

# Jed A. Hartings, PhD

## Curriculum Vitae

**DOB:** May 27, 1973

**Home Address**

3836 Monet's Ln.  
Cincinnati, OH 45241

**Work Address**

Department of Neurosurgery  
University of Cincinnati  
5210 Medical Science Building  
231 Albert Sabin Way  
Cincinnati, OH 45267

**Email:** jed.hartings@uc.edu

**Office:** (513) 558-3567

**Cell:** (513) 295-2370



**Wife:** Andrea

**Children:** Emilia and Lila

### ***CONTENTS***

[Education](#)

[Positions](#)

[Awards and Honors](#)

[Scholarships and Fellowships](#)

[Military Service and Education](#)

[Professional Activities & Service](#)

[In the Press and Media](#)

[Trainees](#)

[Patents and Invention Disclosures](#)

[Research Funding](#)

[Peer-Reviewed Publications](#)

[Seminars and Invited Lectures](#)

[Abstracts](#)

## Education

2000	University of Pittsburgh School of Medicine	Ph.D. in Neuroscience
1995	University of Notre Dame	B.S. in Biological Sciences
1991	St. Xavier High School (Cincinnati, OH)	

## Positions

2019-	Professor with Tenure, Department of Neurosurgery, University of Cincinnati
2018-	Vice-Chair of Research, Department of Neurosurgery, University of Cincinnati
2018-2019	Associate Professor with Tenure, Department of Neurosurgery, University of Cincinnati College of Medicine
2012-2018	Associate Professor, Department of Neurosurgery, University of Cincinnati
2008-2012	Assistant Professor, Department of Neurosurgery, University of Cincinnati
2004-2008	Chief, Neurophysiology Laboratory, Division of Psychiatry and Neuroscience, Walter Reed Army Institute of Research, Silver Spring, MD
2000-2008	Investigator, Neurophysiology Laboratory, Division of Psychiatry and Neuroscience, Walter Reed Army Institute of Research, Silver Spring, MD
2001-2008	Adjunct Assistant Professor, Department of Anatomy and Neurobiology, University of Maryland, Baltimore
2006-2008	Major, Medical Service Corps, U.S. Army
2000-2006	Captain, Medical Service Corps, U.S. Army

## Awards and Honors

### Academia

2018	UC College of Medicine Team Science Award
2013	Hero of Military Medicine, United Service Organizations
2012	Health Care Heroes Finalist, Innovator, Cincinnati Business Courier
2006	Department of the Army Research and Development Achievement Award for Technical Excellence
1995	Distinguished Military Graduate, University of Notre Dame
1991	Notre Dame Scholar Designation

### Military

2005, 2008	Meritorious Service Medal
2004	Global War on Terrorism Service Medal
2003	Army Achievement Medal
2002	Army Commendation Medal
1991, 2002	National Defense Service Medal
2000	Army Physical Fitness Excellence Award
2000	Army Service Ribbon

## Scholarships and Fellowships

1997-2000	Center for the Neural Basis of Cognition Graduate Training Program, University of Pittsburgh and Carnegie Mellon University
-----------	---

- 1998 Methods in Computational Neuroscience at Marine Biological Laboratory, Woods Hole, MA
- 1998-99 University of Pittsburgh School of Medicine Teaching Fellowship
- 1995-1996 University of Pittsburgh School of Medicine Dean's Scholarship
- 1993 Semester in St. Petersburg, Russia, University of Illinois
- 1993 Howard Hughes Undergraduate Research Fellow
- 1991-1995 U.S. Army Reserve Officers Training Corps

### **Military Service and Education**

- 2000-2008 WRAIR, Division of Psych. & Neuroscience
- 2007 Combat Casualty Care Course, Army Medical Department
- 2005 Captain's Career Course, Army Medical Department
- 2003 Acquisitions 101, Defense Acquisitions University
- 2000 Officer Basic Course, Army Medical Department
- 1995 Commissioned 2LT, Medical Service Corps, U.S. Army

### **Professional Activities and Service**

#### **Department of Neurosurgery, University of Cincinnati, and Mayfield Clinic**

- 2020- Department Representative, College of Medicine Faculty Forum
- 2016-2020 Co-Founder, Co-Director | Collaborative for Research on Acute Neurological Injuries (CRANI), University of Cincinnati College of Medicine
- 2016 Program Committee, Workshop Director | Neurotrauma Symposium, UC Gardner Neuroscience Institute
- 2018- Chair, Appointment, Reappointment, Promotions and Tenure Committee
- 2009-2018 Member, Appointment, Reappointment, Promotions and Tenure Committee
- 2009-2017 Clinical Trials Research Committee
- 2014-2017 Planning Committee | Art and Science of Healing, Mayfield Education and Research Foundation
- 2015-2017 Chair, Education and Research Committee
- 2009-2015 Member, Education and Research Committee
- 2009- Resident Interview and Rank Committee

#### **Co-Operative Studies on Brain Injury Depolarizations ([www.cosbid.org](http://www.cosbid.org))**

- 2005, 2006, 2008, 2011, 2018 Annual Meeting Host and Chair
- 2018-2022 Annual Meeting Organizing Committee, International Conference on Spreading Depolarizations (iCSD)
- 2014-2021 Website Designer and Manager
- 2003-2018 U.S. Coordinator and Neurotrauma Director
- 2006-2014 Database Host and Manager
- 2003- Steering Committee
- 2003 Co-Founder

#### **Study Section / Grant Reviewer**

- 2022 Scientist Reviewer, TBI/Psychological Health Research Program – Neuroinflammation, Congressionally Directed Medical Research Program

- 2022 Chairperson, TBI/Psychological Health Research Program – FP-BM-1, Congressionally Directed Medical Research Program
- 2020 Scientist Reviewer, Medical Simulation and Information Science Research Program, Congressionally Directed Medical Research Program
- 2019 Reviewer, Research Innovation Grant Program, University of Cincinnati College of Medicine
- 2018-2019 Reviewer, Pepper Scholars Program, Institute on Aging, University of Florida
- 2015-2018 Integration Panel Member, Epilepsy Research Program, Congressionally Directed Medical Research Program
- 2013-2020 Reviewer, UC Gardner Neuroscience Institute Pilot Grants Program
- 2015-2016 Reviewer, Joint Warfighter Program, Congressionally Directed Medical Research Program
- 2016 Reviewer, UC Gardner Neuroscience Institute Grants Pre-Review Program
- 2014 Reviewer, Technology Foundation STW, Netherlands
- 2013 Scientist Reviewer, TBI/Psychological Health Research Program – Neuroprotection, Congressionally Directed Medical Research Program

### **Editorial Board**

- 2016-2019 Journal of Cerebral Blood Flow & Metabolism
- 2009-2013 Journal of Cerebral Blood Flow & Metabolism

### **Ad-hoc Peer-Reviewer**

- 2022 Operative Neurosurgery (1), BMJ Open (1), JCBFM (1), Ann Neurol (2)
- 2021 Brain (1), JCBFM (1), ACS Chemical Neuroscience (1), Neurocritical Care (1), J Neurotrauma (1)
- 2020 Neurosurgery (1), Cereb Cortex (1), Neurotherapeutics (1), Nature Communications (1)
- 2019 JCBFM (2), J Neurotrauma (3), eNeuro (1), Brain (1), Neurocritical Care (1), J Clin Invest (1)
- 2018 Trans Biomed Eng (1), Sci Rep (1), Nature Materials (1), Neurocritical Care (1), JCBFM (1), J Neurotrauma (1)
- 2017 Sci Rep (1), JCBFM (2)
- 2016 JCBFM (2), Ann Neurol (1), Military Medicine (1)
- 2015 JCBFM (4), J Physiol (1), J Neurosci (1)
- 2014 Neurobio Dis (1), JCBFM (1), PLOS ONE (1), Glia (1)
- 2013 J Neurotrauma (1); Ann Neurol (1); Exp Neurol (1); JCBFM (1)
- 2012 Neurosci Lett (1); Neuroscience (2); The Neuroscientist (1); J Physiol (1); Exp Neurol (1); JCBFM (3)
- 2011 JCBFM (5); Cerebral Cortex (1); J Neurotrauma (2); Future Neurology (1)
- Pre-2011: Cerebral Cortex; Annals of Neurology; Journal of Neuroscience; Neurobiology of Disease; Journal of Neurophysiology; Journal of Cerebral Blood Flow and Metabolism; Journal of Neurotrauma; European Journal of Neuroscience; Brain Research; Journal of Healthcare Engineering; Nonlinearity in Biology, Toxicology and Medicine; Somatosensory and Motor Research

**Professional Societies**

- 2018 Workshop Director, Annual Meeting, Neurocritical Care Society
- 2009- Member, Neurocritical Care Society
- 2008- Member, National Neurotrauma Society
- 2008- Member, International Society for Cerebral Blood Flow and Metabolism
- 2018- Director, Scientific Interest Group (Spreading Depolarizations), International Society for Cerebral Blood Flow and Metabolism
- 1999-2007 Member, Society for Neuroscience

**Cincinnati Classical Academy** | 170 Siebenthaler Ave, Cincinnati, OH 45215  
K-12 charter school with a curriculum in the classical liberal arts and sciences

**2019- Founder and Board President**

Assembled Board of Directors • Established non-profit charitable organization • Built website, content, and marketing materials • Obtained Member School status in Hillsdale College K-12 Initiative • Obtained charter school authorization with Ohio Department of Education • Raised \$335K in start-up funding through charitable donations • Earned \$100K in federal grant funding through Chart School Program • Secured and managed consultants in law, education, finance, and real estate • Hired Headmaster • Secured 3-year lease on school property/facility • Opened 2022-23 with 455 students • >900 applications for 2023-24

**Other Service**

- 2019-2021 Curing Coma Campaign, Scientific Advisory Committee
- 2019 International Conference on Subarachnoid Hemorrhage, Scientific Committee
- 2019 Program Committee, Brain&BrainPET
- 2009-2012 Vasospasm 2011 Organizing Committee
- 2012-2019 Steering Committee, Neurobiology Research Center, University of Cincinnati Gardner Neuroscience Institute
- 2017 Organizing Committee, Research Day, University of Cincinnati Gardner Neuroscience Institute
- 2015-2018 UC Faculty and Staff Campaign, Department of Neurosurgery
- 2015- Mentor, Neuroscience Specialty Education Pathway, University of Cincinnati College of Medicine
- 2002-2018 Steering Committee, Neuroprotection Task Area, Combat Casualty Care Research Program, U.S. Army Medical Research and Materiel Command
- 2008-2011 Intergovernmental Personnel Act / Subject Matter Expert | Neuroscience Portfolio, Telemedicine and Advanced Technology Res. Ctr., U.S. Army Medical Research and Materiel Command

**In the Press and Media**

Forbes J. First-of-its-kind trial hopes to minimize the effects of brain injury. *UC News*, February 3, 2022. <https://www.uc.edu/news/articles/2022/02/interventional-trial-to-control-spreading-depolarizations.html>

Collins TR. Spreading depolarizations are brain injury's "silent culprit," expert says. *Neurology Today*, July 25, 2019.

[https://journals.lww.com/neurotodayonline/Fulltext/2019/07250/Spreading\\_Depolarizations\\_Are\\_Brain\\_Injury\\_s.6.aspx](https://journals.lww.com/neurotodayonline/Fulltext/2019/07250/Spreading_Depolarizations_Are_Brain_Injury_s.6.aspx)

The Dana Foundation, “The End Comes as a Wave”. Sophie Fessl, Sept 26, 2018.

[http://www.dana.org/News/The\\_End\\_Comes\\_as\\_a\\_Wave/](http://www.dana.org/News/The_End_Comes_as_a_Wave/)

Ayata C. Monitoring anoxic depolarization at the bedside: a step closer to the 24<sup>th</sup> century. *Journal of Cerebral Blood Flow and Metabolism* 38(7):1123-1124, 2018.

WVXU, Ann Thompson reporting, March 12, 2018: “The sounds inside your brain right before death.” <http://wvxu.org/post/sounds-inside-your-brain-right-death>

KCBS News Radio San Francisco, Live Interview, March 1, 2018

Newstalk Sean Moncrieff Show, 106-108 fm Ireland, Live Interview March 5, 2018

[https://www.vice.com/en\\_us/article/mbxv9b/this-neurologist-found-out-what-happens-to-our-brains-when-we-die](https://www.vice.com/en_us/article/mbxv9b/this-neurologist-found-out-what-happens-to-our-brains-when-we-die)

Kate Sheridan. Does a dying brain mean death? Some cellular changes may be reversible, new evidence shows. *Newsweek* February 27, 2018. <http://www.newsweek.com/does-dying-brain-mean-death-some-cellular-changes-may-be-reversible-new-820355>

UK Daily Mail, February 28, 2018: <http://www.dailymail.co.uk/sciencetech/article-5444223/What-happens-brain-minutes-die.html>

Robinson R. At the Bench – Subarachnoid Hemorrhage: Spreading Depolarizations Cause Acute, Not Just Delayed, Damage in Subarachnoid Hemorrhage. *Neurology Today* 17(21):23-24, 2017.

Ghoshal S and Claassen J. Spreading depolarization and acute ischaemia in subarachnoid haemorrhage: the role of mass depolarization waves. *Brain* 140(10):2527-2529, 2017.

Mayfield Clinic Press Release: [https://www.mayfieldclinic.com/MC\\_PR/PR\\_17Sep06.htm](https://www.mayfieldclinic.com/MC_PR/PR_17Sep06.htm)

Writer and director of “COSBID”, a documentary educational film

([https://drive.google.com/file/d/0B9I\\_abMZ1hlUkNMWnNQdFdCaFU/view?usp=sharing](https://drive.google.com/file/d/0B9I_abMZ1hlUkNMWnNQdFdCaFU/view?usp=sharing))

Webinar “Comprehensive overview of spreading depolarization monitoring”, sponsored by Moberg Research, Inc. (February 28, 2017)

WVXU, “Searching Out Tsunamis to Help Brain Injury Patients”, Ann Thompson reporting, August 29, 2016

Mayfield Clinic Short Film, “Research – In the Long Run”

<https://www.youtube.com/watch?v=O5FeAkYMecI&feature=youtu.be>

UCGNI Press Release, July 18, 2016: <http://ucneurocriticalcare.com/press-releases/researchers-awarded-4-7m-to-study-secondary-injury-following-traumatic-brain-injury/>

WVXU, “Exploring the Human Toll of Traumatic Brain Injuries”, Cincinnati Edition with Mark Heyne, December 18, 2015

Turner DA. Neurovascular regulation is critical for metabolic recovery from spreading depression. *Brain* 137:2877-8, 2014.

Chase A. Traumatic brain injury: spreading depolarization can cause secondary injury after TBI. *Nature Reviews Neurology*. Sept 16, 2014. doi: 10.1038/nrneurol.2014.169

Mayfield Brain & Spinal Column: “Running on happy for 100 miles through the woods”  
<https://mayfieldclinicblog.com/?p=972>

Neuroscience News (<http://neurosciencenews.com/neurology-eeg-tbi-depolarization-1380/>)

WVXU, “Brain Trunami”, Ann Thompson reporting, August 12, 2012

Stocchetti N. Traumatic brain injury: prognostic implications of cortical electrical disturbances. *Lancet Neurology* 10:1037-9, 2011. doi: 10.1016/S1474-4422(11)70249-6

“Watch Out for That Brain Tsunami”, M.J. Gertner, The Atlantic  
<http://www.theatlantic.com/health/archive/2011/12/watch-out-for-that-brain-tsunami/250634/>

## Trainees

Name of trainee	Program / Position	Dates	Advisor role	Trainee current position
Brandon Foreman, MD	Assistant Professor, UC Dept Neurology and Rehab. Med.	2015-present	Co-mentor, NIH K23 award	Assistant Professor, UC Dept Neurol.
Caroline Folz	Medical Student	2020-	Research mentor	Medical student
Faith Best	PhD Student, Neuroscience Graduate Program	2021-present	Dissertation Committee Member	PhD Student
Patrick Woller	PhD Student, Neuroscience Graduate Program	2022	Qualifying Exam Committee	PhD Student
Ishita Basu	Assistant Professor, UC Dept Neurosurgery	2022-present	Primary Mentor, KL2 Award	Assistant Professor, UC Dept Neurosurgery
Geet Shukla	Medical Student	2021-	MSSRP advisor	Medical student
Sreekar Puchala	Graduate Student, Computer Science	2020-	MS Committee and Research Co-Advisor	PhD Student
Refa't Ahmad Abo Ghazleh	PhD student, Dalhousie University	2020	External Examiner, PhD Dissertation Committee	
Kinsey Barhorst, MS1	Medical Student Summer Research Program	2019	Research co-advisor	MS1
Jonathan Faro, MS1	Medical Student Summer Research Program	2019	Primary Research Advisor	MS1
Liesl Close, MD	Neurosurgery resident, Univ. of Iowa	2018-present	Research mentor	Neurosurgery resident
Laura Ngwenya, MD, PhD	Assistant Professor, UC Dept Neurosurgery	2018-present	Co-mentor, NIH K08 award	Assistant Professor, UC Dept Neurosurgery
Chunyan Li, PhD	Post-doctoral fellow / Assistant Professor	2009-present	Research mentor, R21 consultant	Assistant Professor, Feinstein Institute

J. Adam Wilson, PhD	Post-doctoral fellow	2010-2013	Primary research advisor	Financial analyst
Jason M. Hinzman, PhD	Post-doctoral fellow	2012-2016	Primary research advisor	Medical Liaison, Eli Lilly and Company
Vince DiNapoli, MD, PhD	Neurosurgery Resident Research Year	07/12-06/13	Primary research advisor	Neurosurgeon, Mayfield Clinic
Cyrus King, MD	Neurosurgery Resident Research Year	07/13-06/14	Primary research advisor	Neurosurgeon, St. Louis, MO
Jonathan York, MD	Neurosurgery Resident Research Year	07/14-06/15	Primary research advisor	Neurosurgeon, Knoxville, TN
Ryan Tackla, MD	Neurosurgery Resident Research Year	07/14-06/15	Primary research advisor	Neurosurgeon, Tulsa, OK
Bryan Krueger, MD	Neurosurgery Resident Research Year	09/15-03/16, 03/19-pres.	Primary research advisor	Neurosurgery resident, PGY3, PGY6/7
Chris Carroll, MD	Neurosurgery Resident Research Year; AANS/CNS Robert J. Dempsey Cerebrovascular Research Award	07/16-06/18	Primary research advisor	Neurosurgery chief resident
Katrina Peariso, MD	Resident, Pediatric Neurology	2011-2012	Research mentor	Assistant Professor, UC Department of Pediatrics
Sebastian Pollandt, MD	Neurocritical Care Fellow	2012-2013	Research mentor	Assistant Professor, Rush University Medical Center
Brian Appavu, MD	Clinical Elective Rotation	03/2017	Primary instructor	Neurocritical Care Fellow, Columbia U.
Namir Khandar, MD	Clinical Elective Rotation	12/2017	Primary instructor	Neurocritical Care Fellow, Univ. Pittsburgh
Andrew Look, MS1	Medical Student Summer Research Program	6/10-8/10	Primary research advisor	Resident, Ohio State U.
Justin Gibson, MS1	Medical Student Summer Research Program; 2014 AQA Kuckein Student Research Fellowship	6/13-8/13	Primary research advisor	Neurosurgery resident, PGY1
Mark Costello, MS1	Medical Student Summer Research Program	6/14-8/14	Primary research advisor	Resident
Nirjhar Battacharjee	MS program, Computer and Electrical Engineering	2013-2015 Defense: 4/26/15	Research advisor; Thesis Committee Member	PhD student, Computational Neuroscience
Zhizen Wu	PhD program, Computer and Electrical Engineering	2014-2017 Defense: 5/3/17	Research advisor; Thesis Committee Member	Post-doctoral fellow, UC CEC
Laura Pahren	PhD program, Mechanical and Materials Engineering	06/17 – present	Research advisor; Thesis Committee Member	Doctoral student



Xinyu Cong	PhD program, Biostatistics	2/20-12/22 Defense: 11/1/22	Research advisor	Biostatistician, Astra-Zeneca
Elizabeth Weingartner, DePauw U.	Undergraduate Research Rotation	1/11-2/11	Primary research advisor	unknown
Steven Stoffel, California U. of Pennsylvania	Undergraduate Research Rotation	06/15-08/15	Primary research advisor	Medical student

## Patents and Invention Disclosures

U.S. Patent No. US 10,813,581 B2 (October 27, 2020): “Automated detection of spreading depolarizations”, JA Hartings and JA Wilson.

U.S. Patent No. US 10,849,518 B2 (Date: December 1, 2020): “Non-Invasive Detection of Spreading Depolarization Using Scalp Electroencephalography”, JA Hartings, JA Wilson, V DiNapoli, JM Hinzman, N Andaluz, S Pollandt.

U.S. Patent No. US 7,714,020 B2 (Date: May 11, 2010): “Treatment of non-convulsive seizures in brain injury using G-2-methyl-prolyl glutamate.” Inventors: PD Gluckman, MA Brimble, D Wilson, FC Tortella, AJ Williams, X-C Lu, JA Hartings, D Gryder.

Invention Disclosure: “Non-invasive detection of spreading depression by monitoring EEG delta activity.” ID Docket No. WRAIR 03-39. JA Hartings.

Invention Disclosure: “Band-width enhancement of biopotential recordings by digital inverse filtering.” ID Docket No. WRAIR 07-47. T Watanabe, JA Hartings.

## Research Funding

### Preventing Traumatic Brain Injury in Military CO<sub>2</sub> Conflicts Via the Capture of CO<sub>2</sub>

Robson (PI); Hartings (Co-I)

Funding Agency: DoD CDMRP PRMRP

Award No./Status: Review pending

Award Amount: \$2,919,277      Period: 1 Jan 2023 – 31 Dec 2026

### Improving neurotrauma by depolarization inhibition with combination therapy (INDICT)

Hartings (PI)

Funding Agency: Defense Medical Research and Development Program

Award No.: JW200215

Amount: \$4,480,654      Period: 09/2021-09/2024

### Rapid ketone infusion to prevent brain energy depletion and secondary brain injury in severe TBI with hemorrhagic shock

McGuire (PI); Hartings (Co-I)

Funding Agency: Defense Medical Research and Development Program

Award No.: W81XWH2010830

Amount: \$600,000      Period: 9/2020-9/2023

### A New ‘Medical Record for the Brain’ Enabling Precision Management of TBI

Moberg (PI); Hartings (Co-I)

Funding Agency: Defense Medical Research and Development Program, JPC-6

Application No.: DM180089

Amount (UC): \$981,000

Period: 09/2018–09/2021

**Development and Validation of Spreading Depolarization Monitoring for TBI Management**

Hartings (PI)

Funding Agency: Defense Medical Research and Development Program, JPC-6

Application No.: BA150075

Amount: \$4,484,794

Period: 07/2016–07/2020

**Hypothermia for patients requiring evacuation of subdural hematoma: effect on spreading depolarizations**

Hartings (PI)

Funding Agency: U.S. Army Medical Research and Materiel Command

Application No.: 14241002

Amount: \$997,661

Period: 09/2016-09/2020

**Mechanisms of Cortical Infarction Following Subarachnoid Clot Formation**

Hartings (PI)

Funding agency: Mayfield Education and Research Foundation

Amount: \$47,430

Period: 07/16-06/17

**Adenosine as an endogenous neuroprotectant against the metabolic burden of cortical spreading depolarization**

Hartings (PI)

Funding agency: Mayfield Education and Research Foundation

Amount: \$45,717

Period: 07/14-06/15

**Spreading depolarizations in delayed cerebral ischemia after subarachnoid hemorrhage**

Hartings (Co-I)

Funding agency: Mayfield Education and Research Foundation

Amount: \$47,608

Period: 3/2015 – 2/2016

**Collaborative European NeuroTrauma Effectiveness Research in TBI**

Maas/Menon (PI's)

Funding agency: EU Seventh Framework Programme (Health.2013.2.2.1-1)

Grant No.: 602150

Amount: \$37,000 to UC

Period: 10/2013 – 04/2020

**Novel 'smart' catheter for multimodal monitoring in the head-injured warrior**

Hartings, Narayan (Co-PI's)

Funding agency: Department of Defense PH/TBI Research Program (score: 1.2)

Award No.: W81XWH-10-1-0877

Amount: \$4,786,000

Period: 09/2010 – 08/2015

**Spreading depressions as secondary insults after traumatic injury to the human brain**

Hartings (PI)

Funding agency: Department of Defense PTSD/TBI Research Program (score: 1.7)

Award No.: W81XWH-08-2-0016

Amount: \$2,515,262

Period: 10/2008 – 09/2014

**Continuous electrophysiologic and behavioral monitoring of freely behaving rats after ischemic stroke**

Hartings (PI)

Funding agency: Mayfield Education and Research Foundation

Amount: \$44,686

Period: 07/13-06/14

**Glutamate-induced excitotoxicity of peri-infarct depolarizations in focal cerebral ischemia**

DiNapoli (PI); Hartings (Co-I)

Funding agency: Mayfield Education and Research Foundation

Amount: \$28,556

Period: 07/2012-06/2013

**MONOLithic Rapid Electroencephalogram for brain Arrhythmia Detection (*MonoREAD*)**

Wilson (PI); Hartings (Co-I)

Funding agency: Point-of-care Center for Emerging Neurotechnologies

Amount: \$110,000

Period: 2011-2012

**ECoG for early detection of delayed ischemia after aSAH**

Hartings (PI)

Funding agency: Mayfield Education and Research Foundation

Amount: \$50,000

Period: 03/2010 – 09/2011

**Pharmacology of brain injury-induced seizures**

Hartings (PI)

Funding agency: Department of Defense, U.S. Army Medical Research and Materiel Command, Combat Casualty Care Research Program

Award Number: H83-003-2005-WRAIR

Amount: \$1,239,000

Period: 10/1/04 – 9/30/07

**Brain-specific hypothermia as a neuroprotective therapy in penetrating ballistic brain injury in the rat**

Hartings (PI)

Funding agency: Department of Defense, U.S. Army Medical Research and Materiel Command, Combat Casualty Care Research Program

Award Number: H82-012-2006-WRAIR

Amount: \$410,000

Period: 10/1/05-9/30/07

**Characterization and implementation of a new penetrating head injury model in rats**

Hartings (PI)

Funding agency: Department of Defense, U.S. Army Medical Research and Materiel Command, Combat Casualty Care Research Program

Award Number: H81-001-2004-WRAIR

Amount: \$88,000

Period: 10/1/03-9/30/04

**Non-convulsant seizures secondary to brain injury: experimental models**

Hartings (PI)

Funding agency: Department of Defense, U.S. Army Medical Research and Materiel Command, Combat Casualty Care Research Program

Award Number: H8-011-2003-WRAIR

Period: 10/1/01-9/30/04

**Detection of spreading depression in stroke using non-invasive electroencephalography**

Hartings (PI)

Funding agency: In-House Laboratory Independent Research Award, Walter Reed Army Institute of Research  
 Amount: \$38,000 Period: 07/04-06/05

## Editorships

Zuccarello M, Clark JF, Pyne-Geithman G, Andaluz N, **Hartings JA**, Adeoye OM (eds.). *Cerebral Vasospasm: Neurovascular Events after Subarachnoid Hemorrhage*. Acta Neurochirurgica Supplement 115. Wein: Springer, 2013. Print.

**Hartings JA** and Dreier JP (guest editors). Special Clinical Issue: Brain Injury Depolarizations. *Journal of Cerebral Blood Flow and Metabolism*, May 2017.

## Peer-Reviewed Publications (Web of Science H-index: 38)

### Original research (reverse chronological order)

1. **Hartings JA**, Dreier JP, Ngwenya LB, Balu R, Carlson AP, Foreman B. Improving Neurotrauma by Depolarization Inhibition with Combination Therapy (INDICT): a Phase 2 Randomized Feasibility Trial. *Neurosurgery* (In press; accepted March 1, 2023).
2. LaSarge CL, McCoy C, Namboodiri DV, **Hartings JA**, Danzer SC, Batie MR, Skoch J. Spatial and temporal comparisons of calcium channel and intrinsic signal imaging during in vivo cortical spreading depolarizations in healthy and hypoxic brains. *Neurocritical Care*, 2022 Dec 20. [Online ahead of print] PMID: 36539593
3. Horst V, Kola V, Lemale C, Major S, Winkler MKL, Hecht N, Santos E, Platz J, Sakowitz OW, Vatter H, Dohmen C, Mscheel M, Vajkoczy P, **Hartings JA**, Woitzik J, Martus P, Dreier JP. Spreading depolarization and angiographic spasm are separate mediators of delayed infarcts. *Brain Communications*, in press.
4. Sanchez-Porras R, Kentar M, Olivares-Rivera A, Uhlmann L, Kunzmann K, Mann M, Zerelles R, Hernandez-Aguilera A, Gutierrez-Herrera M, **Hartings JA**, Woitzik J, Dreier JP, Santos E. Eighteen-hour inhibitory effect of s-ketamine on potassium- and ischemia-induced spreading depolarizations in the gyrencephalic swine brain. *Neuropharmacology* 2022 Jul 5 [Online ahead of print] PMID: 35798091
5. Foreman B, Lee H, Okonkwo DO, Strong AJ, Pahl C, Shutter LA, Dreier JP, Ngwenya LB, **Hartings JA**. The relationship between seizures and spreading depolarizations in patients with severe traumatic brain injury. *Neurocritical Care* 2022 Feb 16; 37(Suppl 1):31-48. PMID: 35174446
6. Robinson D, **Hartings JA**, Foreman B. First report of spreading depolarization correlates on scalp EEG confirmed with a depth electrode. *Neurocritical Care* 35(Suppl 2):100-104, 2021. PMID: 34617254
7. **Hartings JA**, Carroll CP, Hilvert N, Lee G. Spreading diffusion-restriction events in the injured gyrencephalic brain revealed by continuous magnetic resonance imaging. *Neurocritical Care* 37(Suppl 1):60-66, 2022. PMID: 34796429.
8. Dreier JP, Winkler MKL, Major S, Horst V, Lublinsky S, Kola V, Lemale CL, Kang E-J, Maslarova A, Salur I, Lückl J, Platz J, Jorks D, Oliveira-Ferreira AI, Schoknecht K,

- Reiffurth C, Milakara D, Wiesenthal D, Hecht N, Dengler NF, Liotta A, Wolf A, Kowoll CM, Schulte AP, Santos E, Güresir E, Unterberg AW, Sarrafzadeh A, Sakowitz OW, Vatter H, Reiner M, Brinker G, Dohmen C, Shelef I, Bohner G, Scheel M, Vajkoczy P, **Hartings JA**, Friedman A, Martus P, Woitzik J. Spreading depolarizations in ischaemia after subarachnoid haemorrhage, a diagnostic phase III study. *Brain*, 2022 May 24; 145(4):1264-84. PMID: 35411920
9. Robinson D, Kreitzer NP, Ngwenya LB, Adeoye O, Woo D, **Hartings JA**, Foreman B. Diffusion-weighted imaging reveals distinct patterns of cytotoxic edema in patients with subdural hematomas. *J Neurotrauma* 38(19):2677-2685, 2021. PMID: 34107754
  10. Jewell S, Strong AJ, Hobson S, Brewer G, Boutelle MG, **Hartings JA**, Foreman B, Lavrador J-P, Sole M, Pahl C. Development and evaluation of a method for automated detection of cortical spreading depolarizations in the injured human brain. *Neurocritical Care* 35(Suppl 2):160-175, 2021. PMID: 34309783
  11. Foreman B, Lee H, Mizrahi, MA, **Hartings JA**, Ngwenya LB, Privitera M, Tortella FC, Zhang N, Kramer JH. Seizures and Cognitive Outcome after Traumatic Brain Injury: A Post-Hoc Analysis. *Neurocritical Care* 36(1):130-138, 2022. PMID: 34232458
  12. Barhorst KA, Alfawares Y, McGuire JL, Danzer SC, **Hartings JA**, Ngwenya LB. Remote and persistent alterations in glutamate receptor subunit composition induced by spreading depolarizations in rat brain. *Cellular and Molecular Neurobiology* 42(4):1253-1260, 2022. PMID: 33184769
  13. **Hartings JA**, Andaluz N, Bullock MR, Hinzman JM, Mathern B, Pahl C, Puccio A, Shutter LA, Strong AJ, Vagal A, Wilson JA, Dreier JP, Ngwenya LB, Foreman B, Pahren L, Lingsma H, Okonkwo DO. Prognostic value of spreading depolarizations in severe traumatic brain injury. *JAMA Neurology* 77(4):489-499, 2020. PMID: 31886870
  14. Jung AD, Morris MC, Veile R, Friend LA, Stevens-Topie S, Cox DD, McGuire JL, Foreman B, **Hartings JA**, Pritts TA, Makley AT, Goodman MD. Vibration does not affect short term outcomes following traumatic brain injury in a porcine model. *Military Medicine* 185(3-4): E473-9, 2020.
  15. Santos E, Olivares-Rivera A, Major S, Sanchez-Porras R, Uhlmann L, Kunzmann K, Zerelles R, Kentar M, Kola V, Aguilera AH, Herrera MG, Lemale CL, Woitzik J, **Hartings JA**, Sakowitz OW, Unterberg AW, Dreier JP. Lasting s-ketamine block of spreading depolarizations in subarachnoid hemorrhage: a retrospective cohort study. *Critical Care* 2019 Dec 30; 23(1):427. [Epub ahead of print] PMID: 31888772
  16. Eriksen N, Pakkenberg B, Rostrup E, Lauritzen MJ, Strong AJ, Woitzik J, Mathern B, Shutter LA, Okonkwo DO, Pahl C, Martus P, Dreier JP, Fabricius M, **Hartings JA**. Neurostereologic lesion volumes and spreading depolarizations in severe traumatic brain injury patients: a pilot study. *Neurocritical Care* 30(3):557-568, 2019. PMID: 30972614.
  17. Dreier JP, Major S, Lemale CL, Kola V, Reiffurth C, Schoknecht K, **Hartings JA**, Woitzik J. Correlates of spreading depolarization, spreading depression and negative ultraslow potential in epidural versus subdural electrocorticography. *Frontiers in Neuroscience* 13:373, 2019. PMID: 31068779

18. Lee H, Mizrahi MA, **Hartings JA**, Sharma S, Pahren L, Ngwenya LB, Moseley BD, Privitera M, Tortella FC, Foreman B. Continuous electroencephalography after moderate to severe traumatic brain injury. *Critical Care Medicine* 47(4):574-582, 2019. PMID: 30624278
19. Vande Vyvere T, Wilms G, Claes L, Martin Leon F, Nieboer D, Verheyden J, van den Hauwe L, Pullens P, Maas AIR, Parizel PM; Collaborative European NeuroTrauma Effectiveness Research in Traumatic Brain Injury (CENTER-TBI) Investigators and Participants. Central versus local radiological reading of acute tomography characteristics in multi-center traumatic brain injury research. *Journal of Neurotrauma* 36(7):1080-1092, 2019. PMID: 30259789
20. Eriksen N, Rostrup E, Fabricius M, Scheel M, Major S, Winkler MKL, Bohner G, Santos E, Sakowitz OW, Kola V, Reiffurth C, **Hartings JA**, Vajkoczy P, Woitzik J, Martus P, Lauritzen M, Pakkenberg B, Dreier JP. Early focal brain injury after subarachnoid hemorrhage correlates with spreading depolarizations. *Neurology* 92(4):e326-e341, 2019. PMID: 30593517
21. Schinke C, Horst V, Schlemm L, Wawra M, Scheel M, **Hartings JA**, and Dreier JP. A case report of delayed cortical infarction adjacent to sulcal clots after traumatic subarachnoid hemorrhage in absence of proximal vasospasm. *BMC Neurology* 18(1):210, 2018. PMID: 30563494
22. van Veen E, van der Jagt M, Cnossen MC, Maas AIR, deBeaufort ID, Menon DK, Citerio G, Stocchetti N, Rietdijk WJR, van Dijck JTJM, Kompanje EJO, CENTER-TBI investigators and participants. Brain death and postmortem organ donation: report of a questionnaire from the CENTER-TBI study. *Critical Care* 22(1):306, 2018. PMID: 30446017
23. Carlson AP, Shuttleworth CW, Dreier JP, **Hartings JA**. Terminal spreading depolarizations cause electrocortical silencing prior to clinical brain death: case report. *Journal of Neurosurgery* 131(6):1773-1779, 2018. PMID: 30544340
24. Foreman B, Ngwenya LB, Stoddard E, Andaluz N, **Hartings JA**. Safety and reliability of bedside, single burr hole technique for intracranial multimodality monitoring in severe traumatic brain injury. *Neurocritical Care* 29(3):469-480, 2018. PMID: 29949001
25. Huijben JA, Volovici V, Cnossen MC, Haitsma IK, Stocchetti N, Maas AIR, Menon DK, Ercole A, Citerio G, Nelson D, Polinder S, Steyerberg EW, Lingsma HF, van der Jagt M, CENTER-TBI investigators and participants. Variation in general supportive and preventive intensive care management of traumatic brain injury: a survey in 66 neurotrauma centers participating in the Collaborative European NeuroTrauma Effectiveness Research in Traumatic Brain Injury (CENTER-TBI) study. *Critical Care* 22(1):90, 2018. PMID: 29650049
26. Luckl J, Lemale CL, Kola V, Horst V, Major S, Winkler MLK, Kang E-J, Schoknecht K, **Hartings JA**, Woitzik J, Dreier JP. The negative ultraslow potential of spreading depolarizations is the electrophysiological correlate of brain infarction in the human cerebral cortex. *Brain* 141(6):1734-1752, 2018. PMID: 29668855
27. Dreier JP, Major S, Foreman B, Winkler MKL, Kang EJ, Milakara D, Lemale CL, DiNapoli V, Hinzman JM, Woitzik J, Andaluz N, Carlson A, **Hartings JA**. Terminal spreading

- depolarization and electric silence in death of human cortex. *Annals of Neurology* 83(2):295-310, 2018. PMID: 29331091
28. **Hartings JA**, York J, Carroll CP, Hinzman JM, Mahoney EJ, Krueger B, Winkler MKL, Major S, Horst V, Jahnke P, Woitzik J, Kola V, Du Y, Hagen M, Jiang J, and Dreier JP. Subarachnoid blood acutely induces spreading depolarizations and early cortical infarction. *Brain* 140(10):2673-2690, 2017. PMID: 28969382
29. Cnossen MC, Huijben JA, van der Jagt M, Volovici V, et al. Variation in monitoring and treatment policies for intracranial hypertension in traumatic brain injury: a survey in 66 neurotrauma centers participating in the CENTER-TBI study. *Critical Care* 21(1):233, 2017. PMID: 28874206
30. Milakara D, Grozea C, Dahlem M, Major S, Winkler MKL, Luckl J, Scheel M, Kola V, Schoknecht K, Lublinsky S, Friedman A, Martus P, **Hartings JA**, Woitzik J, Dreier JP. Simulation of spreading depolarization trajectories in cerebral cortex: correlation of velocity and susceptibility in patients with aneurysmal subarachnoid hemorrhage. *Neuroimage* 16:524-538, 2017. PMID: 28948141
31. Pinczolits A, Zdunczyk A, Dengler NF, Hecht N, Kowoll CM, Dohmen C, Graf R, Winkler ML, Major S, **Hartings JA**, Dreier JP, Vajkoczy P, Woitzik J. Standard-sampling microdialysis and spreading depolarizations in patients with malignant hemispheric stroke. *Journal of Cerebral Blood Flow and Metabolism* 37(5):1896-1905, 2017. PMID:28350195
32. Li C, Narayan RK, Wang P, **Hartings JA**. Regional temperature and quantitative cerebral blood flow responses to cortical spreading depolarization in the rat. *Journal of Cerebral Blood Flow and Metabolism* 37(5):1634-1640, 2017. PMID: 27581720
33. **Hartings JA**, Li C, Hinzman JM, Wilson JA, Ernst GL, Andaluz N, Shuttleworth CW, Foreman B, Dreier JP, Carlson AP. Direct-current electrocorticography for clinical monitoring of spreading depolarizations. *Journal of Cerebral Blood Flow and Metabolism* 37(5):1857-1870, 2017. PMID: 27286981
34. Winkler MKL, Sandow N, Hecht N, **Hartings JA**, Kang EJ, Major S, Vajkoczy P, Woitzik J, Dreier JP. Oxygen availability and spreading depolarizations provide complementary prognostic information in neuromonitoring of aneurysmal subarachnoid hemorrhage patients. *Journal of Cerebral Blood Flow and Metabolism* 37(5):1841-1856, 2017. PMID: 27025768
35. Wu Z, Li C, **Hartings JA**, Narayan RK, Ahn C. Polysilicon based flexible temperature sensor for high resolution brain temperature monitoring. *Conf Proc IEEE Eng Med Biol Soc* 2016:6597-500, 2016. PMID: 28269735
36. Bogdanov VB, Middleton N, Theriot JJ, Parker PD, Abdullah OM, Ju YS, **Hartings JA**, Brennan KC. Susceptibility of primary sensory cortex to spreading depolarizations. *Journal of Neuroscience* 36(17):4733-4743, 2016. PMID: 27122032
37. Wu Z, Li C, **Hartings JA**, Narayan R, Ahn C. Polysilicon thin film developed on flexible polyimide for biomedical applications. *IEEE Journal of Microelectromechanical Systems* 25(4):585-592, 2016.

38. Drenckhahn C, Windler C, Major S, Kang E-J, Scheel M, Vajkoczy P, **Hartings JA**, Woitzik J, Dreier JP. Complications in aneurysmal subarachnoid hemorrhage patients with and without subdural electrode strip for electrocorticography. *Journal of Clinical Neurophysiology* 33(3):250-259, 2016. PMID: 27258449
39. Hinzman JM, Wilson JA, Mazzeo AT, Bullock MR, **Hartings JA**. Excitotoxicity and metabolic crisis are associated with spreading depolarizations in severe traumatic brain injury patients. *Journal of Neurotrauma* 33(19):1775-1783, 2016. PMID: 26586606
40. Li C, Wu Z, Limnusun K, Ahn CH, Narayan RK, **Hartings JA**. Development and application of a microfabricated multimodal neural catheter for neuroscience. *Biomedical Microdevices* 18(1):8, 2016. PMID: 26780443
41. Li C, Narayan RK, Wu P-M, Rajan N, Wu Z, Mehan N, Golanov V, Ahn C, **Hartings JA**. Evaluation of microelectrode materials for direct-current electrocorticography. *Journal of Neural Engineering* 13(1):016008, 2016. PMID: 26655565
42. Li C, Wu P-M, Wu Z, Mehan N, Prince SJ, Rajan N, Mozayan C, Golanov EV, Ahn CH, **Hartings JA**, Narayan RK. Highly accurate thermal flow microsensor for continuous and quantitative measurement of cerebral blood flow. *Biomedical Microdevices* 17(5):87, 2015. PMID: 26256480
43. Li C, Limnusun K, Wu Z, Amin A, Narayan A, Golanov EV, Ahn CH, **Hartings JA**, Narayan RK. Single probe for real-time simultaneous monitoring of neurochemistry and direct-current electrocorticography. *Biosensors and Bioelectronics* 77:62-68, 2015. PMID: 26386904
44. Hinzman JM, Gibson JL, Tackla RD, Costello M, Burmeister JJ, Quintero JE, Gerhardt GA, **Hartings JA**. Real-time monitoring of extracellular adenosine using enzyme-linked microelectrode arrays. *Biosensors and Bioelectronics* 74:512-517, 2015. PMID: 26183072
45. Tackla R, Hinzman JM, Foreman B, Magner M, Andaluz N, **Hartings JA**. Assessment of cerebrovascular autoregulation using regional cerebral blood flow in surgically managed brain trauma patients. *Neurocritical Care* 23(3):339-346, 2015. PMID: 25948537
46. Hinzman JM, DiNapoli VA, Mahoney EJ, Gerhardt GA, **Hartings JA**. Spreading depolarizations mediate excitotoxicity in the development of acute cortical lesions. *Experimental Neurology* 267:243-253, 2015. PMID: 25819105
47. Maas AI, Menon DK, Steyerberg EW, Citerio G, Lecky F, Manley GT, Hill S, Legrand V, Sorgner A, on behalf of CENTER-TBI Investigators. Collaborative European NeuroTrauma Effectiveness Research in Traumatic Brain Injury (CENTER-TBI): a prospective longitudinal observational study. *Neurosurgery* 76(1):67-80, 2015. PMID: 25525693
48. **Hartings JA**, Wilson JA, Hinzman JM, Pollandt S, Dreier JP, DiNapoli V, Ficker D, Shutter LA, Andaluz N. Spreading depression in continuous electroencephalography of brain trauma. *Annals of Neurology* 76(5):681-694, 2014. PMID: 25154587
49. Hinzman JM, Andaluz N, Shutter LA, Okonkwo DO, Pahl C, Strong AJ, Dreier JP, **Hartings JA**. Inverse neurovascular coupling to cortical spreading depolarizations in severe brain trauma. *Brain* 137(Pt 11): 2960-2972, 2014. PMID: 25154387



50. Jeffcote DT, Hinzman JM, Jewell S, Learney RM, Pahl C, Tolias C, Walsh DC, Zakrezewska A, Hocker S, Fabricius M, Strong AJ, **Hartings JA\***, Boutelle MG\*. Detection of spreading depolarisation with intraparenchymal depth electrodes in the injured human brain. *Neurocritical Care* 20(1):21-31, 2014. \*equal contribution. PMID: 24343564
51. **Hartings JA**, Vidgeon S, Strong AJ, Zacko C, Vagal A, Andaluz N, Ridder T, Stanger R, Fabricius M, Mathern B, Pahl C, Tolias C, Bullock MR. Surgical management of traumatic brain injury: a comparative efficacy study of two centers. *Journal of Neurosurgery* 120(2):434-446, 2014. PMID: 24180566
52. Serrone J, Wash E, **Hartings JA**, Andaluz N, Zuccarello M. Venous thromboembolism in subarachnoid hemorrhage. *World Neurosurgery* 80(6):859-863, 2013. PMID: 23298672
53. **Hartings JA**, Wilson JA, Look AC, Vagal A, Shutter LA, Dreier JP, Ringer A, Zuccarello M. Full-band electrocorticography study of spreading depolarizations in patients with subarachnoid hemorrhage. *Acta Neurochirurgica Supplementum* 115:131-141, 2013. PMID: 22890659
54. Wilson JA, Shutter LA, **Hartings JA**. COSBID-M3: A platform for multimodal data collection and research in neurocritical care. *Acta Neurochirurgica Supplementum* 115:67-74, 2013. PMID: 22890647
55. Li C, Wu Z, **Hartings JA**, Rajan N, Chahine N, Cheyuo C, Wang P, Wu PM, Golanov EV, Ahn CH, Narayan RK. Brain-friendly amperometric enzyme biosensor based on encapsulated oxygen generating biomaterial. *Conf IEEE Proc Eng Med Biol Soc* 2012:6003-6006, 2012. PMID: 23367297
56. Hertle DN, Dreier JP, Woitzik J, **Hartings JA**, Bullock MR, Okonkwo DO, Shutter LA, Vidgeon S, Strong AJ, Kowoll C, Dohmen C, Diedler J, Veltkamp R, Bruckner T, Unterberg AW, Sakowitz OW. Effect of analgesics and sedatives on the occurrence of spreading depolarizations accompanying acute brain injury. *Brain* 135(Pt 8):2390-2398, 2012. PMID: 22719001
57. Li C, Wu P-M, **Hartings JA**, Wu Z, Cheyou C, Wang P, LeDoux D, Shutter LA, Ramaswamy BR, Ahn CH, Narayan RK. Micromachined lab-on-a-tube sensors for simultaneous brain temperature and cerebral blood flow measurements. *Biomedical Devices* 14:759-768, 2012. PMID: 22552801
58. Drenckhahn C, Winkler M, Major S, Sheel M, Kang EJ, Grozea C, **Hartings JA**, Woitzik J, Dreier JP. Correlates of spreading depolarization in human scalp electroencephalography. *Brain* 135(Pt 3):853-868, 2012. PMID: 22366798
59. Dreier JP, Major S, Ebner A, Pannek H-W, Woitzik J, Sheel M, Wiesenthal D, Martus P, Winkler M, **Hartings JA**, Fabricius M, Pape H-C, Speckmann E-J, Gorgi A. Spreading convulsions, spreading depolarization, and epileptogenesis in human cerebral cortex. *Brain* 135(Pt 1):259-275, 2012. PMID: 22120143
60. Li C, Wu P-M, Wu Z, Ahn CH, LeDoux D, Shutter LA, **Hartings JA**, Narayan RK. Brain temperature measurement: A study of in vitro accuracy and stability of smart catheter temperature sensors. *Biomedical Microdevices* 14(1):109-118, 2012. PMID: 21952982
61. **Hartings JA**, Bullock MR, Okonkwo DO, Murray L, Murray GD, Fabricius M, Maas AIR, Woitzik J, Sakowitz O, Mathern B, Roozenbeek B, Lingsma H, Dreier JP, Puccio A,

- Shutter LA, Pahl C, Strong AJ. Spreading depolarizations and outcome after traumatic brain injury: a prospective, observational study. *Lancet Neurology* 10(12):1058-1064, 2011. PMID: 22056157
62. Li C, Wu P-M, Wu Z, Ahn CH, **Hartings JA**, Narayan RK. Smart catheter flow sensor for continuous regional cerebral blood flow monitoring. *Applied Physics Letters* 99, 233705, 1-4, 2011.
63. Fioravanti B, Kasasbeh A, Edelmayer R, Skinner DP Jr, **Hartings JA**, Burklund RD, De Felice M, French ED, Dussor GO, Dodick DW, Porreca F, Vanderah TW. Evaluation of cutaneous allodynia following induction of cortical spreading depression in freely moving rats. *Cephalalgia* 31(10):1090-1100, 2011. PMID: 21700643
64. **Hartings JA**, Watanabe T, Bullock MR, Okonkwo DO, Fabricius M, Woitzik J, Dreier JP, Puccio A, Shutter LA, Pahl C, Strong AJ. Spreading depolarizations have prolonged direct current shifts and are associated with poor outcome in traumatic brain injury. *Brain* 134 (Pt 5):1529-1540, 2011. PMID: 21478187
65. Lu XM, **Hartings JA**, Si Y, Balbir A, Cao Y, Tortella FC. Electroconvulsive pathology in a rat model of penetrating ballistic-like brain injury. *Journal of Neurotrauma* 28(1):71-83, 2011. PMID: 20964535
66. Oliveira-Ferreira A, Milakara D, Alam M, Jorks D, Major S, **Hartings JA**, Lückl J, Martus P, Graf R, Dohmen C, Bohner G, Woitzik J, Dreier JP. Experimental and preliminary clinical evidence of an ischemic zone with prolonged negative DC shifts surrounded by a normally perfused tissue belt with persistent electrocorticographic depression. *Journal of Cerebral Blood Flow and Metabolism* 30(8):1504-1519, 2010. PMID: 20332797
67. Eriksen N, Rostrup E, Andersen K, Lauritzen MJ, Fabricius M, Larsen VA, Dreier JP, Strong AJ, **Hartings JA**, Pakkenberg B. Application of stereological estimates in patients with severe head injuries using CT and MR scanning images. *British Journal of Radiology* 83(988):307-317, 2010. PMID: 19690078
68. **Hartings JA**, Strong AJ, Fabricius M, Manning A, Bhatia R, Dreier JP, Mazzeo AT, Tortella FC, Bullock MR. Spreading depolarizations and late secondary insults after traumatic brain injury. *Journal of Neurotrauma* 26(11):1857-1866, 2009. PMID: 19508156
69. Lu XM, Gryder D, Si Y, Williams A, **Hartings JA**, Tortella FC. NNZ-2566, a glypromate analog, attenuates brain ischemia induced non-convulsive seizures in rats. *Journal of Cerebral Blood Flow and Metabolism* 29(12):1924-1932, 2009. PMID: 19638995
70. **Hartings JA**, Watanabe T, Dreier JP, Major S, Fabricius M. Recovery of slow potentials in AC-coupled electrocorticography by digital inverse filtering: application to spreading depolarizations in rat and human cerebral cortex. *Journal of Neurophysiology* 102(4):2563-2575, 2009. PMID: 19494192
71. Dreier JP, Major S, Manning A, Woitzik J, Drenckhahn C, Steinbrink J, Tolia C, Oliveira-Ferreira AI, Fabricius M, **Hartings JA**, Vajkoczy P, Lauritzen M, Dirnagl U, Bohner G, Strong AJ. Cortical spreading ischaemia is a novel process involved in ischaemic damage in patients with aneurysmal subarachnoid haemorrhage. *Brain* 132(Pt 7):1866-1881, 2009. PMID: 19420089

72. Fabricius M, Fuhr S, Willumsen L, Dreier JP, Bhatia R, Boutelle MG, **Hartings JA**, Bullock MR, Strong AJ, Lauritzen M. Association of seizures with cortical spreading depression and peri-infarct depolarisations in the acutely injured human brain. *Clinical Neurophysiology* 119(9):1973-1984, 2008. PMID: 18621582
73. **Hartings JA**, Gugliotta M, Gilman C, Strong AJ, Tortella FC, Bullock MR. Repetitive spreading depolarizations in a case of severe brain trauma. *Neurological Research* 30(8):876-882, 2008. PMID: 18534057
74. Wei G, **Hartings JA**, Yang X, Tortella FC, Lu XC. Extraluminal cooling of bilateral common carotid arteries as a method to achieve selective brain cooling for neuroprotection. *Journal of Neurotrauma* 25(5):549-559, 2008. PMID: 18345596
75. Williams AJ, Tortella FC, Gryder D, **Hartings JA**. Topiramate reduces non-convulsive seizures after focal brain ischemia in the rat. *Neuroscience Letters* 430(1):7-12, 2008. PMID: 18063309
76. Dreier JP, Woitzik J, Fabricius M, Bhatia R, Major S, Drenckhahn C, Lehmann T-N, Sarrafzadeh A, Willumsen L, **Hartings JA**, Sakowitz O, Seemann JH, Thieme A, Lauritzen M, Strong AJ. Delayed ischaemic neurological deficits after subarachnoid hemorrhage are associated with clusters of spreading depolarizations. *Brain* 129(Pt 12):3224-3237, 2006. PMID: 17067993
77. Williams AJ, **Hartings JA**, Lu X-CM, Rolli ML, Tortella FC. Penetrating ballistic-like brain injury in the rat: differential time courses of hemorrhage, cell death, inflammation, and remote degeneration. *Journal of Neurotrauma* 23(12):1828-1846, 2006. PMID: 17184192
78. Fraser G, **Hartings JA**, Simons DJ. Adaptation of trigeminal ganglion cells to periodic whisker deflections. *Somatosensory and Motor Research* 23(3/4):111-118, 2006. PMID: 17178546
79. Williams AJ, Bautista C, Lu XM, Tortella FC, **Hartings JA**. Evaluation of gabapentin and ethosuximide for treatment of acute non-convulsive seizures (NCS) following ischemic brain injury in rats. *Journal of Pharmacology and Experimental Therapeutics* 318(3):947-955, 2006. PMID: 16728590
80. **Hartings JA**, Tortella FC, Rolli ML. AC electrocorticographic correlates of peri-infarct depolarizations following transient focal ischemia and reperfusion. *Journal of Cerebral Blood Flow and Metabolism* 26(5):696-707, 2006. PMID: 16177810
81. Lu X-C, Williams AJ, Wagstaff JD, Tortella FC, **Hartings JA**. Effects of delayed intrathecal infusion of an NMDA receptor antagonist on ischemic injury and peri-infarct depolarizations. *Brain Research* 1056(2):200-208, 2005. PMID: 16112094
82. Williams AJ, **Hartings JA**, Lu XC, Rolli ML, Dave JR, Tortella FC. Characterization of a new rat model of penetrating ballistic brain injury. *Journal of Neurotrauma* 22(2):313-331, 2005. PMID: 15716636
83. Yao C, Williams AJ, **Hartings JA**, Lu XC, Tortella FC, Dave J. Down-regulation of the sodium channel Nav1.1  $\alpha$ -subunit following focal ischemic brain injury in rats: in situ hybridization and immunohistochemical analysis. *Life Sciences* 77(10):1116-1129, 2005. PMID: 15878599

84. Lu XC, Williams AJ, Yao C, Berti R, **Hartings JA**, Whipple R, Vahey MT, Polavarapu RG, Woller KL, Tortella FC, Dave JR. Microarray analysis of acute and delayed gene expression profile in rats after focal ischemic brain injury and reperfusion. *Journal of Neuroscience Research* 77(6):843-857, 2004. PMID: 15334602
85. Khatri V, **Hartings JA**, Simons DJ. Adaptation in thalamic barreloid and cortical barrel neurons to periodic whisker deflections varying in frequency and velocity. *Journal of Neurophysiology*. 92(6):3244-3254, 2004. PMID: 15306632
86. Williams AJ, Tortella FC, Lu XM, Moreton E, **Hartings JA**. Antiepileptic drug treatment of non-convulsive seizures induced by focal brain ischemia. *Journal of Pharmacology and Experimental Therapeutics* 311(1):1-8, 2004. PMID: 15140918
87. **Hartings JA**, Rolli ML, Lu X-C M, Tortella FC. Delayed secondary phase of peri-infarct depolarizations following focal cerebral ischemia: relation to infarct growth and neuroprotection. *Journal of Neuroscience* 23(37):11602-11610, 2003. PMID: 14684862
88. **Hartings JA**, Temereanca S, Simons DJ. Processing of periodic whisker deflections by neurons in the ventroposterior medial and thalamic reticular nuclei. *Journal of Neurophysiology* 90(5):3087-3094, 2003. PMID: 14615426
89. Williams AJ, Lu X-C M, **Hartings JA**, Tortella FC. Neuroprotection assessment by topographic electroencephalographic analysis: effects of a sodium channel blocker to reduce polymorphic delta activity following ischemic brain injury in rats. *Fundamental and Clinical Pharmacology*. 17(5):581-593, 2003. PMID: 14703719
90. **Hartings JA**, Temereanca S, Simons DJ. State-dependent processing of sensory stimuli by thalamic reticular neurons. *Journal of Neuroscience* 23(12):5264-5271, 2003. PMID: 12832551
91. Pinto DJ\*, **Hartings JA**\*, Brumberg JC, Simons DJ. Cortical damping: analysis of thalamocortical response transformations in rodent barrel cortex. *Cerebral Cortex* 13(1):33-44, 2003. \*equal contribution. PMID: 12466213
92. **Hartings JA**, Williams AJ, Tortella FC. Occurrence of nonconvulsive seizures, periodic epileptiform discharges, and intermittent rhythmic delta activity in rat focal ischemia. *Experimental Neurology* 179(2):139-149, 2003. PMID: 12618120
93. Kelly MK, Carvell GE, **Hartings JA**, Simons DJ. Axonal conduction properties of antidromically identified neurons in rat barrel cortex. *Somatosensory and Motor Research* 18(3):202-210, 2001. PMID: 11562083
94. **Hartings JA**, Simons DJ. Inhibition suppresses transmission of tonic vibrissa-evoked activity in the rat ventrobasal thalamus. *Journal of Neuroscience* 20(19):RC100(1-5), 2000. PMID: 11000200
95. **Hartings JA**, Temereanca S, Simons DJ. High responsiveness and direction sensitivity of neurons in the rat thalamic reticular nucleus to vibrissa deflections. *Journal of Neurophysiology* 83(5):2791-2801, 2000. PMID: 10805677
96. **Hartings JA**, Simons DJ. Thalamic relay of afferent responses to 1-12 Hz whisker stimulation in the rat. *Journal of Neurophysiology* 80(2):1016-1019, 1998. PMID: 9705491

**Reviews, commentary, and book chapters (reverse chronological order)**

97. Kondziella D, Menon DK, Helbok R, Naccache L, Othman MH, Rass V, Rohaut B, Diring MN, Stevens RD, and collaborators of the Curing Coma Campaign. A precision medicine framework for classifying patients with disorders of consciousness: Advanced Classification of Consciousness Endotypes (ACCESS). *Neurocritical Care* 35(Suppl 1):27-36, 2021. PMID: 34236621
98. Andrew RD, **Hartings JA**, Ayata C, Brennan KC, Dawson-Scully KD, Farkas E, Herreras O, Kirov SA, Muller M, Ollen-Bittle N, Reiffurth C, Revah O, Robertson RM, Shuttleworth CW, Ullah G, Dreier JP. The critical role of spreading depolarizations in early brain injury: consensus and contention. *Neurocritical Care*, 2022 Mar 7; 37(Suppl 1): 83-101. PMID: 35257321
99. Andrew RD, Farkas E, **Hartings JA**, Brennan KC, Herreras O, Muller M, Kirov SA, Ayata C, Ollen-Bittle N, Reiffurth C, Revah O, Robertson RM, Dawson-Scully KD, Ullah G, Dreier JP. Questioning glutamate excitotoxicity in acute brain damage: the importance of spreading depolarization. *Neurocritical Care*, 2022 Feb 22; 37(Suppl 1):11-30. PMID: 35194729
100. Claassen J, Akbari Y, Alexander S, Bader MK, Bell K, Bleck TP, Boly M, Brown J, Chou S, Diring MN, Edlow B, Foreman B, Giacino JT, Gosseries O, Green T, Greer DM, Hanley D, **Hartings JA**, Helbok R, Hemphill JC, Hinson H, Hirsch K, Human T, James M, Ko N, Kondziella D, Livesay S, Madden L, Mainali S, Mayer S, McCredie V, McNett MM, Meyfroidt G, Monti MM, Muehlschlegel S, Murthy S, Nyquist P, Olson DM, Provencio JJ, Rosenthal E, Sampaio G, Sarasso S, Schiff ND, Sharshar T, Shutter L, Stevens R, Vespa P, Videtta W, Wagner A, Ziai W, Whyte J, Zink E, Suarez JI. Proceedings of the first Curing Coma Campaign NIH symposium: challenging the future of research for coma and disorders of consciousness. *Neurocritical Care* 35(Suppl 1):68-85, 2021. PMID: 34236624
101. Edlow BL, Sanz LRD, Polizzotto L, Pouratian N, Rolston JD, Snider SB, Thibaut A, Stevens RD, Gosseries O, the Curing Coma Campaign and its contributing members. Therapies to Restore Consciousness in Patients with Severe Brain Injuries: A Gap Analysis and Future Directions. *Neurocritical Care* 35 (Suppl 1):68-85, 2021. PMID: 34236624
102. Huie JR, Mondello S, Lindsell CJ, Antiga L, Yuh EL, Zanier ER, Masson S, Rosario BL, Ferguson AR; Transforming Research and Clinical Knowledge in Traumatic Brain Injury (TRACK-TBI) Investigators, CENTER-TBI Participants and Investigators. Biomarkers for traumatic brain injury: data standards and statistical considerations. *J Neurotrauma* 38(18):2514-29, 2021. PMID: 32046588
103. Provencio JJ, Hemphill JC, Claassen J, Edlow BL, Helbok R, Vespa PM, Diring MN, Polizzotto L, Shutter L, Suarez JI, Stevens RD, Hanley DF, Akbari Y, Bleck TP, Boly M, Foreman B, Giacino JT, **Hartings JA**, Human T, Kondziella D, Ling GSF, Mayer SA, McNett M, Menon DK, Meyfoidt G, Monti MM, Park S, Pouratian N, Puybasset L, Rohaut B, Rosenthal ES, Schiff ND, Sharshar T, Wagner A, Whyte J, Olson DM on behalf of the Neurocritical Care Society Curing Coma Campaign. The Curing Coma

- Campaign: Framing Initial Scientific Challenges – Proceedings of the First Curing Coma Campaign Scientific Advisory Council Meeting. **Neurocritical Care** 33(1):1-12, 2020. PMID: 32578124
104. Shuttleworth CW, Andrew RD, Akbari Y, Ayata C, Balu R, Brennan KC, Boutelle M, Carlson AP, Dreier JP, Fabricius M, Farkas E, Foreman B, Helbok R, Henninger N, Jewell SL, Jones SC, Kirov SA, Lindquist BE, Maciel CB, Okonkwo DO, Reinhart KM, Robertson RM, Rosenthal ES, Watanabe T, **Hartings JA**. Which Spreading Depolarizations Are Deleterious To Brain Tissue? **Neurocritical Care** 32(1):317-322, 2020. PMID: 31388871
  105. Helbok R, **Hartings JA**, Schiefecker A, Balanca B, Jewel S, Foreman B, Ercole A, Balu R, Ayata C, Ngwenya L, Rosenthal E, Boutelle MG, Farkas E, Dreier JP, Fabricius M, Shuttleworth CW, Carlson A. What should a clinician do when spreading depolarizations are observed in a patient? **Neurocritical Care** 32(1):306-310, 2020. PMID: 31338747.
  106. **Hartings JA**. How slow can you go? **Nature Materials** 18(3):194-196, 2019. PMID: 30598538
  107. **Hartings JA**, Ngwenya LB, Foreman B. Commentary: Detecting Cortical Spreading Depolarization with Full Band Scalp Electroencephalography: An Illusion? **Frontiers in Systems Neuroscience** 12:19, 2018. PMID: 29869634
  108. **Hartings JA**, Ngwenya LB, Carroll CP, Foreman B. Letter to the Editor. Ketamine sedation for the suppression of spreading depolarizations. 2018 Aug 3:1-2. **Journal of Neurosurgery** [Epub ahead of print] PMID: 30074462
  109. **Hartings JA**. Spreading depolarization monitoring in neurocritical care of acute brain injury. **Current Opinion in Critical Care** 23(2):94-102, 2017. PMID: 28207602
  110. Maas AIR, Menon DK, Adelson PD, Andelic N, Bell MJ, et al. Traumatic brain injury: integrated approaches to improve detection, clinical care, and research. **Lancet Neurology** 16(12):987-1048, 2017. PMID: 29122524
  111. **Hartings JA**, Dreier JP. Real-time detection of lesion development in acute brain injury. **Journal of Cerebral Blood Flow and Metabolism** 37(5):1550-1552, 2017. PMID: 28446106
  112. Dreier JP, Fabricius M, Ayata C, Sakowitz OW, Shuttleworth WC, Dohmen C, Graf R, Vajkoczy P, Helbok R, Suzuki M, Schiefecker AJ, Major S, Winkler MK, Kang EJ, Milakara D, Oliveira-Ferreira AI, Reiffurth C, Revankar GS, Sugimoto K, Dengler NF, Hecht N, Foreman B, Feyen B, Kondziella D, Friberg CK, Piilgaard H, Rosenthal ES, Westover MB, Maslarova A, Santos E, Hertle D, Sánchez-Porrás R, Jewell SL, Balança B, Platz J, Hinzman JM, Lückl J, Schoknecht K, Schöll M, Drenckhahn C, Feuerstein D, Eriksen N, Horst V, Bretz JS, Jahnke P, Scheel M, Bohner G, Rostrup E, Pakkenberg B, Heinemann U, Claassen J, Carlson AP, Kowoll CM, Lublinsky S, Chassidim Y, Shelef I, Friedman A, Brinker G, Reiner M, Kirov SA, Andrew RD, Farkas E, Güresir E, Vatter H, Chung LS, Brennan KC, Lieutaud T, Marinesco S, Maas AI, Sahuquillo J, Dahlem MA, Richter F, Herreras O, Boutelle MG, Okonkwo DO, Bullock MR, Witte OW, Martus P, van den Maagdenberg AM, Ferrari MD, Dijkhuizen RM, Shutter LA, Andaluz N, Schulte AP, MacVicar B, Watanabe T, Woitzik J, Lauritzen M, Strong AJ, and

- Hartings JA.** Recording, analysis, and interpretation of spreading depolarizations in neurointensive care: review and recommendations of the COSBID research group. *Journal of Cerebral Blood Flow and Metabolism* 37(5):1595-1625, 2017. PMID: 27317657
113. **Hartings JA**, Shuttleworth CW, Kirov SA, Ayata C, Hinzman JM, Foreman B, Andrew D, Boutelle MG, Brennan KC, Carlson AP, Dahlem MA, Drenckhahn C, Dohmen C, Fabricius M, Farkas E, Feuerstein D, Graf R, Helbok R, Lauritzen M, Major S, Oliveira-Ferreira A, Richter F, Rosenthal ES, Sakowitz OW, Sánchez-Porrás R, Santos E, Schöll M, Strong AJ, Urbach A, Westover MB, Winkler M.K.L., Witte OW, Woitzik J, Dreier JP. The continuum of spreading depolarizations in acute cortical lesion development: examining Leão's legacy. *Journal of Cerebral Blood Flow and Metabolism* 37(5):1571-1594, 2017. PMID: 27328690 **\*Third most-cited article published in JCBFM in 2017-2019\***
114. Revankar GS, Winkler MKL, Major S, Schoknecht K, Heinemann U, Woitzik J, Claassen J, **Hartings JA**, Dreier JP. Spreading depolarizations and seizures in clinical subdural electrocorticographic recordings. In: Varelas PN, Claassen J, editors. *Seizures in Critical Care: A Guide to Diagnostics and Therapeutics*. New York: Springer; 2017. p. 77-90.
115. Toth P, Szarka N, Farkas E, Ezer E, Czeiter E, Amrein K, Ungvari Z, **Hartings JA**, Buki A, Koller A. Traumatic brain injury-induced autoregulatory dysfunction and spreading depression-related neurovascular uncoupling: pathomechanism and therapeutic implications. *Heart and Circulatory Physiology* 311(5):H1118-H1131, 2016. PMID: 27614225
116. Dreier JP, Reiffurth C, Woitzik J, **Hartings JA**, Drenckhahn C, Windler C, Friedman A, MacVicar B, Herreras O. How spreading depolarization can be the pathophysiological correlate of both migraine aura and stroke. *Acta Neurochirurgica Supplementum* 120:137-140, 2015. PMID: 25366613
117. Bullock R, Strong AJ, **Hartings JA**. Decompressive craniectomy for acute subdural hematomas – Authors' response. *Journal of Neurosurgery* 120(5):1247-1249, 2014.
118. Dreier JP, Drenckhahn C, Woitzik J, Major S, Offenhauser N, Weber-Carstens S, Wolf S, Strong AJ, Vajkoczy P, **Hartings JA**. Spreading ischemia after aneurysmal subarachnoid hemorrhage. *Acta Neurochirurgica Supplementum* 115:125-129, 2013. PMID: 22890658
119. **Hartings JA**, Strong AJ, Okonkwo DO, Bullock MR. Spreading depolarisations and traumatic brain injury: time course and mechanisms – Author's reply. *Lancet Neurology* 11:389-390, 2012.
120. Lauritzen M, Dreier JP, Fabricius M, **Hartings JA**, Graf R, Strong AJ. Clinical relevance of cortical spreading depression in neurological disorders: migraine, malignant stroke, subarachnoid and intracranial hemorrhage, and traumatic brain injury. *Journal of Cerebral Blood Flow and Metabolism* 31(1):17-35, 2011. PMID: 21045864
121. Andaluz N, Zuccarello M, Dreier JP, **Hartings JA**. The role of cortical spreading depolarizations in delayed cerebral ischemia after aneurysmal subarachnoid hemorrhage. *Jornal Brasileiro de Neurocirurgia* 22(1):45-53, 2011.

122. Strong AJ, **Hartings JA**, Dreier JP. Cortical spreading depression: an adverse but treatable factor in intensive care? *Current Opinion in Critical Care* 13(2):126-133, 2007. PMID: 17327732

### Manuscripts Under Review

ChamanZar A, **Hartings JA**, Elmer J, Shutter LA, Grover P. Noninvasive, automated and reliable detection of spreading depolarizations in severe traumatic brain injury using scalp EEG. *Nature Communications Medicine*, under review.

Cong X, Rao M, **Hartings JA**, Jandarov R. A count-weighted Wilcoxon test and application to medical data.

### Other Publicatons

**Hartings JA**. Spreading depolarizations: a window into the black box of the traumatically injured brain. *Neurotrauma and Critical Care News*, AANS/CNS Section on Neurotrauma and Critical Care, Fall 2018, p. 6-9.

**Hartings JA**, Foreman B, Helbok R, Shuttleworth CW, Ayata C, Dreier JP. International Conference on Spreading Depolarizations (iCSD) Joins NCS Annual Meeting. *Currents, News Magazine of the Neurocritical Care Society*, Vol. 13, No. 1 (March 2018), p. 14-15.

Hartings JM, **Hartings JA**. Herd Immunity to COVID-19 has been achieved in some United States counties. *Unpublished*

### Invited Seminars – National and International Meetings

1. HJ Sims Late Winter Conference: Charter Schools and Senior Living (Expert Panelist; 14-16 February 2023; Sarasota, FL)
2. Massey TBI Conference, Weil Institute, University of Michigan (Expert Panelist; 5 May 2022; Ann Arbor, MI)
3. International Conference of Spreading Depolarizations (20-22 Sept 2021; Lyon, France): "SD aspects on ECoG recording in the ICU"
4. International Conference of Spreading Depolarizations – Virtual Meeting (18 Feb 2021): "Improving Neurotrauma by Depolarization Inhibition with Combination Therapy (INDICT): a randomized Phase 2 feasibility trial"
5. Moberg Gray Matters Webinar Series (Sept 30, 2020): "Identification of spreading depolarizations in bedside ECoG with Moberg CNS"
6. NIH Meeting "Curing Coma" (Sept 9-10, 2020): Co-Chair for "Neuroprognostication"
7. Pittcon2020 (Mar 3, 2020; Chicago, IL): Invited Symposium Speaker "Multimodal monitoring and neuroprotection of the injured brain"
8. American Clinical Neurophysiology Society, Annual Meeting (Feb 7-9, 2020; New Orleans, LA): "No lower limit: the slow and infinitely slow waves that mediate secondary injury and death of cerebral cortex"
9. U.S. Army Industry Day (17 Dec 19; Denver, CO): "Ketamine for the targeted treatment of spreading depolarizations in TBI"
10. Massey TBI Summit III, University of Michigan (18 Oct 19): Invited Faculty and Expert Panelist



11. American Academy of Neurology (May 8, 2019): Plenary Speaker: “The silent culprit in neurocritical care of acute brain injury: spreading depolarizations”
12. Neurocritical Care Society Annual Meeting (27 Sept 18): Speaker and Symposium Organizer: “Spreading depolarizations: the silent culprit of brain injury that you’ve been missing”
13. Vasospasm2017: International Conference on Neurovascular Events after Subarachnoid Hemorrhage (1-3 Oct 17): “Subarachnoid blood acutely induces spreading depolarizations and early cortical infarction”
14. COSBID XVIII (13 July 16): “Perspectives on the COSBID consortium: mission, history, and future” **(Keynote)**
15. International Symposium on Intracranial Pressure and Neuromonitoring (29 June 16): “Cortical spreading depolarization: real-time lesion monitoring in acute brain injury?” **(Keynote)**
16. National Neurotrauma Society Symposium (27 June 16, Lexington, KY): “Real-time detection of lesion development in acute brain injury”
17. American Academy of Neurology (April, 2016, Vancouver, BC): “Cortical Spreading Depression: New Formulations of Old Phenomena”
18. Brain15: International Society for Cerebral Blood Flow and Metabolism (29 July 15, Vancouver, Canada): “Spreading depolarizations in clinical TBI: triggers, modulators, and causation”
19. International Stroke Conference (11 Feb 15, Nashville, TN): “Spreading depolarizations in clinical TBI: triggers, modulators, and causation”
20. Neurovascular Coupling and Related Phenomena (8 Jul 14, Toronto, Canada): “Spreading depolarizations in acute brain injury: mathematical dynamic instability of cerebral cortex?”
21. International Neurotrauma Society Symposium (20 Mar 14, Budapest, Hungary): “Monitoring a neuronal pathophysiologic process in traumatic brain injury”
22. COSBID XV (Sept 13-14, 2013, Innsbruck, Austria): “Update on spreading depolarizations in TBI”, “Perspectives on a treatment trial for spreading depolarizations”, and “Electrocorticography with the Moberg Component Neuromonitoring System”
23. ANIM 2013, a joint meeting with DGNI & NCS (25 Jan 2013, Mannheim, Germany): “Research in international networks: transatlantic databanks”
24. COSBID XIV (Sept 21, 2012, London, UK): “A novel ventricular drainage catheter for multimodal monitoring using BioMEMS sensors”
25. Neurocritical Care Society Meeting (6 Oct 2012, Denver, CO): “Developing a research consortium in neurocritical care”
26. Neurocritical Care Society Meeting (5 Oct 2012, Denver, CO): “What do cortical spreading depolarizations mean to neurocritical care patients?”
27. International Razavi Neurotrauma Congress (Nov 23-25, 2011, Mashhad, Iran): "Spreading depolarization and outcome after traumatic brain injury: a prospective, observational study"
28. National Neurotrauma Symposium (July 13, 2011, Hollywood, FL): "Neuromonitoring Techniques: ECoG"
29. Winter Conference on Brain Research (January 24, 2011, Keystone, CO): "Spreading depolarizations: a paradigm shift in severe brain trauma?"

30. Tomographic Physiologic Imaging and Multimodal Monitoring (August 27, 2010, Santa Fe, NM): "Neurophysiology: spreading depression"
31. COSBID XII (May 6, 2010, Barcelona, Spain): "What are slow potential changes?" and "Spreading depolarizations as an independent predictor of poor outcome in TBI"
32. American Clinical Neurophysiology Society (Feb 2010, San Diego, CA): "Neurophysiology of acute brain injury: seizures, periodic patterns, and cortical spreading depression"
33. American Epilepsy Society (Dec 2009, Boston, MA): "Secondary brain damage from non-convulsive seizures and spreading depolarizations: evidence from animals and humans"
34. Brain'09: International Society for Cerebral Blood Flow and Metabolism (June 2009, Chicago, IL): "Spreading Depolarizations and In-Hospital Secondary Insults after Traumatic Brain Injury"
35. Gordon Research Conference: Bioelectrochemistry (23 July 2008): "Cortical spreading depolarizations following acute injury to the human brain"
36. Advanced Technologies in Combat Casualty Care (St. Pete Beach, FL; August 2005): "Incidence of cortical spreading depression in the injured human brain"
37. The Technical Cooperation Program (Brisbane, Australia; March 2005): "Cortical spreading depression in brain injury: from bench to bedside"
38. The Technical Cooperation Program (Brisbane, Australia; March 2005): "Silent seizures in brain injury: electrophysiology and anti-seizure pharmacology"
39. Advanced Technologies in Combat Casualty Care (St. Pete Beach, FL; August 2004): "Penetrating brain injury in the rat: electrocorticography and pathophysiology."
40. Barrels XVI (Covington, LA; November 2003): "Coding, bursting, and filtering: the whisker-related thalamus"

### **Invited Seminars – Other Institutions**

1. University of Pennsylvania, Neurology Grand Rounds (March 16, 2022): "Improving Neurotrauma by Depolarization Inhibition with Combination Therapy (INDICT): a Phase 2 Feasibility Study"
2. Dalhousie University (Halifax, Nova Scotia), Neuroscience Seminar (March 13, 2020): "Brain tsunamis: monitoring a mechanism of lesion development in traumatic brain injury"
3. University of Texas at Houston Health Science Center, Neurosurgery Grand Rounds (20 Jun 2019): "The SD-2 Study: Monitoring a Mechanism of Lesion Development in Traumatic Brain Injury"
4. Columbia University, Department of Neuroscience (10 May 2019): "Neurophysiology of acute brain injury: translational studies"
5. Massachusetts General Hospital, Joint Neurosurgery/Neurocritical Care Grand Rounds (24 May 18): "Physiologic monitoring for targeted interventions in acute brain injury"
6. University of Iowa (6 Apr 18): "Brain tsunamis: monitoring lesion development in acute brain injury"
7. Uniformed Services University of Health Sciences (7 Nov 17): "Brain tsunamis: monitoring a mechanism of lesion development in acute brain injury"
8. Einstein Medical College (13 May 2015): "How the brain dies: the role of spreading depolarizations in acute injury"
9. University of Pittsburgh Neurosurgery Grand Rounds (29 Apr 2015): "How the brain dies: the role of spreading depolarizations in acute injury"

10. University of Pittsburgh Daniel J. Simons Symposium (30 Apr 2015): “Dynamic instability of the injured cerebral cortex”
11. Massachusetts General Hospital, Critical Care Grand Rounds (22 Feb 2014): “How the brain dies: the role of spreading depolarizations in acute brain injury”
12. US Army Medical Research and Materiel Command (Ft. Detrick, MD) TBI Neuroimaging IPR (30 Jan 2014): “How the brain dies”
13. Wayne State University, Neurosurgery Grand Rounds (22 Feb 2013): “Found in translation: tsunamis in the brain”
14. Center for Neuroscience University of Pittsburgh, Annual Retreat (8 Sept 2012): “Tsunamis in the brain: from experimental artifact to clinical insight”
15. Proximagen/Upsher-Smith Laboratories (3 Mar 2012): “Towards a new therapeutic target in traumatic brain injury”
16. Medical College of Georgia, Neuroscience Seminar Series (3 Nov 2010): "Translational studies on spreading depolarizations: from experimental artifact to clinical insight"
17. Medical College of Georgia, Neurosurgery Grand Rounds (4 Nov 2010): "Tsunamis in the brain: spreading depolarizations as a novel culprit in acute brain injury"
18. University of New Mexico, Neurosurgery Grand Rounds (6 Nov 2009): “Spreading depolarizations in ischemic and traumatic injury to the human brain”
19. King’s College Hospital (London, UK), Neurosurgery Grand Rounds (2 Oct 09): “New developments in the study of spreading depolarisations in acute brain injury”
20. University of Miami, Neurosurgery Grand Rounds (April 2009): “Spreading depressions as secondary insults after traumatic brain injury”
21. Medical College of Virginia, Neurosurgery Grand Rounds (March 2009): “Spreading depressions as secondary insults after traumatic brain injury”
22. AIBS (American Institute of Biological Sciences) Review of U.S. Army Neuroprotection Program (Silver Spring, MD; February 2009): "Characterization of non-convulsive seizures in rat MCAo and PBBI models"
23. University of Pittsburgh, Neurosurgery Grand Rounds (November 2007): “Spreading depressions as secondary insults after traumatic brain injury”
24. National Institutes of Health, Model Development in Epileptogenesis and Therapy-Resistant Epilepsy Workshop (Gaithersburg, MD; Nov 2006): “Animal modeling of symptomatic geriatric epilepsy”
25. Columbia University, Neurosurgery Grand Rounds (July 2006): “Spreading depolarizations in the injured human brain: the COSBID study.”
26. National Capital Consortium, Neurosurgery Academics (National Naval Medical Center; Bethesda, MD; March 2006): “Spreading depolarizations in the injured human brain: from bench to bedside.”
27. University of Virginia, Neurosurgery Grand Rounds (November 2005): “Spreading depression in the injured human brain: the COSBID study.” Strong AJ, Fabricius MF, Hartings JA.
28. University of Pennsylvania, Neurosurgery Grand Rounds (November 2005): “Spreading depression in the injured human brain: the COSBID study.” Strong AJ, Fabricius MF, Hartings JA.
29. Virginia Commonwealth University, Neurosurgery Grand Rounds (Richmond, VA; October 2003): “Peri-infarct depolarizations in brain injury: from bench to bedside.”

## Local Seminars

1. UCGNI Special Event for LTG Potter, Deputy Chief of Staff of US Army (Speaker and Organizer; 23 Sept 22): “Tsunamis in the Brain”
2. UC Dept Neurosurgery Grand Rounds (14 Apr 21): “Improving Neurotrauma with Combination Therapy for Depolarization Inhibition (INDICT): a Phase 2 Feasibility Study”
3. Collaborative for Research on Acute Neurologic Injury (CRANI, 12 Dec 19): “Ketamine trial for traumatic brain injury”
4. Collaborative for Research on Acute Neurologic Injury (CRANI, 14 Nov 19): “Blossoming contusions”
5. Collaborative for Research on Acute Neurologic Injury (CRANI, 23 May 19): “Scoring, risk factors, and prognostic value of spreading depolarizations in traumatic brain injury: results of the SD-1 study”
6. UC Dept Neurosurg./Neurology Joint Grand Rounds (19 Dec 18): “Re-thinking excitotoxicity: an alternate theory and history” <https://echo360.org/media/b89e4a5c-a655-41e8-9527-ae3a69d14720/public>
7. Collaborative for Research on Acute Neurologic Injury (CRANI, 15 March 18): “The wave of death in severe brain ischemia”
8. CCHMC Bench-to-Bedside Neuroscience Forum (21 Nov 17): “Brain Tsunamis and Trial Design in Traumatic Brain Injury”
9. UC Dept Neurosurgery Grand Rounds (10 May 17): “The Spreading Depolarizations II and HOPES Studies in Traumatic Brain Injury”
10. UC Dept Neurology Grand Rounds (9 Nov 16): “The continuum of spreading depolarizations in acute cortical infarct development”
11. UC Dept Neurosurgery Grand Rounds (12 Aug 15): “Neurosurgery Residency Research Overview”
12. TriHealth TraumaScope Keynote Speaker (3 Nov 14): “Understanding traumatic brain injury: a scrambled mess, or a coordinated, modifiable process?”
13. UC Neuroscience Seminar Series (2 Oct 14): “Electrophysiology of acute brain lesion development: from bench to bedside”
14. UC Dept Neurology Grand Rounds (25 Feb 14): “How the brain dies: the role of spreading depolarizations in acute brain injury”
15. Division of Physical Medicine and Rehabilitation Grand Rounds (17 Jan 14): “How the brain dies”
16. UC College of Medicine Research Week, Brain Injury and Epigenetics Symposium (Oct 2013): “Tsunamis in the brain: a general pathologic principle of acute brain injury”
17. UC Dept Neurosurgery Grand Rounds (12 Sept 2012): “Tsunamis in the brain: a novel culprit in head trauma and stroke”
18. CCHMC Dept Trauma Grand Rounds (26 June 2012): “Tsunamis in the brain: a novel culprit in head trauma and stroke”
19. Center for Basic Neuroscience Research retreat (1 June 2012): “Tsunamis in the brain: a novel culprit in head trauma and stroke”
20. Epilepsy Research Group (Feb 2012): “A matter of perspective: detection of brain tsunamis by routine clinical EEG”
21. Lecture Series for Dr. Dennis Choi (Jan 2012): “Translational neurotrauma research at UCNI: present and future”

22. Mayfield Associates Grand Rounds (Jan 2012): “Brain tsunamis and the challenge of monitoring head injury”
23. Mayfield Symposium (June 2010): "Leão's spreading depression: translational clinical studies in ischemic and traumatic brain injury"
24. UC Dept Neurosurgery Grand Rounds (December 2008): “Spreading depressions as secondary insults after traumatic brain injury”
25. UC Dept Neurosurgery Grand Rounds (Sept 2007): “Non-convulsive seizures and spreading depolarizations in acute brain injury”
26. AIBS (American Institute of Biological Sciences) Review of U.S. Army Neuroprotection Program (Silver Spring, MD; February 2002): “Non-convulsant seizures in ischemic brain injury: electrophysiological processes and anti-seizure pharmacology”
27. WRAIR Featured Seminar Series (Silver Spring, MD; June 2001): “Inhibition and disinhibition in the rat thalamocortical system”
28. U.S. Army Research Psychology Short-Course (Ft. Dietrick, MD; June 2004): “Spreading depolarizations as a therapeutic target in traumatic brain injury”
29. U.S. Army Research Psychology Short-Course (Aberdeen, MD; May 2002): “Electrophysiological processes in brain injury”
30. University of Pittsburgh School of Medicine Dissertation (Pittsburgh, PA; May 2000): “Somatosensory processing in inhibitory feedback circuits of the thalamus”

### Oral Abstracts

1. \*Shukla G, Parks K, Hartings JA. Evaluating the Neuroprotectivity of Hypercapnia on Spreading Depolarizations. Congress of Neurological Surgeons (October 8-12, 2022; San Francisco, CA) \*presenter
2. \*Shukla G, Parks K, Hartings JA. Evaluating the Neuroprotectivity of Hypercapnia on Spreading Depolarizations. Ohio State Neurosurgical Society (September 10, 2022; Columbus, OH) \*presenter
3. \*Puchala S, Ralescu A, Hartings JA. Automated identification of spreading depolarizations in electrocorticography using machine learning. International Conference on Spreading Depolarizations (Salt Lake City, Utah; October 10-12, 2022) \*presenter
4. Hartings JA, Muchnik E, Puchala S. A software platform for live and offline computer-assisted scoring of spreading depolarizations in electrocorticography. International Conference on Spreading Depolarizations (Salt Lake City, Utah; October 10-12, 2022)
5. Best F, Hopkins T, Knott M, Khatri R, Hartings J, Ngwenya L. Adult hippocampal neurogenesis is altered after cortical spreading depolarizations and traumatic brain injury. International Conference on Spreading Depolarizations (Salt Lake City, Utah; October 10-12, 2022)
6. Shukla G, Parks K, Hartings JA. Evaluating the neuroprotectivity of hypercapnia on spreading depolarizations. UCMC Neuroscience Research Day (April 12, 2022). **\*1<sup>st</sup> Place, Medical Student**
7. Hartings JA, Ngwenya LB, Balu R, Smith D, Cong X, Jandarov R, Robson M, Foreman B. Hypocapnia worsens secondary damage in patients with severe traumatic brain injury. International Conference on Spreading Depolarizations (Sept 20-22, 2021; Lyon, France).
8. Jewell S, Brewer G, Boutelle M, Pahl C, Hartings JA, Foreman B, Strong A. Software to detect spreading depolarisations in the intensive care unit. International Conference on Spreading Depolarizations (Lyon, France; 20-22 Sept 21)

9. Krueger B, Ngwenya LB, Hinzman JM, Strong AJ, Okonkwo DO, and Hartings JA. Spreading depolarizations are associated with worsening pathologic anatomy in computed tomographic imaging after severe brain trauma. International Conference on Spreading Depolarizations (Yokohama, Japan; 1-3 July 19)
10. Watanabe T, Hartings JA. Does the shape of a spreading depolarization matter? International Conference on Spreading Depolarizations (Yokohama, Japan; 1-3 July 19)
11. Shaw C, et al. GFAP, but not UCH-L1, correlates significantly with cognitive outcome after traumatic brain injury. Society for Critical Care Medicine (San Diego, CA; February 2019).  
**\*Bronze Medal Award**
12. Hartings JA, Strong AJ, Andaluz N, Bullock MR, Hinzman JM, Wilson JA, Mathern B, Pahl C, Shutter LA, Vagal A, Lingsma H, Dreier JP, Foreman B, Watanabe T, Puccio AM, Okonkwo DO. Electrocorticography in surgically managed brain trauma patients. Part 1: spreading depolarizations and their relationship to clinical variables. International Conference on Spreading Depolarizations (Boca Raton, FL; 22 Sept 18)
13. Dreier JP, Major S, Woitzik J, Hartings JA. The shallow initial hypoperfusion preceding KCl-induced spreading depolarization (SD) in naïve, well-nourished tissue under thiopental anesthesia is not caused by SD but by the trigger. Vasospasm2017 (Los Angeles, CA; 9/30-10/3)
14. Dreier JP, Winkler M, Major S, Horst V, Jahnke P, Woitzik J, Hartings JA. Early spreading depolarizations are associated with early focal brain damage (either infarcts or intraparenchymal haemorrhage) in patients with aneurysmal subarachnoid hemorrhage. Vasospasm2017 (Los Angeles, CA; 9/30-10/3)
15. Hartings JA, York J, Hinzman JM, Krueger, et al. Subarachnoid blood acutely induces spreading depolarizations and early cortical infarction in the human and swine brain. Brain2017 (3 Apr 17) and International Conference on Spreading Depolarizations (Berlin, Germany)
16. Hinzman JM, Tackla R, Hartings JA. Continuum of spreading depolarizations in rat model of acute subdural hematoma. COSBID 2016, Albuquerque, NM.
17. \*Li C, Limnusun K, Narayan A, Golanov EV, Ahn CH, Narayan RK, Hartings JA. Transient brain temperature elevation as a surrogate indicator of cortical spreading depolarization (AANS, 2016). **\*ThinkFirst Head Injury Prevention Presentation Award**
18. \*Krueger B, York J, Hinzman JM, Mahoney EJ, Dreier JP, Zuccarello M, Hartings JA. Subarachnoid hemorrhage induces spreading depolarizations and cortical infarction. Vasospasm (AANS, 2016). **\*Synthes Cerebrovascular Section Resident/Fellow Award**
19. York J, Hinzman JM, Mahoney EJ, Dreier JP, Krueger B, Zuccarello M, \*Hartings JA. Subarachnoid hemorrhage induces spreading depolarizations and cortical infarction. Vasospasm (Kariuzawa, Japan; 2015). **\*Most Valuable Presentation Award**
20. York J, Hinzman JM, Mahoney E, Hartings JA. Spreading depolarizations in a swine model of traumatic brain injury. COSBID 2015, Elsinore, Denmark (Sept 2016).
21. Hartings JA, Andaluz N, Bullock MR, Hinzman JM, Lingsma H, Mathern B, Okonkwo DO, Pahl C, Shutter LA, Strong AJ, Vagal A, Wilson JA. Spreading depolarizations in severe traumatic brain injury: risk factors, associations, and prognostic value. Military Health Science Research Symposium, 2015.
22. \*Hinzman JM, Andaluz N, Shutter LA, Okonkwo DO, Strong AJ, Dreier JP, Hartings JA. Hemodynamic responses to cortical spreading depolarization in severe traumatic brain injury patients. Neurocritical Care 19(Suppl 1): S10, 2013. **\*Young Investigator Award Winner**

23. Hartings JA, Wilson JA, Pollandt S, Andaluz N, Ficker D, Shutter LA. Detection of spreading depolarizations by continuous EEG: a matter of perspective. *Neurocritical Care* 17(Suppl 2): S20, 2012.
24. Hartings JA, Okonkwo DO, Bullock MR, Shutter LA, Mathern B, Strong AJ. Spreading depolarizations and outcome after traumatic brain injury: a prospective observational study. *Military Health Research Symposium* (8 Aug 2012; Ft. Lauderdale, FL).
25. Hartings JA, Bullock MR, Zacko C, Vidgeon S, Ridder T, Stanger R, Fabricius M, Mathern B, Tolia C, Pahl C, Strong AJ. Pre-emptive decompressive craniectomy: a comparative effectiveness study between a U.K. and U.S. center. *Journal of Neurotrauma* 29(10): A-16-17, 2012.
26. Hartings JA, Wilson JA, Look AC, Shutter LA, Ringer A, Zuccarello M. Full-band electrocorticography study of spreading depolarizations in patients with aneurysmal subarachnoid hemorrhage. *Vasospasm2011: International Conference on Neurovascular Events after SAH*. (July 21-23, 2011, Cincinnati, OH)
27. Hartings JA, Bullock MR, Okonkwo DO, Murray L, Murray GD, Fabricius M, Maas AIR, Woitzik J, Sakowitz O, Mathern B, Roozenbeek B, Lingsma H, Dreier JP, Puccio A, Shutter LA, Pahl C, Strong AJ. Cortical spreading depolarizations are a novel mechanism independently associated with unfavorable clinical outcome in traumatic brain injury. *Journal of Neurotrauma* 28(6): A-3-4, 2011.
28. Hartings JA, Fabricius M, Dreier JP, Woitzik J, Okonkwo DO, Puccio A, Bullock MR, Strong AJ, Watanabe T (2010) Prolonged durations evidence adverse effects of spreading depolarizations in human brain trauma. *Journal of Neurotrauma* 27(5): A-11.
29. Military Health Research Forum (Sept 2009, Kansas City, MO): "Spreading depressions as secondary insults after traumatic injury to the human brain"
30. Society for Neuroscience Annual Meeting (New Orleans, LA; November 1997): "Cortical amplification vs. damping: mechanisms of response tuning in local cortical circuits"

### Poster abstracts

1. Dreier J, Horst V, Major S, Lemale C, Kola V, Hartings J, Woitzik J, Friedman A. Blood-brain barrier dysfunction in abnormal brain tissue two weeks after subarachnoid hemorrhage is a predictor for the development of late epilepsy. *BRAIN2023, Meeting of the International Society for Cerebral Blood Flow and Metabolism*. (Brisbane, Australia; June 12-15, 2023)
2. Best F, Hopkins T, Hartings JA, Ngwenya L. Cortical spreading depolarizations induced days after experimental traumatic brain injury exhibit electrophysiologic properties consistent with ongoing damage. *National Neurotrauma Society* (Austin, TX; June 25-28, 2023).
3. Shukla G, Parks K, Smith D, Hartings JA. Impact of Carbon Dioxide on Spreading Depolarizations in Normoxic and Hypoxic Rats. *International Conference on Spreading Depolarizations* (Salt Lake City, Utah; October 10-12, 2022)
4. ChamanZar A, Hartings JA, Elmer J, Shutter LA, Grover P. Noninvasive, automated and reliable detection of spreading depolarizations in severe traumatic brain injury using scalp EEG. *International Conference on Spreading Depolarizations* (Salt Lake City, Utah; Oct. 10-12, 2022)
5. Sparks T, Sword J, Blake D, Hartings JA, Yalcin N, Shah M, Kirov SA, Vale F. Cardiac arrest from exsanguination of nemestrus macaque monkey causes electrical silencing,

- terminal spreading depolarizations, and death in cortex. American Epilepsy Society (Nashville, TN; Dec. 2-6, 2022).
6. Folz C, Khandwala V, Ngwenya L, Hussein A, Hartings JA. Blossoming contusions: redefining lesion expansion following traumatic brain injury. American Association of Neurological Surgeons (Philadelphia, PA; Apr 29 – May 2, 2022).
  7. Hartings JA, Ngwenya LB, Balu R, Smith D, Cong X, Jandarov R, Robson M, Foreman B. Hypocapnia worsens secondary damage in patients with severe traumatic brain injury. Military Health Science Research Symposium (2021; Ft. Lauderdale, FL).
  8. Best F, Hopkins T, Hartings J, Ngwenya L. Induced spreading depolarizations produce exaggerated electrophysiological pathology in a rat model of traumatic brain injury. Congress of Neurological Surgeons (16-20 Oct 2021; Austin, TX).
  9. Chamanzar A, Elmer J, Shutter L, Hartings J, Grover P. Spreading depolarization is detected non-invasively using scalp electroencephalography. National Neurotrauma Society 2021.
  10. Reeder EL, O’Connell CJ, Norman SV, Hartings JA, Smith DW, Robson MJ. Carbon dioxide inhalation mitigates acute functional deficits and alterations in hippocampal gene transcription elicited by blast-induced traumatic brain injury. Military Health Science Research Symposium (2021; Ft. Lauderdale, FL).
  11. Robinson D, Orth E, Hartings J, Woo D, Foreman B. Diffusion-weighted imaging reveals distinct patterns of cytotoxic edema in subdural hematoma patients. Neurocritical Care Society (Sept 22-25, 2020)
  12. Watanabe T and Hartings JA. Slow potentials of spreading depolarizations in clinical electrocorticography of traumatic brain injury: measurement and modeling. Society for Neuroscience 2019 (Oct 19-23, 2019; Chicago, IL)
  13. Chamanzar A, Gurushankar K, Elmer J, Shutter L, Hartings JA, and Grover P. Towards an algorithm for detection of CSDs based on high frequency ECoG signals. National Neurotrauma Society (Pittsburgh, PA; 2019).
  14. Skoch J, LaSarge C, Namboodiri D, Danzer S, Vishwanath K, Hartings J. Coupling of Calcium Channel Activity, Optical Intrinsic Signals, and Local Blood Oxygenation during Cortical Spreading Depolarizations. 42<sup>nd</sup> Annual American Society of Pediatric Neurosurgeons (ASPN). Kauai. 2019.
  15. Carroll CP, Krueger BM, Mahoney EJ, Hinzman JM, Hartings JA. A porcine model of early cortical infarction after subarachnoid hemorrhage. Congress of Neurological Surgeons 2017 Annual Meeting.
  16. \*Carroll CP, Krueger BM, Mahoney EJ, Hinzman JM, Hartings JA. Subarachnoid hemorrhage acutely induces cortical spreading depolarizations and early cortical infarction. UCGNI Research Day (Cincinnati, OH; April 18, 2017). **\*Best Resident Abstract Award**
  17. Foreman B, Pahren L, Davari H, Hartings JA, Ngwenya L, Lee J. Leveraging predictive analytics to assess ICP-related neuronal dysfunction following severe traumatic brain injury. Neuroscience in Intensive Care International Symposium (Wash DC, March 2-3, 2017).
  18. Ngwenya L, Stoddard E, Andaluz N, Hartings J, Foreman B. Multimodality monitoring in severe traumatic brain injury: clinical feasibility and reliability. National Neurotrauma Symposium (Snowbird, Utah; July 7-12, 2017)
  19. Hartings JA, Major S, DiNapoli V, Winkler MKL, Hinzman JM, Foreman B, Woitzik J, Andaluz N, Carlson A, Dreier JP. Terminal depolarization follows electrical silence in death of the human cerebral cortex. National Neurotrauma Symposium (Snowbird, Utah; July 7-12, 2017)



20. Dreier JP, Major S, Hartings JA. Nonspreading depression followed by spreading depolarization in patients with cardiac arrest and analysis of platinum-iridium electrode interferences with oxygen and pH. Brain2017 and International Conference on Spreading Depolarizations (Berlin, Germany)
21. Hinzman JM, Krueger B, Tackla R, Hartings JA. Continuum of spreading depolarizations in rat model of acute subdural hematoma. Ohio State Neurosurgical Society (Cincinnati, OH; April 2016)
22. Hartings JA, Hinzman JM, Wilson A, Andaluz N, Lingsma H, Mathern B, Pahl C, Shutter LA, Vagal A, Bullock MR, Strong AJ, Okonkwo DO. Characterization of spreading depolarizations in severe traumatic brain injury: a prospective multi-center study. International Neurotrauma Society, 2016.
23. York J, Hinzman JM, Mahoney EJ, Goodman MD, Hartings JA. Spreading depolarizations in a swine model of traumatic brain injury. Military Health Science Research Symposium, 2015.
24. Narayan RK, Li C, Wu P-M, Wu Z, Bhattacharjee N, Ahn C, Hartings JA. A single device for simultaneous real-time monitoring of seven physiologic variables in the injured brain. Military Health Science Research Symposium, 2015.
25. Tackla R, Hinzman JM, Foreman B, Magner M, Andaluz N, Hartings JA. Assessment of cerebrovascular autoregulation using a regional cerebral blood flow monitor in severe brain trauma. Ohio State Neurosurgical Society, 2015.
26. York J, Hinzman JM, Mahoney E, Hartings JA. Spreading depolarizations in a swine model of traumatic brain injury. Ohio State Neurosurgical Society, 2015.
27. Hinzman JA, DiNapoli VA, Gerhardt GA, Hartings JA. Spreading depolarizations mediate excitotoxicity in development of acute cortical lesions. Brain 2015 (Vancouver, Canada; 2015).
28. Hinzman JA, Andaluz N, Shutter LA, Okonkwo DO, Pahl C, Strong AJ, Dreier JP, Hartings JA. Inverse neurovascular coupling to cortical spreading depolarizations in severe brain trauma. National Neurotrauma Society (San Francisco, CA; 2014).
29. Hinzman JA, DiNapoli VA, Gerhardt GA, Hartings JA. Spreading depolarizations mediate glutamate excitotoxicity in development of acute cortical lesions. National Neurotrauma Society (San Francisco, CA; 2014).
30. \*Costello M, King C, Hinzman JM, Hartings JA. Major ischemia transforms cortical spreading depolarizations into a pathophysiological process producing neuronal death. Medical Student Summer Research Program Symposium, Univ Cinti (2013). **\*Best Poster Award**
31. Rahme R, Jimenez L, Ringer AJ, Abruzzo TA, Zuccarello M, Hartings JA. Intra-arterial verapamil inhibits cortical spreading depolarizations in patients with post-hemorrhagic cerebral vasospasm: preliminary evidence. XV WFNS World Congress of Neurosurgery (2013).
32. Li C, Wu Z, Hartings JA, Rajan N, Chahine N, Cheyuo C, Wang P, Wu P-M, Golanov EV, Ahn C, Narayan R. Brain-Friendly Amperometric Enzyme Biosensor Based on Encapsulated Oxygen Generating Biomaterial. International IEEE EMBS Conference (2012).
33. Hocker S, Learney RM, Hartings J, Fabricius ME, Strong AJ. Paradoxical elevation of serum glucose in TBI associated spreading depressions. Neurocritical Care 17(Suppl 2): S76, 2012.

34. Hartings JA, Wilson JA, Pollandt S, Andaluz N, Ficker D, Shutter LA. A matter of perspective: detection of spreading depolarizations by continuous EEG. Princeton Conference XXVIII (2012; Cincinnati, OH).
35. Hartings JA, Wilson JA, Pollandt S, Andaluz N, Ficker D, Shutter LA. A matter of perspective: detection of spreading depolarizations by continuous EEG. *Journal of Neurotrauma* 29(10): A-191, 2012.
36. Li C, Wu Z, Hartings JA, Rajan N, Chahine N, Cheyuo C, Wang P, Wu P-M, Golanov EV, Ahn CH and Narayan RK. Brain-friendly amperometric enzyme biosensor based on encapsulated oxygen generating biomaterial. *IEEE EMBS* 2012.
37. Li C, Wu P-M, Hartings JA, Narayan RK. Cerebral blood flow sensor with in situ temperature and thermal conductivity compensation. *IEEE MEMS* 2012.
38. Dreier JP, Hartings JA. Spreading convulsions, spreading depolarization, and epileptogenesis in human cerebral cortex. *Winter Conference on Brain Research* (Jan 2012; Snowbird, Utah)
39. O'Phelan K, Sanchez-Chavez J, Nemeth Z, Morrison C, Jaggid J, Hartings J, Olvey S, Bullock MR. Evidence of metabolic stress associated with cortical spreading depression. *Journal of Neurotrauma* 28(6): A-93, 2011.
40. \*Wilson JA, Shutter LA, Hartings JA (2011) A platform for multimodal data collection and research in neurocritical care. *Neurocrit Care* 16:S51. **\*Distinguished Poster Recognition.**
41. Li C, Wu P-M, Hartings JA, Narayan RK. Smart catheter flow sensor for continuous regional cerebral blood flow monitoring. *IEEE Sensors* 2011.
42. \*Wilson JA, Hartings JA. A platform for multimodal data collection and research in neurocritical care. 11th International Conference on Neurovascular Events after Subarachnoid Hemorrhage. **\*Young Investigator Award.**
43. Hertle D, Hartings JA, Woitzik J, Dreier JP, Vidgeon S, Strong AJ, Kowoll C, Dohmen C, Diedler J, Veltkamp R, Unterberg AW, Sakowitz OW. Analgesics and sedative drugs have an impact on frequency of spreading depolarizations in the injured human brain. 11th International Conference on Neurovascular Events after Subarachnoid Hemorrhage.
44. Zakrzewska A, Bullock R, Fabricius M, Maas A, Manning A, Murray G, Murray L, Okonkwo D, Pahl C, Shutter L, Vidgeon S, Woitzik J, Strong A, Hartings J (2011) Independent relationship of cortical spreading depolarizations with adverse outcome from traumatic brain injury. *Joint EANS Annual Meeting-4th World ICH Conference.*
45. Li C, Hartings JA, Narayan RK (2011) Smart catheter intracortical electrodes for continuous monitoring of cerebral electrophysiology after traumatic brain injury. *Annual Meeting of the Biomedical Engineering Society.*
46. Wash E, Serrone J, Hartings J, Andaluz N, Zuccarello M (2010) Venous thromboembolism in subarachnoid hemorrhage. *American Association of Neurological Surgeons.*
47. Bodo M, Pearce F, Garcia A, Van Albert S, Settle T, Szebeni J, Baranyi L, Hartings J, Armonda R (2010) In vivo cerebral blood flow autoregulation studies using rheoencephalography. *Journal of Physics: Conference Series* 224: 012088.
48. Wilson JA, Shutter L, Hartings JA (2010) A system for real-time multimodal data integration and decision support during neurologic ICU monitoring. *Tomographic Physiologic Imaging and Multimodal Monitoring.*
49. Hartings JA, Roozenbeek R, Fabricius M, Bullock MR, Okonkwo D, Mathern B, Bhatia R, Manning A, Vidgeon S, Woitzik J, Shutter L, Maas AIR, Strong AJ (2010) First evidence for an independent relationship of cortical depolarisations with adverse outcome in patients with traumatic brain injury. *Society of British Neurological Surgeons Conference.*

50. \*Wilson JA, Bullock MR, Hartings JA (2010) Association of spreading depolarizations with excitotoxicity and metabolic crisis in TBI: a clinical microdialysis study. *Journal of Neurotrauma* 27(5): A-4. **\*Top 10 Poster Award.**
51. Losiniecki AJ, Okonkwo DO, Shutter LA, Bullock MR, Strong AJ, Mathern B, Puccio A, Vidgeon S, Pahl C, Hartings JA (2010) Computed tomographic pathologies associated with cortical dysfunction after traumatic brain injury requiring surgery. *Journal of Neurotrauma* 27(5): A-87.
52. Lu X-CM, Hartings JA, Cao Y, Tortella FC (2010) Characterization of periodic epileptiform discharges following penetrating ballistic-like brain injury in rats. *Journal of Neurotrauma* 27(5): A-34.
53. Shutter L, Strong AJ, Fabricius M, Bullock MR, Okonkwo D, Sakowitz O, Woitzik J, Hartings JA (2009) Association of spreading depolarizations with poor outcome after traumatic brain injury: results from a pilot study. *Neurocritical Care* 11:S55.
54. Pyne-Geithman G, Adeoye O, Hartings J, Bonomo J, Shutter L (2009) Quid pro quo: the role of “basic science” and its practitioners in neurocritical care research. *Neurocritical Care* 11:S206.
55. Hartings JA, Strong AJ, Bullock R, Okonkwo D, Sakowitz O, Fabricius M (2009) Association of spreading depolarizations with poor outcome after severe traumatic brain injury: results from a pilot study. *Journal of Neurotrauma* 26:A42.
56. Hartings JA, Strong AJ, Okonkwo D, Shutter L, Mathern B, Fabricius M, Dreier JP, Tortella FC, Bullock MR (2009) Spreading depolarizations as secondary insults after severe traumatic brain injury. *Military Health Research Forum*.
57. Major S, Woitzik J, Drenckhahn C, Hartings JA, Fabricius M, Strong AJ, Dreier JP (2009) ‘Normal’ and ‘inverse’ neurovascular coupling to cortical spreading depolarization in the human brain. *Journal of Cerebral Blood Flow and Metabolism* 29:S294.
58. Hartings JA, Fabricius M, Dreier JP, Major S, Vendelbo L, Watanabe T (2008) Monitoring of spreading depolarizations in acute brain injury by full-band electrocorticography. *Neurocritical Care* 9:S30.
59. Hartings JA, Manning A, Fabricius M, Bullock R, Strong A (2008) Cortical spreading depressions are associated with low arterial and cerebral perfusion pressures after traumatic brain injury in humans. *Journal of Neurotrauma* 25(7):883.
60. Si Y, Lu M-X, Chao Y, Wei G, Yang X, Tortella FC, Hartings JA (2008) EEG changes following penetrating ballistic-like brain injury in rats – a power spectral analysis. *Journal of Neurotrauma* 25(7):906.
61. Lu M-X, Si Y, Hartings JA, Tortella FC (2008) Characterization of early non-convulsive seizures following penetrating ballistic-like brain injury in rats using continuous EEG. *Journal of Neurotrauma* 25(7):898.
62. Hartings JA, Fabricius M, Dreier JP, Major S, Vendelbo L, Watanabe T. Recovery of slow potentials from AC-coupled electrocorticography: application to spreading depression and peri-infarct depolarizations in the human brain. Program No. 553.26. 2008 Neuroscience Meeting Planner. Washington, DC: Society for Neuroscience, 2008. Online.
63. Fabricius M, Manning A, Hartings JA, Sakowitz O, Woitzek J, Willumsen L, Lauritzen M, Mitchell P, Strong AJ. High incidence of cortical spreading depression in patients with intracerebral haematomas. Program No. 810.2. 2008 Neuroscience Meeting Planner. Washington, DC: Society for Neuroscience, 2008. Online.

64. Dreier JP, Major S, Manning A, Woitzik J, Drenckhahn C, Steinbrink J, Tolia C, Fabricius M, Oliveira-Ferreira AI, Lauritzen M, Hartings J, Dirnagl U, Bohner G, Strong AJ. 'Normal' and 'inverse' neurovascular coupling and suppression of low-frequency vascular fluctuations during cortical spreading depolarisation in the human brain. Program No. 810.1. 2008 Neuroscience Meeting Planner. Washington, DC: Society for Neuroscience, 2008. Online.
65. Fioravanti B, Edelmayer R, Hartings JA, Tortella FC, French ED, Porreca F, Vanderah TW. Behavioral changes in a rat model of cortical spreading depression. Program No. 849.9. 2008 Neuroscience Meeting Planner. Washington, DC: Society for Neuroscience, 2008. Online.
66. Fabricius M, Fuhr S, Willumsen L, Strong AJ, Bhatia R, Boutelle M, Dreier JP, Hartings JA, Bullock R, Lauritzen M (2007) Cortical spreading depression and seizures co-occur after acute brain injury. American Epilepsy Society.
67. Hartings JA, Fabricius M, Strong AJ, Bhatia R, Tortella FC, Bullock R (2007) Cortical spreading depolarizations are associated with high ICP and low MAP in severe TBI patients. National Neurotrauma Society.
68. Hartings JA, Strong AJ, Bullock MR, Bhatia R, Fabricius M, Vo AH, Bell RS, Tortella FC, Ecklund JM, Armonda RA, Dreier JP (2006) Spreading depolarizations of cerebral cortex after brain injury: mechanism of injury progression and relevance to military neurotrauma. Army Science Conference.
69. Fabricius M, Fuhr S, Willumsen L, Strong AJ, Bhatia R, Boutelle MG, Dreier JP, Hartings JA, Bullock MR, Lauritzen M (2006) Co-occurrence of cortical spreading depression and seizure activity in acutely injured human cerebral cortex. Society for Neuroscience.
70. Gryder DS, Williams AJ, Guevarra PA, Pulcifer AM, Hartings JA, Tortella FC, Lu XM (2006) NNZ 2566 treatment reduces non-convulsive seizures in rat model of middle cerebral arterial occlusion (MCAo). Society for Neuroscience.
71. Dreier JP, Woitzik J, Fabricius M, Bhatia R, Major S, Drenckhahn C, Lehmann T-N, Sarrafzadeh A, Willumsen L, Hartings JA, Sakowitz O, Lauritzen M, Strong AJ (2006) Clusters of prolonged spreading depolarizations are the electrocorticographic correlate of delayed ischemic infarcts after subarachnoid hemorrhage. Society for Neuroscience.
72. Hartings JA, Bullock MR, Fabricius M, Bhatia R, Dreier JP, Tortella FC, Strong AJ (2006) Cortical spreading depression after traumatic and penetrating injury to the human brain. *J. Neurotrauma* 23(2): 761.
73. Hartings JA, Mazzeo AT, Fabricius M, Tortella FC, Bullock MR (2005) Temperature effect on spreading depression incidence in the traumatically injured human brain. *J. Neurotrauma* 22(10): 1201.
74. Hartings JA, Mazzeo AT, Fabricius M, Tortella FC, Bullock MR. Spreading depolarizations in the injured human brain. Brain05; Meeting of International Soc. of Cereb. Blood Flow and Metab.
75. Whipple RA, Williams AJ, Dave JR, Tortella FC, Hartings JA. Peri-infarct depolarizations regulate immediate early gene expression 8-24 hr following focal brain ischemia. Program No. 343.5, 2004 Abstract Viewer/Itinerary Planner, Washington, DC: Society for Neuroscience.
76. Connors RA, Bauman RA, Long JB, Tortella FC, Hartings JA. Incidence of cortical spreading depression in fluid percussion brain injury in the rat. Program No. 793.10, 2004 Abstract Viewer/Itinerary Planner, Washington, DC: Society for Neuroscience.

77. Hartings JA, Williams AJ, Bautista CC, Tortella FC. Penetrating brain injury in the rat: electroencephalography and persistence of spreading depression. Program No. 793.14, 2004 Abstract Viewer/Itinerary Planner, Washington, DC: Society for Neuroscience.
78. Hartings JA, Williams AJ, Bauman RA, Long JB, Tortella FC (2004) Penetrating brain injury in the rat: IV. Persistence of cortical spreading depression. International Neurotrauma Society.
79. Tortella FC, Williams AJ, Lu XM, Hartings JA (2004) Penetrating brain injury in the rat: V. Characterization of electroencephalographic abnormalities. International Neurotrauma Society.
80. Williams AJ, Lu XM, Hartings JA, Rolli ML, Bautista C, Dave JR, Tortella FC (2004) Penetrating brain injury in the rat: I. Modeling a survivable, high velocity gunshot wound to the head without using a fired projectile. International Neurotrauma Society.
81. Hartings JA, Rolli ML, Cunningham B, Stefanik C, Tortella FC (2003) Electroencephalographic signatures of spreading depression in non-anesthetized, brain-injured rats. *Soc. Neurosci. Abstr.* Vol 29.
82. Williams AJ, Hartings JA, Cunningham B, Lu X-CM, Tortella FC (2003) Treatment of brain ischemia-induced non-convulsive seizures (NCS) in the rat with clinically available anti-epileptic drugs (AEDs). *Soc. Neurosci. Abstr.* Vol 29.
83. Williams A, Lu X-CM, Hartings JA, Cunningham B, Stefanik C, Roland CL, Wagstaff JD, Tortella FC (2003) Intrathecal treatment of CGX-1007, conantokin-G, reduces infarction and prevents cortical spreading depression in a rat model of focal brain ischemia and reperfusion. *Soc. Neurosci. Abstr.* Vol 29.
84. Yao C, Hartings JA, Lu X-C M, Williams AJ, Yu Z, Hale SL, Berti R, Tortella FC, Dave JR (2003) Down-regulation of sodium channel  $\alpha$ -subunit  $Na_v1.1$  mRNA and protein following ischemic brain injury. *Soc. Neurosci. Abstr.* Vol 29.
85. Hartings JA, Rolli ML, Tortella FC (2003) Repetitive peri-infarct depolarizations at 8-18 h post-injury coincide with infarct growth in rat focal cerebral ischemia. *J. Cereb. Blood Flow Metab.* 23 Suppl (1): 294.
86. Hartings JA, Tortella FC (2002) Continuous monitoring of spreading depression (SD) and ictal activity in the awake rat following focal cerebral ischemia. Program No. 695.5. 2002 Abstract Viewer/Itinerary Planner. Washington, DC: Society for Neuroscience, CD-ROM.
87. Kinjo M, Hartings JA, Lu X-CM, Moreton JE, Tortella FC (2002) Non-convulsive seizures in rat focal cerebral ischemia and treatment with anti-epileptic drugs (AED). Program No. 695.4. 2002 Abstract Viewer/Itinerary Planner. Washington, DC: Society for Neuroscience, CD-ROM.
88. Khatri V, Hartings JA, Simons DJ (2002) Responses of excitatory and inhibitory barrel neurons to periodic whisker deflections. Program No. 45.5. 2002 Abstract Viewer/Itinerary Planner. Washington, DC: Society for Neuroscience, CD-ROM.
89. Hartings JA, Williams AJ, Tortella FC (2001) EEG Characterization of non-convulsive seizures following focal cerebral ischemia in the rat. *Soc. Neurosci. Abstr.* Vol. 27, Program No. 552.4.
90. Ives J, Jonas W, Hartings JA, Olufade A, Williams A, Eagles D, Tortella F (2001) Neuroprotection in experimental rat brain injury with ultra high dilution glutamate but not potassium chloride. *Soc. Neurosci. Abstr.* Vol. 27, Program No. 209.11.

91. Dave JR, Stoica B, Williams AJ, Hartings JA, Yao C, Berti R, Faden A, Tortella F (2001) Studies on neuronal apoptosis following middle cerebral artery occlusion (MCAo)-mediated brain injury in rats. *Soc. Neurosci. Abstr.* Vol. 27, Program No. 773.16.
92. Hartings JA, Simons DJ (1999) Entrainment of somatosensory thalamocortical circuitry in the rat by periodic (1-40 Hz) whisker stimulation. *Somatosens. Mot. Res.* 16(2): 179.
93. Hartings JA, Temereanca S, Simons DJ (1999) Thalamic reticular nucleus control of thalamocortical activity in sensory afferent processing. *Soc. Neurosci. Abstr.*
94. Hartings JA, Pinto DJ, Brumberg JC, Simons DJ (1997) Cortical amplification vs. damping: mechanisms of response tuning in local circuits. *Soc. Neurosci. Abstr.*
95. Hartings JA, Pinto DJ, Simons DJ (1996) Recurrent excitation and its control in a model of rat whisker/barrel cortex. *Soc. Neurosci. Abstr.* 2: 1359.