BIOGRAPHICAL SKETCH

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NAME Cristina Maria Alvira	POSITION TITLE Assistant Professor of Pediatrics
eRA COMMONS USER NAME (credential, e.g., agency login) ALVIRA.CRISTINA	

EDUCATION/TRAINING *(Begin with baccalaureate or other initial professional education, such as nursing, and include postdoctoral training.)*

INSTITUTION AND LOCATION	DEGREE *(if applicable)*	YEAR(s)	FIELD OF STUDY
Tufts University, Medford, MA	BS	1995	Biology
Tufts University School of Medicine, Boston, MA	MD	1999	Medicine
Stanford University School of Medicine	Residency	1999-2002	Pediatrics
Stanford University School of Medicine	Fellowship	2002-2005	Critical Care Medicine

A. Personal Statement

A main focus of my research program is to elucidate novel functions for the transcription factor, NFκB, during perinatal and postnatal development. During the basic research I pursued as a clinical fellow, I identified a unique, anti-inflammatory role for NFκB in the neonatal lung. Upon completion of my clinical training, I completed intensive post-doctoral fellowship training under the mentorship of Dr. Marlene Rabinovitch, a preeminent vascular biologist. During that time, I studied the role of vascular inflammation in models of lung and cardiac disease, and gained proficiency in a wide range of state of the art technologies including the development and use of genetically modified mice, the isolation and harvesting of primary murine endothelial and smooth muscle cells, and molecular strategies to achieve gain and loss of function both *in vivo* and *in vitro*. I was awarded the Fellow to Faculty Transition Award from the American Heart Association, which supported the completion of my post-doctoral fellowship project, and the integration of the principles and strategies obtained during my postdoctoral training into my own line of investigation which focuses on the role of NFκB signaling in the developing mouse.

B. Positions and Honors

Positions:

2005-2009	Instructor of Pediatrics, Stanford University School of Medicine
2009-2010	Acting Assistant Professor of Pediatrics, Stanford University School of Medicine
2010-Present	Assistant Professor of Pediatrics, Stanford University School of Medicine

Honors:

1998	Alpha Omega Alpha National Honor Society
1999	Louise Weinstein Prize for Excellence in Clinical Medicine
2004	Western Society for Clinical Investigation Travel Award
2004	Society of Pediatric Research Travel Award
2007	Pediatric Clerkship Honor Roll for Teaching
2008	AHA Fellow to Faculty Transition Award
2012	SPR Young Investigator Coaching Program
2013	AJP-Lung Outstanding Junior Investigator Award

C. Peer-Reviewed Publications

1. **Alvira CM**, Abate A, Yang GB, Dennery PA, and Rabinovitch M. "Nuclear Factor-κB Activation In Neonatal Mouse Lung Protects Against Lipopolysaccharide-Induced Inflammation." *Am J Respir Crit Care Med* 2007; 175(8):805-15. PMID: 17255561

C. Peer-Reviewed Publications (Cont.)

2. Bland RD, Ertsey R, Mokres LM, Xu L, Jacobson BE, Xiang S, **Alvira CM**, Rabinovitch M, Shinwell ES, Dixit A. "Mechanical Ventilation Uncouples Synthesis and Assembly of Elastin and Increases Apoptosis in Lungs of Newborn Mice." *Am J Physiol Lung Cell Mol Physiol* 2007; Oct 12. PMID: 17934062

3. Spiekerkoetter EF, **Alvira CM**, Kim Y, Bruneau A, Pricola KL, Wang L, Blackman M, Virgin IV HW, Ambarsumian N, Rabinovitch M. "Reactivation of γMHV-68 Induces Neointimal Lesions in Pulmonary Arteries of S100A4/Mts1 Over-Expressing Mice in Association with Degradation of Elastin." *Am J Physiol Lung Cell Mol Physiol*. 2007; Dec 14. PMID: 18083765

4. Hansmann G, de Jesus Perez VA, Alastalo TP, **Alvira CM**, Guignabert C, Bekker JM, Schellong S, Urashima, T Wang L, Morrell NW, Rabinovitch M. "An Antiproliferative BMP-2/PPARgamma/ApoE Axis In Human and Murine SMCs And Its Role In Pulmonary Hypertension." *J Clin Invest*, 2008; 188:1846-1857. PMID: 18382765

5. Ying L, Lau A, **Alvira CM**, West R, Cann GM, Zhou B, Kinnear C, Jan E, Sarnow P, Van de Rijn M, Rabinovitch M. "LC3 Mediated Fibronectin mRNA Translation Induces Fibrosarcoma Growth by Increasing Connective Tissue Growth Factor." *J Cell Sci* 2009; April 14. PMID: 19366727

6. Guignabert C, **Alvira CM**, Alastalo TP, Sawada H, Hansmann G, Zhao M, Wang L, El-Bizri N, Rabinovitch M. "Tie2-Mediated Loss of Peroxisome Proliferator-Activated Receptor-g in Mice Causes PDGF-Receptor b-Dependant Pulmonary Arterial Muscularization. *Am J Physiol Lung Cell Mol Physiol* 2009; Oct 2. PMID: 19801450

7. Mokres LM, Parai K, Hilgendorff A, Ertsey R, **Alvira CM**, Rabinovitch M, Bland RD. "Prolonged Mechanical Ventilation with Air Induces Apoptosis and Causes Failure of Alveolar Septation and Angiogenesis in Lungs of Newborn Mice." *Am J Physiol Lung Cell Mol Physiol* 2010 Jan; 298(1):L23-35. Epub 2009 Oct 23. PMID: 19854954

8. **Alvira CM**, Sukovich DJ, Lyu SC, Umesh A, Cornfield DN. "Rho Kinase Activity Modulates Postnatal Adaptation of the Pulmonary Circulation through Separate Effects on Pulmonary Artery Endothelial and Smooth Muscle Cells." *Am J Physiol Lung Cell Mol Physiol.* 2010 Dec; 299(6):L872-8. PMID: 20709731 ****Faculty of 1000 Recommended****

9. **Alvira CM**, Guignabert C, Kim YM, Wang L, Duong TT, Yeung RS, Li D, Rabinovitch M. "Transforming Growth Factor Beta Inhibition Increases Matrix Metalloproteinase-9 Activity and Enhances Elastin Degradation in a Murine Model of Kawasaki Disease." *Am J Pathol.* 2011 Mar; 178(3):1210-20 PMID: 21356372

10. Kim YM, Haghighat L, Spiekerkoetter E, Sawada H, **Alvira CM**, Wang L, Acharya S, Rodriguez-Colon G, Orton A, Zhao M, and Rabinovitch M. "Neutrophil Elastase is Produced by Pulmonary Artery Smooth Muscle Cells and is Linked to Neointimal Lesions." *Am J Pathol,* 2011 Sep;179(3):1560-72. PMID: 21763677

11. Ahn YT, Kim YM, Adams ES, Lyu SC, **Alvira CM**, and Cornfield DN. "Hypoxia inducible factor 1α regulates KCNMB1 expression in human pulmonary artery smooth muscle cells." *Am J Physiol Lung Cell Mol Physiol*. 2012 Feb1;302(3):L352-9. PMID 22114151

12. Merk DR, Chin JT, Dake BA, Maegdefessel L, Miller MO, Kimura N, Tsao PS, Iosef C, Berry GJ, Mohr FW, Spin JM, **Alvira CM**, Robbins RC, and Fischbein MP. "miR-29b Participates in Early Aneurysm Development in Marfan Syndrome." *Circ Res* 2012 Jan 20;110(2)312-24. PMID 22116819

13. Iosef C, Alastalo TP, Iosef C, Hou Y, Chen C, Ahn Y, Chen C, Lyu SC, Adams ES, Cornfield DN, and **Alvira CM**. "Inhibiting Nuclear Factor Kappa-B (NFκB) in the Developing Lung Disrupts Angiogenesis and Alveolarization." *Am J Physiol Lung Cell Mol Physiol* 2012 May 15;302(10):L1023-36. PMID: 22367785. ****Faculty of 1000 Recommended****

14. **Alvira CM**, Umesh A, Iosef C, Ying L, Hou Y, Lyu SC, Nowak J, and Cornfield DN. "Voltage-Dependent Anion Channel-2 Interaction with NOS Enhances Pulmonary Artery Endothelial NO Production." *Am J Respir Cell Mol Biol* 2012 Jul 27. PMID: 22842492

C. Peer-Reviewed Publications (Cont.)

15. Kim YM, Barnes EA, **Alvira CM**, Ying L, Reddy S, Cornfield DN. Hypoxia-inducible factor-1alpha in pulmonary artery smooth muscle cells lowers vascular tone by decreasing myosin light chain phosphorylation. *Circ Res* 2013;112(9):1230-1233. PMID:23513056 ***Faculty of 1000 Recommended****
16. Hilgendorff A, Reiss I, Ehrhardt H, Eickelberg O, **Alvira CM.** "Chronic Lung Disease in the Preterm Infant: Lessons Learned From Animal Models." *Am J Respir Cell Mol Biol* 2013 Sep 11 [Epup ahead of print]. PMID 24024524
17. **Alvira CM.** "Nuclear Factor-Kappa-B Signaling in Lung Development and Disease: One Pathway, Numerous Functions." *Birth Defects Res A Clin Mol Teratol* 2014 Mar;100(3):202-16. Epub 2014 Mar 1 PMID: 24639404
18. **Baker CD and Alvira CM.** "Disrupted lung development and bronchopulmonary dysplasia: opportunities for lung repair and regeneration." *Curr Opin Pediatr* 2014 Jun;26(3):306-14. PMID: 24739494

D. Research Support

Ongoing Research Support

National Institute of Health (NHLBI): R01HL122918-01 — Alvira (PI) — 05/01/14-04/30/19
"Novel Molecular Mechanisms Regulating Postnatal Angiogenesis"

The goal of this project is to investigate the role of NFκB in promoting pulmonary angiogenesis, and determine the upstream activators of NFκB in the developing lung.
Role: Principal Investigator (PI)

Child Health Research Institute Stanford: Transdisciplinary Initiative Program (TIP) — Alvira (PI) — 03/01/14-02/28/16
"Transforming Growth Factor Beta Induced Protein Promotes Pulmonary Angiogenesis in the Developing Lung by Activating NFκB and Wnt Signaling in the Pulmonary Endothelium"

The goal of this project is to develop novel microfluidic angiogenesis assays to test the whether TGFBI induces pulmonary angiogenesis by activating NFκB and Wnt signaling pathways.
Role: Principal Investigator (PI)

Burroughs Wellcome Fund: Preterm Birth Initiative Program — Cornfield (PI) — 07/01/14-06/30/18
"Myometrial Smooth Muscle Cell TRPV Channel Activity Modulates Contractility"

The goal of this project is to determine the role of TRPV4 channel activity in modulating myometrial contractility and inflammation in an experimental model of preterm labor.
Role: Co-Investigator (Co-I)

Completed Research Support

American Heart Association: #14BGIA18980070 — Alvira (PI) — 01/01/14-05/01/14
A Role for Nuclear Factor Kappa B in Promoting Pulmonary Angiogenesis

The major goals of this project were to determine how the NFκB activating kinases IKKα and IKKβ differentially modulate pulmonary endothelial cell angiogenesis. *Award relinquished early due to scientific overlap with NIH R01HL122918-01*
Role: Principal Investigator (PI)

D. Research Support (Cont.)

Completed Research Support

American Heart Association #0875001N — Alvira (PI) — 07/01/08-06/30/13

The Role of Transforming Growth Factor Beta in Inflammatory Aneurysm Formation

This career development award supported the transition of the PI from fellowship to faculty. The goals of the fellowship portion of the award were to define how disruption of TGF-β signaling by systemic inflammation leads to inflammatory aneurysm formation

Role: PI

P30 HL101315-01 — Cornfield (PI) — 09/30/09-08/31/12

Postnatal Lung Development: Mechanisms of Molecular and Vascular Development

The goal of this project was to create a new research focus concentrated on lung developmental biology, within the Center for Excellence in Pulmonary Biology at Stanford University School of Medicine. The goal was to be achieved by the recruitment and support of a newly independent investigator (NII), Dr. Cristina Alvira.

Role: NII