James Ernest Fonseca

Curriculum Vitae
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Contact

Department of Molecular Biophysics and Physiology
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Position

- Postdoctoral Researcher, Rush University Medical Center, May, 2008 – present
  - I am researching the selectivity and permeation properties of ion channels using reduced-model simulations in the lab of Dr. Bob Eisenberg in the Department of Molecular Biophysics and Physiology.

Education

- Ph.D., Electrical Engineering, Ohio University, June, 2008
  - Advisor: Dr. Savas Kaya, Collaborator: Dr. Bob Rakowski
  - Dissertation: "Temporal and Steric Analysis of Ionic Permeation and Binding in Na^+,K^+-ATPase *via* Molecular Dynamic Simulations"

- M.S., Electrical Engineering, Ohio University, June, 2004
  - Advisor: Dr. Savas Kaya
  - Thesis: "Accurate Treatment of Interface Roughness in Nanoscale Double-Gate Metal Oxide Semiconductor Field Effect Transistors using Non-Equilibrium Green's Functions",

- B.S., Computer Engineering, Minor in Computer Science, Virginia Tech, June, 2001

Experience

- Research Assistant, Russ College of Engineering and Technology, Ohio University 2005–2007
- Teaching Assistant, Russ College of Engineering and Technology, Ohio University 2001-2005

Awards

- Condensed Matter and Surface Science Studentship, 2007
- Ohio Supercomputer Center Major Grant (300,000 processor hours), 2006
- Mitchell Scholarship, Russ College of Engineering and Technology, 2003

Publications

- **J. E. Fonseca**, S. Mishra, S. Kaya, and R. F. Rakowski, Exploration of Na^+,K^+-ATPase ion permeation pathways *via* molecular dynamic simulation and electrostatic analysis, *J. Comp. Elec.*, **7** (1), 20-3, 2008.
- **J. E. Fonseca**, S. Kaya and R. F. Rakowski, Temporal and steric analysis of ionic permeation and binding in SERCA via molecular dynamic simulations, *Nanotechnology*, **18** (42), 424022-8, 2007.
- S. Guennoun, **J. E. Fonseca**, J. D. Horisberger, and R. F. Rakowski, Palytoxin Targets Na^+,K^+-ATPase but not non-gastric H^+,K^+-ATPase, *J. Membrane Biology*, **216** (2-3), 107-16, 2007.
- **J. Fonseca**, S. Kaya, S. Guennoun, and R. F. Rakowski, Temporal Analysis of Valence and Electrostatics in Ion-Motive Sodium Pump, *J. Comp. Elec.*, **6** (1-3), 381-5, 2007.

- R. F. Rakowski, S. Kaya and **J. E. Fonseca**, Electro-Chemical Modeling Challenges of Biological Ion Pumps, *J. Comp. Elec.*, **4** (1-2), 189-93, 2005.
- **J. Fonseca** and S. Kaya, Accurate Treatment of Interface Roughness in Nanoscale DG MOSFETs using Non-Equilibrium Green's Functions, *SSE*, **48** (1-2), 1843-7, 2004.

Presentations

- **J. Fonseca**, R. F. Rakowski, and S. Kaya, Models, Electrostatics and Molecular Dynamics of the Na^+/K^+-ATPase OCCBIO, Ohio University, June 2006.
- **J. Fonseca**, S. Kaya, and R. F. Rakowski, Modeling of Binding Sites and Electrostatics in the Ion-Motive Sodium Pump IEEE Nano, Cincinnati, OH, July 2006.
- **J. Fonseca** and S. Kaya, Accurate Treatment of Interface Roughness in Nanoscale DGMOSFETs using Non-Equilibrium Green's Functions, ISDRS, Washington, DC, Dec. 2003.

Poster Presentations

- **J. E. Fonseca**, S. Mishra, S. Kaya, and R. F. Rakowski , Exploration of Na^+,K^+-ATPase Ion Permeation Pathways via Molecular Dynamic Simulation and Electrostatic Analysis, IWCE12, University of Massachusetts , Oct. 2007, (poster presented by S. Kaya)
- **J. E. Fonseca**, R. F. Rakowski, S. Guennoun, and S. Kaya, Molecular Dynamic Simulations of Transmembrane Protein Ion Pumps, Ohio Nanotechnology Summit, Akron, OH, Apr. 2007, (poster presented by S. Kaya)
- **J. Fonseca**, R. F. Rakowski, and S. Kaya, Prediction of the location of binding sites in homology models of metal and alkaline-earth ion binding proteins, IWCE11, Wien, Austria, May 2006, (poster presented by S. Kaya).
- R. F. Rakowski, S. Kaya and **J. Fonseca**, Electro-Chemical Modeling Challenges of Biological Ion Pumps, 10th Int. Workshop of Computational Electronics, IWCE10, UIUC, Oct. 2004.
- **J. Fonseca** and S. Kaya, Simulation of Interface Roughness in DGMOSFETs Using Non-Equilibrium Green's Functions IEEE 62nd DRC, Washington, DC, June 2004.
- **J. Fonseca** and S. Kaya, Simulation of Interface Roughness in DG-MOSFETs Using Non-Equilibrium Green's Functions IEEE 34th SISC, Washington, DC, Dec. 2003
- **J. Fonseca** and S. Kaya, Accurate Treatment of Interface Roughness in Nanoscale MOSFETs Using Non-Equilibrium Green's Functions, 4th OSC Graduate Student Workshop and Conference, Ohio Supercomputer Center, Columbus, Ohio, Aug. 2003

Activities

- Attendee, International Institute for Nanotechnology Symposium, Northwestern University, Evanston, IL, Oct. 2007.
- Attendee, Gordon Research Conference – Mechanisms of Membrane Transport, Tilton School, NH, June 2007.
- Presenter, Student Research and Creative Activity Fair, Ohio University, May 2007.
- Attendee, Gordon Research Conference – Mechanisms of Membrane Transport, Tilton School, NH, June 2005.
- Attendee, 59th Annual Meeting and Symposium of the Society of General Physiologists on Na, K-ATPase and Related Cation Pumps: Structures, Mechanisms and Diseases, Woods Hole, MA, Sept. 2005.
- Presenter, Russ College of Engineering and Technology Research Fair, Ohio University, Nov. 2004.
- Attendee, Summer School on Computational Materials Science, Introduction to Computational Nanotechnology, UIUC, June 2004
- Attendee, Summer School on Computational Materials Science, Computational Approaches for Simulation of Electron Devices and MEMS, UIUC, June 2002.

Organizations

- IEEE Member (2001-present)
- Eta Kappa Nu Engineering Honor Society
- Society of Hispanic Professional Engineers
- Phi Eta Sigma Honor Society