BIOGRAPHICAL SKETCH

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NAME: David N. Cornfield

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POSITION TITLE: Professor of Pediatrics

EDUCATION/TRAINING *(Begin with baccalaureate or other initial professional education, such as nursing, include postdoctoral training and residency training if applicable. Add/delete rows as necessary.)*

INSTITUTION AND LOCATION	DEGREE *(if applicable)*	Completion Date MM/YYYY	FIELD OF STUDY
University of Wisconsin-Madison, Madison, WI	B.A.	05/1981	Philosophy
University of Wisconsin-Madison Graduate School, Madison, WI			Philosophy
University of Wisconsin Medical School, Madison, WI	M.D.	06/1986	Medicine
Children's Mercy Hospital, Kansas City, MO	Residency	06/1989	Pediatrics
Denver Children's Hospital, University of Colorado Health Sciences Center, Denver, CO	Fellowship	06/1993	Pediatric Pulmonary and Critical Care Medicine

A. Personal Statement

Over the past 20 years, my research program has focused upon basic, translational and clinical research, with a primary focus on lung biology. As an active clinician-scientist, delivering care to acutely and chronically ill infants, I have noted the evolution of chronic lung disease of infancy in terms of disease manifestation, management and epidemiology. Even with dramatic improvements in neonatal care, prematurity dramatically increases the risks of chronic lung disease of infancy, infant morbidity and even mortality. Given our focus on child health and development, our laboratory considers how best to mitigate neonatal and infant morbidity and mortality and embarked on two distinct lines of research in wherein: (i) the primary cause of chronic lung disease infants and children might be prevented; and (ii) the fundamental biology of chronic lung disease of infancy. Using single cell genomics to gain insight into the fundamental biology of physiologic and pathophysiologic lung development we seek to create new knowledge that can be broadly applied to lung injury and repair and inform the discovery of novel therapeutic strategies.

B. Positions and Honors

Positions and Employment

2006-	Director-Center for Excellence in Pulmonary Biology, Stanford University
2006-	Anne T. and Robert M. Bass Professor of Pulmonary Medicine, Stanford University
2004-2006	Associate Dean for Research, University of Minnesota Medical School
2003-2004	Interim Chair, Department of Pediatrics, University of Minnesota Medical School
2003-2005	Professor of Pediatrics, Physiology and Surgery, University of Minnesota Medical School
2001-2003	Associate Professor of Physiology and Surgery, University of Minnesota Medical School
1999-2003	Associate Professor (with tenure) of Pediatrics, University of Minnesota Medical School
1993-1999	Assistant Professor of Pediatrics, University of Minnesota Medical School
1992-1993	Instructor, Department of Pediatrics, University of Colorado Health Sciences Center

Selected Administrative Appointments

2006-	Director-Division of Pulmonary, Asthma and Sleep Medicine, Department of Pediatrics, Stanford University
2007-2014	Director-Division of Pediatrics Critical Care Medicine, Stanford University
2007-2014	Fellowship Director-Pediatric Critical Care Medicine, Stanford University
2011-	Medical Director- Respiratory Therapy, Packard Children's Hospital at Stanford
2007-2012	Medical Director- Pediatric Intensive Care Unit, Packard Children's Hospital at Stanford
2007-	Faculty Practice Organization, Department of Pediatrics, Stanford University
2008-2012	Director, Clinical Resources Management Program, Packard Children's Hospital at Stanford
2002-2005	Director-Sedation and Monitored Anesthesia Program, University of Minnesota Children's Hospital
2000-2004	Program Director- Pediatric Emergency Medicine, University of Minnesota
1997-2005	Divisions Director- Pediatric Pulmonary and Critical Care Medicine, Department of Pediatrics, University of Minnesota
2017-present	Co-Director, Physician-Scientist Training Program, Chan-Zuckerberg Biohub

Selected Honors

2010-2015	Stanford University Medical School Honor Roll for Outstanding Teaching
2014-2015	Invited Lecturer, Stanford University Medical School, Year 2 Master Clinician Lecture
2014	SF Magazine, Top Pediatric Pulmonologist
2011	Keynote Address, Department of Pediatrics, Annual Research Retreat
2008-	Stanford University Medical School Honor Roll for Outstanding Clinical Teaching
2010	President-The Society for Pediatric Research
2007-	Best Pediatrician-San Jose Magazine
2002-	America's Top Pediatricians, Consumer Research Council of America, Washington, D.C.
2003	Distinguished Alumni Lectureship, University of Colorado Medical School,
2000-2004	Established Investigator – American Heart Association.
2000	The Clinical-Scholar Award, Fairview-University Medical Center and the University of Minnesota Medical School
2001	Award for Excellence, University of Minnesota Medical School (Awarded annually to one Medical School faculty member)
2000-2001	Outstanding Faculty Educator – Career Award, Department of Pediatrics, University of Minnesota Medical School, (no longer eligible for educator award, limited to 5 awards per faculty member)
2000	Master Teacher of the Year Award, University of Minnesota Medical School
1993-1995, 1998-2000	University of Minnesota Pediatric Residency Program Outstanding Faculty Educator of the Year Award
1995	Society for Pediatric Research Richard D. Rowe Award: Outstanding Young Investigator Award in Perinatal Cardiology
1993-1998	Clinician-Scientist Award, American Heart Association
1990-1993	National Research Service Award, National Institutes of Health
1989	Daniel Darrow Award as Most Outstanding House Officer, Children's Mercy Hospital
1988-1989	Pediatric Chief Resident, Children's Mercy Hospital
1988-1989	Clark Seely Award for Excellence in Primary Care, Children's Mercy Hospital
1987-1988	Clark Seely Award for Excellence in Primary Care, Children's Mercy Hospital

Selected Service

2015-2019	Regular Member, Pediatrics Peer Review Committee, National Institute of Child Health and Development, National Institutes of Health.
2017-2019	Co-Chair, Grover Meeting in Pulmonary Vascular Biology, American Thoracic Society, American Heart Association
2018	Physician-Scientist Initiative Peer Review Committee, Burroughs Wellcome Fund
2014-2017	External Review Committee Member, K12 award, Department of Pediatrics, University of Colorado
2012-2016	Editor, Pulmonology Edition, Current Opinion in Pediatrics.
2014	Application Comparison Pilot Project, Center for Scientific Review, National Institutes of Health
2008-2013	Regular Member, Peer Review Committee, Respiration, Integrative Biology and Translation,

National Heart, Lung, Blood, Institute, National Institutes of Health

2010-2016 Editorial Board, Pediatrics
2007-2013 Regular Member, National Peer Review Committee, March of Dimes
2008-2012 Program Committee Member, Pediatric Academic Societies
2003-2006 Chair, Heart, Lung, & Resuscitation Peer Review Committee, American Heart Association.

C. Contribution to Science

1. Perinatal pulmonary vascular tone:

Early contributions were focused upon the regulation of perinatal pulmonary vascular tone. Further work addressed the subcellular mechanisms that underlie the postnatal adaption of the pulmonary circulation. Key publications demonstrated that pulmonary artery endothelial cells produced endothelial-derived relaxing factor (EDRF), subsequently identified as nitric oxide (NO), in response to ventilation, oxygenation and shear stress. Further work demonstrated that oxygen, one of the key stimuli for perinatal pulmonary vasodilation, as well as NO acts via quantal and localized release of calcium from ryanodine-sensitive stores to prompt activation of the pulmonary artery smooth muscle cell calcium-sensitive potassium channels. These papers informed the development of several clinical trials wherein the efficacy of inhaled nitric oxide in persistent pulmonary hypertension of the newborn was established.

a) Cornfield, D.N., B.A. Chatfield, J.A. McQueston, I.F. McMurtry and S.H. Abman. Effects of birth-related stimuli on L-Arginine dependent vasodilation in ovine fetus. Am J Physiol, 262: H1474-H1481, 1992.
b) Cornfield, D.N., S. Tolarova, E.K. Weir, and S.L. Archer. Oxygen causes fetal pulmonary vasodilation through activation of a calcium-dependent potassium channel. Proc Natl Acad Sci 93: 8089-8094, 1996.
c) Tristani-Firouzi, M., E.B. Martin, S. Tolarova, E.K. Weir, S.L. Archer, and D.N. Cornfield, Ventilation-induced pulmonary vasodilation at birth is modulated by potassium channel activity. Am J Physiol 271 (Heart Circ. Physiol 40): H2353-H2359, 1996.
d) Saqueton, C.B., R.B. Miller, C.E. Milla, V. Porter, and D.N. Cornfield. Nitric oxide causes perinatal pulmonary vasodilation through ryanodine-sensitive K^+ channel activation. *Am J of Physiol*, (Lung Cell. Mol. Physiol. 20) L925-932, 1999.

2. Developmental regulation of oxygen sensing in the lung:

Over a sustained time period, our lab was able to demonstrate a developmentally conserved role for the transcription factor, hypoxia inducible factor-1α (HIF-1α) and the calcium-sensitive potassium channel, in pulmonary artery smooth muscle cells (PASMC). We provided the first evidence that PASMC were able to sense and respond to an acute hypoxia with an increase in cytosolic calcium. Moreover, we demonstrated that in neonatal, but not adult PASMC, an acute increase in oxygen tension, caused activation of the calcium-sensitive K^+ channel, membrane hyperpolarization via generation of a calcium spark. Subsequent investigation into the molecular underpinnings of the maturational changes in ion channel biology, demonstrated that HIF-1α protein is constitutively expressed and O_2-insensitive in neonatal, but not adult, PASMC.

a) Cornfield, D.N., T. Stevens, I.F. McMurtry, S.H. Abman, and D.M. Rodman. Acute hypoxia causes membrane depolarization and calcium influx in fetal pulmonary artery smooth muscle cells. Am J Physiol (Lung Cell. and Mol Physiol. 10) L469-L475, 1994.
b) Reeve, H.L., S.L. Archer, E.K. Weir, and D.N. Cornfield. Maturational changes in K+ channel activity and oxygen sensing in the ovine pulmonary vasculature. Am J Physiol 275 (Lung Cell. Mol. Physiol. 19): L1019-L1025, 1998.
c) Porter, V.A., H.L. Reeve, D.N. Cornfield, D.N. Fetal rabbit pulmonary artery smooth muscle cell response to ryanodine is developmentally regulated. Am J of Physiol, (Lung Cell. Mol. Physiol.) L751-L757, 2000.
d) Resnik, E.R., Herron, J.M., Lyu, S.C., Cornfield, D.N., Molecular regulation of HIF-1 in the lung, Proc Natl Acad Sci U S A. 2007 Nov 20; 104(47):18789-94.

3. Molecular regulation of pulmonary vascular tone:

Over the past several years, our lab has been engaged in experiments that address the regulation of pulmonary vascular tone. We have investigated the signal transduction pathway of molecules that play an important role in determining pulmonary vascular tone. We have identified a novel, and somewhat controversial, role for HIF-1 in the regulation of tone in lung via effects on myosin light chain phosphorylation in the pulmonary artery smooth muscle cells and in regulating expression of the b1 chain of the calcium sensitive potassium channel. Further, we outlined a novel role for endothelin derived from PASMC in modulating the pulmonary vascular response to hypoxia.

a) Barnes, E.A. Chen, C., Sedan, O., Cornfield, D.N. Loss of hypoxia-inducible factor-1 alpha underlies increased vascular contractility in pulmonary hypertension. FASEB Journal (2) 650-662, 2017.
b) Wang, C.C. Ying, L., Barnes, E.A., Adams, E.S., Kim, F.Y., Engel, K.W., Alvira, C.M. Cornfield, D.N. Pulmonary artery smooth muscle cell HIF-1 alpha regulates endothelin expression via microRNA 543. American Journal of Physiology: Lung, Cell and Molecular Physiology; May, 2018.
c) Kim, Y., Barnes, E.A., Ying, L., Alvira, C.M., Cornfield, D. N. Hypoxia inducible factor-1a in pulmonary artery smooth muscle cells lowers vascular tone by decreasing myosin light chain phosphorylation. Circulation Research;112 (9):1230-3, 2013.
d) Ying, L. Alvira, C.M., and Cornfield, D.N. Developmental differences in focal adhesion kinase expression modulate pulmonary endothelial barrier function in response to inflammation. American Journal of Physiol Lung, Cell and Molecular Physiology, 315(1):L66-77, 2018

4. Clinical and translational research in neonatal, pulmonary and critical care medicine:

As a physician-scientist, I encounter many clinical situations that prompt questions amenable to well designed trials. Moreover, I am also well positioned to employ state-of-the-art tools to address worthy clinical questions. I have contributed original research to the clinical and translational medicine literature.

a) Cornfield, D.N., R. C. Maynard, R-A. O. deRegnier, S. F. Guiang III, J. E. Barbato, and C. E. Milla. Randomized, controlled trial of low dose inhaled nitric oxide in the treatment of term and near term infants with respiratory failure and pulmonary hypertension. Pediatrics 104, 1015-1022, 1999.
b) Eikenberry, M., Bartakova, H., DeFor, T., Ramsey, N.K.C., Milla, C.E., Haddad, I.Y. Blazar, B.R., and D.N. Cornfield. Bone marrow transplant related lung injury in children. Biology of Blood and Marrow Transplantation, 11 (1) 56-64, 2005.
c) Adams, E. Longhurst, C.A., Pageler, N., Widen, E., Franzon, D., Cornfield, D.N. Computerized physician order entry with decision support decreases blood transfusions in hospitalized children. Pediatrics, 127 (5) pp. e1112 -e1119, 2011. (with editorial comment).
d) Blainey, P.C., Milla, C.E.,Cornfield, D.N.*, Quake, S.R.*Quantitative ecology of the cystic fibrosis microbiome correlates with clinical symptoms. Sci Transl Med. 26;4(153):153ra130, 2012. (*co-senior authorship).

5. Clinician-scientist training advocacy:

As a physician-scientist, I recognize the value of being engaged in both the clinic and lab. In response to the decreasing numbers of physician-scientists, I have advocated for preservation and promotion of the physician-scientist training track. This advocacy has led to several publications that articulate putative solutions.

a) Cornfield, D.N., Lane, R., Rosenblum, N., D., Hostetter, M., Jobe, A., Albertine, K., Aschner, J., Abman, S.H. Patching the Pipeline: Creation and Retention of the next generation of Physician-Scientists for Child Health Research, , Journal of Pediatrics 165 (5): 882-884, 2014.
b) Cornfield, D.N, Lane, R., Abman, S.H. Creation and Retention of the Next Generation of Physician-Scientists for Child Health Research. JAMA; 309(17):1781-2, 2013.
c) Cornfield, D.N. Academic Pediatrics and the Narrative of Discovery: The Society for Pediatric Research Presidential Address. Pediatric Research, 70(3); 320-324, 2011.
d) Libby, A.M., Cornfield, D.N. Abman, S.H. There is no 'I' in Team: Challenges for Career Development in the Era of Team Science. J. Pediatrics, 177: 4-5, 2016.

Complete List of Published Work:
http://www.ncbi.nlm.nih.gov/sites/myncbi/1-uC_7hRtpcQh/bibliography/45696163/public/?sort=date&direction=descending

D. Research Support

Ongoing Research Support:

1 R01 HD092316-01A1 Cornfield/Alvira (MPI) 04/01/2018-03/31/2023
Novel Pathways Regulating Calcium Mediated Contractility in the Pregnant Uterus
The goal of this study is to define the role of the transient receptor potential vanilloid chance and inflammation in the uterine contractility that characterizes both term and preterm labor.

Burroughs-Wellcome Preterm Birth
Initiative Cornfield (PI) 07/01/2014-06/30/2019
TRPV Channels, a Target to Prevent and Treat Preterm Labor
The goal of this study is to determine whether uterine expression of the transient receptor potential vanilloid channel plays a role in modulating uterine quiescence and activation. The overall goal is to demonstrate the viability of blocking TRPV4 activation to effect tocolysis.

1T32HL129970-01A1 Cornfield/Nicholls (MPI) 07/01/2016-03/31/2021
Stanford Training Program for Lung Biology
The goal of this training grant is to create a pathway and support for training physician-scientists interest and capacity to develop hypothesis-driven discovery-driven research program. The program will leverage Stanford University's rich biological and translational sciences environment. The program includes both pediatricians and internists with the intention of identifying the most outstanding candidates from across the Medical School with a strong preference for those engaged in clinical medicine based in pulmonary biology. The long-term goal is fill the pipeline with next generation of physician-scientists.

Celtaxsys-4430 Trial Cornfield (PI) 07/01/2016-12/31/2018
A Phase 2, Multicenter, Randomized, Placebo-Controlled, Parallel-Group Study to Evaluate the Efficacy, Safety, and Tolerability of CTX-4430 Administered Orally Once-Daily for 48 Weeks in Adult Patients with Cystic Fibrosis
CTX-4430 is a n novel synthetic, small-molecule with marked anti-inflammatory properties. The trial is designed to demonstrate safety, efficacy and tolerance for the medication. Thr medication inhibits both epoxide hydrolase and the aminopeptidase activities of LTA4H in vitro. CTX-4430 has shown significant inhibition of LTB4 production after oral administration in both oral and human studies.

N30-SN01 Study Moss (PI) 09/04/2013-12/31/2018
A phase 1b, randomized, double-blind, placebo controlled, dose escation study of N6033 to evaluate safety and pharmacokinetics in subjects homozygous for the F508 del of CFTR mutation. The main purpose of this Phase 1b study is to look at the safety of a study drug: N6022 and how well intravenous administration is tolerated. The study will evaluate the pharmacokinetics of N6022 in the serum at different points in the day. The serum concentrations will be compared between patients with cystic fibrosis and control subjects.

Stanford Spectrum Biodesign Grant Cornfield (PI) 01/01/2016-12/31/2018
Passive home monitoring device for early detection and intervention for asthma exacerbation.
The goal of the study is to demonstrate the viability of a strategy that allows ongoing and integrated measurement of respirations, cough, heart rate and air quality. The information will enable early intervention to mitigate the need for hospitalization and urgent care visit. in an integrated manner.

Completed Research Support:

Recently Completed Research Support:

2R01 HL60784 Cornfield (PI) 04/01/2012-06/30/2017
Molecular regulation of pulmonary vascular KCa channels
The goal of this study is determine the molecular mechanisms whereby calcium-sensitive potassium channels in the pulmonary circulation are regulated and thereby understand how pulmonary vascular tone might be modulated.

1RC4AI09267301 Valentine (PI) 09/30/2010-09/29/2013
Genome Transplant Dynamics: non-invasive sequencing based diagnosis of rejection
The goal of this project was to determine whether donor DNA in the bloodstream of transplant recipients might serve as a sensitive biomarker of rejection.

5R01 HL060784 Cornfield (PI) 07/01/2009-06/30/2014
Developmental Regulation of Oxygen Sensing in the Lung
The goal of the study was to determine the molecular underpinnings of oxygen sensing in the lung, in a context- and cell-specific manner.

1P30HL070628 t Cornfield (PI) 07/01/2009-06/30/2012
Postnatal lung development: mechanisms of molecular and vascular development and long-term implications of preterm air breathing life
The goal of this award was to support the recruitment of new faculty by establishing a Biomedical Research Core to study postnatal alveolarization in the lung.