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Curriculum Vitae
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Birthday: Nov. 3, 1959

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Education:

University of California, San Francisco
Ph.D. in Pharmaceutical Chemistry, March 1988

University of California, Davis
B.S. in Biochemistry, June 1981

Professional Experience:

- 3/09 - Carolyn R. Bacon Professorship in Medical Science and Education
- 9/02 - Professor (tenured), Dept. of Pharmacology, University of Texas Southwestern Medical School
- 9/98 - 8/07 Program Chair, Biological Chemistry Graduate Program, U Texas Southwestern Medical School
- 9/97 – 8/02 Associate Professor (tenured), Dept. of Pharmacology, U Texas Southwestern Medical School
- 9/92 - 8/97 Assistant Professor, Dept. of Pharmacology, U Texas Southwestern Medical School
- 4/88 - 8/92 Postdoctoral Fellow, Hormone Research Institute, University of California, San Francisco, Advisor: Professor William J. Rutter
- 9/83 - 3/88 Graduate Student, Department of Pharmaceutical Chemistry, University of California, San Francisco, Advisor: Professor C.C. Wang
- 6/81 - 9/83 Chemist, Development Department, Syva, Co., Palo Alto, CA

Study Sections/Editorial Boards/Service.

- Editor, *Eukaryotic Cell* (2010-2015)
- Malaria medicines venture (MMV) Expert Scientific advisory committee (2006 – 2012)
- Tropical Diseases initiative at Dundee, Scientific Advisory Committee (2010 -)
- NIH, PTHE study section (10/09 – 6/12)
- NIH, Adhoc various panels, 6/05 - present
- Editorial Board, *Journal of Biological Chemistry* (2000 – 2005; 2006 - 2010)
- WHO Steering Committee on Drug Discovery Research (1997 – 2006)
- NIH, Chair, TMP study section (10/03- 6/04); Chair, PTHE study section (10/04- 6/05)
- NIH, TMP study section (2/00- 6/03)
- Sandler Foundation, Scientific Advisory Board 2006
- Publication Committee, *Journal of Biological Chemistry*, 2006 – 2009
- Co-chair, Polyamines Gordon Conference (June, 2007)
- Co-Organizer, Molecular Parasitology Meeting (2004-2007)
- Co-Organizer, Keystone symposium “Drugs against Parasitic Protozoa” (April 9-13, 2005)
- Co-Vice Chair, Polyamines Gordon Conference (June, 2005)

Publications.

1. **Phillips, M.A.** and Wang, C.C. (1987) A *Trypanosoma brucei* mutant resistant to α -difluoromethylornithine. *Mol. and Biochem. Parasitol.* 22, 9-17.
2. **Phillips, M.A.**, Coffino, P. and Wang, C.C. (1987) Cloning and sequencing of the ornithine decarboxylase gene from *Trypanosoma brucei*: implications for enzyme turnover and selective difluoromethylornithine inhibition. *J. Biol. Chem.*, 262, 8721-8727.
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5. **Phillips, M.A.**, Fletterick, R. and Rutter, W.J. (1990) Arginine-127 stabilizes the transition state in carboxypeptidase. *J. Biol. Chem.*, 265, 20692-20698.
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7. **Phillips, M.A.**, Hedstrom, L. and Rutter, W.J. (1992) Guanidine derivatives restore activity to carboxypeptidase lacking Arg-127. *Protein Science*, 1, 517-521.
8. Kuntz, D., **Phillips, M.A.**, Moore, T.D.E., Craig, S.P., Bass, K.E., and Wang, C.C. (1992) The translation initiation site of recombinant *Trypanosoma brucei* ornithine decarboxylase varies with different promoters. *Mol. and Biochem. Parasitol.*, 55, 95-104.
9. Corey, D. R. and **Phillips, M.A.** (1994) Cyclic peptides as proteases: a re-evaluation. *Proc. Natl. Acad. Sci.*, 91, 4106-4109.
10. Osterman, A.L., Grishin, N.V., Kinch, L.N. and **Phillips, M.A.** (1994) Formation of functional cross-species heterodimers of ornithine decarboxylase, *Biochemistry*, 33, 13662-13667.
11. Grishin, N.V. and **Phillips, M.A.** (1994) The subunit interfaces of oligomeric enzymes are conserved to a similar extent as the overall protein sequences, *Protein Science*, 3, 2455-2458.
12. Osterman, A.L., Kinch, L.N., Grishin, N.V. and **Phillips, M.A.** (1995) Acidic residues important for substrate binding and cofactor reactivity in eukaryotic ornithine decarboxylase identified by alanine scanning mutagenesis, *J. Biol. Chem.*, 270, 11797-11802.
13. Grishin, N.V., **Phillips, M.A.** and Goldsmith, E.J. (1995) Modeling of the spatial structure of eukaryotic ornithine decarboxylase, *Protein Science*, 4, 1291-1304.
14. Osterman A.L., Lueder D.V., Quick, M., Myers, D., Canagarajah, B.J. and **Phillips, M.A.** (1995) Domain organization and a protease-sensitive loop in eukaryotic ornithine decarboxylase, *Biochemistry*, 34, 13431-13436.
15. Grishin, N.V., Osterman, A.L., Goldsmith, E.J. and **Phillips, M.A.** (1996) Crystallization and preliminary x-ray analysis of ornithine decarboxylase from *Trypanosoma brucei*, *Proteins*, 24, 272-273.
16. **Phillips, M.A.** and Rutter, W.J. (1996) The role of the prodomain in folding and secretion of rat pancreatic carboxypeptidase A1, *Biochemistry*, 35, 6771-6776.

17. Lueder, D.V. and **Phillips, M.A.** (1996) Characterization of *Trypanosoma brucei* γ -glutamylcysteine synthetase, an essential enzyme in the biosynthesis of trypanothione (diglutathionylspermidine), *J. Biol.Chem.* 271, 17485-17490.
18. Brooks, H.B. and **Phillips, M.A.** (1996) Circular dichroism assay for decarboxylation of optically pure amino acids: application to ornithine decarboxylase, *Anal. Biochem.* 238, 191-194.
19. Osterman, A.L., Brooks, H., Rizo, J. and **Phillips, M.A.** (1997) The role of Arg-277 in the binding of pyridoxal 5'-phosphate to *Trypanosoma brucei* ornithine decarboxylase, *Biochemistry*, 36, 4558-4567.
20. Scott, T.C. and **Phillips, M.A.** (1997) Characterization of *Trypanosoma brucei* pyridoxal kinase: purification, gene isolation and expression in *E. coli*, *Mol. and Biochem. Parasitol.*, 88, 1-11.
21. Harmon, M.A., Scott, T.C., Li, Y., Boehm, M.F., **Phillips, M.A.** and Mangelsdorf, D.J. (1997) *Trypanosoma brucei*: effects of methoprene and other isoprenoid compounds on procyclic and bloodstream forms *in vitro* and in mice, *Experimental Parasitology*, 87, 229-236.
22. Brooks, H.B. and **Phillips, M.A.** (1997) Characterization of the reaction mechanism for *Trypanosoma brucei* ornithine decarboxylase by multiwavelength stopped-flow spectroscopy, *Biochemistry*, 36, 15147-15155.
23. Brekken, D.L. and **Phillips, M.A.** (1998) *Trypanosoma brucei* γ -glutamylcysteine synthetase: characterization of the kinetic mechanism and the role of Cys-319 in cystamine inactivation, *J. Biol.Chem.*, 273, 26317-26322.
24. Swanson, T., Brooks, H.B., Osterman, A.L., O'Leary, M.H. and **Phillips, M.A.** (1998) Carbon-13 isotope effect studies of *Trypanosoma brucei* ornithine decarboxylase, *Biochemistry*, 37, 14943-14947.
25. Kinch, L.N., Scott, J.R., Ullman, B. and **Phillips, M.A.** (1999) Cloning and kinetic characterization of the *Trypanosoma cruzi* S-adenosylmethionine decarboxylase, *Mol. and Biochem. Parasitol.*, 101, 1-11.
26. Osterman, A.L., Brooks, H.B., Jackson, L., Abbott, J.J. and **Phillips, M.A.** (1999) Lysine-69 plays a key role in catalysis by ornithine decarboxylase through acceleration of the Schiff base formation, decarboxylation and product release steps, *Biochemistry* 38, 11814-11826.
27. Grishin, N.V., Osterman, A.L., Brooks, H.B., **Phillips, M.A.** and Goldsmith, E.J. (1999) X-ray structure of ornithine decarboxylase from *Trypanosoma brucei*: the native structure and the structure in complex with α -difluoromethylornithine, *Biochemistry* 38, 15174-15184.
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29. Kinch, L.K. and **Phillips, M.A.** (2000) Single turnover kinetic analysis of *Trypanosoma cruzi* S-adenosylmethionine decarboxylase, *Biochemistry*, 39, 3336-3343.
30. Jackson, L.K., Brooks, H.B., Osterman, A.L., Goldsmith, E. J. and **Phillips, M.A.** (2000) Altering the reaction specificity of eukaryotic ornithine decarboxylase, *Biochemistry*, 39, 11247-11257.
31. Kinch, L.N., Brekken, D.L. and **Phillips, M.A.** (2000) Polyamine and glutathione biosynthetic enzymes from *Trypanosoma brucei* and *Trypanosoma cruzi*. In: *Biology of Parasitism*, C. Tschudi (ed), Kluwer Academic Publishers, 95-119.
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- range interactions in the dimer interface of ornithine decarboxylase are important for enzyme function, *Biochemistry*, 40, 13230-13236.
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 47. Willert, E.K., Fitzpatrick, R. and **Phillips, M.A.** (2007) Allosteric regulation of an essential trypanosome

- polyamine biosynthetic enzyme by a catalytically dead homolog, *Proc. Natl. Acad. Sci. USA*, 104, 8275-8280.
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 50. Malmquist, N.A., Gujjar, R., Rathod, P.K. and **Phillips, M.A.** (2008) Analysis of flavin oxidation and electron transfer inhibition in *Plasmodium falciparum* dihydroorotate dehydrogenase, *Biochemistry*, 47, 2466-2475.
 51. Arakaki, T.L., Buckner, F.S., Gillespie, J.R., Malmquist, N.A., **Phillips, M.A.**, Kalyuzhnyi, O., Luft, J.R., DeTitta, G.T., Verlinde, C.L.M.J., Van Voorhis, W.C., Holl, W.G.J., Merritt, E.A. (2008) Characterization of *Trypanosoma brucei* dihydroorotate dehydrogenase as a possible drug target; structural, kinetic and RNAi studies, *Molecular Microbiology*, 68, 37-50.
 52. **Phillips, M.A.**, Gujjar, R., Malmquist, N.A., White, J., El Mazouni, F., Baldwin, J. and Rathod, P.K. (2008) Triazolopyrimidine-based dihydroorotate dehydrogenase inhibitors with potent and selective activity against the malaria parasite, *Plasmodium falciparum*, *J. Med. Chem.*, 51, 3649-3653.
 53. Willert, E.K. and **Phillips, M.A.** (2008) Regulated expression of an essential allosteric activator of polyamine biosynthesis in African trypanosomes, *PLoS pathogens*, 4(10): e1000183 doi:10.1371/journal.ppat.1000183.
 54. Gujjar, R., Marwaha, A., El Mazouni, F., White J., White K.L., Creason, S., Shackleford, D.M., Baldwin, J., Charman, W.N., Buckner, F.S., Charman, S., Rathod, P.K. and **Phillips, M.A.** (2009) Identification of a metabolically stable triazolopyrimidine-based dihydroorotate dehydrogenase inhibitor with anti-malarial activity in mice. *J. Med. Chem.*, 52, 1864-72.
 55. Lee, J., Sperandio, V., Frantz, D.E., Longgood, J., Camilli, A., **Phillips, M.A.** and Michael, A.J. (2009) An alternative polyamine biosynthetic pathway is prevalent in bacteria and essential for biofilm formation in *Vibrio cholerae*, *J. Biol. Chem.*, 284, 9899-907.
 56. Xiao, Y., McCloskey, D.E. and **Phillips, M.A.** (2009) RNAi-mediated gene silencing of ornithine decarboxylase and spermidine synthase in *Trypanosoma brucei* provides insight into the regulation of polyamine biosynthesis, *Eukaryotic Cell*, 8, 747-755.
 57. Barker, R.H., Liu, H., Hirth, B., Celatka, C.A., Fitzpatrick, R., Xiang, Y., Willert, E.K., **Phillips, M.A.**, Kaiser, M., Bacchi, C.J., Rodriguez, A., Yarlett, N., Klinger, J.D. and Sybertz, E. (2009) Novel S-adenosylmethionine decarboxylase inhibitors for the treatment of human African trypanosomiasis. *Antimicrobial agents and chemotherapy*, 53, 2052-2058.
 58. Hirth, B., Barker, R.H., Celatka, C.A., Klinger, J.D., Liu, H., Nare, B., Nijjar, A., **Phillips, M.A.**, Sybertz E., Willert, E.K. and Xiang, Y. (2009) Discovery of new S-adenosylmethionine decarboxylase inhibitors for the treatment of human African trypanosomiasis, *Bioorganic & Medicinal Chemistry Letters*, 19, 2916-2919.
 59. Willert, E.K. and **Phillips, M.A.** Cross-species activation of trypanosome S-adenosylmethionine decarboxylase by the regulatory subunit prozyme. (2009) *Mol. Biochem. Parasitol.*, 168(1):1-6.
 60. Deng, X., Gujjar, R., El Mazouni, F., Kaminsky, W., Malmquist, N.A., Goldsmith, E.J., Rathod P.K. and **Phillips, M.A.** Structural plasticity of malaria dihydroorotate dehydrogenase allows selective

binding of diverse chemical scaffolds, (2009) *J. Biol. Chem.*, 284(39), 26999-7009.

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62. Smithson, D.C., Lee, J., Shelat, A.A., **Phillips M.A.** and Guy, R.K. (2010) Discovery of potent and selective inhibitors of *Trypanosoma brucei* ornithine decarboxylase, *J. Biol. Chem.*, 285(22):16771-81.
63. Shaw F.L., Elliott K.A., Kinch L.N., Fuell C., **Phillips M.A.**, Michael A.J. (2010) Evolution and multifarious horizontal transfer of an alternative biosynthetic pathway for the alternative polyamine sym-homospermidine, *J. Biol. Chem.*, 285(19), 14711-23.
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65. Deng, X., Lee, J., Michael, A.J., Tomchick, D.R., Goldsmith E.J., and **Phillips, M.A.** (2010) Evolution of substrate specificity within a diverse family of β/α -barrel fold basic amino acid decarboxylases: X-ray structure determination of enzymes with specificity for L-arginine and carboxynorspermidine, *J. Biol. Chem.*, Jun 8. [Epub ahead of print] PMID: 20534592.
66. Klee, N., Wong, P.E., Baragaña, B., El Mazouni, F., **Phillips, M.A.**, Barrett, M.P., Gilbert, I.H. (2010) Selective Delivery of 2-Hydroxy APA to *Trypanosoma brucei* using the melamine motif, *Bioorganic & Medicinal Chemistry Letters*, 20(15):4364-6.

Book chapters and invited reviews.

1. **Phillips, M.A.** and Fletterick, R.J. (1992) Proteases. *Current Opinions in Structural Biology*, 2, 713-720.
2. Hedstrom, L., Graf, L., Stewart, C-B., Rutter, W.J. and **Phillips, M.A.** (1991) Modulation of enzyme specificity by site-directed mutagenesis. *Methods in Enzymology*, 202, 671-687.
3. **Phillips, M.A.** (1999) Ornithine decarboxylase. In: *The Encyclopedia of Molecular Biology*, Creighton, TE (ed), John Wiley & Sons, New York, 1726-1730.
4. **Phillips, M.A.** (2000) Structural and mechanistic studies of *Trypanosoma brucei* ornithine decarboxylase. In: *Biochemistry of Vitamin B₆ and PQQ*, M. Martinez-Carrion (eds), Birkhauser Verlag AG, Basel, Switzerland.
5. Kinch, L.N. and **Phillips, M.A.** (2001) Ornithine decarboxylase. In: *Wiley Encyclopedia of Molecular Medicine*, Creighton, TE (ed), John Wiley & Sons, New York, 2336-2339.
6. Myers, D.P. and **Phillips, M.A.** (2001) Ornithine decarboxylase antizyme. In: *Wiley Encyclopedia of Molecular Medicine*, Creighton, TE (ed), John Wiley & Sons, New York, 235-238.
7. Jackson, L.K. and **Phillips, M.A.** (2002) Target validation for drug discovery in parasitic organisms. *Current Topics in Medicinal Chemistry*, 2 (5) 425-438.
8. Rathod, P.K. and **Phillips, M.A.** (2003) Prized malaria drug target nailed. News and Views. *Nature Structural Biology*, 10, 316-318.
9. **Phillips, M.A.** and Stanley, S.L. (2005) Chemotherapy of protozoal infections: Amebiasis, Giardiasis, Trichomoniasis, Trypanosomiasis, Leishmaniasis, and other protozoal infections. In: *Goodman &*

Gilman's The Pharmacological Basis of Therapeutics, Brunton, L., Lazo, J. and Parker, K. (eds), McGraw-Hill Co, Inc, New York. 1049-1072.

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11. **Phillips, M.A.** and Rathod, P.K. (2010) Dihydroorotate dehydrogenase is a promising target for the identification of novel anti-malarial chemotherapy, *Infectious Disorders Drug Targets*, 10, 226-239.
12. Willert, E.K., Kinch, L.N. and **Phillips, M.A.** (2010). Methods for identification and assay of allosteric regulators of S-adenosylmethionine decarboxylase, *Methods in Molecular Biology*, in press.
13. Jacobs, R.T., Nare, B and **Phillips, M.A.** State of the art in African trypanosome drug discovery, *Curr Top Med Chem Rev*, invited review, submitted.

Patents.

Phillips, M.; Rathod, P. K.; Baldwin, J.; Gujjar, R. Dihydroorotate dehydrogenase inhibitors with selective anti-malarial activity. WO Patent 2007149211 A1, 2007; US Patent 20080027079 A1, 2008.

Phillips, M.; Rathod, P. K.; Gujjar, R.; Marwaha, A.S.; Charman, S.A. Dihydroorotate dehydrogenase inhibitors with selective anti-malarial activity. WO Patent 2009/082691, 2009; US Patent 20090209557.