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Research Interests

Research involves the neural control of respiratory and cardiovascular control. Previous work has focused on airway defensive reflexes altering distributed brainstem neural networks involved in respiratory control. Present projects are focused on the coordination between respiration and sympathetic outflow. Unique methods include ensemble recordings (multi-electrode extracellular array) of *in vivo* and *in situ* preparations and computer simulations of neural networks inferred from collected data

Education

University of Florida (BS)	1991	Zoology
University of South Florida (PhD)	2003	Medicine/Physiology
Case Western Reserve University	2003-2006	Post Doctoral Fellow

Positions

University of Bristol	2006-2007	Leverhulme Visiting Fellow - Physiology
Case Western Reserve University	2007-present	Instructor - Department of Medicine

Organizations

The American Physiological Society
Member, 1995 – present

Society for Neuroscience
Member, 1997 – present

American Heart Association
Professional Member, 2007 – present

Selected peer-reviewed publications

Shannon, R., **D.M. Baekey**, K.F. Morris, and B.G. Lindsey. Brainstem respiratory networks and cough. *Pulm Pharmacol Ther.* 9: 343-347, 1996.

Xu, F., D.T. Frazier, Z. Zhang, **D.M. Baekey**, and R. Shannon. Cerebellar modulation of cough motor pattern in cats. *J Appl Physiol.* 83(2): 391-397, 1997.

Shannon, R., **D.M. Baekey**, K.F. Morris, and B.G. Lindsey. Ventrolateral medullary respiratory network and a model of cough motor pattern generation. *J Appl Physiol.* 84(6): 2020-2035, 1998.

Li, Z., K.F. Morris, **D.M. Baekey**, R. Shannon, and B.G. Lindsey. Responses of simultaneously recorded respiratory-related neurons to sequential stimulation of multiple sensory modalities. *J Neurophysiol.* 82(1): 176-187, 1999.

Li, Z., K.F. Morris, **D.M. Baekey**, R. Shannon, and B.G. Lindsey. Multimodal medullary neurons and correlational linkages of the respiratory network. *J Neurophysiol.* 82(1): 188-201, 1999.

Shannon, R., **D.M. Baekey**, K.F. Morris, Z. Li, and B.G. Lindsey. Functional connectivity among ventrolateral medullary respiratory neurones and responses during fictive cough in the cat. *J Physiol.* 525(1): 207-224, 2000.

Morris, K.F., **D.M. Baekey**, R. Shannon, and B.G. Lindsey. Respiratory neural activity during long-term facilitation. *Respiration Physiology.* 121(2-3): 119-133, 2000.

Baekey, D.M., K.F. Morris, C. Gestreau, Z. Li, B.G. Lindsey, and R. Shannon. Medullary respiratory neurones and control of laryngeal motoneurons during fictive eupnoea and cough in the cat. *J Physiol.* 534(2): 565-581, 2001.

Baekey, D.M., K.F. Morris, S.C. Nuding, L.S. Segers, B.G. Lindsey, and R. Shannon. Medullary raphe neuron activity during fictive cough in the cat. *J Appl Physiol.* 94(1): 93-100, 2003.

Morris, K.F., **D.M. Baekey**, S.C. Nuding, T.E. Dick, R. Shannon, and B.G. Lindsey. Neural network plasticity in respiratory control. *J Appl Physiol.* 94(3):1242-1252, 2003.

Baekey, D.M., K.F. Morris, S.C. Nuding, L.S. Segers, B.G. Lindsey, and R. Shannon. Ventrolateral medullary respiratory network participation in the expiration reflex in the cat. *J Appl Physiol.* 96:2057-2072, 2004.

Dick, T.E., R. Shannon, B. G. Lindsey, S.C. Nuding, L.S. Segers, **D.M. Baekey**, and K.F. Morris. Arterial pulse modulated activity is expressed in respiratory neural output. *J Appl Physiol.* 99(2): 691-8, 2005.

Baekey, D.M. T.E. Dick, and J.F.R. Paton. Ponto-medullary transection attenuates central respiratory modulation of sympathetic discharge, heart rate and the baroreceptor reflex in the *in situ* rat. *Exp Physiol*, 93(7), 803-16, 2008.

Dick, T.E., R. Shannon, B.G. Lindsey, S.C. Nuding, L.S. Segers, **D.M. Baekey**, and K.F. Morris. Pontine respiratory-modulated activity before and after vagotomy in decerebrate cats. *J Physiol.* 586, 4265-4282 2008.

Segers L.S., S.C. Nuding, T.E. Dick, R. Shannon, **D.M. Baekey**, I.C. Solomon, K.F. Morris, and B.G. Lindsey. Functional connectivity in the pontomedullary respiratory network. *J Neurophysiol.* Epub ahead of print, July 2008.

Book Chapters

Bolser, D.C., P.W. Davenport, F.J. Golder, **D.M. Baekey**, K.F. Morris, B.L. Lindsey, and R. Shannon. Neurogenesis of cough. In: *Cough: Causes, Mechanisms and Therapy*. H. Boushey, K.F. Chung, J.G. Widdicombe, eds. Oxford: Blackwell Science, 2003: 173-180.

Shannon, R., **D.M. Baekey**, K.F. Morris, and B.G. Lindsey. Central Cough Mechanisms: Neuroanatomy and Neurophysiology. In: *Acute and Chronic Cough: Lung Biology in Health and Disease*. A.E. Redington and A.H. Morice, eds. Marcel Dekker, 2005: 49-64, 2005.

Abstracts (limited to first author)

Baekey, D.M., K.F. Morris, Z. Li, B.G. Lindsey, and R. Shannon. Functional connectivity among ventral respiratory group neurons and responses during fictive cough. *Soc. Neurosci. Abst.* 23: 724, 1997.

Baekey, D.M., K.F. Morris, Z. Li, B.G. Lindsey, and R. Shannon. Functional connectivity of rostral ventral respiratory neurons (Botzinger) and responses during fictive cough. *FASEB Journal (Abstracts)* 12 (4): A497, 1998.

Baekey, D.M., K.F. Morris, Z. Li, B.G. Lindsey, and R. Shannon. Functional connectivity and responses during fictive cough of inspiratory neurons in the rostral ventrolateral medullary respiratory network. *Soc. Neurosci. Abst.* 24: 875, 1998.

Baekey, D.M., K.F. Morris, Z. Li, S.C. Nuding, B.G. Lindsey, and R. Shannon. Concurrent changes in pontine respiratory group neuron activities during fictive coughing. *FASEB Journal (Abstracts)* 13 (4): A824, 1999.

Baekey, D.M., K.F. Morris, Z. Li, B.G. Lindsey, and R. Shannon. Concurrent changes in ventral respiratory group neuron discharge patterns during fictive expiration reflex. *Frontiers in Modeling and Control of Breathing (Abstracts)*, 2000.

Baekey, D.M., K.F. Morris, S.C. Nuding, L.S. Segers, Z. Li, B.G. Lindsey, and R. Shannon. Involvement of ventral respiratory group neurons in the fictive expiration reflex. *FASEB Journal (Abstracts)* 15 (5): A798, 2001.

Baekey, D.M., K.F. Morris, S.C. Nuding, L.S. Segers, B.G. Lindsey, and R. Shannon. Raphe neuron activity during fictive coughing. *FASEB Journal (Abstracts)* 16 (5): 628.8, 2002.

Baekey, D. M., M. A. Jaber, K. F. Morris, and T. E. Dick. Differential activation of expiratory activity during and after brief episodes of hypoxia in the WHBP from rats. *Soc. Neurosci. Abst.* 30, 2004.

Baekey, D. M., K. F. Morris, and T. E. Dick. Disinhibition of expiratory activity during and immediately after hypoxia in the rat *in situ* preparation. *FASEB Journal (Abstracts)* 19: 371.10, 2005.

Baekey, D. M., A. Abdala, J.F.R. Paton, and T. E. Dick. Respiratory modulation of thoracic sympathetic nerve activity following brief hypoxia in the rat *in situ* preparation. *FASEB Journal (Abstracts)* 20: LB597, 2006.

Baekey, D. M., J.F.R. Paton, T.E. Dick. Baroreceptor responsive Bötzing expiratory (E) neurons in the ventrolateral medulla of the in-situ perfused rat. *FASEB Journal (Abstracts)*, 21: 611.15, 2007.

Baekey, D. M., J.F.R. Paton, T.E. Dick. Ponto-medullary transection attenuates sympathorespiratory coupling and eliminates cardiac sinus arrhythmia in the *in situ* rat. *FASEB Journal (Abstracts)*, 22: 739.6, 2008.

Baekey, D. M., R. Dhingra, M. Dutschmann, E. Oh, S. Herlitze, and T.E. Dick. Light-induced activation of channelrhodopsin-2 (ChR2) in dorsolateral pontine neurons alters sympathetic nerve activity in the *in situ* rat. *Soc. Neurosci. Abst.*, 34: 580, 2008.

Ongoing Research Support

07/01/07 – 06/30/11 American Heart Association National SDG - The interaction of respiratory and cardiovascular brainstem networks in health and disease