

# J. Devon Roll

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## **EDUCATION:**

Ph.D. candidate, Department of Pathology and Laboratory Medicine  
Dissertation Title: "Mechanism and Consequence of the Hypermethylator Phenotype in Human Breast Cancer" (under the direction of William B. Coleman, Ph.D.)  
Department of Pathology and Laboratory Medicine  
School of Medicine  
University of North Carolina  
Chapel Hill, North Carolina  
August 2004-present

B.A. *cum laude*, Biological Sciences with High Honors (Minor: Geology)  
Smith College  
Northampton, Massachusetts  
August 2000-May 2004  
GPA: 3.78

## **RESEARCH EXPERIENCE:**

*Pathology Graduate Student and Ph.D. candidate, Department of Pathology and Laboratory Medicine (with Dr. William B. Coleman), UNC Lineberger Comprehensive Cancer Center, School of Medicine, University of North Carolina, Chapel Hill, North Carolina*

Assessed the expression and methylation status of epigenetically-regulated genes in order to determine if a hypermethylator phenotype exists in human breast cancer cell lines. Unsupervised cluster analysis of expression data revealed a distinct subset of breast cancer cell lines that methylate such genes at high levels, constituting a breast cancer hypermethylator phenotype. DNMT activity and protein analysis revealed a specific methylation defect in hypermethylator cell lines: overexpression of DNMT3b, resulting in elevated DNMT activity. A gene signature indicative of the hypermethylator phenotype was found exclusively among human primary breast tumors of the basal-epithelial subtype, revealing a novel intrinsic characteristic of this poor-prognosis breast cancer subtype. May 2005-present

*Pathology Graduate Student, Department of Pathology and Laboratory Medicine (with Dr. David Kaufman), School of Medicine, University of North Carolina, Chapel Hill, North Carolina*

Investigated the impact of temporally varied growth factor stimulation upon the ability of mTOR to phosphorylate downstream targets in endometrial stromal cells. Performed western blotting and maintenance of primary human cultures. March 2005-May 2005

Pathology Graduate Student, Department of Pathology and Laboratory Medicine (with Dr. William Coleman), School of Medicine, University of North Carolina, Chapel Hill, North Carolina

Examined the methylation status of the promoter regions of CEACAM5 and CEACAM6 in numerous breast cancer cell lines, confirming their epigenetic regulation despite containing only weak CpG islands. Performed RT-PCR, cloning, bisulfite conversion, and DNA sequencing techniques. January 2005-March 2005

*Pathology Graduate Student, Department of Pathology and Laboratory Medicine (with Dr. Frank Church), School of Medicine, University of North Carolina, Chapel Hill, North Carolina*

Quantified the respective roles of migration and replication in the wound closure capabilities of renal carcinoma cell lines under various growth conditions. Assessed the effects of PAI-1 blocking antibodies on cell migration and adhesion to various protein substrates. Performed wound closure and adhesion assays, cell culture. August 2004-December 2004

*Research Assistant, Biological Sciences Department (with Dr. Stephen Tilley), Smith College, Northampton, Massachusetts*

Undergraduate Thesis Title: "Investigation of *D. santeetlah* and an undescribed desmognathine form along a putative contact zone in the Smoky Mountain region of Cosby, Tennessee." Performed field work, animal handling, PCR, and sequencing techniques. May 2003-May 2004

#### **HONORS AND AWARDS:**

Dunn Scholar, Smith College, 2000-2004

Robert C. Byrd Honors Scholar, 2000-2004

Elizabeth B. Horner Fellowship, 2003

Dean's List, Smith College, 2000-2004

First Group Scholar Society, Smith College, 2003-2004

Phi Beta Kappa

Robert H. Wagner Scholar, University of North Carolina, 2004-present

Graduate School Merit Assistantship, University of North Carolina, 2004-2005

*American Society for Investigative Pathology* Trainee Travel Award, 2006

North Carolina Impact Award from the Graduate Education Advancement Board, 2008

*American Society for Investigative Pathology* Trainee Travel Award, 2008

#### **PROFESSIONAL AFFILIATIONS:**

*American Society for Investigative Pathology*, Active Trainee Member, October 2005-present

*DNA Methylation Society*, Active Member, May 2006-present

*Sigma Xi*, Active Member, April 2004-present

*American Medical Writers Association*, Active Member, January 2008-present

#### **FELLOWSHIPS AND GRANTS:**

Predocctoral Fellowship from the Environmental Pathology Training Program, University of North Carolina at Chapel Hill, under National Research Service Award T32 ES 017017 from the National Institute of Environmental Health Sciences, June 2007-May 2008.

## **PUBLICATIONS:**

Rivenbark, A.G., Jones, W.D., **Risher, J.D.**, and Coleman, W.B. (2006) DNA methylation-dependent epigenetic regulation of gene expression in MCF-7 breast cancer cells. *Epigenetics* **1**: 32-44.

**Roll, J.D.**, Rivenbark, A.G., Jones, W.D., and Coleman, W.B. (2008) DNMT3b overexpression contributes to a hypermethylator phenotype in human breast cancer cell lines. *Molecular Cancer*, **7**:15.

**Roll, J.D.**, Parker, J.S., Rivenbark, A.G., Jones, W.D., Carey, L.A., Livasy, C.A., and Coleman, W.B. (2008) High concordance of basal phenotype breast cancers and the hypermethylator phenotype (in preparation).

## **PUBLISHED ABSTRACTS:**

**Risher, J.D.**, Rivenbark, A.G., and Coleman, W.B. (2006) Investigation of the CpG island methylator phenotype reveals two methylation classes among breast cancer cell lines. *FASEB J.* **20**:A220.

**Risher, J.D.**, and Coleman, W.B. (2007) Aberrant DNA Methyltransferase 3b Activity Accounts for the Hypermethylator Phenotype in Human Breast Cancer Cell Lines. *FASEB J.* **21**:A755.

**Risher, J.D.**, Rivenbark, A.G., and Coleman, W.B. (2007) Methylation Status of CEACAM6 Predicts Hypermethylator Phenotype Among Human Breast Cancer Cell Lines. *FASEB J.* **21**:A756.

**Risher, J.D.**, Parker, J.S., Rivenbark, A.G., Jones, W.D., Carey, L.A., Livasy, C.A., and Coleman, W.B. (2008) Basal-like breast cancers express a hypermethylation defect. *FASEB J.* (in press).

**Risher, J.D.**, Rivenbark, A.G., Jones, W.D., and Coleman, W.B. (2008) DNMT3b overexpression contributes to a hypermethylator phenotype in human breast cancer cell lines. *FASEB J.* (in press).

Sandhu, R., **Risher, J.D.**, and Coleman, W.B. (2008) Sensitizing hypermethylator breast cancer cells to chemotherapeutics using demethylating agents. *FASEB J.* (in press).

## **PROFESSIONAL MEETINGS AND INVITED PRESENTATIONS:**

Oral Presentation: "Methylation of CEACAM5 and CEACAM6 in human breast cancer cells." **J.D. Risher** (Presenter), A.G. Rivenbark, and W.B. Coleman. Student Seminar Series, Department of Pathology and Laboratory Medicine, University of North Carolina, March 2005, Chapel Hill, NC.

Poster Presentation: "Investigation of the CpG island methylator phenotype in breast cancer cell lines." **J.D. Risher** (Presenter), A.G. Rivenbark, and W.B. Coleman. Annual Research Symposium, Department of Pathology and Laboratory Medicine, University of North Carolina, September 2005, Chapel Hill, NC.

Poster Presentation: "Epigenetic regulation of genes with typical and atypical CpG features in MCF-7 breast cancer cells." A.G. Rivenbark (Presenter), W.D. Jones, **J. D. Risher**, and W.B. Coleman. Environmental Epigenomics Conference, November 2005, Durham, NC.

Poster Presentation: "Epigenetic regulation of genes with typical and atypical CpG features in MCF-7 breast cancer cells." A.G. Rivenbark (Presenter), W.D. Jones, **J.D. Risher**, and W.B. Coleman. Curriculum in Toxicology Annual Retreat, University of North Carolina, January 2006, Chapel Hill, NC.

Poster Presentation: "Investigation of the CpG island methylator phenotype in breast cancer cell lines." **J.D. Risher** (Presenter), A.G. Rivenbark, and W.B. Coleman. Department of Pathology and Laboratory Medicine Poster Session, University of North Carolina, January 2006, Chapel Hill, NC.

Poster Presentation: "Epigenetic regulation of genes with typical and atypical CpG features in MCF-7 breast cancer cells." A.G. Rivenbark (Presenter), W.D. Jones, **J. D. Risher**, and W.B. Coleman. Department of Pathology and Laboratory Medicine Poster Session, University of North Carolina, January 2006, Chapel Hill, NC.

Oral Presentation: "DNA methylation-dependent epigenetic regulation of gene expression in MCF-7 breast cancer cells." A.G. Rivenbark (Presenter), W.D. Jones, **J.D. Risher**, and W.B. Coleman. Seminar Series, Curriculum in Toxicology, University of North Carolina, March 2006, Chapel Hill, NC.

Poster Presentation: "Investigation of the CpG island methylator phenotype reveals two methylation classes among breast cancer cell lines." **J.D. Risher** (Presenter), A.G. Rivenbark, and W.B. Coleman. University Research Day, Graduate and Professional Student Federation, University of North Carolina, March 2006, Chapel Hill, NC.

Poster Presentation: "Investigation of the CpG island methylator phenotype reveals two methylation classes among breast cancer cell lines." **J.D. Risher** (Presenter), A.G. Rivenbark, and W.B. Coleman. *American Society for Investigative Pathology*, Annual Meeting, April 2006, San Francisco, CA.

Poster Presentation: "Investigation of the CpG island methylator phenotype reveals two methylation classes among breast cancer cell lines." **J.D. Risher** (Presenter), A.G. Rivenbark, and W.B. Coleman. UNC Lineberger Comprehensive Cancer Center Annual Scientific Retreat, University of North Carolina, May 2006, Chapel Hill, NC.

Oral Presentation: "Evidence for the CpG island methylator phenotype among human breast cancer cells." **J.D. Risher** (Presenter), and W.B. Coleman. Annual Research Symposium, Department of Pathology and Laboratory Medicine, University of North Carolina, September 2006, Chapel Hill, NC.

Poster Presentation: "Investigation of the CpG island methylator phenotype reveals two methylation classes among breast cancer cell lines." **J.D. Risher** (Presenter) and W.B. Coleman. Department of Pathology and Laboratory Medicine Poster Session, University of North Carolina, February 2007, Chapel Hill, NC.

Poster Presentation: "Aberrant DNA methyltransferase 3b activity accounts for the hypermethylator phenotype in human breast cancer cell lines." **J.D. Risher** (Presenter) and W.B. Coleman. *American Society for Investigative Pathology*, Annual Meeting, May 2007, Washington, D.C.

Poster Presentation: "Methylation status of CEACAM6 predicts hypermethylator phenotype among human breast cancer cell lines." **J.D. Risher** (Presenter), A.G. Rivenbark, and W.B. Coleman. *American Society for Investigative Pathology*, Annual Meeting, May 2007, Washington, D.C.

Poster Presentation: "Aberrant DNA methyltransferase 3b activity accounts for the hypermethylator phenotype in human breast cancer cell lines." **J.D. Risher** (Presenter) and W.B. Coleman. UNC Lineberger Comprehensive Cancer Center Annual Scientific Retreat, University of North Carolina, May 2007, Chapel Hill, NC.

Poster Presentation: "Methylation status of CEACAM6 predicts hypermethylator phenotype among human breast cancer cell lines." **J.D. Risher** (Presenter), A.G. Rivenbark, and W.B. Coleman. UNC Lineberger Comprehensive Cancer Center Annual Scientific Retreat, University of North Carolina, May 2007, Chapel Hill, NC.

Poster Presentation: "Methylation status of CEACAM6 predicts hypermethylator phenotype among human breast cancer cell lines." **J.D. Risher** (Presenter), A.G. Rivenbark, and W.B. Coleman. Annual Research Symposium, Department of Pathology and Laboratory Medicine, University of North Carolina, September 2007, Chapel Hill, NC.

Poster Presentation: "Increasing efficacy of chemotherapeutics using demethylating agents in hypermethylator breast cancer tumor cells." R. Sandhu (Presenter), **J.D. Risher**, and W.B. Coleman. Annual Research Symposium, Department of Pathology and Laboratory Medicine, University of North Carolina, September 2007, Chapel Hill, NC.

Oral Presentation: "Detection of a DNMT3b-based hypermethylator phenotype among human breast cancer cell lines." **J.D. Risher** (Presenter) and W.B. Coleman. Student Seminar Series, Department of Pathology and Laboratory Medicine, University of North Carolina, October 2007, Chapel Hill, NC.