Stanford



Corey Keller, MD, PhD

Associate Professor of Psychiatry and Behavioral Sciences (Public Mental Health and Population Sciences)

NIH Biosketch available Online Curriculum Vitae available Online

CONTACT INFORMATION

- **Alternate Contact**

  Email ckeller1@stanford.edu

Bio

BIO

Dr. Keller is an Associate Professor of Psychiatry and Behavioral Sciences at Stanford University and an Associate Professor at the Veterans Affairs PaloAlto Health Care System (VAPAHCS). He is a member of Stanford Bio-X and the Wu Tsai Neurosciences Institute. Dr. Keller received his MD and PhD in neuroscience from the Medical Scientist Training Program at Albert Einstein College of Medicine. He completed his residency in psychiatry at Stanford University Medical Center focused on interventional psychiatry. Dr Keller has received several grants including the F31, T32, K23, DP5 Early Independence Award, SBIR, and R01 awards. He co-developed a fully automated non-invasive brain mapping technique used across industry and academia, and has run two clinical trials (NCT01829165 and NCT02843373) collecting over 1500 participants across ten clinical centers. Dr. Keller has extensive experience in the assessment and management of individuals with treatment-resistant depression. He has developed methodology for capturing the neurophysiology of human brain networks and the effect of stimulation through invasive and non-invasive electrophysiology.

The overarching goal of Dr. Keller’s Laboratory, the Stanford Precision Neurotherapeutics Lab (precisionneuro.stanford.edu) is to improve brain stimulation treatment for neurological and psychiatric disease. His lab focuses on understanding the neural mechanisms of how brain stimulation technologies induce alter brain circuits in an effort to develop novel, personalized, and more effective brain stimulation treatments. His lab combines invasive and noninvasive human electrophysiology to answer these critical questions.

ACADEMIC APPOINTMENTS

- Associate Prof-Univ Med Line, Psychiatry and Behavioral Sciences
- Member, Bio-X
- Member, Wu Tsai Neurosciences Institute

HONORS AND AWARDS

- NIH Director's Early Independence Award (DP5), NIH (2019)
- BWF Career Awards for Medical Scientists (CAMS), Burroughs Wellcome Fund (2019)
- NIH K23 Mentored Patient-Oriented Research Career Development Award, NIMH (2019)
- NIMH T32 Postdoctoral Fellowship, Stanford University (2018)
- Alpha Omega Alpha Medical Honor Society, Alpha Omega Alpha (2018)
- Collaborative Research Fellowship, Stanford Society of Physician Scholars (2018)

- Career Development Institute for Psychiatry, Stanford University (2018)
- Outstanding Resident Award, NIMH (2017)
- New Investigator Award, American Society of Clinical Psychopharmacology (2017)
- Travel Fellowship, Winter Conference on Brain Research (2016)
- Early Career Investigator Travel Award, Society of Biological Psychiatry (2016)
- Postgraduate Research Award, Alpha Omega Alpha (2016)
- Fellowship for Clinical Trials, American Society of Clinical Psychopharmacology (2016)
- Collaborative Research Fellowship, Stanford Society of Physician Scholars (2015)
- Medical School Scholar, Society of Biological Psychiatry (2015)
- Senior Research Fellowship, Albert Einstein College of Medicine (2014)
- Combining Clinical and Research Careers in Neuroscience Travel Award, NINDS (2014)
- Endowed Scholarship Fund, Neural Systems and Behavior Course (2013)
- Medical Scientist Training Program Pre-Doctoral Fellowship, Ruth L. Kirschstein National Research Service Award (2011-2015)
- Pre-Doctoral Research Training Fellowship, Epilepsy Foundation (2010-2011)
- Grant for Summer Research, Albert Einstein College of Medicine (2009)
- Master’s Thesis Highest Honors, Tufts University (2009)
- Magna Cum Laude and Senior Thesis Highest Honors, Tufts University (2007)
- Eta Kappa Nu – Electrical Engineering Honors Society, Tufts University (2007)
- Dean’s List Honors, Tufts University (2004-2007)

BOARDS, ADVISORY COMMITTEES, PROFESSIONAL ORGANIZATIONS

- Board of Directors, Clinical TMS Society (2023 - present)
- Associate Member, American College of Neuropsychopharmacology (ACNP) (2023 - present)
- Diplomate, American Board of Psychiatry and Neurology (2019 - present)
- Research and Scientific Oversight, International Neuromodulation Society (2016 - present)
- Research Committee Member, Clinical TMS Society (2017 - present)

PROFESSIONAL EDUCATION

- Post-doctoral Fellowship, Stanford University , Neuroscience (2019)
- Residency, Stanford University , Psychiatry (2019)
- MD, Albert Einstein College of Medicine , Medicine (2015)
- PhD, Albert Einstein College of Medicine , Neuroscience (2015)
- MS, Tufts University , Biomedical Engineering (2009)
- BS, Tufts University , Electrical Engineering (2007)

PATENTS

- Corey Keller, Amit Etkin, Wei Wu. "United States Patent 41243-520P01US, Patent Pending Use of a brain-based signal for predicting and guiding brain stimulation treatment in depression"
- Corey Keller, Amit Etkin, Wei Wu. "United States Patent 41243-520P02US, Patent Pending Artifact Rejection for Transcranial Magnetic Stimulation Electroencephalogram Data."
- Corey Keller, Jessica Ross. "United States Patent 18/587,541 Systems and Methods for Sensory Entrained Transcranial Magnetic Stimulation", Stanford, Feb 1, 2024

LINKS

- Stanford Precision Neurotherapeutics Lab: http://precisionneuro.stanford.edu/

Research & Scholarship

CURRENT RESEARCH AND SCHOLARLY INTERESTS

The overarching goal of Dr. Keller’s Laboratory, Stanford Precision Neurotherapeutics Lab (precisionneuro.stanford.edu) is to improve brain stimulation treatment for neurological and psychiatric disease. His lab focuses on understanding the neural mechanisms of how brain stimulation technologies alter brain circuits in an effort to develop novel, personalized, and more effective brain stimulation treatments. Specifically, his lab seeks to identify and apply individualized stimulation protocols to elicit precise and predictable long-term plasticity in order to alleviate psychiatric suffering. His lab combines invasive and noninvasive human electrophysiology to answer these critical questions.

TMS is a non-invasive brain stimulation technique focused on normalizing dysfunctional brain networks and is FDA-approved for depression, OCD, migraines, and smoking cessation, with clinical trials underway for PTSD, addiction, and Alzheimers. Unfortunately, TMS is typically applied in a one-size-fits-all manner without reference to one’s biology, and as such we are in critical need for a personalized and more effective approach. Dr. Keller's seeks to improve Transcranial Magnetic Stimulation (TMS) and other brain stimulation techniques by better understanding the fundamental principles of human brain plasticity and building trans-diagnostic real-time monitoring platforms for personalized brain stimulation.

Dr. Keller's lab performs translational research at the intersection of neuroscience, electrophysiology, brain stimulation, neuroengineering, psychiatry, and precision therapeutics. Their work suggests that brain-based biomarkers may be used to predict non-responders to TMS treatment, monitor brain networks during intervention, and be used to propose novel targets and treatment paradigms.

This work has the expected outcome of producing novel stimulation treatments with enhanced specificity, plasticity, and efficacy. By increasing our understanding of the underlying mechanism and monitoring of brain changes during TMS, we will markedly increase the utility of these powerful techniques. Together, this work will help transform interventional psychiatry from an isolated (from a clinic perspective), one-size-fits-all treatment approach to one that focuses on targeting objective biomarkers and that is collaborative, large-scale, and automated, pushing the field into the age of personalized neuromodulation.

Dr. Keller emphasizes an environment conducive to team-based learning in order to train the next generation of clinically-informed circuit neuroscientists, question the status quo with rigorous scientific experiments, and make important contributions in understanding how brain stimulation alters neural circuits and behavior and translate these findings to develop targeted, personalized, and more effective treatments.

CLINICAL TRIALS

- Closed-loop Optimized rTMS for Depression, Recruiting
- Probing the Dorsolateral Prefrontal Cortex and Central Executive Network for Improving Neuromodulation in Depression, Recruiting
- Brain-Based Biomarkers in Response to TMS in MDD, Not Recruiting
- Investigating the Neural Mechanisms of Repetitive Brain Stimulation With Invasive and Noninvasive Electrophysiology in Humans, Not Recruiting
- Sleep TMS for Depression, Not Specified

Teaching

STANFORD ADVISEES

Med Scholar Project Advisor

Maximilian Bailey

Postdoctoral Faculty Sponsor

Giacomo Bertazzoli, Sara Crellin, Apoorva Karekal, Sannan Ur Rehman, Leonhard Schreiner

Doctoral Dissertation Co-Advisor (NonAC)

Samantha Gray, Christopher Minasi, Sabra Sisler

Publications

PUBLICATIONS

- **Transcranial magnetic stimulation to the dorsolateral prefrontal cortex modulates single-neuron activity in humans.** *Proceedings of the National Academy of Sciences of the United States of America*
  Dickey, C. W., Hassan, U., Kawasaki, H., Rhone, A. E., Cline, C. C., Howard, M. A., Trapp, N. T., Boes, A. D., Berger, J. I., Keller, C. J.
  2026; 123 (45): e2610803123

- **Neurophysiological signatures of Stanford Neuromodulation Therapy in treatment resistant depression.** *Molecular psychiatry*
  Momi, D., Buchanan, D. M., Wada, M., Geoly, A. D., Johnson, N. J., Cole, E. J., Maron-Katz, A., Tischler, C., Cline, C. C., Pizzagalli, D. A., Saggar, M., Voineskos, D., Griffiths, et al
  2026

- **Transcranial magnetic stimulation to the dorsolateral prefrontal cortex modulates single-neuron activity in humans.** *bioRxiv : the preprint server for biology*
  Dickey, C. W., Hassan, U., Kawasaki, H., Rhone, A. E., Cline, C. C., Howard, M. A., Trapp, N. T., Boes, A. D., Berger, J. I., Keller, C. J.
  2026

- **Personalizing Brain Stimulation for Psychiatric Disorders: From Circuits to Closed-Loop Control.** *The American journal of psychiatry*
  Cline, C. C., Keller, C. J.
  2026; 183 (3): 169-179

- **DLPFC TMS Suppresses High-Frequency Neural Activity in the Human sgACC.** *Brain stimulation*
  Solomon, E. A., Hassan, U., Trapp, N. T., Boes, A. D., Keller, C. J.
  2025

- **High-resolution electrophysiological mapping of effective connectivity of lateral prefrontal cortex.** *Brain : a journal of neurology*
  Avalos-Alais, S., Jedynak, M., Boyer, A., Chanteloup-Forêt, B., Pinheiro, C., Cline, C. C., Parmigiani, S., Alemán-Gómez, Y., Hagmann, P., Keller, C. J., David, O.
  2025

- **NaviNIBS: a comprehensive and open-source software toolbox for neuronavigated noninvasive brain stimulation.** *Journal of neural engineering*
  Cline, C. C., Forman, L., Hartford, W., Truong, J. T., Parmigiani, S., Keller, C. J.
  2025

- **Magnesium-ibogaine therapy effects on cortical oscillations and neural complexity in veterans with traumatic brain injury** *NATURE MENTAL HEALTH*
  Lissemore, J. I., Chaiken, A., Cherian, K. N., Buchanan, D., Espil, F., Keynan, J. N., Sridhar, M., Rolle, C. E., Saggar, M., Keller, C. J., Williams, N. R.
  2025

- **Sensory Entrained TMS (seTMS) Enhances Motor Cortex Excitability.** *Human brain mapping*
  Ross, J. M., Forman, L., Gogulski, J., Hassan, U., Cline, C. C., Parmigiani, S., Truong, J., Hartford, J. W., Chen, N. F., Fujioka, T., Makeig, S., Pascual-Leone, A., Keller, et al

2025; 46 (10): e70267

- **Naturalistic acute pain states decoded from neural and facial dynamics.** *Nature communications*
  Huang, Y., Gopal, J., Kakusa, B., Li, A. H., Huang, W., Wang, J. B., Persad, A., Ramayya, A., Parvizi, J., Buch, V. P., Keller, C. J.
  2025; 16 (1): 4371

- **Scalp EEG predicts intracranial brain activity in humans.** *bioRxiv : the preprint server for biology*
  Subramanian, A. K., Talbot, A., Kim, N., Parmigiani, S., Cline, C. C., Solomon, E. A., Hartford, J. W., Huang, Y., Mikulan, E., Zauli, F. M., d'Orio, P., Cardinale, F., Mannini, et al
  2025

- **Stimulation mapping and whole-brain modeling reveal gradients of excitability and recurrence in cortical networks.** *Nature communications*
  Momi, D., Wang, Z., Parmigiani, S., Mikulan, E., Bastiaens, S. P., Oveisi, M. P., Kadak, K., Gaglioti, G., Waters, A. C., Hill, S., Pigorini, A., Keller, C. J., Griffiths, et al
  2025; 16 (1): 3222

- **Real-time optimization to enhance noninvasive cortical excitability assessment in the human dorsolateral prefrontal cortex.** *Clinical neurophysiology : official journal of the International Federation of Clinical Neurophysiology*
  Parmigiani, S., Cline, C. C., Sarkar, M., Forman, L., Truong, J., Ross, J. M., Gogulski, J., Keller, C. J.
  2025

- **Theta-burst direct electrical stimulation remodels human brain networks.** *Nature communications*
  Huang, Y., Zelmann, R., Hadar, P., Dezha-Peralta, J., Richardson, R. M., Williams, Z. M., Cash, S. S., Keller, C. J., Paulk, A. C.
  2024; 15 (1): 6982

- **Real-time optimization to enhance noninvasive cortical excitability assessment in the human dorsolateral prefrontal cortex.** *bioRxiv : the preprint server for biology*
  Parmigiani, S., Cline, C. C., Sarkar, M., Forman, L., Truong, J., Ross, J. M., Gogulski, J., Keller, C. J.
  2024

- **TMS provokes target-dependent intracranial rhythms across human cortical and subcortical sites.** *Brain stimulation*
  Solomon, E. A., Wang, J. B., Oya, H., Howard, M. A., Trapp, N. T., Uitermarkt, B. D., Boes, A. D., Keller, C. J.
  2024

- **Mapping cortical excitability in the human dorsolateral prefrontal cortex.** *Clinical neurophysiology : official journal of the International Federation of Clinical Neurophysiology*
  Gogulski, J., Cline, C. C., Ross, J. M., Truong, J., Sarkar, M., Parmigiani, S., Keller, C. J.
  2024; 164: 138-148

- **TMS Provokes Target-Dependent Intracranial Rhythms Across Human Cortical and Subcortical Sites**
  Solomon, E., Wang, J., Oya, H., Howard, M., Trapp, N., Uitermarkt, B., Boes, A., Keller, C.
  ELSEVIER SCIENCE INC.2024: S75

- **Reliability of the TMS-evoked potential in dorsolateral prefrontal cortex.** *Cerebral cortex (New York, N.Y. : 1991)*
  Gogulski, J., Cline, C. C., Ross, J. M., Parmigiani, S., Keller, C. J.
  2024; 34 (4)

- **Effects of transcranial magnetic stimulation on the human brain recorded with intracranial electrocorticography.** *Molecular psychiatry*
  Wang, J. B., Hassan, U., Bruss, J. E., Oya, H., Uitermarkt, B. D., Trapp, N. T., Gander, P. E., Howard, M. A., Keller, C. J., Boes, A. D.
  2024

- **Experimental suppression of transcranial magnetic stimulation-electroencephalography sensory potentials.** *Human brain mapping*
  Ross, J. M., Sarkar, M., Keller, C. J.
  2022

- **Intracortical dynamics underlying repetitive stimulation predicts changes in network connectivity.** *The Journal of neuroscience : the official journal of the Society for Neuroscience*
  Huang, Y., Hajnal, B., Entz, L., Fabo, D., Herrero, J. L., Mehta, A. D., Keller, C. J.
  2019

- **Brain Stimulation Therapies** *AMERICAN PSYCHIATRIC ASSOCIATION PUBLISHING TEXTBOOK OF PSYCHIATRY, 7TH EDITION*

Keller, C., Bhati, M. T., Downar, J., Etkin, A.
edited by Roberts, L. W.
2019: 861–98

- **Induction and Quantification of Excitability Changes in Human Cortical Networks** *JOURNAL OF NEUROSCIENCE*
  Keller, C. J., Huang, Y., Herrero, J. L., Fini, M. E., Du, V., Lado, F. A., Honey, C. J., Mehta, A. D.
  2018; 38 (23): S384–S398

- **Mapping human brain networks with cortico-cortical evoked potentials** *PHILOSOPHICAL TRANSACTIONS OF THE ROYAL SOCIETY B-BIOLOGICAL SCIENCES*
  Keller, C. J., Honey, C. J., Megevand, P., Entz, L., Ulbert, I., Mehta, A. D.
  2014; 369 (1653)

- **Neurophysiological Investigation of Spontaneous Correlated and Anticorrelated Fluctuations of the BOLD Signal** *JOURNAL OF NEUROSCIENCE*
  Keller, C. J., Bickel, S., Honey, C. J., Groppe, D. M., Entz, L., Craddock, R. C., Lado, F. A., Kelly, C., Milham, M., Mehta, A. D.
  2013; 33 (15): 6333-6342

- **Intrinsic functional architecture predicts electrically evoked responses in the human brain** *PROCEEDINGS OF THE NATIONAL ACADEMY OF SCIENCES OF THE UNITED STATES OF AMERICA*
  Keller, C. J., Bickel, S., Entz, L., Ulbert, I., Milham, M. P., Kelly, C., Mehta, A. D.
  2011; 108 (25): 10308-10313

- **Heterogeneous neuronal firing patterns during interictal epileptiform discharges in the human cortex** *BRAIN*
  Keller, C. J., Truccolo, W., Gale, J. T., Eskandar, E., Thesen, T., Carlson, C., Devinsky, O., Kuzniecky, R., Doyle, W. K., Madsen, J. R., Schomer, D. L., Mehta, A. D., Brown, et al
  2010; 133: 1668-1681

- **Early brain functional connectivity changes induced by antidepressants and placebo.** *Nature. Mental health*
  Tong, X., Fonzo, G. A., Carlisle, N. B., Xie, H., Berdichevsky, Y., Keller, C. J., Oathes, D. J., Nemeroff, C. B., Lin, F. V., Zhang, Y.
  2026; 4 (11): 1642-1659

- **Correction: Neurophysiological signatures of Stanford Neuromodulation Therapy in treatment resistant depression.** *Molecular psychiatry*
  Momi, D., Buchanan, D. M., Wada, M., Geoly, A. D., Johnson, N. J., Cole, E. J., Maron-Katz, A., Tischler, C., Cline, C. C., Pizzagalli, D. A., Saggar, M., Voineskos, D., Griffiths, et al
  2026

- **Excitation-Inhibition Balance and Fronto-Limbic Connectivity Distinguish TMS Treatment Outcomes in Refractory Depression.** *Biological psychiatry*
  Momi, D., Wang, Z., Oveisi, M. P., Kadak, K., Bastiaens, S. P., Lissemore, J. I., Noda, Y., Downar, J., Rodriguez, F. V., Strafella, R., Daskalakis, Z. J., Zrenner, C., Zomorrodi, et al
  2026

- **Direct cortical stimulation induces short-term modulation of neural oscillations in humans.** *Journal of neurophysiology*
  Munot, S., Kim, N., Huang, Y., Keller, C. J.
  2026

- **Early brain functional connectivity changes induced by antidepressants and placebo** *NATURE MENTAL HEALTH*
  Tong, X., Fonzo, G. A., Carlisle, N. B., Xie, H., Berdichevsky, Y., Keller, C. J., Oathes, D. J., Nemeroff, C. B., Lin, F., Zhang, Y.
  2026

- **Rectangular Pulse Three-Hour Repetitive Transcranial Magnetic Stimulation Treatment for Major Depressive Disorder: A Pilot Trial.** *Neuromodulation : journal of the International Neuromodulation Society*
  Goodman, M. S., Blumberger, D. M., Talebinejad, M., Chan, A. D., Tilman, Y., Johnson, D., Costa, R., Chen, R., Sudheimer, K., Keller, C. J., Ramgopal, K., Yang, T. T.
  2026

- **Effects of Dorsolateral Prefrontal Cortex Trans cranial Magnetic Stimulation Revealed With Intracranial Electroencephalography**
  Tatz, J., Liu, X., Li, Z., Bruss, J., Pace, B., Hassan, U., Tsang, E., Howard, M., Keller, C., Boes, A., Jiang, J., Trapp, N.
  ELSEVIER SCIENCE INC.2026: S405

- **Fronto-insular circuit mechanisms of accelerated intermittent theta burst stimulation.** *Cell*
  Johnson, S. B., Rocks, D., Chalençon, L., Johnson, K., Hassan, U., Arefin, A., Akgül, G., Donatelle, A., Asher, H., Elbau, I., Estrin, D., Zhang, R., Lenz, et al
  2026

- **Clinical utility and prospective of TMS-EEG: Updated review from an international expert group.** *Clinical neurophysiology : official journal of the International Federation of Clinical Neurophysiology*
  Ziemann, U., Bai, Y., Baumer, F. M., Beck, M. M., Belardinelli, P., Belvisi, D., Bender, S., Bergmann, T. O., Bortoletto, M., Casarotto, S., Casula, E., Chaves, A. R., de Andrade, et al
  2026: 2111487

- **Generative Principal Component Regression via Variational Inference** *IEEE TRANSACTIONS ON SIGNAL PROCESSING*
  Talbot, A., Keller, C. J., Trevino, C., Carlson, D. E., Dammer, E. B., Johnson, E. C. B., Wingo, T. S., Kotlar, A. V.
  2026; 74: 1656-1670

- **Generalizable structure-function covariation predictive of antidepressant response revealed by target-oriented multimodal fusion.** *Nature. Mental health*
  Tong, X., Zhao, K., Fonzo, G. A., Xie, H., Carlisle, N. B., Keller, C. J., Oathes, D. J., Sheline, Y., Nemeroff, C. B., Trivedi, M., Etkin, A., Zhang, Y.
  2026; 4 (1): 85-101

- **LOCAL THETA POWER CHANGES AS A RELIABLE BIOMARKER OF ITBS TARGET ENGAGEMENT**
  Solomon, E., Cline, C., Hassan, U., Truong, J., Hartford, W., Forman, L., Keller, C.
  SPRINGERNATURE.2026

- **A Practical Preprocessing Pipeline for Concurrent TMS-iEEG: Critical Steps and Methodological Considerations.** *NeuroImage*
  Li, Z., Liu, X., Tatz, J., Tsang, E. W., Hassan, U., Wang, J. B., Keller, C. J., Trapp, N. T., Boes, A. D., Jiang, J.
  2025: 121677

- **Distinct neural temporal architectures encode rapid social expressions and sustained internal mood states.** *bioRxiv : the preprint server for biology*
  Kakusa, B., Gopal, J. R., Forman, L., Hartford, J. W., Brennan, T., Pantis, S., Persad, A. R., Cline, C. C., Buch, V. P., Parvizi, J., Huang, Y., Keller, C. J.
  2025

- **Generalizable structure-function covariation predictive of antidepressant response revealed by target-oriented multimodal fusion** *NATURE MENTAL HEALTH*
  Tong, X., Zhao, K., Fonzo, G. A., Xie, H., Carlisle, N. B., Keller, C. J., Oathes, D. J., Sheline, Y., Nemeroff, C. B., Trivedi, M., Etkin, A., Zhang, Y.
  2025

- **Transcranial magnetic stimulation with intracranial recording in humans and primates: a review.** *Brain : a journal of neurology*
  Tsang, E. W., Tatz, J. R., Hassan, U., Berger, J. I., Boes, A. D., Keller, C. J., Russo, S., Kaskan, P., Jiang, J., Trapp, N. T.
  2025

- **Noninvasive profiling of input-output excitability curves in human prefrontal cortex.** *bioRxiv : the preprint server for biology*
  Chen, N. F., Hassan, U., Ross, J. M., Forman, L., Hartford, J. W., Gogulski, J., Parmigiani, S., Truong, J., Keller, C. J., Cline, C. C.
  2025

- **A Practical Preprocessing Pipeline for Concurrent TMS-iEEG: Critical Steps and Methodological Considerations.** *bioRxiv : the preprint server for biology*
  Li, Z., Liu, X., Tatz, J., Hassan, U., Wang, J. B., Keller, C. J., Trapp, N. T., Boes, A. D., Jiang, J.
  2025

- **Dorsolateral prefrontal cortex TMS evokes responses in the subgenual anterior cingulate cortex: Intracranial EEG evidence from two human cases.** *Brain stimulation*
  Trapp, N. T., Liu, X., Li, Z., Bruss, J., Keller, C. J., Boes, A. D., Jiang, J.
  2025

- **Deep graph learning of multimodal brain networks defines treatment-predictive signatures in major depression.** *Molecular psychiatry*
  Jiao, Y., Zhao, K., Wei, X., Carlisle, N. B., Keller, C. J., Oathes, D. J., Fonzo, G. A., Zhang, Y.
  2025

- **Dorsolateral prefrontal cortex TMS evokes responses in the subgenual anterior cingulate cortex: Evidence from human intracranial EEG.** *bioRxiv : the preprint server for biology*
  Trapp, N. T., Liu, X., Li, Z., Bruss, J., Keller, C. J., Boes, A. D., Jiang, J.
  2024
- **Sensory Entrained TMS (seTMS) enhances motor cortex excitability.** *bioRxiv : the preprint server for biology*
  Ross, J. M., Forman, L., Gogulski, J., Hassan, U., Cline, C. C., Parmigiani, S., Truong, J., Hartford, J. W., Chen, N. F., Fujioka, T., Makeig, S., Pascual-Leone, A., Keller, et al
  2024
- **Contrastive Functional Connectivity Defines Neurophysiology-informed Symptom Dimensions in Major Depression.** *bioRxiv : the preprint server for biology*
  Zhu, H., Tong, X., Carlisle, N. B., Xie, H., Keller, C. J., Oathes, D. J., Nemeroff, C. B., Fonzo, G. A., Zhang, Y.
  2024
- **Intracortical mechanisms of single pulse electrical stimulation (SPES) evoked excitations and inhibitions in humans.** *Scientific reports*
  Hajnal, B., Szabó, J. P., Tóth, E., Keller, C. J., Wittner, L., Mehta, A. D., Erőss, L., Ulbert, I., Fabó, D., Entz, L.
  2024; 14 (1): 13784
- **Identifying Brain-Clinical Dimensions in Major Depression Using Contrastive Connectivity Analysis**
  Zhu, H., Tong, X., Fonzo, G., Oathes, D., Keller, C., Zhang, Y.
  ELSEVIER SCIENCE INC.2024: S166
- **Naturalistic acute pain states decoded from neural and facial dynamics.** *bioRxiv : the preprint server for biology*
  Huang, Y., Gopal, J., Kakusa, B., Li, A. H., Huang, W., Wang, J. B., Persad, A., Ramayya, A., Parvizi, J., Buch, V. P., Keller, C.
  2024
- **Simultaneous invasive and non-invasive recordings in humans: a novel Rosetta stone for deciphering brain activity.** *Journal of neuroscience methods*
  Pigorini, A., Avanzini, P., Barborica, A., Bénar, C. G., David, O., Farisco, M., Keller, C. J., Manfridi, A., Mikulan, E., Paulk, A. C., Roehri, N., Subramanian, A., Vulliémoz, et al
  2024: 110160
- **TMS-associated auditory evoked potentials can be effectively masked: Evidence from intracranial EEG.** *Brain stimulation*
  Trapp, N. T., Tsang, E. W., Bruss, J., Russo, S., Gander, P. E., Berger, J. I., Nourski, K. V., Rosanova, M., Keller, C. J., Oya, H., Howard, M. A., Boes, A. D.
  2024
- **Optimizing Antidepressant Efficacy: Multimodal Neuroimaging Biomarkers for Prediction of Treatment Response.** *medRxiv : the preprint server for health sciences*
  Tong, X., Zhao, K., Fonzo, G. A., Xie, H., Carlisle, N. B., Keller, C. J., Oathes, D. J., Sheline, Y., Nemeroff, C. B., Williams, L. M., Trivedi, M., Etkin, A., Zhang, et al
  2024
- **Individual deviations from normative electroencephalographic connectivity predict antidepressant response.** *Journal of affective disorders*
  Tong, X., Xie, H., Wu, W., Keller, C. J., Fonzo, G. A., Chidharom, M., Carlisle, N. B., Etkin, A., Zhang, Y.
  2024
- **Neural effects of TMS trains on the human prefrontal cortex.** *Scientific reports*
  Ross, J. M., Cline, C. C., Sarkar, M., Truong, J., Keller, C. J.
  2023; 13 (1): 22700
- **Direct cortical stimulation induces short-term plasticity of neural oscillations in humans.** *bioRxiv : the preprint server for biology*
  Munot, S., Kim, N., Huang, Y., Keller, C. J.
  2023
- **Reliability of the TMS-evoked potential in dorsolateral prefrontal cortex.** *bioRxiv : the preprint server for biology*
  Gogulski, J., Cline, C. C., Ross, J. M., Parmigiani, S., Keller, C. J.
  2023
- **TMS provokes target-dependent intracranial rhythms across human cortical and subcortical sites.** *bioRxiv : the preprint server for biology*

Solomon, E. A., Wang, J. B., Oya, H., Howard, M. A., Trapp, N. T., Uitermarkt, B. D., Boes, A. D., Keller, C. J.
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