

## Kendall S Hunter

Associate Professor, Department of Bioengineering  
University of Colorado Denver, Anschutz Medical Campus  
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### Education

University of Colorado Health Sciences Center Denver, CO  
Postdoctoral Fellow 8/2004-11/2006 Advisor: Robin Shandas, PhD  
Initial Focus: Simulated Hemodynamics in Stiff and Compliant Pulmonary Vessels

University of Colorado at Boulder Boulder, CO  
MS (08/1996), PhD (12/2000): Mechanical Engineering Advisor: Thomas L. Geers, PhD  
Dissertation Title: *Global-Shape-Function Models of an Underwater Explosion Bubble*

New Mexico State University Las Cruces, NM  
BS (05/1993): Mechanical Engineering

### Professional Experience

06/2015 – current: **Associate Professor**, Department of Bioengineering University of Colorado at Denver, Anschutz Medical Campus

03/2010 – 06/2015: **Assistant Professor**, Department of Bioengineering University of Colorado at Denver, Anschutz Medical Campus

12/2006 – current: **Associate Professor (courtesy)** (Associate 2015-), Department of Pediatrics, Division of Cardiology. University of Colorado at Denver, Anschutz Medical Campus

Research focuses on soft tissue mechanics, clinical imaging, and animal models of pulmonary disease; teaching topics focus on programming, numerical methods, and engineering mechanics.

08/2002 – 08/2005: **Senior Engineer/Consultant**, Anteon Corporation, Mystic, CT

- Established/validated new surface-shock computational modeling approaches for naval architectures
- Provided engineering/theoretical support for the Underwater Shock Analysis Code
- Investigated discrete surface remesher for non-conformal overlaying finite-element (FE) meshes
- Developed and implemented method to couple displacement and force quantities acting on two non-conformal FE surface meshes

08/1994-08/2002: **Research Associate/Assistant**, University of Colorado at Boulder

Research focused on improving a computational structural loading model employed in underwater-shock simulation. Advisor: Prof. Thomas L. Geers

- Developed new analytic equations of motion, initial conditions, and radiated field for an underwater spherical bubble; implemented model in USA code
- Investigated and implemented boundary-element model for deformational motion of an underwater bubble in incompressible and compressible fluids



## Refereed Publications

[Underlined names: Dr Hunter provided co-mentoring; *italics + underlined* names, Dr Hunter was primary mentor; \*asterisk indicate co-first author or co-senior author/co-mentor]

### Journal Publications (ordered by Epub Date/PMID)

#### 2019

1. Gold J, Akazawa Y, Sun M, **Hunter KS\***, Friedberg MK. Relation between right ventricular wall stress, fibrosis and function in right ventricular pressure loading. Am J Physiol Heart Circ Physiol. 2019 Dec 30. doi: 10.1152/ajpheart.00343.2019. [Epub ahead of print]. **PMID: 31886720**
2. DiMaria M, Campbell KR, Burkett DA, Younoszai AK, Landeck BF, Mertens L, Ivy DD, **Hunter KS\***, Friedberg MK\*. Parameters of Right Ventricular Function Reveal Ventricular-Vascular Mismatch as Determined by Right Ventricular Stroke Work Versus Pulmonary Vascular Resistance in Children with Pulmonary Hypertension, J Am Soc Echocardiogr. 2019 Dec 10. pii: S0894-7317(19)30993-9. doi: 10.1016/j.echo.2019.09.013. [Epub ahead of print]. **PMID: 31836268**
3. Breeman KTN, Dufva M, Ploegstra MJ, Kheyfets V, Willems TP, Wigger J, **Hunter KS**, Ivy DD, Berger RMF, Truong U. Right ventricular-vascular coupling ratio in pediatric pulmonary arterial hypertension: A comparison between cardiac magnetic resonance and right heart catheterization measurements. Int J Cardiol. 2019 Oct 15; 293:211-217. **PMID: 31109778**
4. Schäfer M, Ivy DD, Abman SH, Stenmark K, Browne LP, Barker AJ, Mitchell MB, Morgan GJ, Wilson N, Shah A, Kollengode M, Naresh N, Fonseca B, DiMaria M, Buckner JK, **Hunter KS**, Kheyfets V, Fenster BE, Truong U. Differences in pulmonary arterial flow hemodynamics between children and adults with pulmonary arterial hypertension as assessed by 4D-flow CMR studies. Am J Physiol Heart Circ Physiol. 2019 May 1;316(5):H1091-H1104. **PMID: 30822118**

#### 2018

5. Schäfer M, Younoszai A, Truong U, Browne LP, Mitchell MB, Jaggars J, Campbell DN, **Hunter KS**, Ivy DD, Di Maria MV. Influence of aortic stiffness on ventricular function in patients with Fontan circulation. J Thorac Cardiovasc Surg. 2019 Feb;157(2):699-707. doi: 10.1016/j.jtcvs.2018.09.039. **PMID: 30396734**
6. Lopez C, Mertens L, Dragulescu A, Landeck B, Younoszai A, Friedberg MK, **Hunter K**, Di Maria MV. Strain and Rotational Mechanics in Children With Single Left Ventricles After Fontan. J Am Soc Echocardiogr. 2018 Dec;31(12):1297-1306. doi: 10.1016/j.echo.2018.09.004. **PMID: 30344011**
7. Schäfer M, Wilson N, Ivy DD, Ing R, Abman SH, Browne L, Morgan G, Ross M, McLennan D, Barker A, Fonseca B, Di Maria M, **Hunter KS**, Truong U. Non-invasive Wave Intensity Analysis Predicts Functional Worsening in Children with Pulmonary Arterial Hypertension. Am J Physiol Heart Circ Physiol. 2018 Oct 1;315(4):H968-H977. doi: 10.1152/ajpheart.00227.2018. **PMID: 30004811**
8. Scalzo RL, Knaub LA, Hull SE, Keller AC, **Hunter K**, Walker LA, Reusch JEB. Glucagon-like peptide-1 receptor antagonism impairs basal exercise capacity and vascular adaptation to aerobic exercise training in rats. Physiol Rep. 2018 Jul;6(13):e13754. doi: 10.14814/phy2.13754. **PMID: 29984491**
9. Mastej EJ, DeBoer EM, Humphries SM, Cook MC, **Hunter KS**, Liptzin DR, Weinman JP, Detering RR. Lung and airway shape in neuroendocrine cell hyperplasia of infancy. Pediatr Radiol. 2018 Nov;48(12):1745-1754. doi: 10.1007/s00247-018-4189-6. **PMID: 29955904**

10. Friesen RM, Schäfer M, Ivy DD, Abman SH, Stenmark K, Browne LP, Barker AJ, **Hunter KS**, Truong U. Proximal pulmonary vascular stiffness as a prognostic factor in children with pulmonary arterial hypertension. *Eur Heart J Cardiovasc Imaging*. 2019 Feb 1;20(2):209-217. doi: 10.1093/ehjci/jey069. **PMID: 29788051**
  11. Schäfer M, Truong U, Ivy DD, Fonseca B, Malone L, DiMaria M, Barker AJ, Vargas D, **Hunter KS**, Jone PN, Browne LP. Children with kawasaki disease present elevated stiffness of great arteries: Phase-contrast MRI study. *J Magn Reson Imaging*. 2018 Nov;48(5):1228-1236. doi: 10.1002/jmri.26167. Epub 2018 Apr 29. **PMID: 29707843**
  12. Schäfer M, Browne LP, Truong U, Jagers JJ, Mitchell MB, Malone L, Morgan G, Chatfield K, McLennan D, Turbendian H, Vargas D, Fonseca B, DiMaria M, Shah A, Ivy MP, Barker AJ, **Hunter KS**, Wilson N, Ivy DD, Campbell DN. Aortic stiffness in adolescent Turner and Marfan syndrome patients. *Eur J Cardiothorac Surg*. 2018 Nov 1;54(5):926-932. doi: 10.1093/ejcts/ezy168. **PMID: 29684119**
  13. Schäfer M, Morgan GJ, Mitchell MB, Ross M, Barker AJ, **Hunter KS**, Fonseca B, DiMaria M, Vargas D, Ivy DD, Wilson N, Browne LP. Impact of different coarctation therapies on aortic stiffness: phase-contrast MRI study. *Int J Cardiovasc Imaging*. 2018 Apr 17; 34(9):1459-1469. **PMID: 29667078**
  14. Wagner J, Landeck B, **Hunter K**. Quantification of Left Ventricular Shape Differentiates Pediatric Pulmonary Hypertension Subjects from Matched Controls. *ASME J of Medical Diagnostics* Feb 2018, 1(1): 011007.
  15. Schäfer M, Collins KK, Browne LP, Ivy DD, Abman S, Friesen R, Frank B, Fonseca B, DiMaria M, **Hunter KS**, Truong U, von Alvensleben JC. Effect of electrical dyssynchrony on left and right ventricular mechanics in children with pulmonary arterial hypertension. *J Heart Lung Transplant*. 2018 Feb 6; 37(7):870-878. **PMID: 29496397**
- 2017**
16. Schäfer M, Barker AJ, Kheyfets V, Stenmark KR, Crapo J, Yeager ME, Truong U, Buckner JK, Fenster BE\*, **Hunter KS\***. Helicity and Vorticity of Pulmonary Arterial Flow in Patients With Pulmonary Hypertension: Quantitative Analysis of Flow Formations. *J Am Heart Assoc*. 2017 Dec 20;6(12). pii: e007010. doi: 10.1161/JAHA.117.007010. **PMID: 29263034**
  17. Schäfer M, Truong U, Browne LP, Morgan GJ, Ross M, Ing R, **Hunter KS**, Kheyfets VO, Abman SH, Ivy DD, Wilson N. Measuring Flow Hemodynamic Indices and Oxygen Consumption in Children with Pulmonary Hypertension: A Comparison of Catheterization and Phase-Contrast MRI. *Pediatr Cardiol*. 2017 Oct 17; 39(2):268-274. **PMID: 29043395**
  18. Schäfer M, Kheyfets VO, Barker AJ, Stenmark K, **Hunter KS**, McClatchey PM, Buckner JK, Reece TB, Jazaeri O, Fenster BE. Reduced shear stress and associated aortic deformation in the thoracic aorta of patients with chronic obstructive pulmonary disease. *J Vasc Surg*. 2017 Oct 3; 68(1):246-253. **PMID: 28986100**
  19. Kheyfets VO, Sucharov CC, Truong U, Dunning J, **Hunter K**, Ivy D, Miyamoto S, Shandas R. Circulating miRNAs in Pediatric Pulmonary Hypertension Show Promise as Biomarkers of Vascular Function. *Oxid Med Cell Longev*. 2017;2017:4957147. doi: 10.1155/2017/4957147. Epub 2017 Jul 27. **PMID: 28819545**
  20. Schäfer M, Humphries S, Stenmark KR, Kheyfets VO, Buckner JK, **Hunter KS\***, Fenster BE\*. 4D-flow cardiac magnetic resonance-derived vorticity is sensitive marker of left ventricular diastolic

dysfunction in patients with mild-to-moderate chronic obstructive pulmonary disease. *Eur Heart J Cardiovasc Imaging*. 2018 Apr 1;19(4):415-424. **PMID: 28460004**

21. Newman JH, Rich S, Abman SH, Alexander JH, Barnard J, Beck GJ, Benza RL, Bull TM, Chan SY, Chun HJ, Doogan D, Dupuis J, Erzurum SC, Frantz RP, Geraci M, Gillies H, Gladwin M, Gray MP, Hemnes AR, Herbst RS, Hernandez AF, Hill NS, Horn EM, **Hunter K**, Jing ZC, Johns R, Kaul S, Kawut SM, Lahm T, Leopold JA, Lewis GD, Mathai SC, McLaughlin VV, Michelakis ED, Nathan SD, Nichols W, Page G, Rabinovitch M, Rich J, Rischard F, Rounds S, Shah SJ, Tapson VF, Lowy N, Stockbridge N, Weinmann G, Xiao L. Enhancing Insights into Pulmonary Vascular Disease through a Precision Medicine Approach. A Joint NHLBI-Cardiovascular Medical Research and Education Fund Workshop Report. *Am J Respir Crit Care Med*. 2017 Jun 15;195(12):1661-1670. **PMID: 28430547**
22. Patel AC, Dodson RB, Cornwell WK III, **Hunter KS**, Cleveland JC Jr, Brieke A, Lindenfeld J, Ambardekar AV. Dynamic Changes in Aortic Vascular Stiffness Among Patients Bridged to Transplant with Continuous-Flow Left Ventricular Assist Devices. *JACC Heart Fail*. 2017 Jun;5(6):449-459. **PMID: 28285118**
23. Schäfer M, Ivy DD, Abman SH, Barker AJ, Browne LP, Fonseca B, Kheifets VO, **Hunter KS\***, Truong U\*. Apparent Aortic Stiffness in Children with Pulmonary Arterial Hypertension: Existence of Vascular Interdependency? *Circ Cardiovasc Imaging*. 2017;10(2): e005817. **PMID: 28193613**
24. Madhavan K, Frid M, **Hunter K**, Shandas R, Stenmark K, Park D. Development of an electrospun biomimetic polyurea scaffold suitable for vascular grafting. *J Biomed Mater Res B Appl Biomater*. 2017 Jan 27; 106(1):278-290. **PMID: 28130878**

## 2016

25. Kheifets VO, Dunning J, Truong U, Ivy DD, **Hunter KS**, Shandas R. A Zero-Dimensional Model and Protocol for Simulating Patient-Specific Pulmonary Hemodynamics From Limited Clinical Data. *J Biomech Engr* 2016 Dec 1;138(12): 121001. **PMID: 27684888**
26. Vanderpool R, Rischard F, Naeije R, **Hunter K**, Simon MA. Simple functional imaging of the right ventricle in pulmonary hypertension: can right ventricular ejection fraction be improved? *Int J Cardiol* 2016. Nov 15;223:93-94 **PMID: 27532240**
27. Kheifets VO, Schäfer M, Podgorski CA, Schroeder JD, Browning J, Hertzberg J, Buckner JK, **Hunter KS**, Shandas R, Fenster BE. 4D magnetic resonance flow imaging for estimating pulmonary vascular resistance in pulmonary hypertension. *J Magn Reson Imaging*. 2016 Oct;44(4):914-22 **PMID: 27173445**
28. Schäfer M, Ivy DD, Barker AJ, Kheifets V, Shandas R, Abman SH, **Hunter KS\***, Truong U\*. Characterization of CMR-derived Haemodynamic Data in Children with Pulmonary Arterial Hypertension. *Eur Heart J Cardiovasc Imaging*. 2017 Apr 1;18(4):424-431 **PMID: 27444679**
29. McClatchey PM Jr, Schäfer M, **Hunter KS**, Reusch JE. The Endothelial Glycocalyx Promotes Homogeneous Blood Flow Distribution within the Microvasculature. *Am J Physiol Heart Circ Physiol*. 2016 Jul; 311(1):H168-76. **PMID: 27199117**
30. Humphries SM, **Hunter KS**, Shandas R, Deterding RR, DeBoer EM. Analysis of pediatric airway morphology using statistical shape modeling. *Med Biol Eng Comput*. 2016 Jun;54(6):899-911. **PMID: 26718559**

31. Schäfer M, Browning J, Schroeder JD, Shandas R, Kheifets VO, Buckner JK, **Hunter KS**, Hertzberg J, Fenster BE. Vorticity is a Marker of Diastolic Ventricular Interdependency in Pulmonary Hypertension. *Pulm Circ.* 2016 Mar;6(1):46-54. **PMID: 27162613**
32. Schäfer M, Kheifets VO, Schroeder JD, Dunning J, Shandas R, Buckner JK, Browning J, Hertzberg J, **Hunter KS\***, Fenster BE\*: Main pulmonary arterial wall shear stress correlates with invasive hemodynamics and stiffness in pulmonary hypertension. *Pulm Circ.* 2016 Mar;6(1):37-45. **PMID: 27076906**
33. Schäfer M, Myers C, Brown RD, Frid MG, Tan W, **Hunter K**, Stenmark KR. Pulmonary Arterial Stiffness: Toward a New Paradigm in Pulmonary Arterial Hypertension Pathophysiology and Assessment. *Curr Hypertens Rep.* 2016 Jan;18(1):4. **PMID: 26733189**

#### 2015

34. Mandell E, Powers KN, Harral JW, Seedorf GJ, **Hunter KS**, Abman SH, Dodson RB. Intrauterine endotoxin-induced impairs pulmonary vascular function and right ventricular performance in infant rats and improvement with early vitamin D therapy. *Am J Physiol Lung Cell Mol Physiol.* 2015 Dec 15;309(12):L1438-46. **PMID: 26475735**
35. Kheifets V, Dunning J, Troung U, Ivy DD, **Hunter K**, Shandas R: Assessment of NT-proBNP as a measure of vascular/ventricular function in pediatric PAH. *Pulm Circ* 2015; 5(4): 658-666. **PMID: 26697173**
36. Truouq UT, Patel S, Kheifets V, Fonseca B, Dunning J, Barker AJ, Ivy DD, Shandas R, **Hunter KS**: Non-invasive determination of right ventricular-vascular coupling in children and adolescents with Pulmonary Hypertension. *J Cardiovasc Magn Reson.* 2015 Sep 16;17(1):81 **PMID 26376972**
37. DiMaria MV, Burkett DA, Younoszai AK, Landeck BF, Mertens L, Ivy DD, Friedberg MK\*, **Hunter KS\***: Echocardiographic Estimation of Right Ventricular Stroke Work in Children with Pulmonary Arterial Hypertension: Comparison to Invasive Measurements. *J Am Soc Echo.* 2015; 28(11):1350-1357 **PMID 26299333**
38. Ambardekar AV, **Hunter KS**, Babu AN, Tuder RM, Dodson RB, Lindenfeld J: Changes in Aortic Wall Structure, Composition, and Stiffness with Continuous-Flow Left Ventricular Assist Devices. *Circ Heart Fail.* 2015 Sep;8(5):944-52. **PMID 26136459**

#### 2014

39. Tan W, Madhavan K, **Hunter KS**, Park D, Stenmark KR: Vascular Stiffening in Pulmonary Hypertension: Cause or Consequence? *Pulm. Circ.* 2014; 4(4): 560-580. **PMID 25610594**
40. Dodson R, Morgan M, Galambos C, **Hunter KS**, Abman S: Chronic Intrauterine Pulmonary Hypertension Increases Main Pulmonary Artery Stiffness and Adventitial Remodeling in Fetal Sheep. *Am. J. Physiol Lung Cell Molec.* 2014; 307(11): L822-L828. **PMID 25326575**
41. Schreier D, Liu A, **Hunter KS**, Hacker TA, Song G, Chesler N: The Impact of Increased Hematocrit on Right Ventricular Afterload in Response to Chronic Hypoxia. *Am. J. Appl. Physiol.* 2014; 117(8): 833-839. **PMID 25170068**
42. Di Maria MV, Younoszai A, Mertens L, Ivy DD, **Hunter KS\***, and Friedberg MK\*: Right Ventricular Stroke Work in Children with Pulmonary Arterial Hypertension: Estimation Based on Invasive Hemodynamic Assessment and Correlation with Outcomes. *Heart* 2014; 100(17): 1342-1347. **PMID 24780910**
43. Rogers NM, Yao M, Sembrat J, George MP, Knupp H, Ross M, Sharifi-Sanjani, M, Milosevic J, St. Croix C, Rajkumar R, Frid MG, **Hunter KS**, Mazzaro L, Novelli EM, Stenmark KR, Gladwin MT, Ahmad F,

Champion HC, Isenberg JS: Cellular, pharmacological and biophysical evaluation of the explanted lung from a patient with sickle cell disease and severe PAH. *Pulm Circ*, 2014; 3(4): 936-951. **PMID 25006410**

44. ~~Tan Y, Tseng P-O, Wang D, Zhang H, Hunter K, Hertzberg J, Stenmark K, Tan W: Stiffening-Induced High Pulsatility Flow Activates Endothelial Inflammation via a TLR2/NF- $\kappa$ B Pathway. *PLoS ONE* 2014; 9(7): e102195. **PMID 25029271**~~
45. **Hunter KS**, Fjield T, Heitzmann H, Shandas R, Kahook M: Characterization of Micro-Invasive Trabecular Bypass Stents by Ex Vivo Perfusion and Computational Flow Modeling. *Clinical Ophthalmology* 2014; 8: 499-506. **PMID 24648713**
46. Yunker BE, Dodd GD, Chen J, Chang S, Lanning CJ, Scherzinger A, Shandas R, Feng Y, and **Hunter KS**: The design and fabrication of two portal vein flow phantoms by different methods. *Medical Physics* 2014; 41(2): 023701. **PMID 24506653**
47. Dodson RB, Rozance PJ, Petrash CC, **Hunter KS\***, Ferguson VL\*: Thoracic and abdominal aortas stiffen through unique extracellular matrix changes in intrauterine growth restricted fetal sheep. *Am J Physiol Heart Circ Physiol*. 2014 Feb; 306(3):H429-37. **PMID 24322609**

### 2013

48. Su Z, Tan W, Shandas R, and **Hunter KS**: Influence of distal resistance and proximal stiffness on hemodynamics and RV afterload in progression and treatments of pulmonary hypertension: a computational study with validation using animal models. *Int J Numer Method Biomed Eng* 2013 Article ID 618326. **PMID 24367392**
49. Truong U, Fonseca B, Dunning J, Burgett S, Lanning C, Ivy DD, Shandas R, **Hunter K\***, Barker AJ\*: Wall shear stress measured by Phase Contrast-MRI in children and adolescents with pulmonary arterial hypertension. *J Cardiovasc Magn Reson* 2013, 15:81. **PMID 24034144**
50. Yunker BE, Cordes D, Scherzinger A, Dodd G, Shandas S, Feng Y, and **Hunter KS**: An evaluation of silicone and polyurethane molding compounds for use in 3D ultrasound, MRI and CT imaging phantoms. *Medical Physics* 2013; 40(5): 052905. **PMID 23635298**
51. Mertens L and **Hunter KS**: Imaging Right Ventricular Shape and Remodeling. *Eur Heart J Cardiovasc Imaging* 2013; 14(4): 311-312. doi: 10.1093/ehjci/jes292 **PMID 23235988**
52. Dodson RB, Martin JT, **Hunter KS**, Ferguson VL: Determination of hyperelastic properties for umbilical artery in preeclampsia from uniaxial extension tests. *Eur J Obstet Gynecol Reprod Biol*. 2013 Jul;169(2):207-12 **PMID 23548660**
53. Dodson RB, Rozance PJ, Reina-Romo E, Ferguson VL\*, **Hunter KS\***: Hyperelastic remodeling in the intrauterine growth restricted (IUGR) carotid artery in the near-term fetus. *J Biomech*. 2013 Mar 15;46(5):956-63. **PMID 23332229**
54. Dodson RB, Rozance PJ, Fleenor BS, Petrash CC, Shoemaker LG, **Hunter KS\***, Ferguson VL\*: Increased stiffness and extracellular matrix reorganization in intrauterine growth restricted (IUGR) fetal sheep. *Ped Res* 2013 Feb; 73(2):147-54. **PMID 23154756**

### 2012

55. Reusser R, Lammers SR, Stenmark K, and **Hunter KS**. Validation of a Pressure Diameter Method for Determining Modulus and Strain of Collagen Engagement for Long Branches of Bovine Pulmonary Arteries. *J Biomech Eng* 2012; 134(5): 054501. **PMID 22757496**



56. Scott D, Su Z, **Hunter KS**, Li M, Shandas R, Tan W: A New Flow Co-culture System for Studying Mechanobiology Effects of Pulse Flow Waves. *Cytotechnology* 2012; Dec;64(6):649-66. **PMID 22526489**
57. Su Z, **Hunter KS**, and Shandas R. Impact of Pulmonary Vascular Stiffness and Vasodilator Treatment in Pediatric Pulmonary Hypertension: 21 Patient-Specific Fluid-Structure Interaction Studies. *Comput Methods Programs Biomed.* 2012 Nov; 108(2):617-28. **PMID 21975085**
58. Tian L, Lammers SR, Kao PH, Albietz JA, Stenmark KR, Qi HJ, Shandas R, **Hunter KS**. Impact of residual stretch and remodeling on collagen engagement in healthy and pulmonary hypertensive calf pulmonary arteries at physiological pressures. *Ann Biomed Eng* 2012; 40(7): 1419-1433. **PMID 22237861**

#### 2011

59. Lammers SR, Scott D, **Hunter KS**, Tan W, Shandas R, Stenmark KR: Mechanics and Function of the Pulmonary Vasculature: Implications for Pulmonary Vascular Disease and Right Ventricular Function. *Comprehensive Physiology* 2011; 2: 295-319. **PMID 23487595**
60. Tian L, Lammers SR, Kao PH, Reusser M, Stenmark KR, **Hunter KS**, Qi HJ, Shandas R. Linked opening angle and histological and mechanical aspects of the proximal pulmonary arteries of healthy and pulmonary hypertensive rats and calves. *Am J Physiol Heart Circ Physiol.* 2011; 301(5): H1810–H1818 **PMID 21856906**
61. **Hunter KS**, Lammers SR, Shandas R: Pulmonary Vascular Resistance and Compliance in Normal and Hypertensive Pulmonary Circulations. *Comprehensive Physiology* 2011; 1: 1413-1435.
62. Kao PH, Lammers SR, Tian L, **Hunter KS**, Stenmark KR, Shandas R, Qi HJ. A Microstructurally-Driven Model for Pulmonary Artery Tissue. *J Biomech Eng* 2011; 133(5): 0510002. **PMID 21599093**

#### 2010

63. **Hunter KS**, Feinstein JA, Ivy DD, Shandas R: Computational Simulation of the Pulmonary Arteries and its Role in the Study of Pulmonary Hypertension. *Prog Ped Card* 2010; 30(1): 63-69. **PMID 21499523**
64. Kao PH, Lammers SR, **Hunter KS**, Stenmark KR, Shandas R, and Qi HJ: Constitutive Modeling of Anisotropic Finite-Deformation Hyperelastic Behaviors of Soft Materials Reinforced by Tortuous Fibers. *International Journal of Structural Changes in Solids* 2010; 2(1):19-29. **PMID 21822502**
65. Tian L, **Hunter KS**, Kirby KS, Ivy DD, Shandas R: Measurement uncertainty in pulmonary vascular input impedance and characteristic impedance estimated from pulsed-wave Doppler ultrasound and pressure: clinical studies on 57 pediatric patients. *Physiol Meas* 2010; 31(6): 729-748. **PMID 20410558**
66. **Hunter KS\***, Albietz JA\*, Lee PF, Lanning CJ, Lammers SR, Hofmeister SH, Kao PH, Qi HJ, Stenmark KR, Shandas R: In-vivo Measurement of Proximal Pulmonary Vascular Stiffness in the Neonatal Calf Model of Pulmonary Hypertension: Ex-Vivo Validation and Clinical Application. *J Appl Physiol* 2010: 108(4): 968-974. **PMID 20093662**

#### 2009 and earlier

67. Chen J, **Hunter KS**, Shandas R: Wave scattering from encapsulated microbubbles subject to high-frequency ultrasound: contribution of higher-order scattering modes. *J Acoust. Soc. Am.* 2009; 126(4): 1766-1775. **PMID 19813791**
68. Lammers SR, Kao P, Qi HJ, **Hunter KS**, Lanning CJ, Albietz JA, Hofmeister SE, Mecham R, Stenmark KR, Shandas R: Changes in the structure-function relationship of elastin and its impact on the proximal

- pulmonary arterial mechanics of hypertensive calves. *Am J. Physiol* 2008; 295(4):H1451-9 **PMID 18660454**
69. **Hunter KS**, Gross JK, Lanning CJ, Kirby KS, Dyer KL, Ivy DD, Shandas R: Noninvasive Methods for Determining Pulmonary Vascular Function in Children with Pulmonary Arterial Hypertension: Application of a Mechanical Oscillator Model, *Congenital Heart Disease* 2008; 3(2): 106-116. **PMID 18380759**
70. **Hunter KS**, Lee PF, Lanning CJ, Ivy DD, Kirby KS, Claussen LR, Chan KC, Shandas R: Pulmonary Vascular Input Impedance is a Combined Measure of Pulmonary Vascular Resistance and Stiffness and Predicts Clinical Outcomes Better than PVR Alone in Pediatric Patients with Pulmonary Hypertension, *Am Heart J* 2008; 155(1): 166-174. **PMID 18082509**
71. Zhang Y, Dunn ML, **Hunter KS**, Lee PF, Lanning CJ, Ivy DD, Shandas R: Application of A Microstructural Constitutive Model of Pulmonary Artery to Patient-Specific Studies: Validation and Effect of Orthotropy, *J. Biomech Engr* 2007; 129(2): 193-201. **PMID 17408324**
72. **Hunter KS**, Lanning CJ, Zhang Y, Garg R, Ivy DD, Shandas R: Simulations of Congenital Defect Closure and Drug Reactivity Testing in Patient-Specific Models of the Pediatric Pulmonary Vasculature: A 3-D Numerical Study with Fluid-Structure Interaction, *J. Biomech Engr.* 2006; 128(4): 564-572. **PMID 16813447**
73. **Hunter KS**, Geers TL: Pressure and Velocity Fields Produced by an Underwater Explosion, *J. Acoust. Soc. Am.* 2004; 115 (4), pp. 1483-1496.
74. Geers TL, **Hunter KS**: An Integrated Wave-Effects Model for an Underwater Explosion Bubble, *J. Acoust. Soc. Am.* 2002; 111 (4), pp. 1584-1601

***Conference Abstracts/Presentations:***

1. Schäfer M, Frank B, Mitchel M, Jagers J, Browne LP, Barker AJ, Morgan GJ, **Hunter KS**, Ivy DD, Younouszai A, DiMaria MV. Principle Component Analysis of Flow Propagation Through Fontan Circulation Identifies Characteristics Associated with Single Ventricle Functional Performance. *Circulation*. Nov 2019;140:A11889.
2. Schäfer M, Frank B, Jacobsen R, Rausch CM, Mitchel M, Jagers J, Browne LP, Barker AJ, **Hunter KS**, Ivy DD, Younouszai A, DiMaria MV. Wave Propagation Through Systemic Vasculature is Abnormal in Patients With Fontan Circulation and Correlates with Functional Exercise Indices. *Circulation*. Nov 2019;140:A10453.
3. Muralidhar A, Hsu S, Mathai SC, Bull TM, Tedford RJ, **Hunter KS**. A Novel Comparison of a Multi-harmonic Approach to Estimate the Ventricular Vascular Coupling Ratio in Human Subjects. *Am J Respir Crit Care Med* 199; 2019: A2796.
4. Muralidhar A, Hsu S, Mathai SC, Bull TM, Tedford RJ, **Hunter KS**. Two Single-Beat Estimates of the Right Ventricular Maximum Isovolumic Pressure Compared to the Gold-Standard Multi-Beat Approach in Human Subjects. *Am J Respir Crit Care Med* 199; 2019: A2795.
5. DiMaria MV, Lopez C, Landeck BF, Younoszai AK, Dragulescu A, Friedberg MK, **Hunter K**, Mertens L. Single left ventricular diastolic function after Fontan: a distinct phenotype compared to age-matched controls. *J Am Soc Echocardiogr.* June 2018; 31(6):B41-42



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34. Schäfer M, Hunter KS, Buckner JK, Kheyfets V, Yeager M, Fenster B. Pulmonary Arterial Wall Shear Stress is a Marker of Pulmonary Arterial Hypertension. *JACC* 2015; 65(10S): A1560.
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74. Wang R, Lacour-Gayet FG, **Hunter KS**, Lanning CJ, Shandas R: Patient-Specific Fluid Structure Interaction Simulation Applied To Evaluating Hemodynamics Within The Total Cavopulmonary Connection. Abstract SBC2007-176494, Proc. 2007 Summer Bioengineering Conference, Keystone, CO, June 2007.
75. **Hunter KS**, Zhang Y, Lanning CJ, Ivy DD, Shandas R: Clinical and Numerical Studies Supporting Pulmonary Vascular Input Impedance as a Determinant of Global Vascular Stiffness in Pediatric Pulmonary Hypertension. Abstract BIO2006-157532, Proc. 2006 Summer Bioengineering Conference, Amelia Island, FL, June 2006.
76. Gross JK, Weber MW, **Hunter KS**, Shandas R: Effect of Orifice Shape on Bubble Formation in Microfluidic Devices: A Computational Fluid Dynamic Simulation Study. Abstract BIO2006-152692, Proc. 2006 Summer Bioengineering Conference, Amelia Island, FL, June 2006.
77. Zhang Y, **Hunter KS**, Lanning CJ, Ivy DD, Claussen L, Shandas R: A Microstructural Finite Element Model Applied to Three-Dimensional Patient-Specific Images of the Pulmonary Vasculature: A Novel Tool to Predict Structural Remodeling in Pulmonary Hypertension, *Am. Thor. Soc. Int. Conf.* May 2006.
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79. **Hunter KS**, Zhang Y, Lanning CJ, Ivy DD, Shandas R: Patient-Specific Simulations of Reactivity in Models of the Pulmonary Vasculature: A 3-D Numerical Study with Fluid-Structure Interaction, American Physical Society Division of Fluid Mechanics 58th Annual Meeting, Chicago, IL, Nov 20-22, 2005.
80. **Hunter KS**, Lanning CJ, DeGroff CG, Ivy DD, Wilson JP, Cai XC, Shandas R: Three-Dimensional Patient-Specific Simulation of Blood and Artery Motion in the Pediatric Pulmonary Vasculature under Normotensive and Hypertensive Conditions, SIAM Annual Meeting, New Orleans, LA, July 2005.
81. Zhang Y, Dunn ML, Ivy DD, Lee P-F, **Hunter KS**, Lanning CJ, Shandas R: Modeling Of Pulmonary Artery Mechanics in Children with Pulmonary Hypertension. Abstract 200722, Proc. 2005 Summer Bioengineering Conference, Vail, CO, June 2005.
82. **Hunter KS**, Lanning CJ, DeGroff CG, Ivy DD, Shandas R: Determination of Shear Stress in Patient Specific Models of the Pulmonary Vasculature through Numerical Simulation with Fluid-Structure Interaction. Abstract 171417, Proc. 2005 Summer Bioengineering Conference, Vail, CO, June 2005.



83. **Hunter KS**, Geers TL: First Order Bubble-Hull Interaction Analysis, 70th Shock and Vibration Symposium, Albuquerque, NM, 1999.
84. Geers TL, **Hunter KS**: Formulation of an Integrated Underwater-Explosion Bubble Model, 70th Shock and Vibration Symposium, Albuquerque, NM, 1999.
85. **Hunter KS**, Geers, TL: Doubly Asymptotic, Boundary-Element Calculation of Bubble Dynamics, (abstract) 5th U.S. National Congress on Computational Mechanics, Boulder, CO, 1999.
86. Geers TL, **Hunter KS**: Dilatational Dynamics of an Underwater Explosion Bubble", Proc. 67th Shock and Vibration Symposium, pp. 315-324, 1996.

### *Book Chapters*

1. Hobson N and Hunter KS. (2018) Chapter 5: Ventricular-Vascular Coupling in the Pulmonary Circulation, In Friedberg MK and Redington AN (Eds) *Right Ventricular Physiology, Adaptation and Failure in Congenital And Acquired Heart Disease*, Toronto ON, Springer.

## Non-Refereed Publications

### *Trade Journal Publications*

1. **Hunter KS**: Modern Medicine Takes Simulation to Heart. ANSYS Advantage 2007 1(1): 12-13.
2. Ueno K, Bye RE, **Hunter KS**: Compressor Efficiency Definitions. 2003, Vairex Corporation.

### *Major Commercial Software Contributions*

1. Fluid-Structure Transformation Coefficients for Non-Coincident Meshes, The Underwater Shock Analysis Code Version 6.27 (2005), Anteon Inc., Fairfax, VA.
2. Geers and Hunter Bubble: Combined Shock and Bubble Loading Model Version 2, The Underwater Shock Analysis Code Version 6.00 (2001), Anteon Inc., Fairfax, VA.
3. Geers and Hunter Bubble: Combined Shock and Bubble Loading Model Version 1, The Underwater Shock Analysis Code Version USA+1 (1997), Unique Software Applications, Colorado Springs, CO.

## Publications in Preparation

### *Submitted / In Revision*

(tupcoming senior author pubs)

1. Cornwell W et al, New Insights into Right Ventricular Performance in the Healthy Heart at Rest and During Activity through Generation of Real-Time Pressure-Volume Loops Using High-Fidelity Conductance Catheters, EURHEARTJ-D-19-02200
2. Cornwell W et al, Pressure-Volume Loop Assessment of Resting and Exertional Right Ventricular Performance Among Patients with CF-LVADs, JP-RP-2019-278907
3. Gold J et al†, Relation between right ventricular wall stress, fibrosis and myocardial function in right ventricular pressure loading, H-00343-2019
4. Scalzo R et al, Age-Related Attenuation of Aerobic Exercise Training Adaptation in 24 Week Old Rats, JP-RP-2019-277927
5. Dufva M et al, Pulmonary Arterial Banding in Mice is an Ideal Model for Studies on Ventricular Mechanics in Pediatric Pulmonary Arterial Hypertension, JCMR-D-19-00199

6. Schäfer M et al, Pulmonary Arterial Flow Profile Characteristics in Patients with Fontan Circulation are Associated with the Single Ventricle Dilation and Function: Principal Component Analysis Study, CIRCHF/2019/006461.

### *In Preparation*

7. Schäfer M et al, Patients with Fontan circulation have abnormal aortic wave propagation patterns: Wave Intensity Analysis Study [To be submitted Dec 2019 – Complete but submission delayed because of AHA abstract award]
8. Muralidhar A et al<sup>†</sup>, *Validation of the Kind Single-Beat Method to Estimate Ventricular-Vascular Coupling*. Submission Fall 2019.
9. Dufva M et al<sup>†</sup>, *Pediatric Pulmonary Hypertension Outcomes Predicted by Ventricular-Vascular Coupling*. Submission Fall 2019.
10. Douwes et al<sup>†</sup>, *Pediatric Pulmonary Hypertension Outcomes Predicted by In-Vivo Vascular Stiffness*. Submission Fall 2019.
11. Douwes et al<sup>†</sup>, *Pediatric Pulmonary Hypertension Outcomes Predicted by Vascular Input Impedance*. Submission Fall 2019.

### **Refereed Presentations/Chairs at Meetings**

University of Colorado Anschutz Department Seminar Integrated Physiology	May 2019, Aurora, CO <i>Presentation</i> “Clinically Assessing the Mechanics of the Right Heart and Pulmonary Vasculature: A Ten Year Journey”
University of Wyoming Department Seminar Mechanical Engineering	April 2019, Laramie, WY <i>Presentation</i> “Clinically Assessing the Mechanics of the Right Heart and Pulmonary Vasculature: A Ten Year Journey”
4 <sup>th</sup> Toronto Right Ventricle Symposium	April 2019, Toronto, ON <i>Invited Presentation</i> “New Reflections on Non-Invasive Estimation of Pulmonary Hemodynamics”
University of Georgia Department Seminar Pharmacology	April 2019, Athens, GA <i>Presentation</i> “Novel Imaging Techniques for Clinical Diagnosis and Treatment of Pulmonary Vascular Disease (PVD): Gaps and Opportunities
University of Colorado Anschutz CVP Talk	May 2018, Aurora, CO <i>Presentation</i> “Novel Imaging Techniques for Clinical Diagnosis and Treatment of

	Pulmonary Vascular Disease (PVD): Gaps and Opportunities
American Society of Echocardiography	July 2017, Baltimore, MD Invited Presentation "Doppler Assessment of Ventricular/Vascular Interactions"
NHLBI-CMREF Workshop: Enhancing Treatments for Pulmonary Vascular Diseases (PVD) Through Precision Medicine	June, 2016, Chicago, IL <i>Invited Presentation</i> "Novel Imaging Techniques for Clinical Diagnosis and Treatment of Pulmonary Vascular Disease (PVD): Gaps and Opportunities"
26th Annual Western Society of Pediatric Cardiology	March, 2015, Vail, CO <i>Invited Presentation</i> "Innovation in Biomedical Engineering: A glimpse into the Future"
Symposium on Cardiac and Vascular Stiffness	September 2014, Graz, Austria <i>Invited Presentation</i> "Mechanical Testing of Diseased Human and Animal Arteries"
Toronto Right Ventricle Symposium	June 2014, Toronto, ON <i>Invited Presentation</i> "Ventricular-Vascular Coupling in PAH: An Engineer's Perspective is Relevant to the Clinician"
World Glaucoma Congress	July 2013, Vancouver, BC <i>Invited Presentation</i> "Ocular Biomechanics"
American Society of Echocardiography	July 2013, Minneapolis MN <i>Invited Speaker</i> "Ventricular-Vascular Interactions in PHT – What Causes the RV to Fail?"
American Thoracic Society (ATS)	May 2013, Philadelphia, PA <i>Co-chair of Scientific Session</i> Session C88, "Arterial Stiffening in Pulmonary Hypertension"
American Thoracic Society (ATS)	May 2010, New Orleans, Louisiana <i>Discussion Facilitator – Poster Presenter</i>

American Heart Association (AHA) Scientific Sessions 2008	November 2008, New Orleans, Louisiana <i>Poster Presenter</i>
The Children's Hospital of Denver Symposium: State of the Art Imaging and Analysis of Cardiac Performance Congenital Heart Disease	July 2008, Aspen, Colorado <i>Invited Speaker</i>
American Thoracic Society (ATS)	May 2008, Toronto, Ontario <i>Poster Presenter</i>
American Society of Mechanical Engineers Summer Bioengineering Conference	June 2007, Keystone, Colorado <i>Podium Speaker</i>
American Physical Society Division of Fluid Dynamics 58 <sup>th</sup> Annual Meeting	November 2005, Chicago, Illinois <i>Podium Speaker</i>
Society for Industrial and Applied Math Annual Meeting	July 2005, New Orleans, Louisiana <i>Podium Speaker</i>
American Society of Mechanical Engineers Summer Bioengineering Conference	June 2005, Vail, Colorado <i>Podium Speaker</i>

## Courses Taught

### *Didactic Teaching*

08/2010 onward – **Instructor of Record**, University of Colorado Anschutz Medical Campus

- Graduate Biostatistics (Fall 2010, 11, 12, 13)
- Graduate Numerical Methods (Spring 2011, 12, 13, 14)
- Graduate System Dynamics (Fall 2012, 13, 14)
- Undergraduate Introduction to Programming (Fall 2014, 15, 16, 17, 18, 19)
- Undergraduate Numerical Methods (Spring 2015, 16, 17, 18, 19)
- Undergraduate Introduction to Biomechanics (Fall 2015, 16, 17, 18, 19)

09/2002 – 05/2003: **Adjunct Professor**, University of Colorado at Boulder

Senior Design: mentored & managed five groups of mechanical engineering seniors as they performed diverse, yearlong design tasks for local industry.

08/1993-05/2000: **Teaching Assistant**, University of Colorado at Boulder

Tasks included providing weekly recitations, occasionally giving lectures, and grading exams and homework. Classes included

- Undergraduate: Statics and Dynamics (2<sup>nd</sup> year); Measurement Laboratory (3<sup>rd</sup> year); System Dynamics/Introductory Theoretical Modeling (4<sup>th</sup> year)
- Graduate: Vibrations (4<sup>th</sup> year/Grad); Acoustics (Grad)

## *Mentoring*

08/2010 onward – **Primary Mentor**, University of Colorado Denver. Current Students:

- PhD Students: Jennifer Wagner
- MS Students: Scotland Adkins
- BS Students: Currently None

Graduated/Previous Students/Trainees: (Graduation Date or Span of Collaboration)

- MD Fellows: Akshay Muralidhar (2017-2019)
- PhD Students: Blair Dodson (Spring 2012; co-mentor with Ginger Ferguson – UC Boulder graduate); Bryan Yunker (Spring 2014); Shawna Burgett (Fall 2015); Michal Schäfer (Spring 2018);
- MS Students: Mark Reusser (Fall 2012); Nicholas Hobson (Spring 2013); Jeremy Puhall (Fall 2013); Chris Tibaldi (Fall 2013); Kathryn Gent (Summer 2014); Marlijne Cook (Summer 2014); Kyle Kenyon (Spring 2017)
- BS Students: Aimee Lam (Spring 2017); Adam Rauff (Spring 2017)

08/2006 – 12/2010 **Co-Mentor**, University of Colorado at Boulder (Mechanical Engineering)

- Masters Students: Justin Gross (Nov 2006)
- PhD Students: Zhenbi Su (Fall 2010), Lian Tian (Fall 2010), Jiusheng Chen (Spring 2010)

08/2006 onward: **Thesis/Dissertation Committee Member**, University of Colorado at Denver and \*Students at the University of Colorado at Boulder

- PhD Students – *Comprehensive and Defense Exams* – Devon Scott\* (Jun 2010); Phil Kao\* (Dec 2010); Andrew Barker\* (June 2011); Benjamin Terry\* (May 2011; Mar 2012); Yuqi Wu\* (Apr 2011; June 2012); Jim Cezo\* (May 2012; May 2013); Michael Zimkowski (Dec 2012; Dec 2013); Arati Gurung (Oct 2013; Jul 2014); Stephen Humphries (Nov 2013; Dec 2014); Kate Worster (April 2014; Mar 2015); Shawna Burgett (Sept 2014; Nov 2015); Matthew Davidson (Nov 2014; June 2017); Penn McClatchey (May 2015; April 2017); Melissa Laughter (Dec 2015; Dec 2018); Michal Schäfer (April 2016; May 2018); Tanya Evans (May 2016); Frank Ntim (Nov 2016, Nov 2017); David Ramirez (Jan 2018); Michael Regner (Oct 2017; May 2019); Maria Bortot (July 2018; Oct 2019); Jenn Dwelet (July 2019); Melanie Dufva (Oct 2019); Connor McCullough (Dec 2019); Jennifer Wagner (2020); Corey Mattson (2020); Margaret Ferrari (2020); Danny Enge (2021)
- MS Students: Paul Miller\* (Jul 2007); John Martin\* (Nov 2007); Luis Loma\* (Apr 2010); Derek Eilers (May 2012); Jenny Lee (Nov 2012); Maximo DeArchval (Nov 2012); Stephen Humphries (Nov 2012); Thomas Hraha (May 2013); David Campbell (Dec 2013); Cassie Cuelcel (Dec 2013); Tessa Gebert (Oct 2014); Ryan Delaney (Nov 2014); Melanie Dufva (April 2015); Miranda Intrator (May 2015); Eric Durham (May 2015); Eric Gunther (May 2015); Miranda Intrator (June 2015); Phil Bien (June 2015); Anna Laura Nelson (Sept 2015); Penn McClatchey (Oct 2015); Aleena Notary (Nov 2015); Ross Volpe (April 2016); Kenneth Milligan (April 2016); Kyle Kenyon (April 2017); Brysen Keith (April 2017); Kevin Hout (May 2017); Logan Lanholz (Nov 2017); Michelle Akiyama (April 2018); Rachelle Walter (May 2019); Ben Pulver (May 2019); Josh Pertile (June 2019); Scotland Adkins (Nov 2019); Lana Bowers (2020); Zack Wuthrich (2020); Vinh Pham (2020)

## Service

### *School of Medicine (SOM)*

Research Oversight Committee, Department of Pediatrics, Division of Cardiology (Summer 2007-Winter 2009)

Interviewer/Tour Guide for incoming Faculty/Fellow/Resident applicants (2007-2011)

### *College of Engineering and Applied Sciences (CEAS)*

Bioengineering Undergraduate Affairs Committee (Member, Aug 2014-May 2017; Chair Aug 2017-)

Bioengineering Primary Unit Committee (Chair, June 2016-)

Bioengineering Graduate Admissions Committee (Chair, March 2010-May 2017)

Bioengineering Graduate Affairs Committee (Member, March 2010-June 2014; Aug 2015-May 2016)

Bioengineering General Committee (Member, March 2010-)

Bioengineering Department Chair (Interim: June 2014-May 2015)

Bioengineering Early Faculty Search Committee (Member, January-March 2011)

Bioengineering Departmental Computer Server Manager (March 2010-June 2013)

CEAS Computing Curriculum Committee (Chair, Sept 2018-March 2019)

CEAS Promotions Committee (Ad Hoc Membership, 2016)

CEAS Executive Committee (Member, June 2014-May 2015)

CEAS Strategic Planning Committee (Member, Winter 2010)

CEAS Scholarships Committee (Member, May 2014-Aug 2015)

UC Denver Faculty Assembly: Academic Personnel Committee (Aug 2016-)

### *Journal Reviewer Service*

Annals of Biomedical Engineering

Biomechanics and Modeling in Mechanobiology

Cardiovascular Engineering and Technology

Chest

Circulation

Journal of Biomechanical Engineering

Journal of Biomechanics

Journal of Applied Physiology

PLoS One

Reproduction

World Journal of Pediatrics

## Recognitions/Honors

BMES Best Teacher/Mentor in Bioengineering, 2017

University of Colorado / NY & May Chang Faculty Research Award (\$2000), 2011

Mechanical Engineering Graduate Fellowship (\$1000), University of Colorado, 1996

ASPE Scholar (\$1000/year), 1990-1994

Crimson Scholar (Full Tuition Scholarship), New Mexico State University, 1989-1993



Dean's List seven of eight undergraduate semesters  
Pi Tau Sigma, National Engineering Honors Society  
Phi Kappa Phi, National Honors Society

## Professional Organizations

American Heart Association (AHA), 2008-2009  
American Thoracic Society (ATS), 2010-  
Biomedical Engineering Society (BMES), 2012-  
American Society of Echocardiographers (ASE), 2014-

## Other Indicators of Scholarly and Creative Activity

### Ongoing Extramural Research Support

**VA Clinical Merit Review CX001532** (PI: Reusch), 04/01/17-03/31/21 0.5 Calendar Months  
*Cardiovascular Mechanisms of Exercise Intolerance in Diabetes and the Role of Sex* (Role: Co-I)

Goals: The goal of this proposal is to understand the contribution of preclinical cardiac and vascular dysfunction and skeletal muscle perfusion abnormalities to impaired CVEC in men and women with T2D and, further, to test the adaptive response to intervention using exercise training to reveal modifiable targets for therapy to improve cardiometabolic health.

### Research Support Won by Mentees

**NIH-NHLBI-F32 HL145839** (PI: Muralidhar), 7/19-7/21 (*Resigned 7/19*)

*A modified approach to a single-beat elastance method to compute ventricularvascular coupling ratio in pulmonary arterial hypertension: clinical utility and outcomes studies.*

Goals: A retrospective study to characterize clinical outcomes as they relate to measurement of the ventricular vascular coupling ratio using a unique technique in human subjects with pulmonary arterial hypertension.

**CCTSI Co-Pilot** (PI: Truong), 1/13-12/13

*Wall shear stress measured by MRI determines outcomes in children and adolescents with pulmonary arterial hypertension*

Goals: Establish relationships between MR imaging-measured pulmonary artery wall shear stress, vascular wall stiffness, and patient outcomes in pediatric pulmonary hypertension.

**NIH-NCI-F31 CA171620** (PI: Yunker), 8/13-8/15

*Development of computer software to accurately measure regional hepatic blood flow from 3D Ultrasound imagery to improve the effectiveness of Hepatic Tumor Ablation by RF methods.*

Goals: Develop methods to extract hepatic vascular flow data from three-dimensional Doppler ultrasound images.

### Completed Extramural Research Support

**Heart and Stroke Foundation of Canada** (PI: Friedberg) 06/17 – 06/19

0.0 Calendar Months

*Septal insertion injury mediates adverse ventricular-ventricular interaction in right ventricular pressure and volume loading* (Role: Collaborator)

Goals: To investigate wall stress as a possible driver of fibrosis in animal models of right ventricular overload.

**NIH-NHLBI-R01 HL114887 *NIH Axis Grant*** (PI: Stenmark) 08/12 – 06/17 1.2 Calendar Months  
*Fibroblasts and Mononuclear Fibrogenic Cells Drive Right Ventricular Pulmonary Arterial Uncoupling in Pulmonary Arterial Hypertension* (Role: Co-I)

Goals: To determine the role that fibroblasts and fibrocytes play in the abnormalities of RV-PA coupling that characterize pulmonary hypertension.

**NIH-NHLBI-R01 HL114753 *NIH Axis Grant*** (PI: Shandas) 08/12 - 06/19 0.6 Calendar Months  
*Functional and Biological Phenotyping of Pediatric PH* (Role: Co-I)

Goals: combine impedance with new mechanical and biological measures of right ventricle function & to improve understanding of the pulmonary system and prediction of pulmonary hypertension outcomes

**CCTSI Novel Methods Award** (PI: Hunter), 6/14-6/16 0.2 Calendar Months  
*Echo- and MR-based quantitative assessment of the systemic vasculature*

Goals: Developing tools to quantitatively analyze flow mediated vasodilatation, and stiffness or elastic properties in the conduit, resistance and precapillary circulation of the systemic vasculature in both rodent models and human subjects.

**CCTSI CO-Pilot Team Science Award** (PI: Stenmark), 1/11-12/11 0.6 Calendar Months  
*A Systems Biology Approach to Pulmonary Vascular Disease: Integrating Vascular Stiffness with Cardiac Function and Microvascular Disease* (Role: Co-PI)

Goals: develop a multiscale, multi-organ approach to the treatment of pulmonary vascular disease.

**NIH-NHLBI-K25 HL094749** (PI: Hunter), 8/10-6/16 9 Calendar Months  
*Vascular Stiffening in Pediatric PAH*

Goals: determine how vascular stiffness affects right ventricular-vascular coupling and develop methods to quantify proximal vascular stiffness.

**AHA 09SDG2260194**, National Affiliate (PI: Hunter), 7/09 – 7/13 (*Resigned 8/10*) 3.6 Calendar Months  
*Clinical Investigation of Vascular Stiffness in Pediatric Pulmonary Hypertension*

Goals: develop methods to quantify proximal pulmonary vascular stiffness in pediatric patients and evaluate these measures as outcomes prognostics.

**NIH-NHLBI-SCCOR(P50) HL084923** (PI: Stenmark), 12/06 – 11/11 8.4 Calendar Months  
*Lung vascular disease in infants and children: Mechanisms and treatment*

Project 3 (PI:Shandas) *Advanced diagnostics and imaging in pediatric PHT* (Role: Significant Contributor)

Goals: develop novel diagnostics for evaluation of hemodynamics in the developing lung circulation.