

## Dr. Michelle L. Hamm

University of Richmond  
Department of Chemistry  
Gottwald B-100  
Richmond, VA 23173

Phone: (804) 287-6327  
FAX: (804) 287-1897  
e-mail: [mhamm@richmond.edu](mailto:mhamm@richmond.edu)  
<http://www.richmond.edu/~mhamm>

### Education

- 1994-1999 University of Chicago, Chicago, IL  
Ph.D. Chemistry  
M.A. Chemistry 1995
- 1990-1994 Carleton College, Northfield, MN  
B.A. Chemistry- Magna cum Laude with distinction

### Teaching and Research Experience

- 2001-present University of Richmond, Richmond, VA  
2007-present Associate Professor of Chemistry  
2001-2007 Assistant Professor of Chemistry  
Organic I and II Lecture and Lab; Biochemistry Lecture and Lab
- 1999-2001 Massachusetts Institute of Technology, Cambridge, MA  
Advisor: John Essigmann; Removal of Formamidopyrimidine-aflatoxin Adducts by Bacterial and Mammalian Base Excision Repair Pathways.
- 1994-1999 University of Chicago, Chicago, IL  
Advisor: Joseph Piccirilli; Synthesis, Characterization and Biochemical Reactivity of Oligonucleotides Containing 2'-Deoxy-2'-mercaptopyrimidines.  
Teaching Assistant for Organic Chemistry I, II and Bioorganic Chemistry  
Tutor for Organic Chemistry I and II, and Bioorganic Chemistry
- 1992-1994 Carleton College, Northfield, MN  
Advisor: Jerry Mohrig; Stereoselection of Addition and H/D Exchange on 3-Ethoxy Substituted Carbonyl Compounds.  
Assistant Laboratory Instructor for Organic Chemistry I and II.

### Awards/Grants

- 2003 National Science Foundation- MRI Grant; \$304,714 over 3 years.
- 2003 American Chemical Society- PRF Type G Grant; \$35,000 for 2 years.
- 2003 National Science Foundation- CAREER Award; \$404,324 for 5 years.
- 2002 Research Corporation Cottrell College Science Award; \$42,684 for 2 years
- 2001 The Thomas F. Jeffress and Kate Miller Jeffress Memorial Trust;  
\$10,000 for 1 year.
- 2001 University of Richmond Faculty Summer Fellowship; \$6,000 for one summer-declined
- 2001 The Thomas F. Jeffress and Kate Miller Jeffress Memorial Trust;  
\$30,000 for 1 year.
- 2001 Camille and Henry Dreyfus Faculty Start-up Grants for Undergraduate Institutions; \$20,000 for 5 years.
- 2000 NIH NRSA Individual Postdoctoral Fellowship

1995 G.A.A.N.N. Fellowship  
1996 Best Poster- 4th Annual Symposium on Nucleic Acids in Chemistry and Biology  
1994 Richard Ramette Award for Excellence in Teaching

**Publications** (\*undergraduate student author)

**Hamm, M.L.;** Gill, T.J.\*; Nicolson, S.C.\*; Summers, M.R.\* Substrate Specificity of Fpg (MutM) and hOGG1, Two Repair Glycosylases *J. Amer. Chem. Soc.* *submitted*

**Hamm, M.L.;** Billig, K.\* Oligonucleotide Incorporation and Base Pair Stability of 7-Methyl-8-oxo-2'-deoxyguanosine. *Org. Biomol. Chem.* (2006) **4**, 4068-4070.

**Hamm, M.L.;** Rajguru, S.\*; Downs, A.M.\*; Cholera, R.\* Base Pair Stability of 8-Chloro and 8-Iodo-2'-deoxyguanosine Opposite 2'-Deoxycytidine: Implications regarding the Bioactivity of 8-Oxo-2'-deoxyguanosine. *J. Amer. Chem. Soc.* (2005) **127**, 12220-12221.

**Hamm, M.L.;** Cholera, R.\*; Hoey, C.L.\*; Gill, T.J.\* Oligonucleotide Incorporation of 8-Thio-2'-deoxyguanosine *Org. Lett.* (2004) **6**, 3817-3820.

Alecseyev Y., **Hamm, M.L.**, and Essigmann J.M. Aflatoxin B1 Formamidopyrimidine Adducts are Preferentially Repaired by the Nucleotide Excision Repair Pathway *in vivo*. *Carcinogenesis* (2004) **25**, 1045-1051.

Smela, M.E., **Hamm, M.L.**, Henderson, P.T., Harris, C.M., Harris, T.M., and Essigmann, J.M. The Aflatoxin B1 Formamidopyrimidine Adduct Plays a Major Role in Causing the Types of Mutations Observed in Human Hepatocellular Carcinoma. *Proc. Natl. Acad. Sci. USA* (2002) **99**, 6655-6660.

**Hamm, M.L.;** Nikolic, D.; van Breemen, R.B.; Piccirilli, J.A. Characterization of 2'-Mercapto-Oligonucleotides as Probes for Metal Ion Catalysis in the Hammerhead Ribozyme reaction. *J. Amer. Chem. Soc.* (2000) **122**, 12069-12078.

**Hamm, M.L.;** Schwans, J.P.; Piccirilli, J.A. "The Hammerhead Ribozyme Catalyzes the Deglycosylation of 2'-Mercaptocytidine." *J. Amer. Chem. Soc.* (2000) **122**, 4223-4224.

Earnshaw, D.J.; **Hamm, M.L.;** Piccirilli, J.A.; Karpeisky, A.; Beigelman, L.; Ross, B.S.; Manoharan, M.; Gait, M.J. Investigation of the Proposed Inter-domain Ribose Zipper in Hairpin Ribozyme Cleavage using 2'-Modified Nucleosides. *Biochemistry* (2000) **39**, 6410-6421.

**Hamm M.L.** and Piccirilli, J.A. Synthesis and Characterization of Oligonucleotides Containing 2'-S,3'-O-Cyclic Phosphorothiolate Termini. *J. Org. Chem.* (1999) **64** 5700-5704.

**Hamm, M.L.** and Piccirilli, J.A. Incorporation of 2'-Deoxy-2'-Mercaptocytidine into Oligonucleotides via Phosphoramidite Chemistry. *J. Org. Chem.* (1997) **62**, 3415-3420.

Mohrig, J.R.; Rosenberg, R.E.; Apostol, J.W.\*; Bastienaansen, M.\*; Evans, J.W.\*; Franklin, S.J.\*; Frisbie, C.D.\*; Fu, S.S.\*; **Hamm, M.L.\*;** Hirose, C.B.\*; Hunstad, D.A.\*; James, T.J.\*; King, R.W.\*; Larson, C.J.\*; Latham, H.A.\*; Owen, D.A.\*; Stein, K.A.\*; Warnet, R.\* Diastereoselectivity of

Enolate Anion Protonation. H/D Exchange of  $\beta$ -substituted Ethyl Butanoates in Ethanol-*d*. *J. Amer. Chem. Soc.* (1997) **119**, 479-86.

### **Invited Seminars/Session Coordinators**

Michelle Hamm. Insights into the Bioactivity of the Potent Promutagen 8-Oxo-2'-deoxyguanosine. Wayne State University Department of Chemistry. January 12, 2007.

Session Coordinator at the Bioorganic Gordon Conference. Oxford, England. August 2, 2006

Michelle Hamm. Insights into the Bioactivity of the Potent Promutagen 8-Oxo-2'-deoxyguanosine. Longwood University Department of Natural Sciences. March 3, 2006.

Michelle Hamm. Insight into the Base Pairing of 8-Oxo-2'-deoxyguanosine. NSF Workshop on Bioorganic Chemistry. August 1, 2005.

Michelle Hamm. Insights into the Bioactivity of the Potent Promutagen 8-Oxo-2'-deoxyguanosine. Old Dominion University Department of Chemistry, April 1, 2005.

Michelle Hamm. Insights into the Bioactivity of the Potent Promutagen 8-Oxo-2'-deoxyguanosine. University of Nebraska at Lincoln Department of Chemistry, March 28, 2005.

### **Poster Presentations** (\*undergraduate student author; presenter in **bold**)

**Sarah Nicolson\***, Tim Gill\* and Michelle Hamm. Insight into substrate recognition by FPG and hOGG, two DNA repair enzymes. UR Undergraduate Research Symposium. April 2007.

**Carlos Siekavizza-Robles\***, Matt Summers\* and Michelle Hamm. Studies on the effect of C8 steric bulk in the replication of 8-oxo-2' deoxyguanosine by different DNA polymerases. UR Undergraduate Research Symposium. April 2007.

**Jennifer Carman\*** and Michelle Hamm. Synthesis of 9-deaza-2'-deoxyguanosine, an analogue of 8-oxo-2'-deoxyguanosine. UR Undergraduate Research Symposium. April 2007.

**Jennifer Carman\***, **Matt Summers\*** and Michelle Hamm. Synthesis, oligonucleotide incorporation, and base pair stability of 9-deaza-2'-deoxyguanosine: an analogue of 8-oxo-2'-deoxyguanosine. American Chemical Society Spring National Meeting. Chicago, IL March 2007

**Michelle Hamm**, Tim Gill\* and Kelly Billig.\* Insight into substrate recognition by FPG and hOGG, two DNA repair enzymes. Bioorganic Gordon Conference. August 2006.

**Matt Summers\*** and Michelle Hamm. Studies on the effect of C8 steric bulk on the promutagenicity of 8-oxo-2'-deoxyguanosine. UR Undergraduate Research Symposium. April 2006.

**Jennifer Carman\*** and Michelle Hamm. Synthesis of 9-deaza-2'-deoxyguanosine, an analogue of 8-oxo-2'-deoxyguanosine. UR Undergraduate Research Symposium. April 2006.

**Tim Gill\*** and Michelle Hamm. Insight into substrate recognition by FPG and hOGG, two DNA repair enzymes. UR Undergraduate Research Symposium. April 2006.

**Michelle Hamm**, Tim Gill\* and Kelly Billig.\* Insight into substrate recognition by FPG and hOGG, two DNA repair enzymes. Bioorganic Gordon Conference. June 2005.

**Rushina Cholera\***, Courtney Hoey\*, and Michelle Hamm. Synthesis and Biochemical Characterization of the 8-Oxo-2'-deoxyguanosine Analogue 8-Thio-2'-deoxyguanosine: Insight into the Bioactivity of a Potent Promutagen. UR Undergraduate Research Symposium. April 2005.

**Kelly Billig\*** and Michelle Hamm. Synthesis of 7-Methyl-8-oxo-2'-deoxyguanosine (MdG), an Analogue of the Potent Promutagen, 8-Oxo-2'-deoxyguanosine. UR Undergraduate Research Symposium. April 2005.

**Tony Downs\***, Sumika Rajguru\* and Michelle Hamm. Synthesis of 8-Iodo and 8-Chloro-2'-deoxyguanosine. UR Undergraduate Research Symposium. April 2005.

**Tim Gill\*** and Michelle Hamm. Insight into substrate recognition by FPG and hOGG, two DNA repair enzymes. UR Undergraduate Research Symposium. April 2005.

**Rushina Cholera\***, Courtney Hoey,\* Sumika Rajguru,\* Tim Gill\* and Michelle Hamm Synthesis and Biochemical Characterization of 8-Oxo-2'-deoxyguanosine Analogues: Insight into the Bioactivity of an Abundant DNA Lesion. American Society for Biochemistry and Molecular Biology (ASBMB) National Meeting. April 2005.

**Rushina Cholera\***, Courtney Hoey,\* Sumika Rajguru,\* Tim Gill\* and Michelle Hamm Synthesis and Biochemical Characterization of 8-Oxo-2'-deoxyguanosine Analogues: Insight into the Bioactivity of an Abundant DNA Lesion. National Conference on Undergraduate Research. April 2005.

**Rushina Cholera\***, Courtney Hoey,\* Sumika Rajguru,\* Tim Gill\* and Michelle Hamm Synthesis and Biochemical Characterization of 8-Oxo-2'-deoxyguanosine Analogues: Insight into the Bioactivity of an Abundant DNA Lesion. Southeast Regional Meeting of the American Chemical Society (SERMACS). November 2004.

**Kelly Billig\*** and Michelle Hamm. Synthesis of 7-Methyl-8-oxo-2'-deoxyguanosine (MdG), an Analogue of the Potent Promutagen, 8-Oxo-2'-deoxyguanosine. Southeast Regional Meeting of the American Chemical Society (SERMACS). November 2004.

**Michelle Hamm**, Rushina Cholera,\* Tim Gill,\* Courtney Hoey,\* and Sumika Rajguru.\* Synthesis and Characterization of 8-Oxo-2'-deoxyguanosine Analogs: Insight into the Bioactivity of a Potent Promutagen. Bioorganic Gordon Conference. June 2004.

**Wait Aumann\*** and Michelle Hamm. Synthesis of 8-Fluoro-2'-deoxyguanosine. UR Undergraduate Research Symposium. April 2004.

**Sumika Rajguru\*** and Michelle Hamm. Synthesis of 8-Chloro-2'-deoxyguanosine and 8-Chloro-7-deaza-2'-deoxyguanosine. UR Undergraduate Research Symposium. April 2004.

**Michelle Hamm**, Courtney Hoey\* and Wait Aumann.\* Synthesis of Analogues of the Potent Promutagen 8-Oxo-2'-deoxyguanosine. Bioorganic Gordon Conference. June 2003.

**Wait Aumann**,\* Sumika Rajguru,\* and Michelle Hamm. Synthesis of 8-Fluoro-2'-deoxyguanosine. UR Undergraduate Research Symposium. April 2003.

**Courtney Hoey**\* and Michelle Hamm. Synthesis of 8-Thio-2'-deoxyguanosine. UR Undergraduate Research Symposium. April 2003.

**Courtney Hoey**,\* **Wait Aumann**,\* and Michelle Hamm. Synthesis of 8-Thio-2'-deoxyguanosine. American Chemical Society Spring National Meeting. New Orleans, LA March 2003

**Wait Aumann**\* and Michelle Hamm. Synthesis of 8-Fluoro-2'-deoxyguanosine. UR Undergraduate Research Symposium. April 2002.

**Courtney Hoey**\* and Michelle Hamm. Synthesis of 8-Thio-2'-deoxyguanosine. UR Undergraduate Research Symposium. April 2002.

**Jeff Vergales**\* and Michelle Hamm. Synthesis of 8-Methoxy- and 7-Methyl-8-oxo-2'-deoxyguanosine. UR Undergraduate Research Symposium. April 2002.

### **Mentored Undergraduate Student Projects** (\*Honors Student)

Carlos Siekavizza-Robles: Replication of 8-oxo-2'-deoxyguanosine analogues. (Spring 2006-present including Summers 2006 and 2007)

Sarah Nicolson: Insight into substrate recognition by FPG and hOGG, two DNA repair enzymes. (Fall 2005-present including Summers 2006 and 2007)

Jennifer Carman\*: Synthesis of 9-deaza-2'-deoxyguanosine. (Spring 2005- present including Summers 2005 and 2006) Currently deciding where to attend Chemistry Graduate School starting Fall 2007

Matt Summers\*: Replication of 8-oxo-2'-deoxyguanosine analogues. (Fall 2004-present including Summer 2005) Will attend Mayo Clinic Medical School starting Fall 2007

Tony Downs: Synthesis of 8-Iodo-2'-deoxyguanosine (Spring 2004-Spring 2006 including Summer 2004) Currently seeking employment

Tim Gill: Insight into substrate recognition by FPG and hOGG, two DNA repair enzymes. (Fall 2003-Spring 2006 including Summers 2004 and 2005) Currently in AmeriCorps

Kelly Billig\*: Synthesis of 7-Methyl-8-oxo-2'-deoxyguanosine. (Spring 2004-Spring 2005 including Summer 2004) *Received the University of Richmond Undergraduate Research Award in the Natural Sciences*. Currently at SUNY-Syracuse Medical School

Sumika Rajguru: Synthesis of 8-Chloro-2'-deoxyguanosine. (Spring 2003-Fall 2005 including Summer 2003) Currently employed at Aspen Systems Corporation

Amanda Claggett: Synthesis of 7-Methyl-8-oxo-2'-deoxyguanosine. (Fall 2002-Fall 2003 including Summer 2003) Currently in Chemistry Graduate School at Ohio State

Rushina Cholera\*: Characterization of the 8-Oxo-2'-deoxyguanosine Analogue 8-Thio-2'-deoxyguanosine: Insight into the Bioactivity of a Potent Promutagen. (Spring 2003-Spring 2005 including Summer 2003) Currently in the MD-PhD program at UNC-Chapel Hill

Wait Aumann: Synthesis of 8-Fluoro-2'-deoxyguanosine. (Spring 2002- Spring 2004, including Summers 2002 and 2003) Currently at University of Maryland Medical School

Courtney Hoey: Synthesis of 8-Thio-2'-deoxyguanosine. (Spring 2002-Spring 2003, including Summer 2002) Currently at Jefferson Medical School

Jeff Vergales: Synthesis of 8-Methoxy- and 7-Methyl-8-oxo-2'-deoxyguanosine. (Fall 2001-Summer 2002). Currently at University of Virginia Medical School.

## **Service**

### **Chemistry Department/ BMB Program:**

2006-present BMB Honors Coordinator  
2006-present Statistics Committee (Chair 2006-present)  
2005-2006 Chemistry Honors Coordinator  
2005-present Curriculum Committee (Chair 2005-2006)  
2001-2006 Outreach Committee (Chair 2003-2006)  
2001-2006 Gamma Sigma Epsilon Faculty Advisor

### **University:**

2005-present University Faculty Council (Secretary 2006-present)  
2006-2007 Honors Committee  
2004-2005 HHMI Bioinformatics Search Committee  
2003-2004 University Web Steering Committee  
2002-2006 Undergraduate Research Committee  
2002-present Academic Advisor to 40 Students Total  
2001-2003 Oldham Scholars Committee