



23rd Annual Neuroscience Day At Dartmouth

SUMMARY OF PRESENTATIONS

Talks:

1:15 – 1:45 PM

A Cluster of Amyotrophic Lateral Sclerosis in Close Proximity to Two Lakes in Enfield, NH, USA with Known Blooms of Potentially Toxic Cyanobacteria

Tracie Caller, M.D.*

Department of Medicine (Section of Neurology, Dartmouth-Hitchcock Medical Center, Lebanon, NH 03756

Chronic Anabolic Androgenic Steroid Effects on GABA_A Receptors and Action Potential Firing in GnRH and non-GnRH neurons of the Forebrain

Matthew C. Davis

Department of Physiology, Dartmouth Medical School. Hanover, NH 03755.

Blood-Brain Barrier Disruption using MRI-guided Focused Ultrasound for Targeted Drug Delivery to the Brain in Rats

Lisa H. Treat^{1,2,3}

¹Department of Biological Sciences, Dartmouth College, 103 Gilman Hall, Hanover, NH 03755, USA

²Thayer School of Engineering, Dartmouth College, 8000 Cummings Hall, Hanover, NH 03755, USA

³Department of Anesthesiology, Dartmouth Medical School and Dartmouth-Hitchcock Medical Center, One Medical Center Drive, Lebanon, NH 03756, USA

Combining Magnetoencephalography and Diffuse Optical Tomography for Human Neuroimaging

Katherine L. Perdue

Thayer School of Engineering at Dartmouth, Hanover, NH, USA

POSTER PRESENTATIONS:

- 1. Contribution of the cholinergic prefrontal cortex to inhibitory learning**
Christina M. Ackerman, Jill E. MacLeod, David J. Bucci
Department of Psychological and Brain Sciences
Dartmouth College, Hanover, NH
- 2. Estrogen modulation of conditioned place preference for artificial vaginocervical stimulation**
Eilish M. Boisvert, Sarah H. Meerts, Ann S. Clark
Department of Psychological & Brain Sciences, Dartmouth College, Hanover, NH
- 3. Contributions of the Medial Entorhinal Cortex to Head Direction Cell Activity in the Anterior Thalamus**
Clark, B.J., Taube, J.S.
Department of Psychological and Brain Sciences, 6207 Moore Hall, Dartmouth College, Hanover, NH
- 4. Characterization of the role of retrosplenial cortex in learning and memory**
Daisy Duan, Evan Lamont, Eric Ross, Christopher S. Keene, & David J. Bucci
Psychological and Brain Sciences, Dartmouth College, Hanover, NH
- 5. Effects of increased kynurenic acid concentration on social behavior and novel object recognition: Implications for schizophrenia**
Gretchen C. Evans, Lan Guo, and David J. Bucci
Department of Psychological and Brain Sciences, Dartmouth College, Hanover, NH
- 6. Working Memory in Musicians and Nonmusicians: Neural and Behavioral Evidence**
Elyse George¹ and Donna Coch²,
¹Neuroscience Program, Department of Psychological and Brain Sciences, Dartmouth College, Hanover, NH
²Department of Education, Dartmouth College, Hanover, NH
- 7. Over-Expression of Id2 Arrests Oligodendroglial Differentiation at the Progenitor Stage: Implications for Gliomagenesis**
Havrdá, MC., Jering, K., Paolella, BP., Israel, MA.
Norris Cotton Cancer Center, Dartmouth Medical School, Lebanon, NH, USA
- 8. Voluntary exercise provides stress-protection in male Long Evans rats and improves performance in a novel object recognition task**
Michael E. Hopkins and David J. Bucci
Department of Psychological and Brain Sciences, Dartmouth College, Hanover, NH 03755
- 9. Neural Reactivity to Smoking Cues: A meta-analysis**
Tang, D, & Dagher, A,
Psychology, Neuroscience, McGill University, Montreal Neurological Institute, Montreal, QC, Canada
- 10. The postsubiculum provides visual landmark control to the head direction signal at the lateral mammillary nuclei**
Yoder, Ryan M. & Taube, Jeffrey S.
Department of Psychological & Brain Sciences, Dartmouth College, 6207 Moore Hall, Hanover, NH
- 11. Mice lacking M1 or M5 acetylcholine receptors exhibit deficits in cue detection and associative learning**
Zhang, S¹, Gullledge, A.T.², Matsui, M.³, and Bucci, D.J.¹
¹Department of Psychological & Brain Sciences, Dartmouth College, Hanover, NH; ²Department of Physiology, Dartmouth Medical School, Hanover, NH; ³Department of Pharmacy, Chiba Institute of Science, Choshi, Japan
- 12. Varicella Zoster Transverse Myelitis: Case Report**
Jennifer Ault, DO, PT, PhD, Enrique Lallana, MD, Timothy Lukovits, MD
Resident presentation, Department of Neurology, Dartmouth-Hitchcock Medical Center, Lebanon, NH
- 13. Insulinoma: An Unusual Cause of Seizures in the Epilepsy Monitoring Unit**
Christina Azevedo, MD, Omar I. Khan, MD, Barbara Jobst, MD
Resident presentation, Department of Neurology, Dartmouth-Hitchcock Medical Center, Lebanon, NH
- 14. Basilar Artery Occlusion associated with Persistent Hypoglossal Artery**
Christina Azevedo, MD, Timothy Lukovits, MD.
Resident presentation, Department of Neurology, Dartmouth-Hitchcock Medical Center, Lebanon, NH

- 15. Quetiapine for the Treatment of Patients with Schizophrenia and Alcohol Use Disorders**
M. Brunette¹, A. I. Green^{1,2}, P. F. Buckley³, C. O'Keefe¹, R Dawson⁴
¹Department of Psychiatry, Dartmouth Medical School, Concord, NH, USA., ²Department of Psychiatry, Dartmouth Medical School, Lebanon, NH, USA., ³Department of Psychiatry, Medical College of Georgia, Augusta, GA, USA., ⁴Frontier Science and Technology Foundation, Boston, MA, USA.
- 16. A Cluster of Amyotrophic Lateral Sclerosis in Close Proximity to Two Lakes in Enfield, NH, USA with Known Blooms of Potentially Toxic Cyanobacteria**
Tracie Caller, M.D.* , James Doolin* , Jim Haney PhD μ , Amanda Murby B.S. μ , Gregory Boyer, Ph.D.° , Katherine West B.S. * Andrea Ball* , Brent Harris M.D., Ph.D.∞ , Elijah Stommel M.D., PhD.*
* Department of Medicine (Section of Neurology), ∞ Department of Pathology, Dartmouth-Hitchcock Medical Center, Lebanon, NH 03756; ° Department of Chemistry, State University of New York, College of Environmental Science & Forestry, Syracuse NY 13210; μ Department of Zoology, University of New Hampshire, Durham, NH 03824
- 17. Deep Brain Stimulation of the Subthalamic Nucleus Versus Globus Pallidus for Parkinson's Disease: A Systematic Review**
T. Caller, M.D.,¹ M. Theis, B.A.²
¹Dartmouth Hitchcock Medical Center, Lebanon, NH.; ²The Dartmouth Institute for Health Policy and Clinical Practice, Lebanon, NH.
- 18. Neural response and gambling strategies differ between Parkinson's disease patients with and without impulse control disorders: An fMRI study.**
Erickson CA¹, Panisset M², Stemmer B², Dagher A¹.
1: Montreal Neurological Institute, McGill University, Montreal.
2: Centre Hopsitalier de l'Université de Montréal.
*Mailing address: Montreal Neurological Institute, 3801 University St., Montreal, Quebec, H3A 2B4, Canada
crystal.erickson@mail.mcgill.ca, (514-398-6644 x 089469)*
- 19. Getting the iron out: Phlebotomy for Alzheimer's disease?**
Barney E. Dwyer¹, Leo R. Zacharski¹, Dominic J. Balestra¹, George Perry^{2,3}, Mark A. Smith², Xiongwei Zhu²
¹Research Service, Department of Veterans Affairs Medical Center, White River Junction, VT and the Department of Medicine, Dartmouth Medical School, Lebanon, NH; ²the Department of Pathology, Case Western Reserve University, Cleveland, OH; and ³College of Science, University of San Antonio, San Antonio, TX
- 20. Limits of Psychiatric Diagnosis in Persons with Intellectual Disability (ID)**
Richard B. Ferrell M.D and Thomas W. McAllister M.D. Section of Neuropsychiatry, Department of Psychiatry, Dartmouth Medical School and New Hampshire Hospital, Concord, N.H.
- 21. fMRI of Brain Reward Processing in Schizotypal Personality Disorder**
Matthew A. Garlinghouse, Ph.D.^{1,2}, Alan I. Green, M.D.², Robert M. Roth, Ph.D.^{1,2}
Neuropsychology Program and Brain Imaging Laboratory¹, Department of Psychiatry², Dartmouth Medical School/DHMC, Lebanon, NH
- 22. Asymmetric Frontal Leukoencephalopathy; An Uncommon Presentation of Hypertensive Encephalopathy**
Juan Carlos Gonzalez, Omar Khan, and Timothy Lukovits
Department of Neurology, Dartmouth-Hitchcock Medical Center, One Medical Drive, Lebanon, NH 03756
- 23. Model-Based Brain Shift Compensation in Image-Guided Neurosurgery**
Songbai Ji^a, Fenghong Liu^a, Xiaoyao Fan^a, Alex Hartov^{ab}, David Roberts^{bc}, Keith Paulsen^{ab}
^aThayer School of Engineering, Dartmouth College, Hanover, NH 03755 USA, ^bNorris Cotton Cancer Center, Lebanon, NH 03756 USA, ^cSection of Neurosurgery, Dartmouth-Hitchcock Medical Center, Lebanon, NH 03756 USA
- 24. Family with Migraine and Idiopathic Bilateral Striopallidodentate Calcinosis**
Omar I. Khan, MD*, Mo Levin, MD*, Brian Kossak, MD
Resident presentation, Department of Neurology, Dartmouth-Hitchcock Medical Center, Lebanon,NH
- 25. Prolonged Refractory Status Epilepticus: Case Report**
Omar I. Khan, MD, Barbara Jobst, MD
Resident presentation, Department of Neurology, Dartmouth-Hitchcock Medical Center, Lebanon,NH
- 26. Bilateral Medial Medullary Infarct: Case Report**
Omar I. Khan, MD, Christina Azevedo, MD, Paula Rauschkolb, DO, Timothy Lukovits, MD.
Resident presentation, Department of Neurology, Dartmouth-Hitchcock Medical Center, Lebanon,NH
- 27. Clozapine vs. Risperidone for People with First Episode Schizophrenia and Co-Occurring Cannabis Use Disorder.**
Douglas L. Noordsy, MD; Jodi F. Marshall, MD; Jessica N. Smith, MA; Alan I. Green, M.D.
Department of Psychiatry, Dartmouth Medical School, 1 Medical Center Drive, Lebanon, NH

- 28. Combining Magnetoencephalography and Diffuse Optical Tomography for Human Neuroimaging**
Katherine L. Perdue¹, David A. Boas², Solomon Gilbert Diamond¹
¹Thayer School of Engineering at Dartmouth, Hanover, NH, USA, ²Athinoula A. Martinos Center for Biomedical Imaging, Massachusetts General Hospital, Charlestown, MA, USA
- 29. Hemichorea-Hemiballismus in the Setting of Acute Infarct of the Insular Cortex.**
Paula Rauschkolb, DO, Omar I. Khan, MD, Timothy Lukovits, MD
Resident presentation, Department of Neurology, Dartmouth-Hitchcock Medical Center, Lebanon, NH
- 30. fMRI of Brain Reward Circuitry in Patients with Co-Occurring Schizophrenia and Substance Use Disorder**
Robert M. Roth, Ph.D.^{1,2}, Matthew A. Garlinghouse, Ph.D.^{1,2}, Alan I. Green, M.D.²
Brain Imaging Laboratory¹, Department of Psychiatry², Dartmouth Medical School/DHMC, Lebanon, NH
- 31. A Phase II Clinical Trial of Thalidomide, a TNF- α Inhibitor, for the Treatment of Amyotrophic Lateral Sclerosis – Clinical Results and Cytokine Expression**
Elijah W. Stommel¹, Jeffrey A. Cohen¹, Camilo E. Fadul², Christopher H. Cogbill³, David J. Graber³, Linda Kingman², Jacqueline Channon Smith⁵, Todd Mackenzie⁴, and Brent T. Harris³
¹Department of Medicine (Neurology), ²Department of Medicine (Oncology), ³Department of Pathology, ⁴Department of Medicine, ⁵Department of Microbiology and Immunology, Dartmouth-Hitchcock Medical Center, Lebanon, NH 03756
- 32. The Use of a Complex Flavonoid as a Treatment for ALS**
Elijah W. Stommel*, Brent T. Harris ∞ , David J. Graber ∞ , Jeffrey A. Cohen*,
Department of Medicine (Section of Neurology) * Department of Pathology ∞ Dartmouth-Hitchcock Medical Center (DHMC), Lebanon, NH 03756
- 33. Continuous EEG monitoring in the Intensive Care Unit: 24 hours vs. 30 minutes**
Vijay Thadani, MD, Omar I. Khan, MD, Christina Azevedo, MD, Talal Arshad, MD, Juan Gonzalez, MD, Justin Montanye, MD
Resident presentation, Department of Neurology, Dartmouth-Hitchcock Medical Center, Lebanon, NH
- 34. Long term seizure prognosis after intracranial EEG evaluation**
Theresa Yang, David W Roberts, Karen Gilbert, Vijay Thadani, T Darcey, Greg Holmes, Richard P Morse, Ann-Christine Duhaime, Peter Williamson, Barbara Jobst
Departments of Neurology & Neurosurgery, Dartmouth Medical School/Dartmouth-Hitchcock Medical Center
- 35. The Role of Immune-Mediated Endocannabinoid Signaling in the Resolution of Post-Operative Pain**
¹Matthew S. Alkaiis, ^{1,2}Edgar Alfonso Romero-Sandoval, ^{1,2}Russell P. Landry III, ^{1,2,3}Joyce A. DeLeo
¹Neuroscience Center at Dartmouth, ²Department of Pharmacology, ³Department of Anesthesiology, Dartmouth Medical School/Dartmouth-Hitchcock Medical Center, Lebanon, NH 03756, USA
- 36. Neuron- Glia interrelationship in NMDAR receptor hypofunction.**
S.Bursztajn¹, F.Y. Fong² S. A.Berman³, J.A. Kelly⁴, R. A. Fava⁴, and M.J. Friedman⁵.
Departments of ¹Pathology, ³Neurology, ⁴Medicine, ⁵Psychiatry, Dartmouth Medical. School and VA Med., CTR, WRJ, VT 05009 and ²Chemistry, Dartmouth College, Hanover, NH 03755.
- 37. Atypical antipsychotics and alcohol drinking in alcohol-preferring hamsters and rats**
David Chau, Ph.D. and Alan I. Green, M.D.
Department of Psychiatry, Dartmouth Medical School, Dartmouth-Hitchcock Medical Center, Lebanon, NH 03756
- 38. Do Serum Markers of Traumatic Brain Injury Indicate the Mechanical Input of Injury and the Histopathological Outcome?**
Beth A. Costine, Patricia B. Quebada, and Ann-Christine Duhaime. Department of Surgery, Dartmouth Medical School. Lebanon, NH 03755.
- 39. Chronic Anabolic Androgenic Steroid Effects on GABA_A Receptors and Action Potential Firing in GnRH and non-GnRH neurons of the Forebrain**
Matthew C. Davis, Carlos A.A. Penatti, Donna M. Porter Leslie P. Henderson.
Department of Physiology, Dartmouth Medical School. Hanover, NH 03755.
- 40. Antagonism of Orexin Receptor 1 (OX₁R) in the Retrotrapezoid Nucleus (RTN) Inhibits the Ventilatory Response to Hypercapnia in Wakefulness**
Mirela Barros Dias, Aihua Li, Eugene Nattie.
Department of Physiology, Dartmouth Medical School, Lebanon, New Hampshire, 03756
- 41. Glioma Resection Guided by Fluorescence Imaging: Initial Results**
Kathryn M. Fontaine^a, Pablo Valdes^a, Frederic Leblond^a, Brian W. Pogue^a, Alex Hartov^{ab}, David W. Roberts^{bc}, Keith D. Paulsen^{ab}
^aThayer School of Engineering, Dartmouth College, Hanover, NH 03755, ^bNorris Cotton Cancer Center, Dartmouth-Hitchcock Medical Center, Lebanon, NH 03756, ^cDepartment of Neurosurgery, Dartmouth-Hitchcock Medical Center, Lebanon, NH 03756

- 42. Synthetic Triterpenoids Attenuate Nitric Oxide Synthesis and Stimulate Quinone Reductase in Neural Cells**
David J. Graber and Brent T. Harris
Department of Pathology, Dartmouth Medical School, Hanover and Lebanon, NH
- 43. Interactive Effects of Ethanol and Nicotine on Learning and Anxiety and Locomotion in C57BL/6 Mice in the Plus-maze Discriminative Avoidance Task**
Danielle Gulick^{1,2} and Thomas J. Gould¹
¹Department of Psychology, Neuroscience Program, Center for Substance Abuse Research, Temple University, Philadelphia, PA,
²Department of Psychiatry and Translational Neuroscience Trainee, Dartmouth Medical School, Lebanon, NH 03756
- 44. Tetanus toxoid Vaccination Induces Acute Spinal Cord Neuroinflammation and May Accelerate ALS-like Paralysis in hmSOD1 Transgenic Rat Model.**
Brent Harris^{1,2}, David Graber², Karlina Merkens², Christopher Cogbill², Amanda Hernan¹, Dustin Elwood¹, Elijah Stommel³
Program in Experimental and Molecular Medicine¹, Department of Pathology², Department of Neurology³, Dartmouth Medical School, Hanover and Lebanon, NH
- 45. A Pro-Neural Role FOR Id2 In Dopaminergic Neurons**
Havrdá, MC., Paoletta BR., Jering, K., Harris, BT., Lee, SL., Yeh HH., Ward NM., Israel, MA.
Norris Cotton Cancer Center, and Departments of Physiology, Pathology and Neurology; Dartmouth Medical School, Lebanon, NH, USA
- 46. Monitoring Glucose Supply and Metabolism to Lactate by ¹H MRS in Rat 9L Glioma**
S. K. Hekmatyar, N. Jerome, J Larivière and R. A. Kauppinen
Biomedical NMR Research Center, Dartmouth Medical School, Hanover, *Department of Diagnostic Radiology, Hanover, NH 03755
- 47. Morphine Enhances Microglial Migration via Interaction with P2X₄ Receptor Signaling**
^{1,2}Ryan J. Horvath and ^{1,2,3}Joyce A. DeLeo
¹Department of Pharmacology, ²Neuroscience Center at Dartmouth, ³Department of Anesthesiology, Dartmouth-Hitchcock Medical Center, 1 Medical Center Drive, HB 7125, NH 03756
- 48. Characterising Vascular Responses in Rat 9L Gliomas by MRI**
Neil P Jerome, S Khan Hekmatyar, Jean P Larivière and Risto A Kauppinen
Biomedical NMR Research Center, Department of Radiology, Dartmouth College, Hanover, NH
- 49. Interictal Spikes in Rats: Modeling Epileptiform Discharges without Seizures in the Developing Brain**
Qian Zhao, Omar I. Khan, Gregory L. Holmes
Department of Neurology, Dartmouth Medical School/Dartmouth-Hitchcock Medical Center, Lebanon, NH 03756
- 50. Cognitive Impact of Interictal Spikes in a Modified Model of Temporal Lobe Epilepsy**
Jonathan Kleen¹, Pierre-Pascal Lenck-Santini², Gregory Holmes^{2,3}
Program in Experimental and Molecular Medicine¹, Department of Neurology², Neuroscience Center at Dartmouth³, Dartmouth Medical School/Dartmouth-Hitchcock Medical Center, Lebanon, New Hampshire
- 51. Morphine Induces and Enhances a Microglial Pro-Inflammatory Phenotype *In Vitro*.**
Landry R.P.², Horvath R.J.², Romero-Sandoval E.A.¹ and DeLeo J.A.^{1,2},
¹Department of Anesthesiology, ²Department of Pharmacology/Toxicology, Dartmouth Medical School/Dartmouth-Hitchcock Medical Center, Hanover & Lebanon NH
- 52. Maturation of hippocampal place cell function in weaning rats.**
P-P Lenck-Santini¹, R. Scott², G. L. Holmes¹
¹Department of Neurology, Dartmouth Medical School/Dartmouth-Hitchcock Medical Center, Lebanon, NH, USA; ²UCL Institute of Child Health, London, UK
- 53. Hypoxia Promotes Tumorigenesis Initiated by Stem-Like Cells Derived from Spontaneous Murine Oligodendroglioma by Enhancing their Self-Renewal Activity.**
Huan Liu and Mark A. Israel
Norris Cotton Cancer Center, Department of Pediatrics and Genetics, Dartmouth Medical School, Lebanon, NH
- 54. Differential Lumbar Spinal Cord GFAP Expression between Wild Type and CD4 -/- Mice following Nerve Injury-Induced Neuropathic Pain**
Swathi Maddula, Jennifer Malon, and Ling Cao
Department of Microbiology, College of Osteopathic Medicine, University of New England, Biddeford, ME

- 55. Cellular Composition and Histoarchitecture of the Postnatal Piglet Subventricular Zone.**
Symeon Missios¹, M.D., Brent Harris³, M.D., PhD., Michael Simoni¹, A.B., Carter Dodge², M.D., Simon Hillier², M.D., and Ann-Christine Duhaime¹, M.D.
Departments of Surgery¹, Anesthesiology² and Pathology³, Dartmouth-Hitchcock Medical Center, One Medical Center Drive, Lebanon, New Hampshire, 03756
- 56. AMPA Receptor Plasticity is linked to the Formation of the Intramission Mnemonic of Pseudopregnancy in Female Rats**
Joseph G. Oberlander, Mary S. Erskine
Department of Biology, Boston University, Boston, MA 02215 USA
- 57. GABAA Receptor Inhibition in Rat Pups Enhances the Ventilatory Response to CO2 but Paradoxically Decreases Heart Rate in an Age-Dependent Manner**
Penatti EM, Barina AE, Schram KK, Sjögren AR, Raju SC, Li A, Nattie EE
Department of Physiology, Dartmouth Medical School, Lebanon, NH
- 58. Role of UCH-L1 in NGF- and VEGF- Induced Neurorescue in an Oxidative Stress Model of Parkinson's Disease**
Aravind Reddy, Tao Wang, Stephen Lee.
Department of Neurology, Dartmouth Medical School, 1 Medical Center Drive, Lebanon, NH 03756
Department of Biology, Dartmouth College, 103 Gilman Hall, Hanover, NH 03755
- 59. Vis Medicatrix PSD-95: Making PDZ Domain Protein-Protein Interaction Antagonism Druggable**
Rupasinghe, C.N.,^{1,2} Jankovic, A.D.,² Saro, D.,² Marshall, J.,³ Goebel, D.J.,⁴ and Spaller, M.R.^{1,2}
¹Norris Cotton Cancer Center & Department of Pharmacology and Toxicology, 1 Medical Center Dr., Lebanon, NH 03756;
²Department of Chemistry, Wayne State University, 5101 Cass Avenue, Detroit, MI 48202; ³Department of Molecular Pharmacology, Physiology and Biotechnology, Brown University, 487 Biomedical Center, Providence, RI 02912, ⁴Department of Anatomy & Cell Biology, Wayne State University, 540 East Canfield Avenue, Detroit, MI 48201
- 60. Spinal Cannabinoid Receptor Type 2 Activation Reduces Neuropathic Pain Hypersensitivity in Animals with Cannabinoid Tolerance.**
E.A. Romero-Sandoval, N. Nutile-McMenemy and J.A. DeLeo
Department of Anesthesiology, Neuroscience Center at Dartmouth, Department of Pharmacology and Toxicology, Dartmouth Medical School, Hanover, NH.
- 61. Scaled Cortical Contusion in Immature Swine: Effect of Age and Gender on Lesion Volume.**
Michael K. Simoni¹, B.A., Symeon Missios², M.D., Patricia B. Quebada¹, M.D., Carter P. Dodge, M.D., Simon C. Hillier, M.D., Brent Harris, M.D., PhD., Ying-Lung Lee, Rachel Curtis, Leslie B. Adams, Beth A. Costine, PhD., and Ann-Christine Duhaime², M.D.
Departments of Surgery¹, Division of Neurosurgery², Anesthesiology, and Pathology, Dartmouth-Hitchcock Medical Center, Lebanon, New Hampshire

62. Exposure to Environmental Tobacco Smoke (ETS) Leads to Greater Habituation of Arousal Response to Hypoxia: Implications for SIDS.

C.M.Tobia¹, R.W.Schneider¹, and R.A.Darnall^{1,2}

Departments of Physiology¹and Pediatrics², Dartmouth Medical School, Lebanon, NH

63. Blood-Brain Barrier Disruption using MRI-guided Focused Ultrasound for Targeted Drug Delivery to the Brain in Rats

Lisa H. Treat^{1,2,3}, Yongzhi Zhang⁴, Nathan McDannold⁴, Natalia Vykhodtseva⁴, Kullervo Hynynen⁵

¹Department of Biological Sciences, Dartmouth College, 103 Gilman Hall, Hanover, NH 03755, USA

²Thayer School of Engineering, Dartmouth College, 8000 Cummings Hall, Hanover, NH 03755, USA

³Department of Anesthesiology, Dartmouth Medical School and Dartmouth-Hitchcock Medical Center, One Medical Center Drive, Lebanon, NH 03756, USA

⁴Focused Ultrasound Laboratory, Department of Radiology, Harvard Medical School and Brigham & Women's Hospital, 221 Longwood Avenue EBRC 521, Boston, MA 02115 USA

⁵Department of Medical Biophysics, University of Toronto and Imaging Research, Sunnybrook Health Sciences Centre, 2075 Bayview Avenue, Room S6 65b, Toronto, Ontario M4N 3M5, Canada