

# Curriculum Vitae for Naomi C. Chesler, Ph.D.

2146 Engineering Centers Building, 1550 Engineering Drive  
University of Wisconsin – Madison; Madison, WI 53706-1609  
Tel: 608 265-8920 Fax: 608 265-9239  
Email: Chesler@engr.wisc.edu

## Professional Experience:

- 2014 - present **Professor**, Department of Biomedical Engineering, UW–Madison College of Engineering, Madison, WI. Affiliate appointments in Departments of Medicine and Mechanical Engineering since 2003. Affiliate appointment in Department of Educational Psychology since 2010. **Vice Chair** 2013-2015. **Associate Chair of Faculty and Academic Staff Development** 2014-2015.
- 2008 - 2014 **Associate Professor**, Department of Biomedical Engineering, UW–Madison College of Engineering, Madison, WI.
- 2002 - 2008 **Assistant Professor**, Department of Biomedical Engineering, UW–Madison College of Engineering, Madison, WI.
- 1998 – 2002 **Assistant Professor**, Department of Mechanical, University of Vermont (UVM), Burlington, VT. Affiliate appointment in Department of Medicine, 1999-2002.
- 1996 – 1998 **Post-Doctoral Research Fellow**, GW Woodruff School of Mechanical Engineering, Georgia Institute of Technology, Atlanta, GA. Advisors: Profs. David N. Ku and Zorina S. Galis (Emory University).

## Education:

- August 1996 **Ph.D. Medical Engineering**, Harvard-MIT Division of Health Sciences and Technology, Massachusetts Institute of Technology, Cambridge, MA.
- June 1991 **M.S. Mechanical Engineering**, Massachusetts Institute of Technology, Cambridge, MA.
- June 1989 **B.S. Engineering**, Swarthmore College, Swarthmore PA *with distinction*.

## Awards and Honors:

- 2015-16 Fulbright Scholar, United States Department of State
- 2015-present Vilas Distinguished Achievement Professor
- 2015 Fellow, American Institute of Medical and Biological Engineering (AIMBE)
- 2015 Harvey Spangler Award for Technology Enhanced Instruction, UW-Madison
- 2014 Diversity Award, Biomedical Engineering Society (BMES)
- 2013 Fellow, American Society of Mechanical Engineers (ASME)
- 2013 Vilas Distinguished Achievement Professor, UW-Madison
- 2013 Fellow, Executive Leadership Program in Academic Technology and Engineering (ELATE) Program

2011	Invited participant in National Academy of Engineering-sponsored Frontiers of Engineering Education
2009	Fulbright Scholar, Belgium-Luxemburg Program
2008	Denice D. Denton Emerging Leader Award, Anita Borg Institute for Women and Computing
2006	Polygon Teaching Award for Biomedical Engineering
2004	Invited participant in National Academy of Engineering-sponsored Japan-U.S. Frontiers of Engineering Symposium for top 100 young engineers aged 30-45 in the U.S.
2003	Invited participant in First USNCB Frontiers in Biomechanics Symposium
2002	Invited participant in National Academy of Engineering-sponsored Frontiers of Engineering Symposium for top 100 young engineers aged 30-45 in the U.S.
2001	Nominated for Best Conference Paper, American Society of Engineering Education
1999	Vermonters Pursuing Excellence (1 of 6 faculty given this honor in 1999), UVM
1999	Selected to participate in NSF-sponsored New Century Scholars Workshop at Stanford University
1998	Selected to participate in NSF-sponsored Engineering Education Scholars Workshop at Carnegie Mellon University
1997	Second Prize in American Society of Mechanical Engineers Bioengineering Division Student Poster Competition
1994-1995	MIT—Japan Program Ayukawa Fellow and Prize Recipient
1993	Meredith Kamm Memorial Award for Outstanding Performance in Mechanical Engineering, MIT
1990-1993	National Science Foundation Fellowship, MIT
1989-1990	General Electric Foundation Fellowship, Swarthmore College
1989	Phi Beta Kappa, Tau Beta Pi, Sigma Xi, Swarthmore College

### Contributions to Science:

***Large artery biomechanics and mechanobiology:*** Large artery biomechanical changes, including stiffening, are a common cause and consequence of cardiovascular disease. Indeed, large stiffening is an independent predictor of mortality from both right and left ventricular failure. I have contributed to improving our understanding of the cellular and molecular mechanisms by which arterial stiffening occurs in vivo (the differential impacts of collagen content and cross-linking on stiffening, and the discovery that arterial viscoelasticity changes are also a consequence of cardiovascular disease and may impair ventricular function. *See:* Chesler et al., AJP Heart 1999; Kobs et al., AJP Heart 2005; Ooi et al., AJP Heart 2010; Wang et al., PLoS ONE 2013.

***Development of and insights from isolated, ventilated, pulsatile-perfused mouse lung studies:*** As noted above, large artery stiffening is an independent predictor of ventricular failure. One mechanism of action of this arterial mechanical change on ventricular function is likely pulsatile blood flow dynamics such as pressure and flow wave reflections. In order to measure the hemodynamic effects of arterial stiffening in the pulmonary circulation, I modified salt-perfused mouse lung systems to provide not only oscillations in airway pressure for ventilation but also pulsations in pulmonary vascular flow to mimic physiological flow. The critical advantage of measuring pulsatile pressure-flow relationships in isolated mouse lungs is that molecular mechanisms in pulmonary vascular impedance changes can be investigated using genetically engineered mouse models of

disease. We first developed this technique with wild type mice, generating pulmonary hypertension with embolization and chronic hypoxia, then quantified the effect of vasoactive agents on pressure and flow and have since used this technique with genetically engineered strains. This work led to important insights into the determinants of pulsatile flow abnormalities with disease progression and potential new therapeutic strategies for limiting arterial stiffening in pulmonary arterial hypertension. *See:* Tuchscherer et al., *Annals of Biomedical Engineering* 2006, Tuchscherer, *Journal of Biomechanics* 2007, Vanderpool et al., *Journal of Applied Physiology* 2011, Vanderpool et al., *Biomechanics and Modeling in Mechanobiology* 2012.

***Development of and insights from pulmonary vascular impedance measurements in vivo:*** While the isolated, ventilated, pulsatile-perfused mouse lung offers precise control of pressure and flow conditions for quantification of structural and functional pulmonary vascular abnormalities with disease progression, the interdependence of pulmonary vascular flow on right ventricular function and blood components is lost. Therefore, we worked with colleagues in the UW-Madison Cardiovascular Core facility to develop and validate techniques for measuring pulsatile pulmonary hemodynamics, from which pulmonary vascular impedance can be measured, in small and large animal models as well as clinically. To date, we have published results in mice, large animals, and results from patients are in preparation. These studies have shed light on the impact of large and small artery stiffening and the hematocrit on pulsatile blood flow dynamics, which are physiologically important consequences of pulmonary arterial hypertension development and progression. These results are especially important for monitoring disease progression and may lead to robust, noninvasive techniques for patient monitoring. *See:* Tabima et al., *Journal of Biomechanics* 2012, Schreier et al., *Journal of Applied Physiology* 2014, Bellofiore et al., *Annals of Biomedical Engineering* 2013.

***Development of and insights from right ventricular-pulmonary vascular coupling measurements in mice:*** The most common cause of death in pulmonary arterial hypertension is right ventricular failure. As noted above, large pulmonary artery stiffening is the best current predictor of mortality in pulmonary arterial hypertension for reasons that remain incompletely understood. To gain insight into this clinically important problem, I have developed and validated measurement techniques for quantifying right ventricular-pulmonary vascular coupling efficiency in mice and used these techniques to determine the role of collagen in progressive right ventricular dysfunction as well as the impact of estrogen on ventricular-vascular coupling efficiency to better understand sex differences in outcomes of pulmonary arterial hypertension. *See:* Tabima et al., *American Journal of Physiology – Heart and Circulatory Physiology* 2010, Schreier et al., *Journal of Biomechanical Engineering* 2013, Liu et al., *American Journal of Physiology – Heart and Circulatory Physiology*, 2014.

***Clinical studies of pulmonary hemodynamics with exercise:*** Our fundamental studies of large artery biomechanics made clear that an acute pressure change, such as might occur with exercise, can mimic the increase in large artery stiffness that occurs with disease progression and is currently used as a predictor of mortality. Therefore, we sought to gain better insight into the pulmonary hemodynamic changes that occur with exercise in healthy subjects and those with pulmonary vascular disease. In studies led by Robert Naeije, I contributed to analysis of hemodynamic data obtained echocardiographically in healthy

subjects with exercise to better understand the impact of exercise-induced arterial stiffening. With Robert Naeije, I also contributed to a detailed and thorough review article which has been well-cited. Independently from Naeije, I led the development of an MRI-compatible exercise device so that we might obtain higher spatial resolution images with exercise. Results from our first studies in human subjects are in review and we are currently conducting studies in patients with pulmonary hypertension. Our long term goal is to merge exercise-induced right ventricular hemodynamic data obtained non-invasively with MRI with exercise-induced pulmonary vascular hemodynamic data obtained invasively during right heart catheterization to completely characterize right ventricular-pulmonary vascular interactions at rest and exercise and thereby improve diagnoses and treatment plans of patients with pulmonary arterial hypertension. *See:* Argiento et al., *European Respiratory Journal* 2010, Argiento et al., *Chest* 2012, Naeije and Chesler, *Comprehensive Physiology* 2012, Forouzan et al., *Journal of Medical Devices* 2014.

### Extra-Mural Biomedical Engineering Research Grants:

#### **Current:**

- National Institutes of Health** U01, 9/1/2016-8/31/2023 for research on “Transplantation of iPS Cell-Derived Vascular Progenitors in an MHC Defined Primate Model.” **Role: Co-I** (PI: Sluvkin).
- Veteran’s Administration** Clinical Science Research and Development Award, 7/1/2017-6/31-2018 for research on “Pulmonary Vascular Dysfunction after Deployment-Related Exposures.” **Role: Collaborator** (PI: Falvo).
- National Institutes of Health** R21, 09/01/14 – 08/31/16 for research on “Impact of the micromechanical environment on inflammation in AAA progression.” **Role: PI.**
- US-Israel Binational Science Foundation** Biomedical Engineering Grant, 07/01/14 – 06/30/18 for research on “Integrated experimental and theoretical studies of cardiac function at the cellular and whole heart levels: toward improved prevention of heart failure.” **Role: PI**
- National Institutes of Health** R01, 07/01/07 – 06/30/17 for research on “Vascular collagen accumulation & mechanical mechanisms in pulmonary hypertension.” **Role: PI.** Plus administrative supplement to investigate mechanisms of sex differences in disease progression.
- National Institutes of Health** R01, 09/01/12 – 08/31/2017 for research “Right ventricular-pulmonary vascular interactions in bronchopulmonary dysplasia” **Role: Co-I.** (PI: Eldridge)

#### **Completed:**

- National Institutes of Health** R01, 09/15/11 – 06/30/2016 for research “Right ventricular-pulmonary vascular interactions in pulmonary hypertension” **Role: PI.**
- National Institutes of Health** R01, 12/01/10 – 11/30/14 for research on “Pulmonary hypertension in genetically modified mice”. **Role: co-I** (PI: Rabinovitch).
- National Institutes of Health** NHLBI R01, 04/01/04 – 03/31/08, for research on “Sleep Disordered Breathing Patterns and Vasomotor Regulation.” PI: Morgan; **Role: Co-Investigator.**
- Whitaker Foundation** Bioengineering Research Grant, 09/01/03 – 08/31/06, for research on “Hypoxia-Induced Pulmonary Artery Remodeling: Molecular and Mechanical Mechanisms.” **Role: PI.**
- National Science Foundation** (CAREER), 06/01/00 – 03/31/05, for research on “Vascular Gene Therapy: Characterization and Optimization.” **Role: PI.**
- American Heart Association** Northeast Affiliate Beginning-Grant-in-Aid, 07/01/00 – 06/30/03, for research on “Enzymes in Hemodynamically-Induced Vascular Remodeling.” **Role: PI.**

Peer-Reviewed Biomedical Research Publications:*Publications in Refereed Journals (and Patent): (\*co first author)***In Preparation**

Golob MJ, Massoudi D, Tabima DM, Johnston JL, Wolf GD, Hacker TA, Greenspan DS, Chesler NC. Cardiovascular function and structure are preserved despite induced ablation of BMP-1-related proteinases

Dinges E, Forouzan O and Chesler NC. A novel low cost, MRI-compatible recumbent ergometer.

**In Review**

Philip J, Tabima DM, Chesler NC. Right ventricular-pulmonary vascular interactions: A Review.

Wang Z, Schreier DA, Abid H, Song G, Hacker TA, Chesler NC. Right ventricular dysfunction in a mouse model of pulmonary arterial hypertension occurs in the absence of myocyte mechanical impairment

Bellofiore A, Vanderpool RR, Brewis M, and Chesler NC. A novel single beat method to assess right ventricular systolic function.

Forouzan O, Dinges E, Bailey M, Eickhoff JE, Francois CJ, Shah SJ, Chesler NC. Comparison of Exercise-Stress CMR and Exercise-Stress Echocardiography for Evaluating Pulmonary Arterial Hemodynamics, Stiffness, and Distensibility

Forouzan O, Dinges Shah SJ, E, Runo JR, Keevil JG, Francois CJ, Chesler NC. Exercise-induced changes in pulmonary artery stiffness in pulmonary arterial hypertension due to systemic sclerosis

**In Press/In Print**

J73. Wang Z, Schreier DA, Abid H, Hacker TA, Chesler NC. Pulmonary vascular collagen content, not cross-linking, contributes to right ventricular pulsatile afterload and overload in early pulmonary hypertension. *J Appl Physiol* Feb 1;122(2):253-263, 2017.

J72. Golob MJ, Tabima DM, Wolf GD, Johnston JL, Forouzan O, Mulchrone AM, Kelliham HB, Bates ML, Chesler NC. Pulmonary arterial strain- and remodeling-induced stiffening are differentiated in a chronic model of pulmonary hypertension. *J Biomech.* Apr 11; 55:92-98, 2017.

J71. Liu A, Philip J, Vinnakota KC, Van den Bergh F, Tabima DM, Hacker T, Beard DA, Chesler NC. Estrogen maintains mitochondrial content and function in the right ventricle of rats with pulmonary hypertension. *Physiol Reports* Mar;5(6), 2017.

J70. Bellofiore A, Dinges E, Naeije R, Mkrdichian H, Beussink-Nelson L, Bailey M, Cuttica MJ, Sweis R, Runo JR, Keevil JG, Francois CJ, Shah SJ, Chesler NC. Reduced hemodynamic coupling, pulmonary artery stiffening and limited exercise tolerance in pulmonary arterial hypertension. *Heart*, Mar;103(6):421-427, 2017.

J69. Liu A, Hacker TA, Eickhoff JE, Chesler NC. Estrogen preserves pulmonary arterial pulsatile hemodynamics in pulmonary arterial hypertension, *Ann Biomed Eng*, Mar;45(3):632-643, 2017.

J68. Lahm T, Frump AL, Albrecht AL, Fisher AJ, Cook TG, Jones TJ, Yakubov B, Whitson J, Fuchs RK, Liu A, Chesler NC, Brown MB. 17 $\beta$ -estradiol mediates superior adaptation of right ventricular function to acute strenuous exercise in female rats with severe pulmonary hypertension. *AJP Lung Cell Mol Physiol*, Aug 1;311(2):L375-88, 2016.

- J67. Brewis M, Vanderpool RR, Bellofiore A, Naeije R, Chesler NC, Martin J, Peacock AJ. Imaging of right ventricular function to predict outcome in pulmonary arterial hypertension. *International J Cardiology*, 218: 206-211. 2016.
- J66. Golob M, Wang Z, Prostrullo A, Hacker TA, Chesler NC. Limiting collagen turnover via collagenase-resistance attenuates right ventricular dysfunction and fibrosis in pulmonary arterial hypertension. *Physiological Reports*, 4(11): e12815. 2016.
- J65. Lee P, Carlson BE, Chesler NC, Olufsen MS, Qureshi U, Smith NP, Sochi T, Beard DA. Heterogeneous mechanics of the mouse pulmonary artery network. *Biomech Model Mechanobiol*, Oct;15(5):1245-61, 2016.
- J64. Freed B, Collins J, Francois C, Barker A, Cuttica M, Chesler NC, Markl M, Shah S. Magnetic resonance and computed tomography imaging for the evaluation of pulmonary hypertension, *JACC Cardiovascular Imaging*, Jun;9(6):715-32, 2016.
- J63. Schreier D, Forouzan O, Hacker TA, Sheehan J, Chesler NC. Increased red blood cell stiffness increases pulmonary vascular resistance and pulmonary arterial pressure, *J Biomech Eng* Feb;138(2):021012, 2016.
- J62. Tian L, Wang Z, Liu Y, Eickhoff JC, Eliceiri KW and Chesler NC. Validation of an Arterial Constitutive Model Accounting for Collagen Content and Crosslinking. *Acta Biomaterialia*, Feb;31:276-87, 2016.
- J61. Forouzan O, Warczytowa J, Wieben O, Francois CJ, Chesler NC. Non-invasive (MRI) measurement of changes in pulmonary artery stiffness with exercise. *Journal of Cardiovascular Magnetic Resonance*, Dec 13;17:109, 2015.
- J60. Liu A, Tian L, Golob MJ, Eickhoff JC, Boston M, and Chesler NC. 17 $\beta$ -estradiol attenuates conduit pulmonary artery mechanical property changes with pulmonary arterial hypertension. *Hypertension*, Nov;66(5):1082-8, 2015.
- J59. Tian T, Henningsen J, Salick M, Crone WC, Gunderson M, Daily SH, Chesler NC. Stretch calculated from grip distance accurately approximates mid-specimen stretch in large elastic arteries in uniaxial tensile tests. *Journal of Mechanical Behavior of Materials*. Jul;47:107-13, 2015.
- J58. Golob MJ, Tian T, Wang Z, Zimmerman TA, Caneba CA, Hacker TA, Song G, and Chesler NC. Mitochondria DNA mutations cause sex-dependent development of hypertension and alterations in cardiovascular function. *Journal of Biomechanics*. Feb 5;48(3):405-12, 2015.
- J57. Bellofiore A, Henningsen J, Lepak CG, Tian L, Roldan-Alzate A, Kelliham HB, Consigny DB, Francois CJ and Chesler NC. A Novel in Vivo Approach to Assess Radial and Axial Distensibility of Large and Intermediate Pulmonary Artery Branches. *Journal of Biomechanical Engineering*, Apr;137(4):044501, 2015.
- J56. Bellofiore\*, Wang\* and Chesler. What does the RC time constant tell us about the progression of right ventricular dysfunction in pulmonary arterial hypertension? *Pulmonary Circulation*, Jun;5(2):291-5, 2015.
- J55. Soydan LC, Kelliham H, Bates, ML, Stepien, RL, Consigny DW, Bellofiore A, Francois CJ and Chesler NC. Accuracy of Doppler echocardiographic estimates of pulmonary artery pressures in a canine model of pulmonary hypertension. *Journal of Veterinary Cardiology*, Mar;17(1):13-24, 2015.
- J54. Schreier DA, Hacker TA, Hunter K, Eickhoff J, Liu A, Song G, and Chesler NC. The impact of hematocrit on right ventricular afterload during the progression of hypoxic pulmonary hypertension. *Journal of Applied Physiology*, Oct 15;117(8):833-9, 2014.

- J53. Tian L, Kellihan HB, Henningsen J, Bellofiore A, Forouzan O, Roldán-Alzate A, Consigny DW, Gunderson M, Dailey SH, Francois CJ and Chesler NC. Pulmonary artery relative area change is inversely related to ex vivo measured arterial elastic modulus in the canine model of acute pulmonary embolization. *Journal of Biomechanics*, Sep 22;47(12):2904-10, 2014.
- J52. Golob M, Moss, RL, Chesler NC. Cardiac Tissue Structure, Properties, and Performance: A Materials science perspective. *Annals of Biomedical Engineering*, Oct;42(10):2003-13, 2014.
- J51. Barker AJ, Roldan-Alzate A., Entezari P, Shah SJ, Chesler NC, Wieben O, Markl M, and Francois CJ. 4D Flow Assessment of Pulmonary Artery Flow and Wall Shear Stress in Adult Pulmonary Arterial Hypertension: Results from Two Institutions, *Magnetic Resonance in Medicine*, May;73(5):1904-13, 2015.
- J50. Liu A, Hacker TA, Eickhoff JE, Wang Z, Chesler NC Direct and indirect protection of right ventricular function by estrogen in an experimental model of pulmonary artery hypertension. *American Journal of Physiology – Heart and Circulatory Physiology*, Aug 1;307(3):H273-83, 2014.
- J49. Roldan-Alzate A., Frydrychowicz A, Johnson KM, Kellihan HB, Chesler NC, Wieben O, and Francois CJ. Non-invasive assessment of an acute canine model of thromboembolic pulmonary hypertension using 4D Flow MR. *Journal of Cardiovascular Magnetic Resonance*, Mar 13;16:23, 2014.
- J48. Forouzan O, Flink E, Thate N, Hanske A, Lee T, Roldan-Alzate A., Francois CJ, Wieben O, and Chesler NC MRI-compatible stepper exercise device for use in cardiac stress tests. *Journal of Medical Devices*. Dec;8(4):0450021-450028, 2014.
- J47. Wang Z, Schreier DA, Hacker TA and Chesler NC Progressive right ventricular functional and structural changes in a mouse model of pulmonary arterial hypertension. *Physiological Reports* 1 (7), 2013.
- J46. Tewari SG, Wang Z, Bugenhagen SM, Schreier D, Carlson BE, Chesler NC, Beard DA. Model analysis of cardiovascular dynamics with pulmonary arterial hypertension progression in a mouse model. *Frontiers in Physiology*, 4:355, 2013.
- J45. Wang Z, Lakes RS, Golob M, Eickhoff JC, Chesler NC. Changes in large pulmonary arterial viscoelasticity in chronic pulmonary hypertension. *PLoS ONE*, 8 (11), E78569, 2013.
- J44. Schiebler ML, Bhalla S, Runo JJ, Jarjour N, Roldan A, Chesler N, Francois CJ. Magnetic resonance and computed tomography imaging of the structural and functional changes of pulmonary arterial hypertension. *Journal of Thoracic Imaging*. 28(3): 178-195, 2013.
- J43. Wang Z, Chesler NC. Pulmonary vascular mechanics: Important contributors to the increased right ventricular afterload of pulmonary hypertension. *Experimental Physiology*, Invited Review. 2013.
- J42. Tian L, Wang Z, Lakes RS, Chesler NC. Comparison of approaches to quantify arterial damping capacity from pressurization tests on mouse conduit arteries. *Journal of Biomechanical Engineering*. 135(5): 054504, 2013.
- J41. Bellofiore, A and Chesler, NC Methods for measuring right ventricular function and hemodynamic coupling with the pulmonary vasculature. *Annals of Biomedical Engineering*. 41(7):1384-98, 2013
- J40. Schreier D, Hacker T, Song G, and Chesler NC Role of collagen synthesis in ventricular and vascular adaptation to pulmonary hypertension. *Journal of Biomechanical Engineering*, 135(2):021018, 2013.
- J39. Wang Z, Kristianto J, Ooi CY, Johnson M, Litscher S, Pugh T, Sandhu G, Chesler NC, and Blank R Blood pressure, artery size and artery compliance parallel bone size and strength in mice with differing ECE1 expression. *Journal of Biomechanical Engineering*. 135(6): 61003-61009, 2013

- J38. Wang Z, Lakes RS, Eickhoff, JC, Chesler NC. Effects of collagen deposition on passive and active mechanical properties of large pulmonary artery in hypoxic pulmonary hypertension. *Biomechanics and Modeling in Mechanobiology*, 12(6):1115-25, 2013.
- J37. Tian, L. and Chesler, N.C. In vivo and in vitro measurements of pulmonary arterial stiffness—a brief review. *Pulmonary Circulation*. 2(4): 505-17, 2013.
- J36. Bellofiore A, Roldan-Alzate A, Besse M, Kelliham HB, Consigny DW, Francois CJ, and Chesler NC. Impact of Acute Pulmonary Embolization on Arterial Stiffening and Right Ventricular Function in Dogs. *Annals of Biomedical Engineering*, Jan;41(1):195-204, 2013.
- J35. Argiento, P., Vanderpool, R.R., Mule, M., Russo, M.G., D'Alto, M. Bossone, E., Chesler, N.C. and Naeije, R. Exercise stress echocardiography of the pulmonary circulation: Limits of normal and sex differences. *Chest*. Nov;142(5):1158-65, 2012.
- J34. Vanderpool, R.R., El-Bizri, N., Rabinovitch, M. and Chesler, N.C. Patchy deletion of *Bmpr1a* potentiates proximal pulmonary artery remodeling in mice exposed to chronic hypoxia *Biomech Model Mechanobiol*, 12(1): 33–42, 2012
- J33. Tabima, D.M., Roldan, A.R., Wang, Z., Hacker, T.A., Molthen, R.C. and Chesler, N.C. Persistent vascular collagen accumulation alters hemodynamic recovery from chronic hypoxia. *J Biomech*. 2011 Dec 17. [Epub ahead of print]
- J32. Wang, Z. and Chesler, N.C., Role of collagen content and cross-linking in large pulmonary arterial stiffening after chronic hypoxia, *Biomech Model Mechanobiol*. 2012 Jan;11(1-2):279-89. Epub 2011 May 3.
- J31. Naeije, R. and Chesler, N.C. Pulmonary Circulation at Exercise. *Comprehensive Physiology*. Jan;2(1):711-41, 2012.
- J30. Wang, Z. and Chesler, N.C. Pulmonary vascular wall stiffness: An important contributor to increased right ventricular afterload in pulmonary hypertension. *Pulm Circ*. 2011 Apr;1(2):212-23.
- J29. Vanderpool, R.R. and Chesler, N.C. Characterization of the isolated, ventilated and instrumented mouse lung perfused with pulsatile flow. *J Vis Exp*. 50: e2690, 2011.
- J28. Vanderpool, R.R., Kim, A.R., Molthen, R. and Chesler, N.C Effects of acute rho kinase inhibition on chronic hypoxia-induced changes in proximal and distal pulmonary arterial structure and function *Journal of Applied Physiology*, 110(1):188-98, 2011.
- J27. Tabima, D.M, Hacker, T.A. and Chesler, N.C. Measuring right ventricular function in the normal and hypertensive mouse hearts using admittance-derived pressure-volume loops. *American Journal of Physiology – Heart and Circulatory Physiology*, 299(6):H2069-75, 2010.
- J26. Ooi, C.Y., Wang, Z., Tabima, D.M., Eickhoff, J.C. and Chesler, N.C. The role of collagen in extralobar pulmonary artery stiffening in response to hypoxia-induced pulmonary hypertension. *American Journal of Physiology Heart & Circulatory Physiology*, 299(6):H1823-31, 2010.
- J25. Tabima, D.M and Chesler, N.C. The effects of vasoactivity and hypoxic pulmonary hypertension on extralobar pulmonary artery biomechanics. *Journal of Biomechanics*, Jul 20;43(10):1864-9, 2010.
- J24. Vanderpool, R.R., Naeije, R. and Chesler, N.C. Impedance in isolated mouse lungs for the determination of site of action of vasoactive agents and chronic hypoxia. *Annals of Biomedical Engineering* May;38(5):1854-61, 2010.



- J23. Sprague, B.J., Chesler, N.C., and Magness, R.R. Shear Stress Regulation of Nitric Oxide Production in Uterine and Placental Artery Endothelial Cells: Experimental studies and Hemodynamic Models of Shear Stress Forces on Endothelial Cells. *International Journal of Developmental Biology* 54: 331-339, 2010.
- J22. Argiento, P., Chesler, N.C., D'Alto, M., Bossone, E., Unger, P. and Naeije, R. Exercise stress echocardiography for the study of the pulmonary circulation, *European Respiratory Journal*. June 1: 35(6): 1273-1278, 2010.
- J21. Philippi, N.R., Bird, C.E., Marcus, N.J., Olson, E.B., Chesler, N.C. and Morgan, B.J. Time course of intermittent hypoxia-induced impairments in resistance artery structure and function. *Respiratory Physiology & Neurobiology*. Feb 28;170(2):157-63, 2009.
- J20. Roldan, A., Haughton, V.M., Wieben, O., Osswald, T., and Chesler, N.C.. Characterization of CSF hydrodynamics in the presence and absence of tonsillar ectopia by means of Computational Flow Analysis. *American Journal of Neuroradiology* 30:941-946 2009.
- J19. Estrada, K.D and Chesler, N.C. Collagen-related gene and protein expression changes in the lung in response to chronic hypoxia. *Biomechanics and Modeling in Mechanobiology* 8(4):263-272, 2009.
- J18. Sprague, B.J., Phernetton, T.M., Magness, R.R., and Chesler, N.C. The effects of the ovarian cycle and pregnancy on uterine vascular impedance and uterine artery mechanics. *European Journal of Obstetrics & Gynecology and Reproductive Biology* 144S: S170-S178, 2009.
- J17. Zhu, Y., Sprague, B.J., Phernetton, T.M., Magness, R.R., and Chesler, N.C. Transmission line models to simulate the impedance of the uterine vasculature during the ovarian cycle and pregnancy. *European Journal of Obstetrics & Gynecology and Reproductive Biology* 144S: S184-S191, 2009.
- J16. Rabinovitch, M, Chesler, N.C. and Molthen, R.C. Chronic hypoxia-induced pulmonary hypertension does lead to loss of pulmonary vasculature. *Journal of Applied Physiology* 103: 1449-1451, 2007.
- J15. Tuchscherer, H.A., Vanderpool, R.R. and Chesler, N.C. Effects of hypoxia-induced pulmonary hypertension on pulmonary vascular resistance in an isolated mouse lung. *Journal of Biomechanics*. 40: 993-1001, 2007.
- J14. Kim, D., Chesler, N.C., and Beebe, D.J. A method for dynamic system characterization using hydraulic series resistance. *Lab on a Chip* 6: 639-644, 2006.
- J13. Tuchscherer, H.A., Webster, E. and Chesler, N.C. Pulmonary vascular resistance and impedance in isolated mouse lungs: Effects of pulmonary emboli. *Annals of Biomedical Engineering*. 34(4): 660-668, 2006.
- J12. Kobs, R.W. and Chesler, N.C. The mechanobiology of pulmonary vascular remodeling in the congenital absence of eNOS. *Biomechanics and Modeling in Mechanobiology*. Nov; 5(4):217-25, 2006.
- J11. Kobs, R.W., Eickhoff, J.C., Muvarak, N.E., and Chesler, N.C., Linked mechanical and biological aspects of pulmonary vascular remodeling with hypoxia-induced hypertension in mice. *American Journal of Physiology Heart & Circulatory Physiology*, 288(3): H1209-17, 2005.
- J10. Ander, S.\*, MacLennan, M.\*, Bentil, S., Leavitt, B., and Chesler, N. Pressure-induced vector transport in human saphenous vein, *Annals of Biomedical Engineering*, 33(2): 202-208, 2005. (\*These authors contributed equally). Cover article.
- J9. Chesler, N., Thompson-Figueroa, J. and Millburne, K. Measurements of mouse pulmonary artery biomechanics, *Journal of Biomechanical Engineering*, 126(2): 309-314, 2004.

- J8. Coulson, R., Cipolla, M.J., Vitullo, L. and Chesler, N. Mechanical properties of rat middle cerebral arteries with and without myogenic tone *Journal of Biomechanical Engineering*, 126(1): 76-81, 2004.
- J7. Chesler, N. and Enyinna, O. Particle deposition in arteries *ex vivo*: Effects of pressure, flow and waveform. *Journal of Biomechanical Engineering*, 125(3): 389-394, 2003.
- J6. Coulson, R., Chesler, N., Vitullo, L. and Cipolla, M.J. Effects of ischemia and myogenic reactivity on the active and passive mechanical properties of rat cerebral arteries. *American Journal of Physiology: Heart & Circulatory Physiology*, 283(6):H2268-75, 2002.
- J5. Mavromatis, K. Fukai, T. Tate, M. Chesler, N. Ku, D. and Galis, Z. S. Early effects of arterial hemodynamic conditions on human saphenous vein perfused *ex vivo*. *Arteriosclerosis, Thrombosis and Vascular Biology*, Aug 20(8): 1889-95, 2000.
- J4. Chesler, N.C., Ku, D. N. and Galis, Z. S. Transmural pressure induces matrix-degrading activity in porcine arteries *ex vivo*. *American Journal of Physiology*, 277 (*Heart Circ. Physiol.* 46): H2002-H2009, 1999.
- J3. Chesler, N. C., Conklin, B. S., Han, H. C. and Ku, D. N. Simplified *ex vivo* culture techniques for porcine arteries. *Journal of Vascular Investigation*; 4: 123-127, 1998.
- J2. Chesler, N. C. and Kamm, R. D. Performance analysis of a cardiac assist device in counterpulsation. *Journal of Biomechanical Engineering*; 120: 437-445, 1998.
- J1. Chesler, N. and Durfee, W. Surface EMG as a fatigue indicator during FES-aided standing. *Journal of Electrophysiology and Kinesiology*; 7 (1): 27-37, 1997.
- Patent: Makower, J., Slee, E., Chesler, N., Gorman, W. and Barber, F. *U.S. Patent Number 5,380,290 for a Body Access Device*. Assignee: Pfizer Hospital Products Group, Pfizer, Inc. Awarded January 10, 1995.

### *Book Chapters:*

- Wang Z, Golob M and Chesler, N.C., “Viscoelastic Properties of Cardiovascular Tissues” In: Viscoelastic and Viscoplastic Materials, InTech, ISBN 978-953-51-4822-7, 2017
- Tian L, Wang Z, and Chesler NC. “Pulmonary vascular mechanics in pulmonary hypertension” In Rawlinson ed. Mechanobiology, 2017
- Tabima, D.M. and Chesler, N.C., “Pulmonary Vascular Mechanobiology.” In: Nagatomi ed. Handbook of Mechanobiology, Taylor & Francis Group, London, England, 2012.
- Roldan, A. and Chesler, N.C., “Pulmonary Vascular Mechanics.” In: Yuan, Garcia, Hales, Rich, Archer and West eds. Textbook of Pulmonary Vascular Disease, Springer-Verlag, New York, NY, 2012.
- Bergman, H., Chesler, N., Ku, D and Wootton, D. “Hemodynamics and Atherosclerosis.” In: Hennerici, M.D. and Meairs, S. eds. Cerebrovascular Ultrasound, Cambridge University Press, Cambridge UK, 2001.

Extra-Mural Engineering Education/Mentoring Grants Funded:**Current:**

**National Science Foundation** DIMES Grant, 09/01/14-08/31/18 for research on “Immersing Teachers and Students in Virtual Engineering Internships” **Role: Subcontract Co-I** (PI: Nash; UC-Berkeley).

**National Science Foundation** Research and Evaluation on Education in Science and Engineering (REESE) Grant, 09/15/12-08/31/17 for research on “Measuring Complex STEM Thinking Using Epistemic Network Analysis” **Role: Co-PI** (PI: Shaffer).

**Completed:**

**National Science Foundation** Collaborative Research: Research Initiation Grants in Engineering Education (RIGEE), 09/15/13-08/31/15 for research on “Development of Innovation Capacity in Engineering Students Through Virtual Internships” **Role: Subcontract Co-PI** (PI: Bodnar; U Pittsburgh).

**National Science Foundation** Transforming Undergraduate Education in Science, Technology, Engineering and Mathematics (TUES) Grant, 09/01/12-08/31/15 for research on “First-year Virtual Internships to Increase Persistence of Underrepresented Groups in Engineering: RescuShell and its parent company RescuTek” **Role: PI**

**National Science Foundation** Research in Engineering Education (REE) Grant, 09/01/12-08/31/15 for research on “Using a Virtual Engineering Internship to Model the Complexity of Engineering Design Problems” **Role: Co-PI** (PI: Shaffer).

**National Science Foundation** Course, Curriculum and Learning Improvement (CCLI) Grant, 09/01/09-08/31/12 for research on “Professional practice simulations for engaging, educating and assessing undergraduate engineers” **Role: Co-PI** (PI: Shaffer).

**National Science Foundation** Nanotechnology Undergraduate Education (NUE) Grant, 09/01/09-08/31/12 for research on “A Nanotechnology certificate program for engineering undergraduates” **Role: Co-PI** (PI: Crone).

**National Science Foundation** Educational Research Grant, 09/01/07 – 08/31/10 for research on “Aligning Educational Experiences with Ways of Knowing Engineering: Improving Learning from Middle School through Professional Practice.” **Role: Consultant** (PI: Courter).

**National Science Foundation** Collaborative Research Advance Leadership Award, 09/01/04 – 08/31/07: Leadership Skills and Community-Building Program for Junior Women Faculty in Engineering. PIs: Hobson and Guerlain; **Role: Consultant**.

**Engineering Information Foundation**, 01/01/01 – 12/31/03: Leadership Skills and Community-Building Program for Junior Women Faculty in Engineering. **Role: PI**.

Intra-Mural Engineering Education/Mentoring Grants Funded:

**College of Engineering 2012 Berndt Technology Enhanced Learning Proposal** for research on “Engineering Epistemic Games in Introduction to Engineering (InterEgr 101)” **Role: PI**.

**College of Engineering 2010 Proposal** for research on “Integrating Professional Development into Undergraduate Design and Research Experiences” **PI: Crone; Role: Co-PI**.

Peer-Reviewed Engineering Education/Mentoring Publications:

*Publications in Refereed Journals related to Education (JE):*

**In Review**

Arastoopour G, Linderoth J, Chesler NC, Shaffer DW. Data-Enabled Cognitive Modeling: Validating student engineers’ fuzzy design-based decision-making

**In Press/In Print**

- JE11. Markovetz MR, Clark RM, Swiecki Z, Arastoopour G, Chesler NC, Shaffer DW, Bodnar CA. Influence of End Customer Exposure on Product Design within an Epistemic Game Environment. *Advances in Engineering Education*, 2016.
- JE10. Arastoopour G, Shaffer DW, Swiecki Z, Ruis JR, Chesler NC. Teaching and Assessing Engineering Design Thinking with Virtual Internships and Epistemic Network Analysis *International Journal of Engineering Education*, 2015.
- JE9. Chesler NC, Ruis AR, Collier W, Swiecki Z, Arastoopour G and Shaffer DW. A Novel Paradigm for Engineering Education: Virtual internships with individualized mentoring and automated assessment of engineering thinking. *Journal of Biomechanical Engineering*, 2015.
- JE8. Arastoopour, G, Chesler, NC and Shaffer, DW. Epistemic Persistence: A Simulation-Based Approach to Increasing Participation of Women in Engineering. *Journal of Women and Minorities in Science and Engineering*, 2014.
- JE7. Nelson, R., Chesler, N.C. and Strang, K. Development of concept-based physiology lessons for biomedical engineering undergraduate students. *Advances in Physiology Education*. 37(2):176-83, 2013.
- JE6. Chesler, N.C., Arastoopour, G., D'Angelo, C.M., Bagley, E.A., and Shaffer, D.W., Design of a Professional Practice Simulator for Educating and Motivating First-Year Engineering Students. *Advances in Engineering Education*. 3(3), 2013.
- JE5. Chesler, N.C., Barabino, G., Bhatia, S.N. and Richards-Kortum, R. The pipeline still leaks and more than you think: A status report on gender diversity in biomedical engineering *Annals of Biomedical Engineering*. May;38(5):1928-35, 2010.
- JE4. Anderson, J.J Goplen, C. Murray, L., Seashore, K., Soundarrajan, M., Lokuta, A., Strang, K., and Chesler, N.C. Human Respiratory Mechanics Demonstration Model. *Advances in Physiology Education* 33: 53-59, 2009.
- JE3. Chesler, N.C. and Chesler, M.A. Theater as a Community-Building Strategy for Women in Engineering: Theory and Practice. *Journal of Women and Minorities in Science and Engineering*, 11(1): 83-95, 2005.
- JE2. Chesler, N.C. Single, P.B. and Mikic, B. On Belay: Peer-Mentoring and Adventure Education for Women Faculty in Engineering. *Journal of Engineering Education*, 92(3):257-262, 2003.
- JE1. Chesler, N.C. and Chesler, M.A. Gender-informed mentoring strategies for women in engineering: On establishing a caring community. *Journal of Engineering Education*, Jan 91(1): 49-56, 2002.

*Other Peer-Reviewed Publications related to Education (E):*

- E19. Arastoopour, G., Collier, W., Chesler, N.C., Linderoth, J., and Shaffer, D.W. Measuring the Complexity of Simulated Engineering Design Problems. *American Society of Engineering Education Proceedings*. Seattle, WA, June 14-17, 2015.
- E18. Arastoopour, G., Swiecki, Z., Chesler, N.C., & Shaffer, D.W. Epistemic Network Analysis as a Tool for Engineering Design Assessment. *American Society of Engineering Education Proceedings*. Seattle, WA, June 14-17, 2015.

- E17. Arastoopour, G., Shaffer, D.W., Swiecki, Z., Ruis, A.R., & Chesler, N.C. Teaching and Assessing Engineering Design Thinking with Virtual Internships and Epistemic Network Analysis. Harvey Mudd Design Workshop. Claremont, CA, May 28-30, 2015.
- E16. Arastoopour, G., Chesler, N., D'Angelo, C.M., Opgenorth, J., Reardan, C., Haggerty, N., Lepak, C., and Shaffer, D.W. Epistemic persistence: A simulation-based approach for increasing women in engineering. American Educational Research Association Proceedings. San Francisco, CA, April 27-May 1, 2013.
- E15. Arastoopour, G., Chesler, N., and Shaffer, D. W. A simulation-based approach for increasing women in engineering. Computer Supported Collaborative Learning Proceedings. Madison, WI, June 15-June 19, 2013.
- E14. Arastoopour, G., Chesler, N.C., D'Angelo, C., Opgenorth, J., Reardan, C., Haggerty, N., Lepak, C. and Shaffer, D.W. Nephrotex: Measuring first-year students' ways of professional engineering thinking in a virtual internship. American Society of Engineering Education Conference Proceedings. San Antonio, TX, June 10-13, 2012.
- E13. Chesler, N.C., Arastoopour, G., D'Angelo, C. and Shaffer, D.W. Use of a professional practice simulation in a first year Introduction to Engineering course. American Society of Engineering Education Conference Proceedings. Vancouver, CA, June 26-29, 2011.
- E12. Chesler, N.C., Brace, C. and Tompkins, W. Learning Assessment in a Design-Throughout-the-Curriculum Program. American Society of Engineering Education Conference Proceedings. Vancouver, CA, June 26-29, 2011.
- E11. D'Angelo, C., Shaffer, D.W. and Chesler, N.C. Engaging in a Professional Practice Simulation for Undergraduate Engineers. American Society of Engineering Education Conference Proceedings. Vancouver, CA, June 26-29, 2011.
- E10. Chesler, N.C. Bagley, E., Breckenfeld, E., West, D. and Shaffer, D.W. Professional practice simulation for undergraduate engineers: A tool for engaging, educating and assessing. American Society of Engineering Education Conference Proceedings. Louisville, KY, June 20-23, 2010.
- E9. Chesler, N.C., Barabino, G., Bhatia, S.N. and Richard-Kortum, R. The pipeline still leaks and more than you think: A status report on gender diversity in biomedical engineering. American Society of Engineering Education Conference Proceedings. Louisville, KY, June 20-23, 2010.
- E8. Cadwell, K.D., Zenner, G.M., Chesler, N.C. and Crone, W.C. Developing undergraduate student design skills using online video modules and active learning exercises. American Society of Engineering Education Conference Proceedings. Austin, TX, June 14-17, 2009.
- E7. Nelson, R.J. and Chesler, N.C. Considering Mathematical Approach and Course Content Structure When Teaching Physiology to Biomedical Engineers. American Society of Engineering Education Conference Proceedings. Austin, TX, June 14-17, 2009.
- E6. Tompkins, W.J., Block, W.F., Chesler, N.C., Masters, K.S., Murphy, W.L., Tyler, M.E., and Webster, J.G. Development of Professional Communication Skills Throughout the BME Curriculum. American Society of Engineering Education Conference Proceedings. Hawaii, HI 2007.
- E5. Chesler, N.C. and Tompkins, W.J. Encouraging non-BME Engineering Majors to Study Biology. American Society of Engineering Education Conference Proceedings. Chicago, IL, 2006.

- E4. Chesler, N.C., Hall, L. and Chesler, M. A. Acting Up: Using Theater to Discuss the Career Struggles of Women Faculty in Engineering. American Society of Engineering Education Conference Proceedings, Salt Lake City, UT. June, 2004.
- E3. Chesler, N.C. and Riley, D. The Art of Engineering: Using Fine Arts to Discuss the Lives of Women Faculty in Engineering. American Society of Engineering Education Conference Proceedings, Salt Lake City, UT. June, 2004.
- E2. Chesler, N.C., Single, P.B. and Mikic, B. Peer-Mentoring for untenured women faculty: A Leadership skills and community-building workshop. American Society of Engineering Education Conference Proceedings, Montreal, QC. June, 2002.
- E1. Chesler, N.C. and Chesler, M. A. Mentoring undergraduate women in engineering: Lessons learned from the sociology of gender. American Society of Engineering Education Conference Proceedings, Albuquerque, NM. June, 2001.

### Courses Taught:

- BME 505 Biofluidics. Spring 2004, Spring 2005, Spring 2006, Spring 2007, Spring 2008, Spring 2010, Spring 2012, Spring 2013, Spring 2014, Spring 2015, Spring 2017.
- BME Design course. Spring 2003, Fall 2003, Spring 2004, Spring 2006, Spring 2007, Fall 2007, Spring 2008, Fall 2009, Spring 2010, Fall 2010, Fall 2011, Fall 2014.
- Biomedical Engineering (BME)/CBE 517 Biology in Engineering Seminar, Fall 2005 (as BME 601), Fall 2006, Fall 2007, Spring 2008, Fall 2009

### Professional Development:

- |             |                                                                                                                                                                                             |
|-------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 2017-2019   | Member, Denise D. Denton Emerging Leader Award Committee                                                                                                                                    |
| 2016-2018   | Member, Denise D. Denton Workshop Organizing Committee                                                                                                                                      |
| 2014-2016   | Member, Frontiers in Engineering Education Advisory Board                                                                                                                                   |
| 2013-2014   | Fellow, Executive Leadership Program in Academic Technology and Engineering (ELATE) Program                                                                                                 |
| 2013-2016   | Vice Chair, Department of Biomedical Engineering                                                                                                                                            |
| 2013        | Co-Chair, Big 10 Women's Workshop                                                                                                                                                           |
| 2012        | BMES Annual conference invited Session Chair                                                                                                                                                |
| 2010        | Co-Chair, Big 10 Women's Workshop                                                                                                                                                           |
| 2009        | Track chair (Cardiovascular) for Biomedical Engineering Society Int'l Conference                                                                                                            |
| 2007        | Local arrangements chair for ASME Summer Bioengineering Conference                                                                                                                          |
| 2005        | Organizer for USNCB-Sponsored Frontiers in Biomechanics meeting                                                                                                                             |
| August 2003 | Developed faculty development program for women faculty members in engineering to enhance strategic career planning and build community for peer mentoring.                                 |
| August 2002 | Developed experiential learning program for women faculty members in engineering to emphasize writing skills and build community for peer mentoring.                                        |
| August 2001 | Developed Outward Bound experiential learning program for women faculty members in engineering in the Northeast Region to develop leadership skills and build community for peer mentoring. |
| August 1999 | Participant in NSF-sponsored New Century Scholars Workshop at Stanford University.                                                                                                          |
| July 1998   | Participant in NSF-sponsored Engineering Education Scholars Workshop at Carnegie Mellon University.                                                                                         |
| 1992-1995   | Teaching assistant for Fluid Dynamics (MIT), Pulmonary Physiology and Pathophysiology (Harvard Medical School) and Quantitative Physiology (MIT).                                           |

### Invited Talks

- College Seminar, Ashesi University, Ghana 2016
- Chemical Engineering and Engineering Education Seminar, Istanbul Technical University, 2016

Biomedical Engineering Seminar, Israel Institute of Technology - Technion, 2015  
 Biomedical Engineering Seminar Tel Aviv University, 2015  
 Harvey Mudd Design Workshop, 2015  
 North American Vascular Biology Organization (NAVBO) Vascular Matrix Biology and Bioengineering Workshop, 2015 (declined)  
 Biomedical Engineering Society, Invited presentation on online learning, San Antonio TX, 2014  
 Biomedical Engineering Department, Munich University of Applied Sciences, Munich Germany, 2014  
 Pulmonary Vascular Imaging Symposium, Sheffield, United Kingdom, 2014  
 Mathematical Biosciences Institute, The Ohio State University, 2014  
 Cardiac Physiome Symposium, Bar Harbor ME, 2013  
 International Union of Physiological Sciences Conference, Birmingham, United Kingdom, 2013  
 American Thoracic Society Scientific Session Podium Presentation, 2013  
 Medical College of Wisconsin, Department of Physiology, December 2012  
 Colorado State University Department of Mechanical Engineering, October 2012  
 American Thoracic Society Scientific Session Podium Presentation, 2012  
 Western Infirmary Pulmonary Unit, Glasgow Scotland, May 2009  
 Institute of Biomedical Engineering, Ghent University, Ghent Belgium, March 2009  
 Erasmus Hospital Pathophysiology Division, Brussels Belgium, February 2009  
 Fourth VUMC Scientific Meeting on Pulmonary Arterial Hypertension, Amsterdam, January 2009  
 Artery 8 International Symposium, Ghent, Belgium, September 2008  
 Design of Medical Devices 2008 Conference, April 2008  
 University of Wisconsin-Madison, Vascular Biology Seminar Series, October 2007  
 University of Wisconsin-Madison, Respiratory Neurobiology Seminar Series, April 2007  
 Texas A&M University, Department of Biomedical Engineering, May, 2006  
 Northwestern University, Department of Biomedical Engineering, November, 2005  
 University of Colorado Health Sciences Center, Pulmonary Hypertension Group, October, 2005  
 Marquette University, Department of Biomedical Engineering, October, 2005  
 University of Wisconsin-Madison, Vascular Biology Seminar Series, May 2005  
 University of Vermont, Vermont Lung Center Seminar, March 2005  
 University of Wisconsin-Madison, WISE living center Dinner Seminar, March 2004  
 University of Wisconsin-Madison, Chemical Engineering Department Seminar, December 2003  
 University of Wisconsin-Madison, Rheology Research Center Seminar, November 2003  
 University of Wisconsin-Madison, Cardiovascular Medicine Seminar, September 2003  
 University of Wisconsin-Madison, Vascular Biology Seminar, March 2003  
 University of Wisconsin-Madison, Department of Biomedical Engineering, January 2003  
 University of Michigan, Department of Biomedical Engineering, March 2002  
 University of California – Irvine, Department of Biomedical Engineering, April 2001  
 University of Illinois – Chicago, Department of Biomedical Engineering, March 2001  
 University of Wisconsin - Madison, Department of Biomedical Engineering, February 2001  
 State University of New York at Stony Brook, Dept. of Biomedical Engineering, January 2001  
 University of Pittsburgh, Department of Biomedical Engineering, December 2000  
 Northwestern University, Department of Biomedical Engineering, November 2000  
 Pennsylvania State University, Department of Biomedical Engineering, February 2000

## Professional Membership and Service Activities

### *Membership in Professional Societies:*

2010-present	Pulmonary Vascular Research Institute (PVRI)
2010-present	American Thoracic Society (ATS)
2005-present	Pulmonary Hypertension Clinicians and Researchers (PHCR)
2004-present	American Physiological Society (APS)
2000-present	American Society of Engineering Education (ASEE)
2000-present	Society of Women Engineers (SWE)
1999-present	Biomedical Engineering Society (BMES)
1996-present	American Society of Mechanical Engineers (ASME)

*Service to Professional Societies:*

2014-present	ASME Bioengineering Division Diversity and Inclusivity Committee Chair
2012-present	Associate Editor, Journal of Biomechanical Engineering
2013	Scientific Symposium organizer, ATS Int'l conference
2012	Scientific Symposium organizer, ATS Int'l conference
2011-present	Editorial Board, Pulmonary Circulation
2010	Publications Chair for ASME Summer Bioengineering Conference
2009	Track Chair (Cardiovascular) for Biomedical Engineering Society Int'l Conference
2007-2015	BMES Ad Hoc committee on Diversity member
2007	Local Arrangements Chair for ASME Summer Bioengineering Conference (~650 attendees)
2005	Conference co-chair for USNCB Frontiers in Biomechanics
2001 – present	ASME Cell and Tissue Committee ASME Education Committee Liaison, Biofluids Committee
2001 – 2002	Acting President, ASME Green Mountain Section
2000 – 2004	ASME Bioengineering Division Student Paper Competition Committee; BS-level (2001), MS-level (2002), Ph.D-level (2003), Competition Chair (2004)
2000 – 2002	Treasurer, ASME Green Mountain Section Faculty Advisor, UVM SWE
1998 – present	ASME Biofluids Committee

*Service to University of Wisconsin-Madison:*

2014-present	Member, Committee on Committees
2013-present	Member, College of Engineering Educational Innovation Committee
2012-2013	Chair, Physical Sciences Divisional Committee
2010-2012	Member, Physical Sciences Divisional Committee
2012	Member, College of Engineering Dean Search committee
2012-present	Founder and Chair, Biomedical Engineering Diversity Committee
2010-2013	Member, Women Faculty Mentoring Program Advisory Board
2010-present	Mentor, Women Faculty Mentoring Program
2009-2012	Member, School of Medicine and Public Health Animal Care and Use Committee
2007-2012	Founder and Chair, Biomedical Engineering Assessment Committee
2004-present	Founder and Chair, Women in the Physical Sciences Motherhood Peer Mentoring Group
2002-2007	Co-Founder and Co-Chair, Junior Faculty Peer Mentoring Group

Mentoring/Supervision/Advising:*Post-Doctoral Fellows*

- Philip, Jenny, September 2017 – present. Mechanisms and mechanics of secondary pulmonary hypertension transition to reactivity
- Caneba, Christine, April 2014 – 2016. Mitochondrial dysfunction in pulmonary hypertension. AWARDED (DECLINED) NIH F32 Post-Doctoral Fellowship
- Liu, Aiping, June 2011 – 2016. Sex differences in pulmonary hypertension: Role of collagen metabolism. AWARDED AHA Post-Doctoral Fellowship January 2013-December 2015.
- Tian, Lian, January 2011 – 2014. Impact of arterial stiffening on hemodynamics in pulmonary and systemic hypertension.
- Bellofiore, Alessandro, August 2011 – 2014. Exercise hemodynamics as a predictor of mortality in PAH.
- Wang, Zhijie. March 2008 – 2013. AWARDED AHA Post-Doctoral Fellowship January 2009-December 2011. Impact of collagen content and cross-linking on arterial viscoelasticity
- Roldan, Alejandro. September 2008 – August 2010. Impact of pulmonary hypertension on cardiopulmonary status: Animal and human studies



*Doctor of Philosophy Degree:*

- Pewowaruk, Ryan. Doctoral Program in Biomedical Engineering. Thesis project titled “Fluid-structure interactions in the proximal pulmonary vasculature.”
- Tik-Chee Jenny Cheng. Doctoral Program in Biomedical Engineering. Thesis project titled “Sex differences in right ventricular dysfunction.”
- Mulchrone, Ashley. Doctoral Program in Biomedical Engineering. Thesis project titled “Right ventricular failure secondary to volume overload in a mouse model of tricuspid valve regurgitation.”
- Schreier, David. Doctoral Program in Biomedical Engineering. Thesis project titled “Role of collagen in progressive right ventricular dysfunction in pulmonary hypertension.”
- Golob, Mark. Successfully obtained Doctor of Philosophy (PhD) degree in Material Sciences Program April 2017. Thesis project titled “Biomechanical analyses of ventricular and vascular function in disease models.”
- Forouzan, Omid. Successfully obtained Doctor of Philosophy (PhD) degree in Biomedical Engineering December 2016. Thesis project titled “MRI measurement of the effect of exercise on the pulmonary vasculature.”
- Nelson, Regina. Successfully obtained Doctor of Philosophy (PhD) degree in Biomedical Engineering August 2013. Thesis project titled “Ways of teaching physiology: qualitative vs. quantitative and systems vs. concept maps.”
- Vanderpool, Rebecca. Successfully obtained Doctor of Philosophy (PhD) degree in Biomedical Engineering August 2010. Thesis project titled “Pulmonary vascular impedance changes with hypoxia-induced hypertension: experiments and modeling.”
- Tabima Martinez, Diana Marcela. Successfully obtained Doctor of Philosophy (PhD) degree in Biomedical Engineering August 2010. Thesis project titled “Impact of collagen type I on ventricular-vascular coupling in a mouse model of pulmonary hypertension.”
- Roldan-Alzate, Alejandro. Successfully obtained Doctor of Philosophy (PhD) degree in Mechanical Engineering August 2008. Thesis project titled “Simulation of physiological flows.”

*Master of Science Degree:*

- Dinges, Eric. M.S. in Biomedical Engineering, May 2016. Thesis project titled “Cardiovascular dysfunction and development of an MRI-compatible recumbent ergometer.”
- McConnell, Kevin, M.S. in Biomedical Engineering, May 2015 (non-thesis)
- Ooi, Chen Yen, M.S. in Biomedical Engineering, August 2008 for thesis project titled “Role of collagen type I in pulmonary artery stiffening with pulmonary hypertension.”
- Sprague, Benjamin, M.S. in Biomedical Engineering, August 2008 for thesis project titled “Uterine vascular mechanical and hemodynamic changes in pregnancy.”
- DeWall, Ryan, M.S. in Biomedical Engineering, December 2007 for thesis project titled “Role of smooth muscle cell tone in carotid artery mechanics.”
- Estrada, Kristine, M.S. in Biomedical Engineering, May 2005 for thesis project titled “The effect of hypoxia-induced pulmonary hypertension on gene expression collagen and its regulators in heart and lung tissue.”
- Tuchscherer, Holly, M.S. in Biomedical Engineering, May 2005 for thesis project titled “Pulmonary vascular impedance changes with hypoxia-induced hypertension and pulmonary embolism.”
- Leach, Crystal, M.S. in Biomedical Engineering, August 2004 non-thesis project titled “Aortic residual strain in mice with and without a full complement of elastin.”
- Ander, Sarah, M.S. in Biomedical Engineering, May 2004 for thesis project titled “Permeability of human saphenous veins to fluid and particles ex vivo: implications for vascular gene therapy delivery.”
- Kobs, Ryan, M.S. in Biomedical Engineering, May 2004 for thesis project titled “Biomechanics of normal and remodeled mouse pulmonary arteries.”

*Undergraduate Project Advising (non-thesis):*

- Fantl, Kevin, Spring 2017. Measurements of cardiac structure in genetically engineered mice.
- Mataczynski, Callie, Fall 2016 – present. Matlab modeling of the circulation: sensitivity analyses.
- Shumaker, Heather, Fall 2015 – 2017. Matlab modules for cardiovascular function
- Patnaik, Rohan, Spring 2017.
- Loi, Bilin, Fall 2014 – present. Multiple projects related to right ventricular consequences of pulmonary hypertension
- Johnston, James, Fall 2016 – present. Axial force measurements of mouse arteries.
- Wolf, Greg, Fall 2016 present. Large artery biomechanics: Applications to tissue engineering
- Wen, Ethan, Spring 2017. Measurements of cardiovascular structure.
- Restle, Grace, Spring 2017. Sickle cell disease in mice.
- Paulson, Ross, 2014-2015. System redesign for axial measurements of arterial biomechanics
- Kemnitz, John, 2015-2016. Impact of sickle cell disease on pulmonary hemodynamics.
- Prostrollo, Anthony, 2015-2017. Ventricular-vascular coupling measurements in mice.
- Anderson, Kyle, Summer 2013-2015. Matlab modeling of the pulmonary vasculature
- Warczytowa, Jared, Spring 2013-2015. MR imaging of hemodynamic changes with exercise
- Zimmerman, Todd, Spring 2013-2014. Isolated vessel tests in a mouse model of aging
- Boston, Madison, Summer 2013. Effects of sex and estrogen on pulmonary vascular remodeling
- Abid, Hinnah, September 2012-2015. Effect of pulmonary hypertension on collagen synthesis
- Henningson, Joseph, Summer 2012-2015. Right ventricular function changes with pulmonary hypertension. **UW-Madison Hilldale Awardee for Undergraduate Research**
- Cline, Jayden, Fall 2012 – Spring 2013. Impact of pulmonary hypertension on right ventricular biology
- Johnson, Rebecca, Fall 2012- Spring 2013. Role of collagen in pulmonary vascular disease
- Fantl, Carrie, Summer 2012. Right ventricular function changes with pulmonary hypertension
- Belognia, Daniel, Summer 2012. Right ventricular function changes with pulmonary hypertension
- Cai, Yishen, Fall 2011- present. Basic vascular biomechanics: theory and experiment
- McConnell, Kevin, Spring 2012. Role of collagen in age-related arterial stiffening
- Bloomquist, Alex, Fall 2011. Role of collagen cross-linking in pulmonary artery stiffening
- Lepak, Clayton, Spring 2011-Summer 2012. Second harmonic imaging for measuring vascular structure
- Krohn, Molly, Fall 2010-Fall 2011. Impact of chronic hypoxia on collagen-related gene regulation
- Clayman, Rebecca, Spring 2010-Spring 2011. Effect of sex on pulmonary vascular impedance
- Schreier, David, Spring 2010-2012. Role of collagen in ventricular-vascular coupling efficiency. Research won BS-level student paper competition at ASME national conference**
- Moses, Lindsey, Summer 2009. Effect of hypoxia and collagen content on arterial distensibility
- Balge, Nicholas, Summer, Fall 2008. Novel systems to measure vascular viscoelasticity
- Henao, Daniel, Summer, Fall 2008, Summer, Fall 2009. Vascular mechanical changes in sheep uterine arteries with first and multiple pregnancies
- Kim, Ah Ram, Spring, Summer, Fall 2008. Introduction to animal experimentation and studies on arterial rarefaction in isolated mouse lungs
- Anderson, Calvin, Fall 2007-present. Regulators of collagen content in mouse lungs and arteries: Effects of hypoxia-induced pulmonary hypertension
- Krupsky, Jaelyn, Fall 2007. Assays for collagen content in murine lungs.
- Ramos, Maria C, Summer 2007. Impact of aging on murine carotid artery structure and function.
- Lewis, Nina, Summer 2005. Setup and refine instrumentation to measure mouse pulmonary vascular impedance in response to dynamic, high frequency pressurization
- Frederick, Brian, Summer and Fall 2004. Setup and refine instrumentation to measure mouse pulmonary artery mechanical properties in response to dynamic, high frequency pressurization.
- Johnson, Chenara, Summer 2004. Experiments to measure gene-level changes in growth factors in pulmonary tissue in response to hypoxia-induced pulmonary hypertension.
- Webster, Eidan, Summer 2004. Experiments to measure pulmonary vascular impedance changes in response to hypoxia-induced pulmonary hypertension.
- Bou-Reslan, Hani, Spring 2004. Redesign and build chambers to expose mice to closed-loop controlled, low oxygen levels for 1 – 20 days.
- Harris, Matthew, Spring 2004. Redesign and build instrumentation to measure axial force changes in pressurized mouse pulmonary arteries.
- Webster, Eidan, Summer 2003. Experiments to measure pulmonary vascular tone in isolated pulmonary arteries.

- Kobs, Ryan, Summer 2002-2003. Setup and refine instrumentation to measure pressure, diameter, wall thickness and axial force changes in pressurized mouse pulmonary arteries. Research won BS-level student paper competition at ASME national conference**
- Williams, Kelly, Fall 2002. Critical journal article review on methods for investigating the role of shear stress on the development of intimal hyperplasia in human saphenous veins.