

## CURRICULUM VITAE

**DATE PREPARED:** November 28, 2006

### **PART I: General Information**

**Name:** BERNADETTE M. LEVESQUE

**Office Address:** Division of Newborn Medicine  
Caritas St. Elizabeth's Medical Center  
736 Cambridge Street, QN 207  
BOSTON, MA 02135 United States

**Phone:** (617) 562-7772

**Email:** bernadette.levesque@childrens.harvard.edu

**Fax:** (617) 789-2735

**Place of Birth:** Rockville Center, NY

#### **Education:**

1987 B.S. (Biology, Philosophy), Magna cum laude, ST. JOHN'S UNIVERSITY, NY  
1991 M.D., ALBANY MEDICAL COL. OF UNION U.

#### **Postdoctoral Training:**

1991-1994 Resident in Pediatrics, University of Massachusetts Medical Center  
1995-1998 Fellow in Newborn Medicine, New England Medical Center

#### **Licensure and Certification:**

1991 Massachusetts Registered Physician  
1994 American Board of Pediatrics  
1999 Neonatal-Perinatal Medicine  
2001 American Board of Pediatrics (renewal)

#### **Academic Appointments:**

1991-1994 Instructor in Pediatrics, University of Massachusetts Medical Center, Worcester, MA  
1995-1998 Instructor in Pediatrics, New England Medical Center (Tufts University Medical School), Boston, MA  
2000-2002 Assistant Clinical Professor of Pediatrics, St. Elizabeth's Medical Center (Tufts University Medical School), Boston, MA  
2002- Instructor in Pediatrics, Children's Hospital, Boston, MA

#### **Hospital or Affiliated Institution Appointments:**

01/94-12/95 Hospitalist, St. Vincent Hospital and Norwood Hospital, Worcester, MA and Norwood, MA  
07/98-05/02 Staff Neonatologist, Caritas St. Elizabeth's Medical Center, Boston, MA

07/02-06/05 Associate Director, Special Care Nursery, MetroWest Medical Center, Framingham, MA  
07/02-06/06 Assistant Neonatologist, Children's Hospital Boston, Boston, MA  
07/06- Assistant Neonatologist, Children's Hospital Boston and Caritas St. Elizabeth's Medical Center, Boston, MA

**Other Professional Positions and Major Visiting Appointments:**

1998-1999 Affiliate, Caritas Good Samaritan Medical Center, Brockton, MA  
1998-1999 Affiliate, Boston City Hospital, Boston, MA  
1998-2001 Affiliate, South Shore Hospital, South Weymouth, MA

**Hospital and Health Care Organization Clinical Service Responsibilities:**

1998-2002 Attending Physician in Newborn Medicine, Caritas St. Elizabeth's Medical Center  
2002-2005 Attending Physician in Newborn Medicine, MetroWest Medical Center  
2004- Attending Physician in Newborn Medicine, Children's Hospital Boston  
2006- Attending Physician in Newborn Medicine, Caritas St. Elizabeth's Medical Center

**Major Committee Assignments:**

2004-2005 New England Association of Neonatologists, Secretary, New England  
2005-2006 New England Association of Neonatologists, Vice President, New England  
2006-2007 New England Association of Neonatologists, President, New England

**Professional Societies:**

2002- American Academy of Pediatrics, Member  
2002- New England Association of Neonatologists, Member

**Awards and Honors:**

1987 Magna Cum Laude, St. John's University  
1996 Ross Award, Best Presentation, New England Perinatal Society

---

## **Part II: Research, Teaching, and Clinical Contributions**

### **A. Narrative report of Research, Teaching, and Clinical Contributions**

Inadequate or arrested lung development results in significant morbidity and mortality among the term and preterm newborn infants in the neonatal intensive care unit. Since my fellowship training my research has focused on lung development, from the embryonic stage, when the branching of the conducting airways begins, to the alveolar stage, when final alveolarization and cellular differentiation are completed.

In my early work in Dr. Heber Nielsen's laboratory, I found that dihydrotestosterone, a male sex hormone that delays fetal lung maturation, increases lung branching morphogenesis. This may be one reason why males have larger lungs than females at birth, though they are less mature. I also found that programmed cell death (apoptosis) plays an important role in lung branching, and is coordinated with cell proliferation in developing the structure of the embryonic lung. I later joined Dr. Mary Sunday's laboratory, where members of her lab had already characterized the expression of mammalian homologs of drosophila tracheless (the master regulator of drosophila respiratory development) in the developing mouse lung. I found that NPAS-1, a very close mammalian homolog of tracheless, was crucial in lung branching, smooth muscle development/migration, and pulmonary neuroendocrine cell differentiation. Most recently, I worked in Dr. Donald Ingber's laboratory where I studied the effect of mechanical strain on the production of vascular endothelial growth factor (VEGF) by type II lung epithelial cells. I found that low (physiologic) levels of mechanical strain increased VEGF production, but that high (pathologic) levels of mechanical strain (such as can be delivered to the lung during mechanical ventilation) reduced VEGF production to basal levels. VEGF is crucial in alveolarization, a process that goes awry in bronchopulmonary dysplasia (BPD), a chronic lung disease of infancy. This may be one mechanism by which excess mechanical strain can contribute to the pathogenesis of BPD.

In my current project, I am studying the correlation of VEGF and matrix metalloproteinases measured in the urine of premature neonates with the subsequent development of BPD and other complications of prematurity. This project is being done in collaboration with Drs. Linda Van Marter and Richard Parad and other members of the SCOR research group at Brigham and Women's Hospital, and with Dr. Donald Ingber, my former mentor.

My clinical interest is in optimizing the respiratory care of newborn infants. I am particularly interested in the provision of bubble CPAP to premature infants within the first 5 minutes of postnatal life (i.e. in the delivery room), limiting the occurrence and/or duration of mechanical ventilation, and continuing CPAP until all signs and symptoms of respiratory distress syndrome have resolved. This approach has been developed at Columbia University and has been shown, among other aspects of their management, to reduce the incidence and severity of BPD in their patient population. This approach is also supported by basic science research in lung development, including published reports demonstrating that physiologic mechanical strain increases lung growth and surfactant release, and also by my own research that demonstrates increased VEGF production with low levels of mechanical strain. Thus, I aim to incorporate my research interests with the bedside care of newborn infants in the neonatal intensive care unit.

### **B. Funding Information**

- 2002-2004 Investigator, N.I.H., 5RO1 HL44984-13, Molecular Mechanisms of Lung Embryogenesis
- 2004-2006 Investigator, N.I.H., 2T32 HD07466-09, Pathobiology of Newborn and Developmental Diseases Training Grant

## D. Report of Teaching

### 1. Local contributions

#### e. Advisory and Supervisory Responsibilities in Clinical or Laboratory Setting

- 2002-2005 15 Medical Students and Residents for 400 hrs/year, Attending in health care organization, MetroWest Medical Center
- 2004- 6 Fellows for 1000 hrs/year, Attending in health care organization, Children's Hospital

### 2. Regional, national, or international contributions

#### a. Invited Presentations

##### Regional

- 2006- Newborn Medicine Research Noon Conference, Morgan Stanley Children's Hospital of New York-Presbyterian, Columbia University Medical Center *[Invited Lecture]*

## E. Report of Clinical Activities

- 1998-2002 Pediatrics, Neonatology Caritas St. Elizabeth's Medical Center  
Clinical Activity Description: Attending coverage in the NICU at Caritas St. Elizabeth's Medical Center and affiliated level 2 hospitals. Moonlighting coverage in the NICU at Boston Medical Center (1998-1999) and/or the special care nursery at South Shore Hospital (1998-2001).  
Patient Load: Variable (average 30 intensive care patients/week); Moderately to highly complex.
- 2002-2004 Pediatrics, Neonatology MetroWest Medical Center  
Clinical Activity Description: Attending coverage in the Special Care Nursery at MetroWest Medical Center for 3 months per year.  
Patient Load: average of 20 inpatients/week; Moderately complex.
- 2004-2005 Pediatrics, Neonatology Children's Hospital  
Clinical Activity Description: Attending coverage in the Neonatal Intensive Care Unit at Children's Hospital for 2 months per year. Night and weekend attending coverage in the NICU at Children's Hospital and at Caritas St. Elizabeth's Medical Center NICU (a Children's Hospital affiliate).  
Patient Load: 30 intensive care patients/week.; Highly complex.
- 2006- Pediatrics, Neonatology Caritas St. Elizabeth's Medical Center  
Clinical Activity Description: Attending coverage of NICU at Caritas St. Elizabeth's Medical Center for 4 months per year with in-house night and weekend call.  
Patient Load: Variable (average 5-15 patients per week); Moderately to highly complex
-

## Part III: Bibliography

### Original Articles

1. Levesque BM, Vosatka RJ, Nielsen HC. Dihydrotestosterone stimulates branching morphogenesis, cell proliferation, and programmed cell death in mouse embryonic lung explants. *Pediatr Res*. 2000;47(4 Pt 1):481-91.
2. Levesque BM, Pollack P, Griffin BE, Nielsen HC. Pulse oximetry: what's normal in the newborn nursery? *Pediatr Pulmonol*. 2000;30(5):406-12.
3. Levesque BM, Zhou S, Shan L, Johnston P, Kong Y, Degan S, Sunday ME. NPAS1 Regulates Branching Morphogenesis in Embryonic Lung. *Am J Respir Cell Mol Biol*. 2006;Epub ahead of print.

### Abstracts

1. B.M. Levesque, Y. Kong, L. Shan, M.E. Sunday. PAS Domain Transcription Factors (TFs) Regulate Early Lung Morphogenesis. *Am J Respir Crit Care Med*. 2003;167:A381.
2. B.M Levesque, M.E. Sunday. Inhibition of Rho Disrupts Embryonic Lung Branching. *Am J Respir Crit Care Med*. 2004;169:A661.
3. L. Shan, B.M. Levesque, Y. Kong, M.E. Sunday. Genes Encoding Neuronal PAS Domain Proteins (Npas1&3) and Aryl Hydrocarbon Receptor Nuclear Translocator (ARNT) are Expressed in Developing Mouse Lung. *Am J Respir Crit Care Med*. 2004;169:A662.
4. B.M. Levesque, A. Mammoto, D.E. Ingber. Vascular Endothelial Growth Factor (VEGF) Production is Mechanically Regulated in Lung Epithelial Cells. 2006.