

Curriculum Vitae
ROSSANA OCCHIPINTI, PH.D.
(updated 12/2016)

Case Western Reserve University
Department of Physiology and Biophysics
10900 Euclid Avenue
Cleveland, OH 44106-4970

phone: (216)-368-3631
email: rossana.occhipinti@case.edu

RESEARCH INTERESTS

My research focus is on developing mathematical models and computational methods, in conjunction with physiological experiments, to investigate (1) the mechanisms by which cells regulate their intracellular pH (pH_i) and by which gases (e.g., CO_2 and NH_3) move through gas channels; (2) how epithelial cells, in particular renal proximal tubule cells, reconcile the competing demands of secreting H^+ with the need to regulate their own pH_i .

My area of expertise include: mathematical modeling of physiological systems, inverse problems, numerical analysis, optimization and Bayesian statistics. I have also expertise in electrophysiological techniques as applied to *Xenopus* oocytes, including two-electrode voltage-clamp, ion-sensitive microelectrodes to record intracellular and surface pH.

EDUCATION

- **Ph.D.**, Applied Mathematics, Case Western Reserve University, Cleveland, OH. August 2009
THESIS: “In silico testing of hypotheses for brain energy metabolism with new computational models within a statistical framework.” (ADVISOR: Dr. Daniela Calvetti)
- **Laurea** (*Summa cum laude*), Mathematics, University of Catania, Catania, Italy, December 2003
THESIS: “Equazioni non lineari ellittiche ed applicazioni.” (ADVISOR: Prof. Francesco Nicolosi)

ACADEMIC APPOINTMENTS

- **08/2016-present: Instructor**, Department of Physiology and Biophysics, Case Western Reserve University, School of Medicine. (MENTOR: Dr. Walter F. Boron)
PROJECT #1: Acid secretion and intracellular pH regulation in proximal-tubule cells
PROJECT #2: Multi-scale modeling of gas transport through channels in living cells
- **07/2016-08/2016: Visiting Instructor**, Department of Physiology and Biophysics, Case Western Reserve University, School of Medicine. (MENTOR: Dr. Walter F. Boron)
PROJECT #1: Acid secretion and intracellular pH regulation in proximal-tubule cells
PROJECT #2: Multi-scale modeling of gas transport through channels in living cells
- **06/2015-06/2016: Adjunct Instructor**, Department of Physiology and Biophysics, Case Western Reserve University, School of Medicine. (MENTOR: Dr. Walter F. Boron)
PROJECT #1: Acid secretion and intracellular pH regulation in proximal-tubule cells
PROJECT #2: Multi-scale modeling of gas transport through channels in living cells
- **03/2015-05/2015: Senior Research Associate**, Department of Physiology and Biophysics, Case Western Reserve University, School of Medicine. (MENTOR: Dr. Walter F. Boron)
PROJECT: Multi-scale modeling of gas transport through channels in living cells
- **10/2009-02/2015: Postdoctoral Research Fellow**, Department of Physiology and Biophysics, Case Western Reserve University, School of Medicine. (MENTOR: Dr. Walter F. Boron)

PROJECT: Mathematical modeling of acid-base physiology in living cells

- **08/2004-08/2009: Research Assistant**, Department of Mathematics, Case Western Reserve University. (MENTOR: Dr. Daniela Calvetti).

PROJECT: Multi-compartment computational models of cellular brain metabolism in a Bayesian framework

TEACHING EXPERIENCE

- **2015: Instructor**, Department of Physiology & Biophysics, Case Western Reserve University
 - **Summer Undergraduate Research Program (SURP)**: Delivered one lecture on *Bio-mathematical Models*, 1.5 hrs
- **2008-2009: Instructor**, Department of Mathematics, Case Western Reserve University.
 - Taught one-semester undergraduate Mathematics courses, including *Calculus III for Science and Engineering Majors* and *Introduction to Linear Algebra*.
 - Responsible for developing and delivering all lectures, preparing homework assignments and exams, grading, and holding office hours.
- **2004-2009: Teaching Assistant**, Department of Mathematics, Case Western Reserve University
 - Graded homework for undergraduate Mathematics courses, including Calculus I and III for Science and Engineering Majors, Elementary Differential Equations, Introduction to Scientific Computing, Introduction to Linear Algebra, Mathematics and the Brain
 - Graded homework for graduate Mathematics courses, including Introduction to Numerical Analysis and Numerical Differential Equation

HONORS AND AWARDS

- **Travel Award** to attend the *International Council for Science (ICSU) Bio-Unions Satellite Symposium: Multi-scale Systems Biology*, Chicheley Hall, UK, July 2013
- **Travel Award** to attend the *XXXVII International Congress of Physiological Sciences (IUPS 2013)*, *International Physiological Committee* and *Council of the American Physiological Society*
- **1st Place Post-doctoral Poster Presentation**, *Annual Retreat of the Department of Physiology and Biophysics*, Case Western Reserve University, October 2012
- **Research Recognition Award**, *The American Physiological Society, Cell and Molecular Physiology Section (CaMPS)*, April 2012
- **Postdoctoral Fellowship**, *American Heart Association*, 2011-2013.
- **Scholarship and Travel Award** to attend the *National Simulation Resource's 2011 Summer School in Cardiovascular and Pulmonary Systems Modeling*, *University of Washington, Seattle, WA*, August 2011
- **Melvin H. Knisely International Award** for outstanding achievements in research on the transport of oxygen and other metabolites in the human body. *International Society on Oxygen Transport to Tissue (ISOTT)*, July 2009
- **Endowment Sponsored Mentorship Travel Award**, Case Western Reserve University, 2008

- **Travel Award** for young investigators//students with the most innovative presentations. *Gordon Research Conference on Brain Energy Metabolism and Blood Flow*, August 2008
- **Travel Award** to attend Workshop on Brain Imaging. *Mathematical Biosciences Institute at The Ohio State University, Columbus, OH*, June 2008, (NSF-MBI)
- **Travel Award** to attend Summer School on Inverse Problems in Radiative Transfer. *University of Washington, Seattle, WA*, June 2007, (FRG)
- **Travel Award** to attend Applied Inverse Problems Conference. *University of British Columbia, Vancouver, Canada, July 2007*, (NSF)
- **Graduate Assistantship**, *Center for Modeling Integrated Metabolic Systems, Case Western Reserve University*, 2004-2007. Received a graduate stipend and tuition through the NIH Grant GM-66309
- **Graduate Assistantship**, *Department of Mathematics, Case Western Reserve University*, 2004-2009. Received a stipend plus tuition to conduct thesis research and teaching assistantship

MEMBERSHIP IN PROFESSIONAL SOCIETIES

- American Society of Nephrology (ASN, 2014-present)
- American Heart Association (AHA, 2012-present)
- American Physiological Society (APS, 2011-present)
- International Society on Oxygen Transport to Tissue (ISOTT, 2009-present)
- Society for Industrial and Applied Mathematics (SIAM, 2004-present)
- Association for Women in Mathematics (AWM, 2004-2009)
- American Mathematical Society (AMS, 2004-2009)

PROFESSIONAL SERVICE

- International Union of Physiological Sciences (IUPS), Physiome and Systems Biology Committee, 2015-present
- CWRU Department of Physiology & Biophysics, Postdoctoral mentoring committee (2016-present)
- CWRU Department of Physiology & Biophysics, Retreat planning committee (2015, 2016)
- Ad hoc reviewer for *The Journal of Physiology*, *Chemical Engineering Science*

PROFESSIONAL DEVELOPMENT

- **Pre-EB Epithelial Transport Meeting for Young Researchers**
Boston Convention Center, March 2015
Attended a one day symposium focusing on the function and regulation of epithelial transporters, channels and receptors
- **Summer School in Cardiovascular and Pulmonary Systems Modeling**
University of Washington, August 2011
Attended a five day summer school focusing on mathematical models of physiological systems
- **Ohio Physiological Society Annual Meeting**
Case Western Reserve University, October 2010
Attended the Annual Meeting of the Ohio Physiological Society
- **Workshop on Brain Imaging**
Mathematical Biosciences Institute at the Ohio State University, June 2008

Participated in a five day multi-disciplinary workshop focusing on the mathematical, physiological and medical aspects of different brain imaging modalities

- **Summer School on Inverse Problems in Radiative Transfer**

University of Washington, June 2007

Attended a five day summer school focusing on theoretical and applied aspects of the inverse problems in optical tomography and optical molecular imaging

- **Statistical and Numerical Methods for Inverse Problems Workshop**

University of Bologna, July 2005

Attended a summer school pertaining to integrated numerical and statistical methods for inverse problems with applications in image processing

- **MIMS Summer Workshop on Modeling Metabolic Dynamics**

Case Western Reserve University, MIMS Center, June 2004

Attended a five day multi-disciplinary workshop focusing on mathematical modeling of metabolic systems

PUBLICATIONS

* Authors in alphabetical order for equal contribution

** Occhipinti corresponding author

RESEARCH ARTICLES

- Hu, H., Rappel, W.J., **Occhipinti, R.**, Ries, A. Bohmer, M. You, L., Xiao, C., Engineer, C.B., Boron, W.F., & Schroeder, J.I. (2015) Distinct cellular locations of carbonic anhydrases mediate CO₂ control of stomatal movements *Plant Physiol*, 169(2):1168-78.
- Musa-Aziz, R., **Occhipinti, R.** & Boron, W.F. (2014) Evidence from simultaneous intracellular- and surface-pH transients that Carbonic Anhydrase II enhances CO₂ fluxes across *Xenopus* oocytes plasma membranes. *Am J Physiol Cell Physiol*, 307(9):C791-813.
 - **Highlighted in Editorial Focus of Am J Physiol Cell Physiol:** “How carbonic anhydrases and pH buffers facilitate the movement of carbon dioxide through biological membranes” by E. Delpire, 307(9):C788-90.
 - **Featured in APS-Select, December 2014**
 - **Nominated for Paper of the Year 2014 in AJP-Cell.**
- Musa-Aziz, R., **Occhipinti, R.** & Boron, W.F. (2014) Evidence from simultaneous intracellular- and surface-pH transients that Carbonic Anhydrase IV enhances CO₂ fluxes across *Xenopus* oocytes plasma membranes. *Am J Physiol Cell Physiol*, 307(9):C814-40.
 - **Highlighted in Editorial Focus of Am J Physiol Cell Physiol:** “How carbonic anhydrases and pH buffers facilitate the movement of carbon dioxide through biological membranes” by E. Delpire, 307(9):C788-90.
 - **Nominated for Paper of the Year 2014 in AJP-Cell.**
- **Occhipinti, R.****, Musa-Aziz, R. & Boron, W.F. (2014) Evidence from mathematical modeling that Carbonic Anhydrase II and IV enhance CO₂ fluxes across *Xenopus* oocytes plasma membranes. *Am J Physiol Cell Physiol*, 307(9):C841-58.
 - **Highlighted in Editorial Focus of Am J Physiol Cell Physiol:** “How carbonic anhydrases and pH buffers facilitate the movement of carbon dioxide through biological membranes” by E. Delpire, 307(9):C788-90.
 - **Nominated for Paper of the Year 2014 in AJP-Cell.**
- Somersalo, E., **Occhipinti, R.****, Boron, W. F. & Calvetti, D. (2012). A reaction-diffusion model of CO₂ influx into an oocyte. *J Theor Biol*, 309:185-203.

- **Occhipinti, R.**, Somersalo, E. & Calvetti, D. (2011). Interpretation of NMR spectroscopy human brain data with a multi-compartment computational model of cerebral metabolism. *Adv Exp Med Biol*, 701:249-54.
- **Occhipinti, R.**, Somersalo, E. & Calvetti, D. (2010). Energetics of inhibition: insights with a computational model of the human GABAergic neuron-astrocyte cellular complex. *J Cereb Blood Flow Metab*, 30(11), 1834-46.
- **Occhipinti, R.**, Somersalo, E. & Calvetti, D. (2009). Astrocytes as the glucose shunt for glutamatergic neurons at high activity: an in silico study. *J Neurophysiol*, 101(5), 2528-38.
- Calvetti, D., Hageman, R., **Occhipinti, R.*** & Somersalo, E. (2008). Sensitivity analysis and stability of a three-compartment model for cardiac metabolism. *Math Biosci*, 212 (1), 1-21.
- **Occhipinti, R.**, Puchowicz, M.A., LaManna, J.C., Somersalo, E. & Calvetti, D. (2007). Statistical analysis of metabolic pathways of brain metabolism at steady state. *Ann Biomed Eng*, 35(6), 886-902.

MANUSCRIPTS IN PROGRESS

- Guo, Y.M., Liu, Y., Liu, M., Wang, J.L., Xie, Z.D., Chen, K.J., **Occhipinti, R.**, Boron, W.F., Chen, L.M. NBCn2 is a novel pathway for HCO_3^- reclamation in the apical membrane of renal proximal tubules (2016, submitted).
- Monzon, C.M., **Occhipinti, R.**, Pignataro O.P., Garvin J.L. Nitric oxide reduces paracellular resistance in rat thick ascending limbs by increasing Na and Cl permeabilities (2016, submitted).
- Lee, S.K., Grichtchenko, I. I., Moss, F. J., Parker, M. D., **Occhipinti, R.** & Boron, W.F. Distinguishing HCO_3^- from $\text{CO}_3^{=}$ transport by SLC4 family members (manuscript).

REVIEWS

- Cooper, G.J., **Occhipinti, R.** & Boron, W.F. (2015) CrossTalk proposal: Physiological CO_2 exchange can depend on membrane channels. *J. Physiol.* 593(23):5025-8. doi: 10.1113/JP270059. (invited).
- Cooper, G.J., **Occhipinti, R.** & Boron, W.F. (2015) Rebuttal from Gordon J. Cooper, Rossana Occhipinti and Walter F. Boron. *J. Physiol.* 593(23):5033. doi: 10.1113/JP271239. (invited).
- **Occhipinti, R.**** & Boron, W.F. (2015) Mathematical modeling of acid-base physiology. *Progr Biophys Mol Biol.* 117 (1):43-58. (invited, **Recommended by F1000**).

REFEREED CONFERENCE PROCEEDINGS

- Calvetti, D., **Occhipinti, R.*** & Somersalo, E. (2008). The inverse problem of brain energetics: ketone bodies as alternative substrates. *Journal of Physics: Conference Series*, 124 012013.

CONFERENCE PROCEEDINGS

- Calvetti, D., Hageman, R., **Occhipinti, R.*** & Somersalo, E. (2005). Large-scale statistical parameter estimation during circulatory occlusion. *International Conference on Computational and Mathematical Methods in Science and Engineering (CMMSE) proceedings*, 2005.
- Calvetti, D., Hageman, R., **Occhipinti, R.*** & Somersalo, E. (2005). Large-scale statistical estimation of metabolic parameters at steady-state. *International Conference on Computational and Mathematical Methods in Science and Engineering (CMMSE) proceedings*, 2005.

PUBLISHED ABSTRACTS

- **Occhipinti, R.**, Calvetti, D., Boron, W.F. & Somersalo, E. (2016) Mathematical modeling of the microenvironment beneath a surface pH electrode tip. *FASEB J*, 30 (1):1300.1.

- **Occhipinti, R.** Lu, J & Boron, W. F. (2016) Is the electrogenic Na/HCO₃ cotransporter a CO₂ channel? *FASEB J*, 30 (1):971.2.
- **Occhipinti, R.**, Zhao, P., Lu, J., Salameh, A. I., Moss, F. J. & Boron, W.F. (2015). Gas channels. Undersea & Hyperbaric Medicine Society Scientific Meeting in conjunction with The Office of Naval Research, Buffalo, NY, August 4-6, 2015.
- **Occhipinti, R.** & Boron, W. F. (2015) NH₃ permeability versus CO₂ Permeability: Insights from mathematical modeling. *FASEB J*, 29 (1), 668.3.
- **Occhipinti, R.**, Kabutomori J., Boron, W.F. & Musa-Aziz, R. (2014) Effect of varying electrode tip diameter on extracellular surface-pH (pH_s) changes caused by CO₂ fluxes across an oocyte plasma membrane. *J Am Soc of Nephrol*, 25, 382A.
- Geyer, R.R., **Occhipinti, R.**, Zhao, P., Musa-Aziz R. & Boron, W.F. Gas transport through channels. Undersea Medicine Review, Durham, NC, July 15-17, 2014.
- **Occhipinti, R.**, Lee, S.K. & Boron, W. F. (2013) Mathematical modeling of bicarbonate versus carbonate transport by the electrogenic Na⁺/HCO₃⁻ cotransporter. IUPS 2013, 543P.
- Boron, W.F., Qin, X., **Occhipinti, R.**, Musa-Aziz, R. & Geyer, R. R. (2012) Gas Channels. International Conference of Physiological Sciences, Suzhou, China, November 1-4, 2012.
- Geyer, R.R., **Occhipinti, R.**, Musa-Aziz, R., Qin, X. & Boron, W. F. (2012) Gas Channels. Undersea & Hyperbaric Medicine Society Scientific Meeting in conjunction with The Office of Naval Research, Philadelphia, PA, August 7-9, 2012.
- **Occhipinti, R.**, Musa-Aziz, R. & Boron, W.F. (2012). Mathematical modeling of the role of carbonic anhydrase II and IV on the influx of CO₂ in a *Xenopus* oocyte. *FASEB J*, 26, 882.9.
- Somersalo, E., **Occhipinti, R.**, Boron, W.F. & Calvetti, D. (2011). A reaction-diffusion model of acid-base balance in a *Xenopus* oocyte. *FASEB J*, 25, 1129.4.
- **Occhipinti, R.**, Musa-Aziz, R., Calvetti, D., Somersalo, E. & Boron, W.F. (2011). Effects of intracellular and extracellular carbonic anhydrase on the influx of CO₂ in a *Xenopus* oocyte: insights with a mathematical model. *FASEB J*, 25, 1039.25.
- **Occhipinti, R.**, Somersalo, E. & Calvetti, D. (2009). In silico study of lactate metabolism in brain during visual stimulation. *FASEB J*, 23, LB113.
- **Occhipinti, R.**, Puchowicz, M.A., LaManna, J.C., Somersalo, E. & Calvetti, D. (2007) Brain energy metabolism: hypotheses testing with a new computational model. Program No. 753.16 2007 Neuroscience Meeting Planner. San Diego, CA: Society for Neuroscience, 2007. Online.

PRESENTATIONS

ORAL

- *Mathematical modeling of acid-base physiology*
Seminar, Department of Physiology & Biophysics, Case Western Reserve University, Cleveland, OH, March 2016
- *Mathematical modeling of bicarbonate versus carbonate transport by the electrogenic Na⁺/HCO₃⁻ cotransporter*
12th Annual Department Retreat, Department of Physiology & Biophysics, Case Western Reserve University, Huron, OH, October 2013
- *Mathematical modeling of CO₂ influx in an oocyte*
Friday Seminar Series, Department of Physiology & Biophysics, Case Western Reserve University, Cleveland, OH, February 2013
- *Mathematical modeling of gas movements in an oocyte*
Gas Channels Workshop, Cleveland, OH, September 2012

- *Effects of carbonic anhydrase II and IV on the influx of CO₂ in a Xenopus oocyte*
Summer School in Cardiovascular and Pulmonary Systems Modeling, Seattle, WA, August 2011
- *Interpretation of NMR spectroscopy human brain data with multi-compartment computational model of cerebral metabolism*
ISOTT 2009 (Annual Meeting of International Society on Oxygen Transport to Tissue), Cleveland, OH, July 2009
- *The inverse problem of brain energetics under different metabolic conditions*, Invited talk
Inverse Days 2007, (Annual Meeting of the Finnish Inverse Problems Society), Lappeenranta, Finland, December 2007
- *Bayesian Model Selection for Brain Metabolism*, Mini-symposium presentation
Applied Inverse Problems 2007, Vancouver, Canada, June 2007

POSTERS

- Occhipinti, R., Calvetti, D., Boron, W.F. & Somersalo, E.: *Mathematical modeling of the microenvironment beneath a surface pH electrode tip*
Experimental Biology 2016, San Diego, CA, April 2016
- Occhipinti, R. Lu, J & Boron, W. F. Is the electrogenic Na/HCO₃ cotransporter a CO₂ channel?
Experimental Biology 2016, San Diego, CA, April 2016
- Occhipinti, R., Calvetti, D., Somersalo, E. & Boron, W.F.: *Modeling of the microenvironment around a pH electrode tip*
IMAG, 2015 Multiscale Modeling Consortium Meeting, Bethesda, MD, September 2015
- Calvetti, D., Callahan, M., Occhipinti, R., Boron, W.F. & Somersalo, E.: *Multi-scale inverse problems: Beyond the modeling limit*
IMAG, 2015 Multiscale Modeling Consortium Meeting, Bethesda, MD, September 2015
- Occhipinti, R. & Boron, W. F.: *NH₃ permeability versus CO₂ Permeability: Insights from mathematical modeling*
Experimental Biology 2015, Boston, MA, March 2015
- Occhipinti, R., Lee, S.K. & Boron, W. F.: *Mathematical modeling of bicarbonate versus carbonate transport by the electrogenic Na⁺/HCO₃⁻ cotransporter*
H⁺ SSS: H⁺ Ion Sensing, Signaling and Servo-control, University of Oxford, Oxford, UK, July 2013
- Occhipinti, R., Lee, S.K. & Boron, W. F.: *Mathematical modeling of bicarbonate versus carbonate transport by the electrogenic Na⁺/HCO₃⁻ cotransporter*
IUPS 2013, Birmingham, UK, July 2013
- Occhipinti, R., Lee, S.K. & Boron, W. F.: *Distinguishing Bicarbonate versus Carbonate Transport by NBCe1: A Mathematical Modeling Approach*
11th Annual Retreat, Department of Physiology and Biophysics, CWRU Cleveland, OH, October 2012
- Occhipinti, R., Lee, S.K. & Boron, W. F.: *Distinguishing bicarbonate versus carbonate transport by NBCe1*
Gordon Research Conference on Brain Energy Metabolism and Blood Flow, Proctor Academy, Andover, NH, August 2012
- Occhipinti, R., Musa-Aziz, R. & Boron, W. F.: *Mathematical modeling of the role of carbonic anhydrase II and IV on the influx of CO₂ in a Xenopus oocyte*
Experimental Biology 2012, San Diego, CA, April 2012
- Occhipinti, R., Musa-Aziz, R. & Boron, W. F.: *Effects of intracellular and extracellular carbonic anhydrase on the influx of CO₂ in a Xenopus oocyte: insights with a mathematical model*
10th Annual Retreat, Department of Physiology and Biophysics, CWRU, Geneva, OH, November 2011

- Occhipinti, R., Musa-Aziz, R., Calvetti, D., Somersalo, E. & Boron, W. F.: *Effects of intracellular and extracellular carbonic anhydrase on the influx of CO₂ in a Xenopus oocyte: insights with a mathematical model*
Experimental Biology 2011, Washington, DC, April 2011
- Somersalo, E., Occhipinti, R., Boron, W. F. & Calvetti, D.: *A reaction-diffusion model of acid-base balance in a Xenopus oocyte*
Experimental Biology 2011, Washington, DC, April 2011
- Occhipinti, R., Boron, W. F., Calvetti, D. & Somersalo, E.: *Mathematical modeling of the effects of CO₂ influx in a Xenopus oocyte*
9th Annual Retreat, Department of Physiology and Biophysics, CWRU Cleveland, OH, October 2010
- Occhipinti, R., Somersalo, E. & Calvetti, D.: *In silico study of lactate metabolism in brain during visual stimulation*
Experimental Biology 2009, New Orleans, LA, April 2009
- Occhipinti, R., Somersalo, E. & Calvetti, D.: *In silico study of metabolic interactions between glutamatergic neuron and astrocyte at different levels of neuronal activity*
Gordon Research Conference on Brain Energy Metabolism and Blood Flow, Proctor Academy, Andover, NH, August 2008
- Calvetti, D., Occhipinti, R. & Somersalo, E.: *Energetics of inhibition: insights with a computational model of the GABAergic neuron-astrocyte cellular complex*
Gordon Research Conference on Brain Energy Metabolism and Blood Flow, Proctor Academy, Andover, NH, August 2008
- Occhipinti, R., Somersalo, E. & Calvetti, D.: *A Seven Compartment Computational Model of Brain Energy Metabolism*
Research Showcase: Case Western Reserve University, Cleveland, OH, April 2008
- Occhipinti, R., Puchowicz, M. A., LaManna, J. C., Somersalo, E. & Calvetti, D.: *Brain Energy Metabolism: hypotheses testing with a new computational model*
Neuroscience 2007 Annual Meeting, San Diego, CA, November 2007
- Occhipinti, R., Puchowicz, M. A., LaManna, J. C., Somersalo, E. & Calvetti, D.: *Bayesian Analysis of Different Brain Energetic Hypotheses*
Research Showcase: Case Western Reserve University, Cleveland, OH, April 2007
- Occhipinti, R., Puchowicz, M. A., LaManna, J. C., Somersalo, E. & Calvetti, D.: *Flux Estimation for Brain Metabolism in Steady State*
Biomedical Engineering Society Annual Meeting, Chicago, IL, October 2006
- Calvetti, D., Hageman, R., Occhipinti, R. & Somersalo, E.: *Large scale statistical parameter estimation and stability analysis for complex systems with an application to metabolic models*
Research Showcase: Case Western Reserve University, Cleveland, OH, April 2005

RESEARCH SUPPORT

ONGOING

- **National Institute of Diabetes and Digestive and Kidney Diseases (NIDDK)** to Rossana Occhipinti
Title: *Acid secretion and intracellular pH regulation in proximal-tubule cells*
The major goal is to facilitate the mentored transition of Dr. Rossana Occhipinti to an independent investigator, capable of combining in-silico (i.e., using computer) and in-vitro experiments in the field of multi-scale modeling of kidney acid-base physiology.
1K01 DK107787-01 (September 18th, 2015-August 31st, 2020)
Role: PI

COMPLETED

- **National Institute of General Medical Sciences (NIGMS)** to Walter F. Boron, Erkki J. Somersalo & Emad Tajkhorshid
Title: *Multi-scale modeling of gas transport through channels in living cells*
The long-term objective is to develop a multi-scale mathematical model to study the mechanisms of gas permeation in normal and pathological states.
1U01 GM111251-01 (January 2015-December 2019)
Role: Key Personnel (January 2015-September 2015)
- **American Heart Association (AHA)** to Rossana Occhipinti
Title: *Three-dimensional mathematical modeling of sodium-coupled "bicarbonate" transport*
The goal of this study is to develop a mathematical model of a *Xenopus* oocyte to investigate the consequences of bicarbonate vs carbonate transport by the electrogenic sodium-bicarbonate cotransporter (NBCe1-A) and the role of the carbonic anhydrase (CA) enzymes on the speed of this transporter.
11POST7670015 (July 2011- June 2013)
Role: PI