

# Steven Roger Angle

Home Address: 6956 Orozco Drive  
Riverside, California 92506  
Phone: 951-288-0732 (cell)  
steven.angle@ucr.edu  
*Please Address correspondence to  
home address*

Dean and Director  
College of Natural and Agricultural Sciences  
University of California, Riverside  
Riverside, California 92521  
Phone: 951-827-3101 (office)  
FAX: 951-827-4190

## EDUCATION

- University of California, Irvine, B.A. (Chemistry), 1978.
- University of California, Los Angeles, M.S. (Organic Chemistry), 1981.  
Thesis: "*Studies Toward the Total Synthesis of Quassin.*"  
Research Advisor - Robert V. Stevens (Deceased 1983).
- University of California, Irvine, Ph.D. (Organic Chemistry), 1984.  
Dissertation: "*Studies Toward the Total Synthesis of Strychnos Alkaloids.*"  
Research Advisor - Larry E. Overman.
- University of Wisconsin, Madison, Postdoctoral Research Associate, 1984-86.  
Research Advisor - Barry M. Trost.

## PROFESSIONAL EXPERIENCE

- Dean, College of Natural and Agricultural Sciences, University of California, Riverside; July 2001 to present.
- Director, Agricultural and Natural Resources Program at the University of California, Riverside, Division of Agriculture and Natural Resources; July 2001 to present.
- Interim Dean, College of Natural and Agricultural Sciences, University of California, Riverside, and Interim Director, Agricultural and Natural Resources Program, University of California, Riverside, Division of Agriculture and Natural Resources; July 2000 to June 2001.
- Associate Dean for Physical and Mathematical Sciences, College of Natural and Agricultural Sciences, University of California, Riverside; 1997 - 2000.
- Professor of Chemistry, University of California, Riverside; 1994 to present.
- Associate Professor of Chemistry, University of California, Riverside; 1991 - 1994.
- Assistant Professor of Chemistry, University of California, Riverside; 1986 - 1991.
- Vice President, Angle and Babbage Office Equipment, Inc. 1981 - 1982.

## HONORS

- University of California, Irvine, 2003 Outstanding Alumni Award.
- Fellow, American Association for the Advancement of Science (AAAS), 1999.
- Alfred P. Sloan Foundation Research Fellow, 1993-1997.
- University of California, Riverside, Academic Senate Distinguished Teaching Award, 1991.
- American Cyanamid Faculty Award, 1991.
- University of California, Riverside, Faculty Development Award, 1986.
- University of California Regents' Dissertation Fellowship (UC Irvine), 1984.
- University of California President's Fellowship (UC Irvine), 1977-78.
- University of California, Irvine, Alumni Association Award for Undergraduate Research, 1978.

## RESEARCH INTERESTS

Organic Synthesis, development of new synthesis methodologies and strategies. Bioorganic chemistry and biomimetic synthesis. Current projects include: (1) development of general methods for the synthesis of heterocycles including tetrahydrofurans and prolines; (2) investigation of the synthesis applications of quinone methides; (3) development of new methods for the synthesis of indolizidine alkaloids.

## RESEARCH PUBLICATIONS

1. L. E. Overman, S. Tsuobi, S. R. Angle "4-Methylene-4,5-Dihydrooxazoles: Isolation, Properties, and Use for the Preparation of Substituted Oxazoles" *Journal of Organic Chemistry* **1979**, *44*, 2323-2325.
2. L. E. Overman, S. R. Angle "Synthesis Applications of Cationic Aza-Cope Rearrangements. Stereocontrolled Synthesis of Hexahydro[2,3-d]-Carbazoles" *Journal of Organic Chemistry* **1985**, *50*, 4021-4028.
3. B. M. Trost, S. R. Angle "Pd Mediated Cleavage of Allyl Epoxides with Retention of Stereochemistry: A *cis*-Hydroxylation Equivalent" *Journal of the American Chemical Society* **1985**, *107*, 6123-6125.
4. B. M. Trost, J. M. Balkovec, S. R. Angle "Synthesis of 4-Methylene-1-Cyclopentenes" *Tetrahedron Letters* **1986**, *27*, 1445-1448.
5. R. V. Stevens, S. R. Angle, K. Kloc, K. F. Mac, K. N. Trueblood, Y. Liu "Quassinoids. 2. A New Approach to the BCD Ring System" *Journal of Organic Chemistry* **1986**, *51*, 4347-4353.
6. B. M. Trost, J. K. Lynch, S. R. Angle "Asymmetric *cis*-Hydroxylation via Epoxidation-Carbonylation: A Formal Synthesis of (+)-Citereoviral" *Tetrahedron Letters* **1987**, *28*, 375-378.
7. S. R. Angle, K. D. Turnbull "*para*-Quinone Methide Initiated Cyclization Reactions" *Journal of the American Chemical Society* **1989**, *111*, 1136-1138.
8. S. R. Angle, D. O. Arnaiz "Stereoselective Synthesis of Substituted Pipecolic Acids" *Tetrahedron Letters* **1989**, *30*, 515-518.
9. S. R. Angle, M. S. Louie, H. L. Mattson, W. Yang "*para*-Quinone Methide Initiated Intramolecular Electrophilic Substitution Reactions" *Tetrahedron Letters* **1989**, *30*, 1193-1196.
10. S. R. Angle, M. S. Louie "Cationic Cyclization Reactions Initiated by Stabilized Benzyl Cations" *Tetrahedron Letters* **1989**, *30*, 5741-5744.
11. S. R. Angle, W. Yang "Synthesis and Chemistry of a Quinone Methide Model for Anthracycline Antitumor Antibiotics" *Journal of the American Chemical Society* **1990**, *112*, 4524-4528.
12. S. R. Angle, K. D. Turnbull "Chemistry of a Quinone Methide Proposed to be an Intermediate in neo-Lignan Biosynthesis" *Journal of the American Chemical Society* **1990**, *112*, 3698-3700.

13. S. R. Angle, D. O. Arnaiz "Synthesis of Dihydro-1*H*-Indenes via a Formal 3+2 Cycloaddition of *para*-Quinone Methides and Styrenes" *Journal of Organic Chemistry* **1990**, *55*, 3708-3710.
14. S. R. Angle, M. S. Louie "A Systematic Study of Benzyl Cation Initiated Cyclization Reactions" *Journal of Organic Chemistry* **1991**, *56*, 2853-2866.
15. S. R. Angle, D. O. Arnaiz "Synthesis of 1,2-Dihydronaphthalenes and Spiro[4.5]Deca-3,6,9-Trienones from Benzylic Alcohols" *Tetrahedron Letters* **1991**, *32*, 2327-2330.
16. S. R. Angle, W. Yang "Nucleophilic Addition of 2'-Deoxynucleosides to the *ortho*-Quinone Methides 10-(Acetyloxy)- and 10-Methoxy-3,4-Dihydro-9(2*H*)-Anthracenone" *Journal of Organic Chemistry* **1992**, *57*, 1092-1097.
17. S. R. Angle, J. G. Breitenbucher, D O. Arnaiz "An Efficient Stereoselective Synthesis of  $\Delta^{4,5}$ -Pipelicolic Esters" *Journal of Organic Chemistry* **1992**, *57*, 5947-5955.
18. S. R. Angle, H. L. Mattson-Arnaiz "A Facile 1,3-Hydride Transfer in a Cycloheptyl Cation" *Journal of the American Chemical Society* **1992**, *114*, 9782-9786.
19. S. R. Angle, D. O. Arnaiz "Formal [3+2]-Cycloaddition of Benzylic Cations and Alkenes" *Journal of Organic Chemistry* **1992**, *57*, 5937-5947.
20. S. R. Angle, J. D. Rainier "Reductive Cyclization of Quinone Methides" *Journal of Organic Chemistry* **1992**, *57*, 6883-6890.
21. S. R. Angle, W. Yang "pH Dependent Stability and Reactivity of a Thiol-Quinone Methide Adduct" *Tetrahedron Letters* **1992**, *33*, 6089-6092.
22. S. R. Angle, R. P. Frutos "Cyclization Reactions Terminated by Enamides and Enecarbamates" *Journal of the Chemical Society, Chemical Communications* **1993**, 171-172.
23. S. R. Angle, J. M. Fevig, S. D. Knight, R. W. Marquis, Jr., L. E. Overman "The Aza-Cope-Mannich Approach to *Strychnos* Alkaloids. Short Stereocontrolled Syntheses of ( $\pm$ )-Dehydrotubifoline and ( $\pm$ )-Akuammicine" *Journal of the American Chemical Society* **1993**, *115*, 3966-3976.
24. S. R. Angle, J. G. Breitenbucher "A General Route for the Synthesis of Enantiopure Indolizidine Alkaloids from  $\alpha$ -Amino Acids. Total Synthesis of (+)-Monomorine" *Tetrahedron Letters* **1993**, *34*, 3985-3988.
25. S. R. Angle, M. S. Louie "Quinone Methide Initiated Cyclization Reactions: Studies Toward the Synthesis of (+)-Pancratistatin" *Tetrahedron Letters* **1993**, *34*, 4751-4754.
26. S. R. Angle, R. P. Frutos "Intramolecular Formal [3+2] Cycloaddition of Alkenes and Benzylic Cations. Stereoselective Synthesis of 1,2,3,4,4a,9a-Hexahydrofluorenes" *Journal of Organic Chemistry* **1993**, *58*, 5135-5144.
27. S. R. Angle, K. D. Turnbull "Synthesis of Neolignans via a Proposed Biosynthetic Intermediate. Total Synthesis of ( $\pm$ )-Futoenone" *Journal of Organic Chemistry* **1993**, *58*, 5360-5369.

28. S. R. Angle, H. L. Mattson-Arnaiz "Carbon—Carbon Bond Formation via Benzylic Cation Initiated Cyclization Reactions" in *Advances in Carbocation Chemistry, Volume 2*, (1995), J. Coxon Ed., JAI Press, Inc., Greenwich, Connecticut; pp 1-40.
29. S. R. Angle, R. P. Frutos "Stereoselective Synthesis of 1-Aryl-4a-Methyloctahydrophenanthrenes" *Journal of Organic Chemistry* **1993**, *58*, 7918-7922.
30. S. R. Angle, J. G. Breitenbucher "Recent Progress in the Synthesis of Piperidine and Indolizidine Alkaloids" in *Studies in Natural Products Chemistry; Stereoselective Synthesis (Part J)*, A.-U.-Rahman Ed., Elsevier Science Publishers, Amsterdam; 1995; p 453-502.
31. S. R. Angle, M. A. Hossain "Mechanism of *para*-Quinone Methide Initiated Cyclization Reactions Terminated by Alkenes: 1,2- vs 1,3-Hydrogen Migration." *Tetrahedron Letters* **1994**, *35*, 4519-4522.
32. S. R. Angle, J. P. Boyce "Formal [3+3]- and [3+2]-Cycloadditions of Allylsilanes with Benzylic Cations." *Tetrahedron Letters* **1994**, *35*, 6461-6464.
33. S. R. Angle, D. O. Arnaiz, R. P. Frutos, M. S. Louie, H. L. Mattson-Arnaiz, J. D. Rainier, K. D. Turnbull, W. Yang "Carbon—Carbon Bond Formation via Quinone Methide Initiated Cyclization Reactions" *Journal of Organic Chemistry* **1994**, *59*, 6322-6337.
34. S. R. Angle, G. P. Wei, Y. K. Ko, K. Kubo "Stereoselective Synthesis of Tetrahydrofurans via the Lewis Acid Promoted Reaction of  $\beta$ -Benzyloxy Aldehydes and Ethyl Diazoacetate" *Journal of the American Chemical Society* **1995**, *117*, 8041-8042.
35. S. R. Angle, J. P. Boyce "A Formal Total Synthesis of ( $\pm$ )- $\gamma$ -Lycorane" *Tetrahedron Letters* **1995**, *36*, 6185-6188.
36. S. R. Angle, J. D. Rainier, C. Woytowicz "Synthesis and Chemistry of Quinone Methide Models for the Anthracycline Antitumor Antibiotics" *Journal of Organic Chemistry* **1997**, *62*, 5884-5892.
37. S. R. Angle, R. M. Henry "The Synthesis of Enantiopure Indolizidine Alkaloids from  $\alpha$ -Amino Acids: Total Synthesis of (-)-Indolizidine 167B" *Journal of Organic Chemistry* **1997**, *62*, 8549-8552.
38. S. R. Angle, T. Wada "An Approach to the Narciclasine Alkaloids via a Quinone Methide Initiated Cyclization Reaction" *Tetrahedron Letters* **1997**, *38*, 7955-7958.
39. S. R. Angle, D. S. Bernier, N. A. El-Said, D. E. Jones, S. Z. Shaw "Synthesis of Tetrahydrofurans from  $\beta$ -Hydroxyaldehydes: Optimization of the Alcohol Protecting Group" *Tetrahedron Letters* **1998**, *38*, 3919-3922.
40. S. R. Angle, R. M. Henry "Studies Toward the Synthesis of (+)-Palustrine: The First Asymmetric Synthesis of (-)-Methyl Palustramic Acid" *Journal of Organic Chemistry*, **1998**, *63*, 7490-7497.
41. S. R. Angle, D. S. Bernier, K. Chann, D. E. Jones, M. Kim, M. Neitzel, S. L. White "Stereoselective Synthesis of 2,3,4-Trisubstituted Tetrahydrofurans" *Tetrahedron Letters* **1998**, *38*, 8195-8198.

42. S. R. Angle, N. A. El-Said "Stereoselective Synthesis of Tetrahydropyrans via a Formal [4+2]-Cycloaddition of Allylsilanes" *The Journal of the American Chemical Society*, **1999**, *121*, 10211-10212.
43. S. R. Angle, M. L. Neitzel "Stereoselective Synthesis of 3-Hydroxy-2-Aryltetrahydrofurans from  $\beta$ -Triethylsilyloxyaldehydes and Aryl Diazomethanes" *The Journal of Organic Chemistry* **1999**, *64*, 8754-8757.
44. S. R. Angle, M. L. Neitzel "A Simple Method for the Synthesis of Substituted Benzylic Ketones: Homologation of Aldehydes via the in Situ Generation of Aryldiazomethanes from Aromatic Aldehydes" *Journal of Organic Chemistry* **2000**, *65*, 6458-6461.
45. S. R. Angle, S. L. White "Stereoselective Synthesis of 4-Aryl-2-(benzyloxy)carbonyl-3-hydroxy Tetrahydrofurans from Aryl Epoxides" *Tetrahedron Letters* **2000**, *41*, 8059-8062.
46. S. R. Angle, K. Chann "Stereoselective Synthesis of Tetrahydrofurans: Reactions of Protected  $\beta$ -Hydroxy Ketones and Benzyl Diazoacetate" *Tetrahedron Letters* **2001**, *42*, 1819-1822.
47. S. R. Angle, S. Z. Shaw "Stereoselective Synthesis of 3-Hydroxy-2-Sulfonyltetrahydrofurans from  $\beta$ -(Triethylsilyloxy)aldehydes and *p*-Tolylsulfonyldiazomethane" *Tetrahedron* **2001**, *57*, 5227-5232.
48. S. R. Angle, N. A. El-Said "Stereoselective Synthesis of Tetrahydrofurans via Formal [3+2]-Cycloaddition of Aldehydes and Allylsilanes. Formal Total Synthesis of the Muscarine Alkaloids (-)-Allomuscarine and (+)-Epimuscarine" *Journal of the American Chemical Society* **2002**, *124*, 3608-3613.
49. S. R. Angle, D. S. Belanger, N. A. El-Said "Stereoselective Synthesis of Tetrahydropyrans via Formal [4+2]-Cycloaddition: A Comparison of Allylsilane and Crotylsilane" *Journal of Organic Chemistry*, **2002**, *67*, 7699-7705.
50. S. R. Angle, D. S. Belanger "Stereoselective Synthesis of 3-Hydroxyproline Benzyl Esters from *N*-Protected  $\beta$ -Aminoaldehydes and Benzyl Diazoacetate" *Journal of Organic Chemistry* **2004**, *69*, 4361-4368.

## RESEARCH GRANTS.

### A. EXTRAMURAL RESEARCH GRANTS.

(Steven R. Angle, Principal Investigator)

**American Chemical Society - The Petroleum Research Fund** (18936-G1).

September 1987 to August 1989; "*Stereoselective Synthesis of Optically Active Tetrahydropyridines from Readily Available  $\alpha$ -Amino Acids*"

Total award (direct costs) for two years: \$18,000.

**Cancer Research Coordinating Committee of the University of California.**

July 1988 to June 1989; "*DNA - Adriamycin Interactions: A Model Study*"

Total award (direct costs): \$24,000.

**National Institutes of Health; Institute of General Medicine** (GM 39354).

July 1988 to June 1991; "*Synthesis and Chemistry of Quinone and Semiquinone Methides*"

Total award approved for three years: \$280,095; direct costs \$221,196.

**Elsa U. Pardee Foundation**

August 1989 to July 1991; "*Total Synthesis of the Anticancer Compound Pancratistatin*"  
Total award approved for two years: \$71,530; direct costs: \$57,224.

**National Institutes of Health Biomedical Research Support Grant Small Instrumentation Program 1989-90** Purchase of Electrochemical equipment.

Total award: \$12,098.

**Cancer Research Coordinating Committee of the University of California.**

1 July 1989 to 30 June 1990; "*Synthesis of Podophyllotoxin*"

Total award (direct costs): \$25,000.

**National Institutes of Health; Institute of General Medicine** (GM 39354, 04 to 06).

August 1991 to July 1994; "*Synthesis and Chemistry of Quinone and Semiquinone Methides*"

Direct costs approved (includes a supplement for a minority graduate research assistant): year 04, \$130,278; year 05, \$127,291; year 06, \$126,724. Total direct costs: \$384,293.

**American Chemical Society - The Petroleum Research Fund** (PRF 25740 AC1)

September 1992 to August 1994; "*Enantioselective Synthesis of Pipecolic Acids*"

Total award (direct costs) for two years: \$40,000.

**American Chemical Society - The Petroleum Research Fund** (PRF 25740 AC1-SF93). Supplement for visiting faculty from La Sierra University, Dr. Roy Kryger. May 1993 to August 1993; "*Enantioselective Synthesis of Pipecolic Acids*"

Total award (direct costs): \$5,000.

**A. P. Sloan Foundation Fellowship Grant** September 1993 to August 1997; no specific project;

Total award (direct costs) for two years: \$30,000.

**National Science Foundation** (CHE-9528266). 1 January 1996 to 31 December 1999; "*1,1-Carbon Dipole Based Annulation Methodology*"

Total costs: \$319,000.

**B. PRIVATE GIFTS TO THE ANGLE RESEARCH PROGRAM.**

**Showa Denko KK**; September 1994 to September 1996; no specific project (donated to support the research of Mr. Tetsuo Wada, a Showa Denko employee on leave in the Angle Laboratory); Total award for two years: \$40,000.

**Showa Denko KK**; September 1994 to September 1996; The salary of Mr. Tetsuo Wada was paid to allow him to work for two years in the Angle Laboratory. No specific Project.

**Takeda Pharmaceuticals, Japan**; September 1994 to September 1995; The salary of Dr. Keji Kubo was paid to allow him to work for one year in the Angle Laboratory. No specific Project.

**C. DEPARTMENTAL RESEARCH GRANTS.****National Science Foundation**

1987; "*Purchase of a Mass Spectrometer, NMR, CD Instrument Package*."

S. R. Angle was one of six (6) co-PI's to contribute to the grant organized by the Department Chair (Professor C. Wilkins). Total requested \$297,992.

**National Science Foundation**

January 1997; "*Upgrade of NMR Instrumentation in a College Wide Facility*"

S. R. Angle was one of 10 Co-PI's to contribute to the grant organized by the Professor W. Okamura. Total awarded \$300,000.

**D. CAMPUS RESEARCH FUNDING.****Chancellor's Funding for Research**

July 2000 to present: \$60,000 per year in funding for my research program.

**College Funding for Research**

July 2000 to present: \$38,000 per year in funding to support a postdoctoral or graduate student researcher(s) in my research program.

**RESEARCH PRESENTATIONS**

1. S. R. Angle, L. E. Overman "*Studies on the Total Synthesis of Pentacyclic Strychnos Alkaloids*" American Chemical Society Conference on Chemistry and Spectroscopy, Pasadena, California; September 25-28, 1983.
2. S. R. Angle, B. M. Trost "*Vicinal Cleavage of Allyl Epoxides with Retention of Stereochemistry: A cis-Hydroxylation Equivalent*" 190th National Meeting of the American Chemical Society, Chicago, Illinois; September 8-13, 1985; Abstract ORGN 180.
3. S. R. Angle "*Studies Toward the Total Synthesis of 2  $\beta$ -Hydroxy Jatraphone*" Invited seminar, Department of Chemistry, The State University of New Jersey, New Brunswick, New Jersey; October 14, 1985.
4. S. R. Angle "*Studies Toward the Total Synthesis of 2  $\beta$ -Hydroxy Jatraphone*" Invited seminar, Department of Chemistry, University of Houston, Houston, Texas; October 30, 1985.
5. S. R. Angle "*Studies Toward the Total Synthesis of 2 $\beta$ -Hydroxy Jatraphone*" Invited seminar, Department of Chemistry, University of Rochester, Rochester, New York; November 5, 1985.
6. S. R. Angle "*Studies Toward the Total Synthesis of 2  $\beta$ -Hydroxy Jatraphone*" Invited seminar, Department of Chemistry, University of Minnesota, Minneapolis, Minnesota; November 15, 1985.
7. S. R. Angle "*Studies Toward the Total Synthesis of 2  $\beta$ -Hydroxy Jatraphone*" Invited seminar, Department of Chemistry, University of California, Riverside; December 2, 1985.
8. S. R. Angle "*Studies Toward the Total Synthesis of 2  $\beta$ -Hydroxy Jatraphone*" Invited seminar, Department of Chemistry, University of California, Los Angeles; December 4, 1985.
9. S. R. Angle "*Studies Toward the Total Synthesis of 2  $\beta$ -Hydroxy Jatraphone*" Invited seminar, Department of Chemistry, University of Michigan, Ann Arbor, Michigan; December 12, 1985.
10. S. R. Angle "*Studies Toward the Total Synthesis of 2  $\beta$ -Hydroxy Jatraphone*" Invited seminar, Department of Chemistry, Texas A&M University, College Station, Texas; December 16, 1985.
11. S. R. Angle "*Studies Toward the Total Synthesis of 2  $\beta$ -Hydroxy Jatraphone*" Invited seminar, Department of Chemistry, University of Texas, Austin; December 18, 1985.

12. S. R. Angle "*Studies Toward the Total Synthesis of 2  $\beta$ -Hydroxy Jatraphone.*" Invited seminar, Department of Chemistry, University of Pittsburgh, Pittsburgh, Pennsylvania; January 9, 1986.
13. R. Marquis, S. R. Angle, L. E. Overman "*Studies on the Total Synthesis of Akuammicine*" 196th National Meeting of the American Chemical Society, Los Angeles, California; September 25-30, 1988; Abstract ORGN 71.
14. S. R. Angle, K. D. Turnbull "*para-Quinone Methide Initiated Cyclization Reactions*" 3rd Chemical Congress of North America, Toronto, Ontario, June 5-10, 1988; Abstract ORGN 253.
15. S. R. Angle, D. O. Arnaiz "*Stereoselective Synthesis of Substituted Pipecolic Acids*" 196th National Meeting of the American Chemical Society, Los Angeles, California; September 25-30, 1988; Abstract ORGN 229.
16. S. R. Angle "*Quinone Methides: Synthesis, Chemistry and Biological Activity*" Invited seminar, Loma Linda University, La Sierra Campus; January 9, 1989.
17. S. R. Angle "*Para-Quinone Methide Initiated Cyclization Reactions*" Eighth Biennial Marvel Symposium; University of Arizona, March 13-14, 1989.
18. S. R. Angle, M. S. Louie, H. L. Mattson, W. Yang "*Para-Quinone Methide Initiated Intramolecular Electrophilic Substitution Reactions*" 197th National Meeting of the American Chemical Society, Dallas, Texas; April 9-14, 1989; Abstract ORGN 166.
19. S. R. Angle "*Quinone Methides; Valuable Intermediates in Synthesis*" as an invited participant in the Twentieth Annual NSF Workshop on Organic Synthesis and Natural Products Chemistry; Hanover, New Hampshire; July 12-16, 1989.
20. S. R. Angle "*Para-Quinone Methide Initiated Cyclization Reactions*" Contributed talk, Gordon Research Conference on Natural Products, New Hampton, New Hampshire; July 24-28, 1989.
21. S. R. Angle "*Quinone Methide Chemistry*" Contributed poster, Gordon Research Conference on Natural Products, New Hampton, New Hampshire; July 24-28, 1989.
22. S. R. Angle "*Quinone Methides: Synthesis, Chemistry and Biological Activity*" Invited seminar, Eli Lilly and Company, Indianapolis, Indiana; August 30, 1989.
23. S. R. Angle, M. S. Louie "*Cationic Cyclization Reactions Initiated by Stabilized Benzyl Cations*" 198th National Meeting of the American Chemical Society, Miami Beach, Florida; September 10-15, 1989; Abstract ORGN 29.
24. S. R. Angle, K. D. Turnbull "*Quinone Methides as Intermediates in Neolignan Biosynthesis.*" 198th National Meeting of the American Chemical Society, Miami Beach, Florida; September 10-15, 1989; Abstract ORGN 210.
25. S. R. Angle "*Quinone Methides: Synthesis, Chemistry and Biological Activity*" Invited seminar, Department of Chemistry, Harvey Mudd College, Claremont California; October 3, 1989.

26. S. R. Angle, H. L. Mattson "*Study of the Intramolecular Nucleophilic Addition to Quinone Methides*" 24th Western Regional Meeting of the American Chemical Society, Pasadena, California; October 18-21, 1989.
27. S. R. Angle, K. D. Turnbull "*Reactivity of Quinone Methides vs. Benzylic Carbocations in the Biomimetic Synthesis of Neolignans*" 24th Western Regional Meeting of the American Chemical Society, Pasadena, California; October 18-21, 1989.
28. S. R. Angle, W. Yang "*Nucleophilic Addition to Quinone Methides: A Model Study for Anthracycline Antitumor Compounds.*" 24th Western Regional Meeting of the American Chemical Society, Pasadena, California; October 18-21, 1989.
29. S. R. Angle, D. O. Arnaiz "*Formal [3+2] Cycloaddition Reaction of Para-Quinone Methides with Alkenes*" 24th Western Regional Meeting of the American Chemical Society, Pasadena, California; October 18-21, 1989.
30. S. R. Angle, M. S. Louie "*Cationic Cyclization Reactions Initiated by Stabilized Benzyl Cations*" 24th Western Regional Meeting of the American Chemical Society, Pasadena, California; October 18-21, 1989.
31. S. R. Angle "*Quinone Methides: Synthesis, Chemistry and Biological Activity.*" Invited seminar, Department of Chemistry and Biochemistry, University of California, Los Angeles; December 7, 1989.
32. S. R. Angle, W. Yang "*Synthesis of a Quinone Methide Model for Anthracycline Antitumor Compounds*" 1989 International Chemical Congress of Pacific Basin Societies, Honolulu, Hawaii; December 17-22, 1989; Abstract ORGN 575.
33. S. R. Angle, M. S. Louie "*Cationic Cyclization Reactions Initiated by Stabilized Benzyl Cations*" 1989 International Chemical Congress of Pacific Basin Societies, Honolulu, Hawaii; December 17-22, 1989; Abstract ORGN 670.
34. S. R. Angle "*Quinone Methides: Synthesis, Chemistry and Biological Activity*" Invited seminar, Department of Chemistry, University of California, Santa Barbara; March 6, 1990.
35. S. R. Angle "*Quinone Methides: Synthesis, Chemistry and Biological Activity*" Invited seminar, Department of Chemistry, State University of New York, Buffalo; March, 23, 1990.
36. S. R. Angle "*Quinone Methides: Synthesis, Chemistry and Biological Activity*" Invited seminar, Division of Pharmaceutical Research, Bristol-Myers Company, Wallingford, Connecticut; March, 26 1990.
37. S. R. Angle "*Quinone Methides: Synthesis, Chemistry and Biological Activity*" Invited seminar, Lederle Laboratories/American Cyanamid Company, Pearl River, New York; March, 27, 1990.
38. S. R. Angle "*Quinone Methides: Synthesis, Chemistry and Biological Activity*" Invited seminar, Department of Chemistry, University of California, Irvine; April, 19, 1990.

39. S. R. Angle "*Quinone Methides as Intermediates in Synthesis*" invited speaker to the "Post-Modern Organic Synthesis" symposium; Joint 45th Northwest/10th Rocky Mountain Regional Meeting of the American Chemical Society, Salt Lake City, Utah; June 13-15, 1990.
40. S. R. Angle "*Quinone Methide Chemistry*" Contributed poster, Gordon Research Conference on Heterocyclic Chemistry, New Hampton, New Hampshire; July 9-16, 1990.
41. S. R. Angle, M. S. Louie "*Substituent Effects in Benzyl Cation Initiated Cyclization Reactions*" 200th National Meeting of the American Chemical Society, Washington, D.C.; August 26-31, 1990; Abstract ORGN 24.
42. S. R. Angle, D. O. Arnaiz "*Synthesis of Dihydro-1H-indenes via a Formal 3+2 Cycloaddition*" 200th National Meeting of the American Chemical Society, Washington, D.C.; August 26-31, 1990; Abstract ORGN 112.
43. S. R. Angle "*Quinone Methides: Synthesis, Chemistry and Biological Activity*" Invited seminar, Department of Chemistry, University of Virginia, Charlottesville; September, 14, 1990.
44. S. R. Angle "*Quinone Methides: Synthesis, Chemistry and Biological Activity*" Invited seminar, Department of Chemistry, University of Pennsylvania, Philadelphia; September, 17, 1990.
45. S. R. Angle "*Quinone Methides: Synthesis, Chemistry and Biological Activity*" Invited seminar, Department of Chemistry, University of Maryland, College Park Campus; September, 19, 1990.
46. S. R. Angle "*Quinone Methides: Synthesis, Chemistry and Biological Activity*" Invited seminar, Department of Chemistry, San Diego State University; September, 23, 1990.
47. S. R. Angle "*Quinone Methides: Synthesis, Chemistry and Biological Activity*" Invited seminar, The UpJohn Company; Kalamazoo, Michigan; October 22, 1990.
48. S. R. Angle "*Quinone Methides: Synthesis, Chemistry and Biological Activity*" Invited seminar, Department of Chemistry, Michigan State University; October 23, 1990.
49. S. R. Angle "*Quinone Methides: Synthesis, Chemistry and Biological Activity*" Invited seminar, Department of Chemistry, University of Michigan; October 24, 1990.
50. S. R. Angle, M. S. Louie "*Systematic Study of Cationic Cyclization Reactions Initiated by Benzyl Cations*" 26th American Chemical Society Western Regional Meeting, San Francisco, California; October 31 - November 2, 1990; Paper No. 67.
51. S. R. Angle "*Quinone Methides: Synthesis, Chemistry and Biological Activity*" Invited seminar, Department of Chemistry, University of California, Riverside; January 28, 1991.
52. S. R. Angle "*Quinone Methides: Synthesis, Chemistry and Biological Activity*" Invited seminar, Department of Chemistry, University of California, Santa Cruz; January 28, 1991.
53. S. R. Angle "*Quinone Methides: Synthesis, Chemistry and Biological Activity*" Invited seminar, Department of Chemistry, California State University, Los Angeles; January 29, 1991.

54. S. R. Angle "*Quinone Methides: Synthesis, Chemistry and Biological Activity*" Invited seminar, Department of Chemistry, University of California, San Diego; February 4, 1991.
55. S. R. Angle "*Quinone Methides: Synthesis, Chemistry and Biological Activity*" Invited seminar, Department of Chemistry, New Mexico State University; February 7, 1991.
56. S. R. Angle "*Quinone Methides: Synthesis, Chemistry and Biological Activity*" Invited seminar, Department of Chemistry, Washington University, St. Louis, Missouri; March 25, 1991.
57. S. R. Angle "*Quinone Methides: Synthesis, Chemistry and Biological Activity*" Invited seminar, Department of Chemistry, University of Missouri, Columbia; March 26, 1991.
58. S. R. Angle "*Quinone Methides: Synthesis, Chemistry and Biological Activity*" Invited seminar, Department of Chemistry, University of Nebraska, Lincoln; March 28, 1991.
59. S. R. Angle "*Quinone Methides: Synthesis, Chemistry and Biological Activity*" Invited seminar, Department of Chemistry, University of Kansas, Lawrence, Kansas; March 29, 1991.
60. S. R. Angle, W. Yang "*Nucleophilic Addition of 2'Deoxy nucleosides to ortho-Quinone Methides: A Model Study for Anthracycline Antitumor Antibiotics*" 201st National Meeting of the American Chemical Society, Atlanta, Georgia; April 14-19, 1991; Abstract ORGN 335.
61. S. R. Angle, H. L. Mattson "*Novel Cyclization of a Vinyl Silane to a Benzylic Cation and a para-Quinone Methide*" 201st National Meeting of the American Chemical Society, Atlanta, Georgia; April 14-19, 1991; Abstract ORGN 336.
62. S. R. Angle "*Quinone Methides: Synthesis, Chemistry and Biological Activity*" Invited seminar, Institute of Organic Chemistry, Syntex, Inc, San Jose, California; May 21, 1991.
63. S. R. Angle "*Quinone Methides: Synthesis, Chemistry and Biological Activity*" Invited seminar, Department of Chemistry, University of Southern California, Los Angeles, California; September 25, 1991.
64. S. R. Angle, W. Yang "*Nucleophilic Addition of 2'Deoxy nucleosides to ortho-Quinone Methides: A Model Study for Anthracycline Antitumor Antibiotics*" Invited seminar, 27th American Chemical Society Western Regional Meeting, Anaheim, California; October 6-11, 1991; Paper No. 973.
65. S. R. Angle, W. Yang "*p-Quinone Methide Initiated Intramolecular Cyclization Reactions with Indoles*" 27th American Chemical Society Western Regional Meeting, Anaheim, California; October 6-11, 1991; Paper No. 1004.
66. S. R. Angle, M. S. Louie "*Application of Quinone Methides and Benzyl Cations Toward the Total Synthesis of (+)-Pancratistatin*" 27th American Chemical Society Western Regional Meeting, Anaheim, California; October 6-11, 1991; Paper No. 1005.
67. S. R. Angle, H. L. Mattson "*Novel Cyclization of Olefins to Benzylic Cations and para-Quinone Methides*" 27th American Chemical Society Western Regional Meeting, Anaheim, California; October 6-11, 1991; Paper No. 1006.

68. S. R. Angle, J. G. Breitenbucher "*Enantioselective Synthesis of Substituted Tetrahydropyridines from Amino Acids*" 27th American Chemical Society Western Regional Meeting, Anaheim, California; October 6-11, 1991; Paper No. 1007.
69. S. R. Angle "*Quinone Methides: Synthesis, Chemistry and Biological Activity*" Invited seminar, Department of Chemistry, University of Wisconsin, Madison; November 12, 1991.
70. S. R. Angle "*Quinone Methides: Synthesis, Chemistry and Biological Activity*" Invited seminar, Department of Chemistry, University of Illinois, Urbana; November 13, 1991.
71. S. R. Angle, J. G. Breitenbucher "*Enantiospecific Synthesis of  $\Delta^{4,5}$ -Pipicolic Acids Substituted from Readily Available  $\alpha$ -Amino Acids*" 203rd National Meeting of the American Chemical Society, San Francisco, California; April 5-10, 1992; Abstract ORGN 93.
72. S. R. Angle, R. P. Frutos "*Alkenes and Enamides as Terminators in Quinone Methide Initiated Cyclization Reactions*" 203rd National Meeting of the American Chemical Society, San Francisco, California; April 5-10, 1992; Abstract ORGN 363.
73. S. R. Angle, H. L. Mattson "*Novel Cyclization of a Vinylsilane onto a Benzylic Cation*" 203rd National American Chemical Society Meeting, San Francisco, California; April 5-10, 1992; Abstract ORGN 454.
74. S. R. Angle "*Quinone Methides: Synthesis, Chemistry and Biological Activity*" Invited seminar, Department of Medicinal Chemistry, Smith Kline Beecham Pharmaceuticals; King of Prussia Pennsylvania; April 15, 1992.
75. S. R. Angle "*Quinone Methides: Synthesis, Chemistry and Biological Activity*" Invited seminar, Department of Chemistry, The State University of New York, Stony Brook, New York; April 16, 1992.
76. S. R. Angle "*Quinone Methides: Synthesis, Chemistry and Biological Activity*" Invited seminar, Pfizer Pharmaceuticals, Canteberry, Kent, UK; June 11, 1992.
77. S. R. Angle "*Quinone Methide Chemistry*" Contributed poster Third Meeting of the French/American Chemical Society, Aussois, France, June 15-18, 1992.
78. S. R. Angle "*Cyclization Reactions and Formal Cycloadditions of para-Quinone Methides and Benzylic Cations*" Invited short talk, Gordon Research Conference on Natural Products, New Hampton, New Hampshire; July 20-24, 1992.
79. S. R. Angle, R. P. Frutos "*Quinone Methide Chemistry*" Contributed poster, Gordon Research Conference on Natural Products, New Hampton, New Hampshire; July 20-24, 1992.
80. S. R. Angle, J. D. Rainier "*Reductive Cyclizations of Quinone Methides with Electrophiles*" 204th National Meeting of the American Chemical Society, Washington, D.C.; August 23-28, 1992; Abstract ORGN 16.
81. S. R. Angle, D. O. Arnaiz, R. P. Frutos, M. A. Hossain, J. R. Rainier "*Quinone Methides as Synthesis Intermediates*" Contributed poster, Gordon Research Conference on Natural Products, New Hampton, New Hampshire; July 18-23, 1993.

82. S. R. Angle "*Quinone Methides: Synthesis, Chemistry and Biological Activity*" Invited seminar, California State University, Fullerton, California; September 9, 1993.
83. S. R. Angle Invited Participant TAPPI-AFPA Research Conference on Current Needs of the Pulp and Paper Industry" Portland, Oregon; October 13-15, 1993.
84. S. R. Angle "*Quinone Methides as Synthesis Intermediates*" Invited presentation to symposium "Current Trends in Organic Synthesis", 29th Western Regional Meeting of the American Chemical Society, Pasadena, California; October 19-23, 1993; Paper No. 126.
85. S. R. Angle, R. P. Frutos "*Stereoselective Synthesis of 4a-Methyloctahydrophenanthrenes via Tandem Cyclizations Initiated by Benzylic Cations*" Contributed presentation, 29th Western Regional Meeting of the American Chemical Society, Pasadena, California; October 19-23, 1993; Paper No. 319.
86. S. R. Angle, J. P. Boyce "*Formal [3+3]-Cycloadditions of Allylic Silanes with Benzylic Cations*" Contributed paper, 29th Western Regional Meeting of the American Chemical Society, Pasadena, California; October 19-23, 1993; Paper No. 171.
87. S. R. Angle "*Quinone Methides: Synthesis, Chemistry and Biological Activity*" Invited seminar, California State University, Northridge, California; December 1, 1993.
88. S. R. Angle "*Quinone Methides: Synthesis, Chemistry and Biological Activity*" Invited seminar, Department of Chemistry, State University of New York at Buffalo, New York; December 9, 1993.
89. S. R. Angle "*Quinone Methides: Synthesis, Chemistry and Biological Activity*" Invited seminar, Selectide Inc., Tucson, Arizona; December 16, 1993.
90. S. R. Angle "*Quinone Methides: Synthesis, Chemistry and Biological Activity*" Invited seminar, California State University, Long Beach, California; February 9, 1994.
91. S. R. Angle, J. P. Boyce "*Progress Toward the Total Synthesis of (+)-Palustrine*" Contributed paper 207th National Meeting of the American Chemical Society, San Diego, California; March 13-18, 1994; Abstract ORGN 483.
92. S. R. Angle, M. Azad Hossain "*Mechanism of p-Quinone Methide Initiated Cyclization Reactions Terminated by Alkenes: 1,2- vs 1,3-Hydrogen Migrations*" Contributed paper 207th National Meeting of the American Chemical Society, San Diego, California; March 13-18, 1994; Abstract ORGN 102.
93. S. R. Angle, J. M. MacDougall, J. D. Rainier, C. Woytowicz "*Reductive Cyclizations of Quinone Methides with Electrophiles*" Contributed paper 207th National Meeting of the American Chemical Society, San Diego, California; March 13-18, 1994; Abstract ORGN 103.
94. S. R. Angle "*Quinone Methides: Synthesis, Chemistry and Biological Activity*" Invited seminar, R. W. Johnson Pharmaceutical Research Institute, Raritan, New Jersey; July 15, 1994.

95. S. R. Angle "*Quinone Methide Chemistry*" Invited Talk, Gordon Research Conference on Reactions and Processes, New Hampton, New Hampshire; July 16-22, 1994.
96. S. R. Angle, G. P. Wei "*Stereocontrolled Synthesis of Tetrahydrofurans*" Contributed paper, The Fourth International Conference on Chemical Synthesis of Antibiotics and Related Microbial Products, Nashville, Brown County, Indiana; September 11-16, 1994.
97. S. R. Angle "*Development of New Methodology for the Synthesis of Biologically Active Compounds*" Invited seminar, Merck & Co., Department of Medicinal Chemistry, West Point, Pennsylvania; October 2, 1994.
98. S. R. Angle "*Development of New Methodology for the Synthesis of Biologically Active Compounds*" Invited seminar, Department of Chemistry, University of Southern California, Los Angeles, California; October 6, 1994.
99. S. R. Angle "*Development of New Methodology for the Synthesis of Biologically Active Compounds*" Invited seminar, Department of Chemistry, University of California, San Diego, California; October 24, 1994.
100. S. R. Angle "*Development of New Methodology for the Synthesis of Biologically Active Compounds*" Invited seminar, Department of Chemistry, University of California, Santa Cruz, California; November 7, 1994.
101. S. R. Angle "*Development of New Methodology for the Synthesis of Biologically Active Compounds*" Invited seminar, Gilead Sciences, Foster City, California; November 8, 1994.
102. S. R. Angle "*Recent Developments in Stereoselective Synthesis*" Invited talk at the symposium for the ACS Award for Creative Work in Synthetic Organic Chemistry, 209th ACS National Meeting, Anaheim, California; April 2-6, 1995; Abstract ORGN 171.
103. S. R. Angle, G. P. Wei, Y. Ko, K. Kubo "*Lewis Acid Assisted Stereoselective Synthesis of Tetrahydrofurans*" Contributed paper 34th National Organic Symposium Williamsburg Virginia; June 11-15, 1995.
104. S. R. Angle, R. M. Henry "*Progress Toward the Synthesis of (-)-Indolizidine 167B*" Contributed Talk, ACS Western Regional Meeting, San Diego, California; October 18-21, 1995; Abstract No. 145.
105. S. R. Angle, J. P. Boyce "*Stereoselective Synthesis of ( $\pm$ )- $\gamma$ -Lycorane*" Contributed Talk, ACS Western Regional Meeting, San Diego, California; October 18-21, 1995; Abstract No. 146.
106. S. R. Angle, C. Woytowicz "*Synthesis and Studies of Tetracyclic Quinone Methides Related to the Anthracycline Antitumor Antibiotics*" Contributed Talk, ACS 211th National Meeting, New Orleans, Louisiana; March 24-28, 1996; Abstract ORGN 187.
107. S. R. Angle "*Stereoselective Synthesis of Tetrahydrofurans*" Contributed Poster, Gordon Research Conference on Reactions and Processes, New Hampton, New Hampshire; July 14-19, 1996.

108. S. R. Angle "*Development and Application of New Synthesis Methodology*" Invited Seminar, Amgen, Inc., Thousand Oaks, California; October 16, 1996.
110. S. R. Angle "*Development and Application of New Synthesis Methodology*" Invited Seminar, Hoechst-Marrion-Roussel Pharmaceuticals, Sommerville, New Jersey; October 21, 1996.
109. S. R. Angle "*Development and Application of New Synthesis Methodology*" Invited Seminar, Bristol-Myers Squibb, Pharmaceutical Research Institute, Lawrenceville, New Jersey; October 22, 1996.
111. S. R. Angle, R. M. Henry "*Progress Toward the Synthesis of (-)-Indolizidine 167B*" Contributed Talk, 213th National Meeting of the American Chemical Society, San Francisco, California; April 13-17, 1997; Abstract ORGN 601.
112. S. R. Angle "*Development and Application of New Synthesis Methodology*" Invited Seminar, University of California, Irvine, California; May 7, 1997.
113. S. R. Angle "*Development and Application of New Synthesis Methodology*" Invited Seminar, University of Oregon, Eugene, Oregon; May 9, 1997.
114. S. R. Angle and R. M. Henry "*Stereoselective Synthesis of Piperidine Alkaloids*" Contributed Poster Gordon Research Conference on Heterocyclic Compounds, Salve Regina College, Newport, Rhode Island; June 29 -July 4, 1997.
115. S. R. Angle "*Development and Application of New Synthesis Methodology*" Invited Seminar, Corvas Pharmaceuticals, La Jolla, California; September 17, 1997.
116. S. R. Angle "*Development and Application of New Synthesis Methodology*" Invited Seminar, University of California, Santa Cruz, California; October 13, 1997.
117. S. R. Angle "*Development and Application of New Synthesis Methodology*" Invited Seminar, Arris Pharmaceuticals International, La Jolla, California; October 14, 1997.
118. S. R. Angle, R. M. Henry "*Progress Toward the Synthesis of Palustrine*" Invited Talk, Symposium on New Synthetic Methods, 33<sup>rd</sup> Western Regional Meeting of the American Chemical Society, Irvine, California; October 21-25, 1997; Abstract No. 4.
119. S. R. Angle, D. Jones "*Stereoselective Synthesis of Tetrahydro-furans. An Investigation of the Reaction Mechanism*" Contributed Talk, 33<sup>rd</sup> Western Regional Meeting of the American Chemical Society, Irvine, California; October 21-25, 1997; Abstract No. 260.
120. S. R. Angle "*Development and Application of New Synthesis Methodology*" Invited Seminar Natural Product Synthesis, 14<sup>th</sup> Rocky Mountain Regional Meeting of the American Chemical Society, Tucson, Arizona; March 15-18, 1998; Abstract No. O51.
121. S.R Angle, N. A. El-Said "*Stereoselective Synthesis of Tetrahydropyrans via Formal [4+2]-Cycloaddition of Allylsilanes*" 216<sup>th</sup> National Meeting of the American Chemical Society, Anaheim, California, 1999; Abstract ORGN 501.

122. S. R. Angle "*Development and Application of New Synthesis Methodology*" Invited Seminar, Protein Design Labs, Fremont, California; January 28, 1999.
123. S. R. Angle "*Development of New Methods for Heterocycle Synthesis*" Invited Talk, Gordon Research Conference on Heterocyclic Chemistry, Newport, Rhode Island, June 1999.
124. S. R. Angle, M. L. Neitzel "*Stereoselective Synthesis of 3-Hydroxy-2-Phenyltetrahydrofurans From  $\beta$ -Triethylsilyloxyaldehydes and ArylDiasomethanes*" Contributed Talk, 218<sup>th</sup> National Meeting of the American Chemical Society, New Orleans, Louisiana; August 22-26, 1999; Abstract ORGN 632.
125. S. R. Angle, M. Kim "*A Study Toward the Total Synthesis of Myrmicarin 237A*" Contributed Talk, 1999 Pacific Conference on Chemistry and Spectroscopy – 35<sup>th</sup> American Chemical Society Western Regional Meeting, Ontario, California; October 26-8, 1999; Abstract 220.
126. S. R. Angle, D. S. Bernier "*Stereoselective Synthesis of Tetrahydrofurans*" Contributed Talk, 1999 Pacific Conference on Chemistry and Spectroscopy - 35<sup>th</sup> American Chemical Society Western Regional Meeting, Ontario, California; October 26-8, 1999; Abstract 221.
127. S. R. Angle, M. L. Neitzel "*Stereoselective Synthesis of C-Aryl Glycoside Analogues by the Addition of Phenyl diazomethane to  $\beta$ -Triethylsilyloxyaldehydes*" Contributed Talk, 1999 Pacific Conference on Chemistry and Spectroscopy - 35<sup>th</sup> American Chemical Society Western Regional Meeting, Ontario, California; October 26-8, 1999; Abstract No. 222.
129. S. R. Angle, N. A. ElSaid "*Synthesis of Tetrahydropyrans and Tetrahydrofurans via Formal Cycloaddition of Allylsilanes*" Contributed Poster, 1999 Pacific Conference on Chemistry and Spectroscopy - 35<sup>th</sup> American Chemical Society Western Regional Meeting, Ontario, California; October 26-8, 1999; Abstract No. 289.
128. S. R. Angle, S. Z. Shaw "*Synthesis of Heterocyclic Compounds*" Contributed Poster, 1999 Pacific Conference on Chemistry and Spectroscopy - 35<sup>th</sup> American Chemical Society Western Regional Meeting, Ontario, California; October 26-8, 1999; Abstract No. 290.
129. S. R. Angle, M. L. Neitzel "*A Simple Procedure for the Synthesis of Benzyl Ketone from Aldehydes and Aryl Toluenesulfonylhydrazones*" Contributed Talk, 219<sup>th</sup> National Meeting of the American Chemical Society, San Francisco, California; November 1-5, 1999; Abstract ORGN 552.
130. S. R. Angle, S. Z. Shaw "*Stereoselective Synthesis of 3-Hydroxy-2-Sulfonyltetrahydrofurans from  $\beta$ -(Triethylsilyloxy)aldehydes and *p*-Tolylsulfonyldiazomethane*" Contributed Talk, 219<sup>th</sup> National Meeting of the American Chemical Society, San Francisco, California; November 1-5, 1999; Abstract ORGN 497.
131. S. R. Angle, D. S. Bernier "*Stereoselective Synthesis of Tetrahydrofurans from Glyceraldehyde Derivative*" Contributed Talk, 219<sup>th</sup> National Meeting of the American Chemical Society, San Francisco, California; November 1-5, 1999; Abstract ORGN 496.
132. S. R. Angle, M. Kim "*A Study Toward the Total Synthesis of the Myrmicarins Alkaloids*" Contributed Talk, 219<sup>th</sup> National Meeting of the American Chemical Society, San Francisco, California; November 1-5, 1999; Abstract ORGN 680.

133. S. R. Angle, K. Chann “*Synthesis of Tetrahydrofurans: Reactions of Ketones with Diazo Esters*” Contributed Talk, 219<sup>th</sup> National Meeting of the American Chemical Society, San Francisco, California; November 1-5, 1999; Abstract ORGN 495.
134. S. R. Angle, N. A. El-Said “*Novel [3+2] Formal Cycloaddition of Allylsilanes to Form Tetrahydrofurans*” Contributed Talk, 219<sup>th</sup> National Meeting of the American Chemical Society, San Francisco, California; November 1-5, 1999; Abstract ORGN 494.
135. S. R. Angle, S. L. White “*Asymmetric Synthesis of 4-Aryl-2-(benzyloxy)carbonyl-3-hydroxy tetrahydrofurans from Optically Active Epoxides*” Contributed Talk, 220<sup>th</sup> National Meeting of the American Chemical Society, Washington, DC; August 20-24, 2000; Abstract ORGN 561.
136. S. R. Angle “*Development and Application of New Synthesis Methodology*” Invited Seminar, Department of Chemistry, Texas A&M University, College Station, Texas; October 26, 2000.
137. S. R. Angle “*Development and Application of New Synthesis Methodology*” Invited Seminar, Department of Chemistry, Tulane University, New Orleans, Louisiana; February 19, 2001.
138. S. R. Angle “*Development and Application of New Synthesis Methodology*” Invited Seminar, Department of Chemistry, University of Florida, Gainesville, Florida; February 21, 2001.
139. S. R. Angle, S. Z. Shaw “*Synthesis of 1,2,3-Triazolines from Schiff Bases and p-Tolylsulfonyl-Diazomethane*” Contributed Talk, 221<sup>st</sup> National Meeting of the American Chemical Society, San Diego, California; April 1-5, 2001; Abstract ORGN 173.
140. S. R. Angle, D. S. Belanger “*Stereoselective Synthesis of 3-Hydroxyproline Benzyl Esters from N-Protected  $\beta$ -Aminoaldehydes and Benzyl Diazoacetate*” Contributed Talk, 225<sup>th</sup> National Meeting of the American Chemical Society, New Orleans, Louisiana; March, 2003; Abstract ORGN 287.
141. S. R. Angle “*Development and Application of New Synthesis Methodology*” Invited Seminar, Pfizer Pharmaceuticals, La Jolla, California; September 19, 2003.
142. S. R. Angle “*Development and Application of New Synthesis Methodology*” Invited Seminar, Gilead Sciences Inc., Foster City, California; November 15, 2004.

## INSTRUCTION AND TEACHING

### 1. Undergraduate Instruction

#### a. Formal Classroom teaching.

I have consistently taught the undergraduate organic chemistry (Chemistry 112ABC) series, as well as the organic chemistry graduate organic courses (Chemistry 211ABC), that are often taken or audited by undergraduates.

#### b. The following undergraduate students have worked in the Angle laboratory:

David Daniel Bradley	Spring 1987-Spring 1989
Aaron Nguyen	Spring 1987

Christopher Shiomi	Spring 1988
Christopher Tegley	Winter 1988-Spring 1990
Aimée Jeanjaquet	Summer 1989/1990
Dorothy Nguyen	Summer 1989/1990
Kathy Nguyen	Summer 1990/1991; Honors Thesis 1992
John Beck	Summer 1990-Spring 1991
Ricardo Rivas	Fall 1990
Tony Perry	Summer 1991; NSF Minority
Program Participant	
Gabriel Weatherhead	Winter-Spring 1992
Hoa Khuu	Spring 1991-Spring 1993
Doan (Rachel) Nguyen	Summer 1993-Fall 1993; Honors Project
Musong Kim	Summer 1993-9/95
Craig Husfeld	Fall 1993-Spring 1995; Rec. UC President's Fellowship
Jason Ferrone	Fall 1993, Summer 1994-Summer 1996
Steve White	Summer 1994; NSF Minority Program Participant
James McCellen	Fall 1994 to Spring 1995
Winfred Sardar	Spring 1995 to 1/96
Joshua Young	Spring 1995 to 9/96
Steve White	Summer 1995, NSF Minority Program Participant
Marcos Palafax	Summer, Fall 1996, Summer 1997
Ming Tran (Jan) Lee	Spring 1999 to 2001
Annie Ma	Summer 2004
Angie Garcia	Spring 2005 to present

*Three of these students have received PhD's from Chemistry/Biochemistry graduate Programs: Doan (Rachel) Nguyen, Cornell University; Craig Husfeld, Stanford University; Steve White, University of California Riverside.*

## 2. Graduate Research:

a. The following students will have received their Ph.D. (S. R. Angle, major professor).

Damian O. Arnaiz, Ph.D. March 1991; admitted 09/86; Recipient of an NIH Postdoctoral Fellowship to work with Professor K. C. Nicolaou, Scripps Research Institute (1 year) and Professor Harold Moore, University of California, Irvine (1 year). Current Position: Senior Research, Chemist Berlex Pharmaceuticals, Alameda, California.

Kenneth Turnbull, Ph.D. March 1991; admitted 09/86; Recipient of an American Cancer Society Postdoctoral Fellowship to work with Professor Peter Dervan, California Institute of Technology. July 1994 to 1999 Assistant Professor, 1999 to 2001 Associate Professor University of Arkansas, Fayetteville.

Wenjin Yang, Ph.D. December 1991; admitted 09/87; Postdoctoral Research Associate with Professor Dale Boger, Scripps Research Institute, LaJolla, California. September 1993 to 2000 Senior Research Chemist, Gilead Sciences, Foster City California. Current position: Group leader Sunesis Pharmaceuticals, South San Francisco, California.

Michael S. Louie, Ph.D. April 1992; admitted 09/87; Senior Research Chemist Monsanto, St. Louis Missouri; January 1993 to present, Current position: Senior Research Chemist, Gilead Sciences, Foster City, California.

Heather L. Mattson-Arnaiz, Ph.D. June 1992; admitted 09/87; Postdoctoral Research Associate with Professor S. Angle, University of California, Riverside. Current Position: Senior Research, Chemist Berlex Pharmaceuticals, Alameda, California.

J. Guy Breitenbucher, Ph.D. December 1993; admitted 09/89; Postdoctoral Research Associate with Professor Clayton Heathcock, University of California, Berkeley, 12/93 to 8/95. Current position: Group Leader, Johnson and Johnson Pharmaceuticals, La Jolla California.

Rogelio P. Frutos, Ph.D. December 1993; admitted 09/89; Recipient of an NIH Minority Postdoctoral Fellowship to work with Professor Al Meyers, Colorado State University, 12/93 to 8/95. Current position: Senior Chemist, Boeringer-Ingelheim Pharmaceuticals, Danbury, CT.

Jon D. Rainier, Ph.D. December 1993; admitted 09/89; Recipient of an NIH Postdoctoral Fellowship to work with Professor Amos Smith, University of Pennsylvania, 1993-1996. Assistant Professor University of Arizona 1996-2002; Current position Associate Professor of Chemistry, University of Utah, Salt Lake City Utah.

James P. Boyce, Ph.D. October 1994; admitted 09/90; November 1994 to present: Senior Research Chemist ChiroSciences Pharmaceuticals, Seattle, Washington.

Catherine Woytowicz, Ph. D. March 1997; admitted 09/91; 1997 to 1999 Postdoctoral Research Associate with Professor J. D. Faulkner, Scripps Oceanographic Institute, University of California, San Diego. Present position: Lecturer, George Washington University, Washington D.C.

Robert M. Henry, Ph.D. December 1997; admitted 09/93; Deceased 1999. Senior Research Chemist, Tularik Pharmaceuticals, Foster City, California.

Martin L. Neitzel, Ph.D. December 2000; admitted 09/96; Current Position: January 2001 to present Senior Research Chemist Drug Discovery, Elan Pharmaceuticals, San Francisco, California.

Nahla A. El-Said, Ph.D, June 2001; admitted 09/96; 2001-2003: American Cancer Society, Postdoctoral researcher with Scott Rychnovsky, University of California, Irvine; Current Position: Lecturer, San Bernardino Valley College, San Bernardino, California.

Stephen L. White, Ph.D. August 2001; admitted 01/96; Current Position: Senior Research Chemist, Drug Discovery, ICOS Corporation, Bothell, Washington.

Daniel S. Bernier, Ph.D. December 2001; admitted 01/96; Current Position: Lecturer, Riverside Community College, Riverside.

Stephanie Z. Shaw, Ph.D. December 2001; admitted 09/96; Current Position: Senior Research Chemist, Drug Discovery, Valeant Pharmaceuticals, Irvine, California.

Keith Chann, Ph.D. March 2002; admitted 09/96; Current Position: High School Chemistry Teacher, Bloomington, California.

Musong Kim, Ph.D. March 2002; admitted 09/97; 2002-2004: Postdoctoral Research Associate with Professor Edwin Vedejs, Department of Chemistry, University of Michigan; Current Position: ICOS Corporation, Bothell, Washington.

Dominique S. Belanger, Ph.D. December 2002; admitted 09/97; 2003: Postdoctoral Research Associate with Professor Huw Davies, Department of Chemistry, SUNY at Buffalo; Current Position: Coordinator of Undergraduate Research for CNAS and CHASS, University of California, Riverside.

- b. Current Ph.D. students (S. R. Angle, major professor):  
Inchang Choi, admitted 09/00

Xuelei Quan, admitted 09/01

3. Postdoctoral Research

a. The following Postdoctoral Research Associates have worked under S. R. Angle:

M. Azad Hossain, Ph.D 1992; Marquette University with William Donaldson; 11/92-3/95.  
Current Position: Senior Chemist, Abbott Laboratories.

Guo Ping Wei, Ph.D. 1988; Shanghai Institute Academia Sinica; 4/94-6/95. Current  
Position: Chemist, Berlex BioSciences, Alameda, California.

Darin Jones, Ph.D. 1996; University of Missouri, Columbia with Michael Harmata; 8/95-2/97.  
Current Position: Senior Research Chemist, Monsanto Pharmaceutical Division.

David Bensa, Ph.D. 2003; Marseille University; 2/03 to 8/04.  
Current Position: Postdoctoral Researcher University of Sheffield, UK.

b. The following Postdoctoral Research Associate is currently working under S. R. Angle:

Alex Pletnev, Ph.D 2002; Iowa State University with Richard Larock; 8/02 to present.

c. The following Visiting Scholars have worked under S. R. Angle:

Young Ko, Ph.D., 1989; Research Fellow, KRICT, Korea; 4/93-5/94.

Roy Kryger, Ph.D., Visiting Professor, La Sierra University, Riverside, CA; 6/93-9/93; 9/94 to 9/95.

Keiji Kubo, Ph.D., Senior scientist Takeda Pharmaceutical Laboratories, Japan; 9/94 to 9/95.

Tetsu Wada, M. S., Senior Chemist Showa Denko, Japan; 9/94 to 9/96.

4. Other Instruction

a. Co-recipient of the UC Riverside Academic Senate Distinguished Teaching Award, 1991.

b. Distinguished Teaching MiniGrant for Instructional Enhancement (1991/92 \$400).

c. Undergraduate Advisor for several students per quarter 1986-2000.

**COMMITTEE AND UNIVERSITY SERVICE**

1. Departmental:

- Undergraduate Advisor, Department of Chemistry; June 1987-April 1988.
- Member of Graduate Admissions Committee; December 1988-present.
- Member of Committee to Supervise the Conversion of Undergraduate Organic Laboratories (Chem 8/112) to Microscale; 1988-1989 academic year.
- Assisted Professor Wilkins in determining which NMR to purchase with our departmental NSF Grant; Summer 1987.
- Along with Professor F. Zaera, submitted an NSF Grant to support summer research of undergraduates; August 1987 (not funded).
- Along with Professor F. Zaera, submitted an NSF grant to support summer research of undergraduates and faculty from small colleges; December 1, 1987 (not funded).
- Member *Ad Hoc* committee to review proposed Program in Chemical Physics; Fall 1992.

- Member Graduate Admissions Committee; July 1993-June 1995.
- Department Representative to the College Executive Committee; 1993-1994.
- Member Department Safety Committee; 1994-1997.
- Graduate Advisor, Admissions; 1995-1997.
- Chair Faculty Search Committee, Atmospheric Chemistry Position; 1995-1996.
- Member Organic Faculty Search Committee; 1996-1997.
- Graduate Advisor and Chair Graduate Study Committee; July 1997- August 1997.
- Member Senior Inorganic Search Committee; 1997-1998.

2. Academic Senate Committees:

- Member University Extension Committee of the Academic Senate; 1987-1989.
- Member Committee on Distinguished Teaching; 1994-1996.
- Chair Committee on Distinguished Teaching; 1996-1997.

3. University and Community Service

- Campus Board of Review; 1989-1992.
- Campus Recharge Committee; 1990-1992.
- Chancellor's Advisory Committee on Hazardous Materials; 1990-1992.
- Faculty Presider at the "First Annual New Directions Research Conference" (undergraduate research symposium), UC Riverside; May 18, 1990.
- Presentation on undergraduate research opportunities at UC Riverside to the Community College Symposium; February 14, 1990.
- Presentation on research to the Summer University Honors Program: "Have Lunch with a Professor" U.C. Riverside Botanic Gardens Conference Room; July 27, 1990.
- Member *Ad Hoc* personnel review committee; Fall 1991.
- Judge for Riverside Unified School District Science Fair; March 27, 1992.
- Department Representative to College Executive Committee; 1993-1994.
- Member Campus Recharge Committee; 1993-1994.
- Member Chancellor's Advisory Committee on Hazardous Materials; 1994-1995.
- Member *Ad Hoc* personnel review committee; Fall 1994.
- Member Committee to Reorganize Purchasing and Acquisitions; 1994-1995.
- Talk on Research to the UC Riverside ACS Student Affiliate, Chemistry Club; November 10, 1995.
- Member of Two *Ad Hoc* Personnel Committees; Winter 1996.
- Judge for Riverside Unified School District Science Fair, High School; March 19, 1996.
- Visit to Watson Pharmaceuticals, Corona, California with Professor Rettig, and Chancellor R. Orbach to explore common areas interest to Watson and UC Riverside; July 1996.

- Member College committee on establishing a Biotech Research Center at UC Riverside; 1996-1997.
- Member of UC System-wide Committee on Graduate Student Enrollment and Affirmative Action; 1995-1996.
- Talk to Chemistry 191, Seminar in Chemistry Careers, “Graduate School Admissions” April 1, 1996.
- Faculty Presider at the UC Riverside New Directions Undergraduate Research Conference; May 18, 1996.
- Assisted Undergraduate Student Jason Ferrone to prepare the talk “*Synthesis of Adriamycin and Daunomycin Derivatives via a Quinone Methide*” on research conducted in the Angle laboratory and presented at the UC Santa Barbara Undergraduate Research Symposium April 1996 and the UC Riverside New Directions Undergraduate Research Conference; May 18, 1996.
- Judge for Riverside Unified School District Science Fair, High School; March 18, 1997.
- Talk to Chemistry 191, Seminar in Chemistry Careers, “Graduate School Admissions” April 7, 1997.
- Member Search Committee for CNAS Dean; 1996-1997.
- Member of Committee to write a grant for Undergraduate Education in the Biological Sciences to the Howard Hughes Medical Institute; Summer 1997.
- Member Building Committee, Pierce Addition; 1997 to 1999.
- *Ex Officio* member Analytical Chemistry Instrumentation Facility (ACIF); 1997 to 2000.
- Member: Search Committee for Director of Health and Safety; December 1997 to January, 1998.
- Chancellor’s Welcome, Faculty Speaker, Embassy Suites, Arcadia, California; March 24, 1998.
- Member: CNAS Dean’s Executive Space Planning Committee; 1998 to 2000.
- Member: CNAS Dean’s Space Transition Committee; 1998 to 2000.
- Member: Science Laboratory Building Committee; 1998-1999.
- Member: Physical Sciences 1 Building Committee; 1998-1999.
- Member: Science Laboratory Building Committee; 1999 to 2002.
- Member: Advisory Board Mesa Schools Program; 1998 to present.
- Chancellor’s Welcome, Faculty Speaker, South Bay Hilton, Torrance, California; March 21, 1999.
- Member: Search Committee, CNAS Facilities Planner; September 1999.
- Selected a Fellow of the American Association for the Advancement of Science (AAAS); 1999.
- Member: University of California Cancer Research Coordinating Committee Grant Review Panel; 1999-2003.
- Member: UC Riverside Foundation Board of Trustees; 2000 to present.
- Chancellor’s Welcome, Faculty Speaker, Holiday Inn, North Hollywood, California; March 27, 2000.
- Member: Executive Council, Division of Agriculture and Natural Resources, University of California; May 2000 to present.

- Attended Trost Symposium, Department of Chemistry, Stanford University, Palo Alto, California; June 2, 2001.
- Opening Address at New Directions Undergraduate Research Conference, UC Riverside, May 18, 2002.
- Attended Gordon Research Conference on Organic Reactions and Processes, Roger Williams University, Bristol, Rhode Island, July 21-24, 2002.
- Member Materials Science and Engineering Building Executive Planning Committee, November 2002 to present (ground breaking scheduled for Spring 2006).
- Chair Search Committee for Associate Vice Chancellor for Marketing and Communications, 2003.
- Member UC Riverside Health Sciences Planning Group, 2004 to present.
- UC Riverside West Campus Area Study Group, 2004/05.
- Member UC Riverside Capital Project Coordination Committee, 2004 to present.
- Member UC Riverside Committee on Immigration and Visa status for Faculty and Visiting Scholars, 2004 to present.
- Member City of Riverside CEO Forum, a group organized to bring high tech companies to Riverside, 2004 to present.
- Member UC System-wide Task Force on Science and Mathematics Initiative, Training teachers in Science and Mathematics Education, March 2005 to present.
- Faculty Mentor California Alliance for Minority Participation in Science (CAMP), May 2005 to present.

The following individuals have agreed to provide letters of reference:

Dr. David Warren, Professor of Psychology  
And former Interim Chancellor (1 yr) and Executive Vice Chancellor and Provost (10 yrs)  
Department of Psychology  
University of California, Riverside  
Riverside, California 92521  
Phone: 951-827-3897  
e-mail: [david.warren@ucr.edu](mailto:david.warren@ucr.edu)

Patricia O'Brien, Executive Dean College of Letters and Science  
University of California, Los Angeles  
Los Angeles, California 90095-1655  
phone: 310-825-4286  
e-mail: [pobrien@college.ucla.edu](mailto:pobrien@college.ucla.edu)

Dr. Satish Tripathi, Provost  
Former UCR Dean of Engineering and Interim Executive Vice Chancellor  
The University at Buffalo  
Buffalo, NY  
(716) 645-2992  
[tripathi@buffalo.edu](mailto:tripathi@buffalo.edu)

Dr. John (Jack) Azzaretto, Vice Chancellor, Public Service and International Programs  
And Dean, University Extension  
University of California, Riverside  
Riverside, California 92521  
Phone: 951-827-5705  
e-mail: [jack.azzaretto@ucr.edu](mailto:jack.azzaretto@ucr.edu)

Dr. Michael Stemerman, Professor of Biomedical Sciences  
And former Dean, UCR/UCLA Biomedical Sciences Program  
University of California, Riverside  
Riverside, California 92521  
Phone: 951-827-5705  
e-mail: [michael.stemerman@ucr.edu](mailto:michael.stemerman@ucr.edu)

*Additional References Available Upon Request.*

#### CONTACT INFORMATION

Steven Angle  
Home address:  
6956 Orozco Drive  
Riverside, CA 92506  
Cell Phone: 951-288-0732