

Curriculum Vitae

Anthony S. Serianni
Summer 2016

Name: Anthony Stephen Serianni

Date of Birth: November 18, 1953

Place of Birth: Chestnut Hill, Pennsylvania

Marital Status: Married (Ann); two children (Catherine Elizabeth, Patrice Gabrielle)

Education: B.S. 1975 Albright College, Reading, Pennsylvania (Biochemistry)

Ph.D. 1980 Michigan State University, East Lansing, Michigan (Biochemistry); Professor Robert Barker, advisor

1980-82 Postdoctoral Research Associate with Professor Robert Barker (retired) at Cornell University, Section of Biochemistry, Molecular and Cell Biology

Appointments and Honors:

Magna cum laude, B.S., 1975

American Chemical Society Award, 1975

Benjamin H. Handorf Chemistry Award, 1975

Elected, *Secretary*, Division of Carbohydrate Chemistry, American Chemical Society, 1988-1989

Elected, *Executive Secretary*, Division of Carbohydrate Chemistry, American Chemical Society, 1989-1990

Elected, *Chairman-Elect*, Division of Carbohydrate Chemistry, American Chemical Society, 1990-1991

Chairman, Division of Carbohydrate Chemistry, American Chemical Society, 1991-1992

Past Chairman, Division of Carbohydrate Chemistry, American Chemical Society, 1992-1993

Recipient, *Horace S. Isbell Award in Carbohydrate Chemistry*, ACS Division of Carbohydrate Chemistry, 1988

Member, Editorial Board, *Carbohydrate Research*, 1988-1992, 1999-present

Member, Editorial Board, *Journal of Carbohydrate Chemistry*, 1991-1998

Editor, *Carbohydrate Research*, 1992-1998

Honorary member, *Alpha Epsilon Delta*, Pre-Medical Honor Society, Notre Dame Chapter

Recipient, *Distinguished Alumnus Award*, Albright College Alumni Association, 1996

Recipient, *John A. Boezi Memorial Alumnus Award*, Michigan State University, 2001

Kaneb Teaching Award, College of Science, University of Notre Dame, 2003

Recipient, *Melville L. Wolfrom Award in Carbohydrate Chemistry*, ACS Division of Carbohydrate Chemistry, 2006

Elected, *Fellow of the American Association for the Advancement of Science*, Chemistry Section, December 2010

Editorial Board, *Reports in Organic Chemistry* (peer-reviewed/open access), 2011-present

Elected, *Alternate Councilor*, Division of Carbohydrate Chemistry, American Chemical Society, 2012-2014

Elected, *Fellow of the American Chemical Society*, July 2012

Elected, *Fellow of the Royal Society of Chemistry*, October 2012

Elected, *Councilor*, Division of Carbohydrate Chemistry, American Chemical Society, 2015-2017

Elected, *Member*, US Advisory Committee for International Carbohydrate Symposia, 2014-2019

Associate Member, ACS Committee on Economic and Professional Affairs (CEPA), American Chemical Society, 2015-2016

Invited and Plenary Lectures (Scientific Conferences/Symposia):

Invited Lecturer, NATO Advanced Study Institute on NMR of Biological Macromolecules: Proteins, Nucleic Acids and Polysaccharides, Crete, Greece, August 23-Sept. 2, 1993.

Invited Lecturer, *Stable Isotopically-Labeled Carbohydrates: Synthesis and Application in Structural Biology*, Stable Isotope Applications in Biomolecular Structure and Mechanisms, Santa Fe, NM, March 27-31, 1994.

Invited Lecturer, *^{13}C - ^1H Spin-Couplings in Flexible Aldofuranosyl Rings: New Probes of DNA/RNA Structure*, 36th Experimental Nuclear Magnetic Resonance Conference, Boston, MA, March 26-30, 1995.

Discussion Leader, 1995 Gordon Research Conference on Purines, Pyrimidines and Related Substances, Salve Regina University, Newport, RI, July 2-7, 1995.

Invited Lecturer, *Structural Interpretation of ^{13}C - ^1H and ^{13}C - ^{13}C Spin-Coupling Constants in Pyranosyl and Furanosyl Rings: Applications to Oligosaccharides and Oligonucleotides*, Symposium on "Advances in NMR Spectroscopy of Complex Carbohydrates, H. van Halbeek, organizer, 211th ACS National Meeting, New Orleans, LA, March 24-28, 1996.

Invited Lecturer, *Applications of Stable Isotopes in NMR Studies of Carbohydrates*, 1997 Gordon Research Conference on Carbohydrates, Tilton School, June 22-27, 1997.

Invited Lecturer, Southeast Regional ACS Meeting, Symposium on Recent Advances in Carbohydrate Chemistry, R. Helm, organizer, October 19-22, 1997.

Invited Lecturer, *^{13}C - ^{13}C and ^{13}C - ^1H Spin Couplings in Carbohydrates and Nucleic Acids*, XVIIIth International Conference on Magnetic Resonance in Biological Systems, Tokyo, Japan, August 23-28, 1998, Abstract No. MIID-2.

Invited Lecturer, *Carbohydrate Chemistry: Developments for the New Millenium*, Southeastern Regional Meeting of the American Chemical Society (SERMACS), D. Baker, organizer, Knoxville, TN, October 17-20, 1999.

Plenary Lecturer, 9th Bratislava Symposium on Saccharides, Smolenice Castle, Bratislava, Slovakia, September 3-8, 2000.

Invited Speaker, XIXth International Conference on Magnetic Resonance in Biological Systems, Florence, Italy, August 20-25, 2000.

Invited Speaker, Wallenberg Mini-symposium, *J-Couplings in the Furanose Rings of Nucleic Acids: Experimental and Theoretical Studies*, Lund, Sweden, November 11-12, 2000.

Invited Speaker, *NMR J-Couplings in Saccharides: Combining Theory with Experiment*, ACS Symposium on High Resolution NMR Spectroscopy of Polymers, Division of Polymer Chemistry, 221st ACS National Meeting, San Diego, CA, April 1-5, 2001.

Award Lecture, *NMR J-Couplings in Saccharide Structure Determination*, John A. Boezi Memorial Alumnus Award, Department of Biochemistry and Molecular Biology, Michigan State University, April 19, 2001.

Plenary Lecturer, *NMR J-Couplings in Saccharide Structure Determination: Theoretical and Experimental Studies*, 9th Meeting on Stereochemistry, Prague, Czech Republic, June 15-18, 2001.

Invited Speaker, *Theoretical Calculations of NMR Parameters in Oligosaccharides Using Density Functional Theory: J-Couplings Across Flexible Bonds*, ACS Symposium on Computer Modeling of Carbohydrates, Divisions of Computers in Chemistry and Carbohydrate Chemistry, 223rd National ACS Meeting, Orlando, FL, April 7-11, 2002.

Invited Speaker, *¹³C-¹H and ¹³C-¹³C Scalar Couplings in Isotopically Labeled Mono-, Di-, and Trisaccharides: NMR and DFT Studies of O-Glycoside and Hydroxymethyl Group Conformation*, ACS Symposium on NMR Spectroscopy of Polymers, Division of Polymer Chemistry, 225th National ACS Meeting, New Orleans, LA, March 23-27, 2003, Abstr. No. 682.

Invited Speaker, *Oligosaccharide Conformation via Redundant ¹³C-¹³C and ¹³C-¹H Scalar Coupling Analysis*, 23rd Gordon Research Conference on Carbohydrates, June 22-27, 2003.

Invited Speaker, *NMR of Isotopically-Labeled Oligosaccharides*, NMR Tutorial, Division of Carbohydrate Chemistry, 227th ACS National Meeting, Anaheim, CA, March 28-April 1, 2004.

Invited Speaker, *Oligosaccharide Conformation: NMR and DFT Methods*, Computational Chemistry of Carbohydrates Symposium, Division of Carbohydrate Chemistry, 227th ACS National Meeting, Anaheim, CA, March 28-April 1, 2004.

Invited Speaker, *NMR Scalar Couplings in Isotopically Labeled Oligosaccharides: New Correlations with Molecular Structure*, Small Molecule NMR Conference (SMASH), Breckenridge, CO, September 12-15, 2004.

Invited Speaker, *Hydroxyl Group Ionization and Anomerization of Aldofuranose Rings*, Implications of Sugar Ring Conformations in Drug Design: A Symposium in Memory of Muttaiya Sundaralingam, 231st ACS National Meeting, Division of Carbohydrate Chemistry, Atlanta, GA, March 26-30, 2006.

Invited Speaker, *Spin-Spin Coupling Studies of Mono- and Oligosaccharides by NMR, Crystallography, DFT and MD*, A Symposium on Modeling of Plant Biopolymers, 231st ACS National Meeting, Division of Cellulose and Renewable Materials, Atlanta, GA, March 26-30, 2006.

Invited Speaker/Award Recipient, *Structural and Functional Roles of Oxygen in Saccharides*, Isbell/Wolfrom Awards Symposium, 232nd ACS National Meeting, Division of Carbohydrate Chemistry, San Francisco, CA, September 10-14, 2006.

Invited Speaker, *Structural and Functional Roles of Oxygen in Saccharides*, Society for Applied Spectroscopy, Chicago, IL, November 12, 2006.

Invited Speaker, *Structural and Functional Properties of NMR J-Couplings in Simple and Complex Saccharides*, Payen Symposium Honoring Charles Buchanan, 232nd ACS National Meeting, Division of Cellulose and Renewable Materials, Chicago, IL, March 25-29, 2007.

Invited Speaker, *Oligosaccharides as Lone-Pair Scaffolds: Influence of Molecular Context, H-Bonding and Solvation on Solution Conformation and Dynamics*, Glycome: Structure To Disease, An I2CAM Exploratory Workshop, Ecole Normale Supérieure, Paris, France, September 14-17, 2007.

Invited Speaker, *Oxygen Lone Pairs and Functional Scalar Couplings in Structural Glycobiology*, Washington Area NMR Group (WANG), Washington, DC, December 7, 2007.

Invited Speaker, *New Correlations Between NMR J-Couplings and Saccharide Structure and Function*, 234th ACS National Meeting, Division of Cellulose and Renewable Materials, New Orleans, LA, April 6-10, 2008.

Plenary Lecturer, *Saccharide Side-chain Conformations as Mediators of Structure and Function: NMR Investigations with Stable Isotopes*, Institute of Organic Chemistry, Polish Academy of Sciences, NMR Conference, Warsaw, Poland, September 23-25, 2009.

Invited Speaker, *Side-chain Conformations as Mediators of Structure and Function: N-Acyl Groups in Aminosugars*, 20th International Symposium on Glycoconjugates, Session on Structure, Function and Synthesis of Bioactive Oligosaccharides, San Juan, Puerto Rico, November 29-December 4, 2009.

Plenary Lecturer, *Saccharides, Isotopes, NMR: Structure, Function, Mechanism*, 25th International Carbohydrate Symposium, Tokyo, Japan, August 1-6, 2010.

Invited Speaker, *O-Glycoside Linkage Conformation: Generalized Equations for $^2J_{COC}$, $^3J_{CCH}$, $^3J_{COCH}$ and $^3J_{COCC}$ NMR J-Couplings Sensitive to ϕ and ψ* , Symposium on Recent Developments in Characterizing Carbohydrate Structure and Dynamics, Division of Carbohydrate Chemistry, 241st ACS National Meeting, Anaheim, CA, March 27-31, 2011

Invited Speaker, *Side-chain Conformations as Mediators of Saccharide Structure and Function: N-Acyl Groups in Aminosugars*, Department of Chemistry, University of Alberta, Edmonton, Canada, June 21, 2010.

Plenary Lecturer, *Isotopically Labeled Saccharides: Applications to Studies of Structure and Mechanism*, Satellite Meeting on Conformational Analysis of Carbohydrates & Protein/Carbohydrate Interactions, 16th European Carbohydrate

Symposium, Monte S. Angelo University Campus, University Federico II, Naples, Italy, July 2, 2011.

Invited Speaker, *1,2-Dicarbonyl Sugars in Biology: Phosphate-Catalyzed Skeletal Rearrangement Involving C1-C2 Transposition*, 16th European Carbohydrate Symposium, Sorrento-Naples, Italy, July 3-7, 2011

Special Lecture, *Isotopically Labeled Saccharides: Structure and Mechanism*, Year of the Sciences, Albright College, March 26, 2012

Invited Speaker, *1,2-Dicarbonyl Sugars: A Phosphate-Catalyzed Skeletal Rearrangement Involving C1-C2 Transposition*, 34th Reaction Mechanisms Conference, University of Missouri, June 19-23, 2012

Invited Speaker, *On the Use of ^1H - ^1H , ^{13}C - ^1H and ^{13}C - ^{13}C NMR Spin-Couplings in Methyl [^{13}C]Idopyranosides To Investigate Conformational Flexibility in Solution*, 26th International Carbohydrate Symposium, Madrid, Spain, July 22-27, 2012

Invited Speaker, *Experimental Validation of Saccharide Molecular Dynamics Simulations: Quantitative Treatment of NMR J-Coupling Ensembles* (with L. Sernau, T. Klepach and I. Carmichael), Symposium on 100 Years of Cellulose Diffraction, Division of Cellulose and Renewable Materials, 245th ACS National Meeting, New Orleans, LA, April 7-11, 2013

Invited Speaker, *Sustainability: Delimiting Core Knowledge in a Multidisciplinary Science*, Reform of Education in Sustainability and Climate in Urban Environments (RESCUE), Needs Assessment Workshop, Lecce, Italy, May 13, 2013

Plenary Speaker, *Interrogating Saccharide with Stable Isotopes*, 27th International Carbohydrate Symposium, Indian Institute of Science, Bangalore, India, January 12-17, 2014

Invited Speaker, *Isotopically Labeled Saccharides: Biologically Inspired NMR Studies of Structure and Mechanism*, Frontiers in Chemistry and Biology of Oligosaccharides, Indian Institute of Science Education and Research, Pune, India January 18-19, 2014

Invited Speaker, *Interrogating saccharides with stable isotopes by solution- and solid-state NMR*, Department of Organic Chemistry, Arrhenius Laboratory, Stockholm University, May 21, 2015

Positions:

Professor of Chemistry and Biochemistry
University of Notre Dame, Indiana 1999-present

President and CEO, Omicron Biochemicals, Inc., 115 South Hill Street, South Bend, IN 1982-present

Director
Lizzadro Magnetic Resonance Research Center
College of Science
University of Notre Dame, Indiana 1989-1994

Associate Professor of Chemistry and Biochemistry
University of Notre Dame, Indiana 1988-1999

Assistant Professor of Chemistry and Biochemistry
University of Notre Dame, Indiana 1982-1988

Postdoctoral Research Associate, Section of Biochemistry,
Cornell University, Ithaca 1980-1982

Graduate Research Assistant, Department of Biochemistry,
Michigan State University, East Lansing 1975-1979

Professional Affiliations:

American Society for Biochemistry and Molecular Biology
American Chemical Society (*Member and Fellow*)- Divisions of
Carbohydrate Chemistry, Biological Chemistry, Small
Chemical Businesses, and Organic Chemistry
American Association for the Advancement of Science (*Member
and Fellow*)
Royal Society of Chemistry (*Member and Fellow*)
The Biophysical Society
Society for Glycobiology
Indiana Academy of Science
International Society of Magnetic Resonance
International Isotope Society
Indiana Lakes Management Society
North American Lake Management Society

Research Interests:

Catalysis in chemical and enzymic systems; carbohydrate and nucleoside chemistry and biochemistry; conformations and dynamics of biomolecules in solution by multidimensional NMR and computational (*ab initio* MO) methods; synthetic methods to introduce stable isotopes into biologically important compounds; NMR spectroscopic methods to elucidate chemical and biochemical reaction mechanisms using labeled compounds; non-enzymic protein glycation reactions and mechanisms.

Courses Taught:

CHEM 115/117	General Chemistry I
CHEM 116	General Chemistry II
CHEM 119L	General Chemistry Laboratory I
CHEM 120L	General Chemistry Laboratory II
CHEM 223	Elementary Organic Chemistry I
CHEM 224	Elementary Organic Chemistry II
CHEM 342	Intermediary Metabolism
CHEM 420	Principles of Biochemistry
CHEM 439L	Physical Chemistry Laboratory
CHEM 521	Fundamentals of Biochemistry
CHEM 529	Enzyme and Coenzyme Mechanisms
CHEM 537	Carbohydrate Biochemistry and Glycobiology
CHEM 539	Molecular Metabolism: Pathways and Regulation
CHEM 621	Seminar in Biochemistry
CHEM 624	Advanced Biochemical Techniques
CHEM 626	NMR Spectroscopy in Chemistry and Biochemistry
CHEM 628	Carbohydrates in Chemistry and Biology
CHEM 628	Research Ethics
SUS20010	Sustainability: Principles and Practices

Courses Planned:

CHEM xxx	Advanced Metabolism with Clinical Correlations
CHEM xxx	Fundamentals of Good Manufacturing Practices (GMP) of Pharmaceuticals

Peer-Reviewed Publications:

1. H. A. Nunez, T. E. Walker, R. Fuentes, J. O'Connor, A. Serianni and R. Barker, Carbon-13 As a Tool For the Study of Carbohydrate Structures, Conformations and Interactions, *J. Supramol. Structure* **1977**, 6, 535.
2. A. S. Serianni, H. A. Nunez and R. Barker, Carbon-13 Enriched Carbohydrates: Preparation of Aldonitriles and Their Reduction with a Palladium Catalyst, *Carbohydr. Res.* **1979**, 72, 71.
3. A. S. Serianni, E. L. Clark and R. Barker, Carbon-13 Enriched Carbohydrates: Preparation of Erythrose, Threose, Glyceraldehyde and Glycolaldehyde with [¹³C]-Enrichment in Various Carbon Atoms, *Carbohydr. Res.* **1979**, 72, 79.
4. A. S. Serianni, J. Pierce and R. Barker, Carbon-13 Enriched Carbohydrates: Preparation of Triose, Tetrose and Pentose Phosphates, *Biochemistry* **1979**, 18, 1192.

5. A. S. Serianni and R. Barker, Isotopically-Enriched Carbohydrates: The Preparation of [^2H]-Enriched Aldoses by Catalytic Hydrogenolysis of Cyanohydrins with $^2\text{H}_2$, *Can. J. Chem.* **1979**, *57*, 3160.
6. A. S. Serianni, H. A. Nunez and R. Barker, The Cyanohydrin Synthesis: Studies with [^{13}C]Cyanide, *J. Org. Chem.* **1980**, *45*, 3329.
7. M. L. Hayes, A. S. Serianni and R. Barker, Methyl Lactoside: 600 MHz ^1H and 75 MHz ^{13}C NMR Studies of ^2H and ^{13}C -Enriched Compounds, *Carbohydr. Res.* **1982**, *100*, 87.
8. A. S. Serianni and R. Barker, ^{13}C Spin-Lattice Relaxation Times of [$1\text{-}^{13}\text{C}$]-Enriched Carbohydrates, *J. Magn. Reson.* **1982**, *49*, 335.
9. A. S. Serianni, J. Pierce, S. Huang and R. Barker, Anomerization of Furanose Sugars: Kinetics of Ring-Opening Reactions by ^1H and ^{13}C Saturation-Transfer NMR Spectroscopy, *J. Am. Chem. Soc.* **1982**, *104*, 4037.
10. M. L. Hayes, N. J. Pennings, A. S. Serianni, and R. Barker, Epimerization of Aldoses by Molybdate Involving a Novel Rearrangement of the Carbon Skeleton, *J. Am. Chem. Soc.* **1982**, *104*, 6764.
11. R. Barker, H. A. Nunez, P. Rosevear and A. S. Serianni, ^{13}C NMR Analysis of Complex Carbohydrates, *Methods in Enzymology* *83*, V. Ginsburg. Ed., **1982**, 58.
12. A. S. Serianni, H. A. Nunez, M. L. Hayes and R. Barker, Chemical Synthesis of Monosaccharides Enriched with Carbon Isotopes, *Methods in Enzymology* *89*, Part D, W. Wood, Ed., **1982**, 64.
13. A. S. Serianni, J. Pierce and R. Barker, Chemical Synthesis of Aldose Phosphates Enriched with Carbon Isotopes, *Methods in Enzymology* *89*, Part D, W. Wood, Ed., **1982**, 73.
14. A. S. Serianni, E. L. Clark and R. Barker, Chemical Synthesis of Aldoses Enriched with Isotopes of Hydrogen and Oxygen, *Methods in Enzymology* *89*, Part D, W. Wood, Ed., **1982**, 79.
15. A. S. Serianni, E. Cadman, J. Pierce, M. L. Hayes and R. Barker, Enzymatic Synthesis of Isotopically-Enriched Aldoses, Ketoses and their Phosphate Esters, *Methods in Enzymology* *89*, Part D, W. Wood, Ed., **1982**, 83.
16. R. Barker, E. L. Clark, H. A. Nunez, J. Pierce, P. R. Rosevear and A. S. Serianni, *The Synthesis of Mono- and Oligosaccharides Enriched with Isotopes of Carbon, Hydrogen and Oxygen*, in: *Stable Isotopes*; Schmidt, Forstel and Heinzinger, Eds., Elsevier, **1982**, 719.
17. G. Wu, A. S. Serianni and R. Barker, Stereospecific Exchange of Methylene Protons in Tetraofuranosides: Hydroxymethyl Group Conformations in Pentofuranosides, *J. Org. Chem.* **1983**, *48*, 1750.
18. A. S. Serianni and R. Barker, [^{13}C]-Enriched Tetroses and Tetraofuranosides: An Evaluation of the Relationship Between NMR Parameters and Furanosyl Ring Conformation, *J. Org. Chem.* **1984**, *49*, 3292.
19. J. Pierce, A. S. Serianni and R. Barker, Anomerization of Furanose Sugars and Sugar Phosphates, *J. Am. Chem. Soc.* **1985**, *107*, 2448.

20. R. Barker and A. S. Serianni, Carbohydrates In Solution: Studies With Stable Isotopes, *Acc. Chem. Res.* **1986**, *19*, 307.
21. M. J. King-Morris and A. S. Serianni, Hydroxide-Catalyzed Isomerization of D-[1-¹³C]Mannose: Evidence For the Involvement of 3,4-Enediols, *Carbohydr. Res.* **1986**, *154*, 29.
22. J. R. Snyder and A. S. Serianni, D-Idose: A One- and Two-Dimensional NMR Investigation of Solution Composition and Conformation, *J. Org. Chem.* **1986**, *51*, 2694.
23. A. S. Serianni and R. Barker, *Synthetic Approaches to Carbohydrates Enriched with Stable Isotopes of Carbon, Hydrogen and Oxygen*, in: *Isotopes in the Physical and Biomedical Sciences*; E. Buncl/J. R. Jones, eds., Elsevier, **1987**, 211.
24. J. R. Snyder and A. S. Serianni, Synthesis and NMR Analysis of Unenriched and [1-¹³C]-Enriched 5-Deoxypentoses and 5-*O*-Methylpentoses, *Carbohydr. Res.* **1987**, *163*, 169.
25. J. R. Snyder and A. S. Serianni, Stable Isotopically-Enriched DL-Apiose: Synthesis, NMR Analysis and Furanose Anomerization, *Carbohydr. Res.* **1987**, *166*, 85.
26. T. Angelotti, M. Krisko, T. O'Connor and A. S. Serianni, [1-¹³C]Aldono-1,4-Lactones: Conformational Studies Based on ¹H-¹H, ¹³C-¹H and ¹³C-¹³C Spin Couplings and *Ab Initio* Molecular Orbital Calculations, *J. Am. Chem. Soc.* **1987**, *109*, 4464.
27. M. J. King-Morris and A. S. Serianni, ¹³C NMR Studies of [1-¹³C]Aldoses: Empirical Rules Correlating Pyranose Ring Configuration and Conformation With ¹³C Chemical Shifts and ¹³C-¹³C Spin Couplings, *J. Am. Chem. Soc.* **1987**, *109*, 3501.
28. A. S. Serianni and D. M. Chipman, Furanose Ring Conformation: Application of *Ab Initio* Molecular Orbital Calculations To the Structure and Dynamics of the Erythrofuranose and Threofuranose Rings, *J. Am. Chem. Soc.* **1987**, *109*, 5297.
29. P. C. Kline and A. S. Serianni, Chiral Hydroxymethyl Groups: ¹H NMR Assignments of the Prochiral C5' Protons of Ribonucleosides, *Mag. Reson. Chem.* **1988**, *26*, 120.
30. M. J. King-Morris, P. Bondo, R. Mrowca and A. S. Serianni, Stable Isotopically-Substituted Carbohydrates: An Improved Synthesis of [6-¹³C]Aldohexoses, *Carbohydr. Res.* **1988**, *175*, 49.
31. O. Kukal, A. S. Serianni and J. Duman, Glycerol Metabolism in a Freeze-tolerant Arctic Insect: An *in vivo* ¹³C NMR Study, *J. Comp. Physiol.* **1988**, *B158*, 175.
32. J. R. Snyder and A. S. Serianni, Furanose Ring Anomerization: A Kinetic Study of the 5-Deoxy-pentoses and 5-*O*-Methylpentoses, *Carbohydr. Res.* **1988**, *184*, 13.
33. J. R. Snyder, E. R. Johnston and A. S. Serianni, Talose Anomerization: NMR Methods to Evaluate the Reaction Kinetics, *J. Am. Chem. Soc.* **1989**, *111*, 2681.
34. O. Kukal, J. G. Duman and A. S. Serianni, Cold-Induced Mitochondrial Degradation and Cryoprotectant Synthesis in Freeze-Tolerant Arctic Caterpillars, *J. Comp. Physiol.* **1989**, *B158*, 661.
35. P. C. Kline and A. S. Serianni, Chiral Hydroxymethyl Groups: ¹H NMR Assignments of the Prochiral C5' Protons of 2'-Deoxyribonucleosides, *Mag. Reson. Chem.* **1990**, *28*, 324.
36. A. S. Serianni, P. C. Kline and J. R. Snyder, On the Use of Model Compounds to Assess Furanose Conformation at Apyrimidinic Sites in DNA, *J. Am. Chem. Soc.* **1990**, *112*, 5886.

37. P. C. Kline and A. S. Serianni, [^{13}C]-Enriched Ribonucleosides: Synthesis and Application of ^{13}C - ^1H and ^{13}C - ^{13}C Spin-Coupling Constants to Assess Furanose and N-Glycoside Bond Conformations, *J. Am. Chem. Soc.* **1990**, *112*, 7373.
38. A. S. Serianni, T. Vuorinen and P. Bondo, Stable Isotopically-Enriched D-Glucose: Strategies to Introduce Carbon, Hydrogen and Oxygen Isotopes at Various Sites, *J. Carbohydr. Chem.* **1990**, *9*, 513.
39. E. C. Garrett and A. S. Serianni, *Ab initio Molecular Orbital Calculations on Carbohydrates: Conformational Properties of Deoxygenated Furanose Sugars*, in "Computer Modeling of Carbohydrate Molecules", J. Brady and A. French, eds., ACS Symposium Series 430, **1990**, p. 91.
40. J. Wu, T. Vuorinen and A. S. Serianni, Furanose Ring Anomerization: Kinetic and Thermodynamic Studies of the D-2-Pentuloses by ^{13}C NMR Spectroscopy, *Carbohydr. Res.* **1990**, *206*, 1.
41. E. C. Garrett and A. S. Serianni, *Ab initio Molecular Orbital Calculations on Furanose Sugars: A Study with the 6-31G* Basis Set*, *Carbohydr. Res.* **1990**, *206*, 183.
42. T. Vuorinen and A. S. Serianni, [^{13}C]-Substituted Pentos-2-uloses: Synthesis and Analysis by ^1H and ^{13}C NMR Spectroscopy, *Carbohydr. Res.* **1990**, *207*, 185.
43. E. C. Garrett and A. S. Serianni, [$1\text{-}^{13}\text{C}$]Alditols: Elimination of Magnetic Equivalence in ^1H and ^{13}C NMR Spectra of Symmetric Compounds Through [^{13}C]-Substitution, *Carbohydr. Res.* **1990**, *208*, 23.
44. U. L. Stafford, A. S. Serianni and A. Varma, Microcomputer Automated Synthesis of Stable Isotopically Labeled Monosaccharides, *Am. Inst. Chem. Eng. J.* **1990**, *36*, 1822.
45. P. C. Kline, S.-G. Huang, M. L. Hayes, R. Barker and A. S. Serianni, Internuclear ^1H - ^1H Distance Measurements in Carbohydrates: Proton Transient Nuclear Overhauser Enhancement and Spin-Lattice Relaxation in [^{13}C]- and [^2H]-Substituted Compounds, *Can. J. Chem.* **1990**, *68*, 2171.
46. T. Vuorinen and A. S. Serianni, Synthesis of D-erythro-2-Pentulose and D-threo-2-Pentulose: Analysis of ^{13}C and ^1H NMR Spectra of [$1\text{-}^{13}\text{C}$]- and [$2\text{-}^{13}\text{C}$]-Substituted Compounds, *Carbohydr. Res.* **1990**, *209*, 13.
47. J. R. Snyder and A. S. Serianni, Deoxygenated and Alkylated Furanoses: Thorpe-Ingold Effects on Tautomeric Equilibria and Rates of Anomerization, *Carbohydr. Res.* **1991**, *210*, 21.
48. J. Wu and A. S. Serianni, D-Penturonic Acids: Synthesis with Stable Isotopic Substitution and Solution Studies by ^1H and ^{13}C NMR Spectroscopy, *Carbohydr. Res.* **1991**, *210*, 51.
49. J. Wu and A. S. Serianni, Ring-Opening Kinetics of the D-Pentofuranuronic Acids, *Carbohydr. Res.* **1991**, *211*, 207.
50. J. Wu and A. S. Serianni, Isotope-Edited 1D and 2D NMR Spectroscopy of [^{13}C]-Substituted Carbohydrates, *Carbohydr. Res.* **1992**, *226*, 209.
51. P. C. Kline and A. S. Serianni, [^{13}C]-Substituted Erythronucleosides: Synthesis and Conformational Analysis by ^1H and ^{13}C NMR Spectroscopy, *J. Org. Chem.* **1992**, *57*, 1772.

52. J. Wu, P. B. Bondo, T. Vuorinen and A. S. Serianni, ^{13}C - ^{13}C Spin Coupling Constants in Aldoses Enriched with ^{13}C at the Terminal Hydroxymethyl Carbon: Effect of Coupling Pathway Structure on J_{CC} in Carbohydrates, *J. Am. Chem. Soc.* **1992**, *114*, 3499.
53. A. S. Serianni, *Nuclear Magnetic Resonance Approaches To Oligosaccharide Structure Elucidation*, in: *Glycoconjugates: Composition, Structure and Function*, H. J. Allen and E. C. Kisailus, eds., Marcel-Dekker, **1992**, p. 71.
54. J. Wu, P. B. Bondo and A. S. Serianni, Multiply ^{13}C -Substituted Monosaccharides: Synthesis of D-[1,5,6- $^{13}\text{C}_3$]Glucose and D-[2,5,6- $^{13}\text{C}_3$]Glucose, *Carbohydr. Res.* **1992**, *226*, 261.
55. T. Bandyopadhyay, J. Wu and A. S. Serianni, [1'- ^{13}C]2'-Deoxyribonucleosides: Structural and Conformational Insights Derived from ^{13}C - ^1H Spin Coupling Constants Involving C1', *J. Org. Chem.* **1993**, *58*, 5513.
56. J. Duker and A. S. Serianni, [^{13}C]-Substituted Sucrose: ^{13}C - ^1H and ^{13}C - ^{13}C Spin Coupling Constants To Assess Furanose and Glycosidic Bond Conformation in Aqueous Solution, *Carbohydr. Res.* **1993**, *249*, 281.
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B. Bose-Basu and A. S. Serianni, Effect of O -Phosphorylation on ^{13}C - ^1H and ^{13}C - ^{13}C Spin-Couplings in Carbohydrates: Substitution and Ionization Effects

Patents:

Saccharide Antifreeze Compositions, Kent Walters, John G. Duman and Anthony S. Serianni, US Patent Number US 8604002B1, issued December 10, 2013.

Copyrights:

The *MA'AT* Program (Version 1.0) – Treatment of Redundant NMR Spin-Couplings To Derive Conformational Models in Solution, January 2015.

Books:

NMR Applications in Biopolymers, edited by J. W. Finley, S. J. Schmidt and A. S. Serianni, Plenum Press, New York, 1990.

A. S. Serianni, *¹³C Nuclear Magnetic Resonance Spectra of the Monosaccharides: Natural and Stable Isotopically-Enriched Compounds*. Published by Omicron Biochemicals, Inc. of South Bend. Copyright 1986.

Book Reviews and Other Articles:

Advances in Carbohydrate Chemistry and Biochemistry, Vol. 44, 1986. In *Carbohydr. Res.* **1987**, 166, C1.

Calculation of NMR and EPR Parameters: Theory and Applications, Kaupp, Bühl & Malkin, Wiley-VCH Verlag, 2004, *J. Am. Chem. Soc.* **2006**, 128, 8987-8988.

Carbohydrate – 25th International Symposium, *IDrugs* **2010**, 13, 686-688 (Thomson Reuters Scientific, Conference Report).

Instrumentation Proposals (Funded):

National Science Foundation, Chemical Instrumentation Program; "Purchase of a Nuclear Magnetic Resonance Data Processing Station." \$105,850. Funded, Spring 1986.

Previously Funded Proposals:

National Institutes of Health, ¹³C-¹H and ¹³C-¹³C Spin-Couplings in Oligosaccharides; \$916,500 total cost (May 2001-April 2005).

National Institutes of Health, Glucose Modification of Proteins in Diabetic Nephropathy; \$213,000 total ND cost (sub-contract with Vanderbilt University) (July 2003-June 2008).

Omicron Biochemicals, Inc. Graduate Research Fellowship in Structural Biology, \$8,000. October 1999-September 2000.

Omicron Biochemicals, Inc. Unrestricted Grant, \$8,000. October 1999-September 2000.

Omicron Biochemicals, Inc. Graduate Research Fellowship in Structural Biology, \$10,000. October 1998-September 1999.

Omicron Biochemicals, Inc. Unrestricted Grant, \$8,000. October 1998-September 1999.

Omicron Biochemicals, Inc. Graduate Research Fellowship in Structural Biology, \$10,000. October 1997-September 1998.

Omicron Biochemicals, Inc. Unrestricted Grant, \$6,000. October 1997-September 1998.

Omicron Biochemicals, Inc. Graduate Research Fellowship in Structural Biology, \$10,000. October 1996-September 1997.

Omicron Biochemicals, Inc. Unrestricted Grant, \$6,000. October 1996-September 1997.

Omicron Biochemicals, Inc. Equipment Grant, \$1,192.46. October 1996.

Omicron Biochemicals, Inc. Unrestricted Grant, \$11,000. October 1995-September 1996.

Undergraduate Summer Research Grant, Cambridge Isotope Laboratories, \$3,000, June-August 1994.

Omicron Biochemicals, Inc. Unrestricted Grant, \$10,500. October 1994-September 1995.

Omicron Biochemicals, Inc. Unrestricted Grant, \$6,000. October 1993-September 1994.

Omicron Biochemicals, Inc. Unrestricted Grant, \$6,000. October 1992-September 1993.

National Institutes of Health, General Medical, GM 33791-04 (1988-1991). Biologically-Important Furanosyl Rings. \$284,440, three years, direct costs.

Omicron Biochemicals, Inc., Unrestricted Grant, \$5,000. October 1991-September 1992.

Construction of an Automated Synthesizer of D-[1-¹³C]Glucose, Imaging Products, Inc., \$5,000.

Construction of an Algal Growth Chamber for the Production of Uniformly [¹³C]-Labeled D-Glucose, Imaging Products, Inc., \$37,000.

National Institutes of Health, General Medical, GM 33791-01. (1985-1988). Biologically-important Furanosyl Rings. Direct costs: 1st year, \$61,940; 2nd year, \$62,009; 3rd year, \$67,799.

ACS-PRF Grant For Scientific Education, "Recent Developments in the NMR Spectroscopy of Carbohydrates," ACS Symposium; \$1500.

J. H. Jones Faculty Research Development Fund, "A Dynamic Multinuclear NMR Study of Carbohydrate Conformation and Motion in Solution," \$3795.

Sigma Xi Grant-in-Aid of Research, "D-Idose: A Unique Model Carbohydrate for Studies of Tautomeric Equilibria and Mutarotation by NMR Spectroscopy." With J. R. Snyder. \$150.

Sigma Xi Grant-in-Aid of Research, "¹³C NMR Spectroscopy of a [¹³C]-Enriched Monoclonal Antibody to Human Plasminogen," with P. C. Kline. \$300.

Research Corporation: Grant No. 10028. Dynamic nuclear magnetic resonance studies of the kinetics of furanose tautomerization in solution. \$10,000.

Industrial Grants/Contracts:

Gliatech, Inc. Research contract on dextran sulfate synthesis. January-June 1993. \$17,201.

Gliatech, Inc. Research contract on dextran sulfate synthesis. July-December 1993. \$17,701.

Gliatech, Inc. Research contract on dextran sulfate synthesis. January-June 1994. \$22,500.

Gliatech, Inc. Research contract on dextran sulfate synthesis. July-December 1994. \$23,900.

Gliatech, Inc. Research contract on dextran sulfate synthesis. January-June 1995. \$24,100.

Gliatech, Inc. Research contract on dextran sulfate synthesis. July-December 1995. \$26,875.

Gliatech, Inc. Research contract on dextran sulfate synthesis. January-June 1996. \$15,000.

Gliatech, Inc. Research contract on dextran sulfate synthesis. June-December 1996, \$10,081.

Gliatech, Inc. Research contract on alginate polysaccharides. January-June 1998, pending.

Recently Expired Research Funding:

1 R01 DK065138-06 (with Dr. Billy Hudson) 05/31/08 – 04/30/12
NIDDK \$211,652 (ND portion only)
Glucose Modification of Proteins in Diabetic Nephropathy
10% effort

This project involved the PI as a subcontractor to Vanderbilt University (\$52,913 Annual DC to Notre Dame). The major goals of the subproject were to design new model systems to investigate the chemistry and biochemistry of non-enzymic protein glycation, investigate the factors influencing the susceptibility of specific protein sites to glycation, and investigate the effects of glycation on protein structure and function.

1025929
National Science Foundation 07/01/10 – 06/30/13
Antifreeze Glycolipids, New Thermal Hysteresis Factors in Insects
Co-PI with Dr. John Duman, Department of Biological Sciences, University of Notre Dame
Total Direct: \$500,000
10 % effort

This collaborative project involved the use of chemical, biochemical, genetics, and structural tools and methods to elucidate the structure and function(s) of a novel antifreeze glycolipid isolated from *Upis ceramboides*.

Center for Rare Diseases – University of Notre Dame 06/01/12 – 05/31/13
Development of Pharmacological Chaperones for the Treatment of MPS IIIA (Sanfilippo Syndrome A)
Total Cost: \$60,000

This project involves the synthesis and testing of new chemical chaperones for the enzyme, *N*-sulfamidase, based on chemical derivatives of its normal saccharide substrates and other saccharide derivatives such as iminosugars.

DaVinci Grant – Institute for Scholarship in the Liberal Arts – University of Notre Dame
Summer 2013
Stakeholder Mindset and Ecological Impact: Do Personal Beliefs and Values of Lake Papakeechee and Lake Wawsee Residents Influence Lake Stewardship?
PI (undergraduate student): Hannah Becker
Supervising Faculty Mentor: Anthony Serianni
Total Cost: \$4468

I wrote this proposal with some assistance from Ms. Becker. Funds were used to set up a lake research laboratory on Lake Papakeechee, Syracuse, Indiana, to conduct scientific studies of lake water (Secchi, dissolved oxygen, *E. coli*), and to conduct a survey of residents on Lakes Wawasee and Papakeechee.

Current Research Funding:

R01 AI052439-06
National Institutes of Health 08/01/10 – 07/31/15
M. avium GPLs in Macrophage Activation and Virulence
Principal Investigator. Professor Jeffrey Schorey (Biological Sciences)
Total Direct: \$1,875,000
5% effort

I serve as a consultant on this proposal, and some funds are provided to my laboratory (\$5000-\$10,000 per year) to support NMR-based structure determinations of the glycopeptidolipids described in the proposal. My research group collaborated with Prof. Schorey's lab in 2008 in support of this work, leading to a publication in the *Journal of Biological Chemistry* (*J. Biol. Chem.* **2008**, 283, 33221-33231); this prior work provided preliminary data required for the present proposal.

HHSN261201300038C 09/13/13 – 06/13/14
National Cancer Institute/National Institute of General Medical Sciences, NIH
Synthesis of High-Mannose N-Glycans

Principal Investigators: Dr. Qingfeng Pan and Dr. Shikai Zhao (Omicron Biochemicals)
Total Costs: \$299,586
7% effort

I wrote this proposal to secure SBIR funding for a glycobiology project at my company, Omicron Biochemicals, Inc. This Phase I SBIR project aims to prepare at least 28 high-mannose oligosaccharides for use in glyco-array screening. The project is potentially extendable to Phase II for an additional 2 years pending attainment of Phase I goals.

Research Funding (Active):

1. National Science Foundation (1402744)

Conformational Equilibria of Biologically Relevant Oligosaccharides

Principal Investigator: Anthony S. Serianni

CoPIs: Ian Carmichael (Notre Dame), Robert Woods (Georgia)

Total Cost: \$750,000

Start Date: August 1, 2014

End Date: July 31, 2017

This project will develop new NMR-based tools to investigate oligosaccharide conformations in aqueous solution.

2. National Institutes of Health/SBIR (Tracking No. 3722332)

Large Scale Synthesis of N-Acetyl-lactosamine and HMO Oligosaccharides

Principal Investigator: Qingfeng Pan (Omicron)

Consultant: Anthony S. Serianni (President/CEO, Omicron)

Total Cost: \$150,000

Submitted: July 29, 2014

This proposed project will develop synthetic methods (chemical and chemo-enzymic) to prepare human milk oligosaccharides (HMOs) on a large (kilogram) scale under cGMP conditions to support anticipated clinical trials in humans.

Research Proposals Submitted:

1. National Institutes of Health: 1 R21 CA199745-01

Solid-State NMR and J-Coupling in Saccharides: New Tools for Structure Analysis

Principal Investigator: Anthony S. Serianni (5% effort)

CoPI: Dr. Wenhui Zhang, University of Notre Dame

Total Cost: \$600,200 (two years)

Submitted: December 1, 2014

An NMR project that aims to develop new solid-state methods to investigate *J*-couplings in solids and to characterize saccharide bound conformations in receptors. There is no overlap with the project described in this proposal.

2. National Institutes of Health

Capillary Electrophoresis Based SELEX For Generation of Oligosaccharide Aptamers

Principal Investigator: Norman J. Dovichi

Co-PI: Anthony S. Serianni

Total Cost: \$608,000 (two years)
Submitted: December 2, 2014

3. National Institutes of Health
Borate Affinity Capillary Electrochromatography (BACE) for High Mannose Glycan Analysis

Principal Investigator: Norman J. Dovichi
Co-PI: Anthony S. Serianni
Total Cost: \$608,000 (two years)
Submitted: December 2, 2014

4. National Institutes of Health/National Cancer Institute
Synthesis of High Mannose N-Glycans

Principal Investigator: Dr. Qingfeng Pan (Omicron)
Consultant: Anthony S. Serianni (President/CEO, Omicron)
Total Cost: \$1,000,000 (2 years)
Submitted: January 29, 2015

Research Proposals (in Preparation):

National; Institutes of Health (R01)
Conformational Properties of Biologically Important Furanosyl Rings
This will be a multi-PI project involving investigators in the US and India.

Additional Fund-Raising (Departmental):

Endowment for the Annual Biochemistry Research Retreat, \$100,000; secured Fall 2013.

Lectures:

Allied-Signal Corporation, March 17, 1986
Villanova University, November 17, 1987
University of Alabama, April 14, 1988
Illinois Institute of Technology, May 4, 1988
Glycomed, Inc., October 7, 1988
State University of New York-Binghamton, November 10, 1989
University of Notre Dame - Dept. of Biol. Sciences, March 1990
University of Michigan, January 22, 1991
ICI Americas, May 20, 1991
Glycomed, Inc., July 25, 1991
Chicago Area NMR Discussion Group, November 2, 1991
University of Minnesota, February 27, 1992
Sugar Processing Research Institute, April 1, 1992
Gliatech, Inc., May 13, 1992
Purdue University, May 27, 1992
Queen's University, November 11, 1992

Purdue University, February 23, 1993
University of Wisconsin - Madison, Brittingham Visiting Scholar, April 15-16, 1993
Fox Chase Cancer Center, May 25, 1993
Miles Laboratories, September 21, 1993
Pennsylvania State University, University Park, October 4, 1993
Sugar Processing Research Institute, March 10, 1994
Genentech, November 1, 1996
National Institutes of Health (Cancer Institute), October 17, 1997
Department of Chemistry, University of Illinois, April 6-8, 1999
Department of Medicinal Chemistry and Pharmacognosy, UI-Chicago, October 13, 2000
Vanderbilt University, Center for Matrix Biology, July 31, 2002
Kenyon College, September 15, 2003
Eastman Chemical Company, May 2, 2006
Society for Applied Spectroscopy, Arlington Heights, IL, November 14, 2006
Purdue University Calumet, Hammond, IN, October 21, 2008
(see others under "Invited and Plenary Lectures", Page 3)

Lectures (Graduate Recruitment):

Haverford College, November 8, 1985
Franklin and Marshall College, November 11, 1985
Albright College, November 12, 1985
St. Joseph's University, November 13, 1985
Villanova University, November 14, 1985
LaSalle University, November 19, 1985
Elizabethtown College, March 19, 1986
Xavier University, February 5, 1988
DePauw University, November 29, 1990

Publicity:

Stable Isotope Labeling of Sugars Simplified, *Chem. & Eng. News*, May 7, **1979**, p. 17.

NMR Probes Freeze Tolerance in Arctic Insect, *Chem. & Eng. News*, May 18, **1987**, p. 28.

South Bend Tribune, Sunday, April 28, **1996**, page A17, Distinguished Alumnus Award, Albright College.

Calculating Carbohydrates, *Chem. & Eng. News*, April 26, **2004**, p. 36.

Too Sweet For Your Own Good, *Notre Dame Magazine*, Winter **2004-2005** (Vol. 33), p. 16: Article spotlighting our work on non-enzymic protein glycation (collaboration with Vanderbilt).

ACS Presents Carbohydrate Chemistry Awards, Chem. & Eng. News **2006**, July 31, 2006, pp. 52-53.

Downtown, South Bend, IN. December 2007, Omicron Biochemicals, Inc. Occupies New Laboratory

Biology: Beetle-juice Antifreeze. *Nature* **2009**, 462, 546.

Freeze Protector is Protein-free. *Chem. Eng. News* **2009**, 87, 9.

When Built-in Antifreeze Beats a Winter Coat. *The New York Times, Science*, January 18, 2010.

ASBMB Member Spotlight, *ASBMB Today*, August 2010.

2012 ACS Fellows, *Chem. & Eng. News*, July 23, **2012**, p. 36.

Omicron Has Chemistry, South Bend Tribune, October **2012**.

NMR study of the glucosone rearrangement (published in *JACS* 2012) highlighted in [SpectroscopyNOW](#) **01/01/13**.

Selected Professional Activities (Internal and External):

Founder and Chair, Lake Papakeeche Sustainability Initiative (LAPSI), 2012-present. This group of lake residents is engaged in scientific studies of Lake Papakeeche, Syracuse, Indiana with the purpose of maintaining and protecting the general watershed and its ecosystems, and maintaining open dialog with similar lake research groups in Indiana and nationwide.

Chair, College of Science Committee on Sustainability (COSCOS), University of Notre Dame, Spring 2009 – 2012.

Accomplishments

Proposal for ND Vertical-Axis Wind Turbine Funded Minor in Sustainability Developed and Approved for Launching in Fall 2011

Sustainability Outreach to Local Elementary Schools Proposal Prepared/Submitted for Large Solar Array at Notre Dame

Member, Provost's Advisory Committee, University of Notre Dame: September 2009-2012

President and CEO, Omicron Biochemicals, Inc., 115 South Hill Street, South Bend, IN 46617. 1982 – present. This biotechnology company specializes in the synthesis of stable isotopically-enriched carbohydrates and nucleosides and their oligomers for biomedical research. Founded in 1982. Currently employs eight research and development personnel.

Currently working on qualifications as a GMP laboratory for the production of pharmaceutical APIs and excipients.

Organizer, ACS Carbohydrate Chemistry Division Symposium, "Recent Developments in NMR Spectroscopy of Carbohydrates", 195th ACS National Meeting, Toronto, 1988.

Organizer, ACS Carbohydrate Chemistry Division Symposium, "Claude S. Hudson Award Symposium", 203rd ACS National Meeting, San Francisco, 1992. Total funds raised: \$20,756.

Co-organizer, ACS Carbohydrate Chemistry Division Symposium, "In Vivo NMR Spectroscopy of Carbohydrate Metabolism", 204th ACS National Meeting, Washington, DC, 1992. Total funds raised: \$2900.

Conference Host, Chicago Area NMR Discussion Group, October 31, 1992.

Founder and Co-organizer, 1st Annual Biochemistry Conference, Potawatomi Inn, Pokagon State Park, June 20-21, 1996.

Thematic Platform Session Organizer, Applications of Stable Isotopes to Study Carbohydrate Structure and Reactivity, XIX International Carbohydrate Symposium, San Diego, CA, August 9-14, 1998. Total funds raised: \$2350.

Conference Co-Host, Chicago Area NMR Discussion Group, October 2002.

Chair, 10-Year Strategic Planning Committee, Department of Chemistry and Biochemistry, University of Notre Dame, 2002.

Member, Strategic Planning Committee, Division of Carbohydrate Chemistry, American Chemical Society, Washington, DC, October 31-November 2, 2008.

Program Committee Member, 20th International Symposium on Glycoconjugates, San Juan, Puerto Rico, November 29-December 4, 2009

Professional Development:

Managers and Supervisors Conference, South Bend, IN, September 9, 1999 (SkillPath Seminars, Mission, KS): Professional one-day seminar on management and leadership skills development.

2002 Teaching Research Ethics Workshop, Poynter Center for the Study of Ethics and American Institutions, Indiana University, Bloomington, IN, May 15-17, 2002.

Student, *Indiana Watershed Leadership Academy*, Spring 2014 (Purdue University Professional *Certificate in Watershed Management* earned upon completion of this on-line course)

Other Activities:

NIH Special Study Section (Project Site Visit), July 6-8, 1988 (Vanderbilt University)
 NIH Special Study Section (Project Site Visit), February 19-20, 1989 (UCSF)
 NIH Special Study Section (Project Site Visit), March 9-10, 1989 (University of Georgia)
 NIH Special Study Section (Shared Instrumentation), June 27-28, 1991
 NIH Biomedical Sciences Study Section (Fellowships), Nov. 16-18, 1992
 NIH Special Study Section (Project Site Visit), October 24-26, 1993 (University of Georgia)
 NIH Special Study Section (Shared Instrumentation), October 31, 1994
 NIH Biophysical Sciences Special Study Section (Fellowships), March 13, 1995
 External Thesis Examiner, Kenyon College, May 1995
 NIH Special Study Section (Shared Instrumentation), July 31-Aug. 1, 1995
 NIH Special Study Section (Shared Instrumentation), Nov. 13-14, 1996
 NIH Special Study Section (Project Site Visit), July 29-30, 1998 (University of Georgia)
 NIH Special Study Section (Shared Instrumentation), November 1998 (relieved due to COI)
 NIH Special Study Section (Shared Instrumentation), November 1999
 NIH Special Study Section (Project Site Visit), July 19-20, 2000 (Los Alamos SIR)
 NSF Major Research Instrumentation Panel, May 14-16, 2001
 NIH Special Study Section (Shared Instrumentation), July 23-24, 2001
 NIH Special Study Section (Shared Instrumentation), July 9, 2003
 NIH Study Section (Physiological Chemistry), June 24-25, 2004
 2004-present: Ad Hoc member of NIH Study Sections (multiple occasions)
 Opponent, PhD Thesis Defense, Olof Engström, Department of Organic Chemistry, Arrhenius Laboratory, Stockholm University, May 22, 2015

Past/Present Graduate Research Assistants:

1. Joseph R. Snyder	Ph.D.	1987	Patent Attorney; Townsend and Townsend and Crew
2. Paul C. Kline	Ph.D.	1991	Associate Professor, Middle Tennessee State University
3. Jian Wu	Ph.D.	1991	Senior Scientist, Rohm and Haas Company
4. Eugenia Garrett	M.S.	1990	Patent Attorney; Townsend and Townsend and Crew
5. Ulick Stafford	M.S.	1990	Production Manager; Bausch & Lomb, Ireland
6. Jennifer Duker	M.S.	1991	High-school Teacher; Pittsburgh, PA
7. Carol Podlasek	Ph.D.	1993	Assistant Professor, Northwestern Medical School, Chicago
8. Philip Rosner	M.S.	1996	Research Scientist; Pfizer, Inc.
9. Wayne Stripe	M.S.	1998	Status Unknown
10. Timothy Church	M.S.	1996	Associate Scientist; Advanced Medicine, Inc.
11. Bidisha Bose-Basu	Ph.D.	1999	Assistant Professor, Fayetteville State University
12. Susan Van Galder	M.S.	1998	Research Scientist; Bayer, Inc.
13. Francis Cloran	M.S.	1998	Radiologist, Wilford Hall Medical Center, San Antonio, Texas
14. Yuping Zhu	M.S.	2001	Research Scientist, Merck Inc., NJ
15. Thomas Klepach	Ph.D.	2008	Visiting Scholar, Department of Chemistry, University of Waikato, New Zealand
16. Qingfeng Pan	Ph.D.	2006	Research Scientist, Omicron Biochemicals, Inc.

17. Peter Nizner	M.S.	2005	Research Scientist, Merck Inc. (NJ)
18. Wenhui Zhang	Ph.D.	2009	Postdoctoral Research Associate, Notre Dame
19. Hongqiu Zhao	Ph.D.	2010	Lecturer, IUPUI
20. Xiaosong Hu	Ph.D.	2009	Associate Professor, Chinese Academy of Sciences, PRC
21. Yuping Zhu	Ph.D.	2008	Research Scientist, Merck Inc., NJ

Past Postdoctoral Research Associates and Visiting Scholars:

1. Tapani Vuorinen	Ph.D.	1988-1989	
2. Tapasree Bandyopadhyay	Ph.D.	1989-1990	
3. Roland Stenutz	Ph.D.	1997-2000 (Wallenberg Fellow)	
4. Christophe Thibaudeau	Ph.D.	2001-2003	
5. Qingquan Wu	M.S.	2002	

Current Research Staff (Permanent, Full-time, Omicron):

Laura Cummins, BS
Meredith Reed, BS
Eric Bondo, BS
Shikai Zhao, PhD
Qingfeng Pan, PhD
Wenhui Zhang, PhD
Zongren Zhao, PhD

Research Staff (Permanent, Part-time, Omicron):

Gail Bondo, BS
Mei Zhao

Administrative Staff (Permanent, Part-time, Omicron):

Ann Serianni, PhD
Nancy Myers, BS

Current Notre Dame Research Personnel:

Luke Sernau
Matthew Hadad
Ivana Surjancev
Toby Turney
Andrew Incandela
Amy Wang
Hannah Becker
Chelsey Fattal

Abstracts of Papers:

1. A. S. Serianni, H. A. Nunez and R. Barker, The Cyanohydrin Synthesis: Studies by ^{13}C NMR Spectroscopy, 178th ACS National Meeting, Division of Carbohydrate Chemistry, Sept. 1979, Abstr. No. 63.
2. A. S. Serianni, H. A. Nunez, J. Pierce, E. Clark and R. Barker, Synthesis of Isotopically-Enriched Carbohydrates, 178th ACS National Meeting, Division of Biological Chemistry, Sept. 1979.
3. A. S. Serianni, H. A. Nunez, J. Pierce, P. Rosevear, E. L. Clark and R. Barker, Isotopically-Enriched Carbohydrates: Synthesis and Use in Chemical and Biochemical Studies, 28th Annual Conference on Mass Spectrometry and Allied Topics, American Society for Mass Spectrometry, May 1980, Abstr. No. RAMP 10.
4. A. S. Serianni, J. Pierce, S. Huang and R. Barker, Unidirectional Rates of Anomerization of Furanoses by ^1H and ^{13}C Saturation-Transfer NMR Spectroscopy, 181st ACS National Meeting, Division of Carbohydrate Chemistry, March 1981, Abstr. No. 44.
5. A. S. Serianni and R. Barker, Conformational Analysis of 1-, 2-, 3- and 4- ^{13}C Enriched Tetroses, Their Methyl Glycosides and Dimethyl Acetals by ^1H and ^{13}C NMR Spectroscopy, 181st ACS National Meeting, Division of Carbohydrate Chemistry, March 1981, Abstr. No. 45.
6. J. Pierce, A. S. Serianni and R. Barker, Tautomerization of Sugar Phosphates of Biological Interest: A Dynamic NMR Study, 181st ACS National Meeting, Division of Carbohydrate Chemistry, March 1981, Abstr. No. 46.
7. A. S. Serianni, C. Vary, G. Wu, N. Pennings, J. Vournakis and R. Barker, The Chemical Synthesis and Preliminary NMR Analysis of Uridine Enriched with Carbon-13 in the Ribosyl Moiety, Adirondacks Molecular Biology and Genetics Conference XIV, Sept. 25-27, 1981, Abstr. No. 16.
8. A. S. Serianni, Nuclear Spin-Lattice Relaxation Times: Application to the Study of Molecular Conformation and Dynamics, Adirondacks Molecular Biology and Genetics Conference XV, Oct. 1-3, 1982, Abstr. No. 16.

9. M. L. Hayes, A. S. Serianni, N. Pennings and R. Barker, ^1H and ^{13}C NMR Studies of Oligosaccharides Enriched with ^2H and/or ^{13}C at Specific Sites, XIth International Carbohydrate Symposium, Vancouver, Canada, Aug. 22-28, 1982, Abstr. No. I-63.
10. G. D. Wu, A. S. Serianni and R. Barker, Orientation of the Hydroxymethyl Group in Pentofuranosides: Stereospecific Exchange of Methylene Protons in Tetraofuranosides, XIth International Carbohydrate Symposium, Vancouver, Canada, Aug. 22-28, 1982, Abstr. I-79.
11. J. Pierce, A. S. Serianni and R. Barker, The Anomerization of Furanoses, Symposium on the Claude S. Hudson Award, 187th ACS National Meeting, Division of Carbohydrate Chemistry, St. Louis, MO, April 1984, Abstr. No. 1.
12. A. S. Serianni, *Ab Initio* Molecular Orbital Calculations of Tetraofuranose Ring Geometry and Flexibility, 189th ACS National Meeting, Division of Carbohydrate Chemistry, Miami Beach, FL, April 1985, Abstr. No. 6.
13. J. R. Snyder and A. S. Serianni, D-Idose: One- and Two-Dimensional NMR Studies of Solution Composition and Conformation, 189th ACS National Meeting, Division of Carbohydrate Chemistry, Miami Beach, FL, April 1985, Abstr. No. 7.
14. J. R. Snyder and A. S. Serianni, Chemical Synthesis and Solution Composition of the 5-Deoxy-L-Pentoses and 5-O-Methyl-D-Pentoses, 20th Midwest Regional ACS Meeting, Division of Biochemistry/Medicinal, Carbondale, IL, November 1985, Abstr. No. 230.
15. M. J. King-Morris and A. S. Serianni, [1- ^{13}C]-Enriched Aldoses: ^{13}C - ^{13}C Couplings in Aldopyranose and Aldofuranose Rings, 191st ACS National Meeting, Division of Carbohydrate Chemistry, New York, NY, April 1986, Abstr. No. 13.
16. J. R. Snyder and A. S. Serianni, DL-[1- ^{13}C]Apiose (3-C-(hydroxymethyl)-D-*Glycero*-Aldotetrose): Synthesis and NMR Studies, 191st ACS National Meeting, Division of Carbohydrate Chemistry, New York, NY, April 1986, Abstr. No. 14.
17. T. Angelotti, M. Krisko, T. O'Connor and A. S. Serianni, [1- ^{13}C]-Enriched Aldono-1,4-Lactones: Interpretation of ^1H - ^1H , ^{13}C - ^1H , and ^{13}C - ^{13}C Couplings in Lactone Rings, 191st ACS National Meeting, Division of Carbohydrate Chemistry, New York, NY, April 1986, Abstr. No. 15.
18. P. C. Kline and A. S. Serianni, Stable Isotopically-Enriched Ribonucleosides: Synthesis and Use in Studies of Furanose, N-Glycoside and Hydroxymethyl Group Conformations, ASBC/ACS Division of Biological Chemistry Meeting, Washington, D.C., June 1986, Abstr. No. 196.
19. M. J. King-Morris, J. R. Snyder and A. S. Serianni, [1- ^{13}C]Aldoses: ^{13}C Chemical Shift Assignments, ^{13}C - ^{13}C Couplings, Tautomeric Composition in Solution, and Rates of Anomerization, XIIIth International Carbohydrate Symposium, Cornell University, Ithaca, NY, August 1986, Abstr. No. B89.
20. A. S. Serianni, J. R. Snyder, P. C. Kline, M. J. King-Morris and Paul Bondo, Combining Stable Isotopic Enrichment, Modern NMR Methods and *Ab Initio* Molecular Orbital Calculations to Study Carbohydrate Structure and Reactivity, Claude S. Hudson Symposium, 193rd ACS National Meeting, Division of Carbohydrate Chemistry, Denver, CO, April 1987, Abst. No. 25. (*invited*)

21. M. J. King-Morris, P. Bondo, R. Mrowca and A. S. Serianni, An Improved Synthesis of D-[6-¹³C]Glucose, 193rd ACS National Meeting, Division of Carbohydrate Chemistry, Denver, CO, April 1987, Abst. No. 44.
22. J. R. Snyder, Eric R. Johnston and A. S. Serianni, The Anomerization of D-[1-¹³C]Talose: A Comparison of Experimental and Computational Methods to Evaluate Reaction Kinetics, 193rd ACS National Meeting, Division of Carbohydrate Chemistry, Denver, CO, April 1987, Abst. No. 45.
23. O. Kukal, J. Duman and A. S. Serianni, *In Vivo* ¹³C NMR Studies of Temperature Effects on Glucose Metabolism in a Freeze-Tolerant Arctic Insect, 193rd ACS National Meeting, Division of Carbohydrate Chemistry, Denver, CO, April 1987, Abst. No. 58.
24. J. R. Snyder and A. S. Serianni, The Thorpe-Ingold Effect in Furanose Ring Anomerization, 4th European Carbohydrate Symposium, Darmstadt, West Germany, July 12-17, 1987.
25. A. S. Serianni and J. R. Snyder, The Anomerization of Monosaccharides: Relationships Between Structure and Rates of Furanose and Pyranose Ring-Opening and Ring-Closing, 8th International Symposium on Solute-Solute-Solvent Interactions, Royal Society of Chemistry, Regensburg, West Germany, August 9-13, 1987. (*invited*)
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