

## Brett L. Foster Ph.D.

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### Academic Appointments

Assistant Professor	University of Pennsylvania Perelman School of Medicine Department of Neurosurgery	2021 – Present
Assistant Professor	Baylor College of Medicine Department of Neurosurgery & Department of Neuroscience	2016 – 2020

### Education

Postdoctoral Fellow	Stanford University Department of Psychology (A. Wagner)	2014 – 2016
Postdoctoral Fellow	Stanford University Department of Neurology & Neurological Sciences (J. Parvizi)	2010 – 2014
Ph.D.	Swinburne University of Technology Major: Neuroscience (D. Liley)	2005 – 2009
B.Sc.(Hons)	Swinburne University of Technology Major: Psychophysiology (1st class honors)	2001– 2004

### Awards

<i>Career Development Award K99/R00, NIH (NIMH)</i>	2014 – 2020
<i>Dean's Postdoctoral Fellowship, School of Medicine Stanford University</i>	2010 – 2011
<i>Swinburne University Postgraduate Research Award (PhD scholarship)</i>	2005 – 2008

### Funding (current)

NIH (NIMH) R01 MH116914	\$1,981,250	2018 – 2023
<i>Sensory reinstatement in human neocortex</i>		
<u>Role</u> : PI		

NIH (NIMH) **R01** MH129439 \$3,456,557 2022 – 2027  
*Posterior cingulate cortex and executive control of episodic memory*  
Role: **PI** [Co-PI: B. Hayden; University of Minnesota]

ERC **Consolidator Grant** 101001121 €1,963,488 2022 – 2026  
*Sculpting memories during sleep*  
Role: **Collaborator** [PI: B. Staresina; University of Oxford]

### Funding (completed)

NIH (NIDC) **R01** DC018579-01 \$2,756,787 2021 – 2026  
*Invasive and non-invasive electrophysiological approaches to understanding functional organization of speech in the brain*  
Role: **Co-I** (Ended role due to institution change) [PI: L. Hamilton; UT Austin]

NIH (NIMH) **R00** MH103479 \$746,853 2016 – 2020  
*Spatiotemporal investigations of parietal cortex contributions to episodic memory*  
Role: **PI**

NIH (NIMH) **K99** MH103479 \$171,915 2014 – 2016  
*Spatiotemporal investigations of parietal cortex contributions to episodic memory*  
Role: **PI**

ARC (Australia) **DP** 130100194 \$489,000 (AUD) 2013 – 2015  
*The neuronal basis of visual consciousness: how brain rhythms control the doors of perception*  
Role: **Partner Investigator** [PI: N. Tsuchiya; Monash University, Aus.]

### Publications

44. Foster BL, Koslov S, Aponik-Gremillion L, Monko M, Hayden B, Heilbronner S. *A tripartite view of posterior cingulate cortex.* (2022). Nature Reviews Neuroscience. Dec 1<sup>st</sup>.

43. Aponik-Gremillion L, Chen Y, Bartoli E, Koslov SR, Rey HG, Weiner KS, Yoshor D, Hayden BY, Sheth SA, Foster BL. *Distinct population and single-neuron selectivity for executive and episodic processing in human dorsal posterior cingulate.* (2022). eLife, 11: e80722.

42. Willbrand EH, Parker BJ, Voorhies WI, Miller JA, Lyu I, Hallock T, Aponik-Gremillion L, Alzheimer's Disease Neuroimaging Initiative, Bunge SA, Foster BL, Weiner KS. *A new tripartite landmark in posterior cingulate cortex.* (2022). Science Advances, 8: eabn9516.

41. Bosking W, Oswald D, Foster BL, Sun P, Beauchamp M, Yoshor D. *Percepts evoked by multi-electrode stimulation of human visual cortex.* (2022). Brain Stimulation, S1935-861X(22)00185-1.

40. Foster BL, Bartoli E. *Aligning evidence for the genesis of visual gamma oscillations.* (2022). PLoS Biology, 20(6): e3001701.

39. Li Y, Bosking W, Beauchamp M, Sheth SA, Yoshor D, Bartoli E, Foster BL. *Biased orientation and color tuning of the human visual gamma rhythm*. (2022). Journal of Neuroscience, 42(6): 1054-1067.
38. Chen Y, Aponik-Gremillion L, Bartoli E, Yoshor D, Sheth SA, Foster BL. *Stability of ripple events during task engagement in human hippocampus*. (2021). Cell Reports, 35(13): 109304.
37. Fox KCR, Shi L, Baek S, Raccah O, Foster BL, Margulies DS, Kucyi A, Parvizi J. *Hierarchical cortical gradients predict the effects elicited by human intracranial brain stimulation*. (2020). Nature Human Behavior, 4(10):1039-1052.  
\*News and Views: "Hot or not". Koch, C. (2020). Nature Human Behavior.
36. Beauchamp MS, Oswald D, Sun P, Foster BL, Magnotti J, Niketeghad S, Pouratian N, Bosking W, Yoshor D. *Dynamic stimulation of visual cortex produces form vision in sighted and blind humans*. (2020). Cell, 181(4): 774-783.  
\*Preview: "Writing to the mind's eye of the blind". Roelfsema, R. (2020). Cell, 181: 758-9.
35. Bartoli E, Bosking W, Foster BL. *Seeing visual gamma oscillations in a new light*. (2020). Trends in Cognitive Sciences, 24(7): 501-503.
34. Bartoli E, Bosking W, Chen Y, Li Y, Sheth SA, Beauchamp MS, Yoshor D, Foster BL. *Functionally distinct gamma range activity revealed by stimulus tuning in human visual cortex*. (2019). Current Biology, 29(20): 1-14.
33. Holdgraf C. ... Foster BL, ... Hermes D. *BIDS-iEEG: an extension to the brain imaging data structure (BIDS) specification for human intracranial electrophysiology*. (2019). Nature-Scientific Data, 6:102.
32. Kucyi A, Schrouff J, Bickel S, Foster BL, Shine JM, Parvizi J. *Intracranial electrophysiology reveals reproducible intrinsic functional connectivity within human brain networks*. (2018). Journal of Neuroscience, 38(17): 4230-42.
31. Fox KCR, Foster BL, Kucyi A, Daitch A, Parvizi J. *Intracranial electrophysiology of the human default network*. (2018). Trends in Cognitive Science, 22(4): 307-24.
30. Maheshwari A, Akbar I, Wang M, Marks R, Yu K, Foster BL, Noebels J. *Persistent aberrant cortical phase-amplitude coupling following seizure treatment in absence epilepsy models*. (2017). Journal of Physiology, 595(23): 7249-60.  
\*Highlight: "Disclosing hidden information in the electroencephalogram using advanced signal analytical techniques". Luttjohann A. (2017). Journal of Physiology, 595(23): 7021-22.
29. Shine JM, Kucyi A, Foster BL, Bickel S, Wang D, Liu H, Poldrack R, Hsieh L, Hsiang J, Parvizi J. *Distinct patterns of temporal and directional connectivity among intrinsic networks in the human brain*. (2017). Journal of Neuroscience, 37(40): 9667-74.

28. Bosking W, Sun P, Ozker M, Pei X, Foster BL, Beauchamp MS, Yoshor D. *Saturation in phosphene size with increasing current levels delivered to human visual cortex.* (2017). Journal of Neuroscience, 37(30): 7188-97.
27. Foster BL, Parvizi J. *Direct cortical stimulation of human posteromedial cortex.* (2017). Neurology, 88(7): 685-691.
26. Daitch AL, Foster BL, Rangarajan V, Kasikci I, Gattas S, Parvizi J. *Mapping human temporal and parietal neuronal population activity and functional coupling during mathematical cognition.* (2016). Proceedings of the National Academy of Sciences USA, 113(46): 7377-86.
25. Ritaccio AL, Williams J, Denison T, Foster BL, Starr PA, Gunduz A, Zijlmans M, Schalk G. *Proceedings of the eighth international workshop on advances in electrocorticography.* (2016). Epilepsy & Behavior, 64: 248-52.
24. Foster BL, He B, Honey CJ, Jerbi K, Maier A, Saalman Y. *Spontaneous neural dynamics and multi-scale network organization.* (2016). Frontiers in Systems Neuroscience, 10:7.
23. Jacques C, Withoft N, Weiner KS, Foster BL, Rangarajan V, Hermes D, Miller KJ, Parvizi J, Grill-Spector K. *Corresponding ECoG and fMRI category-selective signals in human ventral temporal cortex.* (2016). Neuropsychologia, 83: 14-28.
22. Hermes D, Rangarajan V, Foster BL, King JR, Kasikci I, Miller KJ, Parvizi J. *Electrophysiological responses in the ventral temporal cortex during reading of numerals and calculation.* (2015). Cerebral Cortex, 27(1): 5-67-75.
21. Gonzalez A, Hutchinson JB, Uncapher MR, Chen J, LaRocque KF, Foster BL, Rangarajan V, Parvizi J, Wagner AD. *Electrocorticography reveals the temporal dynamics of posterior parietal cortical activity during recognition memory decisions.* (2015). Proceedings of the National Academy of Sciences USA, 112(35): 11066-71.
20. Foster BL, Rangarajan V, Shirer W, Parvizi J. *Intrinsic and task-dependent coupling of neuronal population activity in human parietal cortex.* (2015). Neuron, 86(2), 578-590.  
\*Preview: "Making decisions based on autobiographical memories". Minxha J, Rutishauser U. (2015). Neuron, 86(2): 350-2.
19. Rangarajan V, Hermes D, Foster BL, Weiner KS, Jacques C, Grill-Spector K, Parvizi J. *Electrical stimulation of the left and right human fusiform gyrus causes different effects in conscious face perception.* (2014). Journal of Neuroscience, 17;34(38): 12828-36.
18. Dastjerdi M\*, Ozker M\*, Foster BL, Rangarajan V, Parvizi J. *Numerical processing in the human parietal cortex during experimental and natural conditions.* (2013). Nature Communications, 4:2528.  
\*equal contribution.

17. Foster BL \*, Kaveh A\*, Dastjerdi M, Miller KJ, Parvizi J. *Human retrosplenial cortex displays transient theta phase locking with medial temporal cortex prior to activation during autobiographical retrieval.* (2013). Journal of Neuroscience, 33(25): 10439-46. \*equal contribution.
16. Winawer J, Kay K, Foster BL, Rauschecker A, Parvizi J, Wandell BA. *Asynchronous broadband signals are the principal source of the BOLD response in human visual cortex.* (2013). Current Biology, 23(13): 1145-53.
15. Chen J, Dastjerdi M, Foster BL, LaRocque KF, Rauschecker AM, Parvizi J, Wagner AD. *Human hippocampal increases in low-frequency power during associative prediction violations.* (2013). Neuropsychologia, 51(12): 2344-51.
14. Shum J, Hermes D, Foster BL, Dastjerdi M, Rangarajan V, Winawer J, Miller KJ, Parvizi J. *A brain area for visual numerals.* (2013). Journal of Neuroscience, 33(16): 6709-15.
13. Kuhlmann L, Foster BL, Liley DTJ. *Modulation of functional EEG networks by the NMDA antagonist nitrous oxide.* (2013). PLoS One, 8(2), e56434.
12. Chestek CA, Gilja V, Blabe C, Foster BL, Shenoy KV, Parvizi J, Henderson J. *Hand posture classification using electrocorticography signals in the gamma band over sensorimotor brain areas.* (2013). Journal of Neural Engineering, 10: 1-11.
11. Foster BL, Liley DTJ. *Effects of nitrous oxide sedation on resting electroencephalogram topography.* (2013). Clinical Neurophysiology, 124(2): 417-23.
10. Miller KJ, Foster BL, Honey CJ. *Does rhythmic entrainment represent a generalized mechanism for organizing computation in the brain?* (2012). Frontiers in Computational Neuroscience, 6(85): 1-3.
9. Parvizi J, Jacques C, Foster BL, Withoft N, Rangarajan V, Weiner KS, Grill-Spector, K. *Electrical stimulation of human fusiform face-selective regions distorts face perception.* (2012). Journal of Neuroscience, 32(43), 14915-20.  
\*Highlight: "Perception: Facing reality". Jones, R. (2012). Nat. Rev. Neurosci, 13(12): 812. \*Faculty of 1000 recommendation.
8. Foster BL, Dastjerdi M, Parvizi J. *Neural populations in human posteromedial cortex display opposing responses during memory and numerical processing.* (2012). Proceedings of the National Academy of Sciences USA, 109(38): 15514-9.
7. Foster BL, Parvizi J. *Resting oscillations and cross-frequency coupling in the human posteromedial cortex.* (2012). NeuroImage, 60(1): 384-391.
6. Foster BL, Bojak I, Liley DTJ. *Understanding the effects of anesthetic agents on the EEG through neural field theory.* (2011). Conf. Proc. EMBC IEEE, 4709-12.
5. Nune G, Winawer J, Rauschecker AM, Dastjerdi M, Foster BL, Wandell B, Parvizi J. *Problem of signal contamination in inter-hemispheric dual-sided subdural electrodes.* (2011). Epilepsia, 52(11): 176-80.

4. Parvizi J, Le S, Foster BL, Bourgeois B, Riviello JJ, Prenger E, Saper C, Kerrigan JF. *Gelastict epilepsy and hypothalamic hamartomas: neuroanatomical analysis of brain lesions in 100 patients*. (2011). Brain, 134: 2960-68.

3. Foster BL, Liley DTJ. *Nitrous oxide paradoxically modulates slow EEG oscillations: implications for anesthesia monitoring*. (2011). Anesthesia & Analgesia, 113(4), 758-65.

\*2 Faculty of 1000 recommendations.

2. Dastjerdi M, Foster BL, Nasrullah S, Rauschecker AM, Dougherty RF, Townsend J, Chang C, Greicius MD, Menon V, Kennedy DP, Parvizi J. *Differential electrophysiological response during rest, self-referential and non-self-referential processing in human posteromedial cortex*. (2011). Proceedings of the National Academy of Sciences USA, 108(7): 3023-8.

1. Foster BL, Bojak I, Liley DTJ. *Population based models of cortical drug response: insights from anesthesia*. (2008). Cognitive Neurodynamics, 2(4): 283-96.

## Book Chapters

3. Liley DTJ, Foster BL, Bojak I. (2012). *Co-operative Populations of Neurons: Mean Field Models of Mesoscopic Brain Activity*. In: Le Novere N & Bhalla U (Eds.), Computational Systems Neurobiology (pp. 317-64). The Netherlands: Springer.

2. Liley DTJ, Foster BL, Bojak I. (2011). *A Mesoscopic Modelling Approach to Anaesthetic Action on Brain Electrical Activity*. In: Hutt A. (Ed.), Sleep and Anesthesia: Neural correlates in theory and experiment (pp. 139-66). The Netherlands: Springer.

1. Liley DTJ, Bojak I, Dafilis MP, van Veen L, Frascoli F, Foster BL. (2010). *Bifurcations and State Changes in the Human Alpha Rhythm: Theory and Experiment*. In: Steyn-Ross A & Steyn-Ross M (Eds.), Modelling Phase Transitions in the Brain (pp. 117-145). The Netherlands: Springer

## Invited Talks / Symposia

Human Single-Unit Workshop, UCLA Nov. 2022

Computational Neuroscience Initiative Seminar U.Penn Nov. 2022

Neuroscience Graduate Group Seminar U.Penn June 2022

International Conference on Cognitive Neuroscience XIV, Helsinki [chair] May 2022

\*Unable to attend

Society for Neuroscience, Virtual [chair] Nov. 2021

ECoG Research Group Meeting, U.Penn Nov. 2021

Grand Rounds, Neurosurgery, U.Penn Sept. 2021

Center for Neural Engineering and Therapeutics, U.Penn. May 2020

BCM Rush Record Neuroscience Retreat, Galveston Feb. 2020

Winter Conference on Neural Plasticity, Moorea Feb. 2019

Cognitive Neuroscience seminar, Johns Hopkins Feb. 2019

Neuroscience seminar, University of Minnesota	Jan. 2019
Cog Tea, Rice University	Oct. 2018
Cognitive Neuroscience Seminar, UT Austin	Oct. 2018
COSYNE workshop, Breckenridge	March 2018
Melbourne Neuropsychiatry Center, University of Melbourne	Dec. 2017
International Conference on Biomagnetism (BIOMAG), Seoul	Sept. 2016
Center for Vital Longevity, UT Dallas	Sept. 2016
8th International Workshop on Advances in ECoG, Chicago	Oct. 2015
The Sandler Neurosciences Center (Chang Lab), UCSF	April 2015
Department of Neurosurgery, Baylor College of Medicine	April 2015
Monash Biomedical Imaging, Monash University	Dec. 2014
Society for Neuroscience, Washington DC	Nov. 2014
Bay Area Memory Meeting, Stanford University	Aug. 2014
International Conference on Cognitive Neuroscience XII, Brisbane <a href="#">[chair]</a>	July 2014
Bay Area Memory Meeting, UCSF	Aug. 2013
Department Psychology & Psychiatry, Monash University	March 2013
Psychology Colloquia, Swinburne University of Technology	March 2012
NeuroEngineering Laboratory Seminar, University of Melbourne	March 2012
Stanford Intracranial Research Symposium, Stanford University	Jan. 2012
International Conference on Cognitive Neuroscience XI, Mallorca	Sept. 2011
Engineering in Medicine and Biology IEEE 2011, Boston	Sept. 2011
COSYNE workshop, Salt Lake City	March 2011

## Journal Editor

Advisory Editorial Board	<i>Progress in Neurobiology</i> (2019 – Present)
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## Journal Reviewer

<i>Brain Computer Interfaces</i>	<i>Journal of Neurophysiology</i>
<i>Brain Structure &amp; Function</i>	<i>Journal of Neuroscience</i>
<i>Brain Topography</i>	<i>Journal of Neuroscience Methods</i>
<i>Cerebral Cortex</i>	<i>Nature Communications</i>
<i>Cog. Aff. &amp; Behav. Neuroscience</i>	<i>Nature Neuroscience</i>
<i>Communications Biology</i>	<i>NeuroImage</i>
<i>Cortex</i>	<i>Neuropsychologia</i>
<i>Current Biology</i>	<i>Neuron</i>
<i>Current Opinion in Neurobiology</i>	<i>PLoS One</i>
<i>eLife</i>	<i>PLoS Biology</i>
<i>eBioMedicine</i>	<i>PNAS</i>
<i>Frontiers in Systems Neuroscience</i>	<i>Progress in Neurobiology</i>
<i>Human Brain Mapping</i>	<i>Science Advances</i>
<i>IBRO Reports</i>	<i>Scientific Data</i>
<i>Journal of Cognitive Neuroscience</i>	<i>Scientific Reports</i>
<i>Journal of Neural Engineering</i>	<i>Trends in Cognitive Sciences</i>

## Grant Reviewer

NIH Study Section (Human Complex Mental Function)	2023
Austrian Science Fund (FWF)	2019
NSF (Perception, Action and Cognition)	2018
Czech Science Foundation	2018
German-Israeli Foundation for Scientific Research and Development	2017

## PI Mentoring

### Postdoctoral / Research Faculty

Dr. Pin-Chun Chen	2022 – Present
Dr. Seth Koslov	2020 – Present ( <i>NIH BRAIN F32</i> )
Dr. Yvonne Chen	2017 – Present
Dr. Eleonora Bartoli	2018 – 2021 [Assist. Prof., Baylor College of Medicine]
Dr. Audrey Nath [Neurology fellow]	2018 – 2020 [ <i>Neuro. Mon. Associates; Good Rx</i> ]

### Graduate Students

Lyndsey Aponik-Gremillion	2018 – 2022 [Assist. Prof. Weber State University]
Ye Li	2018 – 2022 [ <i>Intuitive Biomedical</i> ]
Madaline Mocchi	2020 – 2021 [Baylor College of Med. PhD program]

### Thesis Committee

Diego Davila	2022 – Present
Zhuokun Ding	2020 – 2021
Elise Mangin	2020 – 2021
Dat Tran	2019 – 2021
Jaclyn Patterson	2019 – 2021
Carli Domenico	Graduated 2021
Elizabeth Halfen	Graduated 2020 [ <i>HTX Labs</i> ]
Lexi Crommett	Graduated 2018 [ <i>MathWorks</i> ]

### Undergraduate / RA

Aruni Areti (BCM SMART scholar)	2019 – 2021 [Undergrad Rice University]
Sumayyah Khan (BCM PREP scholar)	2019 – 2020 [PhD student UT/MD Anderson]
Nadia Zulfa (Rice U.)	2017 – 2018 [MA student UIW San Antonio]
Santiago Garcia Acosta (Rice U.)	2017 – 2018 [ <i>Cloudera</i> ]

## Faculty Teaching

Anatomy of the CNS (Course director/Lecturer)	2018 – 2021
Human Neuroimaging (Intracranial electrophysiology seminars)	2016 – 2021

## Faculty Service

Project Manager: Neurosurgery Human Research Unit State Approval	2022
Disclosure of Interest representative – Dept. Neurosurgery	2018 – 2021
Promotions committee – Graduate School of Biomedical Science	2018 – 2021
Seminar committee – Dept. Neuroscience	2018 – 2021