

## **CURRICULUM VITAE**

**Qing Lu, DVM, PhD**

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### **EDUCATION**

Anhui College of Agriculture and Technology, China, Veterinary Medicine, D.V.M., 1989  
Nanjing Agriculture University, China, Physiology & Biochemistry, M.S., 1996  
Institute of Zoology, The Chinese Academy of Sciences, China, Physiology, Ph.D., 1999

### **POSTGRADUATE TRAINING**

Postdoctoral Research Fellow  
Departments of OB/GYN & Biological Chemistry  
University of Michigan Medical School, Ann Arbor, MI  
1999-2002

Postdoctoral Research Associate  
Vascular Research Laboratory, Department of Medicine  
Brown Medical School, Providence, RI  
2002-2003

### **HONORS AND AWARDS**

- BEST POSTER SUBMITTED BY A NEW INVESTIGATOR by the RI Science and Technology Advisory Council (STAC) and the statewide network of EPSCoR, INBRE, CTSA and COBRE investigators at the STAC meeting on June 3, 2008.
- Research Award, ATS/Pulmonary Hypertension Association, 2008-2009
- Parker B. Francis Fellow, Francis Family Foundation, 2004-2007
- Research Award, American Lung Association, 2004-2006
- Medical Research Award, Rhode Island Foundation, 2004
- Weihua Science and Technology Award, The Chinese Academy of Sciences, 1999
- Distinguished Graduate Student Achievement Award, The Chinese Academy of Sciences, 1998
- Distinguished Graduate Student Achievement Award, Nanjing Agricultural University, China, 1995
- Anhui Province Science and Technology Progress Award, China, 1992
- Hefei City Science and Technology Progress Award, China, 1992
- First Prize Award, Anhui College of Agriculture and Technology, China, 1986, 1987, 1988

### **ACADEMIC APPOINTMENTS**

2003-2004 Instructor of Medicine (Research), Alpert Medical School of Brown University  
2004-present Assistant Professor of Medicine (Research), Alpert Medical School of Brown University

### **OTHER APPOINTMENTS and SERVICE**

11/2009 Grant Reviewer for the Medical Research Council, UK.  
4/2009 Member, American Heart Association REGION I Molecular Signaling, peer review committee

2/2009, Grant Reviewer for National Priorities Research Program, Qatar National Research Fund  
4/2008 Member, American Heart Association REGION I Molecular Signaling 2, peer review committee  
4/2007 Member, American Heart Association Northeast Consortium 1B, peer review committee  
8/1989-8/1993 Veterinarian, Hefei Zoo, Anhui Province, China

### **HOSPITAL SERVICE**

Member, Safety Sub-Committee, Providence VAMC, 2009-present  
Member, Institutional Animal Care and Use Committee (IACUC), Providence VAMC, 2005-present  
Member, Research & Development Committee, Providence VAMC, 2004-2007

### **UNIVERSITY COMMITTEES**

Member, Zhi-Zhan Gu's Ph.D. Student Thesis Committee, 2005-2007

### **MEMBERSHIP IN SOCIETIES**

American Thoracic Society, 2005-present  
American Society for Cell Biology, 2002-2003  
Society for the Study of Reproduction, 2000-2002

### **EDITORIAL SERVICE AS A REVIEWER**

Journal of Biological Chemistry (JBC)  
FASEB Journal  
American Journal of Respiratory and Critical Care Medicine (AJRCCM---Blue Journal)  
American Journal of Respiratory Cell and Molecular Biology (AJRCMB---Red Journal)  
American Journal of Physiology Lung Cell Molecular Physiology (AJP-LCMP)  
Microvascular Research  
Respiratory Research  
Physiology Research  
Lung  
International Journal of COPD  
European Respiratory Journal  
Journal of Zhejiang University Science (JZUS)

### **ORIGINAL RESEARCH PUBLICATIONS IN PEER-REVIEWED JOURNALS**

1. Jiang FL, He YZ, Jiang H and **Lu Q**. A case of successful propagation of Black Muntjac (*Muntiacus crinifrons*) in captivity. *Proceedings of Chinese Zoological Gardens*, 2: 96-103 (1993, Chinese)
2. Chen L, **Lu Q**, Mao XZ, Zhu ZK, Zhang CM, Shi H, Sun JF and Fan ZH. Chronic catheterization on vascular of sheep fetus. *Chinese Journal of Obstetrics and Gynecology*, 31 (6): 381-382 (1996, Chinese)
3. **Lu Q**, Mao XZ, Chen L and Zhu ZK. The characterization of sheep fetal nutrition metabolism and endocrine activity during late gestation, *Acta Zoologica Sinica*, 45 (2): 162-169 (1999, Chinese)
4. **Lu Q**, Shi H and Mao XZ. The effect of cholic acid loading on pregnant rats on plasma nutrition metabolism and endocrine activity as well as the growth of fetus, *Chinese Journal of Applied Physiology*, 15 (1): 76, 81 (1999, Chinese)
5. Shi H, Zhu ZK, **Lu Q**, Sun JF and Mao XZ. Effects of exogenous cholic acid on the concentration of cholane-glycinate in serum in sheep and rat, *Animal Husbandry and Veterinary Medicine*, 31 (1): 14-16 (1999, Chinese)
6. **Lu Q**, Sun QY, Breitbart H and Chen DY. Expression and phosphorylation of mitogen-activated protein kinase during spermatogenesis and epididymal sperm maturation in mice. *Archives of Andrology*, 43: 55-66 (1999)
7. Sun QY\*, **Lu Q\***, Breitbart H and Chen DY. cAMP inhibits mitogen-activated protein (MAP) kinase

- activation and resumption of meiosis, but exerts no effects after spontaneous germinal vesicle breakdown (GVBD) in mouse oocytes. *Reproduction, Fertility and Development*, 11: 81-86 (1999).
8. **Lu Q**, Smith GD, Chen DY, Yang Z, Han ZM, Schatten H and Sun QY. Phosphorylation of mitogen-activated protein kinase is regulated by protein kinase C, cyclic 3', 5'-adenosine monophosphate, and protein phosphatase modulators during meiosis resumption in rat oocytes. *Biology of Reproduction*, 64: 1444-1450 (2001)
  9. **Lu Q**, Dunn RL, Angeles R and Smith GD. Regulation of spindle formation by active mitogen-activated protein kinase and protein phosphatase 2A during mouse oocyte meiosis. *Biology of Reproduction*, 66: 29-37 (2002)
  10. **Lu Q**, Smith GD, Chen DY, Han ZM and Sun QY. Activation of protein kinase C induces mitogen-activated protein kinase dephosphorylation and pronucleus formation in rat oocytes. *Biology of Reproduction*, 67: 64-69 (2002)
  11. **Lu Q**, Hutchins AE, Doyle CM, Lundblad JR and Kwok RPS. Acetylation of CREB by CBP enhances CREB-dependent transcription. *The Journal of Biological Chemistry*, 278: 15727-15734 (2003)
  12. Kramer K, Harrington EO, **Lu Q**, Bellas R, Newton J, Sheahan KL and Rounds S. Isoprenylcysteine carboxyl methyltransferase activity modulates endothelial cell apoptosis. *Molecular Biology of the Cell*, 14: 848-857 (2003)
  13. **Lu Q**, Harrington EO, Hai C-M, Newton J, Garber M, Hirase T and Rounds S. Isoprenylcysteine carboxyl methyltransferase modulates endothelial monolayer permeability: involvement of RhoA carboxyl methylation. *Circulation Research*, 94: 306-315 (2004)
  14. Harrington EO, Shannon CJ, Morin N, Rowlett H, Murphy C. and **Lu Q**. PKC $\delta$  regulates endothelial basal barrier function through modulation of RhoA GTPase activity. *Experimental Cell Research*, 308: 407-421 (2005).
  15. **Lu Q**<sup>¶</sup>, Harrington EO, Jackson H, Morin N, Shannon CJ, and Rounds S. Transforming growth factor- $\beta$ 1-induced endothelial barrier dysfunction involves SMAD2-dependent p38 activation and subsequent RhoA activation. *Journal of Applied Physiology*, 101: 375-384, (2006).
  16. **Lu Q**, Harrington EO, Newton J, Jankowich M, and Rounds S. Inhibition of ICMT induces endothelial cell apoptosis through GRP94. *American Journal of Respiratory Cell and Molecular Biology*, 36, 1-11, (2007).
  17. **Lu Q**<sup>¶</sup>. Transforming growth factor- $\beta$ 1 protects against main pulmonary artery endothelial cells apoptosis via ALK5. *American Journal of Physiology Lung Cellular and Molecular Physiology*, 295, L123-L133, (2008).
  18. **Lu Q**<sup>¶</sup>, Patel B, Harrington EO, and Rounds S. TGF- $\beta$ 1 causes pulmonary microvascular endothelial cells apoptosis via ALK5. *American Journal of Physiology Lung Cellular and Molecular Physiology*. 296: L825-L838 (2009).
  19. **Lu Q**<sup>\*</sup>, Harrington EO<sup>\*</sup>, Newton J, Casserly B, Radin G, Warburton R, Zhou Y, Blackburn MR, and Rounds S. Adenosine protected against pulmonary edema through transporter- and receptor 2-mediated endothelial barrier enhancement. *American Journal of Physiology Lung Cellular and Molecular Physiology*, under revision.
  20. **Lu Q**, Jankowich M, Newton J, Harrington EO, and Rounds S. Alterations in molecular chaperones and eIF2 $\alpha$  during lung endothelial apoptosis, *American Journal of Physiology Lung Cellular and Molecular Physiology*, under review.
  21. **Lu Q**<sup>¶</sup>, Harrington EO, and Rounds S. Transforming growth factor- $\beta$ 1 increases endothelial monolayer permeability via CREB. *in preparation*.

\* These authors contributed equally to this work; <sup>¶</sup> indicates corresponding author.

## REVIEW ARTICLES

1. **Lu Q**, Chen L and Mao XZ. The roles of insulin-like growth factors (IGFs) and the regulation of its activation. *Abroad Animal Science and Technology*, 23 (4): 4-6 (1996, Chinese).
2. **Lu Q** and Mao XZ. The characterization of fetus nutrition metabolism and endocrine activity, *Acta Universitatis Agriculturae Boreali-occidentalis*, 27 (1): 88-93 (1999, Chinese).
3. **Lu Q**, Liu JL and Chen DY. Cytoplasmic calcium signal. *Chemistry of Life*, 19 (2): 78-82 (1999,

Chinese).

4. Liu JL, **Lu Q** and Chen DY. Nuclear calcium signal. *Chinese Bulletin of Life Science*, 13(1): 41-44 (2001, Chinese).
5. **Lu Q**, Harrington EO and Rounds S. Apoptosis and lung injury. *Keio Journal of Medicine*. 54 (4): 184-189, (2005).
6. Rounds S, **Lu Q**, Harrington EO, Newton J, and Casserly B. Pulmonary endothelial cell signaling and function. *Transactions of the American Clinical and Climatological Association*. 119:155-67 (2008).

## **BOOK CHAPTERS**

1. **Lu Q**. Inter-activation between sperm and oocyte during fertilization. In: *Biology of Fertilization*. Edited by D.Y. Chen, Science Press, Beijing, China, 2000, p.199-222.
2. **Lu Q**. The roles of protein kinases and phosphatases in gametogenesis, oocyte maturation and fertilization. In: *Biology of Fertilization*. Edited by D.Y. Chen, Science Press, Beijing, China, 2000, p. 276-315.
3. Rounds S, Harrington EO, and **Lu Q**. Carboxyl methylation of small GTPases and endothelial cell function. In: *Cell Signaling in Vascular Inflammation*. Edited by J. Bhattacharya, Humana Press, Totowa, NJ, 2005, p. 52-60.
4. Harrington EO, **Lu Q**, and Rounds S. Endothelial Cell Apoptosis. In: *Endothelial Biomedicine*. Edited by W. C. Aird, Cambridge University Press, New York, NY, USA, 2007, p.1081-1097.
5. **Lu Q** and Rounds S. Pulmonary endothelial cell death: implications for lung disease pathogenesis. In: *The Pulmonary Endothelium: Function in health and disease*. Edited by N. F. Voelkel and S. Rounds. John Wiley & Sons, Ltd. Chichester, UK, 2009, p.243-260.

## **ABSTRACTS / PRESENTATIONS**

1. **Lu Q**, Sun QY, Chen DY, Angeles R, and Smith GD. Identification and localization of MAPK and PP2A during mouse oocyte maturation. University of Michigan, Reproductive Sciences Program and Department of OB/GYN, Poster Day, November 19, 1999, Ann Arbor, MI. Poster presentation by **Lu Q**.
2. **Lu Q**, Angeles R, and Smith GD. Localization of phosphorylated-MAPK and PP2A during mouse oocyte meiosis and their roles in microtubule polymerization. Society for the Study of Reproduction (SSR)'s 33<sup>rd</sup> Annual Meeting, July 25-31, 2000, Madison, Wisconsin. Oral presentation by **Lu Q**.
3. **Lu Q**, Smith GD, Chen DY, and Sun QY. Phosphorylation of MAP kinase is regulated by protein kinase C, cAMP, and protein phosphatase modulators during meiosis resumption in rat oocytes. *Biology of the Mammalian Oocyte: Influences on Human In Vitro Maturation and Cryopreservation*, March 2, 2001, Miami Beach, Florida. Poster presentation by **Lu Q**.
4. **Lu Q** and Kwok RPS. The role of acetylation on cAMP-mediated gene activation. Michigan Diabetes Research and Training Center, Winter Symposium, March 17, 2001, Ann Arbor, MI. Poster presentation by **Lu Q**.
5. **Lu Q**, Hutchins AE and Kwok RPS. Lysine mutation within CREB activation domain enhances gene expression. University of Michigan, Reproductive Sciences Program and Department of OB/GYN, Poster Day, November 2, 2001, Ann Arbor, MI. Poster presentation by **Lu Q**.
6. Kwok RPS, **Lu Q**, Hutchin AE, Doyle CM and Lundblad JR. The role of acetylation in cAMP-activated gene expression. *Endocrinology* 84<sup>nd</sup> Annual Meeting, June 19-22, 2002, San Francisco, CA. Oral presentation by Kwok RPS.
7. **Lu Q**, Harrington EO, Newton J and Rounds S. Effect of isoprenylcysteine carboxyl methyltransferase (ICMT) on Rho GTPases and endothelial monolayer permeability. Grover Conference on Proinflammatory Signaling Mechanisms in the Pulmonary Circulation. September 5-8, 2002, Sedalia, Colorado. Poster presentation by **Lu Q**.
8. **Lu Q**, Harrington EO, Newton J and Rounds S. Overexpression of isoprenylcysteine carboxyl methyltransferase (ICMT) activates Rho GTPases and increases endothelial monolayer permeability.

- The American Society for Cell Biology 42<sup>nd</sup> Annual Meeting, December 14-18, 2002, San Francisco, CA. Poster presentation by **Lu Q**. This abstract was published in *Molecular Biology of the Cell* 13: 294a, 2002.
9. Harrington EO, **Lu Q**, Newton J, Morin N and Rounds S. Inhibition of RhoA by adenosine/homocysteine attenuates thrombin-induced endothelial barrier dysfunction. American Thoracic Society 99<sup>th</sup> International Conference, May 16-21, 2003, Seattle, Washington. Poster presentation by Harrington EO. This abstract was published in *American Journal of Respiratory and Critical Care Medicine* 167: A565, 2003.
  10. **Lu Q**, Harrington EO and Rounds S. Transforming growth factor- $\beta$ 1 (TGF- $\beta$ 1) enhances human lung endothelial monolayer permeability. American Thoracic Society 100<sup>th</sup> International Conference, May 21-26, 2004, Orlando, Florida. Poster presentation by **Lu Q**. This abstract was published in *American Journal of Respiratory and Critical Care Medicine* 169 (7): A415, 2004.
  11. **Lu Q**, Newton J, Harrington EO and Rounds S. Alterations in glucose regulated protein 94 (GRP94) upon isoprenylcysteine carboxyl methyltransferase (ICMT) inhibition. American Thoracic Society 101<sup>th</sup> International Conference, May 20-25, 2005, San Diego, CA. Poster discussion by **Lu Q**. This abstract was published in *Proceedings of the American Thoracic Society*, 2: A608, 2005.
  12. **Lu Q**, Harrington EO and Rounds S. RhoA GTPase and p38 MAPK regulates TGF- $\beta$ 1-induced lung endothelial barrier dysfunction. American Thoracic Society 101<sup>th</sup> International Conference, May 20-25, 2005, San Diego, CA. Poster presentation by **Lu Q**. This abstract was published in *Proceedings of the American Thoracic Society*, 2: A753, 2005.
  13. Jankowich M, **Lu Q**, Newton J, Harrington EO, and Rounds S. Isoprenylcysteine-O-carboxyl methyltransferase (ICMT) inhibition alters components of the unfolded protein response (UPR). American Thoracic Society 102<sup>th</sup> International Conference, May 19-24, 2006, San Diego, CA. Poster presentation by Jankowich M. This abstract was published in *Proceedings of the American Thoracic Society*, 3: A685, 2006.
  14. **Lu Q**, Harrington EO, Jackson HM, Kim T, and Rounds S. Transcriptional regulation of transforming growth factor (TGF)- $\beta$ 1-increased endothelial permeability. American Thoracic Society 102<sup>th</sup> International Conference, May 19-24, 2006, San Diego, CA. Oral presentation by **Lu Q**. This abstract was published in *Proceedings of the American Thoracic Society*, 3: A479, 2006.
  15. **Lu Q**, Yang A, Harrington EO, and Rounds S. The distinct effects of transforming growth factor- $\beta$ 1 on pulmonary vascular endothelial cell apoptosis. American Thoracic Society 103<sup>rd</sup> International Conference, May 18-23, 2007, San Francisco, CA. Poster Discussion by **Lu Q**. This abstract was published in *Proceedings of the American Thoracic Society*, 4: A530, 2007.
  16. Harrington EO, Newton J, **Lu Q**, and Rounds S. RhoA GTPase protects against modulation of the unfolded protein response (UPR) protein GRP94 upon inhibition of isoprenylcysteine-O-carboxylmethyltransferase (ICMT). American Thoracic Society 103<sup>rd</sup> International Conference, May 18-23, 2007, San Francisco, CA. Oral presentation by **Lu Q**. This abstract was published in *Proceedings of the American Thoracic Society*, 4: A28, 2007.
  17. **Lu Q**, Harrington EO, and Rounds S. The effects of transforming growth factor- $\beta$ 1 on pulmonary vascular endothelial cell apoptosis. The FASEB Summer Research Conference: TGF-beta Superfamily: Signaling & Development; July 14 - 19, 2007, Tucson, Arizona.
  18. **Lu Q**, Harrington EO, Travers C, and Rounds S. Heterogenic response of pulmonary endothelial cells to TGF- $\beta$ 1. American Thoracic Society 104<sup>th</sup> International Conference, May 16-21, 2008, Toronto, Canada. Poster presentation by **Lu Q**. This abstract was published in *American Journal of Respiratory and Critical Care Medicine* 177: A177, 2008.
  19. **Lu Q**, Harrington EO, Yang A, Kim T, Rounds S. TGF- $\beta$ 1-induced increase in endothelial monolayer permeability signals through CREB. American Thoracic Society 104<sup>th</sup> International Conference, May 16-2008, Toronto, Canada. Poster presentation by **Lu Q**. This abstract was published in *American Journal of Respiratory and Critical Care Medicine* 177: A176, 2008.
  20. **Lu Q**, Harrington EO, Newton J, Casserly B, Warburton R, and Rounds S. Receptor characterization of adenosine-mediated protection against pulmonary edema. American Thoracic Society 104<sup>th</sup> International Conference, May 16-21, 2008, Toronto, Canada. Oral presentation by **Lu Q**. This abstract was published in *American Journal of Respiratory and Critical Care Medicine* 177: A236,

2008.

21. Jankowich M, **Lu Q**, Newton J, Harrington EO, and Rounds S. Inhibition of Prenylation Alters Endoplasmic Reticulum (ER) Chaperones During Endothelial Cell (EC) Apoptosis. American Thoracic Society 104<sup>th</sup> International Conference, May 16-21, 2008, Toronto, Canada. Poster discussion by Jankowich M. This abstract was published in *American Journal of Respiratory and Critical Care Medicine* 177: A847, 2008.
22. **Lu Q.**, Radin, G., Newton, J., and Rounds, S. Pentostatin Enhances Endothelial Baseline Barrier Function through Rac-1 Activation. American Thoracic Society 2009 International Conference, May 15-20, 2009, San Diego, CA. Oral presentation by **Lu Q.** This abstract was published in *American Journal of Respiratory and Critical Care Medicine* 179: A6117, 2009.
23. **Lu Q**, Mazer, J, Choudhary, G, Harrington, EO, and Rounds R. Imbalance of TGF- $\beta$ 1 Signaling Promotes Pulmonary Microvascular Endothelial Cell Proliferation: Implications for formation of plexiform lesions in PAH. American Thoracic Society 2009 International Conference, May 15-20, 2009, San Diego, CA. Poster presentation by **Lu Q.** This abstract was published in *American Journal of Respiratory and Critical Care Medicine* 179: A1833, 2009.
24. **Lu Q**, Newton J, Kang M, Lee C.G, Elias J.A, Harrington EO, and Rounds S. Cigarette smoke causes lung vascular endothelial cell apoptosis and alterations of TGF- $\beta$ 1 signaling. American Thoracic Society 2010 International Conference, May 14-19, 2010, New Orleans, Louisiana.
25. **Lu Q**, Newton J, Gabino-Miranda G, Ortiz M, Harrington EO, and Rounds S. Cigarette smoke extract increases lung endothelial permeability through oxidative stress-mediated alterations of small GTPases. American Thoracic Society 2010 International Conference, May 14-19, 2010, New Orleans, Louisiana.
26. **Lu Q**, Newton J, Ortiz M, Kang M, Lee C.G, Elias J.A, Harrington EO, and Rounds S. Cigarette smoke causes lung vascular endothelial cell apoptosis and activation of unfolded protein response and autophagy. American Thoracic Society 2010 International Conference, May 14-19, 2010, New Orleans, Louisiana.

#### **INVITED RESEARCH ORAL PRESENTATIONS:**

##### **(I) Invited International Oral Presentations:**

1. Society for the Study of Reproduction 33<sup>rd</sup> Annual Meeting. "Localization of phosphorylated-MAPK and PP2A during mouse oocyte meiosis and their roles in microtubule polymerization". Madison, Wisconsin, July 28, 2000.
2. American Thoracic Society 2005 International Conference. "Alterations in glucose regulated protein 94 (GRP94) upon isoprenylcysteine carboxyl methyltransferase (ICMT) inhibition". San Diego, CA, May 24, 2005.
3. American Thoracic Society 2006 International Conference. "Transcriptional regulation of transforming growth factor (TGF)- $\beta$ 1-increased endothelial permeability." San Diego, CA, May 21, 2006.
4. American Thoracic Society 2007 International Conference, "RhoA GTPase protects against modulation of the unfolded protein response (UPR) protein GRP94 upon inhibition of isoprenylcysteine-O-carboxymethyltransferase (ICMT)". May 20, 2007, San Francisco, CA.
5. American Thoracic Society 2008 International Conference, "Receptor characterization of adenosine-mediated protection against pulmonary edema. May 18, 2008, Toronto, Canada.
6. American Thoracic Society 2009 International Conference, "Pentostatin enhances endothelial baseline barrier function through Rac-1 activation". May 18, 2009, San Diego, CA.

##### **(II) Invited Regional Oral Presentations**

1. Departmental Research Seminar. "Acetylation of CREB is involved in repression of related gene expression". Department of Medicine, Brown Medical School, Providence, RI, November 16, 2001. Regional.
2. Pulmonary Research Seminar. "Carboxy methylation of Rho GTPases regulates pulmonary endothelial monolayer permeability". Department of Pulmonary, Critical Care & Sleep Disorder Medicine, Brown Medical School, Providence, RI, September 30, 2002. Regional.

3. Vascular Biology Research Seminar. "TGF- $\beta$ 1 and endothelial barrier function". Brown Vascular Biological Research Group, Brown Medical School, Providence, RI, November 17, 2003. Regional.
4. Pulmonary Research Seminar. "Effect of TGF- $\beta$ 1 in endothelial monolayer permeability". Department of Pulmonary, Critical Care & Sleep Disorder Medicine, Brown Medical School, Providence, RI, February 2, 2004. Regional.
5. Pulmonary Research Seminar. "RhoA GTPase and p38 MAPK regulates TGF- $\beta$ 1-induced lung endothelial barrier dysfunction". Department of Pulmonary, Critical Care & Sleep Disorder Medicine, Brown Medical School, Providence, RI, January 10, 2005. Regional.
6. Division of Surgery Seminar. "Signaling Mechanism(s) underlying TGF- $\beta$ 1-induced lung endothelial barrier dysfunction". Department of Surgery, Brown Medical School, Providence, RI, August 22, 2006. Regional.
7. Pulmonary Research Seminar. "Signaling Mechanism(s) underlying TGF- $\beta$ 1-induced lung endothelial barrier dysfunction". Department of Pulmonary, Critical Care & Sleep Disorder Medicine, Brown Medical School, Providence, RI, October 16, 2006. Regional.
8. Brown Vascular Data Club Meeting, "Transforming growth factor-beta1 and endothelial cell function", Brown Medical School, Providence, RI, February 14, 2007. Regional.
9. Pulmonary Research Seminar. "Heterogeneity of lung vascular endothelial cells in response to TGF- $\beta$ 1 signaling". Department of Pulmonary, Critical Care & Sleep Disorder Medicine, Brown Medical School, Providence, RI, October 1, 2007. Regional.
10. Cardiovascular Research Center Basic Methodology Seminar. "Cell Death and Associated Pulmonary Diseases". CRC Core Building, Brown Medical School, Providence, RI, October 6, 2008. Regional.

## GRANTS

### ONGOING RESEARCH PROJECTS:

1. ATS/Pulmonary Hypertension Association Research Grant (Lu)  
 Title: "TGF-beta1 and Pulmonary Artery Hypertension"  
 Agency: American Thoracic Society/ Pulmonary Hypertension Association  
 Period of Support: 1/1/2008-12/31/2009  
**Role: Principal Investigator**  
 The overall goals of this study are to determine the effect of ALK5 inhibition on plexiform lesion formation and development of PAH and to demonstrate the underlying mechanisms.
2. HL64936 (Rounds)  
 Title: "Small GTPases and Lung Endothelial Apoptosis."  
 Agency: NIH/ NHLBI  
 Period of Support: 4/1/06-3/31/10  
**Role: Co-Investigator**  
 Overall goals: The long-range goal of this grant is to understand the role of isoprenylcysteine carboxyl methyltransferase (ICMT) in endothelial cell apoptosis via dysfunction of unfolded protein response.
3. HL88328 (Klinger)  
 Title: "Natriuretic Peptides in Pulmonary Endothelial Cell Barrier Function"  
 Agency: NIH/ NHLBI  
 Period of Support: 6/2007-5/2012  
**Role: Co-Investigator**  
 The overall objective of this project is to elucidate the signaling mechanisms by which natriuretic peptides attenuate agonist-induced endothelial barrier dysfunction.
4. HL67795 (Harrington)  
 Title: "Endothelial barrier function modulation by PKCdelta".  
 Agency: NIH/NHLBI  
 Period of Support: 4/1/2007-3/31/2012  
**Role: Collaborator**  
 The long range goal of this project is to determine how PKC $\sim$  regulates endothelial barrier function through the modulation of cell-ECM interactions.

5. NHLBI R25 (Rounds)  
 Title: "Short-Term Training Program to Increase Diversity in Health-Related Research"  
 Agency: NIH/ NHLBI  
 Period of Support: 4/1/07-3/31/12  
**Role: faculty trainer**  
 The long-range goal of this grant is to increase the numbers of students from under-represented minority and other under-represented backgrounds who enter careers in research on heart, lung, blood, or sleep disorders.
6. NHLBI T32 (Gideon Koren and Sharon Rounds)  
 "CardioPulmonary Research Training Program"  
 Agency: NIH/ NHLBI  
 Period of Support: 4/1/09-3/31/14  
**Role: faculty trainer**
7. T35 HL 094308 (Philip A. Gruppuso)  
 "The Alpert Medical Student Summer Research Program (AMSSRP)"  
 Agency: NHLBI; Period of Support: 2009-2014  
 The overall objective is to train medical students who desire to be physician scientists and independent investigators in the molecular basis and pathobiology of cardiovascular, blood, and pulmonary diseases and/or the outcomes of prevention and treatment of these diseases.  
**Role: Junior Trainer**

#### **COMPLETED RESEARCH PROJECTS:**

1. The Rhode Island Foundation Medical Research Grant (Lu)  
 Title: "TGF- $\beta$ 1 and endothelial monolayer permeability."  
 Agency: The Rhode Island Foundation  
 Period of Support: 1/1/04-12/31/04  
**Role: Principal Investigator**  
 This award provided seed money for studies of the mechanism(s) underlying TGF- $\beta$ 1-induced endothelial barrier dysfunction.
2. American Lung Association Research Grant (Lu)  
 Title: "The mechanism of TGF- $\beta$ 1 regulation of endothelial monolayer permeability."  
 Agency: American Lung Association  
 Period of Support: 7/1/04-6/30/06  
**Role: Principal Investigator**  
 Overall goals: study signaling mechanisms by which TGF- $\beta$ 1 induces endothelial barrier dysfunction.
3. Parker B. Francis Fellowship (Lu)  
 Title: "TGF- $\beta$ 1 and endothelial monolayer permeability."  
 Agency: Francis Family Foundation  
 Period of Support: 7/1/04-6/30/07  
**Role: Principal Investigator**  
 Overall goals: study the signaling pathways by which TGF- $\beta$ 1 induces endothelial barrier dysfunction.
4. Merit Review (Rounds)  
 Title: "RhoA GTPase Methylation and Vascular Permeability"  
 Agency: Department of Veterans Affairs  
 Period of Support: 4/1/05-3/31/08  
**Role: Co-Investigator**  
 Overall goals: The overall objective of this project is to determine if inhibition of RhoA GTPase methylation decreases RhoA activation and inter-endothelial cell gap formation and thereby decreases lung vascular permeability.

#### **PENDING RESEARCH GRANTS:**

1. R01 (Lu), "TGF-beta1 and Cigarette Smoke-Induced Emphysema". **Role: PI**

2. COBRE grant (Rounds), **role: targeted Investigator**, Target project: “The role of TGF-beta1 in pulmonary endothelial apoptosis and emphysema”.
3. FAMRI grant (Lu), “TGF-beta1 and Cigarette Smoke-Induced Emphysema”. **Role: PI**
4. R01 (Rounds), “The mechanism of cigarette smoke-induced pulmonary endothelial apoptosis and emphysema”, **Role: co-investigator**.

## **RESEARCH TRAINEES**

1. Noelle Hutchins, Summer Research Student, 6-8/2002. University of North Carolina at Chapel Hill.
2. Megan Garber, Research rotation, 1-5/2003, Ph.D student, Brown Medical School.
3. Zhizhan Gu, Research rotation, 6-8/2004. Ph.D. student, Brown Medical School.
4. Thomas Kim, Summer Research Student, 6-8/2005, Brown Medical School
5. Angela Yang, Summer Research Student, 6-8/2006, Brown Medical School
6. Christopher Travers, Summer Research Student, 6-8/2007, Brown Medical School
7. Bhuvic Patel, Summer Research Student, 6-8/2008, Brown Medical School.
8. Melanie Ortiz, Leadership Alliance students, 6-8/2009, University of Puerto Rico, Rio Piedras.