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# Education

**Bachelor of Science in Applied Mathematics** (Summa Cum Laude), December 1985, Florida State University, Tallahassee, FL.

**Doctor of Philosophy in Applied Mathematics**, April 1993
Florida State University, Tallahassee, FL.

# Professional History

8/09–present: **Professor of Mathematics**, Florida State University, Tallahassee, FL.

6/05–present: **Member of the Program in Neuroscience**, Florida State University, Tallahassee, FL.

8/01–present: **Member of the Molecular Biophysics Program**, Florida State University, Tallahassee, FL.

8/04–6/09: **Associate Professor of Mathematics**, Florida State University, Tallahassee, FL.

8/01–7/04: **Assistant Professor of Mathematics**, Florida State University, Tallahassee, FL.

8/99–7/01: **Assistant Scientist**, Institute of Molecular Biophysics, Florida State University, Tallahassee, FL.

6/96–7/99: **Assistant Professor of Mathematics**, Pennsylvania State University, Erie, PA.

5/93–6/96: **Postdoctoral Research Fellow**, Mathematical Research Branch, National Institutes of Health, Bethesda, MD.

# Published Articles

* denotes student

Total number of published articles: 99
Total number of non-self citations: 1093
H-index: 18

1993

1. **R. Bertram**, *A Computational Study of the Effects of Serotonin on a Molluscan Burster Neuron*, Biological Cybernetics, 69:257-267, 1993.

1994

1. **R. Bertram**, *Reduced-System Analysis of the Effects of Serotonin on a Molluscan Burster Neuron*, Biological Cybernetics, 70:359-368, 1994.

1995

1. **R. Bertram**, M. J. Butte, T. Kiemel, A. Sherman, *Topological and Phenomenological Classification of Bursting Oscillations*, Bulletin of Mathematical Biology, 57:413-440, 1995.

2. **R. Bertram**, P. Smolen, A. Sherman, D. Mears, I. Atwater, F. Martin, B. Soria, *A Role for Calcium Release Activated Current (CRAC) in Cholinergic Modulation of Electrical Activity in Pancreatic $\beta$-Cells*, Biophysical Journal, 68:2323-2332, 1995. (Selected for New and Notable, *Biophysical Journal* 68:2216-2217, 1995.)

1996

1. Y.-X. Li, **R. Bertram**, J. Rinzel, *Modeling N-Methyl-D-Aspartate-Induced Bursting in Dopamine Neurons*, Neuroscience, 71:397-410, 1996.

2. **R. Bertram**, A. Sherman, E. F. Stanley, *The Single Domain/Bound Calcium Hypothesis of Transmitter Release and Facilitation*, Journal of Neurophysiology, 75:1919-1931, 1996.

1997

1. D. Mears, N. F. Sheppard Jr., I. Atwater, E. Rojas, **R. Bertram**, A. Sherman, *Evidence That Calcium Release-Activated Current Mediates the Biphasic Electrical Activity of Mouse Pancreatic $\beta$-Cells*, Journal of Membrane Biology, 155:47-60, 1997.

2. **R. Bertram**, *A Simple Model of Transmitter Release and Facilitation*, Neural Computation, 9:515-523, 1997.

1998

1. **R. Bertram** and A. Sherman, *Population Dynamics of Synaptic Release Sites*, SIAM Journal on Applied Mathematics, 58:142-169, 1998.

2. **R. Bertram**, M. Pernarowski, *Glucose Diffusion in Pancreatic Islets of Langerhans*, Biophysical Journal, 74:1722-1731, 1998.

1999

1. **R. Bertram**, G. D. Smith, A. Sherman, *Modeling Study of the Effects of Overlapping $Ca^{2+}$ Microdomains on Neurotransmitter Release*, Biophysical Journal, 76:735-750, 1999.

2. H. Tabakovic, J. Paullet, **R. Bertram**, *Measuring the Curl of Paper*, The College Mathematics Journal, 30:315-317, 1999.

3. **R. Bertram** and M. Behan, *Implications of G-Protein-Mediated $Ca^{2+}$ Channel Inhibition for Neurotransmitter Release and Facilitation*, Journal of Computational Neuroscience, 7:197-211, 1999.

2000

1. **R. Bertram**, J. R. Quine, M. S. Chapman, T. A. Cross, *Atomic Refinement Using Orientational Restraints from Solid-State NMR*, Journal of Magnetic Resonance, 147:9-16, 2000.

2. **R. Bertram**, J. Previte, A. Sherman, T. A. Kinard, L. S. Satin, *The Phantom Burster Model for Pancreatic $\beta$-Cells*, Biophysical Journal, 79:2880-2892, 2000.

3. **R. Bertram** and A. Sherman, *Dynamical Complexity and Temporal Plasticity in Pancreatic $\beta$-Cells*, Journal of Biosciences, 25:197-209, 2000. [Invited article, not refereed]

2001

1. **R. Bertram**, *Differential Filtering of Two Presynaptic Depression Mechanisms*, Neural Computation, 13:69-85, 2001.

2002

1. A. Korostelev*, **R. Bertram**, M. S. Chapman, *Simulated Annealing Real-Space Refinement as a Tool in Model Building*, Acta Crystallographica, D58:761-767, 2002.

2. **R. Bertram**, M. I. Arnot, G. W. Zamponi, *A Role for G Protein Gβγ Isoform Specificity in Synaptic Signal Processing: A Computational Study*, Journal of Neurophysiology, 87:2612-2623, 2002.

3. F. Fabiola, **R. Bertram**, A. Korostelev*, M. S. Chapman, *An Improved Hydrogen Bond Potential for Crystallographic Refinement*, Protein Science, 11:1415-1423, 2002.

4. P. B. Goforth, **R. Bertram**, F. A. Khan, M. Zhang, A. Sherman, L. S. Satin, *Calcium-Activated $K^+$ Channels of Mouse β-Cells are Controlled by Both Store and Cytoplasmic $Ca^{2+}$: Experimental and Theoretical Studies*, Journal of General Physiology, 120:307-322, 2002.

5. **R. Bertram**, K. Wierschem*, M. Zhang, P. Goforth, A. Sherman, L. S. Satin, *Phantom Bursting in Pancreatic Islets: A Potential Role for Insulin Feedback*, in Recent Research Developments in Biophysics, ed. S. G. Pandalai, Transworld Research Network Publishers, 1:31-51, 2002. [Book chapter, not refereed]

2003

1. M. Zhang, P. Goforth, **R. Bertram**, A. Sherman, L. Satin, *The $Ca^{2+}$ Dynamics of Isolated Mouse β-Cells and Islets: Implications for Mathematical Models*, Biophysical Journal, 84:2852-2870, 2003.

2. **R. Bertram**, T. Asbury*, F. Fabiola, J. R. Quine, T. A. Cross, M. S. Chapman, *Atomic Refinement with Correlated Solid-State NMR Restraints*, Journal of Magnetic Resonance, 163:300-309, 2003.

3. **R. Bertram**, J. Swanson*, M. Yousef*, Z.-P. Feng, G. Zamponi, *A Minimal Model for G Protein-Mediated Synaptic Facilitation and Depression*, Journal of Neurophysiology, 90:1643-1653, 2003.

2004

1. K. Wierschem* and **R. Bertram**, *Complex Bursting in Pancreatic Islets: A Potential Glycolytic Mechanism*, Journal of Theoretical Biology, 228:513-521, 2004.

2. M. Egli, **R. Bertram**, M. T. Sellix*, M. E. Freeman, *Rhythmic Secretion of Prolactin in Rats: Action of Oxytocin Coordinated by Vasoactive Intestinal Polypeptide of Suprachiasmatic Nucleus Origin*, Endocrinology, 145:3386-3394, 2004.

3. **R. Bertram** and A. Sherman, *A Calcium-Based Phantom Bursting Model for Pancreatic Islets*, Bulletin of Mathematical Biology, 66:1313-1344, 2004.

4. **R. Bertram**, L. Satin, M. Zhang, P. Smolen, A. Sherman, *Calcium and Glycolysis Mediate Multiple Bursting Modes in Pancreatic Islets*, Biophysical Journal, 87:3074-3087, 2004.

5. J. R. Quine, T. A. Cross, M. S. Chapman, and **R. Bertram**, *Mathematical Aspects of Protein Structure Determination with NMR Orientational Restraints*, Bulletin of Mathematical Biology, 66:1705-1730, 2004.

6. **R. Bertram** and A. Sherman, *Filtering of Calcium Transients by the Endoplasmic Reticulum in Pancreatic $\beta$-Cells*, Biophysical Journal, 87:3775-3785, 2004.

2005

1. M. G. Pedersen, **R. Bertram**, and A. Sherman, *Intra- and Inter-Islet Synchronization of Metabolically Driven Insulin Secretion*, Biophysical Journal, 89:107-119, 2005.

2. C. S. Nunemaker, M. Zhang, D. H. Wasserman, O. P. McGuinness, A. C. Powers, **R. Bertram**, A. Sherman, and L. S. Satin, *Individual Mice can be Distinguished by the Period of Their Islet Calcium Oscillations: Is there an Intrinsic Islet Period That is Imprinted In Vivo?*, Diabetes, 54:3517-3522, 2005.

3. **R. Bertram**, *Mathematical Models of Synaptic Transmission and Short-Term Plasticity*, in Tutorials in Mathematical Biosciences II: Mathematical Modeling of Calcium Dynamics and Signal Transduction, ed. J. Sneyd, Springer, Lecture Notes in Mathematics, 1867:173-202, 2005. [Book chapter, not refereed]

4. A. Sherman and **R. Bertram**, *Integrative Modeling of the Pancreatic $\beta$-Cell*, in Encyclopedia of Genetics, Genomics, Proteomics and Bioinformatics, Part 3: Proteomics, (ed.) Raimond Winslow, Wiley Publishers, ISBN: 0-470-84974-6, (21 pages), 2005. [Book chapter, not refereed]

5. **R. Bertram** and A. Sherman, *Negative Calcium Feedback: The Road from Chay-Keizer*, in Bursting: The Genesis of Rhythm in the Nervous System, (ed.) S. Coombes and P. Bressloff, World Scientific Press, pp. 19-48, 2005. [Book chapter, not refereed]

2006

1. M. Egli, **R. Bertram**, N. Toporikova*, M. T. Sellix*, W. Blanco*, and M. E. Freeman, *Prolactin Secretory Rhythm of Mated Rats Induced by a Single Injection of Oxytocin*, American Journal of Physiology, 290:E566-E572, 2006.

2. **R. Bertram**, M. Egli, N. Toporikova*, and M. E. Freeman, *A Mathematical Model for the Mating-Induced Prolactin Rhythm of Female Rats*, American Journal of Physiology, 290:E573-E582, 2006.

3. K. Tsaneva-Atanasova, C. L. Zimliki, **R. Bertram**, A. Sherman, *Diffusion of Calcium and Metabolites in Pancreatic Islets: Killing Oscillations with a Pitchfork*, Biophysical Journal, 90:3434-3446, 2006.

4. J. R. Quine, S. Achuthan*, T. Asbury*, **R. Bertram**, M. S. Chapman, J. Hu*, and T. A. Cross, *Intensity and Mosaic Spread Analysis from PISEMA Tensors in Solid-State NMR*, Journal of Magnetic Resonance, 179:190-198, 2006.

5. C. S. Nunemaker, **R. Bertram**, A. Sherman, K. Tsaneva-Atanasova, C. R. Daniel, L. S. Satin, *Glucose Modulates $[Ca^{2+}]_i$ Oscillations in Pancreatic Islets via Ionic and Glycolytic Mechanisms*, Biophysical Journal, 91:2082-2096, 2006.

6. T. Asbury*, J.R. Quine, S. Achuthan*, J. Hu*, M. S. Chapman, T. A. Cross, **R. Bertram**, *PIPATH: An Optimized Algorithm for Generating $\alpha$-Helical Structures from PISEMA data*, Journal of Magnetic Resonance, 183:87-95, 2006.

7. **R. Bertram**, M. G. Pedersen, D. S. Luciani, A. Sherman, *A Simplified Model for Mitochondrial ATP Production*, Journal of Theoretical Biology, 243:575-586, 2006.

8. V. Matveev, **R. Bertram**, A. Sherman, *Residual Bound $Ca^{2+}$ Can Account for the Effects of $Ca^{2+}$ Buffers on Synaptic Facilitation*, Journal of Neurophysiology, 96:3389-3397, 2006.

9. **R. Bertram**, J. Tabak, N. Toporikova*, and M. E. Freeman, *Endothelin Action on Pituitary Lactotrophs: One Receptor, Many GTP-Binding Proteins*, Science STKE, 2006(319):pe4, (4 pages), 2006. [Invited review article, not refereed]

10. **R. Bertram**, J. Tabak, N. Toporikova*, *Models of Hypothalamus*, Scholarpedia, 1(12):1330, 2006. [Online encyclopedia chapter, refereed]

2007

1. **R. Bertram**, L. S. Satin, M. G. Pedersen, D. S. Luciani, A. Sherman, *Interaction of Glycolysis and Mitochondrial Respiration in Metabolic Oscillations of Pancreatic Islets*, Biophysical Journal, 92:1544-1555, 2007.

2. J. Tabak, N. Toporikova*, M. E. Freeman, **R. Bertram**, *Low Dose of Dopamine may Stimulate Prolactin Secretion by Increasing Fast Potassium Currents*, Journal of Computational Neuroscience, 22:211-222, 2007.

3. J. Hu*, T. Asbury*, S. Achuthan*, C. Li*, **R. Bertram**, J. R. Quine, R. Fu*, T. A. Cross, *Backbone Structure of the Amantadine-Blocked Trans-Membrane Domain M2 Proton Channel from Influenza A Virus*, Biophysical Journal, 92:4335-4343, 2007.

4. D. T. McKee*, M. O. Poletini, **R. Bertram**, M. E. Freeman, *Oxytocin Action at the Lactotroph is Required for Prolactin Surges in Cervically Stimulated Ovariectomized Rats*, Endocrinology, 148:4649-4657, 2007.

5. J. A. Thompson*, W. Wu, **R. Bertram**, F. Johnson, *Auditory-Dependent Vocal Recovery in Adult Male Zebra Finches is Facilitated by Lesion of a Forebrain Pathway that Includes the Basal Ganglia*, Journal of Neuroscience, 27:12308-12320, 2007.

6. **R. Bertram**, A. Sherman, L. S. Satin, *Metabolic and Electrical Oscillations: Partners in Controlling Pulsatile Insulin Secretion*, American Journal of Physiology, 293:E890-E900, 2007. [Review article, refereed]

2008

1. N. Toporikova*, J. Tabak, M. E. Freeman, **R. Bertram**, *A-type $K^+$ Current Can Act as a Trigger for Bursting in the Absence of a Slow Variable*, Neural Computation, 20:436-451, 2008.

2. S. Achuthan*, T. Asbury*, J. Hu*, **R. Bertram**, T. A. Cross, J. R. Quine, *Continuity Conditions and Torsion Angles from ssNMR Orientational Restraints*, Journal of Magnetic Resonance, 191:24-30, 2008.

3. **R. Bertram**, R. C. Arceo II*, *A Mathematical Study of the Differential Effects of Two SERCA Isoforms on Calcium Oscillations in Pancreatic Islets*, Bulletin of Mathematical Biology, 70:1251-1271, 2008.

4. W. Wu, J. A. Thompson*, **R. Bertram**, F. Johnson, *A Statistical Method for Quantifying Songbird Phonology and Syntax*, Journal of Neuroscience Methods, 174:147-154, 2008.

5. **R. Bertram**, J. Rhoads*, W. P. Cimbora*, *A Phantom Bursting Mechanism for Episodic Bursting*, Bulletin of Mathematical Biology, 70:1979-1993, 2008.

6. **R. Bertram**, Y.-X. Li, *A Mathematical Model for the Actions of Activin, Inhibin, and Follistatin on Pituitary Gonadotrophs*, Bulletin of Mathematical Biology, 70:2211-2228, 2008.

7. M. Zhang, B. Fendler*, B. Peercy, P. Goel, **R. Bertram**, A. Sherman, L. Satin, *Long Lasting Synchronization of Isolated Pancreatic Islet Calcium Oscillations by Cholinergic Stimulation*, Biophysical Journal, 95:4676-4688, 2008.

8. M. Tomaiuolo*, **R. Bertram**, D. Houle, *Enzyme Isoforms May Increase Phenotypic Robustness*, Evolution, 62:2884-2893, 2008.

9. M. E. Freeman, D. T. McKee*, M. Egli, **R. Bertram**, *Biological and Mathematical Modeling Approaches to Defining the Role of Oxytocin and Dopamine in the Control of Mating-Induced PRL Secretion*, in Neurobiology of the Parental Brain, (ed.) R. Bridges, Elsevier, pp. 233-245, 2008. [Book chapter, not refereed]

10. **R. Bertram**, *Bursting in Pituitary Cells*, in Frontiers of Applied and Computational Mathematics, (ed.) D. Blackmore, A. Bose, P. Petropoulos, World Scientific, pp. 47-55, 2008. [Book chapter, not refereed]

2009

1. C. V. Helena, D. T. McKee*, **R. Bertram**, A. M. Walker, M. E. Freeman, *The Rhythmic Secretion of Mating-Induced Prolactin Secretion is Controlled by Prolactin Acting Centrally*, Endocrinology, 150:3245-3251, 2009.

2. B. Fendler*, M. Zhang, L. S. Satin, **R. Bertram**, *Synchronization of Pancreatic Islet Oscillations by Intrapancreatic Ganglia: A Modeling Study*, Biophysical Journal, 97:722-729, 2009.

3. V. Matveev, **R. Bertram**, A. Sherman, *$Ca^{2+}$ Current vs. $Ca^{2+}$ Channel Cooperativity of Exocytosis*, Journal of Neuroscience, 29:12196-12209, 2009.

4. **R. Bertram**, P. Budu-Grajdeanu, M. S. Jafri, *Using Phase Relations to Identify Potential Mechanisms for Metabolic Oscillations in Isolated Beta-Cell Mitochondria*, Islets, 2:87-94, 2009.

5. M. Tomaiuolo, J. Tabak, **R. Bertram**, *Correlation Analysis: A Tool for Comparing Relaxation-Type Models to Experimental Data*, In Michael L. Johnson and Ludwig Brand, editors: Methods in Enzymology, vol. 467, Burlington: Academic Press, 2009, pp. 1-22. [Book chapter, not refereed]

2010

1. J. Tabak, A. E. Gonzalez-Iglesias, N. Toporikova*, **R. Bertram**, M. E. Freeman, *Variations in the Response of Pituitary Lactotrophs to Oxytocin During the Rat Estrous Cycle*, Endocrinology, 151:1806-1813, 2010.

2. J. Tabak, M. Mascagni, **R. Bertram**, *Mechanism for the Universal Pattern of Activity in Developing Neuronal Networks*, Journal of Neurophysiology, 103:2208-2221, 2010.

3. **R. Bertram**, A. Sherman, L. S. Satin, *Electrical Bursting, Calcium Oscillations, and Synchronization of Pancreatic Islets*, In The Islets of Langerhans, editor: Md. Shahidul Islam, Advances in Experimental Medicine and Biology, vol. 654, Springer, pp. 271-279, 2010. [Book chapter, refereed]

4. **R. Bertram**, C. Helena, A. E. Gonzalez-Iglesias, J. Tabak, M. E. Freeman, *A Tale of Two Rhythms: Roles of Oxytocin in Rhythmic Prolactin Release*, Journal of Neuroendocrinology, 22:778-784, 2010. [Review article, refereed]

5. M.J. Merrins, B. Fendler*, M. Zhang, A. Sherman, **R. Bertram**, L.S. Satin, *Metabolic Oscillations in Pancreatic Islets Depend on the Intracellular Calcium Level but not Calcium Oscillations*, Biophysical Journal, 99:76-84, 2010.

6. T. Vo, **R. Bertram**, J. Tabak, M. Wechselberger, *Mixed Mode Oscillations as a Mechanism for Pseudo-Plateau Bursting*, Journal of Computational Neuroscience, 28:443-458, 2010.

7. X. Zhang*, A. Grimley*, **R. Bertram**, M. G. Roper, *Microfluidic System for Generation of Sinusoidal Glucose Waveforms for Entrainment of Islets of Langerhans*, Analytical Chemistry, 82:6704-6711, 2010.

8. M. Tomaiuolo, **R. Bertram**, A. E. Gonzalez-Iglesias, J. Tabak, *Investigating Heterogeneity of Intracellular Calcium Dynamics in Anterior Pituitary Lactotrophs Using a Combined Modeling/Experimental Approach*, Journal of Neuroendocrinology, 22:1215-1324, 2010.

9. S. S. Stojilkovic, J. Tabak, **R. Bertram**, *Ion Channels and Signaling in the Pituitary Gland*, Endocrine Reviews, 31:845-915, 2010. [Invited review article, refereed]

2011

1. J. Thompson*, M. Basista*, W. Wu, **R. Bertram**, F. Johnson, *Dual Pre-Motor Contribution to Songbird Syllable Variation*, Journal of Neuroscience, 31:322-330, 2011.

2. M. Watts*, J. Tabak, C. Zimliki, A. Sherman, **R. Bertram**, *Slow Variable Dominance and Phase Resetting in Phantom Bursting*, Journal of Theoretical Biology, 276:218-228, 2011.

3. J. Tabak, J. Rinzel, **R. Bertram**, *Quantifying the Relative Contributions of Divisive and Subtractive Feedback to Rhythm Generation*, PLoS Computational Biology, 7(4):e1001124. doi:10.1371/journal.pcbi.1001124, 2011.

4. W. Teka*, K. Tsaneva-Atanasova, **R. Bertram**, J. Tabak, *From Plateau to Pseudo-Plateau Bursting: Making the Transition*, Bulletin of Mathematical Biology, 73:1292-1311, 2011.

5. V. Matveev, **R. Bertram**, A. Sherman, *Calcium Cooperativity of Exocytosis as a Measure of $Ca^{2+}$ Channel Domain Overlap*, Brain Research, 1398:126-138, 2011. [Refereed review article]

6. C. V. Helena, R. Cristancho-Gordo, A. E. Gonzalex-Iglesias, J. Tabak, **R. Bertram**, M. E. Freeman, *Systemic Oxytocin Induces a Prolactin Secretory Rhythm via the Pelvic Nerve in Ovariectomized Rats*, American Journal of Physiology, 301:R676-R681, 2011. [Chosen as an Editorial Focus article, AJP, 301:R674-675, 2011.]

7. X. Zhang*, A. Daou*, T. M. Truong, **R. Bertram**, M. G. Roper, *Synchronization of Mouse Islets of Langerhans by Glucose Waveforms*, American Journal of Physiology, 301:E742-E747, 2011.

8. M. Watts*, J. Tabak, **R. Bertram**, *Mathematical Modeling Demonstrates How Multiple Slow Processes Can Provide Adjustable Control of Islet Bursting*, Islets, 3:320-326, 2011.

9. A. Sirzen-Zelenskaya, A. E. Gonzalez-Iglesias, J. Boutet de Monvel, **R. Bertram**, M. E. Freeman, U. Gerber, M. Egli, *Prolactin Induces a Hyperpolarizing Current in Rat Paraventricular Oxytocinergic Neurones*, Journal of Neuroendocrinology, 23:883-893, 2011.

10. J. Tabak, M. Tomaiuolo, A. E. Gonzalez-Iglesias, L. S. Milescu, **R. Bertram**, *Fast Activating Voltage- and Calcium-Dependent Potassium (BK) Conductance Promotes Bursting in Pituitary Cells: A Dynamic Clamp Study*, Journal of Neuroscience, 31:16855-16863, 2011.

11. W. Teka*, J. Tabak, T. Vo, M. Wechselberger, **R. Bertram**, *The Dynamics Underlying Pseudo-Plateau Bursting in a Pituitary Cell Model*, Journal of Mathematical Neuroscience, volume 1, number 12, doi:10.1186/2190-8567-1-12, 2011.

2012

1. T. Vo*, **R. Bertram**, M. Wechselberger, *Bifurcations of Canard-Induced Mixed Mode Oscillations in a Pituitary Lactotroph Model*, Discrete and Continuous Dynamical Systems, 32:2879-2912, 2012.

2. M. J. Merrins, **R. Bertram**, A. Sherman, L. S. Satin, *Phosphofructo-2-Kinase/Fructose-2,6-Bisphosphatase Modulates Oscillations of Pancreatic Islet Metabolism*, PLoS One, 7(4):e34036, doi:10.1371/journal.pone.0034036, 2012.

3. Z. Chu, M. Tomaiuolo, **R. Bertram**, S. Moenter, *Two Types of Burst Firing in Gonadotropin-Releasing Hormone (GnRH) Neurons*, Journal of Neuroendocrinology, 24:1065–1077, 2012.

4. M. O. Poletini, D. T. McKee*, R. E. Szawka, **R. Bertram**, C. V. V. Helena, M. E. Freeman, *Cervical Stimulation Activates A1 and Locus Coeruleus Neurons that Project to the Paraventricular Nucleus of the Hypothalamus*, Brain Research Bulletin, 88:566–573, 2012.

5. A. Daou*, F. Johnson, W. Wu, **R. Bertram**, *A Computational Tool for Automated Large-Scale Analysis and Measurement of Bird-Song Syntax*, Journal of Neuroscience Methods, 210:147–160, 2012.

6. M. Tomaiuolo, **R. Bertram**, G. Leng, J. Tabak, *Models of Electrical Activity: Calibration and Prediction Testing on the Same Cell*, Biophysical Journal, 103:2021–2032, 2012.

7. W. Teka*, J. Tabak, **R. Bertram**, *The Relationship Between Two Fast/Slow Analysis Techniques for Bursting Oscillations*, Chaos, 22:043117, 2012.

2013

1. R. E. Szawka, M. O. Poletini, C. M. Leite, M. P. Bernuci, B. Kalil, L. B. D. Mendoca, R. O. G. Carolino, C. V. V. Helena, **R. Bertram**, C. R. Franci, J. A. Anselmo-Franci, *Release of Norepinephrine in the Preoptic Area Activates Anteroventral Periventricular Nucleus Neurons and Stimulates the Surge of Luteinizing Hormone*, Endocrinology, 154:363-374, 2013.

2. T. Vo*, **R. Bertram**, M. Wechselberger, *Multiple Geometric Viewpoints of Mixed Mode Dynamics Associated with Pseudo-Plateau Bursting*, SIAM Journal of Applied Dynamical Systems, 12:789-830, 2013.

3. J. T. Corthell*, A. M. Stathopoulos*, C. C. Watson*, **R. Bertram**, P. Q. Trombley, *Olfactory Bulb Monoamine Concentrations Vary with Time of Day*, Neuroscience, 247:234–241, 2013.

4. **R. Bertram**, *Endocrine Cell Function and Dysfunction.* In: Jaeger D., Jung R. (Ed.) Encyclopedia of Computational Neuroscience: SpringerReference, Springer-Verlag Berlin Heidelberg 2013. DOI: 10.1007/SpringerReference_349777 2013-09-03, 14:59:05 UTC.

5. A. Daou*, M. T. Ross*, F. Johnson, R. L. Hyson, **R. Bertram**, *Electrophysiological Characterization and Computational Models of HVC Neurons in the Zebra Finch*, Journal of Neurophysiology, 110:1227-1245, 2013.

6. **R. Bertram**, A. Sherman, L. S. Satin, *Electrical, Calcium, and Metabolic Oscillations in Pancreatic Islets*, in The Islets of Langerhans, 2nd edition, editor: Md. Shahidul Islam, Advances in Experimental Medicine and Biology, Springer, 2013. [Invited book chapter, not refereed.]

7. J. Ren, A. Sherman, **R. Bertram**, P. B. Goforth, C. S. Nunemaker, C. D. Waters*, L. S. Satin, *Slow Oscillations of KATP Conductance in Mouse Pancreatic Islets Provide Support for Electrical Bursting Driven by Metabolic Oscillations*, American Journal of Physiology, 305:E805-E817, 2013.

# Articles Accepted for Publication

* denotes student

- **R. Bertram**, J. Tabak, W. Teka*, T. Vo*, M. Wechselberger, *Geometric Singular Perturbation Analysis of Bursting Oscillations in Pituitary Cells*, invited review for Frontiers of Applied Dynamics, in press, 2013.

- T. Vo*, J. Tabak, **R. Bertram**, M. Wechselberger, *A Geometric Understanding of How Fast Potassium Channels Promote Bursting in Pituitary Cells*, *Journal of Computational Neuroscience*, in press, 2013.

- K. Elliott*, W. Wu, **R. Bertram**, F. Johnson, *Disconnection of a Basal Ganglia Circuit in Juvenile Songbirds Attenuates the Spectral Differentiation of Song Syllables*, Developmental Neurobiology, in press, 2013.

## Articles Submitted for Publication

* denotes student

1. **R. Bertram**, J. Tabak, S. Stojilkovic, *Ion Channels and Electrical Activity in Pituitary Cells: A Modeling Perspective*, book chapter, submitted.

2. M. Watts, B. Fendler, M. J. Merrins, L. S. Satin, **R. Bertram**, A. Sherman, *Calcium and Metabolic Oscillations in Pancreatic Islets: Who's Driving the Bus?*, submitted.

3. A. E. Gonzalez-Iglesias and **R. Bertram**, *The Molecular Cell Biology of Anterior Pituitary Cells*, book chapter in Cellular Endocrinology in Health and Disease, Elsevier, submitted, 2013.

4. R. Dhumpa, T. M. Truong, X. Wang, **R. Bertram**, and M. G. Roper, *Negative Feedback Synchronizes Oscillations in Islets of Langerhans*, submitted.

5. A. M. Stathopoulos*, C. V. Helena, P. Velez, P. A. Fletcher*, A. E. Gonzalez-Iglesias, P. Q. Trombley, **R. Bertram**, *Vaspoactive Intestinal Peptide Inhibits Dopamine Neurons and Stimulates Oxytocin Neurons in Ovariectomized Rats*, submitted.

6. P. A. Fletcher*, F. Clément, A. Vidal, J. Tabak, **R. Bertram**, *Interpreting Frequency Responses to Dose-Conserved Pulsatile Input Signals in Simple Cell Signaling Motifs*, submitted.

7. S. Sengül*, R. Clewley, **R. Bertram**, J. Tabak, *The Contributions of Divisive and Subtractive Feedback in the Hodgkin-Huxley Model*, submitted.

## Refereed Abstracts: International Meetings (5 Years)

- V. Matveev, **R. Bertram**, A. Sherman, *Effect of Spatial Arrangement of Presynaptic Calcium Channels on Calcium Current Cooperativity of Neurotransmitter Release*, Annual Computational Neuroscience Meeting, Stockholm, Sweden, 2011.

## Non-Refereed Abstracts: International Meetings (5 Years)

1. C. Helena, D. M. McKee, **R. Bertram**, A. M. Walker, M. E. Freeman, *Prolactin Central Action is Required for the Induction of the Rhythmic Secretion of Pro-*

*lactin by Peripheral Oxytocin in Ovariectomized Rats*, 7th International Congress of Neuroendocrinology, Rouen, France, 2010.

2. J. Tabak, M. Tomaiuolo, L. Milescu, A. E. Gonzalez-Iglesias, M. E. Freeman, **R. Bertram**, *BK Channels Promote Bursting in Pituitary Cells*, 7th International Congress of Neuroendocrinology, Rouen, France, 2010.

3. A. Sherman, M. Watts, **R. Bertram**, J. Ren, L. Satin, *Testing Models for Islet Oscillations by Phase Resetting*, Pancreatic Islet Study Group meeting of the E.A.S.D., Sweden, 2010.

4. **R. Bertram**, *A Hybrid Experimental/Modeling Approach to Studying Pituitary Cell Dynamics*, Biodynamics 2013, Bristol, England, 2013.

## Non-Refereed Abstracts: National Meetings (5 Years)

1. **R. Bertram**, *Bursting in Pituitary Cells: A Totally Different Animal*, Invited Minisymposium talk at the Frontiers in Applied and Computational Mathematics conference, Newark, NJ, 2008.

2. J. Rhoads, **R. Bertram**, *Parallel Biological Simulations on the Graphics Processing Unit*, Society for Mathematical Biology Annual Meeting, Toronto, Canada, 2008.

3. M. Tomaiuolo, J. Tabak, **R. Bertram**, *Distinguishing the Types of Neuronal Bursting Using Voltage Traces Alone*, Annual meeting of the Society for Neuroscience, Washington, DC, 2008.

4. W. Wu, J. A. Thompson, **R. Bertram**, F. Johnson, *Detailed Phonological Analysis of Songbird Vocal Behavior Following Ablation of a Striatal/Pre-Motor Pathway*, Annual meeting of the Society for Neuroscience, Washington, DC, 2008.

5. C. V. Helena, D. T. McKee, M. O. Poletini, **R. Bertram**, M. E. Freeman, *Induction of the Cervical Stimulation Prolactin Secretory Rhythm by a Central but not Peripheral Injection of Ovine Prolactin in Ovariectomized Rats*, Annual meeting of the Society for Neuroscience, Washington, DC, 2008.

6. C. V. Helena, D. T. McKee, **R. Bertram**, M. E. Freeman, *Central Prolactin Antagonist Infusion Blocks the Expression of the Prolactin Secretory Rhythm in Ovariectomized Rats*, Annual meeting of the Endocrine Society, Washington, DC, 2009.

7. V. Matveev, **R. Bertram**, A. Sherman, *$Ca^{2+}$ Current Cooperativity vs. $Ca^{2+}$ Channel Cooperativity in Synaptic Vesicle Exocytosis*, Annual Meeting of the Biophysical Society, Boston, MA, 2009.

8. A. Sherman, V. Matveev, **R. Bertram**, *What Do We Talk About When We Talk About Cooperativity of Synaptic Release?*, Conference on Neural Dynamics and Computation in honor of John Rinzel, New York, NY, 2009.

9. J. Tabak, M. Tomaiuolo, L. Milescu, M.E. Freeman, **R. Bertram**, *BK Channels Promote Bursting in Pituitary Cells*, Annual Meeting of the Society for Neuroscience, Chicago, IL, 2009.

10. C.V. Helena, **R. Bertram**, M.E. Freeman, *Hypothalamic FRA Expression After a Central Ovine Prolactin Injection in Ovariectomized Rats*, Annual Meeting of the Society for Neuroscience, Chicago, IL, 2009.

11. V. Matveev, **R. Bertram**, A. Sherman, *$Ca^{2+}$ Current Cooperativity vs. $Ca^{2+}$ Channel Cooperativity of Exocytosis*, Annual Meeting of the Society for Neuroscience, Chicago, IL, 2009.

12. A. Daou, F. Johnson, W. Wu, **R. Bertram**, *Computational Model of Microcircuit Dynamics Underlying Bird Song in the Zebra Finch*, Society for Neuroscience Annual Meeting, San Diego, CA, 2010.

13. C. V. Helena, R. Cristancho-Gordo, A. E. Gonzalez-Iglesias, J. Tabak, **R. Bertram**, M. Freeman, *Oxytocin Induces an Acute Prolactin Response That Acts in the Brain to Induce a Prolactin Secretory Rhythm*, Society for Neuroscience Annual Meeting, San Diego, CA, 2010.

14. K. Elliott, W. Wu, **R. Bertram**, F. Johnson, *Effects of Early LMAN Ablation on the Fidelity of Song Imitation*, Society for Neuroscience Annual Meeting, San Diego, CA, 2010.

15. **R. Bertram**, *Mixed Mode Oscillations as a Mechanism for Pseudo-Plateau Bursting*, Invited Minisymposium talk at the Frontiers in Applied and Computational Mathematics conference, Newark, NJ, 2010.

16. M. J. Merrins, **R. Bertram**, A. Sherman, L. S. Satin, *6-Phosphofructo-2-kinase/fructose-2,6-bisphosphatase (PFKFB) Modulates Slow Oscillations in Pancreatic Islets*, Biophysical Society Annual Meeting, Baltimore, MD, 2011.

17. B. E. Peercy, **R. Bertram**, A. Sherman, *Metabolically Induced cAMP Oscillations in Pancreatic Beta Cells*, Biophysical Society Annual Meeting, Baltimore, MD, 2011.

18. V. Matveev, **R. Bertram**, A. Sherman, *Effect of Spatial Organization of $Ca^{2+}$ Channels on $Ca^{2+}$ Current Cooperativity of Exocytosis*, Biophysical Society Annual Meeting, Baltimore, MD, 2011.

19. C. Helena, R. Cristancho-Gordo, A. Gonzalez-Iglesias, J. Tabak, **R. Bertram**, M. Freeman, *Systemic Oxytocin Induces a Prolactin Secretory Rhythm via the Pelvic*

*Nerve in Ovariectomized Rats*, Annual Meeting of the Endocrine Society, Boston, MA.

20. A. Gonzalez-Iglesias, R. Christancho-Gordo, **R. Bertram**, J. Tabak, *Oxytocin Stimulates Calcium signaling and Hormone Release in Rat Lactotrophs, Somatotrophs and Gonadotrophs*, World Congress of Neurohypophysial Hormones, Boston, MA, 2011.

21. V. V. Matveev, **R. Bertram**, A. Sherman, *Calcium Current Cooperativity and Variability of Synaptic Response: Domain Overlap Vs. Domain Sharing*, Annual Meeting of the Society for Neuroscience, Washington, DC, 2011.

22. M. J. Basista, W. Wu, **R. Bertram**, F. Johnson, *Spatially-Organized Neural Activity Underlies a Temporally-Organized Behavior*, Annual Meeting of the Society for Neuroscience, Washington, DC, 2011.

23. A. Daou, W. Wu, **R. Bertram**, F. Johnson, *A Computational Tool for Automated Large-Scale Analysis and Measurement of Birdsong Syntax*, Annual Meeting of the Society for Neuroscience, Washington, DC, 2011.

24. A. M. Stathopoulos, C. V. Helena, P. Fletcher, **R. Bertram**, *Acute Effects of Vasoactive Intestinal Polypeptide on Prolactin Release*, Annual Meeting of the Society for Neuroscience, Washington, DC, 2011.

25. M. Tomaiuolo, J. Tabak, G. Leng, **R. Bertram**, *Model Calibration and Testing on the Same Cell*, Annual Meeting of the Society for Neuroscience, Washington, DC, 2011.

26. P. A. Fletcher, N. A. Ciccone, U. B. Kaiser, **R. Bertram**, *Frequency Response of Gonadotropin-Releasing Hormone-Induced Follicle-Stimulating Hormone Transcription*, SIAM Conference on Applications of Dynamical Systems, Snowbird, Utah, 2011.

27. **R. Bertram**, *Mixed Mode Oscillations Underlie Bursting in Pituitary Cells*, SIAM Conference on Applications of Dynamical Systems, Snowbird, Utah, 2011.

28. M. J. Basista, W. Wu, **R. Bertram**, R. L. Hyson, F. Johnson, *Syllable-Specific Topography of a Premotor Vocal Sequence Generating Region*, Annual Meeting of the Society for Neuroscience, New Orleans, LA, 2012.

29. P. Fletcher, D. Lyons, C. Broberger, J. Tabak, **R. Bertram**, *Modeling Bursting and Responses to TRH and Prolactin in the Tuberoinfundibular Dopaminergic Neurons of the Arcuate Nucleus*, Annual Meeting of the Society for Neuroscience, New Orleans, LA, 2012.

30. K. C. Elliott, A. Daou, W. Wu, **R. Bertram**, R. L. Hyson, F. Johnson, *A Cortical Premotor Region That Generates Vocal Sequences Receives Spatially-Organized Afferent Innervation*, Annual Meeting of the Society for Neuroscience, New Orleans, LA, 2012.

31. A. Daou, M. Ross, F. Johnson, R. Hyson, **R. Bertram**, *A Computational Model of the Different Classes of Neurons in the HVC of the Zebra Finch*, Annual Meeting of the Society for Neuroscience, New Orleans, LA, 2012.

32. C. R. Watson, A. M. Stathopoulos, J. T. Corthell, **R. Bertram**, P. Trombley, *Olfactory Bulb Monoamine concentrations Vary with Time of Day*, Annual Meeting of the Society for Neuroscience, New Orleans, LA, 2012.

33. C. V. Helena, A. M. Stathopoulos, **R. Bertram**, *Role of Kisspeptin/Neurokinin B/Dynorphin (KNDy) Neurons in the Prolactin Secretory Rhythm Induced by Cervical Stimulation in Ovariectomized Rats*, Annual Meeting of the Society for Neuroscience, New Orleans, LA, 2012.

34. A. M. Stathopoulos, C. V. Helena, P. A. Fletcher, **R. Bertram**, *Semicircadian Rhythm in Hypothalamic Dopamine release After Cervical Stimulation in Ovariectomized Rats*, Annual Meeting of the Society for Neuroscience, New Orleans, LA, 2012.

35. P. Velez, C. V. Helena, A. M. Stathopoulos, P. Fletcher, J. Tabak, P. Q. Trombley, **R. Bertram**, *Electrophysiological Recordings from Dopaminergic Neurons in the Arcuate Nucleus of Female Rats*, Annual Meeting of the Society for Neuroscience, New Orleans, LA, 2012.

36. J. Tabak, A. E. Gonazlez-Iglesias, R. Cristancho-Gordo, **R. Bertram**, *Multiple Actions of Hypothalamic Oxytocin on Pituitary Cells*, Annual Meeting of the Society for Neuroscience, New Orleans, LA, 2012.

37. A. E. Gonzalez-Iglesias, R. Cristancho-Gordo, J. A. Arias-Cristancho, **R. Bertram**, *Peripheral Administration of Oxytocin Acutely Increases Systemic Prolactin Levels and Advances the Onset of the Prolactin Surge in Proestrus Rats*, Annual Meeting of the Society for Neuroscience, New Orleans, LA, 2012.

38. M. T. Ross, A. Daou, **R. Bertram**, F. Johnson, R. L. Hyson, *The Contribution to Song of Known Ionic Currents in the HVC of the Zebra Finch*, Annual Meeting of the Society for Neuroscience, San Diego, CA, 2013.

39. K. C. Elliott, W. Wu, **R. Bertram**, R. L. Hyson, F. Johnson, *Anatomical Evidence for Parallel Processing in a Cortical Pre-Motor Region During the Sensorimotor Period of Vocal Learning*, Annual Meeting of the Society for Neuroscience, San Diego, CA, 2013.

40. S. Sengul, R. Clewley, **R. Bertram**, J. Tabak, *The Contributions of Two Negative Feedback Processes in the Hodgkin-Huxley Model*, Annual Meeting of the Society for Neuroscience, San Diego, CA, 2013.

41. M. J. Basista, W. Wu, **R. Bertram**, R. Hyson, F. Johnson, *Cellular Architecture of a Zebra Finch Pre-Motor Vocal Region*, Annual Meeting of the Society for Neuroscience, San Diego, CA, 2013.

42. R. Dhumpa, T. M. Troung, X. Wang, **R. Bertram**, M. G. Roper, *Synchronization of islets of Langerhans using a microfluidic feedback system*, Pittcon Conference & Expo, Chicago, IL, 2014.

## Non-Refereed Abstracts: Regional Meetings (5 Years)

- W. Teka, K. Tsaneva-Atanasova, **R. Bertram**, J. Tabak, *From Plateau to Pseudo-Plateau Bursting: Making the Transition*, Dynamics of Bursting Activity of Neurons, Atlanta, GA, 2010.

## Invited Presentations (5 Years)

1. *Topics in Mathematical Neuroscience*, Graduate Student Workshop, Mathematical Biosciences Institute, Ohio State University, Columbus, Ohio, 2008.
2. *Mathematical Modeling of Pancreatic Islets*, Physical Chemistry Seminar, Florida State University, 2008.
3. *Mathematical Analysis of Bursting Electrical Activity in Nerve and Endocrine Cells*, Statistics Colloquium, Florida State University, 2008.
4. *A Combined Modeling/Experimental Study of Pulsatile Insulin Secretion*, Computational Biology Seminar, George Mason University, 2009.
5. *Using Mathematical Modeling and Experiments to Understand the Mechanism of Pulsatile Insulin Secretion*, Biomathematics Seminar, University of Utah, 2009.
6. *Mathematical Aspects of Bursting Oscillations in Nerve and Endocrine Cells*, Mathematics Colloquium, University of Louisville, 2009.
7. *A Mathematical Study of Electrical Bursting in Pituitary Cells*, Workshop on "Dynamical Systems and Neuroendocrinology", Paris, France, 2009.
8. *The Emerging Roles of Oxytocin in Rhythmic Prolactin Secretion*, 7th International Congress of Neuroendocrinology, Rouen, France, 2010.
9. *Fast Negative Feedback Facilitates Bursting in Pituitary Cells*, Modelling Electrical Activity in Physiological Systems, Agra, India, 2012.
10. *The Dual Oscillator Model for Islet Oscillations*, Dynamics in Neural, Endocrine and Metabolic Systems: A Symposium in Honor of Arthur Sherman, Bethesda, MD, 2012.
11. *The Dual Oscillator Model for Pancreatic Islets*, 9th AIMS International Conference on Dynamical Systems, Differential Equations, and Applications, Orlando, FL, 2012.

12. *The Relationship Between Two Fast/Slow Analysis Techniques for Bursting Oscillations*, SIAM Conference on the Life Sciences, San Diego, CA, 2012

13. *The Dual Oscillator Model for Islet Oscillations*, University of Waterloo, Waterloo, ON, 2012.

14. *A Hybrid Approach for Understanding Cell Dynamics*, at workshop on Cellular and Subcellular Models, Mathematical Biosciences Institute, Ohio State University, 2013.

15. *A Mathematical Model for Pancreatic Islet Oscillations and Their Synchronization*, University of Exeter, England, 2013.

16. *A Mathematical Model for Pancreatic Islet Oscillations and Their Synchronization*, Tulane University, New Orleans, LA, 2013.

# Grants and Funding

1. **(current)** Microfluidic Devices for Determining Dynamics of Islets of Langerhans (PI: Mike Roper, Co-PI: Richard Bertram), National Institutes of Health, 2R01DK080714, $870,000 (direct), $1,320,497 (total), 4/1/13–3/31/17.

2. **(current)** Mathematical Analysis of Electrical Oscillations in Anterior Pituitary Cells (PI: Richard Bertram, Co-PIs: Joel Tabak, Arturo Gonzalez-Iglesias), National Science Foundation, DMS 1220063, $199,631 (direct), $275,000 (total), 9/12–9/15.

3. **(current)** Spatial Organization of a Neural Network For Serial-Order Behavior (PI: Frank Johnson, Co-PIs: Richard Bertram, Rick Hyson, Wei Wu), National Science Foundation, IOS 1146607, $258,994 (direct), $350,000 (total), 3/12–2/14.

4. **(current)** Regulation of Prolactin Secretion at the Lactotroph (PIs: R. Bertram, Arturo Gonzalez-Iglesias, Joel Tabak), National Institute of Diabetes and Digestive and Kidney Diseases, NIH, R01 DK043200, $1,623,538 (direct), $2,386,601 (total), 2/10–1/15.

5. **(completed)** A Mathematical Study of the Biochemical and Electrical Dynamics of Pancreatic Islets (PI: R. Bertram), Division of Mathematical Sciences, NSF, DMS 0917664, $168,702 (direct), 9/09–8/12.

6. **(completed)** Modeling Electrical Activity in Physiological Systems (PIs: R. Bertram, Somdatta Sinha), Indo-US Science and Technology Forum, all expenses provided for 7 US and 10 Indian scientists to meet in Agra, India, March 4-9, 2012.

7. **(completed)** Cell Survival in a Neural Circuit for Learning (PIs: R. Bertram, F. Johnson, W. Wu), National Institute of Child Health and Development, NIH, RO1 DC002035, $400,000 (direct), 7/09–6/11.

8. **(completed)** A Joint Computational/Experimental Study of Hypothalamic-Pituitary Interactions (PI: R. Bertram) National Institute of Drug Abuse, NIH, DA193356, $1,754,832, 7/04–6/09.

9. **(completed)** Oscillation and Synchronization of Pancreatic Islets (PI: R. Bertram) Division of Mathematical Sciences, NSF, DMS 0613179, $190,524, 9/06–8/09.

10. **(completed)** Entrainment and Synchronization of the Pancreatic Islet (Sponsor: R. Bertram) Predoctoral fellowship awarded to Bernard Fendler by the Florida/Puerto Rico Affiliate of the American Heart Association, $43,540, 7/07–6/09.

11. **(completed)** Phantom Bursting Models and Complex Bursting Patterns in Pancreatic Islets (PI: R. Bertram) Division of Mathematical Sciences, NSF, $127,298, 9/03–8/07.

12. **(completed)** Computational Methods for the Determination of the Atomic Structure of Membrane Proteins (Sponsor: R. Bertram) Predoctoral fellowship awarded to Tom Asbury by the Florida/Puerto Rico Affiliate of the American Heart Association, $40,000, 7/04–6/06.

13. **(completed)** First-Year Assistant Professor Award (PI: R. Bertram), FSU Research Council, $6667, Summer 2002.

14. **(completed)** Membrane Protein Structural Genomics: Mycobacterium tuberculosis (PI: T. Cross), a Program Project Grant from the National Institute of General Medical Sciences, NIH, $8,100,000, 10/01–10/06.

15. **(completed)** Modeling and Analysis of Multimodal Bursting in Pancreatic $\beta$-Cells (PI: R. Bertram) Division of Mathematical Sciences, NSF, $78,202, 9/99–8/03.

16. **(completed)** Undergraduate Program in Mathematical Biology (PI: C. Panetta), a 1-year REU grant from the Division of Mathematical Sciences, NSF, $30,000, Summer 1999.

17. **(completed)** Undergraduate Program in Mathematical Biology (PI: C. Panetta), a 1-year REU grant from the Division of Mathematical Sciences, NSF, $30,000, Summer 1998.

# Copyrighted Computer Software

1. **ssNMR**, a software package for protein structure determination using uncorrelated solid-state NMR data. Co-written with Jack Quine (FSU), 2000.

2. **ssNMR-02**, an unpdated and improved version of ssNMR, incorporating correlated solid-state NMR data. 2002.

3. **RSREF2000**, a software package for making local improvements to models of proteins using electron density maps. Co-written with Michael Chapman and Andrei Korostelev (FSU), 2000.

4. **HBOND2002**, a software package for determining hydrogen bonds in proteins, and constructing an appropriate double-well potential energy function. Co-written with Felcy Fabiola, Andrei Korostelev, and Michael Chapman (FSU), 2002.

5. **PIPATH**, a software package for automatically assigning solid state NMR data and building helical atomic structures. Co-written with Tom Asbury (FSU graduate student), 2006.

6. **K-L Distance**, a software package for comparing birdsong syllables and sequences. Co-written with Wei Wu (FSU), 2008.

7. **SONGSEQ**, a software package for automatic sequencing and analysis of bird song, Co-written with Arij Daou (FSU graduate student), 2012.

# Professional Service

1. External Examiner for a PhD defense in the Mathematics Department at the University of Waterloo, Ontario, Canada, 2012.

2. Co-organizer of *Mathematical Neuroendocrinology*, a week-long workshop held in Tours, France, 2012.

3. Co-organizer of *Dynamics in Neural, Endocrine and Metabolic Systems: A Symposium in Honor of Arthur Sherman*, Bethesda, MD, 2012.

4. Co-organizer of workshop held in Agra, India on *Modelling Electrical Activity in Physiological Systems*, 2012.

5. Proposal review for the Engineering and Physical Sciences Research Council of the United Kingdom, 2011.

6. Grant review panel member for the American Association for the Advancement of Science, 2011.

7. External Examiner for a PhD defense in the Mathematics Department at the University of Auckland, New Zealand, 2010.

8. Co-organizer of week-long workshop on *Mathematical Neuroendocrinology* at the Mathematical Biosciences Institute, Ohio State University, 2010.

9. Standing member of the Modeling and Analysis of Biological Systems (MABS) Study Section, NIH (appointed July 1, 2010).

10. Editorial Board member, *Mathematical Biosciences*, 2008–present.

11. Reviews Editor, *Mathematical Biosciences*, 2008–present.

12. Associate Editor, *Mathematical Biosciences*, 2013–present.

13. Editorial Board member, *Islets*, 2008–2013.

14. Editorial Board member, *Biophysical Journal*, 2010–present.

15. NICHD/NIH intramural site review team member, 2008.

16. Co-organizer (with Artie Sherman, Yue-Xian Li, Mary Lou Zeeman, and David McCobb) of a week-long workshop *Rhythms in the Hypothalamus and Pituitary*, American Institute of Mathematics, Palo Alto, CA, 2008.

17. Chair of the Landahl Travel Grant committee, Society for Mathematical Biology, 2007–2011.

18. Co-organizer (with Artie Sherman and Les Satin) of a week-long workshop *Insulin Secretion, Insulin Action, and Type 2 Diabetes*, Mathematical Biosciences Institute, Ohio State University, 2007.

19. NINDS/NIH Specialized Neuroscience Research Program site review team member, 2007.

20. Co-organizer (with Jim Selgrade and Mary Lou Zeeman) of Mini-Simposium, *Modeling in Endocrinology*, Joint SIAM-SMB Conference on the Life Sciences, 2006.

21. Ad hoc member of the MABS NIH study section, 2006 and 2008.

22. Grant review panel member for the Texas Higher Education Coordinating Board, 2006.

23. External Examiner for a PhD defense in the Physics Department at Simon Fraser University, Vancouver, Canada, 2006.

24. NSF grant review panel member, 2005–2010.

25. NIDA panel member for Training and Career Development awards, 2005.

26. Organizer of Mini-Symposium, *Mathematical Modeling in Endocrinology*, SIAM Conference on the Life Sciences, 2004.

27. Co-organizer (with Jack Quine, FSU) of *Special Session on Applications of Mathematics to Problems in Biology*, Southeastern Section Meeting of the American Mathematical Society, 2004.

28. Organizer of Symposium, *Mathematical Modeling of Endocrine Cells*, SIAM Life Sciences Conference, 2002.

29. Co-organizer (with Jack Quine, FSU) of Symposium, *Mathematical and Computational Methods in Structural Biology*, SIAM Conference on the Life Sciences, 2002.

30. Co-organizer (with Steve Cox, Rice University) of *Special Session on Mathematical Neuroscience*, Fall Southeastern Section Meeting of the American Mathematical Society, 2002.

31. Referee for papers submitted to:
    Biophysical Journal
    Journal of Neurophysiology
    Journal of Computational Neuroscience
    Cell Biochemistry and Biophysics
    IEEE Transactions on Neural Networks
    SIAM Journal on Applied Math
    Bulletin of Mathematical Biology
    Physica D
    Journal of Computational Chemistry
    Journal of Theoretical Biology
    American Journal of Physiology
    Diabetes
    Biophysical Chemistry
    Neurocomputing
    Mathematical Methods in the Applied Sciences
    Neural Computation
    Mathematical Biosciences
    Chaos
    IEEE Transactions on Biomedical Engineering
    Cell Calcium
    Journal of Biological Physics
    Brain Research
    Physical Reviews E
    Cognitive Neurodynamics
    General and Comparative Endocrinology
    J. Diabetes Science and Technology
    Journal of Neuroendocrinology
    J. Nonlinear Science
    Islets
    Endocrinology
    Discrete and Continuous Dynamcial Systems B
    Reproduction
    Communications in Nonlinear Science and Numerical Simulation
    PLoS Computational Biology

32. Referee for research grant proposals submitted to:
    National Institutes of Health
    National Science Foundation
    Netherlands Foundation for Fundamental Research on Matter
    Thomas F. and Kate Miller Jeffress Memorial Trust
    French Ministry of Research
    Isreal Science Foundation
    The United States Civilian Research and Development Foundation
    Natural Sciences and Engineering Research Council (NSERC) of Canada
    Wellcome Trust
    Czech Science Foundation
    Diabetes UK

## Awards and Honors

- **Penn State Collaborative and Curricular Innovations Award** for "Seminar Course on Mathematical Biology", 1997.
- **Developing Scholar Award**, Florida State University, 2006.

## Past High School Research Assistants

- Kelsey Mayo, Florida High School, 2000.

## Current Undergraduate Research Assistants

- Jose Arias-Cristancho, Biology.

## Past Undergraduate Research Assistants

1. Julie Cain (Honors thesis), Penn State University at Erie, 1998.
2. Bernadette Baumeister, Penn State University at Erie, 1999.
3. Matthew Behan (Honors thesis), Penn State University at Erie, 1999.
4. Jessie Swanson, Applied Mathematics, 2000.
5. Mandy Swann, Applied Mathematics, 2001.
6. Keola Wierschem, Physics, 2003.
7. Alicia Baptiste, Biomedical Mathematics, 2004.
8. Wendy Cimbora (Honors thesis), Applied Mathematics, 2004.
9. Rudy Arceo (Honors thesis), Biomedical Mathematics, 2007.
10. Michelle Outlaw (Hughes Fellow), Biomedical Mathematics, 2008.
11. Tanja Batchelor (Honors thesis), Biomathematics, 2009.

## Master's Degrees Supervised

- Jessie Swanson, *A Mathematical Model of the Presynaptic Terminal with G-Protein-Regulated Calcium Channels and Ancillary $Ca^{2+}$ Channel $\beta$ Subunits*, Mathematics Department, FSU, awarded 2002. Jessie is currently an Analyst at Raytheon Corporation.

# Doctoral Degrees Supervised

- Thomas Asbury, *From Data to Structure: Using Orientational Information Within PISEMA Spectra to Build Atomic Models*, Molecular Biophysics Program, FSU, awarded 2006. Tom is currently a Scientist at Affymetrix Corp.
- Natalia Toporikova, *Regulation of Rhythmic Prolactin Secretion: Combined Mathematical and Experimental Study*, Biomedical Mathematics Program, FSU, awarded 2007. Natalia is an Assistant Professor position in Biology at Washington and Lee University, Lexington, VA.
- Bernard Fendler, *Synchronization of Pancreatic Islets: A Quantitative Investigation of Nonlinear Oscillations in the Endocrine Pancreas*, Physics Program, FSU, awarded 2010. Bernard is currently a Computational Biologist at Brigham and Women's Hospital, Boston, MA.
- Margaret Watts, *Slow Variable Dominance in Pancreatic $\beta$-Cell Models*, Biomathematics Program, FSU, awarded 2011. Margaret is a Postdoctoral Fellow with Artie Sherman at the National Institutes of Health.
- Wondimu Teka, *Nonlinear Dynamics Underlying Fast Bursting in Pituitary Cells*, Biomathematics Program, FSU, awarded 2012. Wondimu is a postdoctoral fellow with Fidel Santamaria at the University of Texas, San Antonio.
- Arij Daou, *From Songs to Ion Channels and Mathematical Modeling*, Biomathematics Program, FSU, awarded 2013. Arij is a posdoctoral fellow with Dan margoliash at the University of Chicago.

# Current Graduate Students

1. Patrick Fletcher (Doctoral candidate), Biomathematics Program
2. Andrea Stathopoulos (Doctoral candidate), Neuroscience Program
3. Sevgi Sengul (Doctoral candidate), Biomathematics Program
4. Diana Flores (Doctoral candidate), Biomathematics Program
5. Daniel Weingard (Doctoral candidate), Biomathematics Program

# Current Postdoctoral Fellows and Research Associates

1. Cleyde Helena, Postdoctoral Fellow, FSU.
2. Joel Tabak, Associate Scientist/Scholar, FSU.
3. Arturo Iglesias, Assistant Scientist/Scholar, FSU.

## Past Postdoctoral Fellows and Research Associates

- Maurizio Tomaiuolo, currently a Postdoctoral Fellow at Univ. Pennsylvania.
- Patricio Velez, currently a staff scientist at a pharmaceutical company in Chile.

## Undergraduate Courses Taught

| | | |
|---|---|---|
| Calculus I | Numerical Analysis I | Math Biology Seminar |
| Calculus II | Precalculus | Differential Equations |
| Calculus III | Real Analysis | Applied Dynamical Systems |
| Business Calculus | Mathematical Modeling in Biology | |

## Graduate Courses Taught

Methods in Applied Mathematics 1
Computational Methods in Biology
Biomathematics Projects
Biomathematics Seminar
Biomathematics Journals Seminar

## Professional Affiliations

Society for Industrial and Applied Mathematics (SIAM)
Society for Mathematical Biology
Society for Neuroscience
Endocrine society
Biophysical Society