

Steven Douglas Aird

Phone: 81-098-961-3767

Email: saird@asia.umuc.edu

Home Page: <http://web.mac.com/sdaird/Site/Professional.html>

Education:

1983-1988	University of Wyoming	Postdoctoral Research,	Biochemistry
1976-1984	Colorado State University	Ph.D.,	Zoology
1974-1976	Northern Arizona University	M.S.,	Biology
1970-1974	Montana State University	B.S.,	Zoology

Professional Experience:

2002-Present

Collegiate Professor, University of Maryland University College (2009 – Present)

Associate Editor, Western North American Naturalist (2005 – present).

Adjunct Professor, Tidewater Community College, Portsmouth, VA (2009)

Adjunct Professor, Department of Biology, Old Dominion University, Norfolk, VA (2003 – 2009)

Associate Professor, Department of Biology, Norfolk State University, Norfolk, VA (2002 – 2008)

- taught undergraduate lectures and laboratories in general chemistry, biochemistry, general biology, zoology, introduction to research
- mentored undergraduate students in supervised research projects
- mentored graduate students in Brasil and India in an unofficial capacity
- edited manuscripts for non-native English speaking scientists in Brasil so that the manuscripts were accepted for publication (over 30 all total)
- reviewed and edited manuscripts for international journals (Copeia, Life Sciences, Biochimie, and Comparative Biochemistry and Physiology, Cell Biochemistry and Function, Gene, Planta Medica, Biology of the Rattlesnakes, and the Western North American Naturalist)
- gave seminars at U.S. and foreign universities
- wrote funded grant proposals
- submitted research publications to international journals
- member, Faculty Senate Committee on University Governance
- member, Curriculum Committee, Department of Biology, NSU
- completed ESRI course, "Learning ArcGIS (9.3) Desktop"
- trained in the use of Tripos molecular modeling software
- trained in the construction of cDNA libraries

1999 - 2001

Visiting Professor, Universidade Estadual do Ceará, Fortaleza, CE, Brasil

- advised M.S. and undergraduate students and supervised their research programs
- taught graduate courses in chemistry of animal toxins and protein chemistry
- wrote successful grant proposals
- became proficient at database mining
- published manuscripts
- edited manuscripts written by Brazilian, Moroccan, German, and Russian colleagues
- reviewed manuscripts for Comparative Biochemistry and Physiology and Archives of Biochemistry and Biophysics

1997 - 1999

Visiting Researcher, Universidade Federal de Pernambuco, Recife, PE, Brasil

- advised M.S. and undergraduate students and supervising their research programs
- taught graduate courses in chemistry of animal toxins and protein chemistry
- wrote successful grant proposals
- published manuscripts
- edited manuscripts written by Brazilian, Moroccan, and Russian colleagues

1996Visiting Professor, Instituto de Pesquisas Energéticas e Nucleares, São Paulo, SP, Brasil

- taught a graduate level course on protein chemistry and chromatography of animal venoms, and structure-function studies of proteinaceous toxins
- assisted graduate students and staff researchers at four Brazilian institutions in solving protein purification problems encountered in their research

1991-1996Natural Toxin Technologies, LC

- isolated highly purified snake and bacterial toxins and supplied them to international biochemical retailers
- conducted novel research in snake venom chemistry
- wrote a successful Phase I SBIR grant proposal (\$100,000)
- business operations resulted in creation of assets in excess of 4x capitalization

1988 - 1991Senior Scientist, Natural Product Sciences, Salt Lake City, UT

- isolated novel compounds from spider, scorpion and snake venoms for bioassay and structural-functional studies
- conducted comparative biochemical studies of snake venoms
- purified spider venom constituents produced recombinantly in *E. coli* and baculoviruses
- asked by Pharmacia-LKB Biotechnology to serve as a beta-tester for FPLC Manager, chromatography software
- field work in Brazilian cerrado and rain forest collecting spiders, scorpions, reptiles, and amphibians

1983 - 1988Postdoctoral Research Associate, University of Wyoming, Laramie, WY

- investigated structure and function of crotalid venom proteins, particularly non-toxic phospholipases, presynaptic neurotoxins, and myotoxins
- became skilled in liquid and high performance liquid chromatography, polyacrylamide gel electrophoresis and other protein purification techniques, protein cleavage chemistry, spectrometry, amino acid composition analyses, protein sequencing, and polyclonal antibody production in rabbits.
- sequenced the basic and acidic subunits of crotoxin, a toxic, heterodimeric phospholipase A₂ from the venom of *Crotalus durissus terrificus*
- purified and sequenced tarantula toxins
- characterized secondary structure of textilotoxin, a heteropentameric, presynaptic, neurotoxic phospholipase
- collaborative research efforts included cloning of genes for non-toxic and presynaptic, neurotoxic phospholipase A₂, and X-ray crystallographic and sequencing studies of Mojave toxin
- appointed to Provisional Committee on Toxin Nomenclature, International Society on Toxinology (1990)
- appointed as Associate Researcher at Universidade Católica de Goiás, Goiânia, Goiás, BRASIL (1988)
- invited lecturer at the National Meeting of the Student Chapter of the American Veterinary Medical Association (1987)
- installed and managed local area computer network in Department of Molecular Biology (1985-1987)
- appointed to the Grants-in-Herpetology Committee - Society for the Study of Amphibians and Reptiles (1986)
- co-instructor - Biochemistry 860 - Natural Toxins (1986)
- reviewed manuscripts for Toxicon, Herpetological Review and Pakistan Journal of Scientific and Industrial Research (1986-1987)
- technical consultant in herpetology for the Colorado Division of Wildlife (1985-1987)

- Research Associate I, Department of Biochemistry, University of Wyoming (1983-1984)

1974-1983

M.S. and Ph.D. Programs, Northern Arizona University, Colorado State University

- judge for Colorado-Wyoming Junior Academy of Sciences (1982)
- reviewer for journal Herpetologica (1980-1981)
- Research Technician - Colorado Division of Wildlife (Nongame Research) (1980)
- Teaching Assistant, Herpetology and Cell Biology, Colorado State University (1978-1979)
- hired by Johnson Wax to do public relations seminars for Holubar Mountaineering, Ltd. concerning rattlesnakes, snake bite and the outdoorsman - seminars given in Racine, WI, Edina, MN, Fort Collins, CO, Denver, CO, Colorado Springs, CO, Glendale, AZ, Santa Ana, CA, and Salt Lake City, UT (1979)
- self-directed field study in herpetology in Mexico (1977)
- Research Assistant and Teaching Assistant, Biochemistry, Louisiana State University Medical Center (1976-1977)
- Teaching Assistant, Cell Physiology, Northern Arizona University (1975 - 1976)
- Teaching Assistant, Plant Taxonomy, Northern Arizona University (1974 -1975)
- Assistant Curator, Deaver Herbarium, Northern Arizona University (1974 -1975)

Awards:

- 2005 NIH Research and Infrastructure at Minority Institutions (RIMI) Grant, NSU Center for Biotechnology and Biomedicine, \$3.6 million, Joseph C. Hall, P. D., Steven D. Aird, Tabmitha Y. Jerve, and Kenneth W. Hicks. The budget for my subproject is \$504,151.
- 2005 NSF Research Opportunity Award, MCB-0523042 (\$25,676), entitled, "cDNA Structure of Phosphodiesterase from Venom of the Eastern Cottonmouth (*Agkistrodon p. piscivorus*)."
Awarded to R. V. Lewis, P.I., J. D. Johnson, Coinvestigator, and S. D. Aird, Coinvestigator, but written by S. D. Aird.
- 2002 Dominion Virginia Power Initiative (\$25,000)
- 2000 FUNCAP (Fundação Cearense de Amparo de Pesquisa) Research Grant (R\$10,000)
- 1999 FUNCAP Fellowship as Visiting Professor at UECE
- 1998 CNPq (Conselho Nacional de Pesquisa) fellowship for research and teaching at Universidade Federal de Pernambuco, Recife, PE, Brasil
- 1998 FACEPE (Fundação de Amparo a Ciência e Tecnologia do Estado de Pernambuco) (R\$10,000)
- 1997 CNPq fellowship for research and teaching at Universidade Federal de Pernambuco, Recife, PE, Brasil
- 1996 CNPq fellowship for lecturing and research at Instituto de Pesquisas Energéticas e Nucleares, Universidade de São Paulo, SP, Brasil
- 1995 Small Business Innovation Research grant. Received priority score of 144. (\$100,000)
- 1991 SBIR Grant (\$50,000). Received priority score of 140. Funds not received due to failure to secure corporate start-up funding
- 1986 Biomedical Research Support Grant (University of Wyoming) (\$2,500)
- 1983 Biomedical Research Support Grant (Colorado State University) (\$900)
- 1980 Colorado Fellowship (Colorado State University) (\$1,000)
- 1979 cited for excellence in teaching - "A Pat on the Back" - Associated Students of CSU
- 1979 Colorado Fellowship (Colorado State University) (\$1,000)
- 1978 Colorado Fellowship (Colorado State University) (\$1,000)
- 1977 Sigma Xi Grant-in-Aid - (Louisiana State University Chapter) (\$100)

Professional Memberships:

- 1984 - present International Society of Toxinology
- 2005 - present Virginia Academy of Science
- 2006 - present American Association of University Professors

Publications:

46. Pegram, S. A. and **S. D. Aird**. 2009. Isolation and N-terminal sequence of phosphodiesterase from venom of the western cottonmouth (*Agkistrodon piscivorus leucostoma*). (manuscript in preparation).
45. Clark, M. H., Jr., T. D. Matos, B. J. Neva, K. T. Chu, and **S. D. Aird**. 2009. Isolation and characterization of Dipeptidyl Peptidase IV from *Ophiophagus hannah* venom. (manuscript in preparation).
44. **Aird, S. D.** 2009. Snake venom purines and pyrimidines. Invited review article. Reptile Venoms and Toxins. Mackessy, S. P., Ed. (in press).
43. **Aird, S. D.** 2008. Frugivory and herbivory in common snapping turtles (Family Chelydriidae: *Chelydra serpentina*). Bull. Chicago Herp. Soc., 43, 189-195.
42. **Aird, S. D.** 2008. Nucleoside Composition of *Heloderma* Venoms. Comp. Biochem. Physiol. B Biochem. Mol. Biol. 150, 183-186. <http://dx.doi.org/10.1016/j.cbpb.2008.02.012>
41. **Aird, S. D.** 2008. Snake Venom Dipeptidyl Peptidase IV: Taxonomic Distribution and Quantitative Variation. Comp Biochem. Physiol. B Biochem. Mol. Biol. 150, 222-8. <http://dx.doi.org/10.1016/j.cbpb.2008.03.005>
40. Soper, A. S. and **S. D. Aird**. 2007. Elution of tightly bound solutes from Concanavalin A Sepharose: Factors affecting the desorption of cottonmouth venom glycoproteins. J. Chromatog. A 1154, 308-318 <http://dx.doi.org/10.1016/j.chroma.2007.03.126>.
39. Higuchi, S., N. Murayama, K. Saguchi, H. Ohi, Y. Fujita, N. Jorge da Silva, Jr., and **S. D. Aird**. 2006. A Novel peptide from the ACEI/BPP-CNP precursor in the venom of *Crotalus durissus collilineatus*. Comp. Biochem. Physiol. 144C, 107-121.
38. **Aird, S. D.** 2005. Taxonomic distribution and quantitative analysis of free purine and pyrimidine nucleosides in snake venoms. Comp. Biochem. Physiol. 140, 109-126.
37. **Aird, S. D.** 2004. Chromatographic behavior of *Bothrops erythromelas* phospholipase and other venom constituents on Superdex 75. Prep. Biochem. Biotech. 34, 345-364.
36. **Aird, S. D.** 2002. Review Article. Ophidian envenomation strategies and the role of purines. Toxicon 40, 335-393.
35. Sigel, R., M. Hackett and **S. D. Aird**. 2002. Primary structure of four dendrotoxin E homologs from the venom of *Dendroaspis angusticeps*. Toxicon. 40, 297-308.
34. Jorge da Silva, N. and **S. D. Aird**. 2001. Prey Specificity, Comparative Lethality and Compositional Differences of Brazilian *Micrurus* Venoms. Comp. Biochem. Physiol. 128C: 425-456.
33. **Aird, S. D.**, G. C. Womble, J. R. Yates, III, and P. R. Griffin. 1999. Primary Structure of γ -bungarotoxin, a New Postsynaptic Neurotoxin from Venom of *Bungarus multicinctus*. Toxicon 37: 609-625.
32. Spencer, P. J., **S. D. Aird**, N. Nascimento, M. Boni-Mitake, and J.R. Rogero. 1998. Single step purification of bothropstoxin-1. Brazilian J. Med. Biol. Res. 31: 1125-1127.
31. Griffin, P. R., **S. D. Aird**, W. G. Kruggel, S. Hudiburg, D. A. Swann, J. Shabanowitz, D. F. Hunt, G. V. Odell, and I. I. Kaiser. 1994. Primary structures of two toxins from the venom of the Mexican red knee tarantula (*Brachypelma smithii*). Toxicon 32: 1083-1093.
30. **Aird, S. D.** 1992. Reptile Venoms and Toxins. (Invited Book Review) Pharmaceutical Res. 9, 1231.
29. Pinto, R. N. L., N. Jorge da Silva and **S. D. Aird**. 1991. Human envenomation by the South American opisthoglyph *Clelia clelia plumbea* (Wied) and a preliminary fractionation of its venom. Toxicon 29: 1512-1516.
28. Jorge da Silva, N., P. R. Griffin, and **S. D. Aird**. 1991. Comparative chromatography of Brazilian coral snake (*Micrurus*) venoms. Comp. Biochem. Physiol. 100B: 117-126.
27. **Aird, S. D.** and N. Jorge da Silva. 1991. Comparative enzymatic composition of coral snake (*Micrurus*) venoms. Comp. Biochem. Physiol. 99B: 287-294.
26. **Aird, S. D.**, W. G. Kruggel, and I. I. Kaiser. 1991. Multiple myotoxins from the venom of a single prairie rattlesnake (*Crotalus v. viridis*). Toxicon. 29: 265-268.
25. **Aird, S. D.** and M. E. Aird. 1990. Behavior for trapping rain water in *Crotalus viridis lutosus*. Bull. Chicago Herp. Soc. 25: 217.

24. Griffin, P. R. and **S. D. Aird**. 1990. A new small myotoxin from the venom of the prairie rattlesnake (*Crotalus viridis viridis*). FEBS Lett. 274: 43-47.
23. **Aird, S. D.**, J. Yates, D. Hunt, and I. I. Kaiser. 1990. Complete amino acid sequence of the acidic subunit of crotoxin. Archs. Biochem. Biophys. 1040: 217-224.
22. **Aird, S. D.**, W. G. Kruggel, and I. I. Kaiser. 1990. Amino acid sequence of the basic subunit of Mojave toxin from the venom of the Mojave rattlesnake (*Crotalus s. scutulatus*). Toxicon 28: 669-673.
21. Kaiser, I. I., D. Plummer, **S. D. Aird**, and G. V. Odell. 1990. The amino acid sequence of a myotoxic phospholipase from the venom of *Bothrops asper*. Archs Biochem. Biophys. 278: 319-325.
20. **Aird, S. D.** 1990. Call for an IST Nomenclatural Committee. (Invited Letter to the Editor) Toxicon 28: 136-137.
19. **Aird, S. D.**, B. L. Steadman, I. I. Kaiser, and C. R. Middaugh. 1989. Comparative spectroscopic studies of four crotoxin homologs and their subunits. Biochim. Biophys. Acta 997: 211-218.
18. **Aird, S. D.**, C. R. Middaugh, and I. I. Kaiser. 1989. Secondary structure of textilotoxin, a heteropentameric phospholipase from the venom of *Pseudonaja t. textilis*, and its subunits. Biochim. Biophys. Acta 997: 219-223.
17. Jorge da Silva, N., **S. D. Aird**, C. S. Seebart, and I. I. Kaiser. 1989. A gyroxin analog from the venom of the bushmaster (*Lachesis muta muta*). Toxicon 27: 763-771.
16. **Aird, S. D.**, C. S. Seebart, L. Thirkhill, and I. I. Kaiser. 1989. Venoms and morphology of Western Diamondback/Mojave Rattlesnake Hybrids. Journal of Herpetology 23: 131-141.
15. Odell, G. V., S. Hudiburg, **S. D. Aird**, and I. I. Kaiser 1988. Spider venom toxins. In: Neurotoxins in Neurochemistry, Chap. 15, pp. 193-204, J. O. Dolly, Ed., Ellis Horwood Series in Biotechnology, A. Wiseman, Series Ed., Halstead Press, Chichester England.
14. **Aird, S. D.**, C. S. Seebart and I. I. Kaiser. 1988. Preliminary fractionation and characterization of the venom of the Great Basin rattlesnake (*Crotalus viridis lutosus*). Herpetologica 44: 71-85.
13. Ownby, C. L., **S. D. Aird** and I. I. Kaiser. 1987. Physiological and immunological properties of small myotoxins from the venom of the midget faded rattlesnake (*Crotalus viridis concolor*). Toxicon 26: 319-323.
12. Kaiser, I. I., and **S. D. Aird**. 1987. A crotoxin homolog from the venom of the Uracoan rattlesnake (*Crotalus vegrandis*). Toxicon 25: 1113-1120.
11. **Aird, S. D.** 1986. Methoxyflurane anesthesia in *Crotalus*: Comparisons with other gas anesthetics. Herp. Review 17: 82-84.
10. **Aird, S. D.**, I. I. Kaiser, R. V. Lewis, and W. G. Kruggel. 1986. A complete amino acid sequence for the basic subunit of crotoxin. Archs Biochem. Biophys. 249: 296-300.
9. **Aird, S. D.**, I. I. Kaiser, R. V. Lewis, and W. G. Kruggel 1985. Rattlesnake presynaptic neurotoxins: Primary structure and evolutionary origin of the acidic subunit. Biochemistry 24: 7054-7058. (Accelerated Publication)
8. **Aird, S. D.** 1985. A statistical assessment of variation in venom constituents within and between three rattlesnake subspecies. Toxicon 23: 1000-1004.
7. **Aird, S. D.** and I. I. Kaiser 1985. Comparative studies on three rattlesnake toxins. Toxicon 23(3): 361-374.
6. **Aird, S. D.**, I. I. Kaiser and A. L. Bieber. 1985. Nomenclature of biological toxins. Toxicon 23: 179-182.
5. **Aird, S. D.** and I. I. Kaiser 1985. Toxicity assays. Toxicon 23: 11-13.
4. **Aird, S. D.** 1984. *Crotalus viridis viridis* (Prairie Rattlesnake) Coloration. Herp. Review 15: 18-19.
3. Haynes, C. M. and **S. D. Aird**. 1981. The distribution and habitat requirements of the wood frog (Ranidae: *Rana sylvatica* Le Conte) in Colorado. Colorado Division of Wildlife Special Report #50., 29 pp.
2. Frost, D. and **S. D. Aird** 1978. *Rhinocheilus lecontei tessellatus*. Herp. Review 9: 62.
1. Frost, D. and **S. D. Aird**. 1978. *Micrurus laticollaris*. Herp. Review 9: 62.

Seminars and Presentations:

- 2007 The Function of Purines in Snake Envenomation, Department of Biology, The College of William and Mary, Williamsburg, VA, 26 October, 2007.
- 2005 The Role of Purines in Snake Envenomation Strategies, Department of Molecular Biology, University of Wyoming, Laramie, WY, 28 July, 2005.
- 2005 Qualitative and Quantitative Study of Snake Venom Purines, Department of Biophysical Chemistry, Sojo University, Kumamoto City, Japan, 23 May, 2005.
- 2004 Snake venom purines, Invited Seminar, Department of Chemistry, Sophia University, Tokyo, Japan, 19 May, 2004.
- 2003 The Role of Purines in Ophidian Envenomation, Invited Seminar, Department of Biology, Old Dominion University, 06 November, 2003.
- 2003 The Role of Purines in Ophidian Envenomation, Invited Seminar, School of Pharmacy, Showa University, Tokyo, Japan, 19 May, 2003.
- 2001 Ophidian envenomation strategies and the role of purines. Plenary Lecture. 7th Symposium, Pan-American Section, International Society on Toxinology, Charlottesville, VA, 4-8 August, 2001.
- 1999 γ -bungarotoxina: Uma nova classe de neurotoxina pós-sináptica., Research Seminar, Mestrado em Ciências Fisiológicas, UECE.
- 1998 A Novel Postsynaptic Neurotoxin from the Venom of *Bungarus multicinctus*, Congresso Brasileiro de Zoologia, Recife, PE, Brasil
- 1996 Chemistry of Animal Venoms and Purification of Natural Toxins, Instituto de Pesquisas Energéticas e Nucleares, Universidade de São Paulo, SP, Brasil
- 1992 Rattlesnakes of Utah, Utah Association of Herpetologists, University of Utah, Salt Lake City, UT
- 1991 Chemistry of Snake Venoms, Department of Biology, Utah State University, Logan, UT
- 1991 Biochemistry of Snake Venoms, Department of Biology, Wichita State University, Wichita, KS
- 1990 Crotalid Presynaptic Neurotoxins and Structure-Function Relationships of Snake Venom Phospholipases, California Institute of Technology, Pasadena, CA
- 1990 Snake Venom Chemistry: Compositional Diversity and Medical Applications of Snake Venom Proteins, Sterling Research Group, Malvern, PA
- 1989 Snake Venoms and Their Potential to Yield Valuable Natural Products., Natural Product Sciences, Inc.
- 1988 A Historical Perspective on Structure-Function Studies of Crotalid Presynaptic Neurotoxins, Instituto Butantan, São Paulo, SP, Brasil
- 1988 The Use of Liquid Chromatography in Protein Purification as Illustrated by Studies on Crotoxin, Hospital de Doenças Tropicais, Goiânia, Goiás, Brasil
- 1987 Technical Writing on the Macintosh Computer using the Word Processing Program "WriteNow," University of Wyoming, Department of Molecular Biology
- 1985 Crotalid Presynaptic Neurotoxins: Structure Function and Phylogenetic Distribution, Brigham Young University, Department of Chemistry, Provo, UT
- 1985 Climatological Factors and the Morphological Differentiation of the Western Rattlesnake in Colorado, Wyoming and Utah, University of Wyoming Chapter of Sigma Xi, Laramie, WY
- 1985 Morphological and Biochemical Differentiation of the Western Rattlesnake, University of Wyoming, Department of Zoology, Laramie, WY
- 1984 Morphological and Biochemical Differentiation of the Western Rattlesnake, Colorado State University, Department of Zoology, Fort Collins, CO