OMB No. 0925-0001/0002 (Rev. 08/12 Approved Through 8/31/2015)

BIOGRAPHICAL SKETCH

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NAME: Jobst, Barbara C

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

POSITION TITLE: Professor of Neurology, Director Dartmouth-Hitchcock Epilepsy Center, Section Chief Department of Neurology

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

| INSTITUTION AND LOCATION | DEGREE  (if applicable) | Completion Date  MM/YYYY | FIELD OF STUDY |
| --- | --- | --- | --- |
| Friedrich-Alexander University, Erlangen, Germany | MD | 07/1993 | Medicine |
| Friedrich- Alexander University, Erlangen, Germany | Dr. med | 06/1995 | PhD equivalent- Clinical Neurosciences |
| Krankenhaus der Barmherzigen Brüder, Regensburg, Germany | Resident | 06/1996 | Neurology |
| Dartmouth Medical School, Hanover, NH | Resident | 06/1999 | Neurology |
| Dartmouth Medical School, Hanover, NH | Postdoctoral | 07/2001 | Epilepsy |

# A. Personal Statement

I am a physician-scientist and currently directing the Dartmouth-Hitchcock Epilepsy Center, a well-recognized center for epilepsy surgery and for work on cognition and epilepsy. I have the leadership skills, specific knowledge and necessary experience to conduct the proposed research. We have protocols in place to study intracranial electrophysiology during cognitive tasks during neurosurgical admissions for epilepsy surgery. Two of the proposed cognitive tasks proposed are already implemented in this setting. I direct the Epilepsy and Cognition Lab at Dartmouth which studies neural patterns of cognitive impairment in epilepsy with extramural funding. It is my long term goal to improve devastating cognitive impairment in epilepsy, a frequent complaint of my patients in clinic. I am a board certified electroencephalographer and have extensive experience with ECoG. Our lab has developed an automated detection algorithm for interictal epileptiform activity and advanced signal processing methods.

I have served as principle investigator (PI) in multiple clinical trials and have experience in multidisciplinary, translational research. Innovative brain stimulation for epilepsy has been my focus for several years. I was the site-PI for the pivotal and long-term trial of responsive brain stimulation in epilepsy at Dartmouth that helped with the approval of the device. I have published extensively in the field of electrical stimulation for epilepsy. This trial was industry sponsored and the device was approved by the FDA in 2013. Through those studies I have been integrally involved with the technical details of the device. My experience with intraoperative monitoring has helped to gain insight into the engineering part of intracranial devices and ECoG recording. Dartmouth- Hitchcock Epilepsy Center is part of the Department of Defense Restoring Active Memory (RAM) project. The project is aimed to study brain stimulation to improve memory function in acute, neurosurgical patients and some of the work performed in this project, led to the insight that memory function may be more reliably studied in chronically implanted patients as compared to patients in the acute, neurosurgical setting with many confounding factors and that epileptiform activity may play a critical role.

1. Jobst BC, Cascino GD (2015). Resective epilepsy surgery for drug-resistant focal epilepsy: a review. JAMA Jan 20;313(3):285-293. <http://www.ncbi.nlm.nih.gov/pubmed/25602999>
2. Heck CN, King-Stephens D, Massey AD, Nair DR, Jobst BC, Barkley GL, Salanova V, Cole AJ, Smith MC, Gwinn RP, Skidmore C, Van Ness PC, Bergey GK, Park YD, Miller I, Geller E, Rutecki PA, Zimmerman R, Spencer DC, Goldman A, Edwards JC, Leiphart JW, Wharen RE, Fessler J, Fountain NB, Worrell GA, Gross RE, Eisenschenk S, Duckrow RB, Hirsch LJ, Bazil C, O'Donovan CA, Sun FT, Courtney TA, Seale CG, Morrell MJ (2014). Two year seizure reduction in adults with medically intractable partial onset epilepsy treated with responsive neurostimulation: Final results of the RNS system Pivotal Trial. Epilepsia Mar;55(3):432-441. PMCID: PMC4233950.
3. Bergey GK, Morrell MJ, Mizrahi EM, Goldman A, King-Stephens D, Nair D, Srinivasan, S, Jobst B, Gross RE, Shields DC, Barkley G, Salanova V, Olejniczak P, Cole A, Cash SS, Noe K, Wharen R, Worrell G, Murro AM, Edwards J, Duchowny M, Spencer D, Smith M, Geller E, Gwinn R, Skidmore C, Eisenschenk S, Berg M, Heck C, Van Ness P, Fountain N, Rutecki P, Massey A, O'Donovan C, Labar D, Duckrow RB, Hirsch, LJ, Courtney T, Sun FT, Seale CG (2015). Long-term treatment with responsive brain stimulation in adults with refractory partial seizures. Neurology Feb 24; 84(8):810-817. PMCID: PMC4339127.
4. Van Straten AF, Jobst BC(2014). Future of epilepsy treatment: integration of devices. *Future Neurol****.***  9(6), 587–599. <http://www.futuremedicine.com/doi/pdf/10.2217/fnl.14.54>

# B. Positions and Honors

**Positions and Employment**

1999-2001 Postdoctoral Research Fellow, Dartmouth Hitchcock Medical Center, Lebanon, NH

1998-2001 Instructor in Medicine (Neurology), Dartmouth Medical School

2001- Attending Physician, Dartmouth-Hitchcock Medical Center, Lebanon, NH

2001-2004 Consulting Neurologist, Littleton Regional Hospital, Littleton, NH

2001-2004 Consulting Neurologist, Cottage Hospital, Woodville, NH

2001-2007 Assistant Professor of Medicine (Neurology)

2001-2010 Director, Intraoperative Monitoring Program, Dartmouth-Hitchcock Medical Center

2005-2008 Director, Women’s Epilepsy Clinic, Dartmouth-Hitchcock Medical Center

2006-2008 Director, Neurophysiology and EEG, Dartmouth-Hitchcock Medical Center, NH

2007-2013 Associate Professor of Neurology

2009- Director, Dartmouth-Hitchcock Epilepsy Center (NAEC level 4)

2013- Professor of Neurology

2013- Section Chief Adult Neurology, Department of Neurology

**Other Experience and Professional Memberships**

1996- Member, American Academy of Neurology

1999- Member, American Epilepsy Society

2002- Diplomat of the American Board of Psychiatry and Neurology

2002-2003 Member, Scientific Committee, American Epilepsy Society

2006- Fellow, American Clinical Neurophysiology Society Fellow

2004-2008 Member, Annual Course Committee, American Epilepsy Society

2004-2006 Member, Scientific Committee, American Epilepsy Society

2005 Member, Education Subcommittee Epilepsy, American Academy of Neurology

2005 Diplomat of the American Board of Clinical Neurophysiology with special certification in epilepsy monitoring

2006- Member, Steering Committee Pivotal multicenter trial of responsive neurostimulation (RNS™)

2008-2011 Member, CME Committee, American Epilepsy Society

2010- Fellow, American Academy of Neurology

2011- Editor Epilepsy Currents

2012- Editor Epilepsia

2013- Scientific Chair Epilepsy American Academy for Neurology

**Honors and Awards**

1999 Clinical Research Gowers Fellowship awarded by the Epilepsy Foundation of America

1999 Tiffany Blake Fellowship Award (Hitchcock Foundation)

2001 Fellowship Award American Clinical Neurophysiology Society.

2002 Fellowship Award for the International School of Epilepsy, San Servolo, Italy, sponsored by the International League of Epilepsy and NATO.

2013- Elected physician member Board of Governors and Board of Trustees, Dartmouth-Hitchcock Medical Center

2015- Executive Leadership in Academic Medicine Fellowship (ELAM)

# C. Contribution to Science

1. My early scientific career was focused on the clinical description of epilepsy syndromes and the outcomes of epilepsy surgery. We established fundamental clinical manifestations of frontal lobe epilepsy, occipital lobe epilepsy and tonic-clonic seizures, based on meticulous videoEEG analysis. Our group also reported good clinical outcomes in difficult to diagnose epilepsy syndromes such as frontal lobe epilepsy.
2. Jobst BC, Siegel AM, Thadani VM, Roberts DW, Rhodes HC, Williamson PD (2000). Intractable seizures of frontal lobe origin: Clinical characteristics, localizing signs and results of surgery. *Epilepsia* 41:1139-1152. <http://www.ncbi.nlm.nih.gov/pubmed/10999553>
3. Jobst BC, Williamson PD, Thadani VM, Gilbert KL, Holmes GL, Morse RP, Darcey TM, Duhaime AC, Bujarski KA, Roberts DW (2010). Intractable Occipital Lobe Epilepsy: Clinical Characteristics and Surgical Treatment. *Epilepsia* 51 (11): 2334-2337. <http://www.ncbi.nlm.nih.gov/pubmed/20662891>
4. Jobst BC, Williamson PD, Neuschwander TB, Darcey TM, Thadani VM, Robert DW (2001). Secondarily generalized seizures in mesial temporal lobe epilepsy: clinical characteristics, lateralizing signs and association with sleep-wake cycle. *Epilepsi*a 42: 1279-1287. <http://www.ncbi.nlm.nih.gov/pubmed/11737163>
5. Kriegel M, Roberts DW, Jobst BC (2012). Orbitofrontal and Insular Epilepsy. *Journal of Neurophysiology* 29 (5): 385-91. <http://www.ncbi.nlm.nih.gov/pubmed/23027095>
6. As epilepsy surgery can have devasting psychiatric and cognitive consequences, my interest in epilepsy surgery shifted to explore other venues to treat drug-resistant epilepsy, which made brain stimulation as a possible treatment quite attractive. For this reason, I initiated study of novel stimulation devices at our center, such as the Responsive Neurostimulator System RNS®, Neuropace Inc. I participated in the pivotal and long-term trial for efficacy, and I am currently the PI on the post-approval study. As the device has unprecented opportunities to study ambulatory intracranial electrophysiology, together with other centers we validated the use of the device for ECoG recordings.

1. King-Stephens D, Massey AD, Heck CN, Nair DR, Barkley GL, Cole AJ, Gwinn RP, Jobst BC, Salanova V, Skidmore CT, Smith MC, Van Ness PC, Bergey GK, Duchowny M, Geller EB, Park YD, Rutecki PA, Spencer DC, Zimmerman R, Edwards JC, Mizrahi E, Berg MJ, James Fessler III A, Fountain NB, Leiphart JW, Wharen RE, Hirsch LJ, Richard Marsh W, Gross RE, Duckrow RB, Eisenschenk S, O'Donovan CA, Bloch DA, Crabtree T, Loring D, Plenys Loftman A, Sun FT, Morrell MJ (2011). Responsive cortical stimulation for the treatment of medical intractable partial epilepsy. *Neurology* 77(13):1295-1304. <http://www.ncbi.nlm.nih.gov/pubmed/21917777>
2. Quigg M, Sun F, Fountain NB, Jobst BC, Wong VS, Mirro E, Brown S, Spencer DC (2015). Interrater reliability in interpretation of electrocorticographic seizure detections of the responsive neurostimulator. *Epilepsia* Apr 20. [http://www.ncbi.nlm.nih.gov/pubmed/25895054](http://www.ncbi.nlm.nih.gov/pubmed/25895054%20)
3. With continued clinical practice, it became apparent that the cognitive consequences of epilepsy can be more debilitating than the seizures themselves. Therefore we at Dartmouth developed HOBSCOTCH (Home-Based Selfmanagement and Cognitive Training CHanges lives), a cognitive intervention based on behavioral problem-solving therapy for memory problems in epilepsy. We conducted a randomized controlled trial that proved efficacy on quality of life and objective memory measures. Within this work I am also the PI of the Managing Epilepsy Well Network, a thematic research network of the Center for Disease Control, focused on the self-management strategies in epilepsy.
4. Caller TA, Secore K, Ferguson RJ, Roth RM, Alexandre FP, Harrington JJ, Henegan PL, Jobst BC(2015). Design and Feasibility of a Memory Intervention with Focus on Self-Management for Cognitive Impairment in Epilepsy. *Epilepsy Behav* Mar; 44:192-194. <http://www.ncbi.nlm.nih.gov/pubmed/25731132>
5. Chen JJ, Caller TA, Mecchella JN, Tahkur DS, Homa K, Finn CT, Kobylarz EJ, Bujarski KA, Thadani VM, Jobst BC (2014). Reducing Severity of Comorbid Psychiatric Symptoms in an Epilepsy Clinic using Co-location Model: Results of a Pilot Intervention. *Epilepsy Behav.* 39:92-96. <http://www.ncbi.nlm.nih.gov/pubmed/25238553>
6. Kobau R, Cui W, Kadima N, Zack MM, Satatovic M, Kaiboriboon K, Jobst B (2014). Tracking psychosocial health in adults with epilepsy- Estimates from the 2010 National Health Interview Survey. *Epilepsy Behav* 41:66-73. <http://www.ncbi.nlm.nih.gov/pubmed/25305435>
7. Another approach to alleviate cognitive problems in epilepsy is to understand the underlying pathophysiology and invent interventions that correct the underlying problem. With this goal in mind, we started to investigate the underlying oscillations related to memory impairment in epilepsy. We showed that interictal spikes interfere with good memory performance if they occur contralateral to the seizure onset zone or bilaterally during memory retrieval, a direct translation of animal work that was performed at Dartmouth by Dr. Gregory Holmes. To further translate animal research, we established single neuron recordings in humans to identify place cells in humans and to study single neuron activity in relation to field potentials. Within this work we validated and tested several cognitive tasks, where some of them focused on spatial navigation. We found that place cell recordings in humans are difficult, due to the paucity of cells recorded, and that virtual spatial navigation does not as consistently show theta activity during navigation as observed in animals. To study the influence of brain stimulation on memory, especially in a less problematic population than the perioperative one, is the next logical step in finding a treatment for cognitive impairment in epilepsy. It is part of my personal challenge to determine whether memory problems are easier treated with brain stimulation versus a cognitive behavioral intervention.
8. Kleen JK, Scott RC, Holmes GL, Roberts DW, Rundle MM, Testorf M, Lenck-Santini PP, Jobst BC (2013). Hippocampal interictal epileptiform activity disrupts cognition in humans. Neurology 81(1):18-24. PMCID: PMC3770206.
9. Kleen JK1, Testorf ME2, Robbins AA2, Roberts DA2, Scott RC3,4, Holmes GL3, Jobst BJ2, Lenck-Santini PP3 Reset of human hippocampal oscillations during a working memory task: relevance to performance (submitted to Neuroimage).
10. Liu JV, Kobylarz EJ, Darcey TM, Lu Z, Wu YC, Meng M, Jobst BC (2014). Improved mapping of interictal epileptiform discharges with EEG-fMRI and voxel-wise functional connectivity analysis. *Epilepsia*. 55(9):1380-1388. <http://www.ncbi.nlm.nih.gov/pubmed/25060924>
11. Robbins A, Titiz A, Scott R, Holmes G, Lenck-Santini P, Jobst BC (2013). Single unit recordings during virtual navigation tasks in patients with temporal lobe epilepsy. Abstract No. 3.054, American Epilepsy Society Annual Meeting, www.aesnet.org

**Complete List of Published Work in MyBibliography:**

[**http://www.ncbi.nlm.nih.gov/sites/myncbi/1052Uc3dLP4kZ/bibliography/48022980/public/?sort=date&direction=ascending**](http://www.ncbi.nlm.nih.gov/sites/myncbi/1052Uc3dLP4kZ/bibliography/48022980/public/?sort=date&direction=ascending)

# D. Research Support

**Ongoing Research Support**

U48DP005018 Jobst (PI) 09/29/2014 – 09/28/2019

CDC

Title: *Home based self-management and cognitive training changes lives (HOBSCOTCH)*

Goal: The goal of this program is to reduce disparities in health for vulnerable populations in NH and VT by studying a cognitive behavioral intervention for memory impairment in epilepsy with a pragmatic trial to distribute HOBSCOTCH to four states, develop a purely virtual intervention system, and study cost effectiveness. The project also involves being the PI of the Managing Epilepsy Well Network, a thematic research network of the CDC focused on self management and providing research leadership to seven other universities.

Role: PI

DN 1009075 Jobst (PI) 05/20/2008 – present

Neuropace Inc.

Title: *Responsive Neurostimulator (RNS) System Long-term Treatment Clinical Investigation*

Goal: The goal of this project is to assess ongoing safety and evaluate the long-term efficacy of the RNS System as an adjunctive therapy in reducing the frequency of seizures in individuals 18 years of age or older with partial onset seizures who have undergone diagnostic testing that localized no more than two epileptogenic foci, that are refractory to two or more antiepileptic medications, and currently have frequent or disabling seizures.

Role: PI

N66001-14-2-4-31 Jobst (PI) 07/16/2014 – 07/15/2018

DARPA

Title: *Memory Enhancement with Modeling, Electrophysiology, and Stimulation*

Goal: It is the goal of this project to identify a stimulation paradigm that enhances memory independent of the epileptic process. The project involves seven centers that perform memory experiments in the perioperative setting. PI of the project is Michael Kahana from the University of Pennsylvania.

Role: Site PI

5R01NS074450-02 Jobst (Co-PI) 08/01/2011 – 04/30/2016

NIH

Title: *Mechanisms of cognitive impairment in temporal lobe epilepsy*

Goal: The goal of this project is to study single unit activity in human during memory processing and to explore the relationship of interictal epileptiform discharges in the acute perioperative epilepsy surgery setting.

Role: Co-PI

Jobst (PI) 12/12/2013 – present

American Epilepsy Society

Title: Imaging neuroinflammation with Ferumoxytol-MRI

Goal: The project is an innovative project to image inflammatory changes associated with seizures with MRI after ferumoxytol, a marker for microglial activation, is injected IV after a seizure. This is followed by an MRI scan 72 hours later to search for iron deposition in the brain.

Role: PI

**COMPLETED**

DN 1008934 Jobst (PI) 12/12/2005 – 11/30/2012

NeuroPace, Inc.

Title: *Responsive Neurostimulator (RNS) System Pivotal Clinical Investigation*

Goal: To assess the safety and to demonstrate that the Responsive Neurostimulator (RNS) system is effective as an adjunctive therapy in reducing the frequency of seizures in individuals 18 years of age or older with partial onset seizures that are refractory to two or more antiepileptic medications. The project lead to the indication of the device to treat seizures.

Role: Site-PI

3U48DP001935-04S3 Jobst (PI) 09/30/2012 – 09/29/2014

CDC

Title: *Home-based self-management and cognitive training changes lives for patients with epilepsy*

Goal: We developed a home based cognitive intervention for memory training and performed a randomized controlled trial in 66 patients. We could demonstrate improvement in quality of life and objective memory measures.

Role: PI