

JULY 2016

## CURRICULUM VITAE

### BIOGRAPHICAL

**Name** Bruce R. Pitt

**Birthplace** New York, NY

**Citizenship** U.S.A.

**Business Address** Department of Environmental and Occupational Health  
University of Pittsburgh Graduate School of Public Health  
Pittsburgh, PA 15219

Telephone:  
(412) 624-8400

---

### EDUCATION AND TRAINING

#### Undergraduate

1966 - 1970 Brown University Providence, RI B.A. Human Biology

#### Graduate

1971 - 1972 Dept.Env. Health Sci. The Johns Hopkins Univ. Baltimore, MD M.H.S. Environ.Hlth.Sci.

1973 - 1977 Dept.Env. Health Sci. The Johns Hopkins Univ. Baltimore, MD Ph.D. Environ. Physiology

### APPOINTMENTS AND POSITIONS

2000 – Present Professor and Chairman  
Department of Environmental and Occupational Health  
The Graduate School Public Health

	University of Pittsburgh Pittsburgh, PA
2002 – Present	Professor Department of Bioengineering School of Engineering University of Pittsburgh Pittsburgh, PA
1991 - Present	Professor Department of Pharmacology and Chemical Biology University of Pittsburgh School of Medicine Pittsburgh, PA
1987 - 1991	Associate Professor Departments of Pharmacology and Anesthesiology University of Pittsburgh School of Medicine Pittsburgh, PA
1985 - 1987	Associate Professor Departments of Anesthesiology and Pediatrics Yale University School of Medicine, New Haven, CT
1981 - 1985	Assistant Professor Department of Anesthesiology Yale University School of Medicine, New Haven, CT
1979 - 1981	Research Associate Department of Surgery Yale University School of Medicine, New Haven, CT
1977 - 1978	Postdoctoral Fellow Institute of Environmental Medicine New York University Medical Center, New York, NY

## **MEMBERSHIPS IN PROFESSIONAL AND SCIENTIFIC SOCIETIES**

American Heart Association  
 American Physiological Society  
 American Society for Pharmacology and Experimental Therapeutics  
 American Thoracic Society  
 Perinatal Research Society  
 Society of Pediatric Research  
 Society Critical Care Medicine  
 Oxygen Society  
 International Society Zinc Biology

## HONORS AND AWARDS

1982 - 1985	New Investigators Research Award, National Institute of Health, Heart, Lung and Blood Institute
1982 - 1985	Parker B. Francis Fellow in Pulmonary Research
1986 - 1991	Established Investigator, American Heart Association
1989 - 1992	Glaxo Cardiovascular Discovery Program
1994 - 1999	Editorial Board, <i>American Journal of Physiology: Lung Cell Molecular Physiology</i>
1998 - 2010	Editorial Board, <i>General Pharmacology</i>
2001 –2009	Editorial Board, <i>Laboratory Investigation</i>
1999- 2011	Associate Editor, <i>American Journal Physiology: Lung Cell Mol Physiol</i>
2000- 2004	Chairman, Respiration Section, American Physiological Society
2000- 2002	Chairman, NIH Lung Biology Pathology Study Section
2000- 2005,2008	California Tobacco Related Disease Program Pulmonary Study Section, Chairman (2002-2005; 2008)
2005 - 2009	Member, NIH HLBI Program Project Review
2004 – Present	Editorial Board, <i>American Journal Respiratory Cell Mol Biology</i>
2001- 2011	MERIT Award, NIH HLBI

## PROFESSIONAL ACTIVITIES

<b>Teaching Trainees</b>	<b>Current Position</b>
2015 – present	Jing Chang, MD Anesthesiologist, Shanghai China
2015 – present	Yueeng Xia, MD Anesthesiologist, Xiang Ya, China
2012 – present	Justin Buland, D.O. Assistant Professor Pediatrics University Pittsburgh Sch Med
2008 – present	Murat Kaynar, MD Associate Professor Critical Care Medicine University Pittsburgh Sch Med
2002 – Present	Li-Ming Zhang, M.D. Associate Professor Dept. Anesthesiology University of Pittsburgh Sch Med
2007 – 2014	Hui-Hua Li, MD, PhD Research Associate, Division Pulmonary Allergy Critical Care Med, Univ Pittsburgh School Med

2006 – 2012	Kalidasan Thambiayya, PhD	Postdoctoral Fellow Medicine University of Chicago
2004 – 2008	Rong Cao, PhD	Associate Professor Chemistry Community College Allegheny County, Pittsburgh PA
2002 – 2004	Karanee Leelavanichkul	Masters student Bioengineering Dept. Environmental Occup.Hlth University of Pittsburgh Graduate School Public Health
2002 – 2005	MaiHua Bo	Research assistant Dept. Surgery University Pittsburgh Sch Medicine
2003 – 2008	Molly Stitt, PhD	Environmental Health Sci Specialist Environmental Health Sciences University Pittsburgh Pittsburgh, PA
2001- 2004	Annette Wilson, Ph.D.	Research Associate Division Gastroenterology University Pittsburgh School Med
1998- 2002	Ziu-Le Tang, M.D.	Kaiser Permenant, Napa, CA
1999- 2002	Claudette St. Croix, Ph.D.	Associate Professor Dept. Environmental Occ Hlth University of Pittsburgh GSPH
1997 – 2002	Linda Pearce, Ph.D.	Research Assistant Professor Dept. Environmental Occup. Hlth Univ. Pittsburgh Grad.Sch.Pub.Hlth
2001- 2002	Wan Huang, Ph.D.	Postdoctoral fellow Dept. Medicine, University of Pittsburgh Sch Med
1997 - 1999	Raphael Villavicencio,M.D.	Resident Dept. Medicine Indiana University Sch. Med.

1996 - 1998	Jamal Razzack, M.D.	Postdoctoral Fellow Division of Pulmonary Medicine University of Pittsburgh
1996 – 1998	Jeffrey Erukhimov, M.D.	Clin. Asst. Professor, Division of Pulmonary Med University of Pittsburgh
1995 - 1996	Gail Deutsch, M.D.	Associate Professor Department of Pathology Childrens Hospital University of Washington Seattle, WA
1994 - 1996	Gary Geneviva, M.D.	Assistant Professor Division Pediatric Critical Care Hershey Medical Center
1994 - 1996	Emily Yee, M.D.	Clin. Asst. Prof. Division Pulmonary Medicine University of Pittsburgh
1993 - 1996	Robert Mannix, Ph.D.	Research associate Harvard University Medical School Boston, MA
1993 – 1995	Hector Wong, M.D.	Professor of Pediatrics, Director of Pediatric Intensive Care Children's Hospital of Cincinnati Cincinnati, OH
1992 - 1994	Margaret Schwarz, M.D. American Heart Assoc.	Professor Department of Pediatrics Critical Care Medicine University Indiana School Medicine South Bend, IN
1990 - 1991	Monalisa Mitra, Ph.D. Glaxo Cardiovascular Discovery Program	Research Associate Southwestern Medical Center Dallas, TX
1990 - 1991	MaryAnn DeMichele, Ph.D NIH HLBI Post-doctoral	Assistant Professor Department of Biology Carlow College Pittsburgh, PA
1990 - 1991	Arthur Atlas, M.D. American Lung Assoc.	Clinical Asst. Professor Columbia University

New York, NY

1988 - 1991	Weili, Weng, M.D. Southwest Pennsylvania American Heart Assoc. Fellow	Associate Professor Department of Anesthesiol. The Johns Hopkins University Baltimore, MD
1986 - 1987	Christina Meyers, Ph.D. NIH-HLBI Postdoctoral Fellowship	Department of Pharmacology Boehring Ingleheim Ridgefield, CT
1986 - 1987	Joaquim Pinheiro, M.D. NIH-HLBI Postdoctoral Fellowship	Professor Department of Pediatrics Albany Medical College Albany, NY
1981 - 1982	James Flink, M.D. NIH-HLBI Postdoctoral Fellowship	Clinical Asst Professor Dept. of Medicine University of Minnesota St. Paul, MN

### UNIVERSITY COMMITTEES

1. Vice-chairman, Department of Pharmacology 1987-2000
2. Director of Education, Medical Pharmacology 1987-1993; 1997-1998
3. Chairman, University of Pittsburgh School of Medicine, Standing Committee for Tenure and Promotion 1997-1999
4. University of Pittsburgh, Internal Review, Department of Biological Sciences, 1997
5. Research Advisory Committee, Childrens Hospital Pittsburgh, 1992- 2002
5. Search committee, Division of Pulmonary Allergy Critical Care Medicine
6. Search committee, Dept. Bioengineering
7. Director, Summer Medical Student Research Fellowship Program 1996-1999
8. Ad hoc committee, Medical School admissions interview 1998-2001
9. Member, Magee-Womens Research Institute Advisory Committee, 2001-present
10. Member, McGowan Institute for Regenerative Medicine, Feb 2002 – present
11. Member, Medical Scientist Training Program (MD/Ph.D) University of Pittsburgh School of Medicine (Sept 2002 – present)
12. Search committee (Chairman), Chairman Department Pharmacology, University of Pittsburgh School of Medicine (July 2004 – present)
13. Member, University of Pittsburgh Technology Transfer Committee
14. Member, Health Sciences Research Advisory Committee
15. Search committee (Chairman), Chair Department Human Genetics, University of Pittsburgh Grad School Public Health
16. Search committee, Chief Pulmonary Medicine, University of Pittsburgh School Medicine
17. Search committee, Director, Magee Womens Research Institute

## NATIONAL COMMITTEES

1. Chairman, Pulmonary Circulation Section, American Thoracic Society, 1991.
2. Member, Publication Policy Committee, American Thoracic Society, 1991 - 1993.
3. Long Range Planning Committee, American Thoracic Society, 1994 - 1996; 1998-1999.
4. Chairman, Program Committee, Respiratory Molecular Cell Biology, American Thoracic Society, 1998.
4. Member, Research Review Committee, American Lung Association, 1986 - 1990.
5. Member, VA Merit Review, Respiration, 1991 - 1994.
6. Lung Biology Pathology Study Section, Ad-hoc, NIH, 1993 - 1995.
7. Respiratory and Applied Physiology Study Section, Ad-hoc, NIH, 1993 - 1997.
8. Program Project Review Committee, Heart-Lung Interactions, NIH, 1992.
9. NIH Advisory Committee, Southwest Foundation, Biomedical Research. 1995-1999
10. NIH Special Emphasis Board, Pulmonary Vascular Biology, 1995.
11. NIH Special Emphasis, Bone Marrow Transplant and Lung Injury, 1995.
12. NIH Special Emphasis, Bronchopulmonary Dysplasia, 1994.
13. American Lung Association Fellowship Review, 1995-1998, member, co-chairman, 1998.
14. NIH SCOR Lung Development and Pathobiology, 1996
15. NIH Special Emphasis, Cystic Fibrosis, 1996
16. NIH Fellowship Review, Physiological Sciences 1996
17. NIH Special Emphasis, Metabolism 1997
18. NIH SCOR Acute Lung Injury, 1997
19. American Heart Association, Lung and Development Review member, 1996-1998
20. NIH Lung Biology and Pathology, Member, 1998-2002
21. March of Dimes Ad hoc reviewer, 1999-2000
22. BSF, United States-Israeli International Science Foundation, Ad hoc reviewer 2000
23. American Physiological Society, Reviewer Giles Filley Award Respiration, 2000-present
24. External Advisory Board, University of Pennsylvania SCOR Acute Lung Injury
25. California Tobacco-Related Disease Research Program, Pulmonary Disease Study Section, 2000-present, Chairman 2002
26. NIH RFA Intermittent Hypoxia, 2000
27. Chairman-elect, Respiration Section, American Physiological Society
28. Chairman, NIH Lung Biology Pathology Study Section, Oct 2000 -
29. Scientific Advisory Board, iNOTherapeutics, Clinton, NJ
30. Adhoc member, promotions committee, Pulmonary Pathology Branch, NIEHS, RTP, NC
31. Ad hoc reviewer, Alice Hamilton Award for Excellence Occupational Safety Health
32. Member, Special study section, NIH Alcohol Toxicology, Oct 2002
33. NIH HLBI SPARKS II, Jan 2003
34. Member, Special study section, NIH Respiratory Applied Physiology, Feb 2003
35. Member, Board Review, Pulmonary Pathobiology NIEHS, Aug 2003
36. Ad hoc reviewer, Kentucky Science and Engineering Foundation, Aug 2003
37. Member, Parker B. Francis Foundation Pulmonary Research Advisory Group
38. External Advisory Board, Case Western Cystic Fibrosis Center, April 2004
39. Ad hoc member, NIH Fellowship Review Pulmonary, Cardiovascular and Exercise March 2004
40. Ad hoc member, NIH PO1 HL60678 (Signaling Endothelial Permeability Lung Vascular Injury) Jun 2004
41. Member, NIH HLBI Program Project Review Committee, 2005 – 2009
42. External Advisory Committee, Chemical Counteract, National Jewish Hospital, Denver CO 2007-

43. External Advisory Committee, T32 Training Program in Pulmonary Research, Harvard School Public Health
44. External Advisory Committee, Institute Vascular Biology, Medical College Georgia
45. External Advisory Committee, Department Environmental Health Sciences, UAB School Public Health
46. External Advisory Committee, University of California at Davis, T32
47. External Advisory Committee, University of Rochester, T32
48. Ad hoc reviewer, NIH KO8 HLBI 2009-present
49. Scientific Advisory Committee, Gilead (Pharmaceuticals) Sciences Research Scholars Program in Pulmonary Arterial Hypertension, 2011-present
50. Ad hoc reviewer, NIH HLBI PO1 University Arizona Oct 2014
51. Scientific Advisory Committee, Southwest Pennsylvania Environmental Health Project

## **RESEARCH - CURRENT GRANTS**

### **ACTIVE:**

#### **Ongoing Research Support**

RO1 NIH GM108639 09/30/2014 – 09/30/2018

(PI: Li-Ming Zhang; co-PI: BR Pitt)

WISP1 and TLR4 in ventilator induced lung injury.

This proposal will determine the role of innate immunity and interactions of the matrikine, Wnt inducible signaling protein-1 (WISP1) with toll receptors and ventilation induced acute lung injury.

RO1 NIH HL126711 04/01/15 – 03/31/20

(PI: Murat Kaynar; co-PI: BR Pitt)

Combined viral and bacterial infection and zinc homeostasis in distal lung

This proposal will determine the mechanism by which hypozincemia, by diet or during aging, sensitizes mice to the combined effect of H1N1 influenza and s. aureus infection, including impaired human alveolar macrophage function and enhanced injury to alveolar type II cells.

PO1 HL114453 (Mallampalli) 01/01/2014 – 12/31/2018

NIH Cardiolipin as a novel mediator of acute lung injury. The goal of this program project is to address biosynthesis, translocation and mechanisms of signaling of cardiolipin (CL) in bacterial pneumonia models and as it enters the extracellular environment and causes severe adverse consequences in innate immune responses linked to acute lung injury. BR Pitt, Co investigator on Project 1 Regulation of cardiolipin biosynthesis in epithelial injury (PI: Mallampalli) and Project 2 (Intra- and extra-cellular signaling by cardiolipin in lung injury (PI: Kagan)



## **Recently Completed**

Heinz Endowments

04/01/10 – 12/31/14

(PI: BR Pitt)

Center Healthy Environment Community

This grant supports research efforts in assessing public health impact of unconventional natural gas drilling in Southwest Pennsylvania. In particular, links between hydrofracturing in Marcellus Shale basin and perinatal outcomes are being pursued by epidemiological and environmental exposure approaches

R21 ES021068 (Pitt;Kagan)

04/01/12 – 03/31/14

NIH Imaging mass spectrometry for oxidized lipidomics in acute lung injury. The goal of this proposal is to developing imaging mass spectrometry techniques for in situ identification, quantitation and anatomic location of phospholipids and oxidized phospholipids in the lung during experimental models of acute lung injury in mouse.

UPMC Initiative Personalized Medicine

07/01/12 – 06/30/2014

(PI: BR Pitt)

Zinc as a complement to vaccination for influenza in aging mouse. The goal of this study is to determine if zinc repletion in aging affects the course and pathogenesis of experimental influenza infection in mice and improves response to vaccination to influenza in aging mice.

RO1 HL070755 (Kagan)

07/01/08 - 06/30/13

NIH Oxidative lipidomics of pulmonary endothelial apoptosis in hyperoxia. The goal of this proposal is to determine the molecular role of cardiolipin-induced peroxidase activity of cytochrome c in pulmonary endothelial apoptosis in hyperoxi mouse lung and the molecular role of oxidized anionic phospholipids in signal transduction pathway of pulmonary endothelial apoptosis including scavenging of apoptotic pulmonary endothelium by macrophages.

U01 NS063732-01 (Peterson)

07/01/08 – 06/30/11

NIH Acute Cyanide Toxicity, Complex IV, NO, & Nitrite. The proposed research will establish the biochemical mechanism through which NO counteracts the inhibition of isolated cytochrome *c* oxidase by HCN; elucidate the mechanisms that account for the interactions between cytochrome *c* oxidase, HCN, molecular oxygen (O<sub>2</sub>) and NO, or sodium nitrite in mitochondria and demonstrate in animals the efficacy of NO and NO-releasing compounds, including sodium nitrite, in the treatment of acute cyanide intoxication.

RO1 HL094488 (Kagan)

07/01/09 – 06/30/11

NIH

Irradiation Damage and Protection of Pulmonary Endothelium: Oxidative Lipidomics

The goal of this proposal is to determine the molecular role of cardiolipin-induced peroxidase activity of cytochrome *c* in pulmonary endothelial cell apoptosis in mouse after lung irradiation; 2) the molecular role of oxidized anionic phospholipids in the signal transduction pathway of pulmonary endothelial cell apoptosis including scavenging of apoptotic pulmonary endothelium by macrophages; 3) the therapeutic potential of hemigramicidin-4-amino-2,2,6,6-tetramethylpiperidine-N-oxyl, XJB-5-131, and peroxidase-activatable nitric oxide donor, 2-hydroxyamino-vinyl-triphenyl-phosphonium, HVTP, - two types of

mitochondria targeted antioxidants/ inhibitors of cytochrome c/cardiolipin peroxidase - in preventing pulmonary endothelial cell cardiolipin oxidation, apoptosis and favorably affecting the course of lung injury and delayed fibrosis after lung irradiation.

R37 HL065697-05 (Pitt)

07/01/05 – 06/30/11

NIH/NHLBI Zinc Homeostasis and Pulmonary Endothelial Cell Injury. The overall goal of this grant is to determine the mechanism by which nitric oxide mediated changes in zinc homeostasis affect pulmonary endothelial cell function including sensitivity and resistance to apoptotic and necrotic stimuli.

R01 HL085134-03A1 (Bauer)

09/26/07 – 07/31/12

0.6 Cal.

Months

NIH Role of Caveolin-1 and eNOS in Mediating the Therapeutic Effects of CO in PAH. This application focuses on the mechanism by which carbon monoxide (CO) exerts its therapeutic actions in a murine model of experimental pulmonary hypertension. The research will test the hypothesis that CO inhalation therapy exerts its beneficial effects on preclinical models of PAH by modulating the expression and interaction of caveolin-1 and endothelial nitric oxide synthase.

R01 ES014701-01A2 (Sheng)

12/14/07 – 11/30/12

0.6 Cal. Months

NIH Epithelial Sodium Channels and Pulmonary Toxicity of Zinc. The goal of this project is to determine the effects of zinc on ENaC activity and its impact on periciliary liquid (PCL) height, mucociliary transport (MCT) and ciliary beat frequency (CBF) in primary cultures of human bronchial epithelium (HBE); to determine the effects of zinc on ENaC activity in a heterologous expression system; and to identify the molecular mechanism by which zinc activates ENaC.

R25 ES016148-01 (Pitt)

01/01/08 – 11/30/12

0.3 Cal.

Months

NIH University of Pittsburgh: Short-Term Educational Experiences for Research (PITT-STEER). The overall goal of the University of Pittsburgh Short-Term Educational Experience for Research (PITT-STEER) in the Environmental Health Sciences for High School and Undergraduate Students is to encourage entry of students into careers in biomedical research and environmental health sciences.

## INVITED SPEAKER

1. Dept. Environmental Health, University of Cincinnati School of Medicine, Cincinnati, OH Aug 1976
2. Institute of Environmental Medicine, New York University School of Medicine, New York, NY August 1976
3. Dept. Physiology, Howard University School of Medicine, Washington, DC Mar 1978
4. NIH Workshop, "Arachidonic acid metabolism and the pulmonary circulation". Bethesda, MD. September, 1982.
5. American Society Pharmacology and Experimental Therapeutics Symposium, "Consequences of

- pulmonary accumulation of drugs". Annual Meeting FASEB, Chicago, IL. April, 1983.
6. Warner-Lambert Parke-Davis Company, Ann Arbor, MI. October, 1983.
  7. Department of Pulmonary Medicine, The Medical College of Georgia, Augusta, GA. October, 1983.
  8. Department of Anesthesia and Critical Care Medicine, The Johns Hopkins University School of Medicine, Baltimore, MD. February, 1984.
  9. Department of Physiology, Brown University School of Medicine, Providence, RI. October, 1984.
  10. Department of Pharmacology, Albany Medical College, Albany, NY. November, 1985.
  11. Department of Medicine, University of Alberta, Edmonton, Canada. December, 1985.
  12. Department of Medicine, State University of New York at Stonybrook, Stonybrook, NY. December, 1985.
  13. Biomedical Engineering Society, St. Louis, MO. April, 1986.
  14. FASEB Conference, Pulmonary Pharmacology and Pathology, Saxons River, VT. July, 1986.
  15. Stuart Pharmaceuticals, Wilmington, DE. July, 1986.
  16. Department of Physiology, New York Medical College, Valhalla, NY. February, 1987.
  17. Department of Medicine, Columbia University College of Physicians and Surgeons, New York, NY. February, 1988.
  18. Department of Physiology, Brown University, School of Medicine, Providence, RI. March, 1989.
  19. American Heart Association Annual Meeting, Established Investigators Conference, New Orleans, LA. November, 1989.
  20. Glaxo Inc., Research Triangle Park, NC. August, 1989.
  21. Department of Anesthesiology, Medical College of Wisconsin, Milwaukee, WI. February, 1990.
  22. NATO ASI, Vascular Endothelium, Corfu, Greece. June, 1990.
  23. Pulmonary endothelium and mucus secreting cells, Torino, Italy. February, 1991.
  24. Department of Medicine, University of Medical Dentistry of New Jersey, New Brunswick, NJ. April, 1991.

25. Department of Pediatrics, University of Utah School of Medicine, Salt Lake City, UT. October, 1991.
26. Glaxo Inc., Research Triangle Park, NC. March, 1992.
27. Grover Conference, Pulmonary Circulation, Dekker, CO. October, 1992.
28. NIH HLBI Workshop, Rockville, MD. September, 1993.
29. Department of Pediatrics, Winthrop University Hospital, Mineola, NY. January, 1994.
30. Western Society Clinical Research, Carmel CA. February, 1994.
31. Department of Medicine, Vanderbilt University School of Medicine, Nashville TN. March, 1994.
32. Department of Pathology, University of Utah School of Medicine, Salt Lake City, UT. April, 1994.
33. Western Society Pediatrics, Cedar City, UT. July, 1994.
34. Institute Environmental Medicine, University of Pennsylvania School of Medicine, Philadelphia, PA. September, 1994.
35. Department of Pediatrics, Washington University School of Medicine, St. Louis, MO. September, 1994.
36. John B. Pierce Foundation, Yale University School of Medicine, New Haven, CT. January, 1995.
37. Special Emphasis Panel, NIH HLBI, Pulmonary Vascular Disease, Bethesda, MD. February, 1995.
38. Department of Anesthesiology, University of Alabama School of Medicine, Birmingham, AL. May, 1995.
39. American Thoracic Society, Seattle, WA. May, 1995.
40. New Jersey Thoracic Society, New Brunswick, NJ, June 1995.
41. Department of Pediatrics, University of Kansas Medical Center, August 1995.
42. Department of Physiology, Medical College of Wisconsin, Milwaukee, WI October 1995
43. Oxygen Society, Pasadena, CA, November, 1995.
44. Keystone Conference on Oxidants, Sante Fe, New Mexico Jan 1996
45. Childrens Hospital of St. Louis, Washington University School of Medicine, St. Louis, MO,

- March 1996
46. Department of Pharmacology, Medical College of Georgia, Augusta, GA March 1996.
  47. Experimental Biology, Washington, DC April 1996
  48. American Thoracic Society, New Orleans, LA May 1996.
  49. Division of Pulmonary Medicine, Brown University School of Medicine, Providence RI September 1996
  50. Department of Pharmacology, West Virginia University School of Medicine, Morgantown, WV October 1996
  51. Children's Hospital of Michigan, Wayne State University School of Medicine, Detroit, MI October 1996
  52. Oxygen Society, Miami Beach, FL Nov 1996
  53. Dept. Chemistry, The Ohio State University, Columbus, OH April 1997.
  54. International Meeting Reactive Oxygen/Nitrogen Radicals and Cellular Injury, Durham NC Sept. 1997
  55. Dept. Molecular Physiology, Hershey Medical Center, Penn St. University, Hershey, PA Nov 1997
  56. Association American Medical Pharmacology Chairmans Meeting, Sea Island, GA Feb 1998
  57. Departments of Anesthesiology and Pharmacology, University of Illinois, Chicago, IL Apr 98
  58. Perinatal Research Center, University of Alberta, Edmonton, CA, May 1998
  59. Dept. Anesthesiology, The Johns Hopkins University Sch.Med., Balt, MD Jun 1998
  60. Dept. Environmental Medicine, University of Rochester School of Medicine and Dentistry., Rochester, NY Jun 1998
  61. FASEB Summer Conference, Renal Hemodynamics, Saxtons River, VT Jun 1998
  62. Division Pulmonary Medicine, The Johns Hopkins University School of Medicine, Balt, MD Aug 1998
  63. III Intl Symposium, In utero stem cell transplantation and gene therapy. Portland, OR Sept 1998
  64. FASEB Endothelial cell conference, Augusta GA Sept 1998
  65. John B. Pierce Foundation, New Haven, CT Oct 1998

66. Metal protein interactions in biology, Banff, Alberta, Canada Oct 1998
67. Division Pulmonary Medicine, Indiana University School Medicine, Indianapolis, IN Oct 1998
68. NIH Conference: Zinc and Health, Bethesda, MD Nov 1998
69. Department of Medicine, Tufts University New England Medical Center, Boston, MA Nov 1998
70. University of California at Davis, Davis, CA Nov 1998
71. Stanford Research Institute, Palo Alto, CA Nov 1998
72. Department of Pediatrics, Yale University School of Medicine, December, 1998
73. Biogen Corp, Cambridge, MA January 1999
74. Department of Medicine, University of Southern California, Los Angeles, CA March 1999
75. Department of Chemistry, Ohio State University, Columbus, OH May 1999
76. Kennametal Incorporated, Latrobe, PA Jul 1999
77. Department of Pathology, University of Vermont Medical College, Burlington, VT Sept 1999
78. Environmental Protection Agency, Chapel Hill, NC Oct 1999
79. Oxygen Club of California, Santa Barbara CA Mar 2000
80. Institute Environmental Medicine, University of Pennsylvania, Philadelphia, PA Mar 2000
81. Experimental Biology, San Diego, CA Mar 2000
82. American Thoracic Society, Toronto, Canada May 2000
83. National Institutes of Environmental Health Science, Research Triangle Park, NC July 2000
84. Duke University, CIIT and EPA, Durham, NC Oct 2000
85. Heart-Lung Institute, The Ohio State University School Medicine, Columbus, OH Nov 2000
86. NIEHS Extramural Branch, Pinehurst, NC Dec 2000
87. Dept. Biophysics, Medical College Wisconsin, Milwaukee, WI Jan 2001
88. Center Environmental Health Sciences, UMDNJ, Piscataway, NJ Feb 2001
89. Division Pulmonary Medicine, University of Iowa Medical College, Iowa City, IO Mar 2001
90. Seventh International Meeting, Toxic Combustion Byproducts, RTP, NC Jun 2001

91. Department Environmental Health Sciences, Harvard University School Public Health, Boston, MA Oct 2001
92. Dept. Pharmacology, University of Illinois School Medicine, Chicago, IL Nov 2001
93. National Institutes Occupational Safety Health, Morgantown, WV Dec 2001
94. Dept. Medicine, Vanderbilt University School Medicine, Nashville, TN March 2002
95. 11<sup>th</sup> Annual Harold and Marilyn Menkes Memorial Lecture, The Johns Hopkins University, Baltimore, MD March 2002
96. Federation American Society Experimental Biology, Experimental Biology Annual Meeting, Workshop on imaging; Symposium Oxidative Stress and Vascular Wall, New Orleans, LA April 2002
97. Dept. Molecular Biology and Biochemistry, West Virginia University, Morgantown, WV, April 2002
98. Dept. Pharmacology, University of Southern Alabama, Mobile, Alabama April 2002
99. 3<sup>rd</sup> International Conference Oxidative and Nitrosative Stress, Morgantown WV, Jun 2002
100. International Conference, Reactive Oxygen and Nitrogen Species, St. Petersburg, Russia, Jul 2002
101. Department Anesthesiology, University of Alabama at Birmingham School Medicine, Birmingham, AL, Jul 2002
102. Whitaker Foundation Biomedical Engineering Annual Research Grant Conference, LaJolla, CA Aug 2000
103. Grovers Conference Pulmonary Circulation, Dekkers, Colorado Sept 2002
104. Stanford University Childrens Hospital, Dec 2002
105. Advisory committee, Tobacco Related Disease Program, San Jose, CA Dec 2002
106. Advisory committee, NIH HLBI Sparks II, Bethesda, MD Jan 2003
107. Center for Vascular Biology, Medical College Georgia, Augusta, GA Feb 2003
108. Division Cardiology, Albert Einstein Medical College, New York, NY Feb 2003
109. Grover Conference Pulmonary Circulation, Dekkers Colorado Sept 2004
110. Center Environmental Health, University of Arizona, Tucson, AZ Oct 2004

111. Department Pharmaceutical Sciences, School Pharmacy, University of Colorado, Nov 2004
112. UCLA Biolaboratories, Division Neonatology, Torrance, CA Feb 2005
113. Center Environmental Health Sciences, University of Montana, Missoula, MO April 2005
114. Postgraduate Course, Grant Writing, American Thoracic Society, San Diego, CA May 2005
115. Fifth International Meeting Metallothionein, Beijing, China, Oct 2005
116. Xiangsha Medical College, University South Central China, Changsha, China, Oct 2005
117. Institute Clinical Pharmacology, Xiangsha Medical College, Changsha, China Oct 2005
118. Department Bioengineering, University of Pennsylvania School Medicine, November 2005
119. Department Chemistry, Duquense University, December 2005
120. Symposium, Endothelium and Inflammation, American Thoracic Society, San Diego CA May 2006
121. Nitric Oxide Society, Monterey CA Jun 2006
122. Lovelace Respiratory Research Foundation, Albuquerque, NM Jan 2007
123. Division Pulmonary Allergy Critical Care Medicine, Tufts University – New England Medical Center, March 2007
124. Division Pulmonary Medicine, University of California at Davis, October 2007
125. Center Free Radical Biochemistry, University of Alabama at Birmingham, Oct 2007
126. National Jewish Hospital, Denver CO Nov 2007
127. Visiting Pulmonary Scholar, Duke University, University North Carolina, North Carolina State University and NIEHS Research Triangle Park, NC Nov 2007
128. Giessen, Germany, July 2008
129. Chemical Countermeasures, Albuquerque, NM Nov 2008
130. Respiration Section, American Physiological Society, New Orleans, LA April 2009
131. Davis Heart Lung Institute, The Ohio State University, Columbus, OH Jun 2009
132. International Society Zinc Biology, Plenary Lecture, Jerusalem, Israel Dec 2009
133. Division Environmental Medicine, University Rochester School Medicine and Dentistry, Dec 2009



134. Department Environmental Health Sciences, The Johns Hopkins School Public Health, Baltimore, MD Jan 2010
135. Division Pulmonary Medicine, Brown University Providence RI Apr 2010
136. Department Environmental Health Sciences, The Johns Hopkins Bloomberg School Public Health, Baltimore, MD Sept 2010
137. Department Pediatrics, West Virginia University, Morgantown WV Apr 2010
138. International Society Zinc Biology, Melbourne, Australia Jan 2012
139. Allegheny County Council, Pittsburgh, PA May 2014
140. University Pittsburgh Science Day, Pittsburgh, PA Oct 2014
141. Division Pulmonary Medicine, University Arizona School Medicine, Jan 2015
142. American Bar Association, Section Municipal and Government Law, Philadelphia PA Apr 2015
143. Health Effects of Hydrofracking. League of Women Voters. Pittsburgh, PA Nov 2015
143. Division Nephrology, Department Medicine, University of Edmonton School Medicine, Edmonton, Alberta CA Jun 2016
144. Health and Shale Gas Development: State of the Science. Southwest Pennsylvania Environmental Health Project Conference. Jun 2016.

## **RESEARCH INTERESTS**

1. Molecular pharmacology of pulmonary circulation.
2. Zinc homeostasis in vascular endothelium
3. Phospholipids and pulmonary endothelium.
4. Nitric oxide in lung biology
5. Health Effects Unconventional Natural Gas Drilling

## **PUBLICATIONS**

## Refereed Articles

1. Pitt, B.R., Radford, E.P., Gurtner, G.G. and Traystman, R.J. Interaction of carbon monoxide and cyanide on cerebral circulation and metabolism. *Arch. Environ. Hlth.* 34:354-359, 1979.
2. Pitt, B.R., Gillis, C.N. and Hammond, G.L. Influence of the lung on arterial levels of endogenous prostaglandins E and F. *J. Appl. Physiol.* 50:1161-1167, 1981.
3. Yeates, D.B., Pitt, B.R., Karron, G. and Albert, R.E. Coordination of mucociliary transport in the human trachea and lung. *J. Appl. Physiol.* 51:1057-1064, 1981.
4. Yeates, D.B., Spekter, D.M., Leikauf, G.M. and Pitt, B.R. Effect of drugs on mucociliary transport in the trachea and bronchial airways. *Chest* 80:870-873, 1981.
5. Altieri, R.J., Pitt, B.R. and Gillis, C.N. Separation of prostaglandin E1 from its major metabolites: application of the technique to measure first-pass clearance of PGE1 in the pulmonary and cerebral circulations of the anesthetized dog. *Biochem. Pharmacol.* 30:2953-2961, 1981.
6. Flink, J.R., Pitt, B.R., Hammond, G.L. and Gillis, C.N. Selective effect of microembolization on pulmonary removal of biogenic amines. *J. Appl. Physiol.* 52:421-427, 1982.
7. Gewitz, M., Pitt, B.R., Laks, H., Hammond, G.L., Talner, N.S. and Gillis, C.N. Reversible changes in norepinephrine extraction by lungs in children with pulmonary hypertension. *Ped. Pharmacol.* 2:53-60, 1982.
8. Pitt, B.R., Hammond, G.L. and Gillis, C.N. Depressed pulmonary removal of prostaglandin E1 after prolonged cardiopulmonary bypass. *J. Appl. Physiol.* 52:887-892, 1982.
9. Pitt, B.R., Hammond, G. and Gillis, C.N. Comparison of pulmonary and extrapulmonary amine extraction. *J. Appl. Physiol.* 52:1545-1551, 1982.
10. Pitt, B.R. and Lister, G. Pulmonary metabolic function in the awake lamb: effect of development and hypoxia. *J. Appl. Physiol.* 55:383-391, 1983.
11. Pitt, B.R., Forder, J.R. and Gillis, C.N. Drug-induced impairment of pulmonary removal of 3H-prostaglandin E1 in vivo. *J. Pharmacol. Exp. Ther.* 227:531-537, 1983.
12. Pitt, B.R. Metabolic functions of the lung and systemic vasoregulation. *Fed. Proc.* 43:2574-2577, 1984.
13. Lister, G., Kopf, G.S. and Pitt, B.R. Functional assessment of the pulmonary microcirculation during postnatal development. *Ped. Pharmacol.* 4:85-99, 1984.
14. Pitt, B.R. and Lister, G. Kinetics of angiotensin-converting enzyme in the conscious newborn lamb. *J. Appl. Physiol.* 57:1158-1166, 1984.
15. Yeates, D.B., Larkridge, C.G., Marrinelli, A., Harshbarger, R.D., Musselman, R.P., Pitt, B.R., Raju, T.N., Gerrity, T.R. and Lourenco, R.V. Unsedated animal models of pulmonary

- mucociliary transport. *Biorheology* 21:273-283, 1984.
16. Pitt, B.R., Gillis, C.N. and Hammond, G.L. Depressed lung metabolism after cardiopulmonary bypass and elevated arterial norepinephrine. *Ann. Thor. Surg.* 38:508-513, 1984.
  17. Chen, X., Pitt, B.R., Moalli, R. and Gillis, C.N. Correlation between lung and plasma angiotensin converting enzyme and the hypotensive effect of captopril in conscious rabbits. *J. Pharmacol. Exp. Ther.* 229:649-653, 1984.
  18. Ashton, J.A., Pitt, B.R. and Gillis, C.N. Apparent kinetics of angiotensin-converting enzyme: hydrolysis of 3H-benzoyl-phenylalanyl-alanyl-proline in the isolated perfused lung. *J. Pharmacol. Exp. Ther.* 232:602-697, 1985.
  19. Pitt, B.R., Moalli, R., Man, S.F.P. and Gillis, C.N. Alveolar transfer of prostaglandin E<sub>2</sub> in isolated perfused guinea pig lung. *J. Appl. Physiol.* 59:691-697, 1985.
  20. Ment, L.R., Stewart, W.B., Duncan, C.C., Cole, J. and Pitt, B.R. Beagle pup model of perinatal cerebral infarction: acute changes in blood flow and metabolism during hemorrhagic hypotension. *J. Neurosurg.* 63:441-447, 1985.
  21. Ment, L.R., Stewart, W.B., Duncan, C.C., Cole, J. and Pitt, B.R. Beagle pup model of perinatal cerebral infarction: acute changes in regional cerebral prostaglandins during hemorrhagic hypotension. *J. Neurosurg.* 63:889-895, 1985.
  22. Ment, L.R., Duncan, C.C., Ehrenkranz, R.A., Kleinman, C.S., Pitt, B.R., Taylor, K.J.W., Scott, D.T., Stewart, W.B. and Gettner, P. Randomized indomethacin trial for the prevention of intraventricular hemorrhage in very low birth weight neonates. *J. Pediatr.* 107:937-943, 1985.
  23. Pitt, B.R., Lister, G., Dawson, C.A. and Linehan, J.H. Effect of hypoxia and hypercapnia on angiotensin converting enzyme activity in the cerebral microcirculation of anesthetized dogs. *Am. J. Physiol.: Heart and Circulation* 250 H:19:806-814, 1986.
  24. Yeates, D.B., Spektor, D.M. and Pitt, B.R. Effect of orally administered orciprenaline on tracheobronchial mucociliary clearance. *Eur. J. Resp. Dis.* 65:100-108, 1986.
  25. Gillis, C.N., Pitt, B.R., Wiedemann, H.P. and Hammond, G.L. Depressed pulmonary metabolic function in patients with the adult respiratory distress syndrome. *Am. Rev. Resp. Dis.* 134:735-744, 1986.
  26. Turrin, M., Pitt, B.R., Ryan, J.W., Chung, A.Y.K., Clark, M.B. and Gillis, C.N. Uptake of N-[1(S)-carboxy-(4-OH-3-<sup>125</sup>I-phenyl)ethyl]-L-Ala-L-Pro, an inhibitor of angiotensin-converting enzyme by rabbit lung *in situ*. *J. Pharmacol. Exp. Ther.* 238:14-18, 1986.
  27. Hammond, G.L., Gillis, C.N. and Pitt, B.R. Pulmonary metabolic function can serve as a monitor for lung preservation. *J. Heart Transplantation* 5:23-28, 1986.
  28. Mackie, K., Lai, Y., Nairn, C., Greengard, P., Pitt, B.R. and Lazo, J.S. Protein phosphorylation in cultured endothelial cells. *J. Cell. Physiology* 128:367-374, 1986.

29. Ment, L.R., Stewart, W.B., Duncan, C.C., Pitt, B.R. and Cole, J.S. Beagle pup model of perinatal cerebral infarction: regional cerebral prostaglandin changes during acute hypoxemia. *J. Neurosurg.* 65:851-855, 1986.
30. Ment, L.R., Stewart, W.B., Duncan, C.C. and Pitt, B.R. Beagle pup model of perinatal cerebral insults: alterations in cerebral blood flow and intraventricular hemorrhage evolved by hypoxemic insult. *J. Neurosurg.* 65:847-850, 1986.
31. Pitt, B.R., Lister, G., Davies, P. and Reid, L.M. Effects of changes in pulmonary perfusion and surface area on endothelial cell ACE activity. *Ann. Biomed. Engineer* 15(2):229-238, 1987.
32. Rothstein, P.R., Cole, J.S. and Pitt, B.R. Pulmonary extraction of [<sup>3</sup>H] bupivacaine: modification by dose, propranolol and interaction with [<sup>14</sup>C]-5-hydroxytryptamine. *J. Pharmacol. Exp. Ther.* 240:410-414, 1987.
33. Moalli, R., Pitt, B.R. and Gillis, C.N. Effect of flow and surface area on angiotensin-converting enzyme activity in isolated rabbit lungs. *J. Appl. Physiol.* 62:2042-2050, 1987.
34. Pitt, B.R., Lister, G., Davies, P. and Reid, L.M. Correlation of pulmonary ACE activity and capillary surface area during postnatal development. *J. Appl. Physiol.* 62:2031-2041, 1987.
35. Pitt, B.R., Woodford, M., Ryan, J.W., Chung, A.K.Y. and Gillis, C.N. In line measurement of pulmonary metabolic function in the anesthetized rabbit. *J. Appl. Physiol.* 62:2500-2506, 1987.
36. Pitt, B.R., Cole, J.S., Davies, P. and Gillis, C.N. Rapid increases in respiratory tract epithelial permeability occur after intratracheal instillation of PMA. *J. Appl. Physiol.* 63:292-301, 1987.
37. Ment, L.R., Stewart, W.B., Duncan, C.C. and Pitt, B.R. Beagle pup model of perinatal asphyxia: nimodipine studies. *Stroke*, 18:599-603, 1987.
38. Ment, L.R., Stewart, W.B., Duncan, C.C., Pitt, B.R. and Cole, J.S. Beagle pup model of brain injury: regional cerebral blood flow and cerebral prostaglandins. *J. Neurosurg.* 67:278-283, 1987.
39. Davies, P., Reid, L., Lister, G. and Pitt, B.R. Postnatal growth of the sheep lung: a morphometric study. *Anatomical Record*, 220:281-286, 1988.
40. Riggs, D., Havill, A.M., Pitt, B.R. and Gillis, C.N. Pulmonary angiotensin converting enzyme kinetics following acute lung injury in the anesthetized rabbit. *J. Appl. Physiol.* 64:2508-2516, 1988.
41. Myers, C.L. and Pitt, B.R. Selective effect of phorbol ester on kinetics of serotonin removal and ACE activity of *in situ* perfused rabbit lungs. *J. Appl. Physiol.* 65:377-388, 1988.
42. Havill, A.M., Riggs, D., Pitt, B.R. and Gillis, C.N. Resolution of impaired pulmonary function and pulmonary hypertension after phorbol ester administration in rabbits. *Am. Rev. Resp. Dis.* 140:782-788, 1989.
43. Myers, C.L., Lazo, J.S. and Pitt, B.R. Translocation of protein kinase C inhibits 5-HT uptake by

- cultured endothelial cells. *Am. J. Physiol.: Lung Cell Mole. Physiol.* 1:L253-L258, 1989.
44. Pinheiro, J.M., Pitt, B.R. and Gillis, C.N. Role of platelet-activating factor and thromboxane in group B streptococcus-induced pulmonary hypertension in piglets. *Ped. Res.* 26:420-424, 1989.
  45. Weng, W. and Pitt, B.R. Activation of protein kinase C inhibits extraction of serotonin by perfused rat lungs, *in situ*. *Am. J. Physiol.* 258: Lung Cell Mole. Physiol. 2:L289-L293, 1990.
  46. Weng, W., Lazo, J.S., Gillis, C.N. and Pitt, B.R. Disposition of radioiodinated benzyguanidines in perfused rabbit lung: pharmacokinetics and effect of an organo-gold complexed antineoplastic agent. *J. Pharmacol. Exp. Ther.* 255:59-65, 1990.
  47. Lazo, J.S., Hoyt, D.G., Sebti, S.M. and Pitt, B.R. Bleomycin: A pharmacologic tool in the study of the pathogenesis of interstitial pulmonary fibrosis. *Pharmacol. Therap.* 47:347-358, 1990.
  48. Pitt, B.R., Lister, G., Fontan, J.P.P. and Davies, P. Functional assessment of pulmonary capillary surface area in the two month old lamb. *J. Appl. Physiol.* 70:1677-1685, 1991.
  49. Kubiak, J., Mitra, M.L., Steve, A.R., Hunt, J.D., Davies, P. and Pitt, B.R. Transforming growth factor alpha gene expression in late-gestation fetal rat lung. *Pediatric Res.* 31:286-290, 1992.
  50. Pitt, B.R., Brookens, M.A., Steve, A.R., Atlas, A.B., Davies, P., Kuo, S.-M. and Lazo, J.S. Expression of pulmonary metallothionein genes in late gestational lambs. *Ped. Res.* 32:424-430, 1992.
  51. Nakayama, D.K., Geller, D.A., Lowenstein, C.J., Davies, P., Pitt, B.R., Simmons, R.L. and Billiar, T.R. Cytokines and lipopolysaccharides regulate induction of nitric oxide synthase in cultured rat pulmonary artery smooth muscle. *Am. J. Resp. Cell. Mol. Biol.* 7:741-746, 1992.
  52. Thomae, K., Geller, D.A., Billiar, T.R., Davies, P., Pitt, B.R., Simmons, R.L. and Nakayama, D. Antisense oligonucleotide to inducible nitric oxide synthase inhibits nitric oxide synthase in rat pulmonary artery smooth muscle cells in culture. *Surgery* 114:272-277, 1993.
  53. Pitt, B.R., Weng, W., Steve, A.R., Blakely, R.D., Reynolds, I. and Davies, P. Serotonin-induced increase in DNA synthesis in rat proximal and distal pulmonary vascular smooth muscle cells in culture. *Am. J. Physiol.: Lung Cell Mol. Physiol.* 10: L178-L186, 1994.
  54. Schwarz, M.A., Lazo, J.S., Yalowich, J.C., Reynolds, I., Kagan, V.E., Tyurin, V., Kim, Y., Watkins, S.C. and Pitt, B.R. Cytoplasmic metallothionein overexpression protects NIH 3T3 cells from tert butylhydroperoxide toxicity. *J. Biol. Chem.* 269:15238-15243, 1994.
  55. Nakayama, D.K., Geller, D.A., DiSilvia, M., Bloomgarden, G., Davies, P., Pitt, B.R., Hatokeyama, K., Kagamiyama, H., Simmons, R.L. and Billiar, T.R. Increased activity of de novo tetrahydrobiopterin synthesis supports lipopolysaccharide- and cytokine-induced nitric oxide production in cultured rat pulmonary artery smooth muscle cells. *Am. J. Physiol.: Lung Cell Mol. Physiol.* 10:L455-L459, 1994.
  56. Johnson, B.A., Lowenstein, C.J., Brookens, M.A., Nakayama, D.K., Pitt, B.R. and Davies, P.

- Culture of pulmonary microvascular smooth muscle cells from intraacinar arteries of the rat: characterization and inducible production of nitric oxide. *Am. J. Resp. Cell Mol. Biol.* 10:604-612, 1994.
57. Weng, W., Reynolds, I.J., Jani, J.P., Blaskovich, M., Sebti, S.M., Davies, P. and Pitt, B.R. Desensitization of 5HT<sub>2</sub> receptors by protein kinase C activation in distal pulmonary vascular smooth muscle cells in culture. *Microcirculation.* 1:129-135, 1994.
  58. Gutierrez, H.H., Pitt, B.R., Schwarz, M.A., Watkins, S.C., Caniggia, I., Chumley, P. and Freeman, B.A. Pulmonary alveolar epithelial inducible nitric oxide synthase gene expression: regulation by inflammatory cytokines. *Am. J. Physiol: Lung Cell Mol. Physiol.* 12:L501-L508, 1995.
  59. Wong, H.R., Pitt, B.R., Su, G.L., Rossignol, Steve, A.R., D., Billiar, T.R. and Wang, S. Induction of lipopolysaccharide binding protein gene expression in cultured rat pulmonary artery smooth muscle cells by interleukin 1- $\beta$ . *Am. J. Resp. Cell Mol. Biol.* 12:449-454, 1995.
  60. Finder, J., Nakayama, D.K., Wasserloos, K., Pitt, B.R. and Davies, P. Transforming growth factor beta inhibits cytokine-induced nitric oxide synthase expression in rat pulmonary artery smooth muscle cells. *Am. J. Physiol.: Lung Cell Mol. Physiol.* 12:L862-L867, 1995.
  61. Tyurina, Y.Y., Tyurin, V.A., Yalowich, J.C., Quinn, P.J., Claycamp, H.G., Schor, N.F., Pitt, B.R. and Kagan, V.E. Phenoxy radicals of etoposide (VP-16) can directly oxidize intracellular thiols: protective or damaging effects of phenolic antioxidants? *Toxicol Appl. Pharmacol.* 131:277-288, 1995.
  62. Kim, Y.-M., Bergonia, H.A., Pitt, B.R., Watkins, W.D. and Lancaster, J.R., Jr. Loss and degradation of enzyme-bound heme induced by cellular nitric oxide synthesis. *J. Biol. Chem.* 270:5710-5713, 1995.
  63. Lazo, J.S., Kondo, Y., Michalska, A., Choo, A. and Pitt, B.R. Enhanced sensitivity to oxidative stress in cultured embryonic stem cells from transgenic mice deficient in metallothionein I and II genes. *J. Biol. Chem.* 270:5506-5510, 1995.
  64. Schwarz, M.A., Lazo, J.S., Yalowich, J.C., Allen, W.P., Whitmore, M., Bergonia, H.A., Tzeng, E., Billiar, T.R., Robbins, P.D., Lancaster, J.R., Jr. and Pitt, B.R. Metallothionein protects against the cytotoxic and DNA damaging effects of nitric oxide. *Proc. Natl. Acad. Sci. USA* 92:4452-4456, 1995.
  65. Hoyt, D.G., Mannix, R.J., Rusnak, J.M., Pitt, B.R. and Lazo, J.S. Collagen is a survival factor against lipopolysaccharide-induced apoptosis in cultured sheep pulmonary artery endothelial cells. *Am.J.Physiol.: Lung Cell. Mol. Physiol.* 13: L-171-L177, 1995.
  66. Pitt, B.R., Pilewski, J.M., Schwarz, M.A., Nakayama, D., Mueller, G.M., Robbins, P.D., Watkins, S.A., Albertine, K. and Bland, R.D. Retroviral-mediated gene transfer in lungs of living fetal sheep. *Gene Therapy.* 2:344-350, 1995.
  67. Wong, H., Finder, J., Wasserloos, K. and Pitt, B.R. Expression of inducible nitric oxide synthase gene in cultured rat pulmonary artery smooth muscle cells is inhibited by the heat

- shock response. *Am.J.Physiol: Lung Cell Mol. Physiol.* 13: L843-L848, 1995.
68. Thomae, K.R., Nakayama, D.K., Billiar, T.R., Simmons, R.L., Pitt, B.R., and Davies, P. The effect of nitric oxide on fetal pulmonary artery smooth muscle. *J. Surg. Res.* 59:337-343, 1995.
  69. Wong, H.R., Finder, J., Wasserloos, K., Lowenstein, C.J., Geller, D.A., Billiar, T.R., Pitt, B.R. and Davies, P.D. Transcriptional regulation of inducible nitric oxide synthase by interleukin-1 $\beta$  in cultured rat pulmonary artery smooth muscle cells. *Am.J.Physiol.:Lung Cell.Mol. Physiol.* 15: L166-L171, 1996.
  70. Hoyt, D.G., Mannix, R.J., Gerritsen, M.E., Watkins, S.A., Lazo, J.S., and Pitt, B.R. Integrins inhibit LPS-induced DNA strand breakage in cultured lung endothelial cells. *Am.J.Physiol.: Lung Cell. Mol. Physiol.* 14:L689-L694, 1996.
  71. Thomae, K.R., Joshi, P.C., Davies, P., Pitt, B.R., Billiar, T.R., Simmons, R.L., and Nakayama, D.K. Nitric oxide produced by cytokine-activated pulmonary artery smooth muscle cells is cytotoxic to cocultured endothelium. *Surgery* 119:61-66, 1996.
  72. Tzeng, E., Shears, L.L., Robbins, P.D., Pitt, B.R., Geller, D.A., Watkins, S.C., Simmons, R.L., and Billiar, T.R. Vascular gene transfer of the human inducible nitric oxide synthase: characterization of activity and effects on myointmal hyperplasia. *Mol. Med.* 2:211-225, 1996.
  73. Yee, E.L., Pitt, B.R., Billiar, T.R., and Kim, Y.-M. The effect of nitric oxide on heme metabolism in pulmonary artery endothelial cells. *Am. J. Physiol: Lung Cell. Mol. Physiol.* 15:L512-L518, 1996.
  74. Wong, H.R., Mannix, R.J., Rusnak, J.M., Boota, A., Zar, H., Lazo, J.S., and Pitt, B.R. Heat shock response protects cultured sheep pulmonary artery endothelial cells from lipopolysaccharide-mediated apoptosis. *Am. J. Resp. Cell. Mol. Biol.* 15: 745-751, 1996.
  75. Boota, A., Zar, H., Kim, Y.-M., Johnson, B., Pitt, B.R., and Davies, P. IL-1 $\beta$  stimulates pulmonary microvascular smooth muscle cells to produce peroxynitrite-mediated lipid peroxides and nitrotyrosine. *Am. J. Physiol: Lung Cell. Mol. Physiol.* 15: L932-L938, 1996.
  76. Hauser, G.J., Dayao, E.K., Wasserloos, K.W., Pitt, B.R., and Wong, H.R. Heat shock induction inhibits iNOS mRNA and attenuates hypotension in endotoxin challenged rats. *Am. J. Physiol: Heart Circul. Physiol.* 40: H2529-H2536, 1996.
  77. Arcasoy, S.M., Latoche, J.D., Gondor, M., Pitt, B.R. and Pilewski, J.M. Polycations increase the efficiency of adenovirus-mediated gene transfer to epithelial and endothelial cells in vitro. *Gene Therapy.* 4: 32-38, 1997.
  78. Baker, P.N., Davidge, S.T., Pitt, B.R., Davies, P. and Roberts, J.M. Plasma from preeclamptic women causes a rapid, calcium-sensitive release of nitric oxide from vascular smooth muscle cells. *Hypertension Pregnancy* 16: 47-63, 1997.
  79. Tzeng, E., Kim, Y.-K., Pitt, B.R., Lizonova, A., Kovesdi, I. and Billiar, T.R. Adenoviral transfer of the inducible nitric oxide synthase gene blocks endothelial cell apoptosis. *Surgery* 122: 255-263, 1997.

80. Kondo, Y., Rusnak, J.M., Hoyt, D.G., Settineri, C.E., Pitt, B.R. and Lazo, J.S. Enhanced apoptosis in metallothionein null cells. *Molecul.Pharmacol.* 52: 195-201, 1997.
81. Pitt, B.R., Schwarz, M., Woo, E.S., Yee, E., Wasserloos, K., Tran, S., Weng, W., Mannix, R.J., Watkins, S.A., Tyurina, Y.Y., Tyurin, V.A., Kagan, V.E. and Lazo, J.S. Overexpression of metallothionein decreases sensitivity of pulmonary endothelial cells to oxidant injury. *Am. J. Physiol.* 273 (Lung Cell. Mol. Physiol. 17): L856-L865, 1997.
82. Hoyt, D.G., Rizzo, M., Gerritsen, M.E., Pitt, B.R., and Lazo, J.S. Integrin activation protects pulmonary endothelial cells from genotoxic effects of bleomycin. *Am.J.Physiol* 273(Lung Cell.Mol.Physiol.17):L612-L617, 1997.
83. Stark, W.W., Jr., Blaskovich, M.A., Johnson, B.A., Qian, Y., Vasudevan, A., Pitt, B.R., Hamilton, A.D. Sebt, S.M. and Davies, P. Inhibition of geranylgeranylation promotes apoptosis in vascular smooth muscle cells. *Am. J. Physiol: Lung Cell. Mol. Physiol.* 19: 55-63, 1998
84. Lazo, J.S., Kuo, S.-M., Woo, E.S. and Pitt, B.R. The protein thiol metallothionein as an antioxidant and protectant against neoplastic drugs. *Chemico-Biol Interact* 111-112: 255-262, 1998.
85. Ceneviva, G.D., Tzeng, E., Hoyt, D.G., Yee, E., Gallagher, A., Englehardt, J.F., Kim, Y.-M., Billiar, T.R. and Pitt, B.R. Nitric oxide inhibits lipopolysaccharide induced apoptosis in pulmonary artery endothelial cells. *Am. J. Physiol: Lung Cell. Mol. Physiol.* 19: L717-L728, 1998
86. Fabisiak, J.P., Tyurin, V.A., Tyruina, Y.Y., Borisenko, G.G., Korotaeva, A., Pitt, B.R., Lazo, J.S. and Kagan, V.E. Redox regulation of copper-metallothionein. *Arch Biochem Biophys* 363: 171-181, 1999
87. Li, S., Wu, S.-P., Whitmore, M., Loeffert, E.J., Wang, L., Watkins, S.C., Pitt, B., and Huang, L. Effect of immune response on cationic lipid-mediated intravenous gene delivery. *Am. J. Physiol: Lung Cell. Mol. Physiol.* 20: L796-L804, 1999
88. Tan, Y., Li. S., Pitt, B.R., and Huang, L. The inhibitory role of CpG immunostimulatory motifs in cationic lipid vector-mediated transgene expression in vivo. *Human Gene Therapy* 10: 2153-2161, 1999
89. Davidge, S.T., Pitt, B.R., McLaughlin, M.K., Roberts, J.M. and Johnson, B.A. Biphasic stimulation of prostacyclin by endogenous nitric oxide in endothelial cells transfected with inducible nitric oxide synthase. *General Pharmacology* 33: 383-387, 1999
90. Fabisiak, J.P., Pearce, L.L., Borisenko, G.G., Tyurina, Y.Y., Tyurin, V.A., Razzack, J., Lazo, J.S., Pitt, B.R. and Kagan, V.E. Bifunctional anti-/prooxidant potential of metallothionein: redox signaling of copper binding and release. *Antioxidants Redox Signalling* 1: 309-324, 1999
91. Pearce, L.L., Pitt, B.R., and Peterson, J. Peroxynitrite reductase: another function for cytochrome c oxidase. *J. Biol. Chem.* 274: 35763-35767, 1999.
92. Pearce, L.L., Gandley, R.E., Han, W., Wasserloos, K., Stitt, M., Kanai, A.J., McLaughlin, M.K., Pitt, B.R. and Levitan, E.S. A role for metallothionein in physiological nitric oxide signaling.



- Proc. Natl. Acad. Sci. 97: 477-482, 2000.
93. Boota, A., Johnson, B., Lee, K.-L., Blaskovich, M.A., Hamilton, A., Pitt, B., Sebti, S. and Davies, P. Ras mediates superoxide production by vascular smooth muscle cells. *Am. J. Physiol: Lung Cell. Mol. Physiol.* 278: L329-L334, 2000.
  94. Johnson, B.A., Pitt, B.R. and Davies, P. Pulmonary arterial microvascular smooth muscle cells modulate cytokine and LPS induced cytotoxicity in cocultured endothelial cells. *Am. J. Physiol: Lung Cell. Mole. Physiol.* 278: L460-L468, 2000.
  95. Li, S., Tan, Y., Viroonchatapan, E., Pitt, B.R and Huang, L. Targeted gene delivery to the lung via systemic administration of DNA complexed with anti-PECAM-PEI conjugate. *Am. J. Physiol: Lung Cell. Mol. Physiol.* 278: L504-L511, 2000.
  96. Schwarz, M., Jin, Y., Zhang, F., Deutsch, G., Starnes, V., and Pitt, B.R. Angiogenesis and morphogenesis in an xenograft model of murine fetal distal lung development.. *Am.J.Physiol: Lung Cell. Mol. Physiol.* 278: L1000-L1007, 2000.
  97. Villavicencio, R.T., Liu, S., Ganster, R.W., Dyer, K.F., Tweardy, D.J., Billiar, T.R. and Pitt, B.R. Induced nitric oxide inhibits IL-6 induced Stat3 activation and type II acute phase mRNA expression. *Shock* 13: 441-445, 2000.
  98. Liu, S.-X., Fabisiak, J.P., Tyurin, V.A., Borisenko, G.G., Pitt, B.R., Lazo, J.S. and Kagan, V.E. Reconstitution of apo-superoxide dismutase by nitric oxide-induced copper transfer from metallothionein. *Chem. Res. Toxicol.* 13: 922-931, 2000.
  99. Ehrukhimov, J.A., Tang, Z.-L., Donahue, M.P., Razzack, J.A., Gibons, K.F., Lee, W.M., Wasserloos, K.J., Watkins, S.A., Johnson, B.A. and Pitt, B.R. Actin-containing sera from patients with adult respiratory distress syndrome are toxic to sheep pulmonary artery endothelial cells. *Am. J. Resp. Crit. Care Med.* 162: 288-294, 2000.
  100. Kawai, K., Liu, S.-X., Tyurin, V.A., Tyurina, Y.Y., Borisenko, G.G., Jiang, J.F., St. Croix, C.M., Fabisiak, J.P., Pitt, B.R. and Kagan, V.E. Antioxidant and anti-apoptotic function of metallothioneins in HL-60 cells challenged with Cu-NTA. *Chem. Res. Toxicol.* 13: 1275-1286, 2000.
  101. Hauser, G.J., Wasserloos, K., Dayao, E.K. and Pitt, B.R. Effect of sodium arsenite on iNOS expression and vascular hyporeactivity associated with cecal ligation and puncture in the rat. *Shock.* 15: 73-76, 2001.
  102. Liu, S.-X., Kawai, K., Tyurin, V.A., Tyurina, Y.Y., Borisenko, G.G., Fabisiak, J.P., Quinn, P.J., Pitt, B.R. and Kagan, V.E. Nitric oxide-dependent pro-oxidant and pro-apoptotic effect of metallothionein in HL-60 cells challenged with cupric nitrilotriacetate. *Biochem. J.* 354: 397-406, 2001.
  103. Pearce, L.L., Epperly, M.W., Greenberger, J.S., Pitt, B.R. and Peterson, J. Identification of respiratory complexes I and III as mitochondrial sites of damage following exposure to ionizing radiation and nitric oxide. *Nitric Oxide* 5: 128-136, 2001
  104. 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: Lung Cell Mol. Physiol.* 281: L243-L249, 2001
105. Finder, J.D., Petrus, J.L., Hamilton, A., Villavicencio, R.T., Pitt, B.R. and Sebti, S.M. Signal transduction pathways of IL-1 $\beta$  mediated induction of iNOS in cultured rat pulmonary vascular smooth muscle cells. *Am.J.Physiol.: Lung Cell Mol. Physiol.* 281: L816-L823, 2001
106. St. Croix, C.M., Wasserloos, K., Dineley, K., Reynolds, I., Levitan, E.S. and Pitt, B.R. Nitric oxide mediated changes in zinc homeostasis are regulated by metallothionein/thionein.. *Am. J. Physiol.: Lung Cell Mol. Physiol.* 282: L185-L193, 2002.
107. Ma, Zheng, Mi, Z., Wilson, A., Robbins, P.D., Pitt, B.R. and Li, S. Redirecting adenovirus to pulmonary endothelium by cationic liposomes. *Gene Therapy* 9: 176-182, 2002
108. Pearce, L.L., Kanai, A.J., Birder, L.A., Pitt, B.R. and Peterson, J. The catabolic fate of nitric oxide: the nitric oxide oxidase and peroxynitrite reductase activities of cytochrome oxidase. *J. Biol. Chem.* 277: 13556-13562, 2002.
109. Tang, Z.L., Wasserloos, K., Liu, X., Reynolds, I.J., Pitt, B.R. and St. Croix, C.M. Roles for metallothionein and zinc in mediating the protective effects of nitric oxide on lipopolysaccharide-induced apoptosis. *Mol. Cell. Biochem.* 234/235: 211-217, 2002.
110. Ma, Z., Zhang, J., Alber, S., DiLeo, J., Stolz, D., Watkins, S., Huang, L., Pitt, B and Li, S. Lipid-mediated delivery of oligonucleotide to pulmonary endothelium. *Am. J. Resp. Cell. Mol. Biol.* 27: 151-159, 2002.
111. 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<sup>+/+</sup> and MT<sup>-/-</sup> mouse lung fibroblasts. *Chem. Res. Toxicol.* 15: 1080-1087, 2002
112. Zhou, W., Yuan, X., Wilson, A., Yang, L., Mokotoff, M., Pitt, B. and Li, S. Efficient intracellular delivery of oligonucleotides formulated in folate receptor targeted lipid vesicles. *Bioconjugate Chemistry* 13: 1220-1225, 2002.
113. Zhang, J., Wilson, A., Ma, Z., Tang, Z.L., Sato, E., Mazda, O., Watkins, S., Huang, L., Pitt, B and Li, S. Prolonged gene expression in mouse lung endothelial cells following transfection with Epstein-Barr virus-based episomal plasmid. *Gen Therapy.* 10: 822-826, 2003.
114. Ma, Z, Li, J, Yang L, Mu Y, Xie W, Pitt, B and Li S. Inhibition of LPS- and CpG DNA induced TNF- $\alpha$  response by oxidized phospholipids. In press, *Am.J.Physiol:Lung Cell Mol Physiol.* 286: L808-L816, 2004.
115. Li, J., Ma Z, Tang ZL, Stevens T, Pitt B and Li S. CpG DNA-mediated immune response in pulmonary endothelial cells. *Am. J. Physiol: Lung Cell Mol Physiol.* 287: L552-L558, 2004
116. St. Croix, CM, Stitt, MS, Leelavanichkul, K, Wasserloos, KJ, Pitt, BR and Watkins, SC. Nitric oxide mediated signaling in endothelial cells as determined by spectral fluorescence resonance energy transfer. *Free Radical Biology Medicine* 15: 785-792, 2004

117. Tyurina YY, Tyurin VA, Zhao Q, Djukic M, Quinn PJ, Pitt BR and Kagan VE. Oxidation of phosphatidylserine: a mechanism for plasma membrane phospholipids scrambling during apoptosis? *Biochem Biophys Res Comm* 324: 1059-1064, 2004.
118. Gandley, R, Han W, Hubel CA, Pitt BR and Kagan VE. S-nitroso-albumin mediated relaxation is enhanced by ascorbate and copper: effects in pregnancy and preeclampsia plasma. *Hypertension* 45: 21-27, 2005
119. Ma Z, Li J, He F, Wilson A, Reynolds PR, Pitt B and Li S. SiRNA mediated sensitization to microbial components. *Biochem Biophys Res Comm.* 330: 755-759, 2005.
120. Wilson A, Zhou W, Alber S, Tang Z-L, Kennel S, Watkins S, Huang L, Pitt B and Li S. Targeted delivery of oligonucleotides to pulmonary endothelium. *Mol Ther* 12: 510-518, 2005.
121. Stoyanovsky DA, Tyurina YY, Tyurin VA, Anand, D, Mandavia DN, Gius D, Ivanova J, Pitt C, Billiar TR and Kagan VE. , Pitt BR and Kagan VE. Thioredoxin and lipoic acid catalyze the denitrosation of low molecular weight and protein S-nitrosothiols. *J. Am. Chem. Soc.* 127: 15815-15823, 2005.
122. He, F, Li J, Mu Y, Ma Z, Wilson, A, Alber S, Stevens T, Watkins S, Pitt B, Xie W, and Li S. Down regulation of endothelin-1 by farnesoid X receptor in vascular endothelial cells. *Circulation Research* 98: 192-199, 2006.
123. Stitt MS, Wasserloos KJ, Tang Z, Liu X, Pitt BR and St. Croix CM. Nitric oxide induced nuclear translocation of the metal responsive transcription factor, MTF-1, is mediated by zinc release from metallothionein *Vascular Pharmacology* 44: 149-155, 2006.
124. Zhang LM, St. Croix CM, Cao R, Wasserloos K, Watkins SC, Stevens T, Li S, Tyurin V, Kagan VE and Pitt BR. Cell-surface protein disulfide isomerase is required for transnitrosation of metallothionein by S-nitroso-albumin in intact rat pulmonary vascular endothelial cells. *Exp. Biol. Med.* 231: 1507-1515, 2006.
125. Tyurina YY, Basova LV, Konduru NV, Tyurin VA, Potapovich AI, Cai P, Bayir H, Stoyanovsky D, Pitt BR, Shvedova AA, Fadeel B, and Kagan VE. Nitrosative stress inhibits the aminophospholipid translocase resulting in phosphatidylserine externalization and macrophage engulfment: implications for the resolution of inflammation. *J. Biol. Chem.* 282: 8498-8509, 2007.
126. Li S, Li J, Wilson A, Kuruba R, Zhang Q, Gao X, He F, Zhang LM, Pitt BR and Xie W. FXR-mediated regulation of eNOS expression in vascular endothelial cells. *Cardiovasc Res* 77: 169-177, 2008
127. Zhang Q, He F, Kuruba R, Gao X., Wilson A, Li J, Billiar TR, Pitt BR and Li S. FXR-mediated regulation of angiotensin type 2 receptor expression in vascular smooth muscle cells. *Cardiovasc Res* 77: 560-569, 2008.
128. Kleinschmidt, AM, Nassiri, M, Stitt, MS, Wasserloos, K, Watkins, SC, Pitt, BR, and Jahroudi, N. Sequences in intron 51 of the VWF gene target promoter activation to a subset of lung endothelial cells in transgenic mice. *J. Biol. Chem.* 283: 2741-2750, 2008.

129. Kaynar, A.M., Houghton AM, Lum EH, Pitt BR and Shapiro SD. Neutrophil Elastase Is Needed For Neutrophil Emigration Into Lungs in Ventilator-Induced Lung Injury. *Am. J. Resp Cell Mol Biol.* 39: 53-60, 2008.
130. Fattman CL, Gambelli F, Hoyle GW, Pitt BR and Ortiz LA. Epithelial expression of TIMP1 does not alter sensitivity to bleomycin induced lung injury in C57BL/6 mice. *Am. J. Physiol: Lung Cell Mol Physiol* 294: L572-L581, 2008.
131. Bernal PJ, Leelavanichkul K, Bauer E, Cao R, Wilson A, Wasserloos KJ, Watkins SC, Pitt BR and St. Croix CM. Nitric oxide mediated zinc release contributes to hypoxic regulation of pulmonary vascular tone. *Circ Res.* 102: 1573-1582, 2008.
132. Nemeč AA, Leikauf G, Pitt BR, Wasserloos KJ and Barchowsky A. Nickel mobilizes intracellular zinc to induce metallothionein in human Airway epithelial cells. *Am J Respir Cell Mol Biol* 2009 41: 69-75, 2009
133. Tyurin VA, Tyurina YY, Jung MY, Tungekar MA, Wasserloos KJ, Bayir H, Greenberger JS, Kochanek PM, Shvedova AA, Pitt B, and Kagan VE. Mass-spectrometric analysis of hydroperoxy – and hydroxyl-derivatives of cardiolipin and phosphatidylserine in cells and tissues induced by pro-apoptotic and pro-inflammatory stimuli. *J Chromatograph B Analyt Technol. Biomed Life Sci* 877: 2863-2872, 2009.
134. Kagan, VE, Bayir HA, Belikova NA, Kapralov O, Tyurina YY, Tyurin VA, Jiang J, Stoyanovsky DA, Wipf P, Kochanek PM, Greenberger JS, Pitt, B, Shvedova AA and Borisenko G. Cytochrome c/cardiolipin relations in mitochondria: a kiss of death. *Free Rad Biol Med* 46: 1439-1453, 2009.
135. Garner AL, St. Croix CM, Pitt, BR, Leikauf GD, Ando S and Koide K. Specific Fluorogenic Probes for Ozone in Biological and Atmospheric Samples. *Nature Chem Biol* 1: 316-321, 2009.
136. Li, J., Wilson, A., Gao, X., Kuruba R., Liu, Y., Poloyac, S., Pitt, B., Xie, W. and Li, S. Coordinated regulation of dimethylarginine dimethylaminohydrolase-1 and cationic amino acid transporter-1 by farnesoid X receptor in mouse liver and kidney and its implication in the control of blood levels of asymmetric dimethylarginine. *J Pharmacol Exp Ther* 331: 234-243, 2009 PMID: 19605523
137. Polk, A.A., Maul, T.M., KcKeel, D.T., Snyder, T.A., Lehocky, C.A., Pitt, B., Beer-Stolz, D., Federspiel, W.J. and Wagner, W.R. A biohybrid artificial lung prototype with active mixing of endothelialized microporous hollow fibers. *Biotech Bioengineer.* 106: 490-500, 2010. PMID 20091735
138. Szczepaniak WS, Pitt BR, McVerry BJ. S1P2 receptor dependent Rho-kinase activation mediates vasoconstriction in the murine pulmonary circulation induced by sphingosine 1-phosphate. *Am J Physiol Lung Cell Mol Physiol.* 299: L137-145, 2010. PMID: 20435688
139. Tyurina YY, Tyurin VA, Kaynar AM, Kapralova VI, Wasserloos KJ, Li J, Mosher M, Wright L, Wipf P, Watkins SK, Pitt BR, Kagan VE. Oxidative lipidomics of hyperoxic acute lung injury: Mass spectrometric characterization of cardiolipin and phosphatidylserine peroxidation. *Am J Physiol Lung Cell Mol Physiol.* 299: L73-L75, 2010 PMID 20418384

140. Li H, Su X, Yan X, Wasserloos K, Chao W, Kaynar AM, Liu Z, Leikauf G, Pitt BR and Zhang L-M. Toll-Like Receptor 4-Myeloid Differentiation Factor 88 Signaling Contributes to Ventilator-induced Lung Injury in Mice. *Anesthesiology* 113: 619-629, 2010 PMID 20683250
141. Phillippi JA, Eskay MA, Kubala BS, Pitt BR and Gleason TG. Altered oxidative stress responses and increased type I collagen expression in bicuspid aortic valve patients. *Ann Thor Surg* 90: 1893-1898, 2010 PMID: 21095332
142. Gamble C, Talbott E, Youk A, Holguin F, Pitt B, Silveira L, Bleecker E, Busse W, Calhoun W, Castro M, Chung K F, Erzurum S, Israel E, and Wenzel S. Racial differences in biological predictors of severe asthma: data from the severe asthma research program. *J Allergy Clin Immunol* 126: 1149-1156, 2010. PMID: 21051082
143. Thambiayya K, Wasserloos KJ, St. Croix CM and Pitt BR. LPS-induced decrease in intracellular labile zinc contributes to apoptosis in cultured sheep pulmonary endothelial cells. *Am J Physiol: Lung Cell Mol Physiol*. 300: L624-L632, 2011 PMID: 21239534
144. Tyurina YY, Tyurin VA, Kapralova VI, Wasserloos K, Mosher M, Epperly M, Greenberger J, Pitt BR and Kagan VE. Oxidative lipidomics of gamma irradiation induced lung injury: mass spectrometric characterization of cardiolipin and phosphatidylcholine peroxidation. *Rad Res* 175: 610-621, 2011 PMID: 21338246
145. Li H, Xu J, Wasserloos KJ, Li J, Tyurina YY, Kagan VE, Wang X, Chen AF, Liu Z-Q, Pitt BR and Zhang L-M. Cytoprotective effects of albumin, nitrosated or reduced, in cultured rat pulmonary vascular cells. *Am J Physiol: Lung Cell Mol Physiol*. 300: L526-L533, 2011 PMID: 21239532
146. Bernal P, Bauer E, Cao R, Maniar S, Mosher M, Chen J, Wang Q, Glorioso J, Pitt B, Watkins S, and St. Croix C. A role for zinc in regulating hypoxia-induced contractile events in pulmonary endothelium. *Am J Physiol: Lung Cell Mol Physiol* 300: L874-L886, 2011 PMID: 21378023
147. Cambal LK, Swanson MR, Yuan Q, Weitz AC, Li HH, Pitt BR, Pearce LL and Peterson JP. Acute, sublethal cyanide poisoning in mice is ameliorated by nitrite alone: complications arising from concomitant administration of nitrite and thiosulfate as an antidotal combination. *Chem Res Toxicol* 24: 1102-1112, 2011. PMID: 21534623
148. Atkinson J, Kapralov AA, Yanamala N, Tyurina YY, Amoscato AA, Pearce L, Peterson J, Huang Z, Jiang J, Samhan-Arias AK, Maeda A, Feng W, Wasserloos K, Belikova NA, Tyurin NA, Tyurin VA, Wang H, Fletcher J, Wang Y, Vlasova II, Klein-SSeetharaman J, Stoyanovsky DA, Bayir H, Pitt BR, Epperly MW, Greenberger JS and Kagan VE. A mitochondria-targeted inhibitor of cytochrome c peroxidase mitigates radiation induced death. *Nat Commun* 2: 497, 2011. PMID 21988913
149. Gorbunov NV, Atkins JL, Gurusamy N and Pitt BR. Iron-induced remodeling in cultured rat pulmonary artery endothelial cells. *Biometals* 25: 203-217, 2012. PMID: 22089858
150. Thambiayya K, Wasserloos KJ, Kagan VE, Stoyanovsky D, and Pitt BR. A critical role for increased labile zinc in reducing sensitivity of cultured sheep pulmonary artery endothelial cells to LPS induced apoptosis. *Am J Physiol: Lung Cell Mol Physiol* 302: L1287-95, 2012. PMID 22523284

151. Cioffi DL, Wu S, Chen H, Alexeyev M, St. Croix CM, Pitt BR, Uhlig S and Stevens T. Orail determines calcium sensitivity of an endogenous TRPC heterotetramer channel. *Circ Res* 110: 1435-1444, 2012. PMID 22534489
152. Sparavero LJ, Amoscato AA, Dixon CE, Long JB, Kochanek PM, Pitt BR, Bayir H and Kagan VE. Mapping of phospholipids by MALDI imaging (MALDI-MS): realities and expectations. *Chem Phys Lipids* 165: 545-562, 2012 PMID 22692104
153. Li HH, Li Q, Liu P, Liu YY, Li J, Wasserloos K, Chao W, You M, Oury TD, Chkinder S, Hackham DJ, Billiar TR, Leikauf GD, Pitt BR and Zhang LM. WNT1 inducible signaling pathway protein 1 (WISP1) contributes to ventilator induced lung injury. *Am J Resp Cell Mol Biol* 47: 528-535, 2012 PMID: 22700866
154. Darwiche SS, Pfeifer R, Menzel C, Ruan X, Hoffman M, Cai C, Chanthaphavong RS, Loughran P, Pitt BR, Hoffman R, Paper HC and Billiar TR. Inducible inducible nitric oxide synthase contributes to immune dysfunction following trauma. *Shock* 38: 499-507, 2012, PMID 23042189
155. Chen, J, Winarski, KL, Myerburg, MM, Pitt, BR and Sheng S. Probing the Structural Basis of Zn<sup>2+</sup> Regulation of the Epithelial Na<sup>+</sup> Channel *J. Biol. Chem.* 287: 35589-98, 2012. PMID 22930753
156. Lee SM, McLaughlin JN, Frederick DR, Zhu L, Thambiayya K, Wasserloos KJ, Kaminski I, Pearce L, Peterson J, Li J, Latoche JD, Peck-Palmer O, Beer-Stolz D, Fattman CL, Alcorn JF, Oury TD, Angus DC, Pitt BR, Kaynar AM. Metallothionein-induced zinc partitioning exacerbates hyperoxic acute lung injury. *Am J Physiol Lung Cell Mol Physiol.* 304: L350-L360, 2013. PMID23275622
157. Li, H-H, Li J, Wasserloos KJ, Sullivan MG, Bauer PM, Stolz DB, Lee JS, Watkins SC, Pitt BR and Zhang LM. Caveolae-dependent and -independent uptake of albumin in cultured rodent pulmonary endothelial cells. *PLoS ONE* 8(11): e81903, 2013 PMID: 24312378
158. Stoyanovsky DA, Sparvero LJ, Amoscato A, He RR, Watkins S, Pitt BR, Bayir H, and Kagan VE. Improved spatial resolution of matrix-assisted laser desorption/ionization imaging of lipids in the brain by alkylated derivatives of 2,5-dihydroxybenzoic acid. *Rapid Commun Mass Spectrom* 28: 403-412, 2014. PMID24497278
159. Zimmerman MW, Isenberg JS, Pitt BR, Wasserloos KA, Homanics GE and Lazo JS. Proangiogenic phosphatase *Ptp4a3* promotes VEGF signaling to stimulate Src activation and migration of mouse and human endothelial cells. *J Biol Chem* 289: 5904-13, 2014. PMID: 24403062
160. Tyurina YY, Poloyac SM, Tyurin VA, Kapralov AA, Jiang J, Anthony-muthu TS, Kapralova VI, Vikulina AS, Jung MY, Epperly MW, Mohammadyan D, Klein-Seetharaman J, Jackson TC, Kochanek PM, Pitt BR, Greenberger JS, Vladimirov YA, Bayir H and Kagan VE. A novel mitochondrial pathway for biosynthesis of lipid mediators via cardiolipin peroxidation by cytochrome c. *Nature Chemistry* 6: 542-552, 2014. PMID24848241
161. Stacy SL, Brink LL, Larkin JC, Sadovsky Y, Goldstein BD, Pitt BR, and Talbott EO. Perinatal outcomes and unconventional natural gas operations in southwest Pennsylvania. *PLOS ONE* |

162. Chen Z, Ding X, Jin S, Fang, X, Pitt B, Zhang LM, Billiar TR and Li Q. WISP1- $\alpha$ v $\beta$ 3 integrin signaling positively regulates TLR-triggered inflammation response via ERK dependent pathway in murine sepsis induced lung injury. In Press Scientific Reports
163. Buland J, Wasserloos K, Tyurin V, Tyurina Y, Amoscato AA, Mallampalli RK, Chen BB, Zhao J, Zhao Y, Ofori-Aquah, Kagan VE and Pitt BR. Biosynthesis of oxidized lipid mediators via lipoprotein associated phospholipase A2 hydrolysis of extracellular cardiolipin induces endothelial cell toxicity. *Am J Physiol: Lung Cell Mol Physiol* 2016 In press. PMID: 27233995
164. Kaynar AM, Nowalk MP, Lin CJ, Moehling KK, Susick M, Bakalov B, Pitt B, Bain D, Alefantis T, Ross TM, Saul SG, Raymund M, Zimmerman RK. Are plasma mineral levels related to antibody response to influenza vaccination in older adults? *Hum Vaccin Immunother* 12: 1003-1008, 2016. PMID 26751915

### INVITED PAPERS AND REVIEWS

1. Radford, E.P., Pitt, B.R., Halpin, B.R., Caplan, Y., Fisher, R. and Schweda, P. Study of fire deaths in Maryland. IN: *Physiological and Toxicological Aspects of Combustion Products*. Washington, DC, National Academy of Science, pp. 26-35, 1976.
2. Gillis, C.N. and Pitt, B.R. The fate of circulating amines within the pulmonary circulation. *Ann. Rev. Physiol.*, 44:269-281, 1982.
3. Gillis, C.N., Pitt, B.R. and Lister, G. Disposition of vasoactive hormones in the lung: developmental aspects and response to injury. In: *Cardiovascular Sequelae of Asphyxia in the Newborn*. Proc. 83rd Ross Symposium on Pediatric Research, pp. 51-58, 1982.
4. Lister, G. and Pitt, B.R. Cardiopulmonary interactions in the infant with congenital heart disease. *Clin. Chest Med.*, 4:219-232, 1983.
5. Linehan, J.H., Dawson, C.A., Rickaby, D.A., Bronikowski, T.A., Gillis, C.N. and Pitt, B.R. Pulmonary endothelial angiotensin-converting enzyme kinetics. In: *Carrier-Mediated Transport of Solutes from Blood to Tissue*. Eds: Yudilevich, D.L. and Mann, G.E. Longman, London, pp. 251-264, 1985.
6. Gillis, C.N., Dawson, C.A., Linehan, J.H., Rickaby, D.A. and Pitt, B.R. Pulmonary endothelial serotonin removal. In: *Carrier-Mediated Transport of Solutes from Blood to Tissue*. Eds: Yudilevich, D.L. and Mann, G.E. Longman, London, pp. 237-250, 1985.
7. Ment, L.R., Duncan, C.C., Stewart, W.B., Pitt, B.R., Rescigno, A. and Ehrenkranz, R.A. Perinatal cerebral infarction: clinical and animal studies. *Concepts Pediatr. Neurosurg.*, 6:181-197, 1985.

8. Gillis, C.N. and Pitt, B.R. The pulmonary microcirculation and metabolic functions of the lung. In: Current Topics in Pulmonary Pharmacology and Toxicology. Ed: Hollinger, M., NY, Elsevier, pp. 112-142, 1986.
9. Pitt, B.R., Lister, G. and Gillis, C.N. Hemodynamic factors affecting lung metabolism. In: Pulmonary Endothelium in Health and Disease. Ed: Ryan, U.S. Marcel-Dekker, NY, pp. 65-87, 1987.
10. Berman, W., Lister, G., Pitt, B.R. and Hoffman, J.I.E. Measurements of blood flow. Adv. Ped., 35:427-482, 1989.
11. Pitt, B.R., Lister, G. and Gillis, C.N. Metabolic function of the lung and cardiopulmonary physiology. In: Heart-Lung Interactions. Eds: Scharf, S.M and Cassidy, S. Marcel-Dekker, NY, pp. 391-405, 1989.
12. Pitt, B.R. and Lister, G. Interpretation of metabolic function of the lung: influence of perfusion, kinetics and injury. Clinics Chest Medicine, 10:1-12, 1989.
13. Lazo, J.S., Hoyt, D.G., Sebti, S.M. and Pitt, B.R. Bleomycin: A pharmacologic tool in the study of the pathogenesis of interstitial pulmonary fibrosis. Pharmacol. Therap., 47:347-358, 1990.
14. Lazo, J.S., Pitt, B.R. and Glorioso, J. The National Medical Series for Independent Study: Review for National Board Comprehensive Part I Examination. First Edition. Williams & Wilkins, Baltimore, MD, 1991.
15. Lazo, J.S., Pitt, B.R. and Glorioso, J. The National Medical Series for Independent Study: Review for United States Medical Licensing Examination Step 1. Second Edition. Williams & Wilkins, Baltimore, MD, 1992.
16. Pitt, B.R., Myers, C.L. and Gillis, C.N. The biochemical pharmacology of pulmonary amine disposition. In: Pulmonary Biology of the Normal Lung. Ed: Parent, R.A. CRC, Boca Raton, FL. 573-586, 1991.
17. Pitt, B.R. Serotonin uptake mechanisms by pulmonary endothelial cells. In: Pulmonary Endothelium and Mucus Secreting Cells. Masson Italia Periodici, pp 107-117, 1991.
18. Pitt, B.R. and Huang, C. Targeted drug delivery to lung. Contemp. Int. Med. 4:81-92, 1992.
19. Evans, R.R., Calmels, T.P., Pitt, B.R., Brookens, M.A., Johnson, C.S., Modzelewski, R.A. and Lazo, J.S. Gene therapy and endothelial cell targeting for cancer. Ann. N.Y. Acad. Sci. 716:257-264, 1994.
20. Morris, S.M., Nakayama, D.K., Nussler, A.K., Liu, Z.Z., Davies, P., Pitt, B.R., Simmons, R.L. and Billiar, T.R. Co-induction of nitric oxide synthase and argininosuccinate synthase gene expression: implications for regulation of nitric oxide synthesis. In: The Biology of Nitric Oxide. Vol.4 Enzymology, Biochemistry and Immunology. Eds: Moncada, S., Freilisch, M., Busse, R. and Higgs, E.A. Portland Press Ltd. London. pp 301-303, 1994.
21. Lazo, J.S., Schwarz, M.A. and Pitt, B.R. Metallothionein and cell death. Metal Ions Biol. Med. 3:15-16, 1994.



22. Lazo, J.S. and Pitt, B.R. Metallothionein and cell death by anticancer drugs. *Ann. Rev. Pharmacol. Toxicol.* 35:635-653, 1995.
23. Kim, Y.M., Bergonia, H.A., Muller, C., Pitt, B.R., Watkins, W.D., and Lancaster, J.R., Jr., Nitric oxide and intracellular heme. *Adv. Pharmacol.* 34: 277-287, 1995.
24. Pitt, B.R., Schwarz, M.A. and Davies, P. Gene regulation during hypoxia. In: *Tissue oxygenation and deprivation: developmental, molecular and integrated function.* Eds: Lister, G. and Haddad, G.G. Marcel-Dekker, 101-115, 1996.
25. Pitt, B.R., Schwarz, M.A. and Bland, R. Methods for retroviral-mediated gene transfer to fetal lung. In: *Methods in Gene Therapy.* Ed: Robbins, P. Humana Press, Inc. Totowa, NJ, 185-194, 1996.
26. Lazo, J.S., Pitt, B.R. and Glorioso, J. The national medical series for independent study: Review for United States Medical Licensing Examination Step 1. Fourth Edition. Williams & Wilkins, Baltimore, MD, 4th Edition, 1996.
27. Pitt, B.R. and Calhoun, W.J. Drugs for Chronic Obstructive Pulmonary Disease. In: *Basic Pharmacology in Medicine.* 4th Edition. Eds: DiPalma, J.R., DiGregorio, G.J., Barbierie, E.J. and Ferko, A.P. Medical Surveillance Inc., West Chester, PA. In Press.
28. Pitt, B.R. and Robbins, P.D. Retrovirus-mediated fetal gene therapy to lung. *Molec. Human Repro.* 2:467-469, 1996.
29. Matalon, S.M, Haddad, I.Y. and Pitt, B.R. Nitric oxide and lung injury. *Scientific Foundation of Lung Function in Health and Disease.* Ed: Fishman, A. and Senior, R. 1999
30. Berrington, W.R., Tarpey, M.M., Pitt, B.R. and Freeman, B.A. Site and mechanism-directed interventions for tissue free radical injury. Eds: Bland, R. and Coalson, J. *Chronic Lung Disease in Early Infancy.* Marcel Dekker, NY, NY, 2000 pp 883-901
31. Lazo, J.S., Pitt, B.R. and Glorioso, J. The national medical series for independent study: Review for United States Medical Licensing Examination Step 1. Seventh Edition. Williams & Wilkins, Baltimore, MD, 2006
32. 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. Nutrition* 130: 1467S-1470S, 2000.
33. Merker, MP., Pitt, B.R., Choi, A.M., Hassoun, P.M., Dawson, C.A. and Fisher, A.B. Lung redox homeostasis: emerging concepts. *Am J. Physiol.: Lung Cell Mol. Physiol* 279: L413-L417, 2000.
34. Pitt, B.R. CFTR Trafficking. *Am.J.Physiol.: Lung Cell Mol. Physiol.* 281: L13-L15, 2001
35. Pitt, B.R. and St. Croix, C.M. Complex regulation of iNOS in lung. *Am.J.Resp.Cell Mol. Biol.* 26: 6-9, 2002
36. Fabisiak, JP, Borisenko, GG, Liu, SX, Tyurin VA, Pitt, BR and Kagan, VE. Redox sensor

- function of metallothioneins. *Methods Enzymol.* 353:268-8, 2002
37. Wilson, A., Pitt, B.R. and Li, S. Complicating roles of CpG in liposomal delivery of DNA and oligonucleotides. *Bio. Sci. Reports* 22: 309-322, 2002
  38. Lawler, C., Suk, W.A., Pitt, B.R., St. Croix, C.M. and Watkins, S.C. Multimodal optical imaging. *Am. J. Physiol.: Lung Cell Mol. Physiol.* 285: L269-L280, 2003.
  39. Pitt, BR and Ortiz, LA. Stem cells in lung biology. *Am. J. Physiol. Lung Cell Mol. Physiol.* 286: 1621-1623, 2004.
  40. St. Croix, CM, Leelavinchkul K, Watkins SC, Kagan VE and Pitt BR. Nitric oxide and zinc homeostasis in acute lung injury. *Proc. Amer Thor Soc.* 2: 236-242, 2005
  41. St. Croix, C.M., Stitt, M., Wasserloos, K. and Pitt, B.R. Fluorescence detection of S-nitrosated species in live cells. *Methods Enzymology* 396: 317-326, 2005.
  42. St. Croix, C.M., Watkins, S.A and Pitt, B.R. Multimodal imaging. *Science and News.* In Press
  43. Wilson A, He F, Li J, Ma Z, Pitt B and Li S. Targeted delivery of therapeutic oligonucleotides to pulmonary circulation. In: *Non Vira Vectors for Gene Therapy.* Ed: Huang L, Hung MC and Wagner E. Academic Press. Pp 21-42, 2005.
  44. Wilson, A, He F., Li J, Ma Z, Pitt B and Li S. Target delivery of therapeutic oligonucleotides to pulmonary circulation. *Adv Genetics* 54: 21-41, 2005.
  45. Matthay MA, Christman JW, Pitt BR, Schwiebert LM, Stevens T, and Ware LB. A new era of opportunities in lung research. *Am. J. Physiol. Lung Cell Mol. Physiol.* 2006
  46. Kagan VE, Wipf P, Stoyanovsky D, Greenberger JS, Borisenko G, Belikova NA, Yanamala N, Samhan Arias AK, Tungekar MA, Jiang J, Tyurina YY, Ji J, Klein-Seetharaman J, Pitt BR, Shvedova AA, Bayir H. Mitochondrial targeting of electron scavenging antioxidants: Regulation of selective oxidation vs random chain reactions. *Adv Drug Deliv Rev* 61: 1375-1388, 2009 PMID 19716396
  47. Huihua Li, Rong Cao, Karla Wasserloos, Bernal Paula, Zhao-Qian Liu, Bruce R Pitt and Claudette M. St. Croix. Nitric oxide and zinc homeostasis in pulmonary endothelium. *Ann New York Acad Sci* 1203: 73-78, 2010 PMID 20716286
  48. Sparvero L, Amoscato A, Kochanek P, Pitt B, Kagan V, and Bayir H. Mass-spectrometry based oxidative lipidomics and lipid imaging: applications in traumatic brain injury. *J Neurochem* 115: 1322-1336, 2010 PMID: 20950335
  49. John E, Laskow TC, Buchser WJ, Pitt B, Basse PH, Butterfield L, Kalinski P and Lotze MT. Zinc in innate and adaptive tumor immunity. *J Translational Research* 8: 118-128, 2010 PMID: 21087493
  50. Pitt BR, Christman JW, Gunst SJ, Matthay MA, Stevens T and Ware LB. Physiology, reductionism and translational medicine: the right mix. *Am J Physiol: Lung Cell Mol Physiol* 301: L389-L390,

2011. PMID: 21856812.

51. Thambiayya K, Kaynar M, St. Croix CM and Pitt BR. Functional role of intracellular labile zinc in pulmonary endothelium. *Pulmonary Circulation*. 2: 4434-450, 2012 PMID 23372928
52. Li HH, Thambiayya K, Kaynar M, Wasserloos KA, St. Croix CM and Pitt BR. Zinc homeostasis in lung. In: *Comparative Biology of the Normal Lung*. 2<sup>nd</sup> Edition. Edited by: Gow A and Laskin DA. Elsevier Publishers, In press
53. Kaynar M and Pitt BR. Heavy metal homeostasis and toxicity. *Physiological Reviews* In preparation.