

Stanford



Nolan Williams

Assistant Professor of Psychiatry and Behavioral Sciences (General Psychiatry and Psychology) at the Stanford University Medical Center

CLINICAL OFFICES

- **Psychiatry and Behavioral Sciences**

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ACADEMIC CONTACT INFORMATION

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Bio

BIO

Dr. Williams is an Assistant Professor within the Department of Psychiatry and Behavioral Sciences and the Director of the Stanford Brain Stimulation Lab. Dr. Williams has a broad background in clinical neuroscience and is triple board-certified in general neurology, general psychiatry, as well as behavioral neurology and neuropsychiatry. In addition, he has specific training and clinical expertise in the development of brain stimulation methodologies under Mark George, MD. Themes of his work include (a) examining the use of spaced learning theory in the application of neurostimulation techniques, (b) development and mechanistic understanding of rapid-acting antidepressants, and (c) identifying objective biomarkers that predict neuromodulation responses in treatment-resistant neuropsychiatric conditions. He has published papers in high impact peer-reviewed journals including *Brain*, *American Journal of Psychiatry*, and the *Proceedings of the National Academy of Science*. Results from his studies have gained widespread attention in journals such as *Science* and *New England Journal of Medicine* *Journal Watch* as well as in the popular press and have been featured in various news sources including *Time*, *Smithsonian*, and *Newsweek*. Dr. Williams received two NARSAD Young Investigator Awards in 2016 and 2018 along with the 2019 Gerald R. Klerman Award. Dr. Williams received the National Institute of Mental Health Biobehavioral Research Award for Innovative New Scientists in 2020.

CLINICAL FOCUS

- Neurology
- Neuropsychiatry
- Interventional Psychiatry
- Psychiatry
- Behavioral Neurology

ACADEMIC APPOINTMENTS

- Assistant Professor - Med Center Line, Psychiatry and Behavioral Sciences
- Member, Bio-X
- Member, Wu Tsai Neurosciences Institute

ADMINISTRATIVE APPOINTMENTS

- Director, Stanford Interventional Psychiatry Clinical Research, (2019- present)
- Director, Stanford Brain Stimulation Laboratory, (2015- present)
- Chief Resident of Neuropsychiatry, Medical University of South Carolina, (2011-2014)
- Chief Resident of Neurology, Medical University of South Carolina, (2011-2012)

HONORS AND AWARDS

- Biobehavioral Research Award for Innovative New Scientists, National Institute of Mental Health (2020)
- Bipolar Research Award, One Mind (2020)
- Leading Research Achievements, Brain & Behavior Research Foundation (2020)
- Chairman's Award for Advancing Science, Stanford University (2019)
- Gerald R. Klerman Award, Brain & Behavior Research Foundation (2019)
- NARSAD Young Investigator Award, Brain & Behavior Research Foundation (2018-2020)
- NARSAD Young Investigator Award, Brain & Behavior Research Foundation (2016-2018)

BOARDS, ADVISORY COMMITTEES, PROFESSIONAL ORGANIZATIONS

- Member, American Neuropsychiatric Association Committee on Research (2016 - present)
- Diplomate, American Board of Psychiatry and Neurology (2014 - present)

PROFESSIONAL EDUCATION

- Board Certification, United Council for Neurologic Subspecialties , Behavioral Neurology and Neuropsychiatry (2020)
- Board Certification: Neurology, American Board of Psychiatry and Neurology (2019)
- Board Certification: Psychiatry, American Board of Psychiatry and Neurology (2014)
- NIH R25 Research Fellowship, Medical University of South Carolina (Mentor: Mark George, MD) , Human Neuroscience (2014)
- Clinical Fellowship, Medical University of South Carolina , Invasive and Non-Invasive Neuromodulation (2014)
- Residency, Medical University of South Carolina , Psychiatry (2014)
- Residency, Medical University of South Carolina , Neurology (2014)
- Internship, Medical University of South Carolina , Internal Medicine (2009)
- MD, Medical University of South Carolina , Medicine (2008)

LINKS

- Stanford Brain Stimulation Lab: <http://med.stanford.edu/bsl.html>

Research & Scholarship

CLINICAL TRIALS

- Accelerated Theta Burst in Treatment-Resistant Depression: A Dose Finding and Biomarker Study, Recruiting
- Bilateral Accelerated Theta Burst in Treatment-Resistant Bipolar Depression, Recruiting
- Establishing Functional Biomarkers for Spaced Theta-Burst Stimulation, Recruiting
- iTBS in Refractory Pediatric Depression, Recruiting
- rTMS for Orthopaedic Trauma Patients, Recruiting
- aTBS for Treatment of Depression in AUD, Not Recruiting

- Establishing a Dose-response Relationship With Accelerated Transcranial Magnetic Stimulation, Not Recruiting
- Neuroimaging Biomarkers for Predicting rTMS Response in OCD, Not Recruiting
- Rapid Non-Invasive Brain Stimulation for OCD (oTMS), Not Recruiting
- SAINT for Treatment of Preoperative Depression to Reduce Opioid Use Following Arthroplasty, Not Recruiting
- The Effects of Stanford Accelerated Intelligent Neuromodulation Therapy on Explicit and Implicit Suicidal Cognition, Not Recruiting
- Use of Repetitive Transcranial Magnetic Stimulation to Augment Hypnotic Analgesia, Not Recruiting

Teaching

STANFORD ADVISEES

Postdoctoral Faculty Sponsor

Azeezat Azeez, Jean Marie Batail, James Bishop, Kirsten Cherian, John Coetzee, Haleh Karbasforoushan, Julio Nunes

Postdoctoral Research Mentor

John Coetzee

Publications

PUBLICATIONS

- **Stanford Accelerated Intelligent Neuromodulation Therapy for Treatment-Resistant Depression.** *The American journal of psychiatry*
Cole, E. J., Stimpson, K. H., Bentzley, B. S., Gulser, M., Cherian, K., Tischler, C., Nejad, R., Pankow, H., Choi, E., Aaron, H., Espil, F. M., Pannu, J., Xiao, et al
2020: appiajp201919070720
- **Attenuation of antidepressant and antisuicidal effects of ketamine by opioid receptor antagonism.** *Molecular psychiatry*
Williams, N. R., Heifets, B. D., Bentzley, B. S., Blasey, C., Sudheimer, K. D., Hawkins, J., Lyons, D. M., Schatzberg, A. F.
2019
- **Attenuation of Antidepressant Effects of Ketamine by Opioid Receptor Antagonism.** *The American journal of psychiatry*
Williams, N. R., Heifets, B. D., Blasey, C., Sudheimer, K., Pannu, J., Pankow, H., Hawkins, J., Birnbaum, J., Lyons, D. M., Rodriguez, C. I., Schatzberg, A. F.
2018: appiajp201818020138
- **High-dose spaced theta-burst TMS as a rapid-acting antidepressant in highly refractory depression.** *Brain : a journal of neurology*
Williams, N. R., Sudheimer, K. D., Bentzley, B. S., Pannu, J., Stimpson, K. H., Duvio, D., Cherian, K., Hawkins, J., Scherrer, K. H., Vyssoki, B., DeSouza, D., Raj, K. S., Keller, et al
2018
- **Five Year Follow-Up of Bilateral Epidural Prefrontal Cortical Stimulation for Treatment-Resistant Depression** *BRAIN STIMULATION*
Williams, N. R., Short, E. B., Hopkins, T., Bentzle, B. S., Sahlem, G. L., Pannu, J., Schmidt, M., Borckardt, J. J., Korte, J. E., George, M. S., Takacs, I., Nahas, Z.
2016; 9 (6): 897-904
- **Deep brain stimulation (DBS) at the interface of neurology and psychiatry** *JOURNAL OF CLINICAL INVESTIGATION*
Williams, N. R., Okun, M. S.
2013; 123 (11): 4546-4556
- **Accelerated Neuromodulation Therapy for Obsessive-Compulsive Disorder.** *Brain stimulation*
Williams, N. R., Sudheimer, K. D., Cole, E. J., Varias, A. D., Goldstein-Piekarski, A. N., Stetz, P., Lombardi, A., Filippou-Frye, M., van Roessel, P., Anderson, K., McCarthy, E. A., Wright, B., Sandhu, et al
2021
- **Synchronized Cervical VNS With Accelerated Theta Burst TMS For Treatment Resistant Depression.** *Brain stimulation*
George, M. S., Caulfield, K. A., O'Leary, K., Badran, B. W., Short, E. B., Huffman, S. M., Li, X., Kerns, S. E., Williams, N. R.
2020
- **Transcranial Magnetic Stimulation Parameter Space: Wide Open for Exploration.** *Biological psychiatry*

- Bentzley, B. S., Williams, N. R.
2020; 87 (5): 384–85
- **Deep Brain Stimulation Results in Greater Symptomatic Improvement in Tourette Syndrome than Conservative Measures: A Meta-Analysis.** *Stereotactic and functional neurosurgery*
Mahajan, U. V., Purger, D. A., Mantovani, A., Williams, N. R., Epsil, F. M., Han, S. S., Stein, S. C., Halpern, C. H.
2020: 1–8
 - **Evidence for the role of the dorsal ventral lateral posterior thalamic nucleus connectivity in deep brain stimulation for Gilles de la Tourette syndrome.** *Journal of psychiatric research*
Kakusa, B., Saluja, S., Barbosa, D. A., Cartmell, S., Espil, F. M., Williams, N. R., McNab, J. A., Halpern, C. H.
2020; 132: 60–64
 - **Brain-Responsive Neurostimulation for Loss of Control Eating: Early Feasibility Study.** *Neurosurgery*
Wu, H., Adler, S., Azagury, D. E., Bohon, C., Safer, D. L., Barbosa, D. A., Bhati, M. T., Williams, N. R., Dunn, L. B., Tass, P. A., Knutson, B. D., Yutsis, M., Fraser, et al
2020
 - **Multimodal characterization of the human nucleus accumbens** *NEUROIMAGE*
Cartmell, S. D., Tian, Q., Thio, B. J., Leuze, C., Ye, L., Williams, N. R., Yang, G., Ben-Dor, G., Deisseroth, K., Grill, W. M., McNab, J. A., Halpern, C. H.
2019; 198: 137–49
 - **Rigorous Trial Design Is Essential to Understand the Role of Opioid Receptors in Ketamine's Antidepressant Effect** *JAMA PSYCHIATRY*
Heifets, B. D., Williams, N. R., Bentzley, B. S., Schatzberg, A. F.
2019; 76 (6): 657–58
 - **Attenuation of Anti-Suicidal Effects of Ketamine by Opioid Receptor Antagonism**
Williams, N., Heifets, B., Bentzley, B., Blasey, C., Sudheimer, K., Lyons, D., Schatzberg, A.
ELSEVIER SCIENCE INC.2019: S113
 - **Stanford Accelerated Intelligent Neuromodulation Therapy for Suicidal Ideation (SAINT-SI)**
Williams, N.
ELSEVIER SCIENCE INC.2019: S28
 - **The Effects of Cortisol Administration on Emotion, Stress Reactivity, and Brain Activity in Depression**
Sudheimer, K., Duvio, D., James, D., Heinemeyer, E., Pirog, S., Williams, N., Schatzberg, A.
ELSEVIER SCIENCE INC.2019: S267
 - **Rigorous Trial Design Is Essential to Understand the Role of Opioid Receptors in Ketamine's Antidepressant Effect.** *JAMA psychiatry*
Heifets, B. D., Williams, N. R., Bentzley, B. S., Schatzberg, A. F.
2019
 - **Rigorous Translational Models Are Key to Studying Ketamine's Antidepressant Mechanism: Response to Wang and Kaplin** *AMERICAN JOURNAL OF PSYCHIATRY*
Heifets, B. D., Williams, N. R., Blasey, C., Sudheimer, K., Rodriguez, C. I., Schatzberg, A. F.
2019; 176 (5): 412
 - **Robust clinical benefit of multi-target deep brain stimulation for treatment of Gilles de la Tourette syndrome and its comorbidities** *BRAIN STIMULATION*
Kakusa, B., Saluja, S., Tate, W. J., Espil, F. M., Halpern, C. H., Williams, N. R.
2019; 12 (3): 816–18
 - **Rigorous Translational Models Are Key to Studying Ketamine's Antidepressant Mechanism: Response to Wang and Kaplin.** *The American journal of psychiatry*
Heifets, B. D., Williams, N. R., Blasey, C., Sudheimer, K., Rodriguez, C. I., Schatzberg, A. F.
2019; 176 (5): 412
 - **Case Studies in Neuroscience: The electrophysiology of a human obsession in nucleus accumbens.** *Journal of neurophysiology*
Miller, K. J., Prieto, T., Williams, N. R., Halpern, C. H.
2019

- **Comparative effectiveness of neuroablation and deep brain stimulation for treatment-resistant obsessive-compulsive disorder: a meta-analytic study** *JOURNAL OF NEUROLOGY NEUROSURGERY AND PSYCHIATRY*
Kumar, K. K., Appelboom, G., Lamsam, L., Caplan, A. L., Williams, N. R., Bhati, M. T., Stein, S. C., Halpern, C. H.
2019; 90 (4): 469–73
- **Robust clinical benefit of multi-target deep brain stimulation for treatment of Gilles de la Tourette syndrome and its comorbidities.** *Brain stimulation*
Kakusa, B., Saluja, S., Tate, W. J., Espil, F. M., Halpern, C. H., Williams, N. R.
2019
- **Interpreting Ketamine's Opioid Receptor Dependent Effect: Response to Sanacora** *AMERICAN JOURNAL OF PSYCHIATRY*
Heifets, B. D., Williams, N. R., Blasey, C., Sudheimer, K., Rodriguez, C. I., Schatzberg, A. F.
2019; 176 (3): 249–50
- **Target Population, Dose, and Timing Considerations for Understanding Naltrexone's Subjective Effect: Response to Amiaz.** *The American journal of psychiatry*
Heifets, B. D., Williams, N. R., Blasey, C., Sudheimer, K., Rodriguez, C. I., Schatzberg, A. F.
2019; 176 (3): 251–52
- **Interpreting Ketamine's Opioid Receptor Dependent Effect: Response to Sanacora.** *The American journal of psychiatry*
Heifets, B. D., Williams, N. R., Blasey, C., Sudheimer, K., Rodriguez, C. I., Schatzberg, A. F.
2019; 176 (3): 249–50
- **Target Population, Dose, and Timing Considerations for Understanding Naltrexone's Subjective Effect: Response to Amiaz** *AMERICAN JOURNAL OF PSYCHIATRY*
Heifets, B. D., Williams, N. R., Blasey, C., Sudheimer, K., Rodriguez, C. I., Schatzberg, A. F.
2019; 176 (3): 251–52
- **Multimodal characterization of the human nucleus accumbens.** *NeuroImage*
Cartmell, S. C., Tian, Q., Thio, B. J., Leuze, C., Ye, L., Williams, N. R., Yang, G., Ben-Dor, G., Deisseroth, K., Grill, W. M., McNab, J. A., Halpern, C. H.
2019
- **Adjunctive repetitive transcranial magnetic stimulation delivers superior quality of life for focal epilepsy compared to anti-epileptic drugs: A meta-analytic utility prediction study.** *Brain stimulation*
Mahajan, U. V., Parker, J. J., Williams, N. R., Bhati, M. T., Ku, S., Grant, G., Fisher, R. S., Stein, S. C., Halpern, C. H.
2019
- **Comparative effectiveness of neuroablation and deep brain stimulation for treatment-resistant obsessive-compulsive disorder: a meta-analytic study.** *Journal of neurology, neurosurgery, and psychiatry*
Kumar, K. K., Appelboom, G., Lamsam, L., Caplan, A. L., Williams, N. R., Bhati, M. T., Stein, S. C., Halpern, C. H.
2019
- **Attenuation of Antidepressant Effects of Ketamine by Opioid Receptor Antagonism**
Williams, N. R., Heifets, B. D., Blasey, C., Sudheimer, K., Pannu, J., Pankow, H., Hawkins, J., Birnbaum, J., Lyons, D. M., Rodriguez, C. I., Schatzberg, A. F.
AMER PSYCHIATRIC PUBLISHING, INC.2018: 1205–15
- **KETAMINE'S ANTIDEPRESSANT EFFECT IS BLOCKED BY A MU-OPIOID RECEPTOR ANTAGONIST IN HUMANS AND MICE**
Heifets, B. D., Williams, N., Sudheimer, K., Pankow, H., Blasey, C., Lyons, D., Schatzberg, A. F.
LIPPINCOTT WILLIAMS & WILKINS.2018: 343
- **Closing the loop on impulsivity via nucleus accumbens delta-band activity in mice and man.** *Proceedings of the National Academy of Sciences of the United States of America*
Wu, H., Miller, K. J., Blumenfeld, Z., Williams, N. R., Ravikumar, V. K., Lee, K. E., Kakusa, B., Sacchet, M. D., Wintermark, M., Christoffel, D. J., Rutt, B. K., Bronte-Stewart, H., Knutson, et al
2018; 115 (1): 192–97
- **Influence of gender on inpatient treatment for bipolar disorder: An analysis of 60,607 hospitalisations** *JOURNAL OF AFFECTIVE DISORDERS*
Fellinger, M., Waldhoer, T., Bluemel, V., Williams, N., Vyssoki, B.
2018; 225: 104–7
- **Modulation of the Neural Circuitry Underlying Trait Hypnotizability With Spaced Continuous Theta-Burst Stimulation**
Williams, N., Sudheimer, K., Stimpson, K., Duvio, D., Chung, C., DeSouza, D., Jo, B., Williams, L., Yeomans, D., Spiegel, D.

NATURE PUBLISHING GROUP.2017: S508–S509

- **It takes time to tune** *ANNALS OF TRANSLATIONAL MEDICINE*
Bentzley, B. S., Pannu, J., Badran, B. W., Halpern, C. H., Williams, N. R.
2017; 5 (7): 171
- **Neuroversion: using electroconvulsive therapy as a bridge to deep brain stimulation implantation** *NEUROCASE*
Williams, N. R., Sahlem, G., Pannu, J., Takacs, I., Short, B., Revuelta, G., George, M. S.
2017; 23 (1): 26-30
- **It Takes Time to Tune** *Annals of Translational Medicine*
Bentzley, B. S., Pannu, J., Badran, B. W., Halpern, C. H., Williams, N. R.
2017; In Press
- **Optimization of epidural cortical stimulation for treatment-resistant depression.** *Brain stimulation*
Williams, N. R., Bentzley, B. S., Hopkins, T., Pannu, J., Sahlem, G. L., Takacs, I., George, M. S., Nahas, Z., Short, E. B.
2017
- **Description of a Novel, Surgically Implanted Neuromodulatory Technique Known as Bilateral Epidural Prefrontal Cortical Stimulation (EpCS) for Treatment-Resistant Depression (TRD)** *Journal of Visualized Experiments*
Williams, N. R., Pannu, J., Bentzley, B. B., Hopkins, T., Badran, B. W., Short, E., George, M. S., Takacs, I., Nahas, Z.
2017; In Press
- **Unilateral ultra-brief pulse electroconvulsive therapy for depression in Parkinson's disease.** *Acta neurologica Scandinavica*
Williams, N. R., Bentzley, B. S., Sahlem, G. L., Pannu, J., Korte, J. E., Revuelta, G., Short, E. B., George, M. S.
2016
- **Reward circuit DBS improves Parkinson's gait along with severe depression and OCD** *NEUROCASE*
Williams, N. R., Hopkins, T. R., Short, E. B., Sahlem, G. L., Snipes, J., Revuelta, G. J., George, M. S., Takacs, I.
2016; 22 (2): 201-204
- **NMDA antagonist treatment of depression.** *Current opinion in neurobiology*
Williams, N. R., Schatzberg, A. F.
2016; 36: 112-117
- **Beyond Neural Cubism: Promoting a Multidimensional View of Brain Disorders by Enhancing the Integration of Neurology and Psychiatry in Education** *ACADEMIC MEDICINE*
Taylor, J. J., Williams, N. R., George, M. S.
2015; 90 (5): 581-586
- **Oscillating Square Wave Transcranial Direct Current Stimulation (tDCS) Delivered During Slow Wave Sleep Does Not Improve Declarative Memory More Than Sham: A Randomized Sham Controlled Crossover Study** *BRAIN STIMULATION*
Sahlem, G. L., Badran, B. W., Halford, J. J., Williams, N. R., Korte, J. E., Leslie, K., Strachan, M., Breedlove, J. L., Runion, J., Bachman, D. L., Uhde, T. W., Borckardt, J. J., George, et al
2015; 8 (3): 528-534
- **Adjunctive triple chronotherapy (combined total sleep deprivation, sleep phase advance, and bright light therapy) rapidly improves mood and suicidality in suicidal depressed inpatients: An open label pilot study** *JOURNAL OF PSYCHIATRIC RESEARCH*
Sahlem, G. L., Kalivas, B., Fox, J. B., Lamb, K., Roper, A., Williams, E. N., Williams, N. R., Korte, J. E., Zuschlag, Z. D., El Sabbagh, S., Guille, C., Barth, K. S., Uhde, et al
2014; 59: 101-107
- **Role of functional imaging in the development and refinement of invasive neuromodulation for psychiatric disorders.** *World journal of radiology*
Williams, N. R., Taylor, J. J., Lamb, K., Hanlon, C. A., Short, E. B., George, M. S.
2014; 6 (10): 756-778
- **Interventional Psychiatry: Why Now?** *JOURNAL OF CLINICAL PSYCHIATRY*
Williams, N. R., Taylor, J. J., Kerns, S., Short, E. B., Kantor, E. M., George, M. S.
2014; 75 (8): 895-897
- **Interventional Psychiatry: How Should Psychiatric Educators Incorporate Neuromodulation into Training?** *ACADEMIC PSYCHIATRY*

- Williams, N. R., Taylor, J. J., Snipes, J. M., Short, E. B., Kantor, E. M., George, M. S.
2014; 38 (2): 168-176
- **STN vs. GPi Deep Brain Stimulation: Translating the Rematch into Clinical Practice.** *Movement disorders clinical practice*
Williams, N. R., Foote, K. D., Okun, M. S.
2014; 1 (1): 24-35
 - **Incidence of sport-related traumatic brain injury and risk factors of severity: a population-based epidemiologic study** *ANNALS OF EPIDEMIOLOGY*
Selassie, A. W., Wilson, D. A., Pickelsimer, E. E., Voronca, D. C., Williams, N. R., Edwards, J. C.
2013; 23 (12): 750-756
 - **Unique Case of "Post-Lumbar Puncture Headache"** *HEADACHE*
Patel, B. A., Williams, N. R., Pritchard, P. B.
2013; 53 (9): 1479-1481
 - **Sports-Related Concussions** *PEDIATRIC EMERGENCY CARE*
Upshaw, J. E., Gosserand, J. K., Williams, N., Edwards, J. C.
2012; 28 (9): 926-935
 - **High school coaches perceptions of physicians' role in the assessment and management of sports-related concussive injury.** *Frontiers in neurology*
Williams, N., Sas, A., Madey, J., Bodle, J., Scovel, L., Edwards, J.
2012; 3: 130-?
 - **Diagnosis, Treatment, and Long-Term Outcomes of Late-Onset (Type III) Multiple Acyl-CoA Dehydrogenase Deficiency** *JOURNAL OF CHILD NEUROLOGY*
Pollard, L. M., Williams, N. R., Espinoza, L., Wood, T. C., Spector, E. B., Schroer, R. J., Holden, K. R.
2010; 25 (8): 954-960
 - **Relapse rates with long-term antidepressant drug therapy: a meta-analysis** *HUMAN PSYCHOPHARMACOLOGY-CLINICAL AND EXPERIMENTAL*
Williams, N., Simpson, A. N., Simpson, K., Nahas, Z.
2009; 24 (5): 401-408