

WELLINGTON V. CARDOSO, MD, PHD

Columbia University Medical Center
Columbia Center for Human Development
Department of Medicine
650 West 168th Street, BB 8-812B
New York, NY 10032
Ph.: (212) 342-3971 Fax: (212) 305-6701
wvc2104@columbia.edu

Date of Preparation: July 2016

ACADEMIC APPOINTMENTS

10/2013 – Present	Director, Columbia Center for Human Development Columbia University Medical Center	New York, NY
10/2013 – Present	Professor of Medicine and Genetics & Development Columbia University Medical Center	New York, NY
01/2008 – 09/2013	Director, Lung Development Program Pulmonary Center, Boston University School of Medicine	Boston, MA
01/2006 – 09/2013	Professor of Medicine, and Pathology and Laboratory Medicine Boston University School of Medicine	Boston, MA
01/2008 – 01/2009	Associate Director Pulmonary Center, Boston University School of Medicine	Boston, MA
09/2000 – 12/2005	Associate Professor of Medicine, and Pathology and Laboratory Medicine Boston University School of Medicine	Boston, MA
09/1998 – 08/2000	Assistant Professor of Pathology and Laboratory Medicine Boston University School of Medicine	Boston, MA
09/1995 – 08/1998	Assistant Professor of Medicine Boston University School of Medicine	Boston, MA
07/1994 – 08/1995	Research Assistant Professor of Medicine Boston University School of Medicine	Boston, MA

HOSPITAL APPOINTMENTS

01/1987 – 12/1989	Attending Pathologist Pathology Service, University of Sao Paulo	Sao Paulo, SP, Brazil
06/1984 – 06/1985	Attending Physician Distrito Federal Hospital Foundation	Brasilia, DF, Brazil

TRAINING

07/1991 – 06/1994	Pulmonary Biology Research Fellowship Boston University School of Medicine	Boston, MA
01/1990 – 06/1991	Postdoctoral Research Fellowship Department of Pathology, University of British Columbia	Vancouver, BC, Canada
01/1982 – 03/1984	Medical Residency in Pathology University of Brasilia, University Hospital	Brasilia, DF, Brazil
01/1980 – 12/1981	Internship University of Brasilia, University Hospital	Brasilia, DF, Brazil

EDUCATION

08/1985 -12/1989	Ph.D. in Pathology, Faculty of Medicine, University of Sao Paulo Thesis: "Morphological and Functional Alterations of the	Sao Paulo, SP, Brazil
------------------	--	-----------------------

HONORS

International Invited Lectures

- 2016 Invited Speaker: Universities of Giessen & Marburg Lung Center, 14th Annual Retreat, "Regulation of airway progenitor cell fate in lung development and disease", *Rauischholzhausen, Germany*; Jul 20-22.
- 2015 Invited Speaker: Latin American Society for Developmental Biology (LASDB), 8th Annual Meeting, *Santos, Sao Paulo, Brazil*; Oct 20-23.
- 2015 Invited Speaker: German Society of Paediatrics (DGKJ) 2015 Conference, *Munich, Germany*; Sept 2-5.
- 2014 Invited Speaker: Symposium - Bronchitis IX: 'Lungs: On the Edge of Health & Ageing', U. Medical Center, *Groningen, Netherlands*; June 23-25.
- 2012 Invited Speaker: Symposium "Perspectives on the Lung". University of Giessen, Marburg Lung Center: *Giessen, Germany*; Oct 22-24.
- 2012 Invited Lecture: Institute of Pulmonary Medicine; Hadassah University Hospital, *Jerusalem, Israel*; Mar 8.
- 2010 Invited Speaker & Visiting Professor: National Taiwan University Medical Center. "2010 Symposium on Developmental Biology and Stem Cells": *Taipei, Taiwan*; May 7-9.
- 2009 Invited Speaker: "Development & Aging: Relevance to COPD", *Lund, Sweden*; Apr 26.
- 2007 Invited Lecture: "Retinoids in early lung morphogenesis". University of Thessaloniki, *Thessaloniki, Greece*, Oct 3.
- 2005 Invited Speaker and Session Co-Coordinator: "Model Organisms and Innovative Approaches in Developmental Biology": *Juquehy, Sao Paulo, Brazil*; April 27 - May 4.
- 2005 Invited Speaker: 2nd International Meeting of the Latin American Society of Developmental Biology. *Sao Paulo, Brazil*. May 6.
- 2005 Speaker: Conference on "Proteoglycans in signaling", Stockholm (Runo), *Sweden*. Sept 7-11.
- 2003 Invited Speaker and Co-Chair Session: *Symposium: FGFs in organogenesis*. "International Meeting on FGF in development and disease": Oxford-Kobe Institute, *Kobe, Japan*; Oct 14.
- 2003 Invited Lecture: "Heparan sulfate-FGF interactions in lung development". Nippon Medical School, *Tokyo, Japan*; Oct 7.
- 2003 Invited lecture: "FGFs and retinoic acid in lung morphogenesis". Tokyo University of Pharmacy and Life Science, *Tokyo, Japan*; Oct 8.
- 2003 Invited lecture: Institute of Anatomy. University of Berne, *Berne, Switzerland*; Nov 7.
- 2001 Invited speaker: "First Siena International Conference on Animal Models of Chronic Obstructive Pulmonary Disease", *Siena, Italy*; Oct 2.
- 2001 XVI Annual Meeting of the Brazilian Federation of the Societies of Experimental Biology (FeSBE) "Symposium: Molecular Control of Heart and Lung Organogenesis": *Caxambu, Brazil*; Aug 30.
- 2001 Invited Lecture: "Genetic regulation of lung development". Department of Histology and Embryology, University of Sao Paulo: *Sao Paulo, Brazil*; Sept 1.
- 2001 Invited Lecture: "Growth factors in organogenesis and pulmonary disease". Instituto do Coracao, University of Sao Paulo School of Medicine: *Sao Paulo, Brazil*; Sept 2.
- 2001 Invited Speaker: Summer Meeting of the Anatomical Society of Great Britain and Ireland. "Symposium: The Respiratory System" - "Molecular Biology of Lung Development". University College, *Dublin, Ireland*; July 10.
- 2001 Invited Lecture: INSERM - Faculte de Medecine - Unite de Recherche de Physiopathologie et Therapeutic Respiratoires, "FGF and development": *Paris, France*; Apr 2.
- 1998 Invited Lecture: XII Annual Meeting of the Brazilian Federation of the Societies of Experimental

Biology (FeSBE), "Genetic Regulation of Lung Development": *Caxambu, Brazil*; Aug 20.

1998 Invited Speaker: "Molecular tools for the study of lung development". Department of Pathology, University of Sao Paulo School of Medicine: *Sao Paulo, Brazil*. Aug 17.

National Invited Lectures

- 2016 Invited Speaker: Inaugural "Mary C. Williams Lecture in Cell Biology", Center for Regenerative Medicine, Boston University Medical Center, *Boston, MA*; Jun 14.
- 2016 Invited Speaker: Columbia University's Columbia Stem Cell Initiative, *New York, NY*; May 16.
- 2016 Invited Speaker: Columbia University Institute for Genomic Medicine & Department of Medicine, Idiopathic Pulmonary Fibrosis: Stem Cells, Lung Regeneration, Genomics, and Beyond, "Lung Development and Insights into Lung Fibrosis", *New York, NY*; Apr 12.
- 2016 Invited Speaker: Pulmonary Center Boston University, "Control of differentiation in airway epithelial progenitors", *Boston, MA*; Apr 1.
- 2016 Invited Speaker: University Southern California, Hastings Center for Pulmonary Research Seminar", *Los Angeles, CA*; Mar 17-19.
- 2016 Invited Speaker: Yale Pulmonary Research Conference, Dept. Internal Medicine, Yale School of Medicine, *New Haven, CT*; Jan 14.
- 2015 Invited Speaker: Dept. of Pharmacological Sciences, Stony Brook University, "Regulation of Epithelial Progenitor Cell Fate in the Lung", *Stony Brook, NY*; Dec 8.
- 2015 Invited Discussant: 2015 Stem Cell Conference, "Stem Cells, Cell Therapies, & Bioengineering in Lung Biology and Diseases", U. Vermont, *Burlington, VT*; Jul 27-30.
- 2015 Invited Speaker: "Prenatal Vitamin-A Deficiency Leads to Airway Hyperresponsiveness in Adult Mice", COPD9USA Conference, *Chicago, IL*; Jun 5-6.
- 2015 Invited Speaker: Keystone Symposium, "The Hippo Pathway: Signaling, Development & Disease", *Taos, NM*; May 17-21.
- 2015 Invited Speaker: New York Genome Center, 2015 New York Epigenomics Symposium, "Epigenomics in Childhood Diseases", *New York, NY*; May 4.
- 2015 Invited Speaker: "Yap Regulation of Airway Progenitor Cell Fate & Morphogenesis of the Lung", Dept. Biomedical Genetics, U. Rochester, *Rochester, NY*; April 17.
- 2015 Invited Speaker: Icahn School of Medicine at Mt. Sinai, Respiratory Institute Grand Rounds "Exploring the Developmental Basis of Pulmonary Diseases", *New York, NY*; Mar 6.
- 2015 Invited Speaker: Keystone Symposium, "Endoderm Lineages in Development & Disease – Hippo-Yap Control of Lung Epithelial Morphogenesis & Differentiation", *Keystone, CO*; Feb 8-13.
- 2014 Invited Speaker: American Society for Cell Biology, 'Mini-symposium – Stem Cells, Tissues and Organs', *Philadelphia, PA*; Dec 6-10.
- 2014 Invited Speaker: FASEB SRC: "The Lung Epithelium in Health & Disease", Vermont Academy, *Saxtons River, VT*; Jul 27-Aug 1.
- 2014 Invited Speaker: Progenitor Cell Biology Consortium, *Boston, MA*; June 9-10.
- 2014 Invited Speaker: Keystone Symposia on Generating and Regenerating the Respiratory System.
- 2013 Invited Speaker: Grand Rounds, Department of Medicine, Columbia University, *New York, NY*; Dec 18.
- 2013 Invited Speaker: Meeting of the Briscoe Lung Club- New York City. "Consequences of Pre-Natal Vitamin-A deficiency in adult lung function": *New York, NY*; Oct 17.
- 2013 Session Chair: "Lung Development, Injury & Repair", Gordon Research Conference, Proctor Academy, *Andover, NH*; Aug 16-21.
- 2013 Invited Discussant: "Stem Cells and Cell Therapies in Lung Biology and Lung Diseases", University of Vermont College of Medicine, Vermont Lung Center, NHLBI, American Thoracic Society, *Burlington, VT*; July 29 – Aug 1.
- 2013 Featured Speaker: 2013 Gordon Research Conference on Salivary Glands & Exocrine Biology "From Development to Disease and Beyond": *Galveston, TX*; Feb 4.
- 2012 Invited Speaker: "Molecular & Developmental Biology Seminars", Cincinnati Children's Hospital, *Cincinnati, OH*; Oct 10.
- 2012 Invited Speaker: "2012 Meeting of the Children Interstitial Lung Disease (ChILD) Foundation". *San Diego, CA*; June 15.

2012 Invited Speaker: 2012 FASEB Research Conference on “Retinoids”, *Snowmass, CO*; June 13.

2012 Invited Speaker: American Thoracic Society, *San Francisco, CA*; May 22.

2011 Invited Speaker: Columbia University, Department of Genetics, *New York, NY*; May 1.

2011 Invited Speaker: “2011 Seminar Series, Department of Genetics, University of Wisconsin,” *Madison, WI*; Nov 9.

2011 Invited Panelist and Featured Speaker: Conference on “Stem Cells and Cell Therapies in Lung Biology and Lung Diseases 2011”. *Burlington, VT*; July 25-28.

2011 Featured Speaker: Symposium: “Novel Methods of Information Transfer to and from Stem Cells” American Thoracic Society Meeting 2011, *Denver, Co*; May 16.

2011 Invited Speaker: Columbia University Department of Medicine Seminar Series. “Airway Epithelial Progenitors in Development and Regeneration”: *New York, NY*; May 4.

2011 Invited Speaker, Visiting Professor: *National Jewish Health Distinguished Seminar Series*, University of Colorado. “Regulation of Progenitor Cell Fate in the Lung”: *Denver, CO*: Apr 19-20.

2011 Invited Speaker: Departmental Seminar Series: University of Massachusetts Amherst. “Notch in Lung Progenitor Cell Fate”: *Amherst, MA*; Mar 9.

2011 Invited Speaker: Gordon Research Conference 2011 on “Cilia, Mucus and Mucociliary Interactions”. Notch balances ciliated and secretory cell phenotypes”. *Ventura, CA*; Feb 14.

2011 Invited Speaker: Keystone Symposia Meeting: Lung Development and Repair;” Notch Signaling in Lung Development”. *Santa Fe, NM*; Feb 9.

2010 Session Chair and Speaker: *2010 FASEB Summer Research Conference*: Symposium: “Molecular Regulation of Lung Development and Other Programmatic Signals” *Saxton Rivers, VT*; Aug 8-13.

2010 Co-Chair and Speaker: Symposium: “*Top-Notch Decisions in Lung Development and Disease*” American Thoracic Society Meeting 2010, *New Orleans, LA*; May 19.

2010 Invited Speaker: Symposium: “Cell Fate Decisions in Lung Development and Repair”: American Thoracic Society Meeting 2010, *New Orleans, LA*; May 17.

2009 Invited Speaker: Gordon Research Conference 2009: Hormone Action in Development and Cancer. *Holderness, NH*; July 27.

2009 Invited Discussant: Workshop on “Stem Cells and Cell Therapies in Lung Biology and Lung Diseases 2009”: *Burlington, VT*; July 27.

2009 Featured Speaker: Symposium: “*Novel Mouse Models of Development and Disease*” American Thoracic Society Meeting 2009, *San Diego, CA*; May 20.

2008 Invited speaker: Symposium: “Lung Regeneration: Concepts, Model Systems and Strategies”: Boston University School of Medicine, *Boston, MA*; Sept 19.

2008 Invited Lecture. Dept. of Biology Boston University; *Boston, MA*; Oct 6.

2008 Invited lecture: “Molecular Regulation of Early Lung Development”. Harbor-Univ. California, Los Angeles Medical Center. *Los Angeles, CA*; April 1.

2007 Invited Speaker and Discussant: Workshop on Stem Cells and Cellular Therapies in Lung Biology and Lung Diseases. *Burlington, VT*; July 31.

2007 Invited Speaker and Discussant: NIH-NHLBI Workshop on “*Resident Cellular Components of the Human Lung*”. *Washington, DC*; July 9.

2007 Invited lecture: “Symposium: Cell Bases Therapies for Lung Disease”. American Thoracic Society 2007: *San Francisco, CA*; May 21.

2007 Invited lecture: Symposium: “From the Developer to the Fixer: Specifying Lung Epithelial Phenotype from the Womb to the Tomb”. American Thoracic Society 2007: *San Francisco, CA*; May 23.

2007 Invited lecture: “Symposium on Patterning in Development” - FASEB Experimental Biology 2007, *Washington, DC*; May 2.

2006 Invited lecture: Mouse Genetics Meeting, Cold Spring Harbor Laboratories. *Cold Spring Harbor, NY*; Sept 2.

2006 Invited Speaker: FASEB Summer Research Conference 2007: Lung Surfactant: Cellular and Molecular Biology. *Aspen, CO*; August 20.

2005 Invited lecture: “Seminars - Developmental Biology”: Cincinnati Children's Hospital Medical Center, *Cincinnati, OH*; Nov 16.

2005 Invited lecture. “Symposium on Developmental Toxicology”: Society of Toxicology Meeting 2005. *New Orleans, LA*; March 9.

- 2004 Invited lecture: "Seminars Hematology & Oncology, Boston Univ. School of Medicine, *Boston MA*; Dec 9.
- 2003 Invited lecture. "Brown Medical School Pulmonary Research Seminar Series": Brown University, *Providence, RI*; Nov 24.
- 2003 Invited lecture: "Research Seminar Series, University of Southern California, Division of Pulmonary and Critical Care Medicine". *Los Angeles, CA*: Feb 14.
- 2002 Invited Speaker: American Society of Nephrology. Symposium: "Molecular Determinants in Organogenesis". *Philadelphia, PA*; Nov 2.
- 2002 Invited Speaker: FASEB Summer Research Conference: Lung Surfactant: Cellular and Molecular Biology. *Saxton River, VT*: July 21.
- 2002 Invited Speaker and Moderator: "Determinants of Alveolar Development". Workshop: Models of Emphysema: Speeding the Pace of Progress. *Airlie, Virginia*; Sept 26.
- 2002 Invited Lecture: "Signaling networks in lung development" Harvard School of Public Health. *Boston, MA*; Jan, 22.
- 2001 Invited Lecture: University of Wisconsin, Madison, EHS Center for Developmental and Molecular Toxicology, "FGFs and retinoids regulate lung pattern formation". *Madison, WI*, Apr 16.
- 2000 Speaker and Co-Chair: Lung Cell Biology Conference at Woods Hole, MA. "Basic Mechanisms of Lung Development ": *Woods Hole, MA*; Oct 30.
- 2000 Boston University, School of Biomedical Engineering and Bioinformatics, "Genetic regulation of lung development": *Boston, MA*; Sept 25.
- 2000 Invited Speaker: Pennsylvania State University College of Medicine "Lung Cell Biology Seminars" *Hershey, PA*; Feb 12.
- 1999 Invited Lecture: Columbia University, Department of Genetics/Department of Urology: "Retinoid signaling in lung morphogenesis". *New York, NY*; Sept 29.
- 1999 Speaker and Co-Chair: "Lung development, the impact of injury" Symposium, FASEB Experimental Biology 99 Meeting, *Washington, DC*; Apr 21.
- 1998 Invited Speaker: NIH -NIHLBI Workshop: "Molecular Embryology of the Lung: Then, Now and in the Future", *Bethesda, MD*; Jun 2
- 1992 Speaker: Lung Cell Biology Conference at Woods Hole, MA: Development of the Lung and Model Systems. "Retinoids and Lung Development", *Woods Hole, MA*; Oct 18.

PROFESSIONAL ORGANIZATIONS, SOCIETIES AND SERVICE (past and current)

Memberships and positions

Society for Developmental Biology, American Thoracic Society, Society for Pediatric Research, American Association of Anatomists, American Association for the Advancement of Science, American Physiological Society, National Flute Association, Harvard Musical Association (Board of Directors).

Consultative

Scientific Journals Reviewer

Nature, Science, Nature Genetics, J. Clinical Investigation, Proc. Nat. Acad. Science, Development, Genes & Development, Developmental Biology, J. Biological Chemistry, Developmental Dynamics, Mechanisms of Development, International J. of Developmental Biology, American J. of Respiratory Cell and Molecular Biology, American J. of Physiology, J. of Anatomy, Pediatric Research, Biochemical Biophysical Acta, Biochemical Biophysical Research Communications, J. of Histochemistry and Cytochemistry.

Study Sections and Other Committees

- 2016 NIH-NHLBI – Lung Injury Repair & Remodeling (LIRR) – Study section, *Washington, DC*; Feb 1-2.
- 2015 NIH-NHLBI – Lung Injury Repair & Remodeling (LIRR) – Study section, *San Francisco, CA*; Jun 1-2.
- 2014 NIH-NHLBI – Lung Injury Repair & Remodeling (LIRR) – Study section, *Washington, DC*; Oct 6-7.

2014 NIH-NHLBI – Lung Injury Repair & Remodeling (LIRR) – Consortium, Sept 12-16.

2014 NIH-NIDCR Board of Scientific Counselors Review Member, *Bethesda, MD*; May 28-30.

2014 NIH-NHLBI – Lung Injury Repair & Remodeling (LIRR) – Study section, Feb 2-3.

2012 Chair, 2012 FASEB Science Research Conferences “*The Lung Epithelium in Health and Disease*”. *Saxton Rivers (VT)*; July 22-27.

2011 Co-Chair, NIH-NHLBI - Workshop on “Molecular Determinants of Lung Development”. *Bethesda, MD*; Sept, 7-8.

2011 Co-Chair, NIH-NHLBI - Workshop on “Molecular Determinants of Lung Development”. *Bethesda MD*; Sept, 7-8.

2011 Chair, Session Discussion: “*Genetic Programs Driving Lung Development and Regeneration*”, American Thoracic Society Meeting 2011, *Denver, CO*; May 17.

2011 Reviewer: 2011 Meeting of the NIH-NHLBI – Progenitor Cell Biology Consortium – External Advisory Committee Member.

2011 Invited Discussant – NIH-NHLBI – Workshop on “*Chronic Bronchitis in the Absence of Airflow Limitation*”. *Bethesda, MD*; June 23-24.

2010 Chair, NIH-NHLBI – Program Project Review Panel- ZHL1 CSR-S(01); May 21.

2010- Present NIH-NHLBI – Progenitor Cell Biology Consortium – External Advisory Committee Member.

2010 European Science Foundation (ESF) Standing Committee of the European Medical Research Councils - member.

2010-12 American Thoracic Society, Respiratory Cell Mol. Biol. Assembly Planning Committee Member.

2009 Chair, NIH-NHLBI – Program Project Review Panel- ZHL1 CSR-S; July 16.

2009 Medical Research Council Reviewer - UK- Career Development Award 2009/10; May 15.

2009 NIH- RFA-09-003 Reviewer - NIH Challenge Grants in Health and Science Research; June 5.

2009 March of Dimes Foundation – Research Grant Reviewer; March 15.

2008 NIH-NHLBI- KO8 Study Section Reviewer (*ad hoc*).

2008 Pediatric Academic Society Meeting 2007 - Abstract Review Program Committee.

2007 External Examiner-Thesis Committee –Dept. Genetics, Univ. of Toronto – Canada; July 20.

2007 European Science Foundation (ESF) Standing Committee of the European Medical Research Councils. Peer Review Evaluation of *ESF Exploratory Workshops*.

2007 Pediatric Academic Society Meeting 2007 - Abstract Review Program Committee.

2007 Ohio Cancer Research Associates - Grant Review Committee - Reviewer (*ad hoc*).

2004-08 NIH-Biology of Development and Aging, (BDA) -*Development 1 (DEV-1)*- Study Section Reviewer (permanent member).

2005 Chair: NIH-NHLBI - Workshop RFA: “*Coordination of Vascularization and Lung Development*”; Oct 7.

2005 Invited Discussant, Workshop on “*Adult Stem Cell, Lung Biology and Lung Disease 2005*”; *Burlington, VT*; July 25-27.

2004 European Science Foundation (ESF) Standing Committee of the European Medical Research Councils. Peer Review Evaluation of *ESF Exploratory Workshops – 2004*; July 8.

2004 NIHHLBI - Special Review Committee (2), 1PO1 HL075161-01A1. Reviewer; May 10.

2004 NIHHLBI - Special Review Committee (1), 2PO1 HL024136-26. Reviewer; Feb 5.

2003 NIH-NHLBI-RFA: *Coordination of Vascularization & Lung Development*, Reviewer; Jun 5-6.

2003 NIH-NHLBI - Special Review Committee, 1PO1 HL075161-01A1, Reviewer; May 02.

2003 Wellcome Trust Fund (England), Physiology & Pharmacology, Grant Reviewer.

2002 NIH-NCI *Site Visit: Laboratory of Metabolism* - Committee Member; Oct 9-11.

2002 NIH-ZRG1 - REN (01) - *Special Emphasis Panel*- Study Section Reviewer.

2002 Invited Discussant, NIH-NHLBI- Working Group on “*Strategies to Augment Alveolarization*”: *Washington, DC*; Aug 15.

2001 March of Dimes, Basil O'Connor Research Award; Reviewer.

2001 NIH-HED-1- *Human Embryology and Development Subcommittee-1* - Study Section Reviewer (*ad hoc*); Oct 22-23.

2000-date Editorial Board: “*Respiratory Research*”.

2000 Co-Chair: “*Eight Woods Hole Conference in Lung Cell Biology*” “*Basic Mechanisms of Lung Development*”, *Woods Hole, MA*; Oct 29-Nov 1.

1999 Co-Chair: Symposium: “*Lung Development, the impact of injury*” FASEB Experimental Biology 99

Meeting. Washington, DC; Apr 21.
 1999 NIH-HED-1- *Human Embryology and Development Subcommittee-1* - Study Section Reviewer (*ad hoc*); May.
 1998 NIHHLBI-RFA-HL-98-011 Study Section Reviewer: “*Strategies to Augment Alveolarization*”; Nov 2.
 1997 Museum of Science Boston, MA; Scientific Advisor and Collaborator.

DEPARTMENTAL AND UNIVERSITY COMMITTEES

2011-2013 Chair, Program Symposia Committee, Evans Center for Interdisciplinary Research, Dept. of Medicine, Boston Univ. School of Medicine.
 2007-2013 Executive Committee, Pulmonary Center, Boston University School of Medicine.
 1997-2003 Member of the Institutional Biosafety Committee, Boston University School of Medicine.

FELLOWSHIP AND GRANT SUPPORT

2016-19 NIH-NHLBI – R01 HL131422-01 (Co I: Cardoso; PI: Lu): “The Trinucleotide Repeat Containing 6a Mediated miRNA Activities in the Ciliogenesis”. \$400,000
 2014-18 NIH-NHLBI - R01 HL119836-01A1 (PI: Cardoso): “Regulation of the Ciliated Cell Fate in Airway Progenitors”. \$286,481
 2014-19 NIH-NHLBI - R01 HL124392 (Co PI: Cardoso; PI: Varelas): “Defining Epithelial Cell Polarity Cues that Direct Cell Fate”. \$256,209
 2012-17 NIH-NHLBI - R01 HL067129-09A1 (PI: Cardoso): “Retinoic Acid Regulation of Lung Development”. \$250,000
 2011-16 NIH-NHLBI - R01 HL105971-01A1 (PI: Cardoso): “Regulation of Airway Progenitor Cell Fate in Development and Regeneration”. \$250,000
 2014-15 NIH-NHLBI - R56 HL121476 (Co-I: Cardoso; PI: Guha): “Regulation of Upk3a-Expressing Airway Progenitors During Homeostasis and Post-Injury Repair”. \$250,000
 2014-15 NIH-NHLBI - R01 HL105971-03S1 (PI: Cardoso, Supervisor: Maria Stupnikov): Diversity Research Supplement for Graduate Research.
 2008-13 NIH NHLBI - P01 HL47049 (PO1-PI: Cardoso): “Determinants of Cell Fate and Differentiation in the Developing Lung”. \$ 1,404,676
 . Project 1 (PI: Cardoso): “Mechanisms of Segregation of Respiratory Progenitors in the Early Lung”.
 . Project 2 (Co-PI: Cardoso): “MiRNA Pathway in Proximal-Distal Differentiation in Mouse Lung Development”
 . Administrative Core (PI: Cardoso).
 2011-12 NIH NHLBI - P01 HL47049 (PO1-PI: Cardoso; Stevenson): Undergraduate Research Supplement (URS). \$20,000
 2009-10 NIH-NHLBI: NOT-OD-09-056. (PI: Lu; Co-PI: Cardoso) Administrative Supplement: “MicroRNA-mediated Gene Regulation in Lung Development”. \$89,350
 2008-12 NIH/NHLBI- 1R01 HL089795 (PI: Fine, Co-PI: Cardoso): “Hematopoietic Cell Fates in the Developing Lung”. \$250,000
 2008-10 NIH-NHLBI - R03 HL095415-01 (PI: Lu & Cardoso). “Characterization of miRNA Expression in Idiopathic Pulmonary Fibrosis (IPF)”. \$50,000
 2006-10 NIH NHLBI 2RO-1 HL067129-05A1 (PI: Cardoso): “Retinoic Acid Signaling in Lung Morphogenesis” \$242,750
 2006-10 NIH NHLBI 1 R01 HL081800-01A1 (PI: Lu; Co-PI: Cardoso): “MicroRNA-mediated Gene Regulation in Lung Development”. \$267,950
 2002-07 NIH NHLBI PO-1 HL47049 (PO1 Project PI: Cardoso): “FGF10 Regulation of Lung Branching Morphogenesis” \$250,000
 2002-07 NIH NHLBI PO-1 HL47049 (PO1: Project Co-PI: Cardoso): “Lung specification and Induction in the Foregut Endoderm”. \$200,000

2001-05 NIH NHLBI RO-1 HL/HD67129-01 (PI: Cardoso): “Retinoic Acid Signaling in Lung Morphogenesis”. \$250,000

2000 NIH-NHLBI- R13 HL62941 (PI: Williams; Co-PI: Cardoso): Funding for Workshop: “Basic Mechanisms in Lung Development. \$ 25,000

1997-02 NIH NHLBI PO-1 HL47049-06 (PO1-Williams; Project PI: Cardoso): “Fibroblast Growth Factors in Lung Development” \$ 200,000

1993-96 Parker B. Francis Fellowship Award (PI: Cardoso)

1991 Canadian Thoracic Society Fellowship Award, Canada (PI: Cardoso)

1991 British Columbia Lung Association Respiratory Health Care Fellowship Award, BC, Canada. (PI: Cardoso).

1990 Postdoctoral Fellowship Award, Conselho Nacional de Desenvolvimento Cientifico e Tecnologico (CNPq of the Ministry for Science and Technology of Brazil). (PI: Cardoso)

1989 Travel Award FAPESP Research Agency - Sao Paulo/SP- Brazil, American College of Chest Physicians International Conference (PI: Cardoso).

Pending Support

NA

Other Awards (past & present)

2016 Inaugural “Mary C. Williams Lecture in Cell Biology”, Boston University Medical Center, *Boston, MA*; Jun 14.

2013 American Lung Association – Senior Research Fellowship Award (**Supervisor** of Hector Marquez, MD)

2013 NIH-F32 Fellowship Award (1F32HL117529-01) (**Supervisor** of Hector Marquez, MD)

2012 Chair-Elect organizer of the 2012 FASEB Summer Conference on “Lung Epithelium in Health and Disease”

2010 American Lung Association – Senior Research Fellowship Award (**Supervisor** of Yixin Tang, PhD - declined)

2005-07 National Health Research Institutes (NHRI) 2005 Physician Scientist Award, Taiwan: (**Supervisor** of Po-Nien Tsao, MD)

2004 1st prize: Massachusetts Thoracic Society Basic Science Research Abstract Award (**Supervisor** of Felicia Chen., MD)

2004 Parker B. Francis Fellowship Award (**Supervisor** of Konstantin Izvolsky, PhD)

2004 GLAXO-SMITH KLINE Fellowship Award: (**Supervisor** of Felicia Chen., MD)

2004 NIH- NRSA Fellowship Award (**Supervisor** of Felicia Chen., MD)

2002 GLAXO-SMITH KLINE Fellowship Award: (**Supervisor** of Tushar Desai MD)

2002 New England Respiratory Research Competition & Awards, Boston, MA (**Supervisor** of C. Wongtrakool, MD)

2000 Poster Award, FASEB Conference “Retinoids”, Copper Mountain, CO (**Supervisor** of S. Malpel, PhD)

1997 Evans Research Award, Department of Medicine, Boston Univ. School of Medicine (**Supervisor** of W. Park, MD).

1994 Evans Research Award, Department of Medicine, Boston Univ. School of Medicine.

1989 University of Sao Paulo School of Medicine (SP/Brazil). PhD Thesis, *Summa Cum Laude*.

TEACHING RESPONSIBILITIES

Specific Courses & Seminars

2003- 2013 Co-Coordinator (W. Cardoso & A. Fine) and Tutor – “Pulmonary Fellows Lab Course”, Pulmonary Center, BUSM

1996- 2013 Coordinator: “Lung Epithelial Biology Group” meeting – Pulmonary Center, BUSM.

2010- 2012 Tutor: “Principles of Basic and Applied Pathology “Constructing the Lung: Developmental Pathways”. Pathology, Dept. (Coordinator: Deborah Stearns-Kurosawa).

2005- 2012	Tutor, “Gene Targeting in Transgenic Mice”, Biochemistry Dept., BUSM (Coordinator: K. Ravid).
2005	Tutor, “Mouse as a model for studying organogenesis”, Genetics Dept. (Coordinator: K. Albrecht).
2005	Tutor: Special Topics in Pathology “Lung Development & Cancer”. Pathology Dept. (Coordinators: A. Spira, M. Ramirez).
2002-2003	Co-Coordinator (W. Cardoso & B. Florence) “Developmental Biology Interest Group”, BUSM.
2002-2003	Tutor, “Molecular Mechanisms of Development”, Biochemistry Dept., BUSM (Coordinator: K. Symes).
1994-2003	Tutor, “Pulmonary Fellows Lab Course”, Pulmonary Center, BUSM

Ph.D. Examination-, Advisory -, and Defense Committees (partial)

2014-15	Rebecca Turcotte, MD, PhD – Postdoctoral Cl. Fellow, Dept. Pediatrics Critical Care Columbia U (NY) (Superv. J. Bhattacharya)
2012-13	Martin Steinback, PhD – Dept. Pathology BUSM (Superv. S. Winandy)
2012-13	Sami Hiemer, PhD – Dept. Biochemistry BUSM (Superv. X. Varelas)
2012-13	Carly Garrison, PhD – Dept. of Medicine BUSM (Superv. Spira/Lenburg)
2012-13	Radhika Dixit, PhD – Dept. of Medicine BUSM (Superv. Alan Fine)
2009-11	Constantina Christodoulou, PhD -BUSM Dept. of Medicine (Superv. D. Kotton)
2009-11	Tyler Longmire, PhD –Dept. of Medicine BUSM (Superv. D. Kotton)
2009-11	Hicham Naimy, PhD -Dept. Biochemistry BUSM (Superv. J. Zaia)
2009-10	Louis Vackus, MD, PhD -Dept. Pathology BUSM (Superv. Dan Remick)
2008-10	Aditi Gurk, PhD -Dept. Pathology BUSM (Superv. Cyrus Vasiri)
2008-11	Pierre Vanden Bore, PhD -Dept. Medicine BUSM (Superv. Adam Lerner)
2007-08	Thomas Thomou, PhD - Dept. Pathology BUSM (Superv. James Kirland)
2007-08	Michelle Musson, MD, PhD - Dept. Medicine BUSM (Superv. Michael Wolf)
2007-08	B. Hovey, PhD -Dept. Medicine BUSM (Superv. David Seldin)
2007	Brian Cox, PhD -Dept. Genetics- Univ. Toronto, Canada (Superv. Janet Rossant)
2007-08	S. Sridhar, PhD -Dept. Medicine BUSM (Superv. Avi Spira)
2006-08	Elma Kutargic, PhD - Dept. Biochemistry, BUSM (Superv. Matt Nugent)
2006-09	Ramon Bonnegio, MD, PhD - Dept. Medicine BUSM (Superv. David Salant)
2006-09	Dorothy Panzin, PhD - Dept. Genetics BUSM (Superv. Kenn Albrecht)
2005	Tatiana Hochgreb, PhD – Univ. Sao Paulo, Brazil (Superv. J.X. Neto)
2005-06	H. Wu, PhD – Dept. Pathology, BUSM (Superv. I. Dominguez)
2004-05	Michael Liang, MD, PhD – Dept. Pathology BUSM (Superv. B. Nicholaczjick)
2004-06	Y. Zuo, PhD – Dept. Pathology, BUSM (Superv. S. Farmer)
2004-08	Susan Solomon, PhD -Dept. Pathology, BUSM (Superv. D. Sherr)
2003-04	Susan Schadinger, PhD – Dept. Pathology BUSM, (Superv. S. Farmer)
2001-02	Chia L. Chu, PhD – Dept. Pathology, BUSM (Superv. M. Nugent)
2001-03	J. Walker, PhD - Molecular Medicine BUSM, (Superv. Y. Zhang)

Ph.D./Master’s Theses Trainees

<u>Name</u>	<u>Dates</u>	<u>Present Position</u>
Serra, C.	2015-	MD/PhD Candidate, U. of Minho, Braga, Portugal, Columbia U. (NY)
van Soldt, B.	2015-Present	Doctoral Candidate, Dept. Genetics & Development, Columbia U. (NY)
Yang, Y.	2013-Present	Doctoral Candidate, Dept. Genetics & Development, Columbia U. (NY)
Stupnikov, M.	2013-Present	Doctoral Candidate, Dept. Genetics & Development, Columbia U. (NY)
Vasconcelos, M.	2007-2012	Scientist, Cell Signaling Technologies (MA)
Mahoney, J.	2011- 2014	Graduate Student (BUSM)
Sedita J. PhD	2002-2007	Business Development, AstraZeneca; Waltham (MA)
Lundgren J. MD	2004-2005	General Surgeon, Boston Medical Center (MA)
Malpel S. PhD	1997-2000	Investigator, ICRES, Lausanne, Switzerland

Postdoctoral Trainees, Visiting scientists, Student Trainees

<u>Name</u>	<u>Dates</u>	<u>Present Position</u>
Riccio, P. PhD	2015-	Postdoctoral Research Fellow (NIH T32), Columbia U. (NY)
Tiozzo, C. MD, PhD	2015-	Postdoctoral Research Fellow, Columbia U. (NY)
Turcotte, R. MD, PhD	2014-	Postdoctoral Research Fellow, Columbia U. (NY)
Mori, M. MD	2011-2015	Associate Research Scientist, Columbia U. (NY)
Marquez, H. MD	2011-2013	Instructor of Medicine (BUSM) (MA)
Stevenson, J.	2011-2012	Undergraduate Research Training (BUSM) (MA)
Guha, A. PhD	2009-2012	Assist. Prof. Medicine, Boston University (MA)
Vasconcelos, M.	2007-2011	Scientist, Cell Signaling Technology, Boston (MA)
Tang, Y. PhD	2009-2010	Scientist, R&D Systems Minneapolis (MN)
Tsao, PN. MD	2006-2008	Prof. of Pediatrics, National Taiwan Univ., Taipei (Taiwan)
Sedita, J.	2002-2007	AstraZeneca (MA)
Moreno, N. PhD	2005-2005	Lead CRA, United BioSource Corporation (Spain)
Lundgren, J.	2004-2005	Medical Student, Boston University (MA)
Fisher, K. MD	2005-2006	Assist. Prof. of Medicine, Univ. of Mass Worcester (MA)
Chen, F. MD	2003-2006	Assist. Professor of Medicine, Boston University (MA)
Wongtrakool, C. MD	2001-2003	Assist. Professor of Medicine, Emory University, Atlanta (GA)
Weintraub, L.	2001-2001	Undergraduate Student, Williams College (MA)
Izvolosky K. PhD	2000-2005	Foresight Science and Technology (RI)
Desai T. MD	2000-2003	Assist. Professor of Medicine, Stanford University (CA)
Simkevich C. PhD	1999-2000	Dept. Cell Biol. & Biochemistry, Brown University (RI)
Hochgreb T. PhD	1998-2000	PEW Fellow, California Inst. Technology -CALTECH (CA)
Malpel, S. PhD	1997-2000	Investigator, ICRES, Lausanne, Switzerland
Lebeche, D. PhD	1997-1999	Assistant Professor, Mount Sinai School Medicine (NY)
Park, WY. MD	1997-1998	Pulmonary & Critical Care Sleep Center, Renton (WA)

PUBLICATIONS

PEER REVIEWED ARTICLES

1. Tsao PN, Matsuoka C, Wei SC, Sato A, Sato S, Hasegawa K, Chen HK, Ling TY, Mori M, **Cardoso WV**, Morimoto M. Epithelial Notch signaling regulates lung alveolar morphogenesis and airway epithelial integrity. Proc Natl Acad Sci, USA. 2016 Jun 30. Pii: 201511236 [Epub ahead of print] PMID: 27364009.
2. Yao Y, Minor PJ, Zhao YT, Jeong Y, Pani AM, King AN, Symmons O, Gan L, **Cardoso WV**, Spitz F, Lowe CJ, Epstein, DJ. Cis-regulatory architecture of a brain signaling center predates the origin of chordates. Nat Genet. 2016 May; 48(5):575-80.doi: 10.1038/ng.3542. Epub 2016 Apr 11. PMID: 27064252.
3. Szymaniak AD, Mahoney JE, **Cardoso WV**, Varelas X. Crumbs3-Mediated Polarity Directs Airway Epithelial Cell Fate through the Hippo Pathway Effector Yap. Dev Cell. 2015 Aug 10;34(3):283-96 doi: 10.1016/j.devcel.2015.06.020 Epub 2015 Jul 30. PMID: 26235047.
4. Mori M, Mahoney JE, Stupnikov MR, Paez-Cortez JR, Szymaniak AD, Varelas X, Herrick DB, Schwob J, Zhang H, **Cardoso WV**. Notch3-Jagged signaling controls the pool of undifferentiated airway progenitors. Development. 2015 Jan 15;142(2):258-67. doi: 10.1242/dev.116855. PMID: 25564622.
5. Chen F, **Cardoso WV**. Culture of mouse embryonic foregut explants. Methods Mol. Biol. 2015; 1189:163-9. doi: 10.1007/978-1-4939-1164-6_11. PMID: 25245693.
6. **Cardoso WV**, Lu J. "Molecular Regulation of Lung Development," Ed.: Fishman AP, Elias JA, Fishman JA, Grippi MA, Kaiser LR, Senior RM. In: Fishman's Pulmonary Diseases and Disorders, 5th Ed. McGraw-Hill Education, New York, 2015. ISBN 978-0-07-179672-9.
7. **Cardoso WV**, Chen F. Retinoic acid in developing lung and other endodermal derivatives. In: Dolle P, Niederreither K, editors. The Retinoids: Biology, Biochemistry, and Disease. John Wiley & Sons, Inc. Chap

- 16: 371-382. 12 Jun 2015. Doi: 10.1002/9781118628003.
8. Mahoney JE, Mori M, Szymaniak A, Varelas X, **Cardoso WV**. The Hippo Pathway Effector Yap Controls Patterning and Differentiation of Airway Epithelial Progenitors. *Dev. Cell*. 2014 Jul 28;30(2):137-50. PMID: 25043473.
 9. Mori M, **Cardoso WV**. Lung Progenitor Cell Specification and Morphogenesis. Ed.: Harding R, Pinkerton KE, In: *The Lung: Development, Aging and the Environment*, Elsevier Science, Oct 2014. Academic Press ISBN: 978-0-12-799941-8.
 10. Chen F, Marquez H, Kim YK, Qian J, Shao F, Cruikshank K, Quadro L, **Cardoso WV**. Prenatal retinoid deficiency leads to airway hyperresponsiveness in adult mice. *J Clin Invest*. 2014 Feb 124:801-11. PMID: 24401276.
 11. Guha A, Vasconcelos M, Zhao R, Gower A, Qian J, Li G, Rajagopal J, **Cardoso WV**. Analysis of Notch signaling-dependent gene expression reveals diversity of Clara cell progenitors. *PLoS One*. 2014 Feb 21;9(2):e88848. doi: 10.1371. PMID: 24586412.
 12. Hamvas A, Deterding R, Balch WE, Schwartz DA, Albertine KH, Whitsett JA, **Cardoso WV**, Kotton DN, Kourembanas S, Hagood JS. Diffuse lung disease in children: Summary of a scientific conference. *Pediatr Pulmonol*. 2013. doi: 10.1002/ppul.2280. PMID: 23798474.
 13. Morrissey EE, **Cardoso WV**, Lane RH, Rabinovitch M, Abman SH, Ai X, Albertine KH, Bland RD, Chapman HA, Checkley W, Epstein JA, Kintner CR, Kumar M, Minoo P, Mariana TJ, McDonald DM, Mukoyama YS, Prince LS, Reese J, Rossant J, Shi W, Sun X, Werb Z, Whitsett JA, Gail D, Blaisdell CJ, Lin QS. Molecular determinants of lung development. *Ann. Am. Thorac. Soc*. 2013, 10, S12-6. PMID: 23607856
 14. Guha A, Vasconcelos M, Cai Y, Yoneda M, Hinds, Qian J, Li G, Dickel L, Johnson JE, Kimura S, Guo J, McMahon J, McMahon AP, **Cardoso WV**. The neuroepithelial body microenvironment is a niche for a distinct subset of Clara-like precursors in the developing airways. *Proc. Natl. Acad. Sci. USA*. 109:12592-12597, 2012. PMID: 22797898.
 15. Manoli SE, Smith LA, Vyhldal CA, An CH, Porrata Y, **Cardoso WV**, Baron RM, Haley KJ. Maternal smoking and the retinoid pathway in the developing lung. *Respir Res*. 2012. Jun 1;13:42. Doi: 10.1186/1465-9921-13-42. PMID: 22651576.
 16. Golan-Gerstl R, Wallach-Dayana SB, Zisman P, **Cardoso WV**, Goldstein RH, Breuer R. c-FLIP Deviates Myofibroblast Fas-Induced Apoptosis Towards Proliferation During Lung Fibrosis. *Am J Respir Cell Mol Biol*. 2012. PMID: 22582174.
 17. Jiang Z, Yu N, Kuang P, Chen M, Shao F, Martin G, Chui DH, **Cardoso WV**, Ai X, Lu J. Trinucleotide Repeat Containing 6a (Tnrc6a)-Mediated microRNA Function Is Required for the Development of Yolk Sac Endoderm. *J. Biol. Chem*. 287:5979-87, 2012. PMID: 22187428.
 18. Tsao PN, Wei SC, Wu MF, Huang MT, Lin HY, Lee MC, Lin KMC, Wang IJ, Kaartinen V, Yang LT, **Cardoso WV**. Notch signaling prevents mucous metaplasia in mouse conducting airways during postnatal development. *Development*, 138:3533-43, 2011. PMID: 21791528.
 19. Ghosh S, Paez-Cortez JR, Boppidi K, Vasconcelos M, Roy M, **Cardoso W**, Ai X, Fine A. Activation dynamics and signaling properties of Notch3 receptor in the developing pulmonary artery. *J. Biol. Chem*. 286:22678-87, 2011. PMID: 21536678.
 20. Qu X, Carbe C, Tao C, Powers A, Lawrence R, van Kuppevelt TH, **Cardoso WV**, Grobe K, Esko JD, Zhang X. Lacrimal gland development and Fgf10-Fgfr2b signaling are controlled by 2-O- and 6-O-sulfated heparan sulfate. *J. Biol. Chem*. 286:14435-44, 2011. PMID: 21357686.
 21. Cushing L, Kuang PP, Qian J, Shao F, Wu J, Little F, Thannickal VJ, **Cardoso WV**, Lu J. miR-29 is a Major Regulator of Genes Associated with Pulmonary Fibrosis. *Am. J. Respir. Cell Mol Biol*. 45:287-94, 2011. PMID: 20971881.
 22. **Cardoso WV**, Kotton DN. Specification and patterning of the respiratory system. *StemBook* [Internet]. Cambridge (MA): Harvard Stem Cell Institute; 2008. Jul 16. PMID: 20614584.
 23. Chen F, Cao Y, Qian J, Shao F, Niederreither K, **Cardoso WV**. A retinoic acid-dependent network in the foregut controls formation of the mouse lung primordium. *J. Clin. Invest*. 120:2040-8, 2010. PMID: 20484817.
 24. Wu J, Qian J, Li C, Kwok L, Cheng F, Liu P, Perdomo C, Kotton D, Vaziri C, Anderlind C, Spira A, **Cardoso WV**, Lü J. miR-129 regulates cell proliferation by downregulating Cdk6 expression. *Cell Cycle* 9:1809-18, 2010. PMID: 20404570.

25. Shi W, Chen F, **Cardoso WV**. Mechanisms of lung development: contribution to adult lung disease and relevance to chronic obstructive pulmonary disease. Proc. Am. Thor. Soc. 6:558-63, 2009. PMID: 19934349.
26. Stanford KI, Wang L, Castagnola J, Song D, Bishop JR, Brown JR, Lawrence R, Bai X, Habuchi H, Tanaka M, **Cardoso WV**, Kimata K, Esko JD. Heparan Sulfate 2-O Sulfotransferase is required for triglyceride-rich lipoprotein clearance. J. Biol. Chem. 285:286-94. 2009. PMID: 19889634.
27. Musson MC, Jepeal LI, Mabray PD, Zhdanova IV, **Cardoso WV**, Wolfe MM. Expression of glucose-dependent- insulinotropic polypeptide (GIP) in the zebrafish. Am J Physiol Regul Integr Comp Physiol. 297:R1803-12, 2009. PMID: 19793957.
28. Tsao PN, Vasconcelos M, Izvolsky KI, Qian J, Lu J, **Cardoso WV**. Notch signaling controls the balance of ciliated and secretory cell fates in developing airways. Development. 2009 Jul; 136(13):2297-307. PMID: 19502490.
29. Trompouki E, Tsagaratou A, Kosmidis SK, Dolle P, Qian J, Kontoyiannis D, **Cardoso WV**, Mosialos G. Truncation of the catalytic domain of the cylindromatosis tumor suppressor impairs lung maturation. Neoplasia. 2009. May;11(5):469-476. PMID: 19412431.
30. Tsao PN, Chen F, Izvolsky KI, Walker J, Kukuruzinska MA, Lu J, **Cardoso WV**. Gamma-secretase activation of notch signaling regulates the balance of proximal and distal fates in progenitor cells of the developing lung. J. Biol. Chem. 283:29532-29544, 2008. PMID: 18694942.
31. **Cardoso WV**, Whitsett JA. Resident Cellular Components of the Lung: Developmental Aspects. Proc. Am. Thor. Soc. 5:767-771, 2008. PMID: 18757315.
32. Franks T, Colby TV, Travis WD, Tuder RM, Reynolds HY, Brody AR, **Cardoso WV**, Crystal RG, Drake CJ, Engelhardt J, Frid M, Erica H, Mason R, Phan SH, Randell SH, Rose MC, Stevens T, Serge J, Sunday ME, Voinow JA, Weinstein BM, Whitsett JA, Williams MC. NHLBI WORKSHOP - Resident Cellular Components of the Human Lung: Current Knowledge and Goals for Research on Cell Phenotyping and Function. Proc. Am. Thor. Soc. 5:763-766, 2008. PMID: 18757314.
33. **Cardoso WV**, Kotton DN. Specification and patterning of the respiratory system. (February 20, 2006), StemBook, ed. The Stem Cell Research Community, StemBook, doi/10.3824/stembook.1.10.1 <http://www.stembook.org>. 2008. PMID: 20614584.
34. Jean JC, Lü J, Joyce-Brady M, **Cardoso WV**. Regulation of Fgf10 Gene Expression in Murine Mesenchymal Cells. J. Cell Biochem. 103:1886-1894, 2008. PMID: 18022820.
35. Izvolsky KI, Lu J, Martin G, Albrecht K, **Cardoso WV**. Systemic inactivation of Hs6st1 in mice is associated with late postnatal mortality without major defects in organogenesis. Genesis 46:8-18, 2008. PMID: 18196599.
36. Liu P, Lu J, **Cardoso WV**, Vaziri C. The Matricellular Factor, The SPARC-Related Factor SMOC-2 Promotes Growth Factor-Induced Cyclin D1 Expression and DNA Synthesis via Integrin-Linked Kinase. Mol. Biol. Cell. 19:248-61, 2008. PMID: 17989364.
37. Chen F, Desai T, Qian J, Niederreither K, Lu J, **Cardoso WV**. Inhibition of Tgf beta signaling by endogenous retinoic acid is essential for primary lung bud induction. Development 134: 2969-2979, 2007. PMID: 17634193.
38. Lü J, Qian J, Keppler D, **Cardoso WV**. Cathepsin H is an FGF10 Target Involved in BMP4 Degradation during Mouse Lung Branching Morphogenesis J. Biol. Chem. 282:22176–22184, 2007. PMID: 17500053.
39. Wang Z, Dollé P, **Cardoso WV**, Niederreither K. Retinoic Acid Regulates Morphogenesis and Patterning of Foregut Derivatives. Dev. Biol. 297:433–445, 2006. PMID: 16806149.
40. **Cardoso WV** and Lu, J. Regulation of early lung morphogenesis: questions, facts and controversies. Development 133: 1161-1624, 2006. PMID: 16613830.
41. Desai T, Chen F, Lu J, Qian J, Niederreither K, Dollé, P, Chambon, P, **Cardoso WV**. Distinct roles for retinoic acid receptors alpha and beta in early lung morphogenesis. Dev. Biol., 291:12-24, 2006. PMID: 16427040.
42. Lü J, Qian J, Tang X, Li C, Chen F, **Cardoso WV**. Differential expression of components of the microRNA machinery during mouse organogenesis. Biochem. Biophys. Research Com. 334:319-323, 2005. PMID: 16036130.
43. Lu J, Izvolsky KI, Qian J, **Cardoso WV**. Identification of FGF10 targets in the embryonic lung epithelium during bud morphogenesis. J. Biol Chem 280:4934-4841, 2005. PMID: 15556938.
44. Sedita J, Izvolsky K, **Cardoso WV**. Differential expression of heparan sulfate 6-O-sulfotransferase isoforms

- in the mouse embryo suggests distinctive roles during organogenesis. *Dev. Dyn.* 231:782-794, 2004. PMID: 15499561.
45. Lü J, Qian J, Izvolosky KI, **Cardoso WV**. Global analysis of genes differentially expressed in branching and non-branching regions of the mouse embryonic lung. *Dev. Biol* 273:402-415, 2004. PMID: 15328023.
 46. Jones JE, Walker JL, Song Y, Weiss N, **Cardoso WV**, Tudor RM, Loscalzo J, Zhang Y. Effect of 5-Lipoxygenase on the Development of Pulmonary Hypertension in Rats *Am.J. Physiol.* 286:H1775-84, 2004. PMID: 14726295.
 47. Desai T, Malpel S, Flentke GR, Smith SM, **Cardoso WV**. Retinoic acid selectively regulates *Fgf10* expression and maintains cell identity in the prospective lung field of the developing foregut. *Dev. Biol* 273:418-435, 2004. PMID: 15328022.
 48. Wongtrakool C, Malpel S, Gorenstein J, Sedita J, Ramirez MI, Underhill TM, **Cardoso WV**. Down-regulation of retinoic acid receptor alpha signaling is required for sacculatation and type I cell formation in the developing lung. *J. Biol Chem*; 278:46911-8, 2003. PMID: 12947094.
 49. Hochgreb T, Linhares VL, Menezes DC, Sampaio AC, Yan CY, **Cardoso WV**, Rosenthal N, Neto JX. A caudorostral wave of RALDH2 conveys anteroposterior information to the cardiac field. *Development* 130, 5363-5374, 2003. PMID: 13129847.
 50. Izvolosky K, Zhong L, Wei L, Yu Q, Nugent MA, **Cardoso WV**. Heparan sulfates expressed in the distal lung are required for FGF10 binding to the epithelium and for airway branching. *Am.J. Physiol* 285, L838-46, 2003. PMID: 12818887.
 51. Izvolosky K, Shoykhet D, Yu Q, Nugent MA, **Cardoso WV**. Heparan sulfate FGF10 interactions during lung morphogenesis. *Dev. Biol*; 253: 185-299, 2003. PMID: 12781692.
 52. **Cardoso WV**. Lung Morphogenesis, Role of Growth Factors and Transcription Factors. In: *The Lung: Development, Aging and the Environment* (Eds: Harding, R; Pinkerton, K; Plopper, C.). Elsevier Science. 2003.
 53. Desai, TJ, **Cardoso, WV**. "Growth factors in lung development and disease: friends or foes?" *Respiratory Res*; 3:2.1-2.4, 2002. PMID: 11806837.
 54. Kotton, DN, Bei YM, **Cardoso, WV**, Sanderson EA, Summer RS, Williams MC, Fine A. Bone marrow-derived cells as progenitors of lung alveolar epithelium. *Development* 128:5181-5188, 2001. PMID: 11748153.
 55. **Cardoso WV**, Williams MC. Perspective: Workshop Summary: Basic Mechanisms of Lung Development. Eight Woods Hole Conference on Lung Cell Biology 2000. *Am. J. Respir. Cell Mol. Biol.*25:137-140, 2001. PMID: 11509321.
 56. **Cardoso, WV**. Molecular regulation of lung development. *Annu Rev Physiol*, 63: 471-494, 2001. PMID: 11181964.
 57. Healy A, Morgenthau L, Zhu X, Farber HW, **Cardoso WV**. VEGF is deposited in the subepithelial matrix at the leading edge of branching airways and stimulates neovascularization in the murine embryonic lung. *Dev Dyn* 219: 341-352, 2000. PMID: 11066091.
 58. **Cardoso, WV**. Lung morphogenesis revisited: Old facts, current ideas. *Dev Dyn* 219:121-130, 2000. PMID: 11002333.
 59. Malpel S, Mendelsohn C, **Cardoso WV**. Regulation of retinoic acid signaling during lung morphogenesis. *Development* 127: 3057-3067, 2000. PMID: 10862743.
 60. Malpel, S, **Cardoso, WV**. Lung Development. In: "Nature Encyclopedia of Life Sciences". Macmillan Reference Limited London: NaturePublishing Group. <http://www.els.net/> doi:10.1038/npg.els.0003307, 2001.
 61. Nakanishi Y, Hieda Y, **Cardoso WV**, Lubkin S, Daniel CW. Epithelial Branching. In: "Nature Encyclopedia of Life Sciences". London: Nature Publishing Group. <http://www.els.net/> doi:10.1038/npg.els.0001145, 2000.
 62. Warburton D, Schwarz M., Tefft, D, Flores-Delgado G, Anderson, KD, **Cardoso WV**. The molecular basis of lung morphogenesis. *Mech. Dev.* 92:55-81, 2000. PMID: 10704888.
 63. Lebeche D, Malpel S, **Cardoso, WV**. Fibroblast growth factor interactions in the developing lung. *Mech. Dev.* 86:125-136, 1999. PMID: 10446271.
 64. Park WY, Miranda B, Lebeche D, Hashimoto G, **Cardoso WV**. FGF-10 is a chemotactic factor for distal epithelial buds during lung development. *Dev. Biol.* 201:125-134, 1998. PMID: 9740653.
 65. Nogawa, H, Morita, K, **Cardoso, WV**. Bud formation precedes the appearance of differential cell

- proliferation during branching morphogenesis of mouse lung epithelium in vitro. *Dev. Dyn.* 213: 228-235, 1998. PMID: 9786423.
66. **Cardoso WV**, Itoh A, Nogawa H, Mason, I, Brody JS. FGF-1 and FGF-7 induce distinct patterns of growth and differentiation in embryonic lung epithelium. *Dev. Dyn.* 208:398-405, 1997. PMID: 9056643.
 67. Meneghetti A, **Cardoso WV**, Brody JS, Williams MC. Epithelial marker genes are expressed in cultured embryonic lung and in vivo with similar spatial and temporal patterns. *J. Histochem. Cytochem.* 44:1173-1181, 1996. PMID: 8813083.
 68. **Cardoso WV**, Mitsialis SA, Brody JS, Williams MC. Retinoic acid alters the expression of pattern-related genes in the developing rat lung. *Dev. Dyn.* 207:47-59, 1996. PMID: 8875075.
 69. **Cardoso WV**. Transcription factors and pattern formation in the developing lung. *Am.J. Physiol.* 269: L429-L442, 1995. PMID: 7485515.
 70. Ji CM, **Cardoso WV**, Gebremichael A, Philpot RM, Buckpitt AR, Plopper CG, Pinkerton KE. Pulmonary cytochrome P-450 monooxygenase system and Clara cell differentiation in rats. *Am. J. Physiol.* 269: L394-L402, 1995. PMID: 7573474.
 71. **Cardoso WV**, Williams MC, Mitsialis SA, Joyce-Brady M, Rishi A, Brody JS. Retinoic acid induces changes in the pattern of airway branching and alters epithelial cell differentiation in the developing lung in vitro. *Am. J. Respir. Cell Mol. Biol.* 12: 464-476, 1995. PMID: 7742011.
 72. **Cardoso WV**, Thurlbeck WM. Pathogenesis and terminology of emphysema. *Am. J. Respir. Crit. Care Med.* 149:1398 (letter), 1994.
 73. Spouge D, Mayo JR, **Cardoso W**, Muller MR. Panacinar emphysema: CT and pathologic findings. *J. Computer Assisted Tomography* 17:710-713, 1993. PMID: 8370825.
 74. **Cardoso WV**, Stewart L, Pinkerton KE, Ji C, Hook GER, Singh G, Katyal SL, Thurlbeck WM, Plopper CG. Secretory product expression during Clara cell differentiation in the rabbit and rat. *Am. J. Physiol.* 264: L543-L552, 1993. PMID: 8333547.
 75. **Cardoso, WV**, Sekhon HS, Hyde DM, Thurlbeck WM. Collagen and elastin in human pulmonary emphysema. *Am. Rev. Respir. Dis.* 147, 975-981, 1993. PMID: 8333547.
 76. Plopper C, St. George J, **Cardoso W**, Wu R, Pinkerton K, Buckpitt A. Development of airway epithelium. Patterns of expression of markers of differentiation. *Chest* 101:2S-5S, 1992. PMID: 1371732
 77. **Cardoso WV**, Saldiva PHN, Zin WA, Criado PMP, Sakae RS, Bohm GM. A comparison between the isovolume and the end-inflation occlusion methods for measurement of lung mechanics in rats. *J. Appl. Toxicol.* 11:79-84, 1991. PMID: 2061554.
 78. Bohm GM, Saldiva PHN, Pasqualucci CAG, Massad E, Martins MA, Zin WA, **Cardoso WV**, Criado PMP, Komatsuzaki M, Sakae RS, Negri EM, Lemos M, Capelozzi VM, Crestana C, Silva R. Biological effects of air pollution in Sao Paulo and Cubatao. *Environment. Res.* 49:208-216, 1989. PMID: 2753007.
 79. Zin WA, Caldeira MPR, **Cardoso WV**, Auler Jr. JOC, Saldiva PHN. Expiratory mechanics before and after uncomplicated heart surgery. *Chest* 95:21-28, 1989. PMID: 2909337.
 80. Saldiva PHN, **Cardoso WV**, Caldeira MPR, Zin WA. Mechanics in rats by the end-inflation occlusion and single breath methods. *J. Appl. Physiol.* 63:1711-1718, 1987. PMID: 3693206.
 81. Auler Jr. JOC, Zin WA, Caldeira MPR, **Cardoso WV**, Saldiva PHN. Pre- and post-operative inspiratory mechanics in ischemic and valvular heart disease. *Chest* 92:984-990, 1987. PMID: 3677843.
 82. Azambuja R, Proenca NG, **Cardoso WV**. Ulerythema ophryogenes and folliculitis ulerythematosia reticulata. *Hautarzt.* 38:411-413, 1987 (in German). PMID: 3654209.
 83. **Cardoso WV**. Volume-pressure relationships in the respiratory system. *J. Pneumol.* 13 (Suppl. 1):27-38, 1987.

CHAPTERS

1. **Cardoso WV**, Chen F. Retinoic acid in developing lung and other endodermal derivatives. In: Dolle P, Niederreither K, editors. *The Retinoids: Biology, Biochemistry, and Disease*. John Wiley & Sons, Inc. 12 Jun 2015. Doi: 10.1002/9781118628003.
2. Cardoso WV, Lu J. "Molecular Regulation of Lung Development," Ed.: Fishman AP, Elias JA, Fishman JA, Grippi MA, Kaiser LR, Senior RM. In: *Fishman's Pulmonary Diseases and Disorders*, 5th Ed. McGraw-Hill Education, New York,

2015. ISBN 978-0-07-179672-9.

3. Mori M, **Cardoso WV**. Lung Progenitor Cell Specification and Morphogenesis. Ed.: Harding R, Pinkerton KE, In: The Lung: Development, Aging and the Environment, Elsevier Science, Oct 2014. Academic Press ISBN: 978-0-12-799941-8.
4. **Cardoso WV**, Kotton DN. Specification and patterning of the respiratory system. Ed.: The Stem Cell Research Community, In: StemBook, 2008.
5. **Cardoso WV**. Lung Morphogenesis, Role of Growth Factors and Transcription Factors. Ed.: Harding R, Pinkerton KE, Plopper C. In: The Lung: Development, Aging and the Environment, Elsevier Science, 2003.
6. Malpel S, **Cardoso WV**. Lung Development. In: Nature Encyclopedia of Life Sciences, Macmillan Reference Limited London: Nature Publishing Group, 2001.
7. Nakanishi Y, Hieda Y, **Cardoso WV**, Lubkin S, Daniel CW. Epithelial Branching. In: Nature Encyclopedia of Life Sciences, Macmillan Reference Limited London: Nature Publishing Group, 2000.

PEER REVIEWED REVIEWS AND EDITORIALS

1. Hamvas A, Deterding R, Balch WE, Schwartz DA, Albertine KH, Whitsett JA, **Cardoso WV**, Kotton DN, Kourembanas S, Hagood JS. Diffuse lung disease in children: Summary of a scientific conference. *Pediatr Pulmonol*. 2013. doi: 10.1002/ppul.2280. PMID: 23798474.
2. Shi W, Chen F, **Cardoso WV**. Mechanisms of lung development: contribution to adult lung disease and relevance to chronic obstructive pulmonary disease. *Proc. Am. Thor. Soc.* 6:558-63, 2009. PMID: 19934349
3. **Cardoso WV**, Whitsett JA. Resident Cellular Components of the Lung: Developmental Aspects. *Proc. Am. Thor. Soc.* 2008, **5**, 767-771.
4. Franks T, Colby TV, Travis WD, Tuder RM, Reynolds HY, Brody AR, **Cardoso WV**, Crystal RG, Drake CJ, Engelhardt J, Frid M, Erica H, Mason R, Phan SH, Randell SH, Rose MC, Stevens T, Serge J, Sunday ME, Voynow JA, Weinstein BM, Whitsett JA, Williams MC. NHBLI Workshop: "Resident Cellular Components of the Human Lung: Current Knowledge and Goals for Research on Cell Phenotyping and Function," *Proc. Am. Thor. Soc.* 2008, **5**, 763-766.
5. **Cardoso WV**, Lu J. Regulation of early lung development: questions, facts and controversies. *Development* 2006, **133**, 1611-1624.
6. Desai TJ, **Cardoso WV**. Growth factors in lung development and disease: friends or foes? *Respiratory Res.* 2002, **3**, 2.1-2.4. PMID: 11806837.
7. **Cardoso WV**, Williams MC. "Perspective: Workshop Summary: Basic Mechanisms of Lung Development. Eight Woods Hole Conference on Lung Cell Biology 2000," *Am. J. Respir. Cell Mol. Biol.* 2001, **25**, 137-140.
8. **Cardoso WV**. "Molecular regulation of lung development," *Annu Rev Physiol.* 2001, **63**, 471-494.
9. **Cardoso WV**. "Lung morphogenesis revisited: Old facts, current ideas," *Dev Dyn* 2000, **219**, 121-130.
10. Warburton D, Schwarz M, Tefft D, Flores-Delgado G, Anderson KD, **Cardoso WV**. "The molecular basis of lung morphogenesis," *Mech. Dev.* 2000, **92**, 55-81.
11. **Cardoso WV**. "Transcription factors and pattern formation in the developing lung," *Am J. Physiol.* 1995, **269**, L429-L442.
12. **Cardoso WV**, Thurlbeck WM. "Pathogenesis and terminology of emphysema," *Am J. Respir. Crit. Care Med* 1994, **149**, 1398 (Letter).
13. **Cardoso WV**. "Volume-pressure relationships in the respiratory system," *J. Pneumol.* 1987, **13** (Suppl. 1), 27-38.

SUMMARY RESEARCH INTERESTS

My research focuses on the regulation of progenitor cell fate and morphogenesis in the developing lung and the contribution of developmental mechanisms to lung disease and regeneration-repair of the adult lung. For nearly two decades my laboratory has been investigating the role of developmental pathways, including retinoic acid, Fgf, Tgf beta and Notch, in the establishment of cell fate and patterning of the embryonic lung. These studies have provided insights into specific gene regulatory networks that control lung progenitor cell fate and expansion, airway branching and differentiation of the lung progenitors into the multiple epithelial cell lineages.

A major effort of my lab has been to understand the mechanisms of induction and diversification of airway

epithelial cell phenotypes and the impact of these mechanisms in human health and disease. This research provided opportunity for productive interactions with a multidisciplinary team of investigators during my tenure as Principal Investigator and Director of the Program in Lung Development and Progenitor Cell Biology at the Pulmonary Center, Boston University School of Medicine.

I have recently joined the faculty of the Departments of Medicine and Genetics and Development at Columbia University and became Director of the Columbia Center for Human Development (CCHD). The Center is a new research hub recently established by the Department of Medicine that integrates basic and clinical scientists across the medical campus to advance knowledge on mechanisms of normal development and the understanding of the developmental basis of human disease.