

Curriculum Vitae

Name: Robert Bradford Duckrow

Birth: Hartford, Connecticut, 1949

Academic Background

1971 Sc.B., Physiology (Honors), Brown University, Providence, Rhode Island

1975 M.D., Yale University, New Haven, Connecticut

Professional Background

7/75-6/76 Intern in Medicine, Department of Medicine, The Rhode Island Hospital, Providence, Rhode Island

7/76-6/79 Resident in Neurology, Department of Neurology, The Yale-New Haven Hospital, New Haven, Connecticut

7/78-6/79 Instructor in Neurology, Department of Neurology, The Yale University School of Medicine, New Haven, Connecticut

7/79-6/81 Research Associate, Department of Neurology, The University of Miami School of Medicine, Miami, Florida

7/81-6/91 Assistant Professor of Medicine, Division of Neurology, The Milton S. Hershey Medical Center, The Pennsylvania State University College of Medicine, Hershey, Pennsylvania

7/90-6/91 Visiting Assistant Professor of Neurology, Department of Neurology, The Yale University School of Medicine, New Haven, Connecticut

7/91-6/92 Associate Professor of Medicine, Division of Neurology, The Milton S. Hershey Medical Center, The Pennsylvania State University College of Medicine, Hershey, Pennsylvania

7/92-9/02 Research Affiliate, Department of Neurosurgery, The Yale University School of Medicine, New Haven, Connecticut

7/92-9/02 Associate Professor of Neurology, Department of Neurology, The University of Connecticut Health Center, Farmington, Connecticut

10/02- Associate Professor of Neurology and Neurosurgery, Department of Neurology, The Yale University School of Medicine, New Haven, Connecticut

Licensure and Certification

1976 National Board of Medical Examiners 159263 (July 1)
1981-1992 Pennsylvania Medical Certificate MD-025386-E
1984 American Board of Psychiatry and Neurology (Neurology), Certificate No. 26585
1994-2014 Added Qualifications in Clinical Neurophysiology, Certificate No. 0297
1990 Connecticut Medical License 030629 (March 9)

Membership in Professional Societies

Society for Neuroscience, American Academy of Neurology, American Neurological Association, American Epilepsy Society

Grant Awards

(Principal Investigator unless otherwise indicated)

1979 PHS Postdoctoral Fellowship Award (Declined)

1979-1981 American Heart Association of Greater Miami Grant-In-Aid

1980 University of Miami Biology Research Small Grant Award

1982 The Pennsylvania State University Research Initiation Grant Award

1982 The Pennsylvania Research Corporation Development Award

1983-1986 American Heart Association Grant-In-Aid, 83-906

1984-1988 Preceptor, American Heart Association Student Scholarship in Stroke

1988 Preceptor, NIH National Research Service Award for Short-term Research Training of Medical Students

1984-1989 American Heart Association
Established Investigator Award 84-122
"Brain blood flow and metabolism after ischemia"

1986-1994 NIH, NINDS, 5 R01 NS24109,
"Cerebral blood flow during hyperglycemia"

1993-1998 NIH, NINDS, P01 NS30619
"Human Epileptogenic Tissue - Basic Analysis and Modeling", D. Spencer, P.I.
Project #1: "Clinical Neurophysiology of the Human Epileptic Foci"
S. Spencer, P.I., R. B. Duckrow, Co-P.I.

2003-2008 NIH, NINDS, R01 NS044102
"Anticipating Seizures in Epileptic Networks" S. Spencer P.I.

Clinical Research Participation

- 1987-1989 G. H. Besselaar - Miles Pharmaceutical Company, Nimodipine Stroke Study, GHB-850, Participating neurologist
- 1988-1990 PHS, NIH, NINDS, Asymptomatic Carotid Atherosclerosis Study Participating neurologist
- 1991 VA Cooperative Study #308, "Stroke prevention in nonvalvular atrial fibrillation - SPINAF", Endpoint Committee
- 2003-2007 NeuroPace Inc, External Responsive Neurostimulator (eRNS™) System Feasibility Clinical Investigation, D. Spencer, P.I.
- 2004-2006 NeuroPace, Inc., Propective Seizure Frequency Study. S. Spencer (P.I.)
- 2004-2008 NeuroPace, Inc., Responsive Neurostimulator (RNS™) System Feasibility Investigation, R Duckrow, P.I.
- 2005-2006 Epilepsy Foundation, Controlling Excitability by Electrical Stimulation, I. Cavus, P.I.
- 2005-2006 Donaghue Initiative in Biomedical and Behavioral Research Ethics, An Ethical Analysis of Role Priorities and Role Conflicts in New Research Designed to Treat Intractable Epilepsy, R. Duckrow and C. Clark, Co-P.I.
- 2005- NeuroPace, Inc., Responsive Neurostimulator (RNS™) System Pivotal Investigation, R. Duckrow, P.I.
- 2006- NeuroPace, Inc., Responsive Neurostimulator (RNS™) System Long-term Treatment Clinical Investigation, R. Duckrow, PI

Professional Society Committees

- 1994- Epilepsy Foundation of Connecticut - Professional Advisory Committee
2005- Chairman
- 1995-1997 American Epilepsy Society - Scientific Program Committee
1996-2001 Technology Committee

Consultantships

- 1981-1983 Participating Consultant, The Medical College of Virginia Head Injury Center, Richmond, Virginia
- 1983 Consultant in Neurology, The Philhaven Psychiatric Hospital, Lebanon, Pennsylvania
- 1983-1990 Consultant in Neurology, Veterans Administration Medical Center, Lebanon, Pennsylvania

- 1987-1991 Consultant in Neurology, The Elizabethtown Hospital and Rehabilitation Center, Elizabethtown, Pennsylvania
- 1991-1993 Neurological Consultant, CORITechs, Inc., New Haven, Connecticut
- 1993-2002 Consultant Privileges, The Hartford Hospital, Hartford, Connecticut
- 1997- DMR Health Advisory Panel, State of Connecticut, Department of Mental Retardation

Ad Hoc Review

- Journals Brain Research, Journal of Cerebral Blood Flow and Metabolism, The American Journal of Physiology, Journal of Applied Physiology, Journal of Neurochemistry, Journal of Neurophysiology, Journal of the Neurological Sciences, Metabolic Brain Disease, Neurology, Stroke: A Journal of Cerebral Circulation, The Journal of Clinical Investigation, Microvascular Research, Annals of Neurology, Clinical Neurophysiology, Neuroscience Letters, APA Neuropsychology
- Agencies Veterans Administration Merit Review Board for Neurobiology
PHS, National Institutes of Health, Special Review Section
The Donaghue Foundation
Engineering and Physical Sciences Research Council (United Kingdom)

Publications

1. Chapman KM, Duckrow RB, Moran DT. Form and role of deformation in excitation of an insect mechanoreceptor. *Nature* 244:453-454, 1973.
2. Chapman KM, Duckrow RB. Compliance and sensitivity of a mechanoreceptor of the insect exoskeleton. *J. Comp. Physiol.* 100:251-268, 1975.
3. Duckrow RB, Taub A. The effect of diphenylhydantoin on self-mutilation in rats produced by unilateral multiple dorsal rhizotomy. *Exp. Neurol.* 54:33-41, 1977.
4. Spencer DD, Yamashita M, Duckrow RB, Kitahata L, Collins WF. The effect of nitrous oxide on evoked cellular responses in the rat nucleus reticularis gigantocellularis. In: *Advances in Pain Research*, edited by J Bonica. Raven Press, New York, pp. 285-291, 1977.
5. Chapman KM, Mosinger JL, Duckrow RB. The role of distributed viscoelastic coupling in sensory adaptation in an insect mechanoreceptor. *J. Comp. Physiol.* 131:1-12, 1979.
6. Duckrow RB, LaManna JC, Rosenthal M, Levasseur JE, Patterson JL. Oxidative metabolic activity of the cerebral cortex after fluid-percussion head injury in the cat. *J. Neurosurg.* 54:607-614, 1981.
7. Duckrow RB, LaManna JC, Rosenthal M. Disparate recovery of resting and stimulated oxidative metabolism following transient ischemia. *Stroke* 12:677-686, 1981.

8. Harik SI, Duckrow RB, LaManna JC, Rosenthal M, Sharma VK, Banerjee SP. Cerebral compensation for chronic noradrenergic denervation induced by locus ceruleus lesion: Recovery of receptor binding, isoproterenol-induced adenylate cyclase activity, and oxidative metabolism. *J. Neurosci.* 1:641-649, 1981.
9. Rosenthal M, Duckrow RB, LaManna JC, Levasseur J, Patterson JL. Consequences of cerebral injury on oxidative energy metabolism measured in situ. In: *Head Injury: Basic and Clinical Aspects*, edited by R Grossman and PL Gildenberg. Raven Press, New York, pp. 69-78, 1982.
10. Duckrow RB, LaManna JC, Rosenthal M. Sensitive and inexpensive dual-wavelength reflection spectrophotometry using interference filters. *Anal. Biochem.* 125:13-23, 1982.
11. Weinstein JM, Duckrow RB, Beard DC, Brennan RW. Regional optic nerve blood flow and its autoregulation. *Invest. Ophthalmol. Vis. Sci.* 24:1559-1565, 1983.
12. Duckrow RB, Sick TJ, Rosenthal M. Potassium transport dysfunction after cerebral ischemia: Relationships between ion homeostasis and oxidative metabolism. *J. Cereb. Blood Flow Metab.* 3,Suppl.1:S347-S348, 1983.
13. Gaumond RP, Duckrow RB, Yohn P. Evoked response measures. In: *Medical Technology for the Neonate, The Association for the Advancement of Medical Instrumentation*, Arlington, pp. 105-108, 1984.
14. Kauer JS, Reddy D, Duckrow RB, Shepherd GM. A simplified method for computerized densitometry of complex shapes in 2-deoxyglucose autoradiographs. *J. Neurosci. Methods* 1:143-158, 1984.
15. Duckrow RB, Beard DC, Brennan RW. Regional cerebral blood flow decreases during hyperglycemia. *Ann. Neurol.* 17:267-272, 1985.
16. Jirka JH, Duckrow RB, Kendig JW, Maisels MJ. Effect of bilirubin on brainstem auditory evoked potentials in the asphyxiated rat. *Pediatric Res.* 19:556-560, 1985.
17. Duckrow RB, Beard DC, Brennan RW. Regional cerebral blood flow decreases during chronic and acute hyperglycemia. *Stroke* 18:52-58, 1987.
18. Duckrow RB, Bryan RM. Regional cerebral glucose utilization during hyperglycemia. *J. Neurochem.* 48:989-993, 1987.
19. Duckrow RB. Glucose transfer into rat brain during acute and chronic hyperglycemia. *Metabolic Brain Disease* 3:201-209, 1988.
20. Duckrow RB. Regional cerebral blood flow and glucose utilization during hyperinsulinemia. *Brain Res.* 462:363-366, 1988.
21. Duckrow RB. The effect of hemodilution on regional cerebral blood flow during chronic hyperglycemia in rats. *Stroke* 21:1072-1076, 1990.

22. Mayevsky A, Duckrow RB, Yoles E, Zarchin N, Kaushausky D. Brain mitochondrial redox state, tissue haemodynamic and extracellular ion responses to four-vessel occlusion and spreading depression in the rat. *Neurol. Res.* 12:243-248, 1990.
23. Duckrow RB. Regional cerebral blood flow during spreading cortical depression in conscious rats. *J. Cereb. Blood Flow Metab.* 11:150-154, 1991.
24. Duckrow RB, Beard DC. Cortical hypoperfusion following spreading depression is not altered by tirilazad mesylate (U-74006F) in awake rats. *Brain Res.* 572:296-299, 1992.
25. Duckrow RB, Spencer SS. Regional coherence and the transfer of ictal activity during seizure onset in the medial temporal lobe. *Electroenceph. clin. Neurophysiol.* 82:415-422, 1992.
26. Pelligrino DA, LaManna JC, Duckrow RB, Bryan RM, Harik SI. Hyperglycemia and blood-brain barrier glucose transport. *J. Cereb. Blood Flow Metab.* 12:887-899, 1992.
27. Oyler GA, Duckrow RB, Hawkins RA. Computer simulation of the blood-brain barrier: A model including two membranes, blood flow, facilitated and non-facilitated diffusion. *J. Neurosci. Methods* 44:179-196, 1992.
28. Duckrow RB. A brief hypoperfusion precedes spreading depression if nitric oxide synthesis is inhibited. *Brain Res.* 618:190-195, 1993.
29. Baghdoyan HA, Mallios VJ, Duckrow RB, Mash DC. Localization of muscarinic receptor subtypes in brain stem areas regulating sleep. *NeuroReport* 5:1631-1634, 1994.
30. Bryan RM, Duckrow RB. Radial columns in autoradiographic images generated from tracer methods for measuring cerebral cortical blood flow. *Am. J. Physiol.* 269:H583-H589, 1995.
31. Bullock TH, McClune MC, Achimowicz JZ, Iragui-Madoz VJ, Duckrow RB, Spencer SS. EEG coherence has structure in the millimeter domain: subdural and hippocampal recordings from epileptic patients. *Electroenceph. clin. Neurophysiol.* 95:161-177, 1995.
32. Duckrow RB. Decreased cerebral blood flow during acute hyperglycemia. *Brain Res.* 703:145-150, 1995.
33. Bullock TH, McClune MC, Achimowicz JZ, Iragui-Madoz VJ, Duckrow RB, Spencer SS. Temporal fluctuations in coherence of brain waves. *Proc. Natl. Acad. Sci.* 92:11568-11572, 1995.
34. Bullock TH, McClune MC, Achimowicz JZ, Duckrow RB, Spencer SS, Iragui-Madoz VJ. Bicoherence of intracranial EEG. *Third Joint Symp. on Neural Computation Proc.* 6:83-87, 1996.
35. Tendler BE, Shoukri K, Malchoff C, MacGillivray D, Duckrow R, Talmadge T, Ramsby GR. Concurrence of Graves' disease and dysplastic cerebral blood vessels of the moyamoya variety. *Thyroid* 7:625-629, 1997.

36. Bullock TH, Achimowicz JZ, Duckrow RB, Spencer SS, Iragui-Madoz VJ. Bicoherence of intracranial EEG in sleep, wakefulness and seizures. *Electroenceph. clin. Neurophysiol.* 103:661-678, 1997.
37. Deckel AW, Cohen D, Duckrow R. Cerebral blood flow velocity decreases during cognitive stimulation in Huntington's Disease. *Neurology* 51:1576-1583, 1998.
38. Zaveri HP, Williams WJ, Sackellares JC, Beydoun A, Duckrow RB, Spencer SS. Measuring the coherence of intracranial electroencephalograms. *Clin. Neurophysiol.* 110:1717-1725, 1999.
39. Duckrow RB, Abu-Hasaballah K, Whipple R, Wolfson L. Stance perturbation evoked potentials in old people with poor gait and balance. *Clin. Neurophysiol.* 110:2026-2032, 1999.
40. Zaveri HP, Duckrow RB, Spencer SS. The effect of a scalp reference signal on coherence measurements of intracranial electroencephalograms. *Clin. Neurophysiol.* 111:1293-1299, 2000.
41. Zaveri HP, Duckrow RB, de Lanerolle NC, Spencer SS. Distinguishing subtypes of temporal lobe epilepsy with background hippocampal activity. *Epilepsia* 42:725-730, 2001.
42. Oncken CA, Duckrow RB. Seizure associated with sleep deprivation and sustained-release bupropion. *Nicotine Tob. Res.* 5(1):131-133, 2003.
43. Duckrow RB, Albano AM. Comment on "Performance of different synchronization measures in real data: A case study on electroencephalographic signals." *Physical Review E* 67, 063901, 2003.
44. Kossof EH, Ritzl EK, Politsky J, Murro AM, Smith JR, Duckrow RB, Spencer DD, Bergey GK. Effect of an external responsive neurostimulator on seizures and electrographic discharges during subdural electrode monitoring. *Epilepsia* 45(12):1560-1567, 2004.
45. Duckrow RB, Zaveri HP. Coherence of the electroencephalogram during the first sleep cycle. *Clin. Neurophysiol.* 116(5):1088-1095, 2005.
46. Cohen-Gadol AA, Bradley CC, Williamson A, Kim JH, Westerveld M, Duckrow RB, Spencer DD. Normal magnetic resonance imaging and medial temporal lobe epilepsy: the clinical syndrome of paradoxical temporal lobe epilepsy. *J. Neurosurg.* 102(5):902-909, 2005.
47. Zaveri HP, Duckrow RB, Spencer SS. On the use of bipolar montages for time-series analysis of intracranial electroencephalograms. *Clin. Neurophysiol.* 117:2102-2108, 2006.

48. Duckrow RB, Tcheng TK. Daily variation in an intracranial EEG feature in humans detected by a responsive neurostimulator system. *Epilepsia* 48(8):1614-1620, 2007.
49. Durazzo TS, Spencer SS, Duckrow RB, Novotny EJ, Spencer DD, Zaveri HP. Temporal distributions of seizure occurrence from various epileptogenic regions. *Neurology* 70:1265-1271, 2008.
50. Gwinn RP, Spencer DD, Spencer SS, Duckrow RB, Vives K, Wu K, Tkeshelashvili D, Zaveri HP. Local spatial effect of 50 Hz cortical stimulation in humans. *Epilepsia* Epub May 8, 2008.
51. Spencer SS, Goncharova II, Duckrow RB, Novotny EJ, Zaveri HP. Interictal spikes on intracranial recording: Behavior, physiology, and implications. *Epilepsia* Epub Apr 24, 2008.

Internet-based publications

1. Duckrow RB. State of Connecticut DMR Medical Advisory #98-6 (Revised #88-3) Guidelines for the neurological care of DMR clients with epilepsy. 1998. http://www.dmr.state.ct.us/publications/centralofc/hcs_ma98-6.htm

Recent Abstracts

Widi GA, Duckrow RB, Spencer DD, Vives KP, Cavus I. Effects of 50 Hz stimulation on glutamate efflux in the human epileptic hippocampus. Annual Meeting of the American Epilepsy Society, Philadelphia, PA, November 30 – December 14, 2007.

Albano AM, Duckrow RB. Chaos, Boltzmann, Shannon and Electroencephalography. In: *Stochastic and Quantum Dynamics of Biomolecular Systems: Proceedings of the 5th Jagna International Workshop*. Edited by CC Bernido and MV Carpio-Bernido. AIP Conference Proceedings 1021:79-90, 2008.