

KELSEY A. POTTER-BAKER, PH.D.

Curriculum Vitae

Tel: (216) 445-6728

potterk@ccf.org

EDUCATION

Case Western Reserve University, Cleveland, Ohio

March 2014

Doctor of Philosophy, Biomedical Engineering

Thesis Title: Anti-oxidative Approaches to Improve Neuronal Viability Surrounding Implanted Intracortical Microelectrodes

Thesis Advisor: Jeffrey R. Capadona, PhD

University of Utah, Salt Lake City, Utah

December 2008

Bachelor of Science, Biomedical Engineering, Minor: Chemistry

PROFESSIONAL EXPERIENCE

Cleveland Clinic Foundation, Department of Biomedical Engineering

Cleveland, Ohio

Postdoctoral Research Fellow

April 2014 to Present

Primary Mentor: Ela B. Plow, PT PhD

Case Western Reserve University, Department of Biomedical Engineering

Cleveland, Ohio

Graduate Research Assistant

June 2009 to April 2014

Research Advisor: Jeffrey R. Capadona, PhD

PUBLICATIONS

H-Index: 6

i10-Index: 5

UNDER REVIEW

1. V. Sankarasubramanian, D.A. Cunningham, S. Roelle, N. Varnerin, E. Beall, **K.A. Potter-Baker**, A. Machado, M. Lowe and E.B. Plow, "Modulating functional connectivity across pain networks using transcranial direct current stimulation (tDCS)." *Under Review*
2. N. Varnerin, J. Cardenas, D. Mirando, **K.A. Potter-Baker**, D.A. Cunningham, V. Sankarasubramanian, E. Beall and E.B. Plow, "Assessment of Vascular Stent Heating with Repetitive Transcranial Magnetic Stimulation (rTMS)." *Under Review*

IN PRESS

1. **K.A. Potter-Baker***, D.P. Janini, F.S. Frost, P. Chabra, N. Varnerin, D.A. Cunningham, V. Sankarasubramanian and E.B. Plow, "Reliability of TMS metrics in patients with chronic incomplete spinal cord injury." *Spinal Cord*. 2016. *In Press*. PMID: 27045553.

PUBLISHED

1. D.A. Cunningham, D.P. Janini, A. Wyant, C. Bonnett, N. Varnerin, V. Sankarasubramanian, **K.A. Potter-Baker**, S. Roelle, X. Wang, V. Siemionow, G.H. Yue and E.B. Plow, "Post-exercise depression following submaximal and maximal isometric voluntary contraction." *Neuroscience*. 2016. 326: 95-104. PMID: 27058145.
2. **K.A. Potter-Baker***, C. E. Bonnett, P.M. Chabra, S. Roelle, N. Varnerin, D.A. Cunningham, V. Sankarasubramanian, S. Pundik, A.B. Conforto, A. G. Machado and E.B. Plow, "Challenges in Recruitment for the Study of Noninvasive Brain Stimulation in Stroke: Lessons from Deep Brain Stimulation." *Journal of Stroke & Cerebrovascular Diseases*. 2016. 25(4):927-937. PMID: 26851211.
3. **K.A. Potter-Baker***, N.M. Varnerin, D.A. Cunningham, S.M. Roelle, V. Sankarasubramanian, A. Machado, A.B. Conforto, K. Sakaie, and E.B. Plow, "Influence of Corticospinal Tracts from Higher Order Motor Cortices on Recruitment Curve Properties in Stroke". *Frontiers in Neuroscience*. 2016. 10:79. PMID: 27013942.

4. E.B. Plow, V. Sankarasubramanian, D.A. Cunningham, **K.A. Potter-Baker**, N. Varnerin, L. Cohen, A. Sterr, A.B. Conforto and A.G. Machado, "Models to Tailor Brain Stimulation Therapies in Stroke." *Neural Plasticity*. 2016, 4071620: 1-17. [PMID: 27006833](#).
5. D.A. Cunningham, N. Varnerin, A.G. Machado, C. Bonnett, D.P. Janini, S. Roelle, **K.A. Potter-Baker**, V. Sankarasubramanian, X. Wang, G. Yue and E.B. Plow, "Stimulation targeting higher motor areas in stroke rehabilitation: A proof-of-concept, randomized, double-blinded placebo-controlled study of effectiveness and underlying mechanism." *Restorative Neurology and Neuroscience*. 2015, 33(6): 911-926. [PMID: 26484700](#).
6. D.A. Cunningham, **K.A. Potter-Baker**, J.S. Knutson, V. Sankarasubramanian, A.G. Machado and E.B. Plow, "Tailoring brain stimulation to the nature of rehabilitative therapies in stroke- a conceptual framework based on their unique mechanisms of recovery" *Physical Medicine and Rehabilitation Clinics of North America*. 2015, 26(4): 759-774. [PMID: 26522911](#).
7. **K.A. Potter-Baker***, C. Bonnett, P.M. Chabra, S. Roelle, N. Varnerin, D.A. Cunningham, V. Sankarasubramanian, S. Pundik, A.B. Conforto, A. Machado and E.B. Plow, "A Game of Hide and Seek: Is it possible to recruit more patients for NIBS studies in stroke?" *Journal of the Neurological Sciences*. 2015, 358: 472-474. [PMID: 26320611](#).
8. V. Sankarasubramanian, S. Roelle, C.E. Bonnett, D.P. Janini, N. Varnerin, D.A. Cunningham, J.S. Sharma, **K.A. Potter-Baker**, X. Wang, G.H. Yue and E.B. Plow, "Reproducibility of TMS metrics in the study of proximal upper limb muscles." *Journal of Electromyography and Kinesiology*. 2015, 25(5): 754-764. [PMID: 26111434](#).
9. E.B. Plow, **K.A. Potter-Baker** and P. Chabra, "Using the Brain to Improve Rehab in Spinal Cord Injury Patients". *Frontiers in Rehabilitation*. 2014, pp. 6-8. (<http://consultqd.clevelandclinic.org/2014/11/using-the-brain-to-improve-rehab-in-spinal-cord-injury-patients/>)
10. M. Jorfi, **K.A. Potter**, J.K. Nguyen, A.E. Hess-Dunning, E. Johan Foster, J.R. Capadona and C. Weder, "Mechanically adaptive materials for intracortical implants." 7th *International IEEE/EMBS Conference on Neural Engineering*. 2015. 601-602.
11. **K.A. Potter-Baker***, W.G. Stewart, W.D. Meador, W.H. Tomaszewski, N.P. Ziats and J.R. Capadona, "Implications of Daily Antioxidant Administration on the Chronic Inflammatory Response to Intracortical Microelectrodes." *Journal of Neural Engineering*. 2015, 12(4): 045002. [PMID: 26015427](#).
12. **K.A. Potter-Baker*** and J.R. Capadona, "Reducing the "Stress": Anti-oxidative Therapeutic and Material Approaches May Prevent Intracortical Microelectrode Failure." *ACS Macro Letters*. 2015, 4(3): 275-279. **Cover**
13. **K.A. Potter-Baker***, M. Ravikumar*, A.A. Burke, W.D. Meador, K.T. Householder, A.C. Buck, S. Sunil, W.G. Stewart, J.P. Anna, W.H. Tomaszewski and J.R. Capadona, "A Comparison of Neuroinflammation to Implanted Microelectrodes in Rat and Mouse Models." *Biomaterials*. 2014, 35(22): 5637-5646. [PMID: 24755527](#).
14. **K.A. Potter-Baker***, J.K. Nguyen*, K. Kovach, M.M. Gitomer, T.W. Srail, W.G. Stewart, J.L. Skousen, and J.R. Capadona, "Development of superoxide dismutase mimetic surfaces to reduce accumulation of reactive oxygen species." *Journal of Materials Chemistry B*. 2014, 2(16): 2248-2258. [PMID: PMC4131700](#).
15. **K.A. Potter***, M. Jorfi*, K.T. Householder, J. Foster, C. Weder and J.R. Capadona, "Curcumin-releasing Mechanically Compliant Implants Prevent Neurodegeneration and Blood Brain Barrier Instability at the Implant-Tissue Interface." *Acta Biomaterialia*. 2014, 10(5): 2209-2222. [PMID: 24468582](#).
16. A.E. Hess, **K.A. Potter**, C.A. Zorman, and J.R. Capadona. "Environmentally-controlled Microtensile Testing of Mechanically-Dynamic Polymer Nanocomposites for Ex Vivo Characterization." *Journal of Visualized Experiments*, 2013, 20(78). [PMID: 23995288](#).
17. **K.A. Potter***, A.C. Buck, W.K. Self, M.E. Callanan, S. Sunil and J.R. Capadona, "The Effect of Resveratrol on Neurodegeneration and Blood Brain Barrier Stability Surrounding Intracortical Microelectrodes." *Biomaterials*, 2013, 34(29):7001-7015. [PMID: 23791503](#).
18. **K.A. Potter***, A.C. Buck, W.K. Self, J.R. Capadona. "Stab Injury and Device Implantation within the Brain Results in Inversely Multiphasic Neuroinflammatory and Neurodegenerative Responses." *Journal of Neural Engineering*, 2012, 9; 046020. [PMID: 22832283](#).
19. **K.A. Potter***, J.S. Simon, B. Velagapudi, J.R. Capadona. "Reduction of autofluorescence at the microelectrode-cortical tissue interface improves antibody detection." *J. Neurosci Meth*. 2012, 203(1); 96-105. [PMID: 21978484](#).

BOOK CHAPTERS

1. **K.A. Potter**, B. Gui, and J.R. Capadona. Chapter 3, "Biomimicry at the cell-material interface," *Biomimetics - Innovation thru mimicking natures inventions*; CRC Press, 2011.

PLATFORM PRESENTATIONS

1. **K.A. Potter-Baker**, D.P. Janini, F.S. Frost, N.M. Varnerin, D.A. Cunningham, V. Sankarasubramanian and E.B. Plow. “A Picture is worth 1000 Words: The Potential of Defining Incompleteness of Injury with Neuroimaging and Brain Neurophysiology”. Academy of Spinal Cord Injury Professionals, Nashville, TN. 2016.
2. **K.A. Potter-Baker**, D.P. Janini, F.S. Frost, N.M. Varnerin, D.A. Cunningham, V. Sankarasubramanian and E.B. Plow. “Transcranial Direct Current Stimulation with Massed Practice to Alleviate Maladaptive Plasticity”. Academy of Spinal Cord Injury Professionals, Nashville, TN. 2016.
3. **K.A. Potter-Baker**, D.P. Janini, F.S. Frost, N.M. Varnerin, D.A. Cunningham, V. Sankarasubramanian and E.B. Plow. “Towards Improving Reliability of Transcranial Magnetic Stimulation (TMS) Metrics in Individuals with Spinal Cord Injury (SCI)”. Academy of Spinal Cord Injury Professionals, Nashville, TN. 2016.
4. **K.A. Potter-Baker**, D.P. Janini, N.M. Varnerin, D.A. Cunningham, V. Sankarasubramanian, K.E. Sakaie, F.S. Frost and E.B. Plow. “Enhancing cortical representational plasticity with non-invasive direct current stimulation to accelerate upper limb recovery in quadriplegia”. Society for Neuroscience, Chicago, IL. 2015.
5. **K.A. Potter-Baker**, D.P. Janini, N.M. Varnerin, D.A. Cunningham, V. Sankarasubramanian, K.E. Sakaie, F.S. Frost and E.B. Plow. “Enhancing cortical representational plasticity with non-invasive direct current stimulation to accelerate upper limb recovery in quadriplegia”. American Society for Neurorehabilitation, Chicago, IL. 2015.
6. **K.A. Potter-Baker**, D.P. Janini, F.S. Frost and E.B. Plow. “Using the Brain to Prognosticate Baseline Function and Rehabilitation-related Recovery Potential in Quadriplegia”. Academy of Spinal Cord Injury Professionals, New Orleans, LA. 2015.
7. J. Nguyen, **K.A. Potter**, J. Skousen, A. Hess, D.J. Tyler, S. Rowan, C. Weder, J.R. Capadona. “The Chronic Neuroinflammatory Response to Mechanically-Adaptive Polymer Implants” Society For Biomaterials, Biomaterials Day 2013, Case Western Reserve University, 2013.
8. **K.A. Potter**, J.K. Nguyen, K. Kovach, J.L. Skousen and J.R. Capadona. “Characterization and Deployment of Engineered Systems Capable of Reducing Oxidative Stress Surrounding Intracortical Microelectrodes”. Biomaterials Day, Cleveland OH. 2013.
9. J. Nguyen, **K.A. Potter**, J. Skousen, A. Hess, D.J. Tyler, S. Rowan, C. Weder, J.R. Capadona. “The Chronic Neuroinflammatory Response to Mechanically-Adaptive Polymer Implants” Biomedical Engineering Society, Seattle, WA, 2013.
10. **K.A. Potter**, A.C. Buck, M.E. Callanan, S. Sunil, W.K. Self and J.R. Capadona. “Suppression of Reactive Oxygen Species by Resveratrol Promotes Neuroprotection at the Cortical-Tissue Device Interface”. Biomedical Engineering Society, Atlanta, GA. 2012.
11. **K.A. Potter**, W.K. Self, A.C. Buck and J.R. Capadona. “Modulation of Neural Degeneration at the Cortical Tissue-Device Interface through Molecular Control of the Inflammatory Response”. Biomedical Engineering Society. Hartford, CT. 2011.

POSTER PRESENTATIONS (SELF)

1. **K.A. Potter-Baker**, D.P. Janini, F.S. Frost, and E.B. Plow, Academy of Spinal Cord Injury Professionals, New Orleans, LA. 2015.
2. **K.A. Potter-Baker**, N.M. Varnerin, D.A. Cunningham, S.M. Roelle, V. Sankarasubramanian, A. Machado, A.B. Conforto, K. Sakaie and E.B. Plow, Society for Neuroscience, Washington, D.C., November 2014.
3. **K.A. Potter**, A.C. Buck, W.K. Self, M.E. Callanan, S. Sunil and J.R. Capadona, Biomaterials and Tissue Engineering Gordon Research Conference, Holderness, July 2013.
4. **K.A. Potter**, A.C. Buck, W.K. Self, M.E. Callanan, S. Sunil and J.R. Capadona, Biomedical Graduate Student Symposium, Cleveland, OH, April 2013.
5. **K.A. Potter**, A.C. Buck, W.K. Self, M.E. Callanan, S. Sunil and J.R. Capadona, Research ShowCASE, Cleveland, OH, April 2013.
6. **K.A. Potter**, A.C. Buck, M.E. Callanan and J.R. Capadona. Society for Biomaterials, New Orleans, LA, October 2012.
7. **K.A. Potter**, A.C. Buck, W.K. Self and J.R. Capadona. Neural Interfaces Conference, Salt Lake City, UT, June 2012.
8. **K.A. Potter**, S. Sunil, W.K. Self, M.E. Callanan and J.R. Capadona. International Conference on Materials, Energy and Environment, Toledo, OH, May 2012.
9. **K.A. Potter**, A.C. Buck, W.K. Self and J.R. Capadona. Graduate Student Research Symposium, Cleveland, OH, April 2012.
10. **K.A. Potter** and J.R. Capadona. Department of Veteran’s Affairs Research Week, Cleveland, OH, April 2011.
11. **K.A. Potter** and J.R. Capadona. Research ShowCASE, Cleveland, OH, April 2010.
12. **K.A. Potter** and J.R. Capadona. Department of Veteran’s Affairs Research Week, Cleveland, OH, April 2010.

13. **K.A. Potter**, C.M. Okoye and J.R. Capadona. Department of Biomedical Engineering 40th Anniversary Symposium, Case Western Reserve University, September 2009.

GRANT FUNDING

CURRENT

Conquer Paralysis Now Potter-Baker (Co-I) \$50,000 10/1/2015 – 10/1/2016
Improving Spinal Cord Injury Rehabilitation Interventions by Retraining the Brain with Stimulation: Applying Concepts from Stroke

PENDING

Department of Veterans Affairs Potter-Baker (PI) \$805,393 (DC)
Non-Invasive Brain Stimulation to Boost Adaptive Plasticity and Motor Recovery

Department of Defense Potter-Baker (Co-I) \$2,471,281 (DC)
Improving Spinal Cord Injury Rehabilitation Interventions by Retraining the Brain

Research Program Committee (RPC) Potter-Baker (PI) \$20,000 (DC)
Feasibility of enhancing motor recovery in patients with incomplete spinal cord injury using non-invasive brain stimulation

HONORS AND AWARDS

- Post-Doctoral Alumni Career Development Award Recipient, October 2015.
- 2014 Acta Biomaterialia Student Award Recipient. A \$2,000 award based on publication merit, July 2015.
- Selected to Attend NextProf Networking Event, University of Michigan, Ann Arbor, MI, September 2015.
- Post-doctoral Travel Award, Department of Biomedical Engineering, Cleveland Clinic Foundation, September 2014.
- Outstanding Poster Award Winner at Biomedical Graduate Student Symposium, May 2013.
- Neural Interfacing Conference Diversity Travel Award Recipient, June 2012.
- Art of Science Contest Winner, May 2012.
- Medtronic Fellow, Case Western Reserve University, 2009-2012.
- *Daniel E. Adams Award for Outstanding Service to Residential Education*, University of Utah, Awarded May 2008.
- *Wendy's Scholarship*, Wendy's Corporation, August 2004 to May 2005. A \$1,000-one year scholarship.
- *Top Ten Scholarship*, University of Utah, Salt Lake City, Utah, August 2004 to May 2005.

PROFESSIONAL AFFILIATIONS

Society for Neuroscience, American Society of Neurorehabilitation, Biomedical Engineering Society, Society for Biomaterials

SERVICE

- Scientific Reviewer: *Journal of Neural Engineering*, *Acta Biomaterialia*, *Frontiers in Neuroscience*, *Brain Research*, *European Journal of Pharmaceutics and Biopharmaceutics*
- Member of Women in Science and Engineering Roundtable (WISER), August 2009 – April 2014.
- Vice President of Department of Biomedical Engineering Graduate Student Association, May 2012 – May 2013.
- Mentor undergraduate and graduate biomedical engineering students as part of WISER, August 2009 – May 2012.
- Department of Biomedical Engineering Student Senator, May 2011 – May 2012.
- Graduate Student Council Professional Liaison, May 2010 – December 2010.

TEACHING

- **Graduate Teaching Assistant, Biomedical Instrumentation Laboratory**, Lead TA, Case Western Reserve University, Cleveland, OH, Spring 2013.
- **Graduate Teaching Assistant, Introduction to Circuits and Instrumentation**, Homework and Review TA, Case Western Reserve University, Cleveland, OH, Fall 2012.
- **Graduate Teaching Assistant, Introduction to Biomaterials**, Case Western Reserve University, Cleveland, OH, Fall 2010.

STUDENT MENTORING

1. Natasha Mohanty, Undergraduate Student, Department of Biomedical Engineering, CCF, May 2015 – Present
2. Shounak Base, Undergraduate Student, Department of Biomedical Engineering, CCF, September 2015 – December 2015
3. Jacqueline Cavendish, Undergraduate Student, Department of Biochemistry, CCF, August 2015 – Present
4. Emily Serfling, Undergraduate Student, Department of Biomedical Engineering, CCF, May 2015 – May 2016
5. Brin Bedwell, Undergraduate Student, Department of Biomedical Engineering, CCF, May 2015 – September 2015
6. Daniel Janini, Undergraduate Student, Department of Biology, CCF, July 2014 – May 2015
7. Priya Srivastava, Undergraduate Student, Department of Biomedical Engineering, CWRU, February 2014 – April 2014
8. William Tomaszewski, Undergraduate Student, Department of Biomedical Engineering, CWRU, Feb 2014 – April 2014
9. Frankie Wong, Undergraduate Student, Department of Biomedical Engineering, CWRU, February 2014 – April 2014
10. Martin Gitomer, Undergraduate Student, Department of Biomedical Engineering, CWRU, August 2013 – April 2014
11. William Meador, Undergraduate Student, Department of Biomedical Engineering, CWRU, August 2013 – April 2014
12. Wade G. Stewart, Undergraduate Student, Department of Biomedical Engineering, CWRU, June 2013 – April 2014
13. Tyler Srail, Undergraduate Student, Department of Biomedical Engineering, CWRU, May 2013 – April 2014
14. Aarathi Sehadevan, High School Student, Hathaway Brown, February 2013 – April 2014
15. Shruti Sudhakar, Undergraduate Student, Department of Biomedical Engineering, CWRU, September 2012 – April 2014
16. Smrithi Sunil, Undergraduate Student, Department of Biomedical Engineering, CWRU, February 2012 – April 2014
17. Jake Anna, Undergraduate Student, Department of Biomedical Engineering, CWRU, January 2013 – May 2013
18. Kyle T. Householder, Undergraduate Student, Department of Biomedical Engineering, CWRU, January 2012 – June 2013
19. Megan E. Callanan, High School Student, Hathaway Brown, August 2011 – April 2014
20. Amy C. Buck, Undergraduate Student, Department of Biomedical Engineering, CWRU, January 2011 – June 2013
21. Wade K. Self, Undergraduate Student, Department of Biomedical Engineering, CWRU, September 2010 – December 2011
22. Bharath Velagapudi, Undergraduate Student, Department of Biomedical Engineering, CWRU, June 2010 – May 2012
23. Robert Jiang, Undergraduate Student, Department of Biomedical Engineering, CWRU, November 2009 – December 2010
24. Chiderah M. Okoye, Undergraduate, Student, Department of Biomedical Engineering, CWRU, June 2009 – May 2010

Student Mentored Presentations and Posters:

1. A. Buck, **K.A. Potter**, W. Self, M. Callanan, S. Sunil, J.R. Capadona “Resveratrol Reduces Neurodegeneration and BBB Instability Around Intracortical Microelectrodes” Biomedical Engineering Society, Seattle, WA, September 2013.
2. K.T. Householder, **K.A. Potter**, M. Jorfi, C. Weder and J.R. Capadona. “Anti-oxidant Releasing Mechanically-Adaptive Materials Improve Neural Device Tissue Integration” Biomedical Engineering Society, Atlanta, GA, October 2012. (podium)
3. K. Householder, **K.A. Potter**, and J.R. Capadona. “Drug Delivery of Ginger Derived Antioxidants from Mechanically Adaptive Intracortical Implants to Improve Neural Device Tissue Integration” PiNO 2012, Cleveland, OH, June 2012.
4. A.C. Buck, **K.A. Potter**, and J.R. Capadona. “Surface Immobilized Anti-Inflammatory Peptides To Enhance Device-Tissue Integration” Biomedical Engineering Society, Atlanta, GA, October 2012.
5. R. Jiang, **K.A. Potter**, M. Ravikumar, J.P. Harris, J.R. Capadona. “Resveratrol-Infused Biomaterials to Minimize Neurodegeneration” Support for Undergraduate Research and Creative Endeavors (SOURCE) Symposium, Cleveland, OH, December 2010.