

Rabi Ann Musah

Curriculum Vitae

Department of Chemistry
University at Albany, State University of New York
1400 Washington Avenue
Albany, NY. 12222
(518) 437-3740 (office); -3741 (fax).
e-mail: musah@albany.edu; web page: www.rabimusah.com

Education

- | | |
|---------|---|
| Postdoc | The Scripps Research Institute, La Jolla, CA. 1994-1998
(Bioinorganic Chemistry—Advisor: David Goodin) |
| Ph.D. | University of Arkansas, Fayetteville, AR. 1995 (Organic
Chemistry: Advisor: Arthur Fry) |
| B.S. | Prairie View A&M University, Prairie View, TX. 1985
(Chemistry), Summa Cum Laude Graduation Honors |

Employment History

- Director, Center for Achievement, Retention and Student Success, University at Albany, State University of New York, 2008-
- University at Albany, State University of New York, Associate Professor, 2005-
- University at Albany, State University of New York, Assistant Professor, 1998-2005
- Member, Center for Comparative Functional Genomics, University at Albany, State University of New York, Albany, NY; 2000-
- Member, Center for Biochemistry and Biophysics, University at Albany, State University of New York, Albany, NY; 2001-
- Visiting Scientist, National Cancer Institute, Natural Products Division, Frederick, MD; 1998-1999
- Postdoctoral Appointment, The Scripps Research Institute, La Jolla, CA; 1994-1998
- Research Assistant, Department of Agronomy, University of Arkansas, Fayetteville, AR; 1993-1994
- Teaching Assistant and Research Associate, Department of Chemistry and Biochemistry, University of Arkansas, Fayetteville, AR; 1988-1994
- Research & Development Technician, Mobay Chemical Co., Baytown, TX; 1986-1988

Honors and Awards

- Chancellors Award for Excellence in Teaching and Service, 2004/2005 academic year.
 - Excellence in Teaching Award, 2004/2005 academic year.
 - Torch Award, in honor of outstanding teaching and service to University at
-

- Albany students, 2001/2002 academic year.
- Promising Inventor Award, in recognition of first invention disclosure at the University at Albany, 2001/2002 academic year.
 - National Research Service Award (National Institutes of Health), The Scripps Research Institute, La Jolla, CA., 1995-1998.
 - Scripps Postdoctoral Research Fellow, 1994-1995.
 - Outstanding Teaching Award, University of Arkansas Department of Chemistry, Fayetteville, AR., 1988.
 - MARC fellowship, National Institutes of Health, Prairie View A&M University Department of Chemistry, 1984-1985.

Professional Service

Reviewer:

- National Science Foundation CAREER Award Appointed Federal Panel Reviewer, 2003.
- National Science Foundation CRIF Award Appointed Federal Panel Reviewer, 2004.
- National Science Foundation Ad Hoc Reviewer.
- American Chemical Society Petroleum Research Fund Ad Hoc Reviewer.
- National Institutes of Health Ad Hoc Reviewer.
- United States Department of Agriculture Ad Hoc Reviewer.

Membership in Societies:

- American Chemical Society (Member, Division of Organic Chemistry).
- Sigma Xi.

Research Supervision

4 Ph.D. students 3 M.S. students, 2 visiting scientists, 2 postdoctoral fellows and 20 undergraduates.

Research Areas of Interest and Collaborations

- Isolation, characterization and synthesis of organosulfur natural products; determination of biosynthetic pathways of organosulfur natural product formation; determination of C-S lyase catalytic mechanisms and structure.
- Biophysical studies of retroviral zinc finger proteins; development of HIV-1 nucleocapsid protein inhibitors.
- Anticancer and antioxidant properties of legumes, especially cowpea (*Vigna unguiculata*): isolation, characterization, and bioactivity assessment of natural products from cowpea and other legumes.
- Isolation and bioassay guided fractionation of natural products from medicinal plants with demonstrated antiinflammatory activity, specifically *Petiveria alliacea*, *Uncaria tomentosa*, *Uncaria guianensis*, and *Croton lechleri*.

Collaborations:

- Cardiovascular effects of organosulfur natural products—with Dr. Gunter Siegel, Institute of Physiology, Campus Benjamin Franklin, Berlin, Germany.
-

- *In vivo* effects of small molecule free radicals—with Dr. David Jourdeuil, Albany Medical College, Albany, NY.
- Antinflammatory effects of Amazonian medicinal plants—with Dr. Mark Miller, Albany Medical College, Albany, NY.
- Biological activity of legume metabolites—with Dr. Teddy Morelock, University of Arkansas, Dept. of Plant Pathology, Fayetteville, AR.

Postdoctoral Fellow/Visiting Faculty Research Supervision

Dr. Rao Nidasanametla, Dr. Roman Kubec (Institute of Chemical Technology, Prague, Czech Republic), Dr. Karen Quaal (Department Chair, Siena College, Latham, NY).

Ph.D./M.S. Supervision

Ph.D.: He Quan*, Abhijit Jadhav*, Pooja Gupta

M.S.: Haiyan Zheng, Peter Kutchukian

*current member of research group

Undergraduate Research Mentoring

Jason Pinto, Robin Hante, Sunjeev Konduru, Adam Goldberg, Edward Gould, Ted Ferenczy, Peter Kutchukian, Amma Agyemang, Sharlene Persaud, Yuliana de La Santos, Trixie Kioko, Renje Grimes, Sarah Conte, Joseph Rozelle, Murfat Ibrahim, Vynessa Gilberston, Bahiyyih Khelghati, Adedoyin Adebogun*, Erica Frazier*, David Wiech, Linda Larochel*.

*current member of research group

Thesis Committee Advising

Krishna Dubey, Sherida Johnson, Xingding Hu, Bingsong Han, Woo Jin Chung, Xiangmei Xi, Warren Dorsch, Yiwei Zhao, Yuhua Sun, Niquiche Sangster, Jin Jin, He Quan, Jin Chao, Xiangmei Xie, Ludmila Popova.

University Service

Department Committees/Appointments

Personnel Committee (since 1998)

Graduate Committee (since 1998)

Graduate Admissions and Recruitment Committee (since 1998)

New Faculty Search Committee (1999-2003, leading to the hiring of Andrea Mayer, Li Niu, Marina Petrukhina, Evgeny Dikarev, Igor Lednev, and Alex Schekhtman)

New Staff Search Committee (1999/2000 leading to the hiring of Cathy Kukulka)

Undergraduate Committee (since 2001)

Forensics Program Committee (2002-2003)

Affirmative Action Representative (since 2000)

Careers in Chemistry Day Speaker (1999 – 2002)

Doctoral and M.S. Thesis Committee's (Krishna Dubey, Sherida Johnson, Xingding Hu, Bingsong Han, Woo Jin Chung, Xiangmei Xi, Warren Dorsch, Yiwei Zhao, Yuhua Sun, Niquiche Sangster, Chao Jin, Wei He)

University Committees/Appointments

- Facilitator, New Faculty Orientation Program (1999-2003)
- College of Arts & Sciences Technical Services Group Director search committee, 2000/2001 and 2002/2003, leading to the hiring of Jaime Garcia and Chris Olsen).
- Albany Research Colloquium Panel on Undergraduate Research Initiatives speaker, Spring 2001.
- Ron McNair Summer Research Program mentor and speaker, Summer 2000-present.
- Department of Women's Studies WSS590 Feminist Research Seminar speaker, Spring 2000.
- Life Sciences Luncheon Tour, Department of Chemistry faculty representative, Spring 2002.
- Department of Chemistry Commencement Speaker, May 2002.
- Undergraduate Academic Council Member, 2002/2003 academic year.
- Presidents Student Retention Committee, 2005 to present.
- Life Sciences Building Manager Search Committee (2006/2007 academic year).

Community Service

- Young Woman in Science program, Simon's Rock College, Great Barrington, MA, summer research mentor and speaker, summer 2001-present.
- Panelist, Iota Sigma Pi and American Chemical Society sponsored Career Panel at the Rensselaer Polytechnic Institute, March 22nd, 2007.

Teaching Activities

Undergraduate:

- ACHM 219—Viruses in Human Society (average class size 50 students)
- ACHM 220—Organic Chemistry I, lecture (average class size 150-200)
- ACHM 220A and B—Organic Chemistry I & II laboratory courses (average class size: 200 students)
- ACHM 321—Physical Chemistry laboratory (co-instructor, average class size: 8 students)
- ACHM 440B—Biochemistry (average class size: 12 students)
- ACHM 425—Introduction to Undergraduate Research (average number of students: 2)
- ACHM 426—Undergraduate Research (average number of students: 2 students)
- ACHM 450—Forensics Chemistry I (Average class size 12)
- ACHM 448—Introduction to Medicinal Chemistry and Pharmacology

Graduate:

- ACHM 526—Experimental Methods of Organic Structure Determination (average class size: 15 students)
- ACHM 550A—Advanced Forensics Chemistry (average class size: 12 students)
- ACHM 558—Introduction to Medicinal Chemistry and Pharmacology
- ACHM 540B—Comprehensive Biochemistry (average class size: 8 students)
- ACHM 626—Pharmacognosy/Natural Products Chemistry (average class size: 10 students)
- ACHM 689—Faculty Research Seminar (average number of participants: 40)

Pedagogical Innovations

- Created a complete set of ancillary materials to accompany the new organic chemistry text book “Organic Chemistry” by Janice Smith. The materials are designed to be used by professors of organic chemistry at the undergraduate level to enhance the in-class learning experience of students, and improve learning and retention of information.

Mentoring

- Serve as a research advisor for underrepresented minority groups through the Ron McNair Post-Baccalaureate Achievement Program (Amma Agyemang, Renje Grimes, Trixie Kioko, Yuliana de La Santos, Murfat Ibrahim, Adedoyin Adebogun).
- Provide opportunities for undergraduates to perform research during the academic year and the summer (Jason Pinto, Robin Hante, Sunjeev Konduru, Adam Goldberg, Edward Gould, Ted Fernezcy, Peter Kutchukian, Amma Agyemang, Sharlene Persaud, Yuliana de La Santos, Trixie Kioko, Renje Grimes, Sarah Conte, Joseph Rozelle, Vynessa Gilbertson, Bahiyyih Khelghati, Erica Frazier, David Wiech, Linda Larochel).

Invited Talks and Conference Participation

- 1999 Public Health Research Institute, New York, NY. “Protein Engineering in Cytochrome *c* Peroxidase”.
- 2000 Eastern New York American Chemical Society meeting, Albany, NY. “The Chemistry of West African Herbal Medicine”.
- 2002 20th International symposium on the Organic Chemistry of Sulfur; Flagstaff, AZ; “*Cysteine sulfoxide derivatives in exotic alliums: Petiveria alliacea, Tulbaghia violacea and Nectaroscordum siculum*”.
- 2002 224th American Chemical Society Meeting; Boston, MA; “*Anticancer, antibacterial, and antifungal activities of sulfur-containing compounds from Petiveria alliacea*”.
- 2002 Mechanistic Studies of Cardiovascular Effects of Botanicals; Sponsored by the National Institutes of Health Office of Dietary Supplements and National Center for Complementary and Alternative Medicine and the National Heart, Lung and Blood Institute; Bethesda, MD.

- 2002 Union College, Department of Chemistry, Schenectady, NY. “*Cysteine sulfoxides in exotic alliums*”.
- 2004 National Science Foundation Organic Dynamics Workshop, Green Lake, WI; “*Organosulfur Natural Products Chemistry*”.
- 2004 21st International Symposium on the Organic Chemistry of Sulfur; Madrid, Spain; “*Antimicrobial Activity of Organosulfur Compounds from Petiveria alliacea*”.
- 2005 City University of New York, Brooklyn, NY. “Medicinal Organosulfur Natural Products from Smelly Plants”.
- 2006 Northeastern University, Boston, MA. “Organosulfur Chemistry of Some Plants used in Traditional Medicine”.
- 2008 Albany College of Pharmacy, Natureceuticals Conference, Albany, NY. “Antimicrobial Phytochemicals from Commercially Available *Petiveria alliacea*—Fact or Fiction?”

Grant Support

Individual External

- National Science Foundation STEP—Center for Achievement, Retention and Student Success; **\$999,999.00**; (06/01/08-05/11/13).
- National Science Foundation SGER Award—Undergraduate Research Curriculum Development in Chemistry **\$100,000.00**; (08/15/06-07/31/07).
- Science Education for New Civic Engagements—Viruses-Chemical Control Systems that Affect Human Life **\$3,000.00**; (10/01/06-09/30/07).
- National Science Foundation CAREER Award—Organosulfur Natural Products Chemistry **\$518,816.00**; (01/01/03-12/31/07).
- National Science Foundation—Organosulfur Natural Products; **\$18,000.00**; (06/01/02 –11/30/03).

Joint External

- National Science Foundation Major Instrumentation Grant (Co-PI with Prof. Eric Block)—Purchase of 400 MHz NMR Spectrometer; **\$233,150.00** (02/01/04-01/31/07).
- National Institutes of Health—EPR and ENDOR of Paramagnetic Molecules (Co-PI with Prof. Charles Scholes); **\$189,000.00**—(01/01/00 – 01/01/02).

Individual Internal

- Faculty Research Award Program—Development of Retroviral Nucleocapsid Protein Inhibitors; **\$10,000.00**; (1998-1999).
- Faculty Research Award Program—Natural Products Drug Discovery; **\$8,000.00**; (2000-2001).

Citations

http://www.albany.edu/cas/updated/version02/CAS/i_featuredfaculty_musah.html

http://www.albany.edu/president/excellence_awards.html

http://www.albany.edu/news/campus_news/2004/apr2004/herzig_musah.htm

http://ugsp.info.nih.gov/ScholarsPage/BioPage_2002.htm

http://www.studenthelp.com/college_aid_resources/research-plan-undergraduate-organic-professor.html

http://www.rfsuny.org/may_20_photos/photos_page_4.htm

<http://www.cancerpage.com/news/article.asp?id=4874>

http://www.dentists-at-work.com/news_article.jsp?news_storyID=1854

http://lenox.iberkshires.com/story.php?story_id=2258

<http://www.nystar.state.ny.us/nl/archives2004/capitalA02-04.htm>

<http://www.eclecticinspiration.com/ifw/events/>

<http://www.enel.it/magazine/boiler/arretrati/107focuslanci1.shtml>

http://www.orthoeurope.com/home.php?page=view_ziektebeeld&ziektebeeld=Dunedarmkanker

Refereed Publications

Kim, Seokwon; Kubec, Roman; **Musah, Rabi A.**¹ *Antibacterial and Antifungal Activity of Sulfur-containing Compounds from *Petiveria alliacea* L. J. Ethnopharmacology (2006), 104, 188-192.*

Kubec, Roman; **Musah, Rabi A.**¹ *γ -Glutamyl Dipeptides in *Petiveria alliacea*. Phytochemistry, (2005), 66, 2494-2497).*

Musah, Rabi A.¹; Kim, Seokwon, Kubec; Roman. *Antibacterial and Antifungal Activity of Sulfur-Containing Compounds from *Petiveria Alliacea* L. Phosphorus, Sulfur and Silicon and Related Elements, (2005), 180, 1455-1456.*

Musah, Rabi A.¹ *The HIV-1 Nucleocapsid Zinc Finger Protein as a Target of Antiretroviral Therapy. Current Topics in Medicinal Chemistry, (2004), 4, 1605-1622.*

Kubec, Roman; Hrbacova, Marcella; **Musah, Rabi A.**² Velisek, Jan. *Allium Discoloration: Precursors Involved in Onion Pinking and Garlic Greening. Journal of Agricultural and Food Chemistry, (2004), 52, 5089-5094.*

¹ Senior/corresponding author

² Significant experimental contribution

Kubec, Roman; Hrbacova, Marcella; **Musah, Rabi A.**;² Velisek, Jan. *Allium Discoloration: The Nature of Onion Pinking and Garlic Greening*. Czech Journal of Food Science, (2004), 22, 109-112.

Rosenfeld, Robin; Goodsell, David; **Musah, Rabi A.**;² Morris, Garrett M.; Goodin, David B.; Olson, Arthur J. *Automated Docking of Ligands to an Artificial Active Site: Augmenting Crystallographic Analysis with Computer Modeling*. Journal of Computer Aided Molecular Design, (2003), 17, 525-536.

Kubec, Roman; Kim, Seokwon; **Musah, Rabi A.**¹ *The Lachrymatory Principle of Petiveria Alliacea*. Phytochemistry, (2003), 63, 37-40.

Kubec, Roman; Velisek, Jan; **Musah, Rabi A.**¹ *The Amino Acid Precursors and Odor Formation in Society Garlic (Tulbaghia violacea Harv.)*. Phytochemistry, (2002), 60, 21-25.

Kubec, Roman; Kim, Seokwon; McKeon, Denise M.; **Musah, Rabi A.**¹ *Isolation of S-Butylcysteine Sulfoxide and Six Butyl-containing Thiosulfinates from Allium sicutum*. Journal of Natural Products, (2002), 65, 960-964.

Kubec, Roman; Kim, Seokwon; **Musah, Rabi A.**¹ *S-Substituted Cysteine Derivatives and Thiosulfinate Formation in Petiveria alliacea - part II*. Phytochemistry, (2002), 60, 675-680.

Sandoval, M.; Okuhama, N. N.; Zhang, X. J.; Condezo, L. A.; Lao, J.; Angeles, F. M.; **Musah, Rabi A.**;² Bobrowski, P.; Miller, M. J. S. *Anti-inflammatory and Antioxidant Activities of Cat's Claw (Uncaria tomentosa and Uncaria guianensis) are Independent of Their Alkaloid Content*. Phytomedicine, (2002), 9, 325-337.

Rosenfeld, Robin J.; Hays, Anna-Maria A.; **Musah, Rabi A.**;² Goodin, David B. *Excision of a Proposed Electron Transfer Pathway in Cytochrome c Peroxidase and its Replacement by a Ligand-Binding Channel*. Protein Science, (2002), 11, 1251-1259.

Musah, Rabi A.;³ Jensen, Gerard M.; Bunte, Steven W.; Rosenfeld, Robin J.; Goodin, David B.; *Artificial Protein Cavities as Specific Ligand-binding Templates: Characterization of an Engineered Heterocyclic Cation-binding Site that Preserves the Evolved Specificity of the Parent Protein*. Journal of Molecular Biology, (2002), 315, 845-857.

Kubec, Roman; **Musah, Rabi A.**¹ *Cysteine Sulfoxide Derivatives in Petiveria alliacea*. Phytochemistry, (2001), 58, 981-985.

Miller, Mark J. S.; Vergnolle, Nathalie; McKnight, Webb; **Musah, Rabi A.**;² Davison, Cathy A.; Trentacosti, Ann Marie; Thompson, Jane H.; Sandoval,

³ Major experimental contribution

Manuel; Wallace, John L. *Inhibition of Neurogenic Inflammation by the Amazonian Herbal Medicine Sangre de Grado*. Journal of Investigative Dermatology, (2001), 117, 725-730.

Jourd'heuil, David; Jourd'heuil, Frances L.; Kutchukian, Peter S.; **Musah, Rabi A.**;² Wink, David A.; Grisham, Matthew B. *Reaction of Superoxide and Nitric Oxide with Peroxynitrite. Implications for Peroxynitrite-mediated Oxidation Reactions In Vivo*. Journal of Biological Chemistry, (2001), 276, 28799-28805.

Cao, Yi.; **Musah, Rabi A.**;² Wilcox, Sheri K.; Goodin, David B.; McRee, Duncan E. *Protein Conformer Selection by Ligand Binding Observed with Crystallography*. Protein Science, (1998) 7, 72-78.

Musah, Rabi A.;³ Jensen, Gerard. M.; Rosenfeld, Robin. J.; Bunte, Steven. W.; McRee, Duncan. E.; Goodin, David. B. *Variation in the Strength of a CH to O Hydrogen Bond in an Artificial Cavity*. Journal of the American Chemical Society, (1997), 119, 9083-9084.

Musah, Rabi A.;³ Goodin, David B. *Introduction of Novel Substrate Oxidation into a Heme Peroxidase by Cavity Complementation: Oxidation of 2-Aminothiazole and Covalent Modification of the Enzyme*. Biochemistry, (1997), 36, 11665-11674.

Fitzgerald, Melissa. M.; **Musah, Rabi A.**;² McRee, Duncan E.; Goodin, David B. *A Ligand-gated, Hinged Loop Rearrangement Opens a Channel to a Buried Artificial Protein Cavity*. Nature Structural Biology, (1996), 3, 626-631.

Published Abstracts (Refereed)

Kim, Seokwon; Kubec, Roman; **Musah, Rabi A.** *Anticancer, antibacterial, and antifungal activities of sulfur-containing compounds from *Petiveria alliacea**. Abstracts of Papers, 224th ACS National Meeting, Boston, MA, United States, August 18-22, 2002.

Musah, Rabi A.; Fitzgerald, Melissa M.; McRee, Duncan E.; Goodin, David B. *Binding and oxidation of antithyroid agents in an artificial cavity constructed at the tryptophan radical site of cytochrome c peroxidase*. Abstracts of Papers, Journal of Bioinorganic Chemistry, 59, 1995, 442.

Fitzgerald, Melissa M.; Jensen, Gerard M.; **Musah, Rabi A.**; Trester, Michelle L.; McRee, Duncan E.; Goodin, David B. *Structural determinants of the cation binding specificity and ligand pathway to an artificial cavity constructed at the TRP-191 radical site of cytochrome c peroxidase*. Abstracts of papers, Journal of Bioinorganic Chemistry, 50, 1995, 446.

Musah, Rabi A. *The mechanisms of the reactions of substituted phenylalkynes with brominating agents (especially tribromide ion) and aryl sulfenyl halides:*

product, stereochemical, kinetic and isotope effect studies (tetrabutylammonium tribromide, electrophilic addition). Dissertation Abstracts, 1995.