October 4, 2013

CURRICULUM VITAE

PERSONAL INFORMATION

Name:	David C. Williams Jr.
Title:	Associate Professor
Institution Name:	University of North Carolina
Business Address 1:	Department of Pathology and Laboratory Medicine Room 909 Brinkhous Bullitt; CB7525 160 N Medical Dr
City, State, Zip:	Chapel Hill, NC 27599-7525
Business Phone:	(919) 843-9949
Business Email:	david_willjr@med.unc.edu

EDUCATION

07/05-06/06	**Hematopathology Fellowship,** Virginia Commonwealth University, Richmond, Virginia
07/01-06/05	**Post-Doctoral Fellow,** Laboratory of Chemical Physics, NIDDK, National Institutes of Health, Bethesda, Maryland (in the lab of Dr. G. Marius Clore)
07/98-06/01	**Residency in Anatomic Pathology**, Duke University Medical Center, Durham, North Carolina
05/97-05/98, 07/90-06/92	**M.D.**, University of Virginia School of Medicine, Charlottesville, Virginia
07/92-05/97	**Ph.D., Biophysics,** University of Virginia Graduate School of Arts and Sciences, Charlottesville, Virginia
08/86-05/90	**B.S., Chemistry,** College of William and Mary, Williamsburg, Virginia

LICENSURE AND CERTIFICATIONS

LICENSURE

Medical License: Virginia & North Carolina

CERTIFICATIONS

The American Board of Pathology, Certification in Anatomic Pathology, 09/01-indefinite

The American Board of Pathology, Subspecialty Certification in Hematology, 09/06-12/16

PROFESSIONAL EXPERIENCE

07/13-present	Associate Professor (tenure eligible), Department of Pathology and Laboratory Medicine, University of North Carolina, Chapel Hill, North Carolina
06/13-07/13	Associate Professor with tenure, Department of Pathology, Virginia Commonwealth University, Richmond, Virginia
07/11-07/13	Director of Molecular Hematology, Department of Pathology, Virginia Commonwealth University, Richmond, Virginia
02/11-07/13	Co-Director of Tissue and Data Acquisition and Analysis Core, Department of Pathology, Virginia Commonwealth University, Richmond, Virginia
07/09-07/13	Co-Director of Hematology, Department of Pathology, Virginia Commonwealth University, Richmond, Virginia
03/08-07/13	Associate Member, Massey Cancer Center, Virginia Commonwealth University, Richmond, Virginia
07/06-06/13	Assistant Professor, Department of Pathology, Virginia Commonwealth University, Richmond, Virginia (tenure eligible July 1, 2008)

HONORS AND AWARDS

2011-2012	High Evaluation Teaching Award in the Hematology/Oncology Course, School of Medicine
2008-2011	American Society of Hematology Junior Faculty Scholar Award
2009-2010	Outstanding Teaching Award for Best Teacher in the Hematology/Oncology Course, School of Medicine
2001-2004	PRAT Fellowship, National Institute of General Medical Sciences, Bethesda, MD
1990-1998	Medical Scientist Training Program, University of Virginia, Charlottesville, VA
1997	Invited Speaker to the Mid-Atlantic Immunobiology Conference, "Amide hydrogen exchange rates in an Fv fragment free and bound to antibody"
1996	Keystone Award for Outstanding Scientific Contribution, at the Keystone Symposium "Exploring and Exploiting Antibody and Ig Superfamily Combining Sites"
1992	Alpha Omega Alpha national medical honor society
1990	Graduated with highest honors, College of William and Mary, Williamsburg VA
1990	Student Awardee of The American Institute of Chemists Foundation
1990	Gamma Sigma Epsilon Chemistry Honors Society

1989 Phi Beta Kappa member elect, Alpha Chapter, College of William and Mary, Williamsburg VA
1987-1988 William and Mary ranking scholars
1986-1987 Alpha Lambda Delta freshman honors society

BIBLIOGRAPHY

REFEREED PAPERS

1. Amaya, M.L., Desai, M., Gnanapragasam, M.N., Wang, S.Z., Zu Zhu, S., **Williams, D.C., Jr.,** Ginder, G.D. Mi2β-mediated silencing of the fetal γ-globin gene in adult erythroid cells. Blood, 121(17):3493-3501, 2013.

2. Walavalkar NM, Gordon N, **Williams DC Jr.** Unique features of the anti-parallel, heterodimeric coiled-coil interaction between methyl-cytosine binding domain 2 (MBD2) homologues and GATA zinc finger domain containing 2A (GATAD2A/p66α). J. Biol. Chem, 288(5):3419-3427, 2013.

3. Rahmani M, Aust MM, Attkisson E, **Williams DC Jr**, Ferreira-Gonzalez A, Grant S. Dual inhibition of Bcl-2 and Bcl-xL strikingly enhances PI3K inhibition-induced apoptosis in human myeloid leukemia cells through a GSK3- and Bim-dependent mechanism. Cancer Res, 73(4):1340-1351, 2013.

4. Toor AA, Payne KK, Chung HM, Sabo RT, Hazlett AF, Kmieciak M, Sanford K, **Williams DC**, Clark WB, Roberts CH, McCarty JM, Manjili MH. Epigenetic induction of adaptive immune response in multiple myeloma: sequential azacitidine and lenalidomide generate cancer testis antigen-specific cellular immunity. Br. J. Haematol., 158(6):700-711, 2012.

5. Rahmani M, Aust MM, Attkisson E, **Williams DC Jr**, Ferreira-Gonzalez A, Grant S. Inhibition of Bcl-2 anti-apoptotic members by obatoclax potently enhances sorafenib-induced apoptosis in human myeloid leukemia cells through a Bim-dependent process. Blood, 119(25):6089-6098, 2012.

6. Toor AA, Sabo RT, Chung HM, Roberts C, Manjili RH, Song S, **Williams DC Jr**, Edmiston W, Gatesman ML, Edwards RW, Ferreira-Gonzalez A, Clark WB, Neale MC, McCarty JM, Manjili MH. Favorable Outcomes in Patients with High Donor-Derived T Cell Count after in Vivo T Cell-Depleted Reduced-Intensity Allogeneic Stem Cell Transplantation. Biol Blood Marrow Transplant, 18(5): 794-804, 2012.

7. Scarsdale JN, Webb HD, Ginder GD, **Williams DC Jr.** Solution structure and dynamic analysis of chicken MBD2 methyl binding domain bound to a target-

methylated DNA sequence. Nuc Acids Res, 39(15):6741-6752, 2011.

8. Gnanapragasam MN, Scarsdale JN, Amaya ML, Webb HD, Desai MA, Walavalkar NM, Wang SZ, Zu Zhu S, Ginder GD, **Williams DC Jr.** p66α-MBD2 coiled-coil interaction and recruitment of Mi-2 are critical for globin gene silencing by MBD2-NuRD complex. Proc Natl Acad Sci USA, 108(18): 7487-7492, 2011.

9. Riley RS, **Williams DC Jr**, Ross M, Zhao S, Chesney A, Clark BD, Ben-Ezra JM. Bone marrow aspirate and biopsy: a pathologist's perspective. II. interpretation of the bone marrow aspirate and biopsy. J Clin Lab Anal, 23:259-307, 2009.

10. Hu J, Hu K, **Williams DC Jr**, Komlosh ME, Cai M, Clore GM. Solution NMR structures of productive and non-productive complexes between the A and B domains of the cytoplasmic subunit of the mannose transporter of the *Escherichia coli* phosphotransferase system. J Biol Chem, 283(16):11024-11037, 2008.

11. **Williams DC Jr**, Massey GV, Russell EC, Riley RS, Ben-Ezra J. Translocation positive acute myeloid leukemia associated with valproic acid therapy. Pediatr Blood Cancer, 50(3):641-643, 2008.

12. Basu P, Lung TK, Lemsaddek W, Sargent TG, **Williams DC Jr,** Basu M, Redmond LC, Lingrel JB, Haar JL, Lloyd J.A. EKLF and KLF2 have compensatory roles in embryonic ρ-globin gene expression and primitive erythropoiesis. Blood, 110(9):3417-3425, 2007.

13. Suh J-Y, Cai M, **Williams DC Jr**, Clore GM. Solution structure of a post-transition state analog of the phosphotransfer reaction between A and B cytoplasmic domains of the mannitol transporter $II^{mannitol}$ of the *Escherichia coli* phosphotransferase system. J Biol Chem, 281(13):8939-8949, 2006.

14. **Williams DC Jr**, Lee JY, Cai M, Bewley CA, Clore GM. Crystal structures of the HIV-1 inhibitory cyanobacterial protein MVL free and bound to $Man_3GlcNAc_2$: Structural basis for specificity and high-affinity binding to the core pentasaccharide from N-linked oligomannoside. J Biol Chem, 280(32):29269-29276, 2005.

15. **Williams DC Jr**, Cai M, Suh JY, Peterkofsky A, Clore GM. Solution NMR structure of the 48-kDa $IIA^{Mannose}$-HPr complex of the *Escherichia coli* mannose phosphotransferase system. J Biol Chem, 280(21):20775-20784, 2005.

16. Tang C, **Williams DC Jr**, Ghirlando R, Clore GM. Solution structure of enzyme $IIA^{Chitobiose}$ from the *N,N'*-diacetylchitobiose branch of the *Escherichia coli* phosphotransferase system. J Biol Chem, 280(12): 11770-11780, 2005.

17. Miclet E, **Williams DC Jr**, Clore GM, Boisbouvier J, Bax A. Relaxation-optimized NMR spectroscopy of methylene groups in proteins and nucleic acids. J Am Chem Soc, 126: 10560-10570, 2004.

18. **Williams DC Jr**, Cai M, Clore GM. Molecular basis for synergistic transcriptional activation by Oct1 and Sox2 revealed from the solution structure of the 42 kDa Oct1·Sox2·*Hoxb1*-DNA ternary transcription factor complex. J Biol Chem, 279(2):1449-1457, 2004.

19. Cai* M, **Williams* DC Jr**, Wang G, Peterkofsky A, Clore GM. Solution structure of the phosphoryl transfer complex between the signal-transducing protein $IIA^{Glucose}$ and the cytoplasmic domain of the glucose transporter $IICB^{Glucose}$ of the *Escherichia coli* glucose phosphotransferase system. J Biol Chem, 278(27):25191-25206, 2003. *contributed equally.

20. Gong JZ, **Williams DC Jr**, Liu K, Jones C. Fine-needle aspiration in non-Hodgkin lymphoma: evaluation of cell size by cytomorphology and flow cytometry. Am J Clin Path, 117(6):880-888, 2002.

21. **Willliams DC Jr**, Poljak RJ, Rule GS, Benjamin DC. Reduction in the amide hydrogen exchange rates of an anti-lysozyme Fv fragment due to formation of the Fv-lysozyme complex. J Mol Biol, 270:751-762, 1997.

22. Mueller GA, Smith AM, **Williams DC Jr**, Hakkaart GAJ, Aalberse RC, Chapman MD, Rule GS, Benjamin DC. Expression and secondary structure determination by NMR methods of the major house-dust-mite allergen Der p 2. J Biol Chem, 272:26893-26898, 1997.

23. **Williams DC Jr**, Benjamin DC, Poljak RJ, Rule GS. Global changes in amide hydrogen exchange rates for a protein antigen in complex with three different antibodies. J Mol Biol, 257:866-876, 1996.

24. Benjamin DC, **Williams DC Jr**, Smith-Gill SJ, Rule GS. Long-range changes in a protein antigen due to antigen-antibody interaction. Biochemistry, 31:9539-9545, 1992.

25. Smith SH, Forrest SM, **Williams DC Jr**, Cabell MF, Acquavella MF, Abelt CJ. Regioselectivity of the insertion reactions of some aromatic diazo compound complexes with cyclomaltoheptaose. Carbohyd Res, 230:289-297, 1992.

EXTRAMURAL PRESENTATIONS

INTERNATIONAL

08/2012 Oral and poster presentation, FASEB Science Research Conference, Snowmass, CO

04/2012 Oral presentation and poster presentations (2), Experimental Biology 2012, San Diego, CA

12/2009 Oral presentation, American Society of Hematology 51st Annual Meeting and Exposition, San Francisco, CA

12/2008 Oral presentation, American Society of Hematology 50th Annual Meeting and Exposition, San Francisco, CA

04/2007 Poster presentation, NCI Symposium, National Institutes of Health, Bethesda, MD

07/2005 Poster presentation, Annual Symposium of The Protein Society, Boston, MA

02/1996 Poster presentation, Keystone Symposium, Taos, New Mexico

REGIONAL

10/2011 Seminar, Laboratory of Molecular Carcinogenesis, National Institute of Environmental Health Sciences, Research Triangle Park, NC

10/2010 Poster presentation, 5th Annual Atlantic Coast Chromatin Conference, Chapel Hill, NC

06/1997 Oral Presentation, Mid-Atlantic Immunobiology Conference, Maryland

LOCAL

2008 Lecture for the Annual Mini-Medical School, Science Museum of Virginia

2006 Lecture for the Leukemia & Lymphoma Society Family Support Group

03/2006 Seminar, Physics Department, University of Richmond, Richmond, VA

11/2005 Seminar, Pathology Department, University of North Carolina, Chapel Hill, NC

12/1999 Seminar, NIDDK, National Institutes of Health, Bethesda, MD

TEACHING, ADVISING, AND MENTORING

2013-present Small group instructor, Hematology/Oncology, 10 contact hours

2009-2013 Lecturer, Lymphoma, Hematology section of M-II Pathology course, 1 contact hour

2008-2013 Lab instructor, Cardiovascular Pathology section of M-II Pathology course, 2 contact hours

2008-2013	Journal Club, Hematopathology service, 2 contact hours
2008-2013	Lecturer, Hematopathology, pathology residents, 2 contact hours
2006-2013	Attending Physician, Hematopathology service (1-2 residents, 1 fellow), 4 hours per day, 2.5-5 months per year
2006-2013	Lecturer, Oncogenes, Hematology section of M-II Pathology course, 1 contact hour
2006-2013	Small group instructor, Hematology section of M-II Pathology course, 18 contact hours
2007, 2009-2011	Guest Lecturer, Chemistry Graduate Students, 1 contact hour

Formal Mentees:

Graduate Students:

2012-present	Leander Sinanan, Pathology and Laboratory Medicine, 4 contact hours per week
2012-present	Jason Cramer, Biochemistry, 4 contact hours per week
2008-2013	Ninad Walavalkar, Integrated Life Sciences
2012-2013	Khaled Yassine, Pediatric Hematology/Oncology Fellow and Masters student in Biochemistry

Post-Doctoral Students:

2013-present	Ninad Walavalkar, Pathology, 4 contact hours per week
2007-2009	Eugene Kim, Microbiology

Graduate Committee Member for:

2012-present	Justin Sperlazza, Genetics, 2 contact hours
2011-present	Megha Desai, Genetics, 4 contact hours
2010-present	James Marion, Biochemistry, 4 contact hours
2009-present	Railey White, Chemistry, 4 contact hours
2008-present	Yousef Alhashem, Genetics, 2 contact hours
2008-2011	Jason Call, Biochemistry, 4 contact hours
2008	Becca Eller, Biochemistry, 3 contact hours

GRANTS

ACTIVE

R01-GM098264-01 Williams (PI) 05/01/2012-04/30/2017
Structural and functional diversity of the methyl-binding domain protein family

The goal of this project is to characterize protein:DNA interactions for members of a family of proteins that bind methylated DNA. This work includes NMR analysis, biophysical measurements, and gene expression analysis in whole cells.
Role: PI (25% effort) $950,000

2R01-CA039687-23 Moran (PI) 02/01/2010-01/31/2015
Human folylpolyglutamate synthetase and cancer therapeutics

The goal of this project is to characterize the function of folypolyglutamate synthetase and its role in cancer therapeutics through folate anti-metabolites. This work will include determining the structure of the human FPGS by NMR and/or x-ray crystallography.
Role: Co-Investigator (5% effort)

1R01HD076257-01 Zhang (PI) 04/01/2013-03/31/2018
Dissection of the structural basis of MEIG1 in assembling sperm flagella

The goal of this project is to study the role of the Meig1 protein in binding and transporting different cargo out the sperm flagella during spermatogenesis. This work involves determining the structure of Meig1 by NMR and characterizing binding by mutagenesis, functional, and biophysical analyses.
Role: Co-Investigator (3% effort)

COMPLETED

Massey Cancer Center Pilot Project Williams (PI) 07/01/2010-06/30/2012
The mechanism of MBD2 dependent silencing of methylated tumor suppressor genes in cancer

The goal of this project is to determine how the p66α-MBD2 sub-complex interacts with remaining members of MBD2-NuRD. This work will involve structural analysis of the interaction between MBD2 and RbAp46/48 as well as co-immunoprecipitation experiments involving of single chain p66α-MBD2 peptides in whole cells.
Role: PI (10% effort – no salary support) $30,000

ACS Institutional Research Grant Williams (PI) 07/01/2010-12/31/2011
Developing a peptide inhibitor of the MBD2-NuRD methylated DNA binding complex

The goal of this project is to further develop a coiled-coil peptide that disrupts MBD2 function *in vivo*. This work will involve biophysical characterization of a coiled-coil domain and development of a cell-penetrating peptide.

Role: PI (20% effort) $25,000

ASH Junior Faculty Scholar Williams (PI) 07/01/2008-06/30/2011
Developing a methyl cytosine-binding protein complex as a molecular therapeutic target

The goals of this project are to i) determine direct contact between MBD2 and MeCPC(NuRD) using a chemical crosslinking approach, and ii) determine the structure of MBD bound to methylated DNA. This complex regulates the switch to β-globin expression and serves as a therapeutic target for sickle cell anemia.
Role: PI (20% effort) $150,000

Massey Cancer Center Pilot Project Taylor (PI) 05/2009-05/2010
Mechanisms generating aberrant CpG methylation patterns in oncogenesis

The goal of this project is to characterize two novel isoforms of DNMT1 both *in vivo* and *in vitro.* In particular, the interaction between the N-DNMT1 isoform and the UHRF1 SRA domain will be characterized as well as the impact of overexpression of C-DNMT1 and N-DNMT1 on genomic methylation patterns.
Role: Co-Investigator

ACS Institutional Research Grant Williams (PI) 01/01/2007-12/31/2008
Structural analysis of the crosstalk between the TGF-β and HOX regulatory pathways

The goal of this project is to determine the structure of Smad:Hox complexes involved in the crosstalk between the TGFβ and HOX regulatory pathways.
Role: PI (10% effort – no salary support) $20,000

Pharmacology Research Associate Williams (Fellowship) 10/09/2001-10/16/2004
Role: Post-doctoral fellow

PROFESSIONAL SERVICE

2009-present	College of American Pathologist, Fellow Member
2006-present	American Society of Hematology, Active Member
2005-present	United States and Canadian Academy of Pathology
2007-2013	Research Strategic Planning Committee, Department of Pathology, Virginia Commonwealth University
April 2012	Graduate Steering Committee, Department of Physiology and Biophysics
2008-2011	Member, Faculty Senate, Virginia Commonwealth University

February 2008 Search Committee, Department of Physiology and Biophysics, Virginia Commonwealth University