

Curriculum vitae

Robert Stephen Phillips

Education:

Georgia Tech., Chemistry Dept., B.S., 1974, Chemistry

Georgia Tech., Chemistry Dept., Ph.D., 1979, Biochemistry

Georgia Tech., Chemistry Dept., Postdoctoral, 1979-80, Enzyme Mechanisms

National Institute of Mental Health, Postdoctoral, 1981-83, Enzyme Regulation

NIADDKD, NIH, Postdoctoral, 1983-85, Bio-organic Chemistry

Employment:

Assistant Professor of Chemistry and Biochemistry
University of Georgia, 1985-1991

Associate Professor of Chemistry and Biochemistry
University of Georgia, 1991-1996

Professor of Chemistry, Biochemistry and Molecular Biology
University of Georgia, 1996 - present

Awards and Honors:

Japan Society for the Promotion of Science Fellowship, 1992

Northeast Georgia Section, American Chemical Society
Chemist of the Year for Research, 1992

Northeast Georgia Section, American Chemical Society
Chemist of the Year for Service, 1995

Creative Research Medal, University of Georgia Research Foundation, 1996

Dozor Visiting Professor, Ben-Gurion University, Beersheeva, Israel, 1997

Visiting Professor, University of Cergy-Pontoise, France, June 5-16, 2006

CNRS Professor Rouge, University of Rouen, Mont St.-Aignan, France, October 10, 2006-
July 31, 2007

Service on Review Panels:

Ad Hoc member, Biochemistry Study Section, National Institutes of Health, February 22-23,
2001.

Ad Hoc member, Biochemistry Study Section, National Institutes of Health, February 21-22, 2002.

NSF Panel on Biosensors, June 4-5, 2004.

EPA Scientific Advisory Panel on Enzyme Nomenclature, May 3-4, 2005.

Ad Hoc member, MSFA Study Section, National Institutes of Health, February 5-6, 2007.

Ad Hoc member, F04A Chemical and Bioanalytical Sciences Fellowship Study Section, National Institutes of Health, October 19, 2007.

Ad Hoc member, MSFE Study Section, National Institutes of Health, January 31-February 1, 2008.

Membership in Scientific Societies:

American Chemical Society, 1976-present

American Society of Pharmacognosy, 1976-2005

American Society of Biochemistry and Molecular Biology, 2002-present

Publications list:

1. "Interaction of Protocatechuate-3,4-dioxygenase with 3-Fluoro-4-hydroxybenzoic acid and Related Compounds," May, S.W., Phillips, R.S. and Oldham, C.D. *Biochemistry* 17, 1853-1860 (1978).
2. "Resonance Raman Study of Substrate and Inhibitor Binding to Protocatechuate-3,4-dioxygenase," Felton, R.H., Cheung, L.D., May, S.W. and Phillips, R.S., *Biochem. Biophys. Res. Comm.* 85, 844-850 (1978).
3. "Protocatechuate-3,4-dioxygenase: Implications of Ionization Effects on Binding and Dissociation of Halohydroxybenzoates and on Catalytic Turnover," May, S.W. and Phillips, R.S., *Biochemistry*, 18, 5933-5939 (1979).
4. "Asymmetric Sulfoxidation by Dopamine- β -Hydroxylase, an Oxygenase Heretofore Considered Specific for Methylene Hydroxylation," May, S.W. and Phillips, R.S., *J. Am. Chem. Soc.* 102, 5981-5983 (1980).
5. "Enzymatic Oxygenation of Sulfur," Phillips, R.S. and May, S.W., *Enzyme Microb. Technol.* 3, 9-17 (1981).
6. "Dopamine- β -Hydroxylase: Demonstration of Enzymatic Ketonization of the Product Enantiomer, S-Octopamine," May, S.W., Phillips, R.S., Mueller, P.W. and Herman, H.H., *J. Biol. Chem.* 256, 2258-2261 (1981).
7. "Dopamine- β -Hydroxylase: Comparative Specificities and Mechanisms of the Oxygenation Reactions," May, S.W., Phillips, R.S., Mueller, P.W. and Herman, H.H., *J.*

- Biol. Chem.* 256, 8470-8475 (1981).
8. "Bioactivation of *Catha Edulis* Alkaloids: Enzymatic Ketonization of Norpseudophedrine," May, S.W., Phillips, R.S., Mueller, P.W. and Herman, H.H., *Biochem. Biophys. Res. Comm.* 104, 38-44 (1982).
 9. "Dopamine- β -Hydroxylase: Suicide Inhibition by the First Olefinic Substrate, 1-Phenyl-1-aminomethylethene," May, S.W., Mueller, P.W., Padgett, S.R., Herman, H.H. and Phillips, R.S., *Biochem. Biophys. Res. Comm.* 110, 161-168 (1983).
 10. "Ligand Effects on the Limited Proteolysis of Rat Liver Phenylalanine Hydroxylase: Evidence for Multiple Conformational States," Phillips, R.S., Iwaki, M. and Kaufman, S., *Biochem. Biophys. Res. Comm.* 110, 919-925 (1983).
 11. "On the Nature of the Spontaneous Activation of Phenylalanine Hydroxylase," Phillips, R.S. and Kaufman, S., *Ann. N. Y. Acad. Sci.* 41, 87-95 (1983).
 12. "Preparation of 2-Bromo-L-tryptophan and 2-Chloro-L-tryptophan," Phillips, R.S. and Cohen, L.A., *Tetrahedron Letts.* 24, 5555-5558 (1983).
 13. "The Interaction of Aromatic Amino Acids with Rat Liver Phenylalanine Hydroxylase," Phillips, R.S., Parniak, M.A. and Kaufman, S., *J. Biol. Chem.* 259, 271-277 (1984).
 14. "Ligand Effects on the Phosphorylation State of Hepatic Phenylalanine Hydroxylase," Phillips, R.S. and Kaufman, S., *J. Biol. Chem.* 259, 2474-2479 (1984).
 15. "Spectroscopic Investigation of Ligand Interaction with Hepatic Phenylalanine Hydroxylase: Evidence for a Conformational Change Associated with Activation," Phillips, R.S., Parniak, M.A. and Kaufman, S., *Biochemistry* 23, 3836-3842 (1984).
 16. "Interactions of Tryptophan Synthase, Tryptophanase and Pyridoxal Phosphate with Oxindolyl-L-alanine and 2,3-Dihydro-L-tryptophan: Support for an Indolenine Intermediate in Tryptophan Metabolism," Phillips, R.S., Miles, E.W. and Cohen, L.A., *Biochemistry* 23, 6228-6234 (1984).
 17. "Photoinactivation and Photoaffinity Labeling of Tryptophan Synthase $\alpha_2\beta_2$ Complex by the Product Analogue, 6-Azido-L-tryptophan," Miles, E.W. and Phillips, R. S., *Biochemistry* 24, 4694-4703 (1985).
 18. "Differential Inhibition of Tryptophan Synthase and of Tryptophanase by the Two Diastereoisomers of 2,3-Dihydro-L-tryptophan: Implications for the Stereochemistry of the Reaction Intermediates," Phillips, R. S., Miles, E.W. and Cohen, L. A., *J. Biol. Chem.* 260, 14665-14670 (1985).
 19. "Proteolytic Modification of the Amino-terminal and Carboxyl-terminal Regions of Rat Hepatic Phenylalanine Hydroxylase," Iwaki, M., Phillips, R. S. and Kaufman, S., *J. Biol. Chem.* 261, 2051-2056 (1986).
 20. "Intramolecular General Acid and General Base Catalyses in the Hydrolysis of 2-Halotryptophans and Their Analogues," Phillips, R. S. and Cohen, L. A., *J. Am. Chem. Soc.*, 108, 2023-2030 (1986).

21. "Isomerization of (3S)-2,3-Dihydro-5-fluoro-L-tryptophan and of 5-Fluoro-L-tryptophan Catalyzed by Tryptophan Synthase: Studies Using Fluorine-19 Nuclear Magnetic Resonance and Difference Spectroscopy," Miles, E.W., Phillips, R. S., Yeh, H. J. C., and Cohen, L. A., *Biochemistry* 25, 4240-4249 (1986).
22. "Interaction of Human Serum Albumin with 6-Nitro-L-tryptophan Studied by Visible Difference Spectroscopy and Induced Circular Dichroism," Phillips, R. S., in *Progress in Tryptophan and Serotonin Research*, 369-372 (1986).
23. "Reactions of O-Acyl-L-serines with Tryptophanase, Tyrosine Phenol-lyase and Tryptophan Synthase," Phillips, R.S., *Arch. Biochem. Biophys.* 256, 302-310 (1987).
24. "Preparation of 2-Nitro-L-tryptophan," Phillips, R. S. and Cohen, L. A., *J. Heterocyc. Chem.* 25, 191-192 (1988).
25. "6-Nitro-L-tryptophan: A Novel Spectroscopic Probe of *trp* Aporepressor and Human Serum Albumin," Phillips, R. S. and Marmorstein, R. Q., *Arch. Biochem. Biophys.* 262, 337-344 (1988).
26. "Mechanistic Deductions from Multiple Kinetic and Solvent Isotope Effects and pH Studies of Pyridoxal Phosphate-Dependent Carbon-carbon Lyases: *Escherichia coli* Tryptophan Indole-lyase," Kiick, D. M. and Phillips, R. S., *Biochemistry* 27, 7333-7338 (1988).
27. "Mechanistic Deductions from Kinetic Isotope Effects and pH Studies of Pyridoxal Phosphate-dependent Carbon-carbon Lyases: *Erwinia herbicola* and *Citrobacter freundii* Tyrosine Phenol-lyase," Kiick, D. M. and Phillips, R. S., *Biochemistry* 27, 7339-7344 (1988).
28. "Detection and Identification of Intermediates in the Reactions of Tryptophan Synthase with Oxindolyl-L-alanine and 2,3-Dihydro-L-tryptophan via Rapid-Scanning and Single Wavelength Stopped-flow Studies," Roy, M., Miles, E. W., Phillips, R. S. and Dunn, M. F., *Biochemistry* 27, 8661-8669 (1988).
29. "Synthesis of L-tyrosine from Phenol and S-(*o*-Nitrophenyl)-L-cysteine Catalyzed by Tyrosine Phenol-lyase," Phillips, R.S., Ravichandran, K. and Von Tersch, R.L., *Enz. Microb. Technol.*, 11, 80-83 (1989).
30. "The Mechanism of Tryptophan Indole-lyase: Insights from Pre-steady-state Kinetics and Substrate and Solvent Isotope Effects," Phillips, R. S., *J. Am. Chem. Soc.* 111, 727-730 (1989).
31. "Evidence that Cysteine-298 is in the Active Site of Tryptophan Indole-lyase," Phillips, R. S. and Gollnick, P. D., *J. Biol. Chem.* 254, 10627-10632 (1989).
32. "Temperature-Dependent Enantiospecificity of Secondary Alcohol Dehydrogenase from *Thermoanaerobacter ethanolicus*," Pham, V. T., Phillips, R. S. and Ljungdahl, Lars G., *J. Am. Chem. Soc.* 111, 1935-1936 (1989).
33. "Oxygenation of Fluorinated Tyrosines by Mushroom Tyrosinase Releases Fluoride Ion," Phillips, R. S., Fletcher, J. G., Von Tersch, R. L. and Kirk, K. L., *Arch. Biochem. Biophys.*, 276, 65-69 (1990).

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35. "Structural and Stereochemical Studies of Esterification of Aromatic Amino Acids by α -Chymotrypsin in Alcohol Solvents," Phillips, R. S., Matthew, M. S., Olson, E., and Von Tersch, R. L., *Enz. Microb. Technol.*, *12*, 731-735 (1990).
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38. "Cycloneridiol from a Novel Source, *Trichoderma koningii*: Plant Growth Regulatory Activity," Cutler, H. G., Jacyno, M. M., Phillips, R. S., Von Tersch, R. L., Cole, P. D. and Montenuorra, N., *Agr. Biol. Chem.*, *55*, 243-244 (1991).
39. "The Reaction of Indole and Benzimidazole with Amino Acid Complexes of *E. coli* Tryptophan Indole-lyase: Detection of a New Reaction Intermediate," Phillips, R. S., *Biochemistry*, *30*, 5927-5934 (1991).
40. "Stereochemistry and Mechanism of Aldol Reactions Catalyzed by Kynureninase," Phillips, R. S. and Dua, R. K., *J. Am. Chem. Soc.*, *113*, 7385-7388 (1991).
41. "Replacement of Lysine 269 by Arginine in *Escherichia coli* Tryptophan Indole-lyase Affects the Formation and Breakdown of Quinonoid Complexes," Phillips, R. S., Richter, I., Brzovic, P. and Dunn, M. F., *J. Biol. Chem.* *266*, 18642-18648 (1991).
42. "Temperature and DMSO Increase the Enantioselectivity of Hydrolysis of Methyl Alkyl Dimethylmalonates Catalyzed by Pig Liver Esterase," Andrade, M. A. C., Andrade, F. A. C. and Phillips, R. S., *Bio. Med. Chem. Letts.* *1*, 373-376 (1991).
43. "Synthesis and Resolution of 7-Fluorotryptophans," Lee, M. S. and Phillips, R. S. *Bio. Med. Chem. Letts.*, *1*, 477-480 (1991).
44. "Synthesis of 5-Cyano-L-tryptophan," Dua, R. K. and Phillips, R. S., *Tetrahedron Letts.*, *33*, 29-32 (1992).
45. "An Enzymatic Synthesis of 2-Azidotyrosine," Hebel, D., Phillips, R. S., Koushik, S., Creveling, C. R. and Kirk, K. L., *Bio. Med. Chem. Letts.*, *2*, 41-44 (1992).
46. "Temperature Effects on Stereochemistry of Enzymatic Reactions," Phillips, R. S., *Enz. Microb. Technol.*, *14*, 417-419 (1992).
47. "The Inhibition of Pig Kidney L-Aromatic Amino Acid Decarboxylase by 2,3-Methano-*m*-tyrosines," Ahmad, S. A., Phillips, R. S. and Stammer, C. H., *J. Med. Chem.*, *35*, 1410-1417 (1992).
48. "Fluorine Substituent Effects for Tryptophan in ^{13}C NMR," Lee, M. S. and Phillips, R. S.,

Mag. Res. in Chemistry, 30, 1035-1040 (1992).

49. "Effect of Coenzyme Analogues on Enantioselectivity of Alcohol Dehydrogenase," Zheng, C. and Phillips, R. S., *J. Chem. Soc., Chem. Comm.*, 1083-1084 (1992).
50. "Indole Protects Tryptophan Indole-lyase, but not Tryptophan Synthase, from Inactivation by Trifluoroalanine," Phillips, R. S. and Dua, R. K., *Arch. Biochem. Biophys.*, 296, 489-496 (1992).
51. "Asymmetric Reduction of Ketoesters with Alcohol Dehydrogenase from *Thermoanaerobacter ethanolicus*," Zheng, C. S., Pham, V. T. and Phillips, R. S., *Bio. Med. Chem. Letts.*, 2, 619-622 (1992).
52. "Substituent Effects for Methytryptophans in ^{13}C NMR," Lee, M. and Phillips, R. S., *J. Heterocyc. Chem.*, 29, 1181-1187 (1992).
53. "Cellobiose Oxidase from *Phanerochaete chrysosporium*: Stopped-flow Spectrophotometric Analysis of pH-Dependent Reduction," Samejima, M., Phillips, R. S. and Eriksson, K-E. L., *FEBS Letts.*, 306, 165-168 (1992).
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55. "Enzymatic Synthesis of Aza-L-Tryptophans: The Preparation of 5- and 6-Aza-L-Tryptophan," Sloan, M. J. and Phillips, R. S., *Bio. Med. Chem. Letts.*, 2, 1053-1056 (1992).
56. "Enzymatic Synthesis of Chloro-L-Tryptophans," Lee, M. and Phillips, R. S., *Bio. Med. Chem. Letts.*, 2, 1563-1564 (1992).
57. "S-Aryl-L-cysteine S,S-Dioxides: Design and Evaluation of a New Class of Mechanism Based Inhibitors of Kynureninase," Dua, R. K., Taylor, E. W. and Phillips, R. S., *J. Am. Chem. Soc.*, 115, 1264-1270 (1993).
58. "The Three-dimensional Structure of Tyrosine Phenol-lyase," Antson, A. A., Demidkina, T. V., Gollnick, P., Dauter, Z., Von Tersch, R. L., Long, J., Berezhnoy, S. N., Phillips, R. S., Wilson, K. S. and Harutyunyan, E. H., *Biochemistry*, 32, 4195-4206 (1993).
59. "Binding of Phenol and Analogues to Alanine Complexes of Tyrosine Phenol-lyase from *Citrobacter freundii*: Implications for the Mechanism of β -Elimination and Alanine Racemization," Chen, H. and Phillips, R. S., *Biochemistry*, 32, 11591-11599 (1993).
60. "Chlorine Substituent Effects for Indole and Tryptophan in ^{13}C NMR," Lee, M. and Phillips, R. S., *J. Heterocyclic Chem.*, 31, 711-716 (1994).
61. "Effects of Temperature on Stereochemistry of Enzymatic Reactions," Phillips, R. S., Zheng, C., Pham, V. T., Andrade, F. A. C. and Andrade, M. A. C., *Biocatalysis*, 10, 77-86 (1994).

62. "Asymmetric Reduction of Aliphatic and Cyclic Ketones with Secondary Alcohol Dehydrogenase from *Thermoanaerobacter ethanolicus*: Effects of Substrate Structure and Temperature," Zheng, C., Pham, V. T. and Phillips, R. S., *Catalysis Today*, 22, 607-620 (1994).
63. "Site-directed Mutagenesis of Histidine 343 to Alanine in *Citrobacter freundii* Tyrosine Phenol-lyase: Effects on the Kinetic Mechanism and Rate-determining Step," Chen, H., Phillips, R. S. and Gollnick, P., *Eur. J. Biochemistry*, 229, 540-549 (1995).
64. "The Mechanism of *Escherichia coli* Tryptophan Indole-lyase: Substituent Effects on Steady-state and Pre-steady-state Kinetic Parameters for Aryl-substituted Tryptophan Derivatives," Lee M. and Phillips, R. S., *Bio. Med. Chem.*, 3, 195-205 (1995).
65. "Terpene Esters Synthesis by Lipase-catalysed Transesterification," Yee, L. N., Akoh, C. C. and Phillips, R. S., *Biotechnol. Letts.*, 17, 67-70 (1995).
66. "*Pseudomonas* sp. Lipase-catalyzed Synthesis of Geranyl Esters by Transesterification," Yee, L. N., Akoh, C. C., and Phillips, R. S., *J. Am. Oil Chem. Soc.*, 72, 1407-1408 (1995).
67. "Enzymatic Synthesis of Thia-L-tryptophans," Phillips, R. S., Cohen, L. A., Annby, U., Wensbo, D. and Gronowitz, S., *Bio. Med. Chem. Letts.*, 5, 1133-1134 (1995).
68. "Site-directed Mutagenesis of Tyrosine-71 to Phenylalanine in *Citrobacter freundii* Tyrosine Phenol-lyase: Evidence for Dual Roles of Tyrosine 71 as a General Acid Catalyst in the Reaction Mechanism and in Cofactor Binding," Chen, H. Y., Demidkina, T. V. and Phillips, R. S., *Biochemistry*, 34, 12276-12283 (1995).
69. "The Role of the Catalytic Base in the Protein Tyrosine Kinase Csk," Cole, P. A., Grace, M. R., Phillips, R. S., Burn, P. and Walsh, C. T. *J. Biol. Chem.*, 270, 22105-22108 (1995).
70. "Temperature Modulation of the Stereochemistry of Enzymatic Catalysis: Prospects for Exploitation," Phillips, R. S., *Trends in Biotechnology*, 14, 13-16 (1996).
71. "Lipase-catalysed Stereoselective Esterification of DL-Menthol in Organic Solvents Using Acid Anhydrides as Acylating Agents," Wu, W.-H., Akoh, C. C. and Phillips, R. S., *Enz. Microb. Technol.*, 18, 536-540 (1996).
72. "Effects of pH on Enantiospecificity of Alcohol Dehydrogenases from *Thermoanaerobacter ethanolicus* and Horse Liver," Secundo, F. and Phillips, R. S., *Enz. Microb. Technol.*, 19, 487-492 (1996).
73. "Interactions of *Escherichia coli* Tryptophanase with Quasisubstrates and Monovalent Cations Studied by the Circular Dichroism and Fluorescence Methods," Ben-Kasus, T., Markel, A., Gdalevsky, G. Ya., Torchinsky, Y. M., Phillips, R. S. and Parola, A. H., *Biochem. Biophys. Acta*, 1294, 147-152 (1996).
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77. "The Catalytic Mechanism of Tyrosine Phenol-lyase from *Erwinia herbicola* - The Effect of Substrate Structure on pH Dependence of Kinetic Parameters in the Reaction with Ring Substituted Tyrosines," Faleev, N. G., Spirina, S. N., Demidkina, T. V. and Phillips, R. S., *Zeitschrift fur Naturforschung C-A Journal of Biosciences*, *51*, 363-370 (1996).
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80. "Effects of Tyrosine Ring Fluorination on Rates and Equilibria of Formation of Intermediates in the Reactions of Carbon-carbon Lyases," Phillips, R. S., Von Tersch, R. L. and Secundo, F., *Eur. J. Biochem.*, *244*, 658-663 (1997).
81. "The Crystal Structure of *Citrobacter freundii* Tyrosine Phenol-lyase Complexed with 3-(4'-Hydroxyphenyl)propionic Acid, Together with Site-directed Mutagenesis and Kinetic Analysis, Demonstrates that Arginine-381 is Required for Substrate Specificity," Sundararaju, B., Antson, A. A., Phillips, R. S., Demidkina, T. V., Barbolina, M. V., Gollnick, P., Dodson, G. G. and Wilson, K. S., *Biochemistry*, *36*, 6502-6510 (1997).
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85. "The Catalytic Mechanism of Kynureninase from *Pseudomonas fluorescens*: Insights from the Effects of pH and Isotopic Substitution on Steady State and Pre-steady State Kinetics," Koushik, S. V., Moore, J. A., Sundararaju, B. and Phillips, R. S., *Biochemistry*, *37*, 1376-1382 (1998).
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- 94."Improved Syntheses of [3,2-b] and [2,3-b]-fused Selenolo and Thienopyrroles, and of Furo[3,2-b]pyrrole", Welch, M., and Phillips, R. S., *Heterocyclic Comm.*, 5, 305-310, (1999).
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30. "Enzymatic Synthesis of Difluoro-L-tyrosines," with A. H. Lai and R.L. von Tersch, presented at the 40th Southeast Regional Meeting of the American Chemical Society, Nov. 9-11, 1988, Atlanta, GA.
31. "Essential Cysteine and Tryptophan Residues in Tryptophan Indole-lyase Studied by Site-directed Mutagenesis," with J. Blalock, P.D. Gollnick, and C. Yanofsky, presented at the 40th Southeast Regional Meeting of the American Chemical Society, Nov. 9-11, 1988, Atlanta, GA.
32. "Essential Cysteine and Tryptophan Residues in Tryptophan Indole-lyase Studied by Site-directed Mutagenesis," with P.D. Gollnick presented at the 11th Enzyme Mechanisms Conference, St. Petersburg, FL, Jan. 6-8, 1989.
33. "Enzymatic Synthesis and Biochemical Reactions of Fluorinated Analogues of L-Tyrosine and L-Dopa," with R.L. Von Tersch, J.G. Fletcher, and A.H. Lai, presented at the First International Conference on Amino Acids in Therapy, Vienna, Austria, August 7-12, 1989.
34. "Preparation and Resolution of (E)-2,3-Methano-*m*-tyrosine, a Novel Inhibitor of Dopa Decarboxylase," with S. Ahmad and C.H. Stammer, presented at the Fourth Annual Symposium on Cardiovascular Research, Athens, GA, August 4, 1989.
35. "Catalytic Properties of Mutant Tryptophan Indole-lyases," with P.D. Gollnick, presented in Symposium on Protein Engineering, 198th Meeting of the American Chemical Society, Miami Beach, FL, September 10-15, 1989.
36. "Asymmetric Reduction of Ketones and Ketoesters using Immobilized Secondary Alcohol Dehydrogenase from *Thermoanaerobacter ethanolicus*," with V.T. Pham, presented at the 198th Meeting of the American Chemical Society, Miami Beach, FL, September 10-15, 1989.
37. "Synthesis of Phosphonate Analogues of Aromatic Amino Acids as Inhibitors of Dopa Decarboxylase," with R.K. Dua, presented at the Fifth Annual Symposium on Cardiovascular Research, American Heart Association, Athens, GA, June 22, 1990.
38. "Preparation and Resolution of BOC-(D)^E and BOC-(D)^Z-2,3-methano-*m*-tyrosine, a Novel Inhibitor of Dopa Decarboxylase," with S.A. Ahmad and C.H. Stammer, presented at the Fifth Annual Symposium on Cardiovascular Research, American Heart Association, Athens, GA, June 22, 1990.
39. "Replacement of Lys-269 by Arginine in *E. coli* Tryptophan Indole-lyase Reduces the Rate of Quinonoid Complex Formation," with I. Richter, presented at the 1990 Gordon Research Conference on Enzymes, Coenzymes and Metabolic Pathways," Meriden, NH, July 2-6, 1990.
40. "Mechanism of Tryptophan Indole-lyase: Insights from Rapid-scanning and Single-wavelength Stopped-flow Kinetic Studies," presented at the Southeast/Southwest Combined Regional Meeting of the American Chemical Society, New Orleans, LA, December 5-7, 1990.
41. "Reactions of Fluorotyrosines and Fluorohydroxytyrosines with Mushroom Tyrosinase," with S.V. Koushik, presented at the Southeast/Southwest Combined Regional Meeting of

- the American Chemical Society, New Orleans, LA, December 5-7, 1990.
42. "Synthesis and Reactions of Fluorinated L-Tyrosines with Tyrosine Phenol-lyase," with R.L. Von Tersch, presented at the Southeast/Southwest Combined Regional Meeting of the American Chemical Society, New Orleans, LA, December 5-7, 1990.
 43. "Synthesis and Resolution of (Δ)-(E) and (Δ)-Z-2,3-Methano-*m*-tyrosine, a Cyclopropane-containing Inhibitor of Dopa Decarboxylase," with S.A. Ahmad and C.H. Stammer, presented at the Southeast/Southwest Combined Regional Meeting of the American Chemical Society, New Orleans, LA, December 5-7, 1990.
 44. "Phosphonate Analogs of Aromatic Amino Acids as Inhibitors of Dopa Decarboxylase," with R.K. Dua, presented at the Southeast/Southwest Combined Regional Meeting of the American Chemical Society, New Orleans, LA, December 5-7, 1990.
 45. "Synthesis and Enzymatic Reactions of Azatryptophans," with M.J. Sloan, presented at the Southeast/Southwest Combined Regional Meeting of the American Chemical Society, New Orleans, LA, December 5-7, 1990.
 46. "Synthesis and Resolution of 7-Fluorotryptophan," with M.S. Lee, presented at the Southeast/Southwest Combined Regional Meeting of the American Chemical Society, New Orleans, LA, December 5-7, 1990.
 47. "Stereospecificity of Inhibition of Pig Kidney Dopa Decarboxylase by 2,3-Methano-*m*-tyrosine," with S.A. Ahmad and C.H. Stammer, presented at the 12th Enzyme Mechanisms Conference, San Diego, CA, January 4-6, 1991.
 48. "Intermediates in the Reaction of *E. coli* Tryptophan Indole-lyase," presented at The First International Conference on Amino Acid Research: New Frontiers and New Horizons, 1991, Kyoto, Japan, August 13-19, 1991.
 49. "Effect of Indole on Reactions of Trifluoroalanine with Tryptophan Enzymes," with R.K. Dua, presented at the 202nd National Meeting of The American Chemical Society, New York, New York, August 25-30, 1991.
 50. "Stereochemistry and Mechanism of Aldol Reactions Catalyzed by Kynureninase," with R.K. Dua presented at the 201st National Meeting of The American Chemical Society, Atlanta, Georgia, April 14-19, 1991.
 51. "Phenols Protect Tyrosine Phenol-lyase From Inactivation by β, β, β - Trifluoroalanine," with R.L. Von Tersch, presented at the 43rd Southeast Regional Meeting of The American Chemical Society, Richmond, Virginia, November 12-15, 1991.
 52. "The Preparation of Azatryptophans and Kinetic Studies with Tryptophan Indole-lyase," with M. Sloan, presented at the 43rd Southeast Regional Meeting of The American Chemical Society, Richmond, Virginia, November 12-15, 1991.
 53. "Synthesis and Resolution of Difluorotryptophans," with M. Lee, presented at the 43rd Southeast Regional Meeting of the American 'Chemical Society, Richmond, Virginia, November 12-15, 1991.
 54. "Fluorine Substituent Effects for Tryptophan in C-13 NMR," with M. Lee, presented at

the 43rd Southeast Regional Meeting of The American Chemical Society, Richmond, Virginia, November 12-15, 1991.

55. "Synthesis of 5-Substituted-L-tryptophans," with R.K. Dua, presented at the 43rd Southeast Regional Meeting of The American Chemical Society, Richmond, Virginia, November 12-15, 1991.
56. "Asymmetric Reduction of Ketones with Secondary Alcohol Dehydrogenase from *Thermoanaerobacter ethanolicus*," with C.S. Zheng, presented at the 43rd Southeast Regional Meeting of The American Chemical Society, Richmond, Virginia, November 12-15, 1991.
57. "Effects of Temperature on Stereochemistry of Alcohol Dehydrogenases from *Thermoanaerobacter ethanolicus*," with V.T. Pham, C.S. Zheng, F.A.C. Andrade and M.A.C. Andrade, presented at "Fundamentals of Biocatalysis in Non-conventional Media, Noordwijkerhout, The Netherlands, April 25-29, 1992.
58. "Stereoselectivity in the Reduction of Ketones with Secondary Alcohol Dehydrogenase from *Thermoanaerobacter ethanolicus*," with C. Zheng, 13th Enzyme Mechanisms Conference, Key Largo, Florida, January 6-9, 1993.
59. "Interaction of Phenol and Analogues with Alanine Complexes of Tyrosine Phenol-lyase," with H. Chen, 13th Enzyme Mechanisms Conference, Key Largo, Florida, January 6-9, 1993.
60. "Temperature Effects on Enzyme Stereochemistry," with C. Zheng, American Chemical Society, 205th Meeting, Denver, CO, March 28-April 2, 1993.
61. "pH Dependence Studies of Kynureninase Activity," with S. Koushik, American Society for Biochemistry and Molecular Biology and American Chemical Society, Division of Biological Chemistry, San Diego, CA, May 23-30, 1993.
62. "Structural and Functional Investigations of Tyrosine Phenol-lyase," with T.V. Demidkina, A.A. Antson, P. Gollnick, E.G. Harutyunyan and K.S. Wilson, International Conference on Vitamin B6 and Carbonyl Catalysis, Capri, Italy, May 19-27, 1994.
63. "Fluorescence of Tryptophanase and Its Quasisubstrate Complexes," with Y.M. Torchinsky, A. Markel, T. Ben-Kasus, G. Gdalevsky, D. Gill and A.H. Parola, International Conference on Vitamin B6 and Carbonyl Catalysis, Capri, Italy, May 19-27, 1994.
64. "Cold Lability of the Wild Type and Mutant Tryptophanases from *Escherichia coli*," with T. Ben-Kasus, G. Gdalevsky, A. Markel, Y.M. Torchinsky and A.H. Parola, International Conference on Vitamin B6 and Carbonyl Catalysis, Capri, Italy, May 19-27, 1994.
65. "Tyrosine Phenol Lyase from *Erwinia Herbicola*, Kinetic Isotope Effects on the Reaction with 3-Fluoro-Tyrosine," with N.G. Faleev and S.N. Spirina, International Conference on Vitamin B6 and Carbonyl Catalysis, Capri, Italy, May 19-27, 1994.
66. "Rapid Kinetic Studies of the Reaction of Indole with the α -Aminoacrylate Intermediate of *Escherichia coli* Tryptophan Indole-lyase: Evidence for Indole-indolenine

- Tatomerization," 14th Enzyme Mechanisms Conference, Phoenix, AZ, January 4-8, 1995.
67. "Purification of Secondary Alcohol Dehydrogenase from *Thermoanaerobacter ethanolicus* and Effect of pH on Stereoselectivity," with F. Secundo, Gordon Conference on Biocatalysis, Meriden, NH, July 11-16, 1994.
 68. "Purification of Secondary Alcohol Dehydrogenase from *Thermoanaerobacter ethanolicus* and Effect of pH on Stereoselectivity," with F. Secundo, 46th Southeast Regional Meeting, American Chemical Society, Birmingham, AL, October 16-19, 1994.
 69. "pH Dependencies and Solvent Kinetic Isotope Effects on the Reaction of Kynureninase Support Rate-determining General Base Catalysis," with S.V. Koushik, 46th Southeast Regional Meeting, American Chemical Society, Birmingham, AL, October 16-19, 1994.
 70. "Synthesis and Resolution of β -Methyltryptophan and Inhibition Studies with Tryptophan Synthase and Tryptophan Indole-lyase," with L.V. Cyr, 46th Southeast Regional Meeting, American Chemical Society, Birmingham, AL, October 16-19, 1994.
 71. "Rapid Kinetic Studies of the Reaction of Indole with the α -Aminoacrylate Intermediate of *Escherichia coli* Tryptophan indole-lyase: Evidence for Indole-Indolenine Tautomerization," 14th Enzyme Mechanisms Conference, Phoenix, AZ, January 4-8, 1995.
 72. "Partial Sequence of Kynureninase from *Pseudomonas fluorescens*," with S.V. Koushik and R.A. McGraw, American Society for Biochemistry and Molecular Biology and American Chemical Society, Division of Biological Chemistry, joint meeting, San Francisco, CA, May 21-25, 1995.
 73. "Effect of Cooling on the Activity and Quaternary Structure of *Escherichia coli* Tryptophanase and its Mutant Forms," with T. Ben-Kasus, Y.M. Torchinsky, and A.F. Parola, American Society for Biochemistry and Molecular Biology and American Chemical Society, Division of Biological Chemistry, joint meeting, San Francisco, CA, May 21-25, 1995.
 74. "Reaction of *Escherichia coli* Tryptophan Indole-lyase with Aza and Thia Analogs of L-Tryptophan," with M.J. Sloan, American Society for Biochemistry and Molecular Biology and American Chemical Society, Division of Biological Chemistry, joint meeting, San Francisco, CA, May 21-25, 1995.
 75. "Changing the Substrate Specificity of Tyrosine Phenol-lyase," B. Sundararaju, R.S. Phillips, T.V. Demidkina, P. Gollnick, A.A. Anston, G. Dodson, K. Wilson, Gordon Research Conference on Enzymes, Coenzymes and Metabolic pathways, Meriden, NH, July 14-18, 1996.
 76. "Cloning and Sequence of *Pseudomonas fluorescens* Kynureninase," S.V. Koushik, R.A. McGraw, R.S. Phillips, 212th National Meeting of the American Chemical Society, Orlando, FL, August 25-29, 1996.
 77. "Determination of the Role of Arginine-381 of Tyrosine Phenol-lyase by Crystallography, Site-directed Mutagenesis and Kinetic Analysis," B. Sundararaju, R.S. Phillips, T.V. Demidkina, P. Gollnick, , 212th National Meeting of the American Chemical Society, Orlando, FL, August 25-29, 1996.

78. "Synthesis of Vincinal Diols as Possible Inhibitors of Kynureninase," C.Heiss, R.S. Phillips, Southeastern Regional Meeting of the American Chemical Society, Greenville, SC, November 11-14, 1996.
79. "Synthesis of Inhibitors for Kynureninase," J.A. Moore, R.S. Phillips, Southeastern Regional Meeting of the American Chemical Society, Greenville, SC, November 11-14, 1996.
80. "Preparation and Investigation of ^{13}C and ^{15}N Isotopomers of L-tryptophan," A. Osborne, R.S. Phillips, Southeastern Regional Meeting of the American Chemical Society, Greenville, SC, November 11-14, 1996.
81. "Transition State Analog Inhibitors of Tyrosine Phenol-lyase," E.B. Watkins, R.S. Phillips, Southeastern Regional Meeting of the American Chemical Society, Greenville, SC, November 11-14, 1996.
82. "Arginine-381 in *Citrobacter freundii* Tyrosine Phenol-lyase is Required for Substrate Specificity," with B. Sundararaju, A.A. Antson, T.V. Demidkina, M.V. Barbolina, P. Gollnick, G.G. Dodson and K.S. Wilson, 15th Enzyme Mechanisms Conference, Naples, FL, January 4-8, 1997.
83. "The Sequence and Mechanism of Kynureninase from *Pseudomonas fluorescens*," with S.V. Koushik, 15th Enzyme Mechanisms Conference, Naples, FL, January 4-8, 1997.
84. "Cold-induced Dissociation of Tetrameric *E. coli* Tryptophanase into Dimers," with T. Ben-Kasus, G.Y. Gdalvsky, Y.M. Torchinsky and A.H. Parola, 17th International Congress of Biochemistry and Molecular Biology, San Francisco, CA, August 24-27, 1997.
85. "Conversion of Tyrosine Phenol-lyase to Tryptophan Indole-lyase," with B. Sundararaju, 17th International Congress of Biochemistry and Molecular Biology, San Francisco, CA, August 24-27, 1997.
86. "The Mechanism of Kynureninase from *Pseudomonas fluorescens*," with S.V. Koushik, J.A. Moore III, and B. Sundararaju, 17th International Congress of Biochemistry and Molecular Biology, San Francisco, CA, August 24-27, 1997.
87. "Is Proton Transfer And Elimination Of Indole Concerted In The Reaction of Tryptophan Indole-Lyase?," with R. S. Phillips, B. Sundararaju, and N. G. Faleev, 26th Steenbock Symposium, Enzymatic Mechanisms, Madison, WI, May 28-31, 1998.
88. "Conversion Of Tyrosine Phenol-Lyase To Tryptophan Indole-Lyase by Site-Directed Mutagenesis," with B. Sundararaju and R. S. Phillips, 26th Steenbock Symposium, Enzymatic Mechanisms, Madison, Wi, May 28-31, 1998.
89. "Asymmetric Reduction of Ethynylketones by Secondary Alcohol Dehydrogenase from *Thermoanaerobacter ethanolicus*," with C. Heiss, R. S. Phillips, 216th American Chemical Society National Meeting & Exposition Program, Boston, MA, August 23-27, 1998.
90. "Is Proton Transfer to Indole and Elimination Concerted in the Reaction Of Tryptophan Indole-Lyase?," with R. S. Phillips, B. Sundararaju, and N. G. Faleev, Sixteenth Enzyme Mechanisms Conference, Napa Valley, CA, January 6-9, 1999.

91. "Asymmetric Reduction of Ketones and Ketoesters With Wild-Type And Mutant Forms of Secondary Alcohol Dehydrogenase From *Thermoanaerobacter Ethanolicus*," with R. S. Phillips, C. Heiss, and J. G. Zeikus, Bio Trans '99, 4th International Symposium On Biocatalysis and Biotrans Formations, Giardini Naxos-Taormina, Italy, September 26-October 1, 1999.
92. "Cold Inactivation And Dissociation Of Tryptophanase," with Y. M. Torchinsky, T. Erez, G. Y. Gdalevsky, R. S. Phillips, A. H. Parola, 10th International Symposium on Vitamin B6 And Carbonyl Catalysis, And 4th Meeting On PQQ And Quinoproteins, Santa Fe, NM, October 31-November 5, 1999.
93. "Effects Of Quasisubstrates And Cations On Spectral Properties Of Tryptophanase," with T. Erez, A. Markel, G. A. Gdalevsky, Y. M. Torchinsky, R. S. Phillips, A. H. Parola, 10th International Symposium on Vitamin B6 And Carbonyl Catalysis, and 4th Meeting On PQQ And Quinoproteins, Santa Fe, NM, October 31-November 5, 1999.
94. "Evidence For Concerted Proton Transfer And Carbon-Carbon Bond Cleavage In The Elimination Of Indole Catalyzed By *Escherichia coli* Tryptophan Indole-Lyase," with R. S. Phillips, B. Sundararaju, and N. G. Faleev, 10th International Symposium on Vitamin B6 And Carbonyl Catalysis, and 4th Meeting On PQQ And Quinoproteins, Santa Fe, NM, October 31-November 5, 1999.
95. "Pyridoxal Phosphate Binding To Wild Type, W330F, and C298S Mutants of E. coli Apotryptophanase: Unraveling The Cold Inactivation," with T. Erez, R. S. Phillips, A. H. Parola, 10th International Symposium on Vitamin B6 And Carbonyl Catalysis, and 4th Meeting On PQQ And Quinoproteins, Santa Fe, NM, October 31-November 5, 1999.
96. "Mutation of Cysteine-295 to Alanine in Secondary Alcohol Dehydrogenase from *Thermoanaerobacter ethanolicus* Affects the Enantioselectivity and Substrate Specificity of Ketone Reductions," R. S. Phillips, C. Heiss, M. Laivenieks, and J. G. Zeikus, Southeast-Southwest Regional American Chemical Society Meeting, New Orleans, LA , December 6-8, 2000.
97. "Structure and Mechanism of Kynureninase from *Pseudomonas fluorescens*", Phillips, R. S., Levdikov, V., Blagova, L. and Momany, C., 17th Enzyme Mechanisms Conference, Marco Island, FL, January 3-6, 2001.
98. "HSQC-NMR Evaluation of 1-¹⁵N-L-Tryptophan Bound to Wild-type, K87T, E109D and D305A Tryptophan Synthase," A. S. Osborne, Q. Teng and R. S. Phillips, 53rd Southeast Regional Meeting, American Chemical Society, Savannah, GA, September 23-26, 2001.
99. "Structure of Kynureninase from *Pseudomonas fluorescens*", 3rd International Symposium on Vitamin B6, PQQ, Carbonyl Cofactors and Quinoproteins, Southampton, England, April 14-19, 2002.
100. "Crystals of Tryptophan Indole-lyase and Tyrosine Phenol-lyase form Stable Quinonoid Complexes", 3rd International Symposium on Vitamin B6, PQQ, Carbonyl Cofactors and Quinoproteins, Southampton, England, April 14-19, 2002.
101. "Tryptophan Indole-lyase from *Proteus vulgaris*: A Role of Tyr-72 in Catalysis", 3rd International Symposium on Vitamin B6, PQQ, Carbonyl Cofactors and Quinoproteins, Southampton, England, April 14-19, 2002.

102. "Tryptophanase Activity in Involved in *Escherichia coli* S17.1 Biofilm Formation on Polystyrene Surfaces and Epithelial Cells Adherence," P. DiMartino, R. Fursy, and R. S. Phillips, IUMS, Paris, France, July 27-August 1, 2002.
103. "Reaction of Kynureninase with β -Benzoylalanine: Removal of the Aromatic Amino Group Changes the Rate Determining Step from Alanine Release to Elimination", Gawandi, V. B., Liskey, D. and Phillips, R. S., 18th Enzyme Mechanisms Conference, Galveston Island, Texas, January 4-7, 2003.
104. "The Kinetic Isotope Effect in the β -Subunit Reaction of Tryptophan Synthase is Dependent on Different Monovalent Cations and α -Subunit Ligands", Cash, M. T., Miles, E. W., and Phillips, R. S., 18th Enzyme Mechanisms Conference, Galveston Island, Texas, January 4-7, 2003.
105. "Cloning, Expression and Purification of Aspartate β -Decarboxylase from *Pseudomonas dacunhae*", Khristoforov, R., Lima, S., and Phillips, R. S., 18th Enzyme Mechanisms Conference, Galveston Island, Texas, January 4-7, 2003.
106. "Lysine-256 is Required for Monovalent Cation Activation of Tyrosine Phenol-lyase from *Citrobacter freundii*", Chen, H. Y., Sundararaju, B., Tavakoli, K., Lima, S., Shim, D. and Phillips, R. S., American Society for Biochemistry and Molecular Biology, San Diego, California, April 11-15, 2003.
107. "Reaction of Kynureninase With β -Benzoyl-L-alanine: Removal of the Aromatic Amino Group Changes the Rate Determining Step", Gawandi, V., Lima, S., and Phillips, R. S., Southeast Regional Meeting, American Chemical Society, Atlanta, Georgia, Nov. 16-19, 2003.
108. "Enantioselective Oxidations of Chiral Alcohols by Mutants C295V and C295L of Secondary Alcohol Dehydrogenase from *Thermoanaerobacter ethanolicus*", Osborne, A. S. and Phillips, R. S., Southeast Regional Meeting, American Chemical Society, Atlanta, Georgia, Nov. 16-19, 2003.
109. "Modulation of biofilm formation by the Tryptophanase enzyme: a proteomic study", Vilain S., Jouenne T., Phillips R. S., Di Martino P. Affiche. Biofilms, American Society of Microbiology. Victoria (Canada) november 01-06, 2003.
110. "A Kinetic Isotope Effect in the β -Reaction of Tryptophan Synthase is Dependent on Monovalent Cations and α -Subunit Ligands", Cash, M. T., Miles, E. W., and Phillips, R. S., Gordon Conference on Isotopes in Chemistry and Biology, Ventura, California, February 15-20, 2004.
111. "Modulation de la formation de biofilm chez *Escherichia coli*, rôle de l'indole", Vilain S., Jouenne T., Phillips R.S., Di Martino P. 6^{ème} congrès national de la Société Française de Microbiologie, Bordeaux, May 10-12, 2004.
112. "Hydrostatic Pressure Stabilizes the Open Conformation of *Salmonella typhimurium* Tryptophan Synthase", Phillips, R. S., Miles, E. W., Holtermann G., and Goody, R. S., 228th National Meeting, American Chemical Society, Philadelphia, PA, August 22-26, 2004.
113. "Cloning, expression, and three-dimensional structure of *Homo sapiens* kynureninase",

- Lima, S., Gawandi, V., Momany, C. and Phillips, R. S., 19th Enzyme Mechanisms Conference, Pacific Grove, CA, Jan 5-9, 2005.
114. "Interaction of amino acids with the H463F mutant of *Escherichia coli* tryptophan indole-lyase", Phillips, R. S., Holterman, G. and Goody, R. S., 19th Enzyme Mechanisms Conference, Pacific Grove, CA, Jan 5-9, 2005.
115. "Metal-Specificity of Tn21 MerR Probed by Nuclear Magnetic Resonance", Song, L., Teng, Q., Phillips, R. S. and Summers, A. O., American Society for Microbiology, Atlanta, GA June 4-9, 2005.
116. "Design of a *Thermoanaerobacter ethanolicus* secondary alcohol dehydrogenase mutant derivative showing high activity and high stereoselectivity on phenylacetone and 4-phenyl-2-butanone", Fjeld-Ziegelman, K., Musa, M., Phillips, R. S., Zeikus, J. G. and Vieille, C., Biochemical Engineering XIV: Frontiers and Advances in Biotechnology, Biological and Biomolecular Engineering July 10-14, 2005, Harrison Hot Springs, British Columbia, Canada.
117. "Mass Defect Labeling of Cysteine and Tryptophan for Improving Peptide Assignment in Shotgun Proteomic Analyses", Hernandez, H., Li, C., Niehauser S., Gawandi, V., Phillips, R., and Amster, I. J., American Society for Mass Spectrometry, 2005.
118. "Genetic and Biophysical Insights into How MerR Distinguishes Hg(II), Cd(II), and Zn(II)", Song, L., Olliff, L., Teng, Q., Shokes, J., Phillips, R. S., Scott, R. A. and Summers, A. O., ICBIC, 2005.
119. "Inter-subunits Region Difference in *E. coli* and *P. vulgaris* Tryptophanase Affect Cold Lability", Kogan, A., Gdalevsky, G. Y., Phillips, R. S., Cohen-Luria, R., Goldgur, Y. and Parola, A. H., 15th International Biophysics Congress, Montpellier, France, Aug. 27-Sept. 1, 2005.
120. "Cold Dissociation of *E. coli* Tryptophanase and its Mutants", Gdalevsky, G. Y., Kogan, A., Phillips, R. S., Cohen-Luria, R., Goldgur, Y. and Parola, A. H., 15th International Biophysics Congress, Montpellier, France, Aug. 27-Sept. 1, 2005.
121. "Hydrostatic Pressure Affects the Conformational Equilibrium of *Salmonella typhimurium* Tryptophan Synthase", Phillips, R. S., Miles, E. W., Holtermann, G., and Goody, R. S., Trends in High Pressure Protein Sciences, Montpellier, France, September 1-3, 2005.
122. "Hydrostatic Pressure Affects the Conformational Equilibrium of *Salmonella typhimurium* Tryptophan Synthase", Phillips, R. S., Miles, E. W., Holtermann, G., and Goody, R. S., Biochemical Engineering Miniconference, University of Georgia, Athens, GA, September 9, 2005.
123. "Hydrostatic Pressure as a Conformational and Mechanistic Probe of Tryptophan Synthase and Tryptophan Indole-lyase", International Conference on Vitamins, Coenzymes, and Biofactors, Awaji, Japan, November 6-11, 2005.
124. "Crystal Structure of the *Homo sapiens* kynureninase-2-amino-3-hydroxyhippuric acid inhibitor complex", Lima, S., Gawandi, V., Momany, C. and Phillips, R. S., Experimental Biology 2006, San Francisco, California, April 1-5, 2006.

125. "Hydrostatic Pressure as a Structural and Mechanistic Probe of Tryptophan Synthase and Tryptophan Indole-lyase", Phillips, R. S., Holtermann, G., Miles, E. W. and Goody, R. S., Experimental Biology 2006, San Francisco, California, April 1-5, 2006.
126. "Hydrostatic Pressure as a Structural and Mechanistic Probe of Tryptophan Synthase and Tryptophan Indole-lyase", Phillips, R. S., Holtermann, G., Miles, E. W. and Goody, R. S., Gordon Conference on Enzymes, Coenzymes and Metabolic Pathways, University of New England, Biddeford, ME, July 16-21, 2006.
126. "Cold dissociation of *E. coli* tryptophanase and its Y74F and C298S mutants", Gdalevsky G. Y., Kogan, A., Phillips, R. S., Goldgur, Y., Cohen-Luria, R. and Parola A. H., The 20th Symposium of The Protein Society, San Diego, California, August 5-9, 2006.
127. "Asymmetric reduction of ketones employing free and immobilized *Thermoanaerobacter ethanolicus* SADH", Musa, M. M., Felja, K., Zeikus, G. and Phillips, R. S., 232nd ACS National Meeting, San Francisco, CA, September 10-14, 2006.
128. "Defining substrate specificity in tryptophan synthase beta-subunit homologs", Lima, S., Schlett, C., Kaufmann, M., Striepen, B. and Phillips, R. S., Experimental Biology 2007, Washington, DC, April 28-May 2, 2007.
129. "Asymmetric synthesis of optically active phenyl ring-containing alcohols using sol-gel encapsulated W110A TeSADH", Musa, M. M., Ziegelmann-Fjeld, K. I., Vieille, C., Zeikus, J. G. and Phillips, R. S., 11th Annual Green Chemistry & Engineering Conference, Washington, DC, June 26-29, 2007.
130. "Isotope Effects on Stopped-flow Kinetics of Tryptophan Indole-lyase and Tyrosine Phenol-lyase", Phillips, R. S., Chen, H. Y., Sundararaju, B. and Faleev, N. G., Isotopes 2007, Bencassim, Spain, May 26-June 1, 2007.
131. "Structural Basis of the Substrate Specificity of Constitutive and Inducible Kynureninases", Phillips, R. S., Lima, S., Kumar, S., and Momany, C., 235th ACS National Meeting, New Orleans, LA, April 6-10, 2008.
132. "Defining Substrate Specificity in Tryptophan Synthase β Subunit Homologs", Lima, S., Schlett, C., Adams, M. W.W., Kaufmann, M., Striepen, B., and Phillips, R. S., 2nd International Interdisciplinary Conference on Vitamins, Coenzymes and Biofactors, Athens, GA, October 26-31, 2008.

Invited Lectures: (listing prior to 1992 was lost--about 20 lectures from 1980-1992)

1. "Structure and Mechanism of PLP-Dependent Lyases," European Molecular Biology Laboratory, Hamburg, Germany, April 30, 1992.
2. "Structure and Mechanism of PLP-Dependent Lyases," Georgia Institute of Technology, Department of Chemistry, May 28, 1992.
3. "Mechanism of Alanine Racemization by Tyrosine Phenol-lyase," Institute for Chemical Research, Kyoto University, Uji, Japan, October 6, 1992.

4. "Mechanism of Tryptophan Indole-lyase," Faculty of Agriculture, Niigata University, Niigata, Japan, October 14, 1992.
5. "Interaction of Kynureninase with Mechanism-based Inhibitors," in "Modern Enzymology: Problems and Trends," St. Petersburg, Russia, June 24-29, 1992.
6. "Temperature and Coenzyme Effects on Alcohol Dehydrogenase Stereochemistry," Gordon Conference on Biocatalysis, July 6-10, 1992.
7. "Mechanism-based Inhibitors of Kynureninase," Taniguchi Symposium, Nara, Japan, September 28-October 2, 1992.
8. "Temperature Effects on Stereochemistry of Enzymatic Reactions," First Lilly Symposium on Biocatalysis, Indianapolis, IN, April 15-16, 1993.
9. "Novel Inhibitors of Kynureninase," National Institutes of Health, Bethesda, Maryland, April 20, 1993.
10. "Temperature and Cofactor Effects on the Stereochemistry of Alcohol Dehydrogenase from *Thermoanaerobacter ethanolicus*," American Society for Microbiology, 93rd General Meeting, Atlanta, GA, May 16-20, 1993.
11. "Effects of Temperature on Stereochemistry of Enzymatic Reactions," European Symposium on Biocatalysis, Graz, Austria, September 12-17, 1993.
12. "Structure and Mechanism of Tyrosine Phenol-lyase," Center for Advanced Research in Biotechnology, Rockville, MD, May 2, 1994.
13. "Studies of the Mechanism of Tyrosine Phenol-lyase: Kinetics and Site-directed Mutagenesis," 9th International Meeting, Vitamin B6 and Carbonyl Catalysis, Capri, Italy, May 22-27, 1994.
14. "Structure and Mechanism of Tyrosine Phenol-lyase," Gordon Conference on Enzymes, Coenzymes and Metabolic Pathways, Meriden, NH, July 17-21, 1994.
15. "Chemoenzymatic Synthesis of Ring di and Trifluorinated Tyrosines with Tyrosine Phenol-lyase: Effects of Fluorination on the Reaction Kinetics and Mechanism," Symposium on "Fluoroaminoacids and Peptides in Medicinal Chemistry," 210th National Meeting, American Chemical Society, Chicago, IL, August 20-24, 1995.
16. "Structure and Mechanism of Carbon-carbon Lyases," Auburn University, February 7, 1996.
17. "Effects of Temperature, Cofactor and pH on the Stereoselectivity of Secondary Alcohol Dehydrogenase from *Thermoanaerobacter ethanolicus*," Thermophiles 96, Athens, GA, September 4-9, 1996.
18. "Sequence and Mechanism of *Pseudomonas fluorescens* Kynureninase," 3rd International Engelhardt Conference on Molecular Biology, Moscow, Russia, June 9-14, 1997.
19. "Sequence and Mechanism of *Pseudomonas fluorescens* Kynureninase," Biochemical Institute, University of Zurich, Switzerland, June 17, 1997.

20. "How to Make a Tyrosine Specific Enzyme Prefer Tryptophan?" University of Florida, Gainesville, FL, September 11, 1997.
21. "To Be or Not To Be An Indolenine Intermediate? The Question of Tryptophan Synthase And Tryptophan Indole-Lyase," with R. S. Phillips, 10th International Symposium on Vitamin B6 And Carbonyl Catalysis, And 4th Meeting On PQQ And Quinoproteins, Santa Fe, NM, October 31-November 5, 1999.
22. "Tailoring the Stereospecificity of Thermophilic Alcohol Dehydrogenase by Site-Directed Mutagenesis", Instituto di Biocatalisi e Riconoscimento Molecolare, CNR, Milan, Italy, September 23, 1999.
23. "To Be or Not To Be an Indolenine Intermediate: The Question of Tryptophan Indole-Lyase and Tryptophan Synthase", Faculty of Pharmacy, University of Parma, Parma, Italy, September 23, 1999.
24. "To Be or Not To Be an Indolenine Intermediate: The Question of Tryptophan Indole-Lyase and Tryptophan Synthase", Department of Biochemistry, Faculty of Medicine, University of Verona, Verona, Italy, Sept. 25, 1999.
25. "Synthesis and Evaluation of Inhibitors of Kynureninase from *Pseudomonas fluorescens*", Dept. of Biological Sciences And Engineering, The University of Tokushima, Tokushima, Japan, Feb. 23, 2000.
26. "Synthesis and Evaluation of Inhibitors of Kynureninase from *Pseudomonas fluorescens*", Faculty of Pharmaceutical Sciences, Toyama Medical and Pharmaceutical University, Toyama, Japan, Feb. 28, 2000.
27. "Mechanism and Structure of Kynureninase from *Pseudomonas fluorescens*", Institute of Chemical Research, Kyoto University, Kyoto, Japan, October 20, 2000.
28. "Temperature Dependence of Enantiospecificity of Enzymatic Reactions," in International Symposium on Development of Food-based Lipids with High Functionality, Kyoto, Japan, October 21, 2000.
29. "Temperature Dependence of Enantiospecificity of Enzymatic Reactions," Okayama University, Okayama, Japan, October 23, 2000.
30. "The Mechanism of Tyrosine Phenol-lyase: An Elimination Reaction with a Carbon Leaving Group," Department of Chemistry, Georgia State University, February 2, 2001.
31. "To Be or Not To Be an Indolenine Intermediate: The Question of Tryptophan Indole-Lyase and Tryptophan Synthase", Department of Biology, University of Cergy-Pontoise, Cergy-Pontoise, France, May 17, 2001.
32. "The Role of Glutamate-69 and Lysine-256 in the Activation of Tyrosine Phenol-lyase by Monovalent Cations," Department of Biochemistry, Faculty of Pharmacy, University of Parma, Parma, Italy, May 29, 2001.
33. "How does Active Site Water Affect Stereospecificity of Enzymatic Reactions?" Instituto di Biocatalisi e Riconoscimento Molecolare, CNR, Milan, Italy, June 4, 2001.

34. "How does Active Site Water Affect Stereospecificity of Enzymatic Reactions?" Department of Chemistry, University of Bologna, Bologna, Italy, June 5, 2001.
35. "Structure and Mechanism of Kynureninase from *Pseudomonas fluorescens*," Department of Biochemistry, Faculty of Medicine, University of Verona, Verona, Italy, June 7, 2001.
36. "Structure and Mechanism of Kynureninase from *Pseudomonas fluorescens*," 3rd International Engelhardt Conference on Molecular Biology, Moscow, Russia, June 21-26, 2001.
37. "How Does Active Site Water Affect Enzymatic Stereorecognition?" Biotrans2001, Darmstadt, Germany, September 2-7, 2001.
38. "How Does Active Site Water Affect Enzymatic Stereospecificity?" Symposium on Biocatalysis in the 21st Century, 53rd Southeast Regional Meeting, American Chemical Society, Savannah, GA, September 23-26, 2001.
39. "Fun with Fluorotyrosine: Enzymatic Synthesis and Mechanistic Studies with Tyrosine Phenol-lyase", Laboratory of Bioorganic Chemistry, NIDDK, NIH, February 20, 2002.
40. "Tailoring the Reaction Specificity of Secondary Alcohol Dehydrogenase", Department of Chemistry, University of Puerto Rico, March 4, 2002.
41. "Specificity and Mechanism of Tyrosine Phenol-lyase and Tryptophan Indole-lyase: Enzymes with Carbon Leaving Groups", Department of Chemistry, University of Wisconsin, Milwaukee, April 8, 2002.
42. "Structure and Mechanism of Tyrosine Phenol-lyase and Tryptophan Indole-lyase", 3rd International Symposium on Vitamin B6, PQQ, Carbonyl Cofactors and Quinoproteins, Southampton, England, April 14-19, 2002.
43. "Specificity and Mechanism of Tyrosine Phenol-lyase and Tryptophan Indole-lyase: Enzymes with Carbon Leaving Groups", Max Planck Institute for Physiological Chemistry, Dortmund, Germany, April 22, 2002.
44. "Specificity and Mechanism of Tyrosine Phenol-lyase and Tryptophan Indole-lyase: Enzymes with Carbon Leaving Groups", Department of Biology, University of Cergy-Pontoise, France, May 28, 2002.
45. "Isotopic Probes of Tryptophan Synthase Structure and Mechanism", Department of Biochemistry, University of Parma, Parma, Italy, June 7, 2002.
46. "Isotopic Probes of Tryptophan Synthase Structure and Mechanism", Department of Biochemistry, Faculty of Medicine, University of Verona, Verona, Italy, June 14, 2002.
47. "Specificity and Mechanism of Tyrosine Phenol-lyase and Tryptophan Indole-lyase: Enzymes with Carbon Leaving Groups", Department of Chemistry, Auburn University, Auburn, AL, September 19, 2002.
48. "Lysine-256 is Required for Monovalent Cation Activation of Tyrosine Phenol-lyase from *Citrobacter freundii*", Biocatalytics, Pasadena, California, April 9, 2003.

48. "Lysine-256 is Required for Monovalent Cation Activation of Tyrosine Phenol-lyase from *Citrobacter freundii*", American Society for Biochemistry and Molecular Biology, San Diego, California, April 11-15, 2003.
49. "Lysine-256 is Required for Monovalent Cation Activation of Tyrosine Phenol-lyase from *Citrobacter freundii*", Max Planck Institute for Physiological Chemistry, June 25, 2003.
50. "Lysine-256 is Required for Monovalent Cation Activation of Tyrosine Phenol-lyase from *Citrobacter freundii*", 6th International Conference of the Engelhardt Institute for Molecular Biology, Russian Academy of Sciences, St. Petersburg, Russia, June 29-July 5, 2003.
51. "Structure and Mechanism of Kynureninase", Institute of Molecular Medicine, Medical College of Georgia, Augusta, Georgia, September 4, 2003.
52. "Chemoenzymatic Synthesis of Aromatic Amino Acid Analogs", Southeast Regional Meeting, American Chemical Society, Atlanta, Georgia, Nov. 16-19, 2003.
53. "New Chemistry and New Biology for an Old Enzyme, Tryptophanase", Department of Biochemistry and Molecular Biology, University of Georgia, Athens, Georgia, January 30, 2004.
54. "Novel Probes of Tryptophan Synthase Structure and Mechanism, Biocatalytics, Inc., Pasadena, California, February 20, 2004.
55. "Hydrostatic Pressure as a Structural and Mechanistic Probe of Tryptophan Synthase and Tryptophan Indole-Lyase", Department of Chemistry and Biochemistry, University of Maryland, Baltimore County, May 6, 2005.
56. "Structural Basis of Reaction Specificity of Bacterial and Human Kynureninase", Department of Biochemistry, University of Verona, Verona, Italy, June 10, 2005.
57. "Hydrostatic Pressure as a Structural and Mechanistic Probe of Tryptophan Synthase and Tryptophanase", Department of Biochemistry, University of Parma, Parma, Italy, June 13, 2005.
58. "Hydrostatic Pressure as a Structural and Mechanistic Probe of Enzymes", CNR, Milan, Italy, June 14, 2005.
59. "Structural Basis of Reaction Specificity of Bacterial and Human Kynureninase", International Conference on Biocatalysis, St. Petersburg, Russia, June 19-23, 2005.
60. "Hydrostatic Pressure as a Structural and Mechanistic Probe of Tryptophan Synthase and Tryptophanase", Department of Biochemistry, University of Witten, Witten, Germany, July 1, 2005.
61. "Structural Basis of Reaction Specificity of Bacterial and Human Kynureninase", AIST, Tsukuba, Japan, November 4, 2005.
62. "Structure and Reaction Specificity of Bacterial and Human Kynureninase", International Conference on Vitamins, Coenzymes, and Biofactors, Awaji, Japan, November 6-11,

- 2005.
63. "Chemoenzymatic Synthesis of Aromatic Amino Acids", Department of Chemistry, Kyung Hee University, Yongin-city, Korea, November 14, 2005.
 64. "Structural Basis of Reaction Specificity of Bacterial and Human Kynureninase", Department of Pharmacology, Sungkyunkwan University, Suwon, Korea, November 14, 2005.
 65. "Structure and Reaction Specificity of Bacterial and Human Kynureninase", Department of Biology, University of Cergy-Pontoise, France, June 13, 2006.
 66. "Hydrostatic Pressure as a Structural and Mechanistic Probe of Tryptophan Synthase and Tryptophanase", University of Montpellier, France, June 19, 2006.
 67. "Twenty-four More Years of Tryptofun. New Chemistry and New Biology for an Old Enzyme: Tryptophanase", CNRS, IBBR, University of Rouen, France, January 26, 2007.
 68. "The Crystal Structure of Human Kynureninase Reveals the Basis for the Reaction Specificity", National Institutes of Health, Bethesda, MD, February 7, 2007.
 69. "Twenty-four More Years of Tryptofun. New Chemistry and New Biology for an Old Enzyme: Tryptophanase", University of Toulouse, France, March 1, 2007.
 70. "The Crystal Structure of Human Kynureninase Reveals the Basis for the Reaction Specificity", Centre for Molecular Biosciences, University of St. Andrews, Scotland, May 16, 2007.
 71. "The Crystal Structure of Human Kynureninase Reveals the Basis for the Reaction Specificity", IBS, Grenoble, France, June 18, 2007.
 72. "Twenty-four More Years of Tryptofun. New Chemistry and New Biology for an Old Enzyme: Tryptophanase", Center for Drug Discovery, University of Georgia, October 15, 2007.
 73. "Hydrostatic Pressure Affects the Conformational Equilibrium of Tryptophan Synthase from *Salmonella typhimurium*", Phillips, R. S., Miles, E. W., McPhie, P., Marchal, S., Lange, R., Holtermann, G. and Goody, R. S., Fifth International Conference on High Pressure Bioscience and Biotechnology, Scripps Institution of Oceanography, La Jolla, CA, Nov. 15-19, 2008.
 74. "The Crystal Structure of Human Kynureninase Reveals the Basis for the Reaction Specificity", Department of Chemistry, University of California, Davis, September 23, 2008.
 75. "The Crystal Structure of the *Pseudomonas dacunhae* Aspartate-Beta-Decarboxylase Reveals a Novel Oligomeric Assembly for a Pyridoxal-5'-Phosphate Dependent Enzyme", Phillips, R. S., Lima, S., Sundararaju, B., Huang, C., Khristoforov, R., and Momany, C., 2nd International Interdisciplinary Conference on Vitamins, Coenzymes and Biofactors, Athens, GA, October 26-31, 2008.
 76. "The Crystal Structure of Human Kynureninase Reveals the Basis for the Reaction

Specificity”, Department of Chemistry and Biochemistry, University of North Carolina, Greensboro, November 7, 2008.

Grants Received:

1. "Mechanistic Studies and Synthetic Applications of Carbon-carbon Lyases," Petroleum Research Fund of American Chemical Society, \$18,000, July 1, 1986-August 31, 1988.
2. "Tautomerism in Enzymatic Catalysis: The Mechanism of Action of Carbon-carbon Lyases," Research Corporation, \$13,000 (+ \$20,000 matching funds), May 1, 1986 - April 30, 1987.
3. "Tautomerism in Enzymatic Catalysis: The Mechanism of Carbon-carbon Lyases," Faculty Research Grant, University of Georgia, \$4,000, December 1, 1985 - May 31, 1987.
4. "Preparation of Novel Aromatic Amino Acids Active Against Malignant Melanoma," American Cancer Society, \$88,000, January 1, 1987 - December 31, 1988.
5. "Preparation of Optically Active Alcohols with the Thermostable Alcohol Dehydrogenase from *Thermoanaerobacter ethanolicus*," with L. G. Ljungdahl, Biotechnology Grant, University of Georgia, \$35,400, November 1, 1987 - June 30, 1989.
6. "Evaluation of Novel Inhibitors of Dopa Decarboxylase," with C. H. Stammer, American Heart Association, \$99,000, July 1, 1988 - June 30, 1991.
7. "Preparation and Properties of Antimelanoma Amino Acids," American Cancer Society, \$63,000, January 1, 1989 - December 31, 1990.
8. "Mechanisms of Carbon-carbon lyases and Kynureninase," National Institutes of Health, \$565,277 (total costs), September 1, 1989 - August 31, 1994.
9. "Collaborative Studies on the Structure and Mechanism of Tyrosine Phenol-lyase," \$3,000, SOROS Foundation, October 1, 1990 - December 1, 1991.
10. "Intermediates in the Reaction of Histidine Decarboxylase," American Heart Association, Georgia Affiliate, \$2,750, July 1, 1991 - September 1, 1991.
11. "Novel Inhibitors of Tryptophan Synthase," Monsanto Agricultural Products., \$10,000, January 1, 1992 - December 31, 1993.
12. "Structure and Mechanism of PLP-Dependent Enzymes," National Institutes of Health, Fogarty International Center, \$72,480, September 1, 1993 - April 30, 1997.
13. "Design, Synthesis and Evaluation of Novel Mechanism-Based Inactivators of Kynureninase," Farmitalia Carlo Erba, \$146,759, December 1, 1993 - November 30, 1995.
14. "Mechanisms of Pyridoxal-5'-phosphate Dependent Enzymes" National Institutes of Health, \$656,887, April 1, 1995 - March 31, 1999.
15. "Structure and Mechanism of Pyridoxal 5'-Phosphate Dependent Lyases," Civilian Research and Development Foundation, \$50,000, October 1, 1997 - September 30, 1999.

16. "Three Dimensional Structure of Kynureninase," National Science Foundation, NSF-NATO Postdoctoral Fellowship, \$45,000, October 1, 1997 - September 30, 1998.
17. "Structure and Mechanism of PLP-Dependent Enzymes," National Institutes of Health, Fogarty International Center, \$85,860, May 1, 1998 - June 30, 2002.
18. "Mechanisms of Pyridoxal-5'-phosphate Dependent Enzymes," National Institutes of Health, \$806,573, June 1, 2000-May 31, 2004.
19. "Microspectrophotometry of Tyrosine Phenol-lyase and Tryptophan Indole-lyase Crystals," NATO CLG, \$19,200, July 1, 2000-June 30, 2002.
20. "Mechanisms of Pyridoxal-5'-phosphate Dependent Enzymes," National Institutes of Health, \$44,000, July 1, 2004-June 30, 2005.
21. "Proteomic Analysis Using FTICR/MS", National Institutes of Health, \$128,000 (my share of direct costs), December 1, 2003-November 30, 2007.
22. "Structure and Mechanisms of PLP-dependent Lyases", National Institutes of Health, Fogarty International Center, \$114,720, September 1, 2004 - August 31, 2008.
23. "Collaborative Research: Molecular Design of Thermophilic Alcohol Dehydrogenase for Chiral Synthesis", National Science Foundation, \$151,185, March 15, 2005-February 28, 2008.