

## **K. MELISSA HALLOW, Ph.D.**

610D Driftmier Engineering Center,  
Phone: 404-668-7168 • Email: hallowkm@uga.edu

### **EDUCATION:**

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- 2007 Ph.D. Georgia Institute of Technology**  
School of Mechanical Engineering, Bioengineering Program  
**Major Area:** Biomechanics **Minor Area:** Systems Modeling
- Advisor:** Raymond P. Vito  
**Dissertation Title:** Relationship between Mechanical Stress and Markers of Inflammation in Diseased Human Coronary Arteries
- 2002 B.S. Georgia Institute of Technology**  
Major: Mechanical Engineering  
Graduated with Highest Honors

### **PROFESSIONAL EXPERIENCE:**

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- 2014 – present University of Georgia, Assistant Professor**  
Joint appointment in College of Engineering and College of Public Health, Department of Epidemiology and Biostatistics
- 2009-14 Novartis Pharmaceutical Corp, Senior Principal Scientist**  
*Advanced Quantitative Sciences (AQS) Department, within Global Development*
- 2007-9 Lehigh University, Postdoctoral Research Associate**  
*Bioengineering Program*  
*Field of Research: Mechanobiology and Inflammatory Mechanisms in Ventilator Induced Lung Injury*
- 2002-7 Georgia Institute of Technology, Graduate Research Assistant**  
*School of Mechanical Engineering*  
*Field of Research: Mechanobiology and Inflammatory Mechanisms in Atherosclerosis*
- 2000 NASA Kennedy Space Center, Student Intern**  
*Environmental Control Systems Group*
- 1999 Georgia Tech Research Institute, Student Intern**  
*Sensors and Electronics Applications Laboratory, Air and Missile Defense Division*
- Developed Matlab-based GUI-driven software tool to calculate output parameters for phased-array radar

### **TEACHING EXPERIENCE:**

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- 2009 Instructor of Mechanical Engineering, Lehigh University**
- Independently taught sophomore-level Strength of Materials course

**2006 Teaching Practicum Participant, Georgia Institute of Technology**  
*Woodruff School of Mechanical Engineering*

**2001-2 United Technologies Teaching Intern Program, Georgia Institute of Technology**  
*Woodruff School of Mechanical Engineering*

**2000-2 Teaching Assistant, Georgia Institute of Technology**  
*School of Mathematics*

## **AWARDS/HONORS:**

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Novartis Bravo Award, 2013  
American Thoracic Society International Meeting, Trainee Travel Award, 2009  
Georgia Tech Presidential Fellowship, Georgia Institute of Technology, 2002-2006  
Woodruff Graduate Fellowship, Georgia Institute of Technology, 2002-2006

## **PUBLICATIONS/PRESENTATIONS:**

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### ***Journal Articles and Book Chapters:***

1. Hallow KM, Lo A, Beh J, Rodrigo M, Ermakov S, Friedman S, de Leon H, Sarkar A, Xiong Y, Sarangapani R, Schmidt H, Webb R, Kondic A. A model-based approach to investigating the pathophysiological mechanisms of hypertension and response to antihypertensive therapies: Extending the Guyton model. *Am J Physiol Reg Integr Comp Physiol*, Epub ahead of print, 2014
2. Lo A, Beh J, de Leon H, Hallow KM, Ramakrishna R, Rodrigo M, Sarkar A, Sarangapani S, Georgieva A. Using Systems Biology Approach to Explore Hypotheses Underlying Diversity of the Renin Angiotensin System and the Response to Antihypertensive Therapies. In *Clinical Trial Simulations*, edited by C. Peck and H. Kimko, Springer, 2010.
3. Yalcin HC\* and Hallow KM\* (co-first authors), Ou-Yang HD, Ghadiali SN. Effect of cytoskeletal mechanics and structure on epithelial cell injury during airway reopening. *Am J Physiol Lung Cell Mol Physiol*, 297(5):L881-91, 2009.
4. Hallow KM, Taylor WR, Rachev A, Vito RP. Markers of inflammation collocate with increased wall stress in human coronary arterial plaque. *Biomech Mod Mechanobiol*. 8(6):473-486, 2009.
5. Wei MT, Zaorski A, Huseyin CY, Wang J, Hallow KM, Ghadiali SN, Chiou A, Ou-Yang HD. A comparative study of living cell micromechanical properties by oscillatory optical tweezers. *Optics Express*, 16(12):8594-8603, 2008.

### ***Conference Proceedings, Abstracts, and Presentations:***

6. Hallow KM, Sarkar A, Xiong Y, Soubret A, Webb R, Sarangapani S, Georgieva A. A systems modeling approach to understanding the mechanisms of renal effects of the direct renin inhibitor aliskiren. American Society of Clinical Pharmacology and Therapeutics Annual Meeting, Mar 17, 2012.
7. Xiong Y, James DA, Soubret A, Sarangapani R, Georgieva A, Webb R, Hallow M. A systems modeling approach to understanding the mechanisms of salt sensitivity in essential hypertensive patients and the effect on blood pressure response to antihypertensive agents. American Society of Clinical Pharmacology and Therapeutics Annual Meeting, Mar 16, 2012.
8. Hallow KM, Lo A, Beh J, Rodrigo M, Ermakov S, Sarkar A, Sarangapani R, Schmidt H, Kondic A. The Cardiovascular-Renal Simulator (CVR-sim): a large-scale mechanistic model for evaluating the effects of antihypertensive agents on chronic heart failure. American Conference on Pharmacometrics, Podium presentation. San Deigo, CA. 2011.
9. Hallow KM, Sarkar A, Sarangapani R, Georgieva A, Beh J, Ermakov S, de Leon H, Rodrigo M, Lo A. A systems modeling approach to understanding the mechanisms of renal protection observed in the AVOID study. European Society of Hypertension Annual Meeting. Oslo, Norway, 2010.

10. Sarkar A, Hallow KM, Soubret A, Helmlinger G, Sarangapani R, Ermakov S, Lo A, Rodrigo M, Beh J, de Leon H, Georgieva A. Multiscale disease model of heart failure and renal disease with therapeutic application in drug R&D. Biomedical Engineering Society Annual Meeting 2010, Austin, Texas.
11. Hallow KM, Beh J, de Leon H, Ermakov S, Friedman S, Georgieva A, Helmlinger G, Lo A, Ramakrishna R, Rodrigo M, Sarangapani R, Sarkar A, Stankski D, Trimmer J. Local generation of AngI and AngII in the kidney does not contribute to systemic peptide levels in a dynamic model of systemic and tissue renin-angiotensin system (RAAS) kinetics. American Association of Pharmaceutical Scientists, Annual Meeting, Los Angeles, CA 2009.
12. Sarkar A, Hallow KM, Helmlinger G, Ramakrishna R, Sarangapani S, Georgieva A, Lo A, de Leon H, Trimmer J, Rodrigo M, Beh J, Friedman S, Ermakov S. Disease modeling and its applications in model-based drug R&D: the example of an integrated model of hypertension, renal disease progression, and therapeutic modulation of the renin-angiotensin-aldosterone (RAAS). InnovationWell 2009 Interaction Meeting, Bryn Mawr College, Bryn Mawr, PA. Oct 2009.
13. Hallow KM, Ghadiali SN. Simvastatin treatment mitigates lung Epithelial Cell Injury During Cyclic Airway Reopening in Vitro. American Thoracic Society International Conference, San Diego, CA. 2009
14. Hallow KM, Dailey HL, Ghadiali SN. Influence of Methyl- $\beta$ -Cyclodextrin on epithelial cell injury and mechanotransduction during airway reopening. American Thoracic Society International Conference, San Diego, CA. 2009
15. Natalini J, Hallow KM, Ghadiali SN. Effect of fluid shear stress and microbubble flows on surfactant secretion from alveolar epithelial cells. American Thoracic Society International Conference, San Diego, CA. 2009
16. Hallow KM, Ghadiali SN. Mechanobiology of lung epithelial cells during airway reopening. Biomedical Engineering Society Annual Meeting, St. Louis, MO, Podium Presentation, October 2008.
17. Ghadiali SN, Hallow KM, Dailey HL. Influence of power-law rheology and membrane mechanics on Cell Injury During Airway Reopening. Biomedical Engineering Society Annual Meeting, St. Louis, MO. Podium Presentation, October 2008
18. Hallow KM, Ghadiali SN. Effect of cytoskeletal structure and mechanics on epithelial cell adhesion during airway reopening. ASME Summer Bioengineering Conference, Keystone, CO, Podium Presentation, June 2008.
19. Ghadiali SN, Hallow KM, Yalcin HC, Dailey HL, Wang J, Ou-Yang HD. Effect of cytoskeletal structure and mechanics on epithelial cell injury during cyclic airway reopening. American Thoracic Society International Conference, Toronto, CAN, Poster Presentation, May 2008.
20. Ghadiali, SN, Dailey, HL, Yalcin, HC, Hallow, KM, Wang, J, Ou-Yang, HD, Mechanical and Biological Response of Lung Epithelial Cells to Microbubble Flows, 5th International Bio-Fluid Symposium and Workshop, California Institute of Technology, Podium Presentation, 2008.
21. Hallow KM, Carnell PW, Taylor WR, Vito RP. Collocation of macrophages and mechanical stress in human coronary atherosclerotic plaque. Proceedings of the ASME 2007 Summer Bioengineering Conference, Podium Presentation, June 2007.
22. Hallow KM, Carnell PW, Taylor WR, Vito RP. Correlation of inflammation and mechanical stress in human coronary atherosclerotic plaque. Biomedical Engineering Society Annual Meeting, Poster Presentation, October 2006.

***Additional Presentations:***

23. Hallow KM, Ramakrishna P, Mendonza A, Bachman E, Li L. Advanced quantitative analysis to support development decisions for LIK066 and the potential for differentiation from existing compounds. Novartis Global Development Science and Innovation Day, Basel, Switzerland, October 2013
24. Li L, Mendonza A, Ramakrishna P, Sunkara G, Bachman E, Hallow KM. Model – based strategy to optimize development of anti-diabetic agent LIK066. Novartis Global Development Science and Innovation Day, Basel, Switzerland, October 2013
25. Hallow KM. Cardiovascular Renal Simulator (CVR-sim): an integrative physiological model to support CV drug development. American Society of Pharmacometrics, New Jersey local meeting, February 2, 2012.

26. Hallow KM. Cardiovascular Renal Simulator: a large scale mechanistic model for evaluating the effects of antihypertensive agents on chronic heart failure. NYU Biomathematics/Computational Biology Colloquium, invited speaker, Dec 6, 2011.
27. Hallow KM, Georgieva A, Soubret A, Sarkar A, Xiong Y, Helmlinger G, Sarangapani R, Webb R.. Simulating Renal Outcomes for Aliskiren with the Cardiovascular-Renal Simulator (CVR-sim) Platform. Novartis internal white paper, Aug 2011, didacted version available upon request.
28. Hallow KM, Taylor WR, Vito RP. Mechanics and Inflammation in cardiovascular and pulmonary pathologies, Temple University School of Mechanical Engineering, Mar 26, 2009, invited speaker.
29. Hallow KM, Carnell PW, Taylor WR, Vito RP. Collocation of inflammation and mechanical stress in human coronary atherosclerotic plaque. Georgia Tech /Emory Center for the Engineering of Living Tissues (GTEC) Educational Partners Symposium, October 2006.
30. Hallow KM, Carnell PW, Taylor WR, Vito RP. Quantification of arterial plaque microstructure for development of finite element models. Atlanta Chapter of the American Society of Metals, International – invited technical talk, November 2006.