Carl D. Bortner
Curriculum Vitae

Signal Transduction Laboratory
National Institute of Environmental Health Sciences
Research Triangle Park, NC 27709
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PERSONAL DATA

Date of Birth:	February 11, 1962
Marital Status:	Married, 2 children
Home Address:	106 Sturdivant Road Durham, NC 27705 (919) 382-3155

EDUCATION

Ph.D. Physiology, 1998	Department of Physiology University of North Carolina at Chapel Hill Advisor: Dr. John Cidlowski
M.S. Microbiology, 1987	Department of Microbiology Iowa State University, Ames, Iowa Advisor: Dr. Peter A. Pattee
B.S. Microbiology, 1984	Pennsylvania State University University Park, PA

ACADEMIC AND PROFESSIONAL EXPERIENCE

Staff Scientist: 2001 - present
National Institute of Environmental Health Sciences, Research Triangle Park, NC
Laboratory of Signal Transduction
Molecular Endocrinology Group, Laboratory of Dr. John A. Cidlowski
Director of the Flow Cytometry Center at NIEHS

Research Fellow: 1998 - 2001
National Institute of Environmental Health Sciences, Research Triangle Park, NC
Laboratory of Signal Transduction
Molecular Endocrinology Group, Laboratory of Dr. John A. Cidlowski
Manager of the Flow Cytometry Center at NIEHS

Pre-doc IRTA Fellow: 1994-1998
National Institute of Environmental Health Sciences, Research Triangle Park, NC
Laboratory of Signal Transduction
Molecular Endocrinology Group, Laboratory of Dr. John A. Cidlowski
Thesis title: A Role for Cell Shrinkage and Movement of Ions in Apoptosis

Graduate Student: 1992-1994
University of North Carolina, Chapel Hill, NC

Department of Physiology, Laboratory of Dr. John A. Cidlowski
Studied the loss and regulation of cell volume during apoptosis.

Research Analyst: 1987 - 1992
University of North Carolina, Chapel Hill, NC
Lineberger Comprehensive Cancer Center, Laboratory of Dr. Jack Griffith
Investigated the biochemical aspects of prokaryotic recombinases, focusing on the RecA protein of *E. coli*.

Graduate Research Assistant: 1986 - 1987
Iowa State University, Ames, IA
Microbiology Department, Laboratory of Dr. Peter A. Pattee
Thesis title: Investigation of Tn916 as a genetic tool for chromosome mapping in *Staphylococcus aureus*.

Graduate Teaching Assistant: 1984 - 1985
Iowa State University, Ames, IA

Undergraduate Research Assistant: 1983 - 1984
Pennsylvania State University, State College, PA
Work on isolation of chloroplasts and phycoerythrin from red algae and preparation samples for electron microscopy.

SPECIALIZED TECHNICAL EXPERTISE

Flow Cytometry
Expertise includes laser alignment, optic maintenance, and standard operating procedures for the FACSort, FACSVantage, FACSAria II, LSR II, Fortessa, and Melody flow cytometers and software, experimental design and data analysis. Flow cytometric expertise using the FACSort, Cell Lab Quanta, Sony ec800, ImageStreamX, and Helios instrumentation.

Transmission Electron Microscopy
Lineberger Comprehensive Cancer Center, University of North Carolina at Chapel Hill
Expertise includes tungsten and platinum/palladium shadowing negative staining of direct mounts, and immunocytochemistry using gold-labeled beads. Devised a biotin-avidin end-labeling procedure to use in conjunction with electron microscropy.

TEACHING EXPERIENCE

Lecturer: Apoptosis, Department of Toxicology
University of North Carolina at Chapel Hill, Spring semester 2000, 2001, 2002

Lecturer: Muscle Physiology, Physiology 114
University of North Carolina at Chapel Hill School of Dentistry, Spring semester 1997

Instructor: General Physiology review sessions, Physiology 114
University of North Carolina at Chapel Hill School of Dentistry, Spring semester 1996/1997

Instructor: Comparative Anatomy and Physiology of Anaerobic Bacteria Lab
Iowa State University, Ames, Iowa, Fall semester 1985

Instructor: Advanced Bacteriology Lab
Iowa State University, Ames, Iowa, Spring semester 1985

Instructor: General Bacteriology Lab
Iowa State University, Ames, Iowa, Fall semester 1984

PROFESSIONAL SOCIETY AFFILIATIONS

Member of the International Society of Analytical Cytometry: 1998-present
Member of the Research Triangle Cytometry Association: 1995-present
Research Triangle Park, NC

AWARDS AND HONORS

Unsung Hero Award, NIEHS, 2010, 2015
Society of Toxicology Speaker Bureau 2004
Outstanding Poster Award, International Society of Analytical Cytology Meeting 2002
Fellows Award for Research Excellence (FARE), NIH, 1999
Member of Gamma Sigma Delta Honor Society, Iowa State University, Spring 1986

EDITORIAL BOARDS

The Open Toxicology Journal 2008 – 2013
International Journal of Molecular Biology and Biochemistry 2013 – present

PROFESSIONAL SERVICE AND COMMITTEES

Extramural
East Carolina University Flow Advisory Committee (2016-preent)

Intramural (NIEHS/NIH)
Board of Survey 2007 – 2009 (Chairman – 2009)
COPIII 2009 - 2014
Member – Search Committee for Administrative Coordination Specialist, 2014
Building 101 Renovation Committee (2018-2019)

INVITED PRESENTATIONS

Cell Shrinkage and the Movement of Ions during Apoptosis
Apoptosis and Growth Factor Meeting
NEIHS, Research Triangle Park, NC April 1999

Plasma Membrane Depolarization as an Early Characteristic of Apoptosis
Research Triangle Cytometry Association Meeting
Glaxo Wellcome, Research Triangle Park, NC October 1999

Cell Shrinkage and Apoptosis
Discovery Research

Glaxo Wellcome, Research Triangle Park, NC October 2001

Cell Shrinkage and the Movement of Ions during Apoptosis
Department of Biochemistry
East Carolina University, Greenville, NC April 2002

Cell Shrinkage during Apoptosis: A tale of two ions
Research Triangle Cytometry Association Meeting
Glaxo Wellcome, Research Triangle Park, NC January 2004

Defining Primary and Secondary Cell Shrinkage during the Apoptotic Volume Decrease Response of Jurkat Cells by Flow Cytometry and Confocal Microscopy
ISAC Congress
Montpellier, France May 2004

Functional Flow Cytometry: Applications in Toxicology
Society of Toxicology Annual Meeting
Baltimore, MD March 2004

Defining Primary and Secondary Cell Shrinkage during the Apoptotic Volume Decease (AVD) Response of Jurkat Cells by Flow Cytometry
Cell Volume Control in Health and Disease Meeting
Copenhagen, Denmark September 2005

Multiparameter Flow Cytometric Assays for the Study of Apoptosis
Workshop on Cellular Functional Analysis, ISAC Congress
Quebec City, Canada May 2006

Cell Shrinkage and Ion Fluxes: Role in Apoptosis
Apoptosis: Ion Fluxes and Oxidative Signaling Congress
Dusseldorf, Germany October 2006

A Lymphoid Cell Model designed to evaluate the Role of RVI and RVD in Apoptosis
40th NIPS International Symposium on Physiology of Anion Transport and Cell Volume Regulation
Okazaki, Japan August 2009

Osmotic Stress Response Mechanisms Impart Intrinsic Apoptotic Pathway Resistance in Lymphocytes
Cell Volume Regulation Meeting: Hydration & Cell Volume Regulation
Tubingen, Germany September 2011

Seeing is Believing: Image based Cytometry of Cultured Cells and Tissue Sections
ISAC Congress
Leipzig, Germany June 2012

Quantitative Imaging of Cultured Cells via Flow Cytometry
GSK Imaging Symposium
Research Triangle Park, NC November 2012

The Warburg Effect and Metabolic Consequences in the Development of Apoptotic Resistance in Osmotically Stressed Lymphoid Cells

10th International Congress on Cell Volume Regulation: Novel Therapeutic Targets & Pharmacological Approaches
Moscow, Russia August 2013 (Declined)

Going with the Flow… Cytometry in the 21st Century
Laser Technology and Applications Group Annual Meeting
East Carolina University, Greenville, NC June 2015

Resistance to Intrinsic Apoptotic Stimuli in Lymphocytes: a Role for Mitochondrial Dysfunction
30th ISAC Congress
Glasgow, Scotland June 2015

The Warburg Effect and Metabolic Consequences in the Development of Apoptotic Resistance in Osmotically Stressed Lymphoid Cells
11th International Congress on Cell Volume Regulation: Cell Volume Regulation and Fluid Homeostasis
DePaul University, Chicago August 2016

Flow Cytometry in the 21st Century
Epigenetic and Stem Cell Biology Laboratory Seminar Series
NEIHS, Research Triangle Park, NC October 2016

The (Action) Potential of using Flow Cytometry in Neuroscience
Neurobiology Laboratory Seminar Series
NEIHS, Research Triangle Park, NC February 2017

Technical Advances in Flow Cytometry and Reprogramming of Cell Death
Genome Integrity and Structural Biology Laboratory Retreat
EPA, Research Triangle Park, NC March 2017

What you didn't Know about Flow Cytometry
Immunity, Inflammation, and Disease Laboratory Retreat
E. Harvey Estes Conference Center, Research Triangle Park, NC May 2017

PUBLICATIONS

Primary Publications

1. **C. Bortner** and J. Griffith. Three-Stranded Paranemic Joints: Architecture, Topological Constraints and Movement. J. Mol. Biol. 215, 623 - 634 (1990).

2. Y. T. Kim, S. Tabor, **C. Bortner**, J. Griffith, and C. C. Richardson. Purification and Characterization of the Bacteriophage T7 Gene 2.5 Protein: A Single-Stranded DNA Binding Protein. J. Biol. Chem. 267, 15022-15031 (1992).

3. **C. Bortner**, T. R. Hernandez, I. R. Lehman, and J. Griffith. Herpes Simplex Virus 1 Single-Strand DNA Binding Protein (ICP8) will promote Homologous Pairing and Strand Transfer. J. Mol. Biol. 231, 241-250 (1993).

4. Y. -H. Wang, **C. D. Bortner**, and J. Griffith. RecA Binding to Bulge- and Mismatch-Containing DNAs. J. Biol. Chem. 268, 17571-17577 (1993).

5. **C. D. Bortner** and J. A. Cidlowski. Absence of Volume Regulatory Mechanisms Contribute to the Rapid Activation of Apoptosis in Lymphocytes. Am. J. Physiol. 271, C950-C961 (1996).

6. F. M. Hughes Jr., **C. D. Bortner**, and J. A. Cidlowski. Intracellular K^+ Suppresses the Activation of Apoptosis in Lymphocytes. J. Biol. Chem. 272, 30567-30576 (1997).

7. **C. D. Bortner,** F. M. Hughes Jr., and J. A. Cidlowski. A Primary Role for K^+ and Na^+ Efflux in the Activation of Apoptosis. J. Biol. Chem. 272, 32436-32442 (1997).

8. J. W. Montague, **C. D. Bortner**, F. M. Hughes Jr., and J. A. Cidlowski. A Necessary Role for Reduced Intracellular Potassium during the DNA Degradation Phase of Apoptosis. Steroids 64, 563-569 (1999).

9. **C. D. Bortner** and J. A. Cidlowski. Caspase Independent and Dependent Regulation of K^+, Cell Shrinkage, and Mitochondrial Membrane Potential during Lymphocyte Apoptosis. J. Biol. Chem. 274, 21953-21962 (1999).

10. M. Gómez-Angelats, **C. D. Bortner,** and J. A. Cidlowski. PKC Inhibits Fas-receptor-induced Apoptosis Through Modulation of the Loss of K^+ and Cell Shrinkage: A Role for PKC Upstream of Caspases. J. Biol. Chem. 275, 19609-19619 (2000).

11. A. B. Scoltock, **C. D. Bortner**, G. St.J. Bird, J. Putney, Jr., and J. A. Cidlowski. A Selective Requirement for Elevated Calcium in DNA Degradation, but Not Early Events in Anti-Fas-Induced Apoptosis. J. Biol. Chem. 275, 30586-30596 (2000).

12. K. L. King, C. M. Jewell, **C. D. Bortner**, and J. A. Cidlowski. Caspase and Bcl-2 Dependent/Independent Pathways for Ribosome Catabolism during Lymphocyte Apoptosis. Cell Death Differ. 7, 994-1001 (2000).

13. **C. D. Bortner,** M. Gómez-Angelats, and J. A. Cidlowski. Plasma Membrane Depolarization without Repolarization is an Early Molecular Event in Apoptosis Mediated by the Inactivation of the Na^+/K^+-ATPase. J. Biol. Chem. 276, 4304-4314 (2001).

14. D. R. Mercatante, **C. D. Bortner**, J. A. Cidlowski, and R. Kole. Modification of Alternative Splicing of Bcl-x Pre-mRNA Induces Apoptosis in Prostate and Breast Cancer Cells. J. Biol. Chem. 276, 16411-16417 (2001).

15. M. St.J. Battalora, J. W. Spalding, C. J. Szczesniak, J. E. Cape, R. J. Morris, C. S. Trempus, **C. D. Bortner**, B. M. Lee, and R. W. Tennant. Age-Dependent Skin Tumorigenesis and Transgene Expression in the Tg.AC (v-Ha-ras) Transgenic Mouse. Carcinogenesis 22, 651-659 (2001).

16. C. C. Q. Vu, **C. D. Bortner**, and J. A. Cidlowski. Regulation of Cell Shrinkage during Apoptosis: Initiator/Effector Caspase-Dependent and -Independent Mechanisms. J Biol Chem. 276, 37602-37611 (2001).

17. C.L. Mann, **C. D. Bortner**, C. M. Jewell, and J. A. Cidlowski. Glucocorticoid-induced Plasma Membrane Depolarization during Thymocyte Apoptosis: Association with Cell Shrinkage and Degradation of the Na^+/K^+-adenosine triphosphatase. Endocrinology 142, 5059-5068 (2001).

18. W. Qu, **C. D. Bortner**, M. J. Hobson, T. Sakurai, and M. P. Waalkes. Acquisition of Apoptotic Resistance in Arsenic-Induced Malignant Transformation: Role of Mitochondria and the JNK Signal Transduction Pathway. Carcinogenesis 23, 151-159 (2002).

19. S. J. Wei, C. S. Trempus, R. E. Cannon, **C. D. Bortner**, and R. W. Tennant. Identification of Dss1 as a 12-O-Tetradecanoylphorbol-13-acetate-responsive Gene Expressed in Keratinocyte Progenitor Cells, with Possible Involvement in Early Skin Tumorigenesis. J. Biol. Chem. 278, 1758-1768 (2003).

20. J. H. Santos, L. Hunakova, Y. Chen, **C. Bortner**, and B. Van Houten B. Cell sorting experiments link persistent mitochondrial DNA damage with loss of mitochondrial membrane potential and apoptotic cell death. J. Biol. Chem. 278, 1728-1734 (2003).

21. C. S. Trempus, R. J. Morris, **C. D. Bortner**, G. Cotsarelis, R. S. Faircloth, J. M. Reece, and R. W. Tennant. Enrichment for Living Murine Keratinocytes from the Hair Follicle Bulge with the Cell Surface Marker CD34. J. Invest. Dermatol. 120, 501-511 (2003).

22. N.M. Storey, M. Gomez-Angelats, **C. D. Bortner**, D. L. Armstrong, and J. A. Cidlowski. Stimulation of Kv1.3 potassium channels by death receptors during apoptosis in Jurkat T lymphocytes. J Biol. Chem. 278, 33319-33326 (2003).

23. **C. D. Bortner** and J. A. Cidlowski. Uncoupling cell shrinkage from apoptosis reveals Na^+ influx is required for volume loss during programmed cell death. J. Biol. Chem. 278, 39176-39184 (2003).

24. R. Patterson, L. Vega, K. Trouba, **C. Bortner** and D. Germolec. Arsenic-induced alterations in the contact hypersensitivity response in Balb/c mice. Toxicol. Appl. Pharmacol. 198, 434-443 (2004).

25. W. Qu, B. A. Diwan, J. M. Reece, **C. D. Bortner**, J. Pi, J. Liu, and M. P. Waalkes**.** Cadmium-induced malignant transformation in rat liver cells: Role of aberrant oncogene expression and minimal role of oxidative stress. Int. J. Cancer 114, 346-355 (2005).

26. J. Pi, Y. He, **C. Bortner**, J. Huang, J. Liu, T. Zhou, W. Qu, S. L. North, K. S. Kaprzak, B. A. Diwan, C. F. Chignell, and M. P. Waalkes. Low level, long-term inorganic arsenite exposure causes generalized resistance to apoptosis in cultured human keratinocytes: Potential role in skin co-carcinogenesis. Int. J. Cancer 116, 20-26 (2005).

27. C. S. Trempus, R. J. Morris, M. Ehinger, A., Elmore, **C. D. Bortner**, M. Ito, G. Cotsarelis, J.G. Nijhof, J. Peckham, R. N. Flagler, G. Kissling, M. M.

Humble, L. C. King, L. D. Adams, D. Desai, S. Amin, and R. W. Tennant. CD34 expression by hair follicle stem cells is required for skin tumor development in mice. Cancer Res. 67, 4173-4181 (2007).

28. C. S. Trempus, H. Dang, M. M. Humble, S. J. Wei, M. J. Gerdes, R. J. Morris, **C. D. Bortner**, G. Cotsarelis, and R. W. Tennant. Comprehensive microarray transcriptome profiling of CD34-enriched mouse keratinocytoe stem cells. J. Invest. Dermatol. J. Invest. Dermatol. 127, 2904-2907 (2007).

29. A. B. Moore, L. Castro, L. Yu, X. Zheng, X. Di, M. I. Sifre, G. E. Kissling, R. R. Newbold, **C. D. Bortner**, and D. Dixon. Stimulatory and inhibitory effects of genistein on human uterine leiomyoma cell proliferation are influenced by the concentration. Hum. Reprod. 22, 2623-2631 (2007).

30. P. S. Chen, C. C. Wang, **C. D. Bortner**, G. S. Peng, X. Wu, H. Pang, R. B. Lu, P. W. Gean, D. M. Chuang, and J. S. Hong. Valproic acid and other histone deacetylase inhibitors induce microgrial apoptosis and attenuate lipopolysaccharide-induced dopaminergic neurotoxicity. Neuroscience 149, 203-212. (2007).

31. **C. D. Bortner**, M. I. Sifre, and J. A. Cidlowski. Cationic gradient reversal and cytoskeleton-independent volume regulatory pathways define an early stage of apoptosis. J. Biol. Chem. 283, 7219-7229 (2008).

32. K. Ajiro, **C. D. Bortner**, J. Westmoreland, and J. A. Cidlowski. An endogenous calcium-dependent, caspase-independent intranuclear degradation pathway in thymocyte nuclei: antagonism by physiological concentrations of K(+) ions. Exp. Cell Res. 314, 1237-1249 (2008).

33. L. Yang, J. M. Reece, J. Cho, **C. D. Bortner**, and S. B. Shears. The nucleolus exhibits and osmotically regulated gatekeeping activity that controls the spatial dynamics and functions of nucleolin. J. Biol. Chem. 283, 11823-11831 (2008).

34. R. Franco, W. I. DeHaven, M. I. Sifre, **C. D. Bortner**, and J. A. Cidlowski. Glutathione depletion and disruption of intracellular ionic homeostasis regulate lymphoid cell apoptosis. J. Biol. Chem. 283, 36071-36087 (2008).

35. J. Liu, L. Yu, E. J. Tokar, **C. Bortner**, M. I. Sifre, Y. Sun, and M. P. Waalkes. Arsenic-induced aberrant gene expression in fetal mouse primary liver-cell cultures. Ann. N.Y. Acad. Sci. 1140, 368-375 (2008).

36. X. Gao, L. Yu, L. Castro, A. B. Moore, T. Hermon, **C. Bortner**, M. Sifre, and D. Dixon. An endocrine-disrupting chemical, fenvalerate, induces cell cycle progression and collagen type I expression in human myometrial cells. Toxicol. Lett. 196:133-141 (2010).

37. M. I. Panayiotidis, R. Franco, **C. D. Bortner**, and J. A. Cidlowski. Ouabain-induced perturbations in intracellular ionic homeostasis regulate death receptor-mediated apoptosis. Apoptosis, 15:834-849 (2010).

38. H. S. Kang, K. Okamoto, Y. S. Kim, Y. Takeda, **C. D. Bortner**, H. Dang, T. Wada, W. Xie, X. P. Yang, G. Liao, and A. M. Jetten. Nuclear orphan

receptor TAK1/TR4-deficient mice are protected against obesity-linked inflammation, hepatic steatosis, and insulin resistance. Diabetes, 60:177-188 (2011).

39. C. S. Trempus, S. J. Wei, M. M. Humble, H. Dang, **C. D. Bortner**, M. I. Sifre, G. E. Kissling, J. A. Sunman, S. K. Akiyama, J. D. Roberts, C. J. Tucker, K. S. Chun, R. W. Tennant, R. Langenbach. A novel role for the T-box transcription factor Tbx1 as a negative regulator of tumor cell growth in mice. Mol. Carcinog. 50:981-991 (2011).

40. H. Li, J. A. Bradbury, R. T. Dackor, M. L. Edin, J. P. Graves, L. M. Degraff, P. M. Wang, **C. D. Bortner**, S. Maaruoka, F. B. Lih, D. N. Cook, K. B. Tomer, A. M. Jetten, and D. C. Zeldin. Cycooxygenase-2 (COX-2) regulates Th17 cell differentiation during allergic lung inflammation. Am. J. Respir. Crit. Care Med. 184:37-49 (2011).

41. H. S. Kang, K. Okamoto, Y. Takeda, J. Y. Beak, K. E. Gerrish, **C. D. Bortner**, L. M. Degraff, T. Wada, W. Xie, and A. M. Jetten. Transcriptional profiling reveals a role for ROR-alpha in regulating gene expression in obesity-associated inflammation and hepatic steatosis. Physiol. Genomics 43:818-828 (2011).

42. **C. D. Bortner**, A. B. Scoltock, M. I. Sifre, and J. A. Cidlowski. Osmotic stress resistance imparts acquired anti-apoptotic mechanisms in lymphocytes. J. Biol. Chem. 287:6284-62-95 (2012).

43. S. S. Brar, J. N. Meyer, **C. D. Bortner**, B. Van Houten, W. J. Martin, 2nd. Mitochondrial DNA-depleted A549 cells are resistant to bleomycin. Am. J. Physiol. (Lung Cell Mol Physiol) 303:L413-424 (2012).

44. L. A. Annab, **C. D. Bortner**, M. I. Sifre, J. M Collins, R. R. Shah, D. Dixon, H. Karimi Kinyamu, and T. K. Archer. Differential responses to retinoic acid and endocrine disruptor compounds of subpopulations within human embryonic stem cell lines. Differentiation 84:330-343 (2012).

45. H. Nakano, J. E. Burgents, K. Nakano, G. S. Whitehead, C. Cheong, **C. D. Bortner,** and D. N. Cook. Migratory properties of pulmonary dendritic cells are determined by their developmental linage. Mucosal Immunol. doi: 10.1038/mi.2012.106 (2013).

46. H. Li, M. L. Edin, J. A. Bradbury, J. P. Graves, L. M. DeGraff, A. Gruzdev, J. Cheng, R. T. Dackor, P. M. Wang, **C. D. Bortner**, S. Garantziotis, A. M. Jetten, and D. C. Zeldin. Cyclooxygenase-2 inhibits T helper cell type 9 differentiation during allergic lung inflammation via down-regulation of IL-17RB. Am. J. Respir. Crit. Care Med. 187, 812-822 (2013).

47. H. S. Kang, G. Lial, L. M. DeGraff, K. Gerrish, **C. D. Bortner**, S. Garantziotis, and A. M. Jetton. CD44 plays a critical role in regulating diet-induced adipose inflammation, hepatic steatosis, and insulin resistance. PLoS ONE 8(3): e58417. doi:10.1371/journal.pone.0058417 (2013).

48. R. Franco, **C. D. Bortner**, I. Schmitz, and J. A. Cidlowski. Glutathione depletion regulates both extrinsic and intrinsic apoptotic signaling cascades

independent from multidrug resistance protein 1. Apoptosis 19:117-134 (2014).

49. V. P. Stober, C. Szczesniak, Q. Childress, R. L. Heise, **C. D. Bortner**, J. W. Hollingsworth, I. P. Neuringer, S. M. Palmer, S. Garantziotis. Bronchial epithelial injury in the context of alloimmunity promotes lymphocytic bronchiolitis through hyaluronan expression. Am. J. Physiol. Lung Cell Mol. Physiol. 306:L1045-1055 (2014).

50. P. R. Brown, F. Odet, **C. D. Bortner**, and E. M. Eddy. Reporter mice express green fluorescent protein at initiation of meiosis in spermatocytes. Genesis 52:976-984 (2014).

51. H. Nakano, T. P. Moran, K. Nakano, K. E. Gerrish, **C. D. Bortner**, and D. N. Cook. Complement receptor C5aR1/CD88 and dipeptidyl peptidase-4/CD26 define distinct hematopoietic lineages of dendritic cells. J. Immunol. 194:3808-3819 (2015).

52. S. T. Yong, H. N. Nguyen, J. H. Choi, **C. D. Bortner**, J. Williams, N. K. Pulloor, M. N. Krishnan, and S. B. Shears. Identification of a functional nuclear translocation sequence in hPPIP5K2. BMC Cell Biol. 16:17 doi: 10.11.1186/s12860-015-0063-7 (2015).

53. J. H. Joo, E. Ueda, **C. D. Bortner**, X. P. Yand, G. Liao, and A. M. Jetten. Fernesol actives the tntrinsic pathway of apoptosis and the ATF4-ART3-CHOP cascade of ER stress in human T lymphblastic leukemia Molt4 cells. Biochem. Pharmacol. 97:256-268 (2015).

54. N. K. Sharma, A. Kumari, E. J. Tokar, M. P. Waalkes, **C. D. Bortner**, J. Williams, M. Ehrenshaft, R. P. Mason, and B. K. Sinha. Nitric oxide down-regulates topoisomerase I and induces camptothecin resistance in human breast MCF-7 tumor cells. PLoS One 5;10(11):e0141897. doi: 10.1371/journal.pone.0141897 (2015).

55. **C. D. Bortner**, A. B. Scoltock, D. W. Cain, and J. A. Cidlowski. T-cell development of resistance to apoptosis is driven by a metabolic shift in carbon source and altered activation of death pathways. Cell Death Differ. 23:889-202 (2016).

56. H. S. Kang, L. Y. Chen, K. Lichti-Kaiser, G. Liao, K. Gerrish, **C. D. Bortner**, H. H. Yao, E. M. Eddy, and A. M. Jetten. Transcription Factor GLIS3: A New and Critical Regulator of Postnatal Stages of Mouse Spermatogenesis. Stem Cells 34:2772-2783 (2016).

57. B. K. Sinha, T. J. van't Erve, A. Kumar, **C. D. Bortner**, A. G. Motten, and R. P. Mason. Synergistic Enhancement of Topotecan-Induced Cell Death by Ascorbic Acid in Human Breast MCF-7 Tumor Cells. Free Radic Biol Med. 113:406-412 (2017).

58. B. K. Sinha, **C. D. Bortner**, R. P. Mason, and R. E. Cannon. Nitric oxide reverses drug resistance by inhibiting ATPase activity of p-glycoprotein in human multi-drug resistant cancer cells. Biochim Biophys Acta. 1862:2806-2814 (2018).

59. L. Yu, P. Das, A. J. Vall, Y. Yan, X. Gao, M. I. Sifre, **C. D. Bortner**, L. Castro, G. E. Kissling, A. B. Moore, D. Dixon. Bisphenol A induces human uterine leiomyoma cell proliferation through membrane-associated ERα36 via nongenomic signaling pathways. Mol Cell Endocrinol. 484:59-68 (2019).

60. J. Lui, L. Yu, L. Castro, Y. Yan, M. I. Sifre, **C. D. Bortner**, D. Dixon. A nongenomic mechanism for "metalloestrogenic" effects of cadmium in human uterine leiomyoma cells through G protein-coupled estrogen receptor. Arch. Toxicol. 93:2773-2785 (2019).

Review Articles / Book Chapters

1. R. Rubin, **C. Bortner**, C. Hseih, and J. Griffith. An Approach to the Analysis of DNA Curvature by Computer Modeling and Electron Microscopy, in Mechanisms and Consequences of DNA Damage Processing. UCLA Symposia on Molecular and Cellular Biology, New Series, volume 83, pp 7-11 (1988).

2. J. Griffith, **C. Bortner**, G. Christiansen, J. Register, and R. Thresher. The Structure of Three-Stranded Joints Catalyzed by the RecA Protein, in Molecular Mechanisms in DNA Replication and Recombination. UCLA Symposia on Molecular and Cellular Biology, New Series, volume 127, pp 105-114 (1990).

3. **C. D. Bortner** and J. A. Cidlowski. The Role of DNA Fragmentation in Apoptosis. Trends in Cell Biology 5, 21-26 (1995).

4. J. A. Cidlowski, K. L. King, R. B. Evans-Storms, J. W. Montague, **C. D. Bortner**, and F. M. Hughes Jr. The biochemistry and molecular biology of glucocorticoid-induced apoptosis in the immune system. Rec. Prog. Horm. Res. 51, 457-491 (1996).

5. **C. D. Bortner**, F. M. Hughes Jr., and J. A. Cidlowski. Cell volume regulation, ions, and apoptosis. In: Programmed Cell Death (eds. Y-B Shi, Y Shi, D Scott and Y Xu), Plenum Press, NY pp 63-70 (1997).

6. **C. D. Bortner** and J. A. Cidlowski. Cell Volume Regulation and the Movement of Ions during Apoptosis. In: Cell Death in Reproductive Physiology (eds. J. Tilly, J. Strause III, and M. Tenniswood), Springer-Verlag, NY pp 230-248 (1997).

7. **C. D. Bortner** and J. A. Cidlowski. A Necessary Role for Cell Shrinkage in Apoptosis. Biochem. Pharmacol. 56, 1549-1559 (1998).

8. M. Gomez-Angelats, **C. D. Bortner**, and J. A. Cidlowski. Cell Volume Regulation in Immune Cell Apoptosis. Cell Tissue Res. 301, 33-42 (2000).

9. **C. D. Bortner** and J. A. Cidlowski. Volume Regulation and Ion Transport during Apoptosis. Meth. Enzymol. 322, 421-432 (2000).

10. **C. D. Bortner** and J. A. Cidlowski. Flow Cytometric Analysis of Cell Shrinkage and Monovalent Ions during Apoptosis. Meth. Cell Biol. 66, 49-67 (2001).

11. **C. D. Bortner** and J. A. Cidlowski. Cellular Mechanisms for the Repression of Apoptosis. Annu. Rev. Pharmacol. Toxicol. 42, 259-281 (2002).

12. **C. D. Bortner** and J. A. Cidlowski. Apoptotic volume decrease and the incredible shrinking cell. Cell Death Differ. 12,1307-1310 (2002).

13. **C. D. Bortner** and J. A. Cidlowski. The role of apoptotic volume decrease and ionic homeostasis in the activation and repression of apoptosis. Pflügers Archiv. European Journal of Physiology 448, 313-318 (2004).

14. G. Heimlich, **C. D. Bortner**, and J. A. Cidlowski. Apoptosis and cell volume regulation: the importance of ions and ion channels. Adv. Exp. Med. Biol. 559, 189-203 (2004).

15. **C. D. Bortner.** Apoptotic Volume Decrease and Nitric Oxide. Toxicology 208, 213-221 (2005).

16. R. Franco, **C. D. Bortner**, and J. A. Cidlowski. Potential roles of electrogenic ion transport and plasma membrane depolarization in apoptosis. J. Membr. Biol. 209, 43-58 (2005).

17. M. I. Panayiotidis, **C. D. Bortner**, and J. A. Cidlowski. On the mechanism of ionic regulation of apoptosis: would the Na/K-ATPase please stand up? Acta Physiol. (Oxf) 187, 205-215 (2006).

18. **C. D. Bortner**, and J. A. Cidlowski. Cell shrinkage and monovalent cation fluxes: role in apoptosis. Arch. Biochem. Biophys. 462, 176-188 (2007).

19. **C. D. Bortner**, M. I. Sifre, and J. A. Cidlowski. New approaches for determining apoptotic volume decrease in cells. Meth. Enzymol. 428, 161-181 (2007).

20. **C. D. Bortner** and J. A. Cidlowski. Life and death of lymphocytes: a volume regulation affair. Cell Physiol. Biochem. 28:1079-1088 (2011).

21. **C. D. Bortner** and J. A. Cidlowski. Ion channels and apoptosis in cancer. Philo Trans. R. Soc. Lond. B. Biol. Sci. 369: 20130104 (2014).

22. M.G. Petrillo, **C. D. Bortner** and J. A. Cidlowski. Glucocorticoids: Inflammation and Immunity. The Hypothalamic-Pituitary-Adrenal Axis in Health and Disease. E. B. Geer (ed.) DOI 10.1007/978-3-319-45950-9_3 (2017).