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Academic Qualifications

- **PhD. Industrial Engineering, Bioelectronics (Jan 1998-Dec 2001)**

Integrated Laboratory of Bioengineering, Technical University of Valencia, Spain.

- **MSc. Industrial Engineering, Electronics (Sept 1992- Dec 1997)**

Technical University of Valencia, Spain.

Career History

- **Senior Research Fellow (Aug 2004-)**

Computational Biology Group, Computing Laboratory, University of Oxford, UK.

- **Postdoctoral Research Fellow (May 2002-July 2004)**

Cardiac Electrophysiology Group, Biomedical Engineering Department, Tulane University, New Orleans, LA, USA.

- **Assistant Professor (April 1998-May 2002)**

Department of Electronic Engineering, Technical University of Valencia, Spain.

Teaching Biomedical Instrumentation and Electronics to Telecommunication Engineers.

PhD studies in Integrated Laboratory of Bioengineering.

Awards

- Supervisor of Martin J. Bishop, First Prize in the Student Paper Award Competition at Annual International Conference of the IEEE Engineering in Medicine and Biology, New York, USA, September 2006.
- First Prize, Young Investigators Award Competition, Heart Rhythm Society, San Francisco, USA, May 2004.
- Postdoctoral Award, Technical University of Valencia, Spain, 2002.
- Postdoctoral Award, Science and Technology Office, Generalitat Valenciana, Spain, 2002.
- PhD Fellowship, Fundación Juan Gil Albert, Alicante, Spain, 1998.
- Fellowship of the Spanish Agency of International Cooperation, 1997.

Editorial and Reviewer activities

- Associate Editor of Philosophical Transactions of the Royal Society A
- Reviewer of Circulation, Journal of Theoretical Biology, Med Biol Eng Comp, Cardiovascular Research, IEEE Transactions in Biomedical Engineering, Interface, EURASIP Journal of Applied Signal Processing, Journal of Cardiovascular Electrophysiology, Philosophical Transactions of the Royal Society, Progress in Biophysics and Molecular Biology.

Languages

Spanish	Level: Mother Tongue
English	Level: Advanced
French	Level: Advanced

Peer-reviewed Journal Publications

1. Maharaj T, **Rodríguez B**, Blake R, Trayanova N, Gavaghan D. Role of transmural heterogeneities in cardiac vulnerability to electric shocks. *Prog Biophys Mol Biol*, 2007 (accepted).
2. Arevalo H, **Rodríguez B**, Trayanova N. Arrhythmogenesis in the heart. Insights from multiscale modeling studies. *Chaos*, 2007 (in press). (Equal contribution first authors)
3. Bishop M, **Rodríguez B**, Trayanova N, Gavaghan D. Inference of intramural wavefront orientation from optical recordings in realistic whole-heart models. *Biophys J*, 91(10):3957-8, 2006.
4. **Rodríguez B**, Trayanova N, Noble D. Modeling cardiac ischemia. *Ann N Y Acad Sci*, 1080:395-414, 2006.
5. Trayanova N, Plank G, **Rodríguez B**. What have we learned from mathematical models of defibrillation and postshock arrhythmogenesis? Application to bidomain simulations. *Heart Rhythm*, Oct;3(10):1232-5, 2006.
6. Bourn DW, Maleckar MM, **Rodríguez B**, Trayanova N. Mechanistic insight into the increase in the upper limit of vulnerability for rapid pacing. *Philos Trans A Math Phys Eng*, 15:1333-48, 2006.
7. Bishop M, **Rodríguez B**, Eason J, Whiteley J, Trayanova N, Gavaghan D. Synthesis of voltage-sensitive optical signals: Application to panoramic optical mapping. *Biophys J*, 90(8):2938-2945, 2006.
8. **Rodríguez B**, Eason J, Trayanova N. Differences between left and right ventricular anatomy determine the types of reentrant circuits induced by an external electric shock. A rabbit heart simulation study. *Prog Biophys Mol Bio*, 90(1-3):399-413, 2006.
9. **Rodríguez B**, Li L, Eason J, Efimov IR, Trayanova N. Differences between LV and RV chamber geometry affect cardiac vulnerability to electric shocks. *Circ Res*, 97:168-175, 2005. (Figure in Journal Cover).
10. Trénor B, Ferrero JM Jr, **Rodríguez B**, Montilla F. Effect of pinacidil on reentrant arrhythmias generated during acute myocardial ischemia. *Ann Biom Eng* 33(7):897-906, 2005.
11. **Rodríguez B**, Tice B, Eason J, Aguel F, Trayanova N. Cardiac vulnerability to electric shocks during phase 1A of acute global ischemia. *Heart Rhythm*, 1(6):695-703, 2004 .
12. **Rodríguez B**, Tice B, Eason JC, Aguel F, Ferrero JM Jr, Trayanova N. Effect of acute global ischemia on the upper limit of vulnerability. *Am J Physiol*, 286:H2078-H2088, 2004.
13. **Rodríguez B**, Trayanova N. Upper limit of vulnerability in a defibrillation model of the rabbit ventricles. *J Electrocardiol* 36 (Suppl): 51-56, 2003.
14. Ferrero JM Jr, Trénor B, **Rodríguez B**, Sáiz J. Electrical activity and reentry during acute regional myocardial ischemia: insights from simulations. *Int J Bif Chaos*. 13:1-13, 2003.
15. **Rodríguez B**, Ferrero JM Jr, Trenor B. Mechanistic investigation of extracellular K⁺ accumulation during acute myocardial ischemia. *Am J Physiol* 283: H490-H500, 2002.

Abstracts in Journals and Conferences

16. Maharaj T, **Rodríguez B**, Blake R, Trayanova N, Gavaghan D. Role of transmural heterogeneities in cardiac vulnerability to electric shocks. *Heart Rhythm* 3(5): S225, 2006.
17. **Rodríguez B**, Tice B, Blake R, Eason J, Gavaghan D, Trayanova N. Vulnerability to electric shocks in regional ischemia. *Heart Rhythm* 3(5):S226, 2006.
18. Jie X, **Rodríguez B**, Blake R, deGroot J, Coronel R, Trayanova N. Reentry in surviving epicardium coupled to depolarized midmyocardial tissue: a simulation of arrhythmogenesis during phase 1B. *Heart Rhythm* 3(5):S267-S268, 2006.
19. Tice B, **Rodríguez B**, Trayanova N. Arrhythmogenicity of transmural heterogeneities in a realistic model of regional ischemia. *Heart Rhythm*, 2(5):S261, 2005.
20. Bishop MJ, **Rodríguez B**, Eason JC, Whiteley JP, Noble JA, Trayanova N, Gavaghan DJ. Direct optical mapping signal synthesis over a geometrically accurate ventricular model. *Heart Rhythm*, 2(5):S220, 2005.
21. **Rodríguez B**, Li L, Eason J, Efimov IR, Trayanova N. Role of ventricular anatomy in vulnerability to electric shocks. *Heart Rhythm*, 2(5):S257, 2005.
22. Maleckar MM, Bourn DW, **Rodríguez B**, Trayanova N. Mechanistic insight into the increase in the upper limit of vulnerability to electric shocks following rapid pacing. *Heart Rhythm*, 2(5):S219, 2005.
23. Trayanova N, Tice B, **Rodríguez B**. Arrhythmogenesis in regional ischemia: insights from computer simulations. *The Physiological Society Meeting*, Oxford, UK. October 2004.
24. **Rodríguez B**, Trayanova N. Modeling cardiac defibrillation under normal and ischemic conditions. *SIAM*, Portland, OR. July 2004.
25. **Rodríguez B**, Tice B, Eason J, Aguel F, Trayanova N. Cardiac vulnerability to electric shocks during phase 1A of acute global ischemia. *Heart Rhythm* 1(1):S90, 2004.
26. Tice B, **Rodríguez B**, Eason J, Aguel F, Trayanova N. Computational study of the regionally ischemic heart. *Multi-Scale Computational Modeling Workshop (UCSD)*, March 25-27, 2004.
27. **Rodríguez B**, Campbell C, Li L, Eason J, Efimov I, Trayanova N. The effect of electrode polarity on shock-induced arrhythmogenesis. *PACE* 26(4): 978, 2003.

Book chapters and Proceedings Publications

28. Lloyd S, Gavaghan D, Boyd D, Noble D, **Rodríguez B**, Maharaj T, Bishop M, Clayton R, Handley J, Brodlie K, Plank G. Integrative Biology: Real science through e-Science. *All Hands Meeting*, 2006.
29. **Rodríguez B**, Tice B, Blake R, Eason J, Gavaghan D, Trayanova N. Vulnerability to electric shocks in the regionally-ischemic ventricles. *XXVIII Conference of the IEEE EMBS, 2006*.
30. Jie X, **Rodríguez B**, Trayanova N. Role of Cellular Uncoupling in Arrhythmogenesis in Ischemia Phase 1B. *XXVIII Conference of the IEEE EMBS, 2006*.
31. Bishop MJ, **Rodríguez B**, Trayanova B, Gavaghan D. Modulation of Shock-End Virtual Electrode Polarisation As a Direct Result of 3D Fluorescent Photon Scattering. *XXVIII Conference of the IEEE EMBS, 2006*.
32. Maharaj T, **Rodríguez B**, Blake R, Trayanova N, Gavaghan D. Transmural electrophysiological heterogeneities in action potential duration increase the upper limit of vulnerability. *XXVIII Conference of the IEEE EMBS, 2006*.

33. **Rodríguez B**, Trayanova N, Gavaghan D. Role of shock timing in cardiac vulnerability to electric shocks. *APICE International Symposium on Critical Care Medicine*, Trieste (Italy), November, 2005.
34. Jie X, **Rodríguez B**, Trayanova N. The ischemic heart: what causes ectopic beating. *XXVII International Conference of the IEEE/EMBS*, 2005.
35. Trayanova N, **Rodríguez B**. Changes in rabbit heart vulnerability during phase 1A of acute global ischemia. *The 31st International Congress on Electrocardiology*, Singapore, pp. 818-826, 2004.
36. **Rodríguez B**, Tice B, Eason J, Ferrero JM Jr, Trayanova N. The effect of acute global ischemia on cardiac vulnerability to electrical shocks in a slice of the canine heart. *XXV International Conference of the IEEE/EMBS*, 2003.
37. **Rodríguez B**, Ferrero JM Jr. Mechanistic investigation of the causes of cellular K⁺ loss during acute myocardial ischemia: a simulation study. *XXVIII Computers in Cardiology*, 28, IEEE Inc., 2001.
38. **Rodríguez B**, Ferrero JM Jr. Integrated mechanisms of K⁺ loss in myocardial ischemia: a simulation study. *XXIII International Conference of the IEEE/EMBS*, 2001.
39. **Rodríguez B**, Ferrero JM Jr. Effect of Na⁺-K⁺ pump inhibition on extracellular potassium accumulation in myocardial ischemia: a simulation study. *XXVII Computers in Cardiology* 27: 315-318, IEEE Inc., 2000.
40. **Rodríguez B**, Ferrero JM Jr. Effect of Sodium Inward Current on Extracellular Potassium Accumulation during Myocardial Ischemia: a Simulation Study. *XXVI Computers in Cardiology* 26:101-103, IEEE Inc., 1999.
41. **Rodríguez B**, Ferrero JM Jr. Sodium-related mechanisms of extracellular K⁺ accumulation in myocardial ischemia: a simulation study. *Fifth Conference of the European Society for Engineering and Medicine*, 403-404, 1999.
42. **Rodríguez B**, Ferrero JM Jr, Trénor B, Ferrero-Corral JM, Sáiz J, Thakor NV. Simulation Study of the Contribution of the ATP-dependent Potassium Current to Extracellular Potassium Accumulation During Myocardial Ischemia. *XX International Conference of the IEEE/EMBS* 20:174-177, IEEE Inc., 1998.
43. Ferrero JM Jr, **Rodríguez B**, Trénor B, Torres V, Sáiz J, Ferrero JM, Thakor NV. Action Potential Duration Inhomogeneities in Acute Ischemia: Computer Simulations of Alternans and Graded Responses. *XXV Computers in Cardiology* 25:577-580, IEEE Inc., 1998.
44. **Rodríguez B**, Ferrero JM Jr, Trénor B, Ferrero JM, Thakor NV. Role of the ATP-sensitive Potassium Current in Extracellular Potassium Accumulation During Myocardial Ischemia. *XXV Computers in Cardiology*, 25: 585-587, IEEE Inc., 1998.
45. Trénor B, Ferrero JM Jr, **Rodríguez B**, Sáiz J, Ferrero JM. Simulation Study of the Effect of Pinacidil on ATP-sensitive Potassium Current and Action Potential Duration in Myocardial Tissue. *XXV Computers in Cardiology* 25:581-584, IEEE Inc., 1998.
46. Trénor B, Ferrero JM Jr, **Rodríguez B**, Sáiz J, Ferrero JM, Thakor NV. Computer Model of the Effects of Pinacidil on ATP-sensitive Potassium Current. *XIX International Conference of the IEEE/EMBS* 20:178-181, IEEE Inc., 1998.
47. **Rodríguez B**, Ferrero JM Jr, Trénor B, Ferrero JM, Sáiz J, Thakor NV. Simulación de la contribución de la I_{K(ATP)} a la acumulación extracelular de K⁺ en isquemia. *XVI Congreso Anual de la Sociedad Española de Ingeniería Biomédica*. 67-69, 1998.
48. Ferrero JM Jr, **Rodríguez B**, Trénor B, Torres V, Sáiz J, Ferrero JM. Estudio mediante simulación de las causas de los "alternantes eléctricos" en la isquemia miocárdica. *XVI Congreso Anual de la Sociedad Española de Ingeniería Biomédica*. 45-48. 1998

49. Trénor B, **Rodríguez B**, Ferrero JM Jr, Ferrero JM. Simulación de la actividad eléctrica de las células ventriculares mediante circuitos analógicos. *XV Congreso Anual de la Sociedad Española de Ingeniería Biomédica*. 203-205, 1997.

Invited lectures in International Conferences

1. Gordon Conference on "Cardiac Arrhythmias Mechanisms", Ventura, California, March 18-23 2007.
2. Workshop on Virtual Organ Modelling, Oxford, March 13-14, 2007.
3. International Workshop on Nonlinear dynamics, Ghent, Belgium, April 15-18, 2007.
4. 4th Fairberg Cardiac Workshop on "Interactive and Integrative Cardiology" Charleston, South Carolina April 23-27, 2006.