**CURRICULUM VITAE**

**Education**

**Institution and Location** Degree Dates Field

St. Ambrose University B.S. 1980-1984 Biology/Philosophy

Davenport, IA

University of Iowa M.S. 1987-1989 Plant Biochemistry

Iowa City, IA

University of Iowa Ph.D. 1991-1994 Anatomy and Cell Biology

Iowa City, IA

# Professional Experience

8/2008- Professor of Cell Biology

Missouri State University

7/2006- Director, Center for Biomedical & Life Sciences

Missouri State University

6/2005-7/2008 Associate Professor of Cell Biology

Missouri State University (formerly Southwest Missouri State University)

8/2004-6/2006 Executive Director - Center for Applied Science and Engineering

Missouri State University

8/2001-5/2005 Assistant Professor of Cell Biology

Southwest Missouri State University

4/1998-7/2001 Assistant Research Scientist, Department of Physiology

University of Iowa (Dr. Andrew Russo)

1/1995-3/1998 Postdoctoral Fellow, Department of Physiology

University of Iowa (Dr. Andrew Russo)

##### Area of Research Interest

My long-term interest lies in understanding the cellular and molecular mechanisms involved in the synthesis and release of neuropeptides from sensory neurons. A primary goal of my research is to determine the signaling pathways by which inflammatory and anti-inflammatory agents control neuropeptide gene expression in disorders involving the trigeminal nerve. Currently, I am studying the regulation of the neuropeptide calcitonin gene-related peptide gene (CGRP) expression in cultured trigeminal neurons, neuronal-like cell lines, in vivo animal models, and clinical studies. A major focus of my research has been to elucidate the cellular/molecular mechanisms by which antimigraine drugs and inflammatory stimuli that activate MAP kinase pathways regulate CGRP transcription, synthesis, and release from neuronal cells. More recently, I have begun to study the effects of CGRP on glial cells and neuronal-glial cell interactions within the ganglion under normal and inflammatory conditions and have initiated studies to identify novel plant compounds that block trigeminal nerve activation and thus, may be useful in the treatment of diseases involving trigeminal nerves.

**Peer-reviewed Research Publications**

1. Finkelhor, B.J., Titze, I.R. and **Durham, P.L.** (1987) The Effect of Viscosity Changes in the Vocal Folds on the Range of Oscillation. J. Voice 1: 320-325.

2. Alipour-Haghighi, F., Titze, I.R. and **Durham, P.L.** (1987) Twitch Response in the Canine Vocalis Muscle. J. Speech Hearing Res. 30: 290-294.

3. **Durham, P.L.** and Poulton, J.E. (1989) Effect of Castanospermine and Related Polyhydroxalkaloids on Purified Myrosinase from *Lepidium sativum* Seedlings. Plant Physiol. 90: 48-52.

4. **Durham, P.L.** and Poulton, J.E. (1990) Enzymatic Properties of Purified Myrosinase from *Lepidium sativum* Seedlings. Z. Naturforsch. 45c: 173-178.

5. Snyder, J.M., Rodgers, H.F., O'Brien, J.A., Mahli, N., Magliato, S.A. and **Durham, P.L.** (1992) Glucocorticoid Effects on Rabbit Fetal Lung Maturation in vivo: An Ultrastructural Morphometric Study. Anat. Rec. 232: 133-140.

6. **Durham, P.L.**, Davis-Nanthakumar, E.K. and Snyder, J.M. (1992) Developmental Regulation of Surfactant-associated Proteins in Rabbit Fetal Lung in vitro. Exp. Lung Res. 18: 775-793.

7. Wohlford-Lenane, C.L., **Durham, P.L.** and Snyder, J.M. (1992) Localization of Surfactant-associated Protein C (SP-C) in Fetal Rabbit Tissue by in situ Hybridization. Am. J. Respir. Cell Mol. Biol. 6: 225-234.

8. **Durham, P.L.**, Wohlford-Lenane, C.L. and Snyder, J.M. (1993) Glucocorticoid Regulation of Surfactant-Associated Proteins in Rabbit Fetal Lung in vivo. Anat. Rec. 237: 365-377.

9. **Durham, P.L.** and Snyder, J.M. (1995) Characterization of 1, 1, and 1 Laminin Subunits during Rabbit Fetal Lung Development. Dev. Dynamics 203: 408-421.

10. **Durham, P.L.** and Snyder, J.M. (1996) Regulation of Laminin 2 Subunit Chain during Rabbit Fetal Lung Development. Differentiation 60: 229-243.

11. Russo, A.F., Clark, M.S., and **Durham, P.L.** (1996) Thyroid Parafollicular Cells: An Accessible Model for the Study of Serotonergic Neurons. Mol. Neurobiol. 13: 257-276.

12. **Durham, P.L.**, Sharma, R.V., and Russo, A.F. (1997) Repression of the Calcitonin Gene-Related Peptide Promoter by 5HT1 Receptor Activation. J. Neurosci. 17: 9545-9553.

13. **Durham, P.L.** and Russo, A.F. (1998) Serotonergic Repression of Mitogen-Activated Protein Kinase Control of the Calcitonin Gene-Related Peptide Enhancer. Mol. Endocrinol. 12:1002-1009.

1. **Durham, P.L.** and Russo, A.F. (1999) Regulation of Calcitonin Gene-Related Peptide Secretion by a Serotonergic Antimigraine Drug. J. Neurosci. 19: 3423-3429.
2. **Durham, P.L**. and Russo, A.F. (2000) Differential Regulation of Mitogen-Activated Protein Kinase-Responsive Genes by the Duration of a Calcium Signal. Mol. Endocrinology. 14: 1570-1582.
3. **Durham, P.L.** and Russo, A.F.(2002) New Insights into the Molecular Actions of Serotonergic anti-migraine Drugs. Pharmacology & Therapeutics, 94:77-92.
4. Mora, S., **Durham, P.L.,** Smith, J.R., Russo, A.F., Jeromin, A., and Pessin, J.E. (2002) NCS-1 Inhibits Insulin-stimulated GLUT4 Translocation in 3T3L1 Adipocytes through a Phosphatidylinositol 4-kinase-dependent Pathway. J. Biol. Chem. 277:27494-27500.
5. **Durham, P.L.** and Russo, A.F. (2003) Stimulation of the Calcitonin Gene-Related Peptide Enhancer by Mitogen-Activated Protein Kinases and Repression by an Antimigraine Drug in Trigeminal Ganglia Neurons. J. Neuroscience, 23:807-815.
6. **Durham, P.L.,** Cady, R, and Cady, R. (2004) Regulation of Calcitonin Gene-Related Peptide Secretion from Trigeminal Nerve Cells by Botulinum Toxin Type A: Implications for Migraine Therapy. Headache, 44:35-43.
7. **Durham, P.L.**, Dong, P.X., Belasco, K.T., Kasperski, J., Gierasch, W.W.,Edvinsson, L.,Heistad, D., Faraci, F.M., and Russo, A.F. (2004) Neuronal expression and regulation of CGRP promoter activity following viral gene transfer into cultured trigeminal ganglia neurons. Brain Research, 997:103-110.
8. **Durham, P.L.** (2004) **CGRP** Receptor Antagonists – A Fresh Approach to Migraine Therapy? New Engl. J. Med., 350:1073-1075.
9. Eddings, D., Barnes, C., Gerasimchuk, N., **Durham, P.**, Domasevich, K. (2004) First Bivalent Palladium and Platinum Cyanoximates: Synthesis, Characterization and Biological Activity. Inorganic Chemistry, 43:3894-3909.
10. **Durham P.L.** (2004) CGRP receptor antagonists: A new choice for acute treatment of migraine. IDrugs? Curr Opin Invest Drugs. 5:731-735.
11. Cady, R.C., Dodick, D.W., Levine, H.L., Schreiber, C.P., Eross, E.J., Setzen, M., Blumenthal, H.J., Lumry, W.R., Berman, G.D., and **Durham, P.L.** (2005) Sinus headache: a neurology and otolaryngology consensus on diagnosis and treatment. Mayo Clinic Proceedings. 80:908-916.
12. Bellamy, J., Cady, R. and **Durham, P.L.** (2006) Salivary Levels of CGRP and VIP in Rhinosinusitis and Migraine Patients, Headache. 46:24-33.
13. Bowen, E., Schmidt, T., W., Firm, C.S., Russo, A.R., and **Durham, P.L.** (2006) Tumor Necrosis Factor-  Stimulation of Calcitonin Gene-Related Peptide Expression and Secretion from Rat Trigeminal Ganglion Neurons, J Neurochem. 96:65-77.
14. [Levine, HL](http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?db=pubmed&cmd=Search&itool=pubmed_Abstract&term=%22Levine+HL%22%5BAuthor%5D)., [Setzen, M](http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?db=pubmed&cmd=Search&itool=pubmed_Abstract&term=%22Setzen+M%22%5BAuthor%5D)., [Cady, R.K](http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?db=pubmed&cmd=Search&itool=pubmed_Abstract&term=%22Cady+RK%22%5BAuthor%5D)., [Dodick, D.W](http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?db=pubmed&cmd=Search&itool=pubmed_Abstract&term=%22Dodick+DW%22%5BAuthor%5D)., [Schreiber, C.P](http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?db=pubmed&cmd=Search&itool=pubmed_Abstract&term=%22Schreiber+CP%22%5BAuthor%5D)., [Eross, E.J](http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?db=pubmed&cmd=Search&itool=pubmed_Abstract&term=%22Eross+EJ%22%5BAuthor%5D)., [Blumenthal, H.J](http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?db=pubmed&cmd=Search&itool=pubmed_Abstract&term=%22Blumenthal+HJ%22%5BAuthor%5D)., [Lumry, W.R](http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?db=pubmed&cmd=Search&itool=pubmed_Abstract&term=%22Lumry+WR%22%5BAuthor%5D)., [Berman, G.D](http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?db=pubmed&cmd=Search&itool=pubmed_Abstract&term=%22Berman+GD%22%5BAuthor%5D)., and [**Durham, P.L**](http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?db=pubmed&cmd=Search&itool=pubmed_Abstract&term=%22Durham+PL%22%5BAuthor%5D)**.** (2006) An Otolaryngology, Neurology, Allergy, and Primary Care Consensus on Diagnosis and Treatment of Sinus Headache. Otolaryngol Head Neck Surg. 134:516-523.
15. Bellamy, J., Bowen, E., Russo, A.F., **Durham, P.L.** (2006) Nitric Oxide Regulation of Calcitonin Gene-Related Peptide Gene Expression in Rat Trigeminal Ganglia Neurons, Eur J Neurosci. 23:2057-2066.
16. **Durham, P.L.** (2006) Calcitonin Gene-Related Peptide (CGRP) and Migraine, Headache. 46(Suppl 1):S1-S6.
17. **Durham, P.L.** Niemann, C., Cady, R.K. (2006) Repression of Stimulated Calcitonin Gene-Related Peptide Secretion by Topiramate. Headache, 46:1291-1295.
18. Thalakoti, S., Patil, V.V., Damodaram, S., Vause, C.V., Langford, L.E., Freeman, S.E., **Durham, P.L.** (2007) Neuron-Glia Signaling in Trigeminal Ganglion: Implications for Migraine Pathology, Headache, 47:1008-1023.
19. Vause, C.V., Bowen, E.J., Spierings, E.L.H., and **Durham, P.L.** (2007) Effect of Carbon Dioxide on Calcitonin Gene-Related Peptide Secretion from Trigeminal Ganglia Neurons. Headache, 47:1385-1397.
20. [Gerasimchuk, N](http://www.ncbi.nlm.nih.gov/sites/entrez?Db=pubmed&Cmd=Search&Term=%22Gerasimchuk%20N%22%5BAuthor%5D&itool=EntrezSystem2.PEntrez.Pubmed.Pubmed_ResultsPanel.Pubmed_RVAbstractPlus)., [Maher, T](http://www.ncbi.nlm.nih.gov/sites/entrez?Db=pubmed&Cmd=Search&Term=%22Maher%20T%22%5BAuthor%5D&itool=EntrezSystem2.PEntrez.Pubmed.Pubmed_ResultsPanel.Pubmed_RVAbstractPlus)., [**Durham, P**](http://www.ncbi.nlm.nih.gov/sites/entrez?Db=pubmed&Cmd=Search&Term=%22Durham%20P%22%5BAuthor%5D&itool=EntrezSystem2.PEntrez.Pubmed.Pubmed_ResultsPanel.Pubmed_RVAbstractPlus)., [Domasevitch, K.V](http://www.ncbi.nlm.nih.gov/sites/entrez?Db=pubmed&Cmd=Search&Term=%22Domasevitch%20KV%22%5BAuthor%5D&itool=EntrezSystem2.PEntrez.Pubmed.Pubmed_ResultsPanel.Pubmed_RVAbstractPlus)., [Wilking, J](http://www.ncbi.nlm.nih.gov/sites/entrez?Db=pubmed&Cmd=Search&Term=%22Wilking%20J%22%5BAuthor%5D&itool=EntrezSystem2.PEntrez.Pubmed.Pubmed_ResultsPanel.Pubmed_RVAbstractPlus)., [Mokhir, A](http://www.ncbi.nlm.nih.gov/sites/entrez?Db=pubmed&Cmd=Search&Term=%22Mokhir%20A%22%5BAuthor%5D&itool=EntrezSystem2.PEntrez.Pubmed.Pubmed_ResultsPanel.Pubmed_RVAbstractPlus). (2007) Tin (IV) Cyanoximates: Synthesis, Characterization and Cytotoxicity. Inorg Chem, 46:7268-7284.
21. Abbey, M.J., Patil, V.V., Vause, C.V., **Durham, P.L.** (2008) Repression of Calcitonin Gene-Related Peptide Expression by a *Threobroma cacao* Extract, J Ethnopharmacol, 115:238-248.
22. Li, J., Vause, C.V., **Durham, P.L.** (2008) Stimulation of iNOS Expression in Trigeminal Ganglia Satellite Glia Cells by Calcitonin Gene-Related Peptide, Br Res, 1196:22-32.
23. Gerasimchuk, N., Goeden, L., **Durham, P.,** Barnes, C., Cannon, J.F., Silchenko, S., Hidalgo, I. (2008) Synthesis and Characterization of Disubstituted Arylcyanoximes and Their Several Metal Complexes. Inorganica Chimica Acta, 361:1983–2001.
24. **Durham, P.** (2008) Inhibition of Calcitonin Gene-Related Peptide Function: A Promising Strategy for Treating Migraine. Headache, 48:1269-1275.
25. Freeman, S.E., Patil, V.V., **Durham, P.L.** (2008) Stimulation of Trigeminal Neurons by Nitric Oxide Causes Increased MAP Kinase Expression in Neurons and Satellite Glial Cells in Trigeminal Ganglia, Neuroscience, 157:542-555.
26. Damodaram, S., Thalakoti, S., Freeman, S.E., Garrett, F.G., **Durham, P.L.** (2009) Tonabersat Inhibits Trigeminal Ganglion Neuronal-Satellite Glial Cell Signaling. Headache, 49:5-20.
27. **Durham, P.L.,** Garrett, F.G. (2009) Neurological mechanisms of migraine: potential of the gap-junction modulator tonabersat in prevention of migraine. Cephalalgia, Suppl 2:1-6.
28. Vause, C.V., **Durham, P.L.** (2009) CGRP Stimulation of iNOS and NO Release from Trigeminal Ganglion Glial Cells Involves MAP Kinase Pathways, J Neurochem, 110:811-821.
29. Cady, R.K., Vause, C. V., Ho, T.W., Bigal, M.E., **Durham, P.L.** (2009) Elevated Saliva Calcitonin Gene-Related Peptide (CGRP) Levels During Acute Migraine Predicts Therapeutic Response to Rizatriptan, Headache. 49:1258-66.
30. Garrett, F.G., **Durham, P.L.** (2009) Differential Expression of Connexins in Trigeminal Ganglion Neurons and Satellite Glial Cells in Response to Acute or Chronic Joint Inflammation, Neuron Glia Biol 13:1-12.
31. Cady, R. J., **Durham, P.L.** (2010) Cocoa Enriched Diets Enhance Expression of Phosphatases and Decrease Expression of Inflammatory Molecules in Trigeminal Ganglion Neurons, Brain Res Apr 6;1323:18-32. Epub 2010 Feb 6
32. **Durham, P.L.,** Garrett, F.G. (2010) Emerging Importance of Neuron-Satellite Glia Interactions within Trigeminal Ganglia in Craniofacial Pain, The Open Pain Journal 11:3-13 doi: 10.2174/1876386301003020003
33. **Durham, P.L.,** Vause, C. V. (2010)CGRP Antagonists in the Treatment of Migraine, CNS Drugs. Jul 1;24(7):539-48. doi: 10.2165/11534920-000000000-00000
34. Masterson, C.G., **Durham P.L.** (2010)DHE Repression of ATP-Mediated Sensitization of Trigeminal Ganglion Neurons, [Headache.](javascript:AL_get(this,%20'jour',%20'Headache.');) 2010 Jun 18. [Epub ahead of print].
35. **Durham, P.L.,** Vause, C.V., Derosier, F., McDonald, S., Cady, R., Martin, V. (2010) [Changes in Salivary Prostaglandin Levels During Menstrual Migraine With Associated Dysmenorrhea.](http://www.ncbi.nlm.nih.gov/pubmed/20353434)

Headache. May;50(5):844-51. Epub 2010 Mar 26

1. Strider, J.W., Masterson, C.G., **Durham, P.L.** (2010) Treatment of Mast Cells with Carbon Dioxide Suppresses Degranulation via a Novel Mechanism Involving Repression of Increased Intracellular Calcium Levels, Allergy DOI: 10.1111/j.1398-9995.2010.02482.x.
2. Vause, C.V., **Durham, P.L.** (2010) Calcitonin Gene-Related Peptide Differentially Regulates Gene and Protein Expression in Trigeminal Neurons and Glia Cells: Findings from Array Analysis, Neurosci Lett. 2010 Apr 12;473(3):163-7. Epub 2010 Feb 4.
3. **Durham, P.L.,** Garrett, F.G. (2010) Development of Functional Units within Trigeminal Ganglia Correlates with Increased Expression of Proteins Involved in Neuron-Glia Interactions, Neuron Glia Biol, accepted for publication.

##### Published Book Chapters and Technical Reports

1. Perlman, A.L. and **Durham, P.L.** (1986) Passive Mechanisms Influencing Fundamental Frequency Control in Laryngeal Function in Phonation and Respiration. Edited by Baer, T., Sasaki, C. and Harris, K., pp. 291-303.

2. **Durham, P.L.**, Scherer, R.C., Druker, D.G. and Titze, I. R. (1987) Development of Excised Procedure for Studying Mechanisms of Phonation, Technical Report VA1-1-1-1987, January 1987. The Denver Center for the Performing Arts, Denver, CO.

1. Bolay, H., **Durham, P.L.** (2010) Biological Sciences for Headache: Pharmacology in Handbook of Clinical Neurology, 3rd Series: Headache. Edited by Nappi, G., Moskowitz, M., Handb Clin Neurol. 97C:47-71.