

# JOHN S. CLEMMER

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University of Mississippi Medical Center  
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## EDUCATION

**PhD, Physiology & Biophysics.** University of Mississippi Medical Center, Jackson, MS (2010-2015)

**Master of Science, Physiology & Biophysics.** University of Mississippi Medical Center, Jackson, MS (2010-2012), GPA 3.83/4.0

**Master of Science, Biological Engineering.** Mississippi State University, Mississippi State, MS (2008-2010), GPA 4.0/4.0

**Bachelor of Science, Biological Engineering.** Mississippi State University, Mississippi State, MS (2004-2008), GPA 3.62/4.0

## EMPLOYMENT

2017 – present      **Instructor** – Center for Computational Medicine. Physiology and Biophysics Department. University of Mississippi Medical Center

2015 – 2017      **Post-doctoral Research Fellow** – Center for Computational Medicine. Physiology and Biophysics Department. University of Mississippi Medical Center

2015 – 2016      **Adjunct Professor** –William Carey University Graduate School (Medical Physiology I & II)

2008 – 2010      **Graduate Assistant** – Biological Engineering Department, Mississippi State University

2007 – 2008      **Chemistry Lab Technician** – Biofuel/Biochemistry Laboratory, Mississippi State University

2006 – 2007      **Health Center Technician** – Longest Health Center, Mississippi State University

## PROFESSIONAL SOCIETY MEMBERSHIPS

- American Heart Association (AHA) (2011 - present)
- American Physiological Society (APS) (2011 - present)
- Biomedical Engineering Society (BMES) (2008 - present)
- Society for Experimental Biology and Medicine (SEBM) (2013 - 2016)
- Microcirculatory Society (MCS) (2011 - 2015)
- Institute of Biological Engineering (IBE) (2004 - 2010)

## HONORS/AWARDS

- American Heart Association Postdoctoral Fellowship Grant, AHA-17POST33661071 (2017-2019)
- T32 Postdoctoral Training Grant (Granger, PI) (2016-2017)

- American Heart Association Predoctoral Fellowship Grant, AHA-14PRE20380069 (2014-2016)
- International Academy of Cardiovascular Sciences Travel Award (2015)
- Regions Outstanding Graduate Research Award (2015)
- Selected for Featured Topic Oral Presentation: Recent Advances in Obesity Research, American Physiological Society (2015)
- Young Investigator Award, Society for Experimental Biology and Medicine (2014)
- Caroline tum Suden/Hellebrandt Professional Award, American Physiological Society (2014)
- Benjamin Zweifach Student Travel Award, Microcirculatory Society (2012)
- T32 Predoctoral Training Grant (Granger, PI) (2010-2014)
- Dean's Scholarship, University of Mississippi Medical Center (2010-2015)
- President's Scholar, Mississippi State University (2006-2007)
- Dean's List Scholar, Mississippi State University (2005-2006)
- ACT Scholarship, Mississippi State University (2004-2008)

## JOURNAL PUBLICATIONS

1. **Clemmer JS**, Pruett WA, Hester RL, Lohmeier TE. Preeminent Role of the Cardiorenal Axis in the Antihypertensive Response to an Arteriovenous Fistula: An *In Silico* Analysis. Hypertension. *Submitted*, 2019.
2. **Clemmer JS**, Faulkner JL, Mullen AJ, Butler KR, Hester RL. Sex-specific responses to mineralocorticoid receptor antagonism in hypertensive African American males and females. *Biol Sex Differ*. 10(1): 24, 2019.
3. Xiang L, Thompson MS, **Clemmer JS**, Mittwede PN, Khan T, Hester RL. Early treatment with GLP-1 following severe trauma preserves renal function in obese Zucker rats. *Am J Physiol Regul Integr Comp Physiol*. 316(5): R621-627, 2019.
4. **Clemmer JS**, Pruett WA, Hester RL, Iliescu R, Lohmeier TE. Role of the heart in blood pressure lowering during chronic baroreflex activation: Insight from an in silico analysis. *Am J Physiol Heart Circ Physiol* 315 (5): H1368–H1382, 2018.
5. **Clemmer JS**, Hester RL, Pruett WA. Simulating a virtual population's sensitivity to salt and uninephrectomy. *Interface Focus*. 8 (1), 2018.
6. Blair ET, **Clemmer JS**, Harkey HL, Hester RL, Pruett WA. Physiological mechanisms of water and electrolyte disturbances following transsphenoidal pituitary surgery. *World Neurosurg*. 107: 429-436, 2017.
7. **Clemmer JS**, Pruett WA, Butler K, Hester R. The use of complex clinical data and topological data analysis for personalized medicine. *Biomed Sci Instrum Symposium*. 512: ISA, 2017.
8. **Clemmer JS**, Pruett WA, Coleman T, Hall J, Hester R. Mechanisms of blood pressure salt sensitivity: New insights from mathematical modeling. *Am J Physiol Regul Integr Comp Physiol*. 312 (4): R451-466, 2017.
9. Pruett WA, **Clemmer JS**, Hester R. Validation of an integrative mathematical model of dehydration and rehydration in virtual humans. *Physiological Reports*. 4 (22): e13015, 2016
10. **Clemmer JS**, Xiang L, Lu S, Mittwede P, Hester R. Hyperglycemia-mediated oxidative stress increases pulmonary vascular permeability. *Microcirculation*. 23(3):221-9,2016.

11. Mittwede P, **Clemmer JS**, Bergin P, Xiang L. Obesity and critical illness: insights from animal models. *Shock*. 45 (4):349-58, 2016.
12. **Clemmer J**, Prabhu R, Chen J, Colebeck E, Priddy L, McCollum M, Brazile B, Whittington W, Wardlaw J, Rhee H, Horstemeyer M, Williams L, Liao J. Experimental observation of high strain rate responses of porcine brain, liver, and tendon. *J Mech Med Biol*. 16 (3), 2016.
13. Xiang L, Mittwede P, **Clemmer JS**. Glucose homeostasis and cardiovascular alterations in diabetes. *Compr Physiol*. 5:1815-1839, 2015.
14. Mittwede P, Bergin P, **Clemmer JS**, Xiang, L. Obesity, Malnutrition, and the Response to Critical Illness, To the Editor. *Crit Care Med*. 43(8): e321, 2015.
15. Mittwede P, Xiang L, Lu S, **Clemmer JS**, Hester R. Oxidative stress contributes to orthopedic trauma-induced acute kidney injury in obese rats. *Am J Physiol Renal*. 308 (2): F157-63, 2014.
16. **Clemmer JS**, Xiang L, Lu S, Mittwede P, Hester R.  $\beta_2$ -adrenergic regulation of stress hyperglycemia following hemorrhage in the obese Zucker rat. *Physiological Reports*. 2 (12): e12215, 2014.
17. **Clemmer JS**, New Investigator Editorial: Professional Skills Training in Effective Science Teaching. *Am J Physiol Heart Circ Physiol*. 307(9): H1267-H1268, 2014.
18. Lu S, Xiang L, **Clemmer JS**, Mittwede P, Hester R. Oxidative stress increases pulmonary vascular permeability in diabetic rats through activation of transient receptor potential melastatin 2 (TRPM2) channels. *Microcirculation*. 21(8): 754-60, 2014.
19. Xiang L, Lu S, Mittwede P, **Clemmer JS**, Husband G, Hester R.  $\beta_2$  adrenoceptor blockade improves early post-trauma hyperglycemia and pulmonary injury in obese rats. *Am J Physiol Heart Circ Physiol*. 307: 621-7, 2014.
20. Xiang L, Lu S, Mittwede P, **Clemmer JS**, Hester R. Inhibition of NADPH oxidase prevents acute lung injury in obese rats following severe trauma. *Am J Physiol Heart Circ Physiol*. 306: 684-9, 2014.
21. Mittwede P, Xiang L, Lu S, **Clemmer JS**, Hester R. A novel experimental model of orthopedic trauma with acute kidney injury in obese Zucker rats. *Physiological Reports*. 1 (5), 2013.
22. Lu S, Xiang L, **Clemmer JS**, Gowdey A, Mittwede P, Hester R. Impaired Vascular  $K_{ATP}$  Function Attenuates Exercise Capacity in Obese Zucker Rats. *Microcirculation*. 20: 662-9, 2013.
23. Xiang L\*, **Clemmer JS\***, Lu S, Mittwede P. Impaired Blood Pressure Compensation Following Hemorrhage in Conscious Obese Zucker Rats. *Life Sciences*. 93: 214-219, 2013.
24. **Clemmer JS**, Liao J, Davis D, Horstemeyer M, Williams L. A Mechanistic Study for Strain Rate Sensitivity of Rabbit Patellar Tendon. *Journal of Biomechanics*. 43: 2785-91, 2010.

## ABSTRACTS

1. **Clemmer J**, WA Pruett, and Hester RL. In silico trial of baroreflex activation therapy for the treatment of resistant hypertension. *Mississippi Academy of Sciences* 64 (1) 2019.
2. **Clemmer J**, WA Pruett, Hester RL, and Lohmeier TE. In silico trial of baroreflex activation therapy for the treatment of resistant hypertension. *FDA/BMES Frontiers Conference*, 2019.

3. **Clemmer J**, WA Pruett, and Hester R. Reducing disparities in the treatment of hypertension in African Americans using computational modeling. Delta Clinical and Translational Science Health Disparities Conference 2018.
4. **Clemmer J**, Hester R, and WA Pruett. Investigating mechanisms of response to AV fistula for the treatment of hypertension using a mathematical model of physiology. Virtual Physiological Human Conference 2018.
5. **Clemmer J**, WA Pruett, and Hester R. Reducing disparities in the treatment of hypertension in African Americans using computational modeling. Experimental Biology 2018.
6. **Clemmer J**, Lohmeier T, Ilescu R, WA Pruett, and Hester R. Blood pressure lowering during chronic baroreflex activation: Don't forget the heart. Council on Hypertension 70:AP180 2017.
7. **Clemmer J**, Pruett W, and Hester R. Physiological Sensitivity to Salt and Uninephrectomy. FASEB J 2017; 31:1026.1.
8. **Clemmer J**, Pruett W, Butler K, and Hester R. Personalizing medicine in obesity using topological data analysis. Mississippi Academy of Sciences 62 (1) 2017.
9. **Clemmer J**, Hester R, Pruett W. Physiological Sensitivity to Salt and Nephrectomy. Virtual Physiological Human Conference, 2016; 978-90-826254-0-0.
10. **Clemmer J**, Pruett W, and Hester R. Predicting salt and diuretic sensitivity in a virtual population using topological data analysis. FASEB J 2016; 30:1216.14.
11. **Clemmer J**, Xiang L, Lu S, Mittwede P, and Hester R. Effects of Acute and Chronic Hyperglycemia on Lung Capillary Permeability. International Academy of Cardiovascular Sciences Meeting, Omaha 2015.
12. **Clemmer J**, Xiang L, Lu S, Mittwede P, and Hester R. Effects of Acute and Chronic Hyperglycemia on Lung Capillary Permeability. FASEB J 2015; 29:863.22.
13. Mittwede P, Lu S, **Clemmer J**, Hester R, and Xiang L. Attenuation of Post-Trauma Hyperglycemia Prevents Acute Kidney Injury in Obese Rats. FASEB J 2015; 29:800.6.
14. **Clemmer J**, Xiang L, Lu S, Mittwede P, and Hester R. Pulmonary permeability after hemorrhage and resuscitation in the obese Zucker rat. FASEB J 2014; 28:1157.2.
15. **Clemmer J**, Xiang L, Lu S, Mittwede P, and Hester R. Hemorrhage-induced Hyperglycemia Improved with Acute TNF $\alpha$  blockade in the Obese Zucker Rat. Gulf Coast Physiological Meeting 2013.
16. **Clemmer J**, Xiang L, Lu S, Mittwede P, and Hester R. Hemorrhage-induced Hyperglycemia Improved with Acute TNF $\alpha$  blockade in the Obese Zucker Rat. FASEB J 2013; 27:1193.4.
17. **Clemmer J**, Xiang L, Lu S, Lee L, and Hester R, Autonomic Impairment During Severe Hemorrhage in Obese Zucker Rats. FASEB J 2012; 26:853.27.
18. **Clemmer J**, Williams L, and Liao J, "A Mechanistic Study for Strain Rate Sensitivity in Rabbit Patellar Tendon." IBE Annual Conference, Cambridge, MA, March 4-6, 2010
19. **Clemmer J**, Williams L, and Liao J, "Mechanistic Study for Strain Rate Sensitivity in Rabbit Patellar Tendon." BMES Annual Fall Meeting, Pittsburgh, PA, October 7-10, 2009
20. **Clemmer J**, Liao J, Horstemeyer M, Williams L, "Mechanistic Study for Strain Rate Sensitivity in Rabbit Patellar Tendon." ASME Summer Bioengineering Conference, Lake Tahoe, CA; June 17-21, 2009

## PRESENTATIONS

1. In silico trial of baroreflex activation therapy for the treatment of resistant hypertension. Oral Presentation. Mississippi Academy of Sciences Feb. 21, 2019. Hattiesburg, MS.
2. In silico trial of baroreflex activation therapy for the treatment of resistant hypertension. FDA/BMES Frontiers Conference, Mar. 20, 2019. Washington D.C.
3. Modeling device-based therapies for the treatment of hypertension. Physiology Departmental Seminar, December 19, 2018.
4. Modeling device-based therapy in a virtual hypertensive population. Work in Progress Departmental Presentation, Sept. 20, 2018.
5. Investigating mechanisms of response to AV fistula for the treatment of hypertension using a mathematical model of physiology. Oral Presentation. Virtual Physiology Human Conference, Zaragoza, Spain, Sept. 7, 2018.
6. Reducing disparities in the treatment of hypertension in African Americans using computational modeling. Delta Clinical and Translational Science Health Disparities Conference, UMC July 19, 2018.
7. Reducing disparities in the treatment of hypertension in African Americans using computational modeling. Experimental Biology 2018, San Diego. Oral Presentation: Novel Approaches and Techniques in Water and Electrolyte Research Session.
8. Improving hypertension treatment through the use of computational modeling. Physiology Departmental Seminar, Dec. 20, 2017.
9. Computational modeling to improve hypertension treatment in African Americans. Work in Progress Departmental Presentation, Sept. 28, 2017.
10. Blood pressure lowering during chronic baroreflex activation: Don't forget the heart. Council on Hypertension 2017. San Francisco.
11. Physiological Sensitivity to Salt and Uninephrectomy, Experimental Biology 2017. Chicago.
12. Personalizing medicine in obesity using topological data analysis. Oral Presentation in the Population Health Symposium. Mississippi Academy of Sciences Meeting 2017. Hattiesburg.
13. Simulating physiological sensitivity to salt and uninephrectomy. Oral Presentation at the UMC Research Symposium 2016.
14. Predicting salt and diuretic sensitivity in a virtual population using topological data analysis. Experimental Biology 2016. San Diego.
15. Regulation of cardiovascular and stress hyperglycemic responses after hemorrhage in the obese Zucker rat. Physiology Departmental Seminar, Mar. 18, 2015.
16. Effects of Acute and Chronic Hyperglycemia on Lung Capillary Permeability. International Academy of Cardiovascular Sciences Meeting 2015.
17. Effects of Acute and Chronic Hyperglycemia on Lung Capillary Permeability. Experimental Biology 2015, Oral Presentation: Recent Advances in Obesity Research Featured Topic.
18. Pulmonary permeability after hemorrhage and resuscitation in the obese Zucker rat. Experimental Biology 2014.
19. Cardiovascular and pulmonary consequences of obesity after hemorrhage. Physiology Departmental Seminar. Oct. 16, 2013.
20. Hemorrhage-induced Hyperglycemia Improved with Acute TNF $\alpha$  blockade in the Obese Zucker Rat. Gulf Coast Physiological Meeting 2013.

21. Hemorrhage-induced Hyperglycemia Improved with Acute TNF $\alpha$  blockade in the Obese Zucker Rat. Experimental Biology 2013.
22. Autonomic Impairment During Severe Hemorrhage in Obese Zucker Rats. Experimental Biology 2012.
23. Mechanistic Study for Strain Rate Sensitivity in Rabbit Patellar Tendon. BMES Annual Fall Meeting, Pittsburgh, PA, October 2009.
24. Mechanistic Study for Strain Rate Sensitivity in Rabbit Patellar Tendon. ASME Summer Bioengineering Conference, Lake Tahoe, CA; June 2009.

## **TEACHING EXPERIENCE**

- Lectures for PHYSIO 731: UMC, Renal and Body Fluid Physiology (2019)
- Lectures for PHYSIO 717: UMC, Circulatory Physiology (2018)
- Lectures for PHYSIO 715: UMC, Advanced Endocrinology (2018)
- Instructor, PHYSIO 744: UMC, Simulation of Physiological Mechanisms (2014-2018)
- Teaching assistant, PHYSIO 701: UMC, Physiology Simulation Lab (2015-2018)
- UMMC Online Teaching Course – Excellent Teacher: Faculty Edition (2018)
- Teaching assistant, PHYSIO 701: UMC, Physiology Renal PBL (2018)
- Adjunct Professor: Medical Physiology I & II, William Carey University (2015-2016)
- Guest Lectures: UMC Physical Therapy, Physiology (2013-2018)
- Guest Lectures: Belhaven University, Computational Biology (2016)
- APS PST Teaching in Science Workshop: Bar Harbor, Maine (2014)
- Teaching assistant, PHYSIO 701: UMC, Physiology Cardiovascular Lab (2012-2014)
- Guest Lectures: Tougaloo College, Respiratory Physiology (2014)
- Teaching Practicum (UMC class ID 716) (2013)
- Guest Lectures : Holmes Community College, Anatomy & Physiology II (2013)
- UMC M1 Physiology Tutor (2013-present)
- UMC STEP 1 Review Course, Renal Section (2013)
- Teaching assistant, ABE 4723/6723: MSU, Tissue Engineering and Regeneration (2009)
- Teaching assistant, ABE 8723: MSU, Tissue and Cellular Biomechanics (2010)

## **LABORATORY EXPERIENCE/SKILLS**

- Computational biology/programming
- Mathematica
- Topological data analysis
- Big data analysis
- ELISA/Western Blotting
- Lab Chart
- Lung function (isolated lung/ perfusion techniques)
- Animal exercise and metabolic/oxygen consumption testing
- Microcirculatory preparations (in vivo and isolated vessels)
- Rat/mice catheter preparation surgeries
- EchoMRI
- Uniaxial biomechanics on soft tissue
- High strain rate soft tissue testing (Polymeric Split Hopkinson Pressure Bar )
- LabVIEW programing for imaging acquisition, processing, and image analysis
- Biaxial mechanical testing of planar soft tissues, e.g., porcine heart valves

- Microscopy techniques for tissue characterization: Laser Scanning Confocal Microscopy (LSCM), Scanning Electron Microscopy (SEM), and Transmission Electron Microscopy (TEM)
- Data processing and statistical analysis

## **SERVICE**

- Experimental Biology Judge for David Bruce Research Award (2013- 2018)
- APS Physiology Understanding (PhUn Week) volunteer (2011- present)
- UMC Discover U volunteer (2015-present)
- Peer Reviewer – Injury (2015-present)
- Peer Reviewer – AJP - Heart and Circulatory Physiology (2016)
- Peer Reviewer - Frontiers in Physiology (2016)
- Peer Reviewer – Journal of Anatomy (2015)
- Responsible Conduct of Research Course (2016)
- UMC Associated Student Body Mentoring Chair (2014-2015)
- Mississippi High School State Science Fair Judge (2013-2014)
- Vice President of UMC Graduate School (2013- 2015)
- UMC Graduate School Curriculum Committee (2013-2014)
- UMC Project Outreach Davis Magnet Elementary (2012-2016)
- MSU Honors College (2004-2008)
- Bulldogs for Heart Health (2008-2010)
- Student Association – Athletic Affairs (2005-2006)
- Big Brother/Big Sister Mentoring Scholarship Award (2004)
- Eagle Scout (2004)