *Journal of Clinical Sleep Medicine.* 2012;8:655-6.

15. Bianchi MT, Williams KL, McKinney SM, **Ellenbogen JM**. The subjective-objective mismatch (SOM) in sleep perception among those with insomnia and sleep apnea. *The Journal of Sleep Research.* 2013;22(5):557-568.

16. Marino, M, Li Y, Rueschman MD, Winkelman JW, **Ellenbogen JM**, Solet JM, Dulin H, Berkman LF, Buxton OM. Measuring Sleep: Accuracy, Sensitivity, and Specificity of Wrist Actigraphy Compared to Polysomnography. *Sleep.* 2013;36(11):1147-1155.

17. Pace-Schott EF, Tracy LE, Rubin Z, Mollica AM, **Ellenbogen JM**, Bianchi MT, Milad MR, Pitman RK, Orr SP. Interactions of time of day and sleep with between-session habituation and extinction memory in young adult males. *Experimental Brain Research.* 2014.

18. Prerau MJ, Hartnack KE, Obregon-Henao G, Sampson A, Merlino M, Gannon K, Bianchi MT, **Ellenbogen JM**, Purdon PL. Tracking the Sleep Onset Process: An Empirical Model of Behavioral and Physiological Dynamics. *PLOS Computational Biology.* 2014.

19. Alameddine Y, **Ellenbogen JM**, Bianchi MT. Sleep-Wake Time Perception Varies by Direct or Indirect Query. *Journal of Clinical Sleep Medicine.* 2015.

20. Prerau MJ, Bianchi MT, Brown RE, **Ellenbogen JM**, Patrick PL. Sleep neurophysiologic dynamics through the lens of multitaper spectral analysis. *Physiology.* 2017.

21. Akeju O, Hobbs LE, Gao L, Burns SM, Pavone KJ, Plummer GS, Walsh GS, Houle TT, Kim SE, Bianchi MT, **Ellenbogen JM**, Brown EN. Dexmedetomidine promotes biomimetic non-rapid eye movement stage 3 sleep in humans: A pilot study. *Clinical Neurophysiology.* 2017.

22. Gottlieb DJ, **Ellenbogen JM**, Bianchi MT, Czeisler CA. Sleep deficiency and motor vehicle crash risk in the general population: a prospective cohort study. *BMC Medicine.* 2018.

- **Other Peer Reviewed Original Publications**

Reviews or Opinion

1. **Ellenbogen JM**, Payne JD, Stickgold R. The role of sleep in declarative memory consolidation: passive, permissive or active or none? *Current Opinion in Neurobiology.* 2006;16:716-22.

2. **Ellenbogen JM**, Grace S, Heiger-Bernays WJ, Manwell JF, Mills DA, Sullivan KA, Weisskopf MG. Wind Turbine Health Impact Study: Report of Independent Expert Panel. *Report for the Massachusetts Department of Environmental Protection.* 2012.

3. **Ellenbogen JM.** Pace-Schott EF. Drug-induced sleep: Theoretical and practical considerations. *Pflugers Archiv – European Journal of Physiology.* 2012;463(1):177-186.

4. **Ellenbogen JM.** Noise-induced sleep disruption among hospitalized patients: Brain-based approaches toward sleeping soundly on noisy nights. *Noise-Con*. 2013.

5. **Ellenbogen JM**. Sleepiness. *Seminars in Neurology*. 2016.

6. **Ellenbogen,, JM, Guay, Christian.** Emergency Sleep Medicine. *Seminars in Neurology*. 2017.

Editorials

1. **Ellenbogen JM**. Cognitive benefits of sleep, and their loss due to sleep deprivation. *Neurology*. 2005;64:E25-7.

2. Bianchi MT, Thomas RJ, **Ellenbogen JM**. Hypnotics and Mortality Risk. *The Journal of Clinical Sleep Medicine.* 2012;8(4):351-352

Case Reports

1. Aguirre GK, **Ellenbogen JM**, Pollard J, Stolzenberg ED, Galetta SL. Amyloid angiopathy. *Neurology.* 2002;59:1656.

2. Ances BM, **Ellenbogen JM**, Herman ST, Jacobs D, Liebeskind DS, Chatterjee A, Galetta SL. Balint's syndrome due to Creutzfeldt-Jakob disease. *Neurology.* 2004;63:395.

3. Roy S, **Ellenbogen JM**. Pathologic quiz case: seizures, frontal lobe mass and remote history of periodontal abscess. *Archives of Pathology & Laboratory Medicine.* 2005;129:805-6.

4. **Ellenbogen JM**, Hurford MO, Liebeskind DS, Neimark GB, Weiss D. Ventromedial frontal lobe trauma. *Neurology* 2005;64:757.

5. **Ellenbogen JM**. Sleep-Specific Atrioventricular Block. *Neurology*. 2010;74:90

6. Mesarwi OA, **Ellenbogen JM**, Polotsky VY. A patient with unusual electroencephalographic findings during rapid eye movement sleep. *Annals of the American Thoracic Society*. 2014.

Letters, correspondence

1. **Ellenbogen JM**. Letter (to the science editor). "Waking to the possibilities." The New York Times 15 Nov., 2005.

2. **Ellenbogen JM**. Letter. "Unsafe highways." The New York Times, 17 Dec., 2006.

3. **Ellenbogen JM**. Letter. "A key teen lesson: Don't drive drowsy." The Boston Globe, 2 Jan., 2007.

4. **Ellenbogen, JM.** Letter. "Sleepless in New York." The New York Times, 11 Oct., 2007.

5. **Ellenbogen JM.** Letter. "The sleep-industrial complex." The New York Times Sunday Magazine 2 Dec., 2007.

6. **Ellenbogen JM.** Letter. "My Dream: For a Good Night's Sleep." The New York Times 26 Sept., 2016.

7. **Ellenbogen JM.** Letter. "Sleep and the Biological Clock." The New York Times 13 March, 2017.

Book Chapters, Monographs

1. **Ellenbogen JM**. The interaction of sleep and memory. In: Chebykin OY, Bedny GB, Karwowski W, eds. *Ergonomics and Psychology: Developments in Theory and Practice*. Taylor and Francis Group; 2008.

2. Dang-Vu TT, Foulkes D, Cartwright RD, **Ellenbogen JM**. Sleep. *Encyclopaedia Britannica*. 2010.

3. **Ellenbogen JM**. Noise-induced sleep deprivation: Toward sleeping soundly on noisy nights. In: Bianchi MT. *Sleep Deprivation: Effects on Mind, Body, and Disease*. Springer New York Heidelberg Dordrecht London; 2013.

4. Geyer MB, **Ellenbogen JM**. Insomnia and Sleep Disorders. In: Kiefer MM, Chong CR, eds. Pocket Primary Care: A Massachusetts General Hospital Handbook. Philadelphia: Lippincott Williams & Wilkins; 2014.

Teaching

Classroom instruction

1999 - 2000	"Problem-Based Learning," Instructor, Tufts University School of Medicine (Boston, MA)
2007 - 2012	"The Sleeping Brain" (Neurobiology 95hf), Instructor, Harvard University (Cambridge, MA)

Clinical instruction

2013 - present	Inpatient neurology service. Attending physician, 4-6 weeks each year, Johns Hopkins
2013 - present	Outpatient sleep medicine service. Attending physician, ½ day per week Johns Hopkins

CME instruction

2008 - 2012	Annual Psychiatry Course, lecturer, "Psychopharmacology of Sleep," Mass General Hospital

CERTIFICATIONS

Medical licenses:

2004 - 2008	Pennsylvania # 424784 (inactive)
2005 - 2014	Massachusetts # 226436 (inactive)
2013 - present	Maryland # D0075375 (**active**)

Boards Memberships:

2005 - present	Neurology (American Board of Psychiatry and Neurology);
2009 - present	Sleep Medicine (American Board of Psychiatry and Neurology)

ORGANIZATIONAL ACTIVITIES

Editorial Activities

- Editorial Board appointments

2012 - present	*Sleep*
2013-2015	*National Science Foundation (NSF), College of Reviewers*
2017, 2018	*Seminars in Neurology*, guest editor

- Journal Reviewer

2007 - present	*Neurology*
2008 - present	*Journal of Clinical Sleep Medicine*
2008 - present	*Journal of Sleep Research*
2008 - present	*Sleep*
2008 - present	*CNS: Neuroscience and Therapeutics*
2008 - present	*PLoS One*
2009 - present	*Journal of Cognitive Neuroscience*

2010 - present *Current Biology*
2013 - present *Transactions in Biomedical Engineering (TBME)*

Professional Societies

2001 - present Member, American Academy of Neurology
2004 - present Fellow, American Academy of Sleep Medicine

RECOGNITION

Awards, Honors

1991	Branstrom Prize for Academic Excellence, University of Michigan
2007	Outstanding Abstract, Sleep Research Society
2006 - 2011	Certificate of Distinction in Teaching, Harvard University (Received this award each of the six years that I taught this course in neurobiology on sleep neurosciences)
2011	Fellow, American Academy of Sleep Medicine
2011	John E. Dowling Teaching Award in Neurobiology, Harvard University
2012	Wayne A. Hening Sleep Medicine Investigator Award, American Academy of Neurology
2013	International Award for Publishing Excellence (Journal of Clinical Endocrinology and Metabolism, JCEM) for authoring one of the top 14 best clinical research papers in JCEM in 2012.
2017	Firefighter training award, (station 29), Baltimore County Fire Department

OTHER PROFESSIONAL ACCOMPLISHMENTS

2009 - 2010 Physician Leadership Development Program, Massachusetts General Hospital

2014 – 2015 Junior Faculty Leadership Program, Johns Hopkins Hospital