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## BIOGRAPHICAL SKETCH

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NAME C. William Davis	POSITION TITLE Professor of Cell & Molecular Physiology and Medicine		
eRA COMMONS USER NAME CWDAVIS			
EDUCATION/TRAINING <i>(Begin with baccalaureate or other initial professional education, such as nursing, and include postdoctoral training.)</i>			
INSTITUTION AND LOCATION	DEGREE <i>(if applicable)</i>	YEAR(s)	FIELD OF STUDY
San Francisco State University	BA	1969	Biology
San Francisco State University	MA	1973	Biology
University of North Carolina at Chapel Hill	PhD	1978	Zoology
University of North Carolina at Chapel Hill	Postdoc.	1978-1983	Cell Physiology

### A. Positions and Honors.

- 1978 – 1983 Post-Doctoral Fellow/Research Associate, Dept. of Medicine (Nephrology), Univ. of North Carolina School of Medicine
- 1983 – 1986 Assistant Professor of Physiology, University of North Carolina School of Medicine
- 1986 – 2002 Associate Professor of Cell and Molecular Physiology, and of Medicine, University of North Carolina School of Medicine
- 2002 – present Professor of Cell and Molecular Physiology, and of Medicine, University of North Carolina School of Medicine
- 1985 - 2001 Director, Cystic Fibrosis/Pulmonary Research & Treatment Center, Video Microscopy/Imaging Core
- 2001 - present Founding and, presently, Co-Director, Michael Hooker Microscopy Facility
- 1995, 2003 *Outstanding Contribution*, Medical Educational Development Program, University of North Carolina School of Medicine
- 2001 *Excellence in Teaching Award*, University of North Carolina School of Medicine

### B. Selected Publications

#### **Book Chapters and Reviews (Selected & Recent, of 12 total chapters and reviews)**

- Davis, C.W. 1997. Goblet cells: physiology and pharmacology. In: *Airway Mucus: Basic Mechanisms and Clinical Perspectives*. Eds. D.F. Rogers and M.I. Lethem. Birhäuser Verlag, Basel, pp. 149-177.
- Davis, C.W. and S.H. Randell. 2001. Airway goblet and mucous cells: identical, similar, or different?. In: *Cilia and Mucus: From development to respiratory disease*. Ed. M. Salathe. Marcel Dekker, N.Y., p.195-210.
- Davis, C.W. 2002. Regulation of mucin secretion from in vitro cellular models. *Novartis Found Symp.* 248:113-25; discussion 125-31, 277-82.
- Davis, C.W. and B.F. Dickey. 2008. Regulated airway goblet cell mucin secretion. *Ann. Rev. Physiol.* 70:487-512.
- Davis, C.W. and E.R. Lazarowski. 2008. Coupling of airway ciliary activity and mucin secretion to mechanical stresses by purinergic signaling. *Resp. Physiol. Neurobiol.* ePub May 28, PMID 18635403

#### **Publications in Refereed Journals (Selected & Recent, of 42 total peer-reviewed papers)**

- Davis, C.W., M.L. Dowell, M. Lethem, and M. Van Scott. 1992. Goblet cell degranulation in isolated canine tracheal epithelium: response to exogenous ATP, ADP, and adenosine. *Am. J. Physiol.* 262:C1313-23.
- Lethem, M., M.L. Dowell, M. Van Scott, J.R. Yankaskas, T. Egan, R. Boucher, and C.W. Davis. 1993. Nucleotide regulation of goblet cells in human airway epithelial explants. Normal exocytosis in cystic fibrosis. *Am. J. Respir. Cell Mol. Biol.* 9: 315-322.
- Gray, T.E., C.W. Davis, L.H. Abdullah, and P. Nettekheim. 1996. Mucociliary differentiation of serially passaged normal human tracheobronchial epithelial (NHTBE) cells. *Am. J. Respir. Cell Molec. Biol.* 14:104-112.
- Abdullah, L.H., S.W. Davis, L. Burch, M. Yamauchi, S.H. Randell, P. Nettekheim, and C. W. Davis. 1996.

- $P_{2U}$  purinoceptor regulation of mucin secretion in SPOC1 cells, a goblet cell line from the airways. *Biochem. J.* 316:943-951.
- Abdullah, L.H., J.D. Conway, J.A. Cohn, and C.W. Davis. 1997. Protein Kinase C and  $Ca^{2+}$  activation of mucin secretion in airway goblet cells. *Am. J. Physiol.* 273:L201-L210.
- Scott, C.E., L.H. Abdullah, and C.W. Davis. 1998.  $Ca^{2+}$  and protein kinase C activation of mucin granule exocytosis in permeabilized SPOC1 cells. *Am. J. Physiol.* 275:C285-C292.
- Matsui, H., B.R. Grubb, R. Tarran, S.H. Randell, J.T. Gatzky, C.W. Davis, and R.C. Boucher. 1998. Evidence for periciliary liquid layer depletion, not abnormal ion composition, in the pathogenesis of cystic fibrosis airways disease. *Cell* 95:1005-1015.
- Bernacki, S.H., A.L. Nelson, L. Abdullah, J.K. Sheehan, A. Harris, C.W. Davis, and S.H. Randell. 1999. Mucin gene expression during differentiation of human airway epithelia in vitro: MUC4 and MUC5B are strongly induced. *Am. J. Respir. Cell Mol. Biol.* 20:595-604.
- Matsui, H., C.W. Davis, R. Tarran, and R.C. Boucher. 2000. Osmotic water permeabilities of cultured, well-differentiated normal and CF airway epithelia. *J. Clin. Invest.* 105:1419-1427.
- D.M. Morse, J.L. Smullen, and C.W. Davis. 2001. Differential effects of UTP, ATP, and adenosine on ciliary activity of human nasal epithelial cells. *Am. J. Physiol., Cell Physiol.* 280:C1485-C1497.
- R. Tarran, B.R. Brubb, D. Parsons, M. Picher, A.J. Hirsh, C.W. Davis, and R.C. Boucher. 2001. The CF salt controversy: In vivo observations and therapeutic approaches. *Mol. Cell.* 8:149-158.
- R. Tarran, B.R. Grubb, J.T. Gatzky, C.W. Davis, and R.C. Boucher. 2001. Role of passive surface forces and active ion transport in the modulation of airway surface liquid volume and composition. *J. Gen. Physiol.* 118:223-236.
- Yerxa, B., J. Sabater, C.W. Davis, M.J. Stutts, M. Picher, A.C. Jones, M. Cowlen, R. Dougherty, J. Boyer, W. Abraham, R. Boucher. 2002. Pharmacology of INS37217, a next generation  $P2Y_2$  receptor agonist for the treatment of Cystic Fibrosis. *J. Pharmacol. Exp. Therap.* 302:871-880.
- Conway, J.D., L.H. Abdullah, Tracy Bartolata, and C.W. Davis. 2003. Regulation of mucin secretion from human bronchial goblet cells grown in murine hosted xenografts. *Am. J. Physiol.* 284:L945-L954.
- Abdullah, L.H., J.T. Bundy, C. Ehre, and C.W. Davis. 2003. Mucin secretion and PKC isoforms in the SPOC1 airway goblet cell line: differential activation by purinergic agonist and PMA. *Am. J. Physiol.* 285:L149-160.
- Rossi, A.H., P.R. Sears, and C.W. Davis. 2004.  $Ca^{2+}$  Dependency of "Ca-independent" exocytosis in SPOC1 goblet cells. *J. Physiol.* 559:553-563.
- Holmén, Jessica, N.G. Karlsson, L.H. Abdullah, S.H. Randell, J.K. Sheehan, G.C. Hansson, and C.W. Davis. 2004. Mucins and their O-Glycans from Normal and Cystic Fibrosis Bronchial Epithelial Cell Cultures. *Am. J. Physiol.* 287:L824-L834.
- Ehre, C., A.H. Rossi, L.H. Abdullah, K. De Pestel, S. Hill, J.C. Olsen, and C.W. Davis. 2005. Barrier Role of Actin Filaments in Regulated Mucin Secretion from Airway Goblet Cells. *Am. J. Physiol.* 288:C46-C56.
- Rossi, A.H., W.C. Salmon, M. Chua, and C.W. Davis. 2007. Calcium signaling in human airway goblet cells following purinergic activation. *Am. J. Physiol.* 292:L92-L98.
- Winters, S., C.W. Davis, and R.C. Boucher. 2007. Mechanosensitivity of Mouse Tracheal Ciliary Beat Frequency: roles for  $Ca^{2+}$ , purinergic signaling, tonicity, and viscosity. *Am. J. Physiol.* 292:L614-624.
- Kreda, S.M. S.F. Okada, C.A. van Heusden, W. O'Neal, S. Gabriel, L.H. Abdullah, C.W. Davis, R.C. Boucher, and E.R. Lazarowski. 2007. Coordinated release of nucleotides and mucin from human airway Calu-3 cells. *J. Physiol.* 584:245-259.
- Abdullah, L.H. and C.W. Davis. 2007. Regulation of Mucin Secretion from SPOC1 and human bronchial epithelial cells by Tyrosine Phosphorylation-activated Pathways. *Am. J. Physiol.* 293:L591-L599.
- Ehre, C., Y. Zhu, L.H. Abdullah, J.C. Olsen, K.I. Nakayama, K. Nakayama, R.O. Messing, and C.W. Davis. 2007. PKC $\epsilon$ , a  $P2Y_2$ -R downstream effector in regulated mucin secretion from airway goblet cells. *Am. J. Physiol.* 293:C1445-C1454.
- Zhu, Y., C. Ehre, Abdullah, L.H., J.K. Sheehan, M. Roy, C.M. Evans, B.F. Dickey, and C.W. Davis. 2008. MUNC13-2 $^{-/-}$  Baseline Secretion Defect Reveals Source of Oligomeric Mucins in Mouse Airways. *J. Physiol.* 586:1977-1992.
- M. J. Tuvim, Rossi, A.H., P. J. Mohler, K.A. Burns, M. Chua, Roberto Adachi, Ernestina Melicoff, C.W. Davis, and B.F. Dickey. Revision submitted. Synaptotagmin 2 couples Mucin Granule Exocytosis to  $Ca^{2+}$  Signaling from Endoplasmic Reticulum. *J. Biol. Chem.*