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## CURRICULUM VITAE

University of Pittsburgh  
School of Medicine

### SHORT BIOGRAPHICAL

**Name:** Claudette M. St. Croix

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### EDUCATION AND TRAINING

#### UNDERGRADUATE:

<i>Dates Attended</i>	<i>Institution</i>	<i>Degree Received and Year</i>	<i>Major Subject</i>
1984-1988	University of Guelph, Canada	Honors BS, 1988	Human Kinetics

#### GRADUATE:

<i>Dates Attended</i>	<i>Institution</i>	<i>Degree Received and Year</i>	<i>Major Subject</i>
1988-1991	University of Toronto, Canada	MS, 1991	Exercise Sciences
1991-1995	University of Western Ontario	PhD, 1995	Kinesiology

#### POSTGRADUATE:

<i>Dates Attended</i>	<i>Institution</i>	<i>Degree Received and Year</i>	<i>Major Subject</i>
1995-1997	University of Western Ontario	Postdoctoral Fellow	Cardiovascular Physiology
1997-2000	University of Wisconsin-Madison	Postdoctoral Fellow	Cardiopulmonary Physiology
2000-2002	University of Pittsburgh	Postdoctoral Fellow	Cell and Molecular Biology

### APPOINTMENTS AND POSITIONS

<i>Years Inclusive</i>	<i>Name and Location of Institution</i>	<i>Rank/Title</i>
2002-2007	Department of Environmental and Occupational Health University of Pittsburgh Graduate School of Public Health	Assistant Professor
2007-2014	Department of Environmental and Occupational Health University of Pittsburgh Graduate School of Public Health	Assistant Professor (Tenure Stream)

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2008-2014	Secondary Appointment, Department of Cell Biology and Physiology, University of Pittsburgh School of Medicine	Assistant Professor
2006-2014	Center for Biologic Imaging, University of Pittsburgh	Assistant Director
2014-2016	Department of Environmental and Occupational Health University of Pittsburgh Graduate School of Public Health	Associate Professor (tenured)
2014-present	Center for Biologic Imaging, University of Pittsburgh	Associate Director
2016-present	Department of Cell Biology University of Pittsburgh School of Medicine	Associate Professor (tenured)

### HONORS AND AWARDS

2002-2005	Parker B. Francis Fellowship in Pulmonary Medicine
2002	Giles F. Filley Memorial Award, American Physiological Society Young Investigators Award in Pulmonary Physiology and Medicine
2002	Julius H. Comroe, Jr. Award (American Physiological Society)
2000-2002	American Heart Association (Pennsylvania-Delaware Affiliate) Postdoctoral Fellowship
1997-1999	American Heart Association (Wisconsin Affiliate) Postdoctoral Research Fellowship.
1997	Post-doctoral Investigator Award, Midwest Physiological Society.
1995-1997	Routledge Research Fellowship, Department of Physiology, University of Western Ontario, Canada.
1993-1994	Ontario Graduate Scholarship, Ontario Ministry of Education and Training.
1991	Faculty Entrance Scholarship, Ph.D program, University of Western Ontario
1987-1988	Dean's Honours List, University of Guelph

### PUBLICATIONS (Refereed articles only)

1. **St. Croix, C.M.**, Cunningham, D.A., McConnell, A.K., Kowalchuk, J.M., Kirby, A.S., Scheuermann, B.W., Petrella, R.J. and Paterson, D.H. The estimation of arterial PCO<sub>2</sub> in the elderly. *J. Appl. Physiol.* 79(6): 2086-2093, 1995.
2. **St. Croix, C.M.**, Cunningham, D.A. and Paterson, D.H. Central-peripheral ventilatory chemoreflex interaction in humans. *Adv. Exp. Med. Biol.* 393: 351-355, 1995.
3. **St. Croix, C.M.**, Cunningham, D.A. and Paterson, D.H. Effect of hyperoxia on ventilatory control in moderate intensity exercise. *J. Physiol.* 487: 178-179P, 1995.
4. **St. Croix, C.M.**, Cunningham, D.A., Paterson, D.H. and Kowalchuk, J.M. Peripheral chemoreflex drive in moderate intensity exercise. *Can. J. Appl. Physiol.* 21(4): 285-300, 1996.
5. **St. Croix, C.M.**, Cunningham, D.A. and Paterson, D.H. The nature of the interaction between central and peripheral chemoreceptor drives in human subjects. *Can. J. Physiol. Pharmacol.* 74: 7-13, 1996.
6. Cunningham, D.A., Paterson, D.H., Koval, J.J. and **St. Croix, C.M.** A Model of oxygen transport capacity changes for men and women aged 55 to 86 years. *Can. J. Appl. Physiol.* 22(5): 439-453, 1997.
7. **St. Croix, C.M.**, Harms, C.A., McClaran, S.R., Nickele, G.A., Pegelow, D.F., Nelson, W.B. and Dempsey, J.A. Effects of prior exercise on exercise-induced arterial hypoxemia in young women. *J. Appl. Physiol.* 85(4): 1556-1563, 1998.
8. Paterson, D.H., Cunningham, D.A., Koval, J.J. and **St. Croix, C.M.** Aerobic fitness in a population of independently living men and women aged 55-86. *Med. Sci. Sports Exerc.* 31(12): 1813-1820, 1999.

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9. **St. Croix, C.M.**, Wetter, T.J., Pegelow, D.F., Meyer, K.C. and Dempsey, J.A. Assessment of nitric oxide formation during exercise. *Am. J. Respir. Crit. Care Med.* 159: 1125-1133, 1999.
  10. **St. Croix, C.M.**, Satoh, M., Morgan, B.J., Skatrud, J.B. and Dempsey, J.A. Role of respiratory motor output in within-breath modulation of muscle sympathetic nerve activity in humans. *Circ. Res.* 85: 457-469, 1999.
  11. Pearce, L.L., Wasserloos, K., **St. Croix, C.M.**, Gandley, R., Levitan, E.S. and Pitt, B.R. Metallothionein, nitric oxide and zinc homeostasis in vascular endothelial cells. *J. Nutr.* 130(5S Suppl):1467S-70S, 2000.
  12. Harms, C.A., Wetter, T.J., **St. Croix, C.M.**, Pegelow, D.F. and Dempsey, J.A. Effects of respiratory muscle work on exercise performance. *J. Appl. Physiol.* 89:131-8, 2000.
  13. Cunningham, D.A., **St. Croix, C.M.**, Paterson, D.H., Ozyener, F. and Whipp, B.J. Time dependence of the off-transient VO<sub>2</sub> kinetics following the attainment of a particular VO<sub>2</sub> during heavy-intensity exercise in humans. *Exp. Physiol.* 85(3):339-347, 2000.
  14. **St. Croix, C.M.**, Morgan, B.J., Wetter, T.J. and Dempsey, J.A. Fatiguing respiratory muscle work causes reflex sympathetic activation in humans. *J. Physiol. (London)*. 529:493-504, 2000.
  15. Kawai, K., Liu, S.X., Tyrurin, V.A., Tyrurina, Y.Y., Borisenko, G.G., Jiang, J.F., **St. Croix, C.M.**, Fabisiak, J.P., Pitt, B.R. and Kagan, V.E. Antioxidant and antiapoptotic function of metallothioneins in HL-60 cells challenged with copper nitrilotriacetate. *Chem. Res. Toxicol.* 13(12): 1275-1286, 2000.
  16. Wetter, T.J., Pegelow, D.F., Sonetti, D., **St. Croix, C.M.** and Dempsey, J.A. Effects of exhaustive endurance exercise on pulmonary gas exchange and airway function in females. *J. Appl. Physiol.* 91: 847-858, 2001.
  17. Tang, Z.L., Wasserloos, K., **St. Croix, C.M.** and Pitt, B.R. Role of zinc in pulmonary endothelial cell response to oxidative stress. *Am. J. Physiol.* 281: L243-L249, 2001.
  18. Tang, Z.L. Wasserloos, K.J., Liu, X.H., Reynolds, I.J., Pitt, B.R. and **St. Croix, C.M.** Nitric oxide decreases the sensitivity of pulmonary endothelial cells to LPS-induced apoptosis in a zinc-dependent fashion. *Mol. Cell. Biochem.* 234/235:211-217, 2002.
  19. Jiang, J., **St. Croix, C.M.**, Sussman, N., Zhao, Q, Pitt, B.R. and Kagan, V.E. Contribution of glutathione and metallothioneins to protection against copper toxicity and redox cycling: Quantitative analysis using MT +/- and MT -/- mouse lung fibroblast cells. *Chem. Res. Toxicol.* 15(8):1080-1087, 2002.
  20. **St. Croix, C.M.**, Wasserloos, K.J., Dineley, K.E., Reynolds, I.J., Levitan, E.S. and Pitt, B.R. Nitric oxide-induced changes in intracellular zinc homeostasis are modulated by metallothionein/thionein. *Am. J. Physiol. Lung Cell Mol. Physiol.* 282:185-193, 2002.
  21. Dempsey, J.A., Sheel, A.W., **St. Croix, C.M.** and Morgan, B.J. Respiratory influences on sympathetic
  22. Chengelis, DA, Shade, CM, Yingling,AM, Oxley, DS, Badger, P, Watkins, SC, **St Croix CM** and Petoud, S. Semiconductor CdSe Nanocrystals Emit Near-infrared Light. *Journal of the American Chemical Society*. Submitted.
  23. Bernal, PJ, Leelavanichkul, K, Bauer, EM, Cao, R, Wilson, A, Wasserloos, KJ, Watkins,SC, Watkins, SC, Pitt, BR,Watkins, SC and **St.Croix, C.M.** Nitric oxide mediated zinc release contributes to hypoxic regulation of pulmonary vascular tone. *Circ Res.* 102(12):1575-83, 2008. PMID: 18483408
  24. Garner AL, **St Croix CM**, Pitt BR, Leikauf GD, Ando S and Koide K. Specific fluorogenic probes for vasomotor outflow in humans. *Respir. Physiol. Neurobiol* 130: 3-20, 2002.
  25. **St. Croix, C.M.**, Stitt, M.S., Leelavanichkul, K.,Wasserloos,, K.J., Pitt, B.R. and Watkins, S.C. Nitric oxide mediated signaling in endothelial cells as determined by spectral fluorescence resonance energy transfer. *Free Radicals in Biology and Medicine.* 37(6):785-92, 2004.
  26. **St. Croix, C.M.**, Stitt, M.S., Watkins, S.C. and Pitt, B.R. Fluorescence resonance energy transfer based assays for real time detection of nitric oxide signaling. *Methods Enzymol.* 396: 317-326, 2005.

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  32. Bhatia S, Fei M, Yarlagadda M, Qi Z, Akira S, Saijo S, Iwakura Y, van Rooijen N, Gibson GA, **St Croix CM**, Ray A, Ray P. et al. 2011 Rapid Host Defense against *Aspergillus fumigatus* Involves Alveolar Macrophages with a Predominance of Alternatively Activated Phenotype. *PLoS ONE* 6(1): e15943, 2011. PMID: 21246055.
  33. Thambiayya K, Wasserloos KJ, Huang Z, Kagan VE, **St Croix CM**, Pitt BR. LPS-induced decrease in intracellular labile zinc [Zni] contributes to apoptosis in cultured sheep pulmonary artery endothelial cells (SPAEC). *Am J Physiol Lung Cell Mol Physiol*. 300(4):L624-32. Epub 2011 Jan 14, PMID: 21239534
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  35. Zhao J, O'Donnell VB, Balzar S, **St Croix CM**, Trudeau JB, Wenzel SE. 15-Lipoxygenase 1 interacts with phosphatidylethanolamine-binding protein to regulate MAPK signaling in human airway epithelial cells. *Proc Natl Acad Sci USA*. 2011 Aug 23;108(34):14246-51. Epub 2011 Aug 9. PubMed PMID: 21831839.
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  38. Watkins SC, Maniar S, Mosher M, Roman BL, Tsang M, **St Croix CM**. High resolution imaging of vascular function in zebrafish. *PLoS One*. 2012;7(8):e44018. Epub 2012 Aug 30. PubMed PMID: 22952858; PubMed Central PMCID: PMC3431338.
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  44. Sayeed S, Nistico L, **St Croix C**, Di YP. Multifunctional role of human SPLUNC1 in *Pseudomonas aeruginosa* infection. *Infect Immun*. 2012 Nov 6. [Epub ahead of print] PubMed PMID: 23132494.
  45. Thambiayya K, Kaynar AM, **St Croix CM**, Pitt BR. Functional role of intracellular labile zinc in pulmonary endothelium. *Pulm Circ*. 2012 Oct;2(4):443-51. doi: 10.4103/2045-8932.105032. PubMed PMID: 23372928; PMCID: PMC3555414.
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  47. Watkins SC, **St Croix CM**. Building a live cell microscope: what you need and how to do it. *Curr Protoc Cytom*. 2013 Jul; Chapter 2:Unit2.21. doi: 0.1002/0471142956.cy0221s65. PubMed PMID: 23835804.
  48. Li HH, Li J, Wasserloos KJ, Wallace C, Sullivan MG, Bauer PM, Stolz DB, Lee JS, Watkins SC, **St Croix CM**, Pitt BR, Zhang LM. Caveolae-dependent and independent uptake of albumin in cultured rodent pulmonary endothelial cells. *PLoS One*. 2013 Nov 27;8(11):e81903. doi: 10.1371/journal.pone.0081903. PubMed PMID: 24312378; PubMed Central PMCID: PMC3842245.
  49. Pride CK, Mo L, Quesnelle K, Dagda RK, Murillo D, Geary L, Corey C, Portella R, Zharikov S, **St Croix C**, Maniar S, Chu CT, Khoo NK, Shiva S. Nitrite activates protein kinase A in normoxia to mediate mitochondrial fusion and tolerance to ischaemia/reperfusion. *Cardiovasc Res*. 2013 Nov 5. [Epub ahead of print] PubMed PMID: 24081164.
  50. Fazzi F, Njah J, Di Giuseppe M, Winnica DE, Go K, Sala E, **St Croix CM**, Watkins SC, Tyurin VA, Phinney DG, Fattman CL, Leikauf GD, Kagan VE, Ortiz LA. TNFR1/Phox Interaction and TNFR1 Mitochondrial Translocation Thwart Silica-Induced Pulmonary Fibrosis. *J Immunol*. 2014 Apr 15;192(8):3837-46. doi: 10.4049/jimmunol.1103516. Epub 2014 Mar 12. PubMed PMID: 24623132; PubMed Central PMCID: PMC3977215.
  51. Yao M, Rogers NM, Csányi G, Rodriguez AI, Ross MA, **St Croix C**, Knupp H, Novelli EM, Thomson AW, Pagano PJ, Isenberg JS. Thrombospondin-1 Activation of Signal-Regulatory Protein- $\alpha$  Stimulates Reactive Oxygen Species Production and Promotes Renal Ischemia Reperfusion Injury. *J Am Soc Nephrol*. 2014 Feb 7. [Epub ahead of print] PubMed PMID: 24511121.
  52. Kelley EE, Baust J, Bonacci G, Golin-Bisello F, Devlin JE, **St Croix CM**, Watkins SC, Gor S, Cantu-Medellin N, Weidert ER, Frisbee JC, Gladwin MT, Champion HC, Freeman BA, Khoo NK. Fatty acid nitroalkenes ameliorate glucose intolerance and pulmonary hypertension in high-fat diet-induced obesity. *Cardiovasc Res*. 2014 Mar 1;101(3):352-63. doi: 10.1093/cvr/cvt341. Epub 2014 Jan 2. PubMed PMID: 24385344; PubMed Central PMCID: PMC3928004.
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- promotes lung fibrosis. *J Clin Invest*. 2015 Feb;125(2):521-38. doi: 10.1172/JCI74942. Epub 2014 Dec 22. PubMed PMID: 25562319; PubMed Central PMCID: PMC4319413.
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55. Krawiec JT, Weinbaum JS, **St Croix CM**, Phillippi JA, Watkins SC, Rubin JP, Vorp DA. A cautionary tale for autologous vascular tissue engineering: impact of human demographics on the ability of adipose-derived mesenchymal stem cells to recruit and differentiate into smooth muscle cells. *Tissue Eng Part A*. 2015 Feb;21(3-4):426-37. doi: 10.1089/ten.TEA.2014.0208. Epub 2014 Sep 16. PubMed PMID: 25119584; PubMed Central PMCID: PMC4334096.
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57. Kagan VE, Kapralov AA, **St Croix CM**, Watkins SC, Kisin ER, Kotchey GP, Balasubramanian K, Vlasova II, Yu J, Kim K, Seo W, Mallampalli RK, Star A, Shvedova AA. Lung macrophages "digest" carbon nanotubes using a superoxide/peroxynitrite oxidative pathway. *ACS Nano*. 2014 Jun 24;8(6):5610-21. doi: 10.1021/nn406484b. Epub 2014 Jun 4. PubMed PMID: 24871084; PubMed Central PMCID: PMC4072413.
58. Coblenz J, **St Croix C**, Kiselyov K. Loss of TRPML1 promotes production of reactive oxygen species: is oxidative damage a factor in mucopolidiosis type IV *Biochem J*. 2014 Jan 15;457(2):361-8. doi: 10.1042/BJ20130647. PubMed PMID: 24192042.
59. Phinney DG, Di Giuseppe M, Njah J, Sala E, Shiva S, **St Croix CM**, Stolz DB, Watkins SC, Di YP, Leikauf GD, Kolls J, Riches DW, Deiluiis G, Kaminski N, Boregowda SV, McKenna DH, Ortiz LA. Mesenchymal stem cells use extracellular vesicles to outsource mitophagy and shuttle microRNAs. *Nat Commun*. 2015 Oct 7;6:8472. doi: 10.1038/ncomms9472. PubMed PMID: 26442449; PubMed Central PMCID: PMC4598952.
60. Khoo NK, Cantu-Medellin N, **St Croix C**, Kelley EE. In Vivo Immuno-Spin Trapping: Imaging the Footprints of Oxidative Stress. *Curr Protoc Cytom*. 2015 Oct 1;74:12.42.1-11. doi: 10.1002/0471142956.cy1242s74. PubMed PMID: 26423693.
61. Balasubramanian K, Maeda A, Lee JS, Mohammadyani D, Dar HH, Jiang JF, **St Croix CM**, Watkins S, Tyurin VA, Tyurina YY, Klöditz K, Polimova A, Kapralova VI, Xiong Z, Ray P, Klein-Seetharaman J, Mallampalli RK, Bayir H, Fadeel B, Kagan VE. Dichotomous roles for externalized cardiolipin in extracellular signaling: Promotion of phagocytosis and attenuation of innate immunity. *Sci Signal*. 2015 Sep 22;8(395):ra95. doi: 10.1126/scisignal.aaa6179. PubMed PMID: 26396268; PubMed Central PMCID: PMC4760701.
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63. Lai YC, Tabima DM, Dube JJ, Hughan KS, Vanderpool RR, Goncharov DA, **St Croix CM**, Garcia-Ocaña A, Goncharova EA, Tofovic SP, Mora AL, Gladwin MT. SIRT3-AMP-Activated Protein Kinase Activation by Nitrite and Metformin Improves Hyperglycemia and Normalizes Pulmonary Hypertension Associated With Heart Failure With Preserved Ejection Fraction. *Circulation*. 2016 Feb 23;133(8):717-31. PubMed PMID: 26813102; PubMed Central PMCID: PMC4766041.
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- Schlattner M, Boissan M, Lacombe ML, Epand RM, Chu CT, Mallampalli RK, Bayir H, Schlattner U. NDPK-D (NM23-H4)-mediated externalization of cardiolipin enables elimination of depolarized mitochondria by mitophagy. *Cell Death Differ*. 2016 Jan 8. doi: 10.1038/cdd.2015.160. [Epub ahead of print] PubMed PMID: 26742431.
65. Mao G, Qu F, St **Croix CM**, Tyurina YY, Planas-Iglesias J, Jiang J, Huang Z, Amoscato AA, Tyurin VA, Kapralov AA, Cheikhi A, Maguire J, Klein-Seetharaman J, Bayir H, Kagan VE. Mitochondrial Redox Opto-Lipidomics Reveals Mono-Oxygenated Cardiolipins as Pro-Apoptotic Death Signals. *ACS Chem Biol*. 2016 Feb 19;11(2):530-40. doi: 10.1021/acschembio.5b00737. Epub 2016 Jan 5. PubMed PMID: 26697918.
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67. He J, Wang Y, Missinato MA, Onuoha E, Perkins LA, Watkins SC, **St Croix CM**, Tsang M, Bruchez MP. A genetically targetable near-infrared photosensitizer. *Nat Methods*. 2016 Mar;13(3):263-8. doi: 10.1038/nmeth.3735. Epub 2016 Jan 25. PubMed PMID: 26808669.
68. Dezfulian C, Kenny E, Lamade A, Misse A, Krehel N, **St Croix C**, Kelley EE, Jackson TC, Uray T, Rackley J, Kochanek PM, Clark RS, Bayir H. Mechanistic characterization of nitrite-mediated neuroprotection after experimental cardiac arrest. *J Neurochem*. 2016 Nov;139(3):419-431. doi: 10.1111/jnc.13764. PubMed PMID: 27507435.
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72. Pohl PH, Lozito TP, Cuperman T, Yurube T, Moon HJ, Ngo K, Tuan RS, **St Croix C**, Sowa GA, Rodrigues LM, Kang JD, Vo NV. Catabolic effects of endothelial cell-derived microparticles on disc cells: Implications in intervertebral disc neovascularization and degeneration. *J Orthop Res*. 2016 Aug;34(8):1466-74. doi:10.1002/jor.23298. PubMed PMID: 27246627.
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  92. Wenzel SE, Tyurina YY, Zhao J, **St Croix CM**, Dar HH, Mao G, Tyurin VA, Anthony Muthu TS, Kapralov AA, Amoscato AA, Mikulska-Ruminska K, Shrivastava IH, Kenny EM, Yang Q, Rosenbaum JC, Sparvero LJ, Emlet DR, Wen X, Minami Y, Qu F, Watkins SC, Holman TR, VanDemark AP, Kellum JA, Bahar I, Bayır H, Kagan VE. PEBP1 Wardens Ferroptosis by Enabling Lipoxigenase Generation of Lipid Death Signals. *Cell.* 2017 Oct 19;171(3):628-641.e26. doi: 10.1016/j.cell.2017.09.044. PubMed PMID: 29053969; PubMed Central PMCID: PMC5683852.
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### **Invited Reviews, Proceedings of Conference and Symposia, and Book Chapters**

1. Morgan, B.J., **St. Croix, C.M.** and Skatrud, J.B. Influence of respiration on autonomic control of heart rate and blood pressure. In: *Sleep Disorders and Cardiovascular and Cerebrovascular Disease. Lung Biology in Health and Disease Vol. 146.* T.D. Bradley and J.S. Floras, eds. Marcel Dekker Inc. pp. 1-13, 2000
2. Pitt, B.R. and **St. Croix, C.M.** Complex regulation of iNOS in lung. *A. J. Respir. Cell Mol. Biol.* 26: 6-9, 2002.
3. Lawler, C., Suk, W.A., Pitt, B.R., **St. Croix, C.M.** and Watkins, S.C. Invited Review: Multimodal Optical Imaging. *Am. J. Physiol. Lung Cell Mol. Physiol.* 285: L269-80, 2003.

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4. **St. Croix, C.M.**, Pitt, B.R. and Watkins, S.C. The use of contemporary fluorescent imaging technologies in biomedical research. *Medicine and Science*. 10(1): 16-29, 2005
  5. **St. Croix, C.M.**, Shand, S. and Watkins, S.C. Confocal microscopy; comparisons, applications and problems. *Biotechniques* 39: S2-S5, 2005.
  6. **St. Croix, C.M.**, Leelavinchkul, K., Watkins, S.C., Kagan, V.E. and Pit, B.R. Nitric oxide and zinc homeostasis in acute lung injury. *Proceedings of the American Thoracic Society*. 2:236-242, 2005.
  7. **St. Croix, C.M.** and Watkins, S.C. Intravital fluorescence microscopy in pulmonary research. *Advanced Drug Discovery Reviews*. 58: 834-840, 2006.
  8. **St. Croix, C.M.**, Zipfel, W.R. and Watkins, S.C. Potential solutions for confocal imaging of living animals. *Biotechniques* 43(1): 14S-19S, 2007.
  9. **St. Croix, C.M.** and Bauer, EM. Use of fluorescence resonance energy transfer to detect nitric oxide-based signaling events in isolated perfused lung. *Current Protocols in Cytometry*. Chapter 12:Unit12.13, 2008. PMID: 18770645
  10. Wallace CT, **St Croix CM**, Watkins SC. Data management and archiving in a large microscopy-and-imaging, multi-user facility: Problems and solutions. *Mol Reprod Dev*. 2015 Sep;82(9):630-4. doi: 10.1002/mrd.22538. Epub 2015 Sep 14. Review. PubMed PMID: 26284826.

## **Books**

1. Watkins, S.C. and St. Croix, C.M. (eds). *Current Protocols Select: Methods and Applications in Microscopy and Imaging*. Wiley-Blackwell, New York, 2013.

## **PROFESSIONAL ACTIVITIES**

### **TEACHING**

#### **Courses:**

- |         |  |
|---------|--|
| 2009-   | MSCBMP 2860 Multiparametric Microscopic Imaging, Department of Cell Biology, University of Pittsburgh School of Medicine (Course Directors: Donna Beer-Stolz, PhD and <b>Claudette St Croix, PhD</b> ) |
| 2016-   | ISB 2030 Quantitative Imaging, Department of Cell Biology, University of Pittsburgh School of Medicine (Course Director: Mike Butterworth, PhD)  |
| 2011-   | MSCBMP 2885 Imaging cell biology in living systems from single molecules to animal models (Course Director: Simon Watkins)   |
| 2008-16 | EOH 3210: Pathophysiology of Environmental Disease, Department of Environmental and Occupational Health, University of Pittsburgh (Course Director: <b>Claudette St. Croix, PhD</b> )                  |
| 2006-   | CLRES 2700: Fundamentals of Bench Research, University of Pittsburgh School of Medicine (Course Director: Janet Lee, MD)   |
| 2004-   | Faculty, Quantitative Fluorescence Microscopy, Mount Desert Biological Institute, Salisbury Cove, Maine (Course Director, Simon C. Watkins, PhD)   |
| 2004-   | EOH 2310: Molecular Fundamentals, Department of Environmental and Occupational Health, University of Pittsburgh (Course Director: Patty Opresko, PhD)  |
| 2007-13 | Invited Faculty, Intensive Course in Physiology, University of Pittsburgh and Mount Desert Biological Institute, Salisbury Cove, Maine (Course Director: Raymond Frizzell, PhD)                        |
| 2007-08 | Invited Faculty, INBRE Course: Functional Genomics of Membrane Transport, Mount Desert   |

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2011-15	Biological Institute, Salisbury Cove, Maine (Course Director: Bruce Stanton, PhD) MSCMP 2730: Molecular Mechanisms of Tissue Growth and Differentiation, Department of Pathology, University of Pittsburgh School of Medicine (Course Director: Aaron Bell, MD)
2002-12	INTBP 2005: Foundations of Biomedical Science, Faculty Preceptor, University of Pittsburgh School of Medicine (Course Director: Steve Phillips, PhD)
1996-1997	KIN442A: Honours Exercise Physiology; Lecturer, Departments of Kinesiology and Physiology, University of Western Ontario. (Course Director: <b>Claudette St. Croix, PhD</b> )
1996-1997	KIN020: Introductory Kinesiology, Lecturer, Department of Kinesiology, University of Western Ontario. (Course Director: Ron Watson, PhD)

### Graduate Students:

2006-2010	Paula J. Bernal, PhD (Cell Biology and Physiology)
2007-2010	Eileen Bauer, PhD (Environmental and Occupational Health)
2002-2005	Karanee Leelavanichkul, MS (Bioengineering)

### Graduate Thesis Committees:

2003-2005	Meihua Bo, MS (Environmental and Occupational Health)
2003-2008	Molly S. Stitt, PhD Candidate (Environmental and Occupational Health)
2006-2008	Adam Straub, PhD (Environmental and Occupational Health)
2007-2009	Sanket Patel, PhD (School of Biomedical Engineering)
2009-	Tom Biksey, PhD Candidate (Environmental and Occupational Health)
2009-2011	Pornsri Khlangwiset, PhD 2011 (Environmental and Occupational Health)
2010-2014	Michelle Messner, PhD (Immunology)
2011-2014	Yessica Garciafigueroa, PhD (Environmental and Occupational Health)
2011-2014	Michelle Heid, PhD (Immunology)
2013-2015	Jessica Coblentz, PhD (Biological Sciences)
2014-2016	Marion Joy (Bioengineering)
2015-2017	Amin Cheikhi, PhD Candidate (EOH)
2015-2017	Alexis Carter, PhD Candidate (EOH)
2016-	Diane Pharm, PhD Candidate (Chemistry)
2016-	Anastasia Gorelova, PhD Candidate (Pharmacology)
2016-	Anthony Otero, PhD Candidate (Neuroscience)

### Comprehensive or Qualifying Examination Committees:

2004	Adam Straub (EOH), Qualifying Exam, Comprehensive Exam
2005	Josh Synder (CBMP), <b>Chair</b> , Qualifying Exam
2006	Wenjie He (EOH), Qualifying Exam
2008	Nagarjun Konduru (EOH), Qualifying Exam
2008	Yan Liu (EOH), <b>Chair</b> , Qualifying Exam
2009	Jing Ji (EOH), <b>Chair</b> , Qualifying Exam
2009	Steve Mischler (EOH), <b>Chair</b> , Qualifying Exam
2010	Yesica Garciafigueroa (EOH) <b>Chair</b> , Qualifying Exam
2011	Dhvani Parikh (EOH), <b>Chair</b> , Qualifying Exam

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- 2012 Dushani Palliyaguru (EOH), **Chair**, Qualifying Exam
  - 2013 Shaina Stacy (EOH), **Chair**, Qualifying Exam
  - 2013 Sheila Tripathy (EOH), **Chair**, Qualifying Exam
  - 2013 Randall McCauley (Developmental Biology), Qualifying Exam
  - 2014 Alexis Carter (EOH), **Chair**, Qualifying Exam
  - 2015 Rahel Birru (EOH), **Chair**, Qualifying Exam
  - 2016 Cody Wolfe (EOH), **Chair**, Qualifying Exam
  - 2016 Antonella Morracco, **Chair**, Qualifying Exam

**RESEARCH:**

**Current Grant Support**

**P01 AG043376-04 (PI: Robbins)** 07/01/13 – 04/30/18 0.45 Cal Months  
 Scripps Research Institute/NIH \$59,127  
 Core C: Imaging Core - Cell Autonomous and Non-Autonomous Mechanisms of Aging

The goal of this Program Project Grant is to identify key mechanisms driving aging and age-related pathologies through both cell autonomous and non autonomous mechanisms using mouse models of accelerated and natural aging.

**P30 DK072506 (PI: Frizzell)** 06/1/16 - 05/31/18 0.30 Cal Months  
 NIH \$4,173  
 Core C & Clinical Studies for Cystic Fibrosis

The central aim of this core is to provide optical imaging services for the pulmonary airways and the lung

**R01 ES022644-04 (PI: Burton)** 12/01/13 – 10/30/18 0.60 Cal Months  
 NIH \$8,752  
 Pathogenic Mechanisms of Gene-Environment Interactions in Parkinsons Disease

The goal of this project is to identify pathogenic mechanisms of gene-environment interactions in Parkinsons Disease.

**P01 HL114453-03 (PI: Mallampalli)** 01/01/14 – 12/31/18 0.72 Cal Months  
 NIH \$10,239  
 Cardiolipin as a Novel Mediator of Acute Lung Injury (Core D)

Execution of these studies will provide a paradigm-changing conceptual model for ARDS pathogenesis that serves as a basis for therapeutic intervention and providing a new and sustained field of scientific inquiry in lung biology

**R01 HL123766-02 (PI: Rojas)** 09/01/15 – 06/30/19 0.24 Cal Months  
 NIH \$6,806  
 Aging of MSCs Missing Link in IPF

We will focus on the effect of age on B-MSCs biology by comparing B-MSCs isolated from young and old donors and in the characteristics of B-MSCs during chronic Injury, by comparing B-MSCs isolated from IPF patients and age-matched and young controls.

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**1R01 AI114587 (PI: Rothstein)** 07/01/15-12/31/19 0.60 Cal Months  
NIH \$8,726  
In Vivo Detection and Mechanisms of Regulatory B Cell Function in Transplantation

We utilize state of the art imaging to enhance our understanding of immunobiology of regulatory B cells in the context of transplant medicine and provide therapeutic insights highly relevant to allograft tolerance

**R01 HL079207-08 (PI: Pagano)** 08/15/15 – 05/31/20 0.60 Cal Months  
NIH \$8,315  
Reactive Oxygen Species in Vascular Disease

The research plan is expected to open up a new field of inquiry in vascular biology and is conceptually and technologically innovative.

**R01 HL128297 (PI: Sundd)** 08/15/15-05/31/20 0.42 Cal Months  
NIH \$24,983  
Pulmonary Arteriole Occlusion by Platelet Neutrophil Micro Emboli in acute chest syndrome

We propose to use an integrative physiologic approach to test the hypothesis that Acute Chest Syndrome (ACS) in sickle cell disease is caused by occlusion of the pulmonary arterioles by aggregates of neutrophils and platelets.

**U01 AI132758 (PI: Camirand)** 06/01/17-05/31/20 0.78 Cal Months  
NIH \$16,670  
Mechanisms and Promotion of Immune Regulation by CD4+ Regulatory T cells with allografts.

The goals of this project are to use multiphoton microscopy to test the hypothesis that cognate interactions between regulatory T (Treg) cells and dendritic cells are key to Treg function within allografts in the context of transplant medicine, and that these interactions can be manipulated therapeutically to enhance Treg suppressor function in the graft.

**U19 AI068021-12 (PI: Greenberger)** 09/01/15 – 08/31/20 0.42 Cal Months  
NIH \$5,839  
Mechanism-Directed Sequential Delivery of Radiation Mitigators

The central aim of this core is to provide optical imaging services for the Center which is focused to understanding the molecular processes involved in radiation induced pathology and therapy.

**RF1MH114103-01 (PI: Bruchez)** 09/01/17-08/31/20 0.60 Cal Months  
NIH \$8,750  
Visualizing Synaptic Connections Between Distinct Cell Types in Whole Mouse Brain.

**R01 HL131789-02 (PI: Mora)** 04/01/16 – 03/31/21 0.30 Cal Months  
NIH \$4,131  
Signaling Mechanisms by which Mitochondria Regulates Fibrosis in the Lung

Overall, these studies will identify novel therapeutic targets in ameliorating mitochondria damage and fibrosis in IPF.

**R01 HL128304-01A1 (PI: Straub)** 07/01/16 – 04/30/21 0.30 Cal Months  
NIH \$7,410  
Vascular Smooth Muscle and Blood Pressure Regulation by Cyb5R3

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Our proposed studies may help to identify new therapeutic targets to alleviate the physical, mental, and financial burdens linked to hypertension as well as other associated cardiovascular pathologies.

**P01 HL103455-06 (PI: Gladwin)** 05/01/16 – 04/30/21 1.2 Cal Months  
NIH \$65,748  
Vascular Subphenotypes of Lung Disease – Preclinical Assessment Core

The Preclinical Assessment Core will provide expertise in novel hemodynamic assessments of pulmonary hypertension and heart function in mouse and rat models.

**R01 HL132550-01 (PI: Freeman/Holguin)** 07/01/16 – 06/30/21 0.60 Cal Months  
NIH \$8,575  
Anti-Inflammatory Lipid Mediators in Asthma

The research plan is designed to test the beneficial metabolic and anti-inflammatory actions of an endogenously present class of modified fats, termed nitro-fatty acids.

**R01 HL133864-01(PI: Straub)** 09/01/16 – 06/30/21 0.30 Cal Months  
NIH \$4,585  
Novel Role of Smooth Muscle B5 Reductase in Sickle Cell Disease

Our proposed studies may help to identify new therapeutic targets to alleviate the physical, mental, and financial burdens linked to Sickle Cell Disease.

**R01 AG052978-01A1 (PI: Ambrosio)** 09/15/17 – 08/31/21 0.60 Cal Months  
NIH \$26,884  
The Anti-Aging Role of Klotho in Skeletal Muscle Regeneration

These studies identify a novel role for Klotho in the regulation of mitochondrial integrity in muscle progenitor cells.

**R01 HL132917 (PI: Scott)** 09/01/17-08/31/21 0.24 Cal Months  
NIH \$3,643  
Regulation of Fuel Utilization by Lysine Acetylation in the Failing Heart

The objective of this proposal is to understand how GCN5L1 acetylation impacts mitochondrial bioenergetics in the heart, and to investigate how dysregulated energy substrate utilization can lead to mitochondrial dysfunction, cardiac energy depletion and heart failure.

**DP2 AI136598 (PI: Delgoffe)** 09/01/17 – 06/30/22 0.60 Cal Months  
NIH \$8,708  
Dissecting and Breaking Metabolic Symbiosis between Cancer Cells and Regulatory T Cells

We aim to dissect how tumor cells promote an immunosuppressive environment through the modulation of metabolism.

**R01 HL142084-01 (PI: Lee)** 04/01/18 – 03/31/23 0.60 Cal Months  
NIH \$27,479  
Host Control Mechanisms Against K. Pneumonia Infection in the Lungs

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**PENDING:**

<b>R01 HL141080 (PI: Sundd)</b> NIH Mechanisms of Platelet Exosome-mediated Acute Chest Syndrome in Sickle Cell Disease	04/01/18 – 03/31/23 \$25,234	0.24 Cal Months
<b>R01 (PI: Dutta)</b> NIH Mechanisms of Myelopoiesis after Myocardial Infarction	07/01/18 – 06/30/23 \$10,392	0.36 Cal Months
<b>P01 HL137629 (PI: Wenzel)</b> NIH The Redox Phospholipoxysome Regulates Epithelial Ferroptosis in Asthma	07/01/18 – 06/30/23 \$98,322	1.2 Cal Months
<b>R01 AG059728 (PI: Fitz)</b> NIH APOE Isoform Specific Effect on Microglial Mediated Response to Amyloid Dependent and Independent Alzheimer's Disease Pathogenesis	07/01/18 – 06/30/23 \$20,070	0.36 Cal Months
<b>R01 (PI: Finkel)</b> NIH Mitophagic Flux as a Modulator of the Heart's Response to Exogenous and Endogenous Stress	07/01/18 – 06/30/23 \$28,569	0.60 Cal Months
<b>R01 (PI: Berman)</b> NIH Axonal Mitochondrial Biogenesis, Endoplasmic Reticulum interactions and Quality Control in Neurodegenerative Diseases	07/01/18 – 06/30/23 \$3,587	0.24 Cal Months
<b>R01 (PI: St. Hilaire)</b> NIH The Role of Telomerase in Calcific Aortic Valve Disease	07/01/18 – 06/30/23 \$3,808	0.24 Cal Months
<b>R01 DK114012 (PI: Jurczak)</b> NIH Obesity-associated Mitophagy Resistance	07/01/18 – 06/30/23 \$10,000	0.36 Cal Months
<b>R01 HL143749 (PI: Ortiz)</b> NIH The Irony of Pulmonary Fibrosis: Bone Marrow Derived Lipofibroblasts (Mesenchymal Stem Cells) to Treat IPF	07/01/18 – 06/30/23 \$21,116	0.60 Cal Months
<b>R01 NS076511 (PI: Bayir)</b> NIH Unearthing Ferroptotic Mechanisms and Therapies Against Acute Kidney Injury in Sepsis	07/01/18 – 06/30/23 \$26,874	0.60 Cal Months
<b>R01 (PI: Villaneuva)</b> NIH Biological and Physical Mechanisms of Ultrasound/Microbubble-Mediated Therapeutic Gene Delivery Across the Endothelial Barrier	07/01/18 – 06/30/23 \$36,857	0.60 Cal Months
<b>R01 PR171686 (PI: Yechoor)</b> DOD Circadian Disruption-Induced Mitochondrial Dysfunction in Beta Cells and Diabetes	09/01/18 – 08/31/21 \$10,028	0.24 Cal Months

<b>R01 PR171686 (PI: Sundd)</b> Fox Chase Cancer Center/NIH Inflammasome Dependent Mechanism of E-cigarette Induced Atherosclerosis	09/01/18 – 08/31/22 \$9,697	0.12 Cal Months
<b>R01 (PI: Tamama)</b> NIH Cellular Rejuvenation by Formation of Mesenchymal Stem Cell Spheroids	09/01/18 – 08/31/23 \$8,000	0.12 Cal Months
<b>R01 (PI: Tamama)</b> NIH Search for Novel Molecular Targets of Anti-Aging Therapy for Progeria Using Spheroid-Mediated Cellular Rejuvenation	09/01/18 – 08/31/20 \$10,000	0.24 Cal Months
<b>R01 (PI: Ortiz)</b> NIEHS Improving Animal Models to Implement Stem Cell-Based Regenerative Medicine in Environmentally Induced Lung Fibrosis (Silicosis)	09/01/18 – 08/31/23 \$21,571	0.60 Cal Months
<b>R01 (PI: Finkel)</b> NIH Molecular Mechanisms Underlying the Age-Dependent Increase in Vascular Stiffness and Calcification	09/01/18 – 08/31/23 \$14,615	0.60 Cal Months
<b>P01 AG043376-04 (PI: Robbins)</b> Scripps Research Institute/NIH Core C: Imaging Core - Cell Autonomous and Non-Autonomous Mechanisms of Aging	12/01/19 – 11/3/23 \$66,323	0.60 Cal Months

The goal of this Program Project Grant is to identify key mechanisms driving aging and age-related pathologies through both cell autonomous and non autonomous mechanisms using mouse models of accelerated and natural aging.

<b>P01 HL114453-03 (PI: Mallampalli)</b> NIH Cardiolipin as a Novel Mediator of Acute Lung Injury (Core D)	01/01/19 – 12/31/23 \$27,112	0.60 Cal Months
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Execution of these studies will provide a paradigm-changing conceptual model for ARDS pathogenesis that serves as a basis for therapeutic intervention and providing a new and sustained field of scientific inquiry in lung biology.

**Prior Grant Support**

*Principal Investigator*

<b>Grant Number</b>	<b>Years Inclusive</b>	<b>Grant Title</b>	<b>Source</b>	<b>Annual Direct Costs</b>	<b>Role</b>
1R01EB017268	2013-2017	(Dual PI: St Croix/Bruchez) Targeted fluorescent indicators for endothelial physiology: Ca(II), ROS, NO	NIH/NIBIB	195,000	20%



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<b>Grant Number</b>	<b>Years Inclusive</b>	<b>Grant Title</b>	<b>Source</b>	<b>Annual Direct Costs</b>	<b>Role</b>
N/A	2002-2005	Parker B. Francis Fellowship in Pulmonary Medicine	Francis Families Foundation	50,000	30%
N/A	2002-2004	Beginning Grant-in-Aid Role of zinc and metallothionein in the anti-apoptotic effects of nitric oxide in pulmonary endothelium	American Heart Association	45,455	30%
1R01HL081421	2006-2012	NO Zinc Signaling in Intact Pulmonary Endothelium	NIH/NHLBI	200,000	40%
3R01HL08142	2009-2011	Administrative Supplement	NIH/NHLBI	68,589	40%

**SEMINARS AND INVITED LECTURESHIPS:**

<i>Date</i>	<i>Title of Presentation</i>	<i>Venue</i>
April 1996	Aspects of the Control of Breathing in Hyperoxia	Invited lecture: Department of Physiology Seminar Series, University of Toronto
April 1999	Role of respiratory motor output in within-breath modulation of muscle sympathetic nerve activity	Invited Speaker: Department of Physiology, Queen's University, Kingston, Ontario, Canada
June 1999	Effect of Expiratory Airflow Rate on Calculated NO Production During Exercise	Invited Symposium Speaker: American College of Sports Medicine Annual Meeting, Seattle, WA
October 2002	Nitric oxide, metallothionein and zinc homeostasis in pulmonary endothelial cells	Invited Speaker: Magee-Womens Research Institute Seminar Series Pittsburgh, PA

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<i>Date</i>	<i>Title of Presentation</i>	<i>Venue</i>
May 2003	Cellular regulation of transition metal homeostasis by metallothionein S-nitrosylation	Invited Speaker: American Thoracic Society Annual Meeting, Seattle Symposium entitled "Nitrosothiol Signaling in Pulmonary Cell Biology"
May 2003	The use of fluorescent microscopy techniques to visualize nitric oxide based signaling events in pulmonary endothelium	Invited Speaker: American Thoracic Society Annual Meeting, Seattle Symposium entitled "Special Topics in Pulmonary Physiology: the Next Generation"
October 2003	Nitric oxide, metallothionein and zinc homeostasis in pulmonary endothelial cells	Guest speaker, Molecular Therapeutics and Drug Discovery Program Research Conference, Pittsburgh Cancer Institute, Pittsburgh, PA
October 2003	Cellular Regulation of Metal Homeostasis by Metallothionein S-Nitrosation.	Guest speaker, Pediatric Pulmonary Research Conference, Children's Hospital, Pittsburgh, PA
April 2004	Stem Cells of the Developing and Adult Lung	Symposium Chair and Organizer, Experimental Biology, Washington, DC
May 2004	Metallothionein, nitric oxide and the regulation of metal ion homeostasis in pulmonary endothelium	Invited speaker, Department of Physiology Seminar Series, Queen's University, Kingston, Ontario, Canada
February, 2004	Mechanisms of protection against oxidative injury: Metallothionein, nitric oxide and the regulation of metal ion homeostasis	Invited Speaker, Gordon Conference on Oxygen Radicals, Ventura California, February, 2004
October 2004	Nitric oxide, intracellular zinc homeostasis and pulmonary vascular reactivity	Invited Speaker, <b>Institute for Environment Medicine</b> , University of Pennsylvania, Philadelphia, PA

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<b><i>Date</i></b>	<b><i>Title of Presentation</i></b>	<b><i>Venue</i></b>
November 2004	Nitric oxide, intracellular zinc homeostasis and pulmonary vascular reactivity	Guest Speaker, Pulmonary Allergy and Critical Care Medicine Joint Collaborative Conference, University of Pittsburgh, Pittsburgh, PA
April 2005	The Use of Fluorescence Resonance Energy Transfer to Visualize Nitric Oxide Based Signaling Events in Living Systems	Keynote Speaker, Spectroscopy Society of Pittsburgh General Meeting
May 2005	The use of fluorescent resonance energy transfer to visualize nitric oxide based signaling events in living systems	Invited Speaker, NIH/NCI Workshop on "Redox Biology Biomarkers and Imaging", Gaithersburgh, MD
May 2005	Imaging Nitric Oxide-Zinc Mediated Signaling Events In Intact Pulmonary Endothelium	Invited Speaker, American Thoracic Society Meetings, Symposium: "Real time optical imaging of the lung: New insights in lung biology
December 2005	Imaging Nitric Oxide-Zinc Mediated Signaling Events in Intact Pulmonary Endothelium	Invited Speaker, Respiratory Neurobiology Speaker Series, School of Veterinary Medicine, University of Wisconsin-Madison
April 2006	Nitric oxide, zinc and hypoxia-induced contraction of isolated pulmonary endothelium	Invited Speaker, Experimental Biology, San Francisco, Symposium entitled "Mechanisms of Hypoxic Vasoconstriction".
September 2006	Nitric oxide mediated zinc release contributes to hypoxic regulation of pulmonary vascular tone	Invited Speaker, Zinc Signals 2006, International Society for Zinc Biology Meetings, Sienna, Italy
October 2006	Contribution of nitric oxide-induced zinc release in the hypoxic regulation of pulmonary vascular tone	Invited Speaker, Department of Pharmacology, University of Illinois at Chicago

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<b><i>Date</i></b>	<b><i>Title of Presentation</i></b>	<b><i>Venue</i></b>
October 2006	Respiratory Engineering - New Horizons in Lung Imaging	Symposium Co-Chair, Bioengineering Society Annual Meetings, Chicago, IL
January 2007	Contribution of nitric oxide-induced zinc release in the hypoxic regulation of pulmonary vascular tone	Invited Speaker, Magee- Women's Research Institute, Pittsburgh, PA
April 2007	Visualizing Nitric Oxide- Zinc Mediated Signaling Events in Intact Pulmonary Endothelium	Invited Speaker, Focus on Microscopy Conference, Valencia, Spain
December 2007	Nitric oxide mediated zinc release contributes to hypoxic regulation of pulmonary vascular tone	Invited Speaker, University of Pittsburgh Graduate School of Public Health Dean's Junior Faculty Seminar Series
January 2008	<i>Contribution of nitric oxide-induced zinc release in the hypoxic regulation of pulmonary vascular tone</i>	Invited Speaker, Department of Cell Biology and Physiology Seminar Series, University of Pittsburgh School of Medicine
April 2008	The use of contemporary optical imaging technologies to reveal molecular pathways regulating contractile events in the pulmonary vasculature	Invited Speaker, Focus on Microscopy Conference, Osaka, Japan
April 2008	Novel Optical Methods for Studying the Living Circulatory System and Lung	Symposium Chair and Organizer, Experimental Biology, San Diego, CA
August 2008	Fluorescence resonance energy transfer: Assaying molecular behavior in living systems	Invited Lecturer, Short Course on Live Cell Imaging Using Fluorescence Methods, Microscopy and Microanalysis Meetings, Albuquerque, NM

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<b><i>Date</i></b>	<b><i>Title of Presentation</i></b>	<b><i>Venue</i></b>
October 2008	Imaging reveals a role for nitric oxide and zinc in regulating contraction of pulmonary endothelium	Invited Speaker, Biomedical Engineering Society Meetings, St. Louis, MO
November 2008	Fluorescent Probes	Invited Lecturer, Avances Recientes en Microscopia, Instituto Dr Neurobiologia, Mexico City, Mexico
November 2008	Studying molecular interactions in living systems	Invited Lecturer, Live Cell Imaging for the Advanced User, The Centre for Microscopy, Characterization and Analysis, University of Western Australia, Perth, Australia
November 2008	Cutting edge sensors in optical microscopy	Invited Lecturer, Invited Lecturer, Live Cell Imaging for the Advanced User, The Centre for Microscopy, Characterisation and Analysis, University of Western Australia, Perth, Australia
December 2008	The use of contemporary optical imaging technologies to reveal molecular pathways regulating contractile events in the pulmonary vasculature	Invited Speaker, West Australian Sleep Disorders Research Institute/Department of Pulmonary Physiology, University of Western Australia, Perth, Australia
January 2009	The use of contemporary optical imaging technologies to reveal molecular pathways regulating contractile events in the pulmonary vasculature	Invited Speaker, Basic & Translational Research in Lung Diseases Conference, Division of Pulmonary Allergy and Critical Care Medicine, University of Pittsburgh

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<i>Date</i>	<i>Title of Presentation</i>	<i>Venue</i>
February 2009	Confocal Microscopy	Invited Lecturer, IDL650 Optical Imaging Techniques, Ph.D. degree in Basic Medical Science, School of Medicine, University of South Alabama, Mobile Alabama
February 2009	The use of contemporary optical imaging technologies to reveal molecular pathways regulating contractile events in the pulmonary vasculature	Invited Speaker, Cell Signaling Seminar, Department of Pharmacology, University of South Alabama, Mobile Alabama
March 2009	A Novel Role for Zinc in Regulating Contractile Events in the Pulmonary Vasculature	Invited Speaker, McGowan Institute Wound Healing Seminar Series, University of Pittsburgh
March 2009	The Use of Fluorescent Sensors to Study Molecular Behavior in Living Systems	Invited Speaker, McGowan Institute Scientific Retreat, Nemaclin Woodlands Resort, Farmington, PA
August 2009	The use of contemporary optical imaging to reveal molecular pathways regulating contractile events in the pulmonary vasculature	Keynote Speaker, Confocal Imaging Workshop, Department of Physiology and Biophysics, University of Southern California Keck School of Medicine, Los Angeles, CA
January 2010	Visualizing nitric-oxide zinc mediated signaling events in living systems	Invited Speaker, Bioimaging Day, Carnegie Mellon University, Pittsburgh, PA
May 2010	Visualization of nitric oxide-zinc mediated signaling events in pulmonary endothelium	Frontiers of Cellular Imaging for Research and Education, Marquette University, Milwaukee, WI
August 2010	Optical Imaging Reveals a Role for Zinc in Mediating Contraction of Pulmonary Endothelium	Invited speaker, 17th International Microscopy Congress - IMC17, Rio de Janeiro, Brazil

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<b><i>Date</i></b>	<b><i>Title of Presentation</i></b>	<b><i>Venue</i></b>
December 2010	Use of Optical Imaging to Study Molecular Behavior in Living Systems	Keynote Speaker, Penn State Milton S. Hershey Medical Center
April 2011	Live Cell Imaging: Limitations and Possibilities	Invited Speaker, Institute for Human Infections & Immunity, University of Texas Medical Branch at Galveston
April 2011	A Novel Role for Zinc in Regulating Contractile Events in the Pulmonary Vasculature	Invited Speaker, Sealy Center for Environmental Health and Medicine, University of Texas Medical Branch at Galveston
September 2011	Use of contemporary optical imaging to reveal molecular pathways regulating contractile events in vascular endothelium	Invited Speaker, University of Pittsburgh, Department of Cell Biology and Physiology, Annual Retreat, Pittsburgh, PA
October 2011	Zinc-Metallothionein: A Molecular Target for Nitric Oxide-Mediated Signaling	Invited Symposium Speaker, Full Metal Jacket—The Roles of Metal Ions in Proteins, Science 2011 Next Gen, University of Pittsburgh
January 2012	Zinc-Mediated Signaling and Regulation of Contractility in Vascular Endothelium	Seminar Speaker, Department of Environmental and Occupational Health, University of Pittsburgh Graduate School of Public Health
April 2012	Constriction in the microvasculature: muscle is not required	Invited Speaker, Experimental Biology, San Diego, Symposium entitled “Novel Sites of Regulation in the Pulmonary Vasculature: Contradictions and Non-traditional Responses”.
February 2013	The use of Optical Imaging Tools to Study the Pulmonary Vasculature	Invited Speaker: AFIRM Workshop in Enabling Technologies Program McGowan Institute, Pittsburgh

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<b><i>Date</i></b>	<b><i>Title of Presentation</i></b>	<b><i>Venue</i></b>
March 2013	Use of contemporary optical imaging to reveal ROS-mediated pathways regulating vascular contractile function.	Invited Speaker, McGowan Institute Scientific Retreat, Nemaquin Woodlands Resort, Farmington, PA
October 2014	The use of contemporary optical imaging and novel probes to study vascular function.	Invited Speaker: The University of Akron, Department of Chemistry Seminar Series
October 2014	Microscopies: Future Facts	Invited Speaker, Nikon Corporation Tokyo Japan October 21 <sup>st</sup> 2014
June 2015	Innovative techniques in aging and mitochondria research	Invited Speaker: University of Pittsburgh Basic Biology of Aging Working Group: Healthy Aging Advance
November 2015	The use of contemporary optical imaging and novel probes to assay mitochondrial function	National Sales Meeting, Nikon Inc., Tucson Arizona
March, 2016	Invited Panelist: Academic Research	Graduate Career Day, Penn State College of Medicine, Hersey, PA
June, 2016	Managing access, use and training in a large multiuser facility	MAD SSCi Annual Meeting, Pittsburgh, PA
March, 2016	Invited Panelist: Academic Research	Graduate Career Day, Penn State College of Medicine, Hersey, PA
June, 2016	Managing access, use and training in a large multiuser facility	MAD SSCi Annual Meeting, Pittsburgh, PA

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<i>Date</i>	<i>Title of Presentation</i>	<i>Venue</i>
September, 2016	Making sense of mitochondria: Novel techniques for measuring dynamics, (dys)function, and interaction	Annual Retreat, Department of Cell Biology, University of Pittsburgh
August 2017	Combining Novel Probes and High Resolution Imaging to Dissect Mitochondrial Function in Living Systems	Invited Symposium Speaker: Microscopy & Microanalysis 2017, St. Louis MO
August 2017	Advanced probes and quantitative optical imaging approaches for studying aging	Invited Speaker: Vail Scientific Summit, Steadman Philippon Research Institute, Vail Colorado

## **STUDY SECTIONS AND REVIEW PANELS:**

2004-07	American Heart Association, Mid Atlantic Consortium Study Section, Member
2006-08	American Heart Association, National Center Molecular Signaling Study Section, Member
2007	NIH/NIDDK Special Emphasis Panel 05 ZDK1 GRB-8
2009	NIH/NHLBI Challenge Grants Panel 10 ZRG1 CVRS-B (58) R
2009	NIH/NHLBI Special Emphasis Panel/Scientific Review Group RIBT Ad hoc
2010	NIH/NHLBI 1020/10 HLBP 1, Program Project Review Committee, ad hoc reviewer
2011-15	American Heart Association, National Center, Molecular Signaling 4 Study Section, Member
2015	NIH/NHLBI 2015/10 HLBP 1, Member
2015	NIH/NIAMS 2016/01 ZAR1 XZ (M1) P30 MSK Review Panel, member
2016-	American Heart Association, Molecular Signaling 3 Study Section, Co-chair
2017	NIH/EBIT-A (90), Panel Member
2017-	NIH CMT Standing Panel - Cellular and Molecular Technologies 2018/01
2018-	American Cancer Society RE Clinical Cancer Research and Epidemiology (CCE) Panel Member

## **Other Research Related Activities**

**Reviewer**, American Journal of Physiology; American Journal of Pathology; American Journal of Respiratory and Critical Care Medicine; Antioxidants and Redox Signaling; Biotechniques; Experimental Biology and Medicine; Free Radicals in Biology and Medicine; Journal of Applied Physiology; Medicine and Science in Sports and Exercise; Microvascular Research

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## CURRENT RESEARCH INTERESTS

*Personal Research Program* combines a variety of cutting edge optical imaging techniques including high speed, camera based imaging, and high speed, 3D confocal and multiphoton methods, to collect real time metrics of vascular performance (blood flow, vascular reactivity and barrier function) in living organisms, including mice and zebrafish. These approaches are central to funded efforts with colleagues at Carnegie Mellon University to develop and novel genetically encoded fluorescent biosensors for reactive oxygen and nitrogen species (ROS and RNS, respectively), and to apply these new sensors to establish the role of ROS and RNS based signaling in the regulation of vascular tone and barrier function in cell culture and in zebrafish models of vascular disease.

*Collaborative Research Program* is directed thematically towards: 1) assessing mitochondrial dynamics and ROS/NO generation in living cells and tissue using optical microscopy; and 2) use of advanced imaging modalities to investigate mechanisms regulating pulmonary and cardiovascular diseases including asthma, hypertension, and sickle cell disease.

## SERVICE

### University and Medical School

2002	Marketing Committee, University of Pittsburgh Graduate School of Public Health
2002-2004	Public Relations Committee, University of Pittsburgh Graduate School of Public Health
2002-2004	Alumni Committee, University of Pittsburgh Graduate School of Public Health
2003-2006	Curriculum Committee, Department of Environmental and Occupational Health, University of Pittsburgh Graduate School of Public Health
2003-2016	Graduate Student Mentoring Committee, Department of Environmental and Occupational Health, University of Pittsburgh Graduate School of Public Health
2006-2016	Director of Student Recruitment and Admissions, Department of Environmental and Occupational Health, University of Pittsburgh Graduate School of Public Health
2017-	Faculty Recruiting Committee, Department of Cell Biology

### Professional Organizations and Honorary Societies

2002-2004	Program Committee, American Physiological Society: Respiration Section
2007-2014	Program Committee, American Physiological Society: Respiration Section
2008-2014	Steering Committee, American Physiological Society: Respiration Section
2008-2010	Chair, Awards Committee, American Physiological Society: Respiration Section
2011- 2013	Chair, Banquet Committee, American Physiological Society: Respiration Section
2011- 2012	Finance Committee, American Physiological Society: Respiration Section
2011-2015	Editorial Board Member: American Journal of Physiology: Lung, Cell and Molecular Physiology
2012-2017	Panel Member, Giles F. Filley Awards Committee, American Physiological Society