

David Sherman's Publications

1. Stork, Gilbert and David H. Sherman. 1982. "Efficient *de novo* construction of the indanpropionic acid precursor of 11-keto steroids. An improved internal Diels-Alder sequence," *J. Amer. Chem. Soc.* 104:3758-3759.
2. Kranz, David M., David H. Sherman, Michael V. Sitkovsky, Mark S. Pasternack, and Herman N. Eisen. 1984. "Immunoprecipitation of cell surface structures of cloned cytotoxic T lymphocytes by clone-specific antisera," *Proc. Natl. Acad. Sci. USA* 81:573-577.
3. Sherman, David H. 1984. "Increasing sensitivity of luminescent enzyme immunoassay," *Trends in Biotechnology* 2:1-2.
4. Sherman, David H., David M. Kranz, and Herman N. Eisen. 1984. "Expression of structurally diverse Qa-2 encoded molecules on the surface of cloned cytotoxic T lymphocytes," *Journal of Experimental Medicine* 160:1421-1430.
5. Devlin, James J., Georg Widera, Andrew L. Mellor, Karen Fahrner, David H. Sherman, Elisabeth H. Weiss, and Richard A. Flavell. 1985. "Evolution and expression of the transplantation antigen gene family," *Federation Proceedings* 44:2736-2740.
6. Sherman, David H., David M. Kranz, and Herman N. Eisen. 1985. "Qa-2 encoded molecules expressed on the surface of cloned cytotoxic T lymphocytes are structurally diverse," *The Cell Biology of the MHC*, H. Vogel and B. Pernis (eds.), Academic Press, Inc., New York.
7. Flavell, Richard A., Hamish Allen, Linda C. Burkly, David H. Sherman, Gerald L. Waneck, and Georg Widera. 1986. "Molecular biology of the H-2 complex," *Science* 223:437-443.
8. Sherman, David H., Paula S. Hochman, Robert Dick, Richard Tizard, K.L. Ramachandran, Richard A. Flavell, and Brigitte T. Huber. 1987. "A molecular analysis of antigen recognition by insulin specific T cell hybridomas from B6 wild type and bm12 mutant mice," *Molecular and Cellular Biology* 7:1865-1872.
9. Waneck, Gerald L., David H. Sherman, Susan Calvin, Hamish Allen, and Richard A. Flavell. 1987. "Tissue-specific expression of a transfected Qa region gene (Q7^b) encoding the Qa-2 alloantigen," *Journal of Experimental Medicine* 165:1358-1370.
10. Sherman, David H., Gerald L. Waneck, and Richard A. Flavell. 1988. "Qa-2 antigen encoded by Q7^b transfected R1.1 cells is biochemically indistinguishable from Qa-2 expressed on the surface of C57B1/10 mouse spleen cells," *Journal of Immunology* 140:138-142.

11. Waneck, Gerald L., David H. Sherman, Paul W. Kincade, Martin G. Low, and Richard A. Flavell. 1988. "Molecular mapping of sites in Qa-2 required for attachment of the phosphatidylinositol membrane anchor," *Proc. Natl. Acad. Sci. USA* 85:577-581.
12. Sherman, D.H., F. Malpartida, M.J. Bibb, H.M. Kieser, S.E. Hallam, J.A. Robinson, S. Bergh, M. Uhlen, T.J. 1988. "Cloning and analysis of genes for the biosynthesis of polyketide antibiotics in *Streptomyces* species," in Durand, G., Bobichon, L. and Florent, J. (eds.) *Proceedings of the 8th International Biotechnology Symposium, Paris*. Societe Francaise de Microbiology, Vol. 1, pp. 123-137.
13. Sherman, David H., Francisco Malpartida, Maureen J. Bibb, Helen M. Kieser, Mervyn J. Bibb, and David A. Hopwood. 1989. "Structure and deduced function of the granaticin-producing polyketide synthase gene cluster from *Streptomyces violaceoruber* Tu22," *EMBO Journal* 8:2717-2725.
14. Hopwood, David A. and David H. Sherman. 1990. "Molecular genetics of polyketides and its comparison to fatty acid biosynthesis," *Annual Review of Genetics* 24:37-66.
15. Hopwood, David A., David H. Sherman, Chaitan Khosla, Maureen J. Bibb, Thomas J. Simpson, Miguel A. Fernandez, Eduardo Martinez and Francisco Malpartida. 1990. "Hybrid pathways for the production of secondary metabolites," in *Proceedings of the Sixth International Symposium on the Genetics of Industrial Microorganisms (GIM 90)*, Strassbourg, France .
16. Sherman, David H., M.J. Bibb, T.J. Simpson, D. Johnson, F. Malpartida, M. Fernandez-Moreno, E. Martinez, C.R. Hutchinson and D.A. Hopwood. 1991. "Molecular genetic analysis reveals a putative bifunctional polyketide cyclase/dehydrase gene from *Streptomyces coelicolor* and *Streptomyces violaceoruber*, and a cyclase/O-methyltransferase from *Streptomyces glaucesens*," *Tetrahedron*, 47:6029-6043.
17. Arrowsmith, T.J., F. Malpartida, D.H. Sherman, D.A. Hopwood, A. Birch, J.A. Robinson. 1992. "Characterization of *actI*-homologous DNA encoding polyketide synthase genes from the monensin producer *Streptomyces cinnamonensis*." *Mol. Gen. Genet.* 234:254-264.
18. Sherman, D.H., Eung-Soo Kim, M.J. Bibb, and D.A. Hopwood, 1992. "Functional replacement of polyketide synthase genes in *Streptomyces coelicolor* by heterologous genes from a different polyketide pathway," *J. Bacteriol.* 174:6184-6190.
19. Malmberg, Li-Hong, Sherman, D.H., Hu, Wei-Shou, 1993. "Analysis of rate-limiting reactions in cephalosporin biosynthesis," *Annals of the New York Academy of Sciences* 665:16-26.

20. Khosla, C., McDaniel, R., Ebert-Khosla, S., Torres, R., Sherman, D.H., Bibb, M.J. and Hopwood, D.A., 1993. "Genetic construction and functional analysis of hybrid polyketide synthases containing heterologous acyl carrier protein." *J. Bacteriol.* 175:2197-2204.
21. Malmberg, L.-H., Hu, W.-S. and D.H. Sherman, 1993. "Precursor flux control through targeted chromosomal insertion of the lysine ϵ -aminotransferase gene in cephamycin C biosynthesis." *J. Bacteriol.* 175:6916-6924.
22. Hopwood, D.A., C. Khosla, D.H. Sherman, M.J. Bibb, S. Ebert-Khosla, E.-S. Kim, R. McDaniel, W.P. Revill, R. Torres, and T.-W. Yu. 1994. "Toward an understanding of the programming of aromatic polyketide synthases: a genetics-driven approach," in R.H. Baltz, G.D. Hegeman, and P.L. Skatrud (Eds.), *Industrial Microorganisms: Basic and Applied Molecular Genetics*, American Society for Microbiology, Washington, D.C.
23. Kim, E.-S., D.A. Hopwood and D.H. Sherman, 1994. "Analysis of type II polyketide β -ketoacyl synthase specificity in *Streptomyces coelicolor* A3(2) by *trans* complementation of actinorhodin synthase mutants." *J. Bacteriol.* 176:1801-1804.
24. Kim, E.-S., Bibb, M.J., Butler, M.J., Hopwood, D.A., and D.H. Sherman. 1994. "Sequences of the oxytetracycline polyketide synthase-encoding *otc* genes from *Streptomyces rimosus*." *Gene* 141:141-142 (1994)
25. Bibb, M.J., D.H. Sherman, S. Omura and D.A. Hopwood. 1994. "Cloning, sequencing and deduced functions of a cluster of *Streptomyces* genes probably encoding for biosynthesis of the polyketide antibiotic frenolicin." *Gene* 142:31-39.
26. August, P.A., Flickinger, M.C. and D.H. Sherman. 1994. "Cloning and analysis of a locus (*mcr*) involved in mitomycin C resistance from *Streptomyces lavendulae*." *J. Bacteriol.* 176:4448-4454.
27. Malmberg, L.H., A. Khetan, D.H. Sherman and W.-S. Hu. 1994. "Metabolic engineering of cephalosporin biosynthesis in *Streptomyces clavuligerus*." In *Advances in Bioprocess Engineering*. E. Galindo & O.T. Ramirez, Eds.: 413-416. Kluwer Pub.
28. Kim, E.-S., Cramer, K., Shreve, A., and D.H. Sherman. 1995. "Heterologous expression of an engineered biosynthetic pathway: functional dissection of type II polyketide synthase components in *Streptomyces* species." *J. Bacteriol.* 177:1202-1207.
29. Crosby, J., Sherman, D.H., Bibb, M.J., Revill, W.P., Hopwood, D.A., and T.J. Simpson, 1995. "Polyketide synthase acyl carrier proteins from *Streptomyces*:

Expression in *Escherichia coli*, purification and partial characterization." *Biochimica et Biophysica Acta* 1251:32-41.

30. Malmberg, L.-H., Hu, W.-S., and D.H. Sherman. 1995. "Effects of enhanced lysine ϵ -aminotransferase activity on cephamycin C biosynthesis in *Streptomyces clavuligerus*." *Applied Microbiol. Biotechnol* 44: 198-205.
31. Khetan, A., L.-H. Malmberg, D.H. Sherman and W.-S. Hu. 1995. "Metabolic engineering of cephalosporin biosynthesis in *Streptomyces clavuligerus*." *Annals of the New York Academy of Sciences* 782:17-24.
32. August, P.R., J.A. Rahn, M.C. Flickinger, and D.H. Sherman, 1996. "Inducible expression of the mitomycin C resistance gene product (MCRA) from *Streptomyces lavendulae*." *Gene* 175:261 - 267.
33. Williams, M.D., A.M. Fieno, R.A. Grant and D.H. Sherman. 1996. "Expression and analysis of a bacterial poly(hydroxyalkanoate) synthase in insect cells using a baculovirus system." *Prot. Exp. Purif.* 7:203-211.
34. Williams, M.D., J. Rahn, and D.H. Sherman. 1996. "Production of a polyhydroxyalkanoate biopolymer in insect cells with a modified eucaryotic fatty acid synthase." *Appl. Environ. Microbiol.* 62:2540-2546.
35. Sheldon, P.J., D.A. Johnson, P.R. August, H.-w. Liu and D.H. Sherman. 1997. "Characterization of a mitomycin resistance determinant (*mrd*) from the producing organism. *Streptomyces lavendulae*." *J. Bact.* 179:1796 - 1804.
36. Johnson, D., P.R. August, C. Shackleton, H.-w. Liu and D. H. Sherman. 1997. "Microbial resistance to mitomycins involves a redox relay mechanism." *J. Amer. Chem. Soc.* 119:2576 - 2577.
37. Sheldon, P.J., D. A. Johnson, P.R. August, H.-w. Liu and D. H. Sherman. 1997. "Cellular self-protection against the antitumor antibiotic mitomycin C in *Streptomyces lavendulae*." *Industrial Microorganisms: Basic and Applied Molecular Genetics* (R. Baltz, G. Hegemann and P. Skatrud), Vol. 34, pp. 123 - 130.
38. Van Pilsum, J.F., D.H. Sherman, T.V. Line, A. Bedekar and L. Ayala. 1997. "Sequence comparison and functional analysis of amidinotransferases from eukaryotes and prokaryotes." In De Deyn, P.P., Marescau, B., Qureshi, I.A., and Mori, A. (eds.) *Guanidino Compounds in Biology and Medicine II*, London: John Libbey and Company LTD; 111 - 120.
39. Bedeker, B., R.M. Zink, D. H. Sherman, T.V. Line, and J. Van Pilsum. 1998. "The comparative amino acid sequences, substrate specificities and gene or cDNA

nucleotide sequences of some procaryotic and eucaryotic amidinotransferases: implications for evolution." *Comp. Biochem. Physiol.* 119:677-690.

40. Zhao, L., D. H. Sherman, and H.-w. Liu. 1998. "Biosynthesis of desosamine: molecular evidence suggesting β -glucosylation as a self-resistance mechanism in methymycin/neomethymycin producing strain, *Streptomyces venezuelae*." *J. Amer. Chem. Soc.* 120:9374-9375.
41. Zhao, L., D. H. Sherman, and H.-w. Liu. 1998. "Biosynthesis of desosamine: Construction of a new methymycin/neomethymycin analog by deletion of a desosamine biosynthetic gene." *J. Amer. Chem. Soc.* 120:10256-10257.
42. Xue, Y., L. Zhao, H.-w. Liu and D. H. Sherman. 1998. "A gene cluster for macrolide antibiotic biosynthesis in *Streptomyces venezuelae*: Architecture of metabolic diversity." *Proc. Natl. Acad. Sci. USA* **95**:12111-12116.
43. Xue, Y., D. Wilson, L. Zhao, H.-w. Liu, and D. H. Sherman. 1998. Hydroxylation of macrolactones YC-17 and narbomycin is mediated by the *pikC*-encoded cytochrome P450 in *Streptomyces venezuelae*. *Chem. & Biol.* 5:661-667.
44. Zhao, L., N.L.S. Que, Y. Xue, D. H. Sherman, and H.-w. Liu. 1998. "Mechanistic studies of desosamine biosynthesis: C-4 deoxygenation precedes C-3 transamination." *J. Amer. Chem. Soc.* 120:12159-12160.
45. Borisova, S., L. Zhao, D.H. Sherman and H.-w. Liu. 1999. Biosynthesis of desosamine: Construction of a new macrolide carrying a genetically designed sugar moiety. *Organic Lett.* 1:133-136.
46. Zhao, L., J. Ahlert, Y. Xue, Jon S. Thorson, David H. Sherman, and Hung-wen Liu. 1999. Engineering A Methymycin/Pikromycin-Calicheamicin Hybrid: Construction of Two New Macrolides Carrying a Designed Sugar Moiety. *J. Amer. Chem. Soc.* 121:9881-9882.
47. Mao, Y., M. Varoglu and D.H. Sherman. 1999. "Molecular characterization of two genes (*mitAB*) required for biosynthesis of the antitumor antibiotic mitomycin C." *J. Bacteriol.* 181:2199-2208.
48. Sheldon, P.R., Y. Mao, Min He and D.H. Sherman. 1999. "Mitomycin resistance in *Streptomyces lavendulae* includes a novel drug-binding protein-dependent export system." *J. Bacteriol.* 181:2507-2512.
49. Mao, Y., M. Varoglu and D. H. Sherman. 1999. Molecular characterization and analysis of the biosynthetic gene cluster for the antitumor antibiotic mitomycin C from *Streptomyces lavendulae* NRRL 2564. *Chem. & Biol.* 6:251-263.

50. Khetan, A., L.-H. Malmberg, Y. S. Kyung, D.H. Sherman and W.-S. Hu. 1999. "Precursor and cofactor as a check valve for cephamycin biosynthesis in *Streptomyces clavuligerus*." *Biotechnology Progress* 15:1020-1027.
51. Han, Lei, A. Khetan, W.-S. Hu, and D.H. Sherman. 1999. "Time-lapse microscopy reveals temporal and spatial expression of lysine- ϵ -aminotransferase gene in *Streptomyces clavuligerus*." *Mol. Microbiol.* 34:878-886.
52. Belcourt, M.F., P.G. Penketh, W.F. Hodnick, D.A. Johnson, D.H. Sherman, S. Rockwell and A.C. Sartorelli. 1999. "Mitomycin resistance in mammalian cells expressing the bacterial mitomycin C resistance protein MCRA." *Proc. Natl. Acad. Sci. USA* 96:10489-10494.
53. Xue, Y., and D.H. Sherman. 2000. Alternative modular polyketide synthase expression controls macrolactone structure. *Nature* 403:571-575.
54. Xue, Y., D. Wilson, and D.H. Sherman. 2000. "Genetic architecture of the polyketide synthases for methymycin and pikromycin series macrolides." *Gene* 245:203-211.
55. He, M., M. Varoglu and D.H. Sherman. 2000. "Functional analysis of conserved amino acid residues in the actinorhodin β -ketoacyl-ACP-synthase." *J. Bacteriol.* 182:2619-2623.
56. Chen, S. Y. Xue, D.H. Sherman, and K.A. Reynolds. 2000. "Mechanisms of molecular recognition in the pikromycin polyketide synthase." *Chemistry & Biology* 7:907-918.
57. Khetan, A., W.-S. Hu, and D.H. Sherman. 2000. "Temporal and spatial distribution of lysine- ϵ -aminotransferase in *Streptomyces clavuligerus*." *Microbiology* 146:1869 – 1880.
58. Kyung, Yung Sun, W.-S. Hu and D.H. Sherman. 2001. Analysis of temporal and spatial expression of the CcaR regulatory element in the cephamycin C biosynthetic pathway using green fluorescent protein. *Mol. Microbiol.* 40: 530-541.
59. Kyung, Y. S., D. H. Sherman and W.-S. Hu. 2001. Simultaneous analysis of spatio-temporal gene expression for cephamycin biosynthesis in *Streptomyces clavuligerus*. *Biotechnol. Prog.* 17: 1000-1007.
60. He, M., P. Sheldon and D. H. Sherman. 2001. "Characterization of a novel quinone reductase activity for the mitomycin C binding protein (MRD): functional switching from a drug activating enzyme to a drug-binding protein. *Proc. Natl. Acad. Sci. USA* 98:926–931.

61. Varoglu, M., Y. Mao and D. H. Sherman. 2001. Mapping the mitomycin biosynthetic pathway by functional analysis of the MitM aziridine N-methyltransferase. *J. Amer. Chem. Soc.* 123:6712-6713.
62. Penketh, P. G., W. F. Hodnick, M. F. Belcourt, K. Shyam, D. H. Sherman, and A. C. Sartorelli. 2001. Inhibition of DNA Cross-linking by Mitomycin C by Peroxidase Mediated Oxidation of Mitomycin C Hydroquinone. *J. Biol. Chem.* 276:34445-34452.
63. Xue, Y. and D. H. Sherman. 2001. Biosynthesis and combinatorial biosynthesis of pikromycin-related macrolides in *Streptomyces venezuelae*. *Metabolic Engineering* 3: 15-26.
64. Chen, S., J. B. Roberts, D. H. Sherman and K. A. Reynolds. 2001. The *S. venezuelae pikAV* gene contains a transcription unit essential for expression of enzymes involved in glycosylation of narbonolide and 10-deoxymethynolide. *Gene* 263: 255-263.
65. Wilson, D.J., Y. Xue, K. A. Reynolds and D. H. Sherman. 2001. Characterization and analysis of the PikD regulatory factor in the pikromycin biosynthetic pathway of *Streptomyces venezuelae*. *J. Bacteriol.* 183:3468-3475.
66. Sang-Jung Kim, Han-Young Kang, and David H. Sherman. 2001. Synthesis of triketide delta-lactones. *Synthesis* 12:1790-1793.
67. Zhang, Q. and D. H. Sherman. 2001. Isolation and structure determination of novamethymycin, a new bioactive metabolite of the methymycin biosynthetic pathway in *Streptomyces venezuelae*. *J. Nat. Prod.* 64:1447-1450.
68. Baumann, R. P., W. F. Hodnick, H. A. Seow, M. F. Belcourt, S. Rockwell, D. H. Sherman and A. C. Sartorelli. 2001. Reversal of mitomycin C resistance by overexpression of bioreductive enzymes in Chinese hamster ovary cells. *Cancer Research* 61:7770-7776.
69. Baumann, R.P., D. H. Sherman and A. C. Sartorelli. 2002. A novel selection marker for mammalian cell transfection. *BioTechniques* 32:1030-1036.
70. Yoon, Y.J., Beck, B. J., Kim, B.S., Kang, H.-Y., Reynolds, K. A. and David H. Sherman. 2002. Generation of multiple bioactive macrolides by hybrid polyketide synthases in *Streptomyces venezuelae*. *Chem. Biol.* 9:203-214.
71. Beck, B. J., Yoon, Y.J., Reynolds, K.A. and David H. Sherman. 2002. The hidden steps of domain skipping: mechanistic studies of macrolactone ring size determination in the pikromycin modular polyketide synthase. *Chem. Biol.* 9:575-583.

72. Kim, B.S., T. A. Cropp, G. Florova, Y. Lindsay, D. H. Sherman, and K. A. Reynolds. 2002. An unexpected interaction between the modular polyketide synthases, erythromycin DEBS1 and pikromycin PikAIV, leads to efficient triketide lactone synthesis. *Biochemistry* 41:10827-10833.
73. Cropp, T.A., B.S. Kim, B.J. Beck, Y.J. Yoon, D.H. Sherman and K.A. Reynolds. 2002. Recent developments in the production of novel polyketides by combinatorial biosynthesis. In *Biotechnology and Genetic Engineering Reviews* Vol. 19, pp. 159-172. Intercept Ltd. Andover, UK
74. Chang, Z., P. Flatt, W. H. Gerwick, V.-A. Nguyen, C. L. Willis and D. H. Sherman. 2002. The barbamide biosynthetic gene cluster: a novel marine cyanobacterial system of mixed PKS-NRPS origin involving an unusual trichloroleucyl starter unit. *Gene* 296:235-247.
75. Kim, B. S., T. A. Cropp, B.J. Beck, D.H. Sherman and K.A. Reynolds. 2002. Biochemical evidence for an editing role of thioesterase II in the biosynthesis of the polyketide pikromycin. *J. Biol. Chem.* 277:48028-48034.
76. Martin TW, Dauter Z, Devedjiev Y, Sheffield P, Jelen F, He M, Sherman DH, Otlewski J, Derewenda ZS, Derewenda U. 2002. Molecular basis of mitomycin C resistance in *Streptomyces*: structure and function of the MRD protein. *Structure (Camb)*. 2002 10(7):933-42.
77. Sherman, D.H. 2002. New enzymes for "warheads". *Nature Biotechnol.* 20: 984-985.
78. Podust, L.M., Kim, Y., Arase, M., Neely, B.A., Beck, B.B., Bach, H., Sherman, D.H., Lamb, D.C., Kelly, S.C., and Waterman, M.R. 2003. The 1.92Å structure of the *Streptomyces coelicolor* A3(2) CYP154C1: A new monooxygenase that functionalizes macrolide ring systems. *J. Biol. Chem.* 278: 12214-12221.
79. Beck, B.J., Aldrich, C.C., Fecik, R.A., Reynolds, K.A. and D. H. Sherman. 2003. Iterative chain elongation by a pikromycin monomodular polyketide synthase. *J. Amer. Chem. Soc.* 125:4682-4683.
80. Beck, B.J., Aldrich, C.C., Fecik, R.A., Reynolds, K.A. and D. H. Sherman. 2003. Substrate recognition and channeling activities of mono-modules from the pikromycin polyketide synthase. *J. Amer. Chem. Soc.* 125:12551-12557.
81. Podust L. M., Bach, H., Kim, Y., Lamb, D. C, Arase, M., Sherman, D.H., Kelly, S.L., and M. R. Waterman. 2004. Comparison of the 1.85 Å structure of CYP154A1 from *Streptomyces coelicolor* A3(2) with the closely related CYP154C1 and CYPs from antibiotic biosynthetic pathways. *Protein Sci.* 2004. 13:255-268.

82. Salomon, C. E., N. A. Magarvey and D. H. Sherman. 2004. Merging the potential of microbial genetics with biological and chemical diversity: An even brighter future for marine natural product drug discovery. *Natural Product Reports* 21:105-121.
83. Kim, B.-S., Sherman, D. H. and K. A. Reynolds. 2004. An efficient method for creation and functional analysis of libraries of hybrid type I polyketide synthases. *Prot. Eng. Des. Sel.* 17:277-284.
84. Srinivasan, A., Bach, H., Sherman, D. H. and J. S. Dordick. 2004. Bacterial P450-catalyzed polyketide hydroxylation on a microfluidic platform. *Biotechnol. Bioeng.* 88(4):528-535.
85. Chang, Z., Sitachitta, N., Rossi, J.V., Roberts, M.A., Flatt, P.M., Jia, J., Sherman, D.H., W. H. Gerwick. 2004. Biosynthetic pathway and gene cluster analysis of curacin A, an anti-tubulin natural product from the tropical marine cyanobacterium *Lyngbya majuscula*. *J. Nat. Prod.* 67:1356-1367.
86. Magarvey, N.A., Keller J.M., Bernan^o V., Dworkin, M., and David H. Sherman. 2004. Isolation and characterization of novel marine-derived actinomycete taxa rich in secondary metabolites. *Appl. Env. Microbiol.* 70(12):7520-7529.
87. Hildebrand, M., Waggoner, L.E., Liu, H., Sudek, S., Allen, S., Anderson, C., Sherman, D.H., and M. Haygood. 2004. *bryA*: an unusual modular polyketide synthase gene from the uncultivated bacterial symbiont of the marine bryozoan *Bugula neritina*. *Chem. Biol.* 11(11):1543-1552.
88. Jeong, J.-C., Srinivasan, A., Gr \ddot{u} schow, S., Bach, H., Sherman, D.H., and J.S. Dordick. 2005. Exploiting the reaction flexibility of a type III polyketide synthase through *in vitro* pathway manipulation. *J. Amer. Chem. Soc.* 127(1):64-65.
89. Nishizawa, T., Aldrich, C.C. and D. H. Sherman. 2005. Molecular analysis of the rebeccamycin L-amino acid oxidase from *Lechevalieria aerocolonigenes* ATCC 39243. *J. Bacteriol.* 187:2084-2092.
90. Fortman J.L., Sherman D. H. 2005. Utilizing the power of microbial genetics to bridge the gap between the promise and the application of marine natural products. *ChemBioChem.* 6:960-978.
91. Aldrich, C. C., Beck, B. J., Fecik, R.A. and D. H. Sherman. 2005. Biochemical investigation of pikromycin biosynthesis employing native penta- and hexaketide chain elongation intermediates. *J. Amer. Chem. Soc.* 127: 8441-8452.
92. Aldrich, C. C., Venkatraman L., Sherman, D. H. and R. A. Fecik. 2005. Chemoenzymatic synthesis of the polyketide macrolactone 10-deoxymethynolide. *J. Amer. Chem. Soc.* 127:8910-8911.

93. Venkatraman L., Aldrich, C. C., Sherman, D. H. and R. A. Fecik. 2005. Formal total synthesis of the polyketide macrolactone narbonolide. *J. Org. Chem.* 70:7267-7272. [Designated one of 20 [Most-Accessed Articles](#) during July-September 2005]
94. Lee, S. K., Basnet, D. B., Hong, J. S. J., Jung, W. S., Choi, C. Y., Lee, H. C., Sohng, J. K., Ryu, K. G., Kim, D. J., Ahn, J. S., Kim, B. S., Oh, H. C., Sherman, D. H., Yoon Y. J. 2005. Structural diversification of macrolactones by substrate-flexible cytochrome P450 monooxygenases. *Adv. Synth. Catal.* 347:1369-1378.
95. Sherman, D. H. 2005. The lego-ization of polyketide biosynthesis. *Nature Biotechnol.* 23:1083-1084.
96. Beck, Z.Q., Aldrich, C.C., Magarvey, N.A, Georg, G.I. and D.H. Sherman. 2005. Chemoenzymatic synthesis of cryptophycin/arenastatin natural products. *Biochemistry* 44:13457-13466. [Designated "Hot" article for *Biochemistry*, November 2005]
97. Mehra S., Lian W., Jayapal K.P., Charaniya S.P., Sherman D.H., Hu W.S. 2006. A framework to analyze multiple time series data: A case study with *Streptomyces coelicolor*. *J Ind Microbiol Biotechnol* 33(2): 159-172.
98. Beck, Z.Q. and Sherman, D.H. 2006. Development of an internally quenched fluorogenic substrate for analysis of thioesterases. *Anal. Biochem.* 349(2):309-311.
99. Nishizawa, T., Grüşchow, S., Jayamaha, D.E., Nishizawa-Harada, C. and Sherman, D.H. 2006. Enzymatic assembly of the bis-indole core of rebeccamycin. *J. Amer. Chem. Soc.* 128(3):724-725.
100. Jung WS, Lee SK, Hong JS, Park SR, Jeong SJ, Han AR, Sohng JK, Kim BG, Choi CY, Sherman DH, Yoon YJ. 2006. Heterologous expression of tylosin polyketide synthase and production of a hybrid bioactive macrolide in *Streptomyces venezuelae*. *Appl. Microbiol. Biotechnol.* 72(4):763-769.
101. Lee SK, Park JW, Kim JW, Jung WS, Park SR, Choi CY, Kim ES, Kim BS, Ahn JS, Sherman DH, Yoon YJ. 2006. Neopikromycin and novapikromycin from the pikromycin biosynthetic pathway of *Streptomyces venezuelae*. *J. Nat. Prod.* 69(5):847-849.
102. Flatt PM, O'Connell SJ, McPhail KL, Zeller G, Willis CL, Sherman DH, Gerwick WH. 2006. Characterization of the initial enzymatic steps of barbamide biosynthesis. *J. Nat. Prod.* 69:938-944.
103. Gu L., Jia J., Liu H., Håkansson K., Gerwick W. H., and Sherman, D. H. 2006. Metabolic coupling of dehydration and decarboxylation in the curacin A pathway: functional identification of a mechanistically diverse enzyme pair. *J. Am. Chem. Soc.* 128:9014-9015.

104. [Sherman D. H.](#), [Li S.](#), [Yermalitskaya L.V.](#), [Kim Y.](#), [Smith J.A.](#), [Waterman M.R.](#), and [Podust L.M.](#) 2006. The structural basis for substrate anchoring, active site selectivity, and product formation by P450 PikC from *Streptomyces venezuelae*. *J. Biol. Chem.* 281:26289-26297.
105. [Ku B.](#), [Cha J.](#), [Srinivasan A.](#), [Kwon S.J.](#), [Jeong J.C.](#), [Sherman D.H.](#), and [Dordick J.S.](#) 2006. Chip-based polyketide biosynthesis and functionalization. *Biotechnol. Prog.* 22:1102-1107.
106. Giraldes J.W., Akey D.L., Kittendorf J.D., Sherman D.H., Smith J.L., and Fecik R.A. 2006. Structural and mechanistic insights of polyketide macrolactonization from polyketide-based affinity labels. *Nature Chemical Biology.* 2:531-536.
107. Akey D.L., Kittendorf J.D., Giraldes J.W., Fecik R.A., Sherman D.H., and Smith J.L. 2006. Structural basis for macrolactonization by the pikromycin thioesterase. *Nature Chemical Biology.* 2:537-542.
108. Sherman D.H. and Smith J.L. 2006. Clearing the skies over modular polyketide synthases. *ACS Chem. Biol.* 1:505-509.
109. Kittendorf J.D. and Sherman D.H. 2006. Developing tools for engineering hybrid polyketide synthetic pathways. *Curr. Opin. Biotechnol.* 17:597-605.
110. Venkatraman L., Salomon C.E., Sherman D.H., and Fecik R.A. 2006. Total synthesis of narbonolide and biotransformation to pikromycin. *J. Org. Chem* 71:9853-9856.
111. Magarvey N.A., Beck Z.Q., Golakoti T., Ding Y., Huber U., Hemscheidt T.K., Abelson D., Moore R.E., Sherman D.H. 2006. Biosynthetic characterization and chemoenzymatic construction of the cryptophycins, potent anti-cancer agents from *Nostoc* cyanobionts. *ACS Chem. Biol.* 1:766-779.
112. Lee J.Y., Janes B.K., Passalacqua K.D., Pflieger B., Bergman N.H., Liu H., Håkansson K., Somu R.V., Aldrich C.C., Cendrowski S., Hanna P.C., Sherman, D.H. 2007. Biosynthetic analysis of the petrobactin siderophore pathway from *Bacillus anthracis*. *J. Bacteriol.* 189:1698-1710.
113. Sudek S., Lopanik N.B., Waggoner L.E., Hildebrand M., Anderson C., Liu H, Patel A., Sherman D.H., Haygood MG. 2007. Identification of the putative bryostatin polyketide synthase gene cluster from "Candidatus Endobugula sertula", the uncultivated microbial symbiont of the marine bryozoan *Bugula neritina*. *J Nat Prod.* 70:67-74.
114. Li S., Grünschow S., Dordick J.S., and Sherman D.H. 2007. Molecular analysis of the role of tyrosine 224 in the active site of *Streptomyces coelicolor* RppA, a bacterial type III polyketide synthase. *J. Biol. Chem.* 282:12765-72.

115. Pflieger B. F., Lee, J.Y., Somu, R.V., Aldrich, C.C., Hanna, P.C., and D. H. Sherman. 2007. Characterization and analysis of early enzymes for petrobactin biosynthesis in *Bacillus anthracis*. *Biochemistry* 46:4147-4157.
116. Choi S.-S., Hur Y.-A., Sherman D.H., and E.-S. Kim. 2007. Isolation of the biosynthetic gene cluster for tautomycetin, a linear polyketide T cell-specific immunomodulator from *Streptomyces* sp. CK4412. *Microbiology* 153:1095-1102.
117. Liu H., Håkansson K., Lee J.Y., and Sherman D.H. 2007. Collision-activated dissociation, infrared multiphoton dissociation, and electron capture dissociation of the *Bacillus anthracis* siderophore petrobactin and its metal ion complexes. *Journal of the American Society for Mass Spectrometry* 18:842-849.
118. Passalacqua K.D., Bergman N.H., Lee J.Y., Sherman D.H., and Hanna P.C. 2007. The global transcriptional responses of *Bacillus anthracis* Sterne (34F2) and Δ *sodA1* to paraquat reveal metal ion homeostasis imbalances during endogenous superoxide stress. *J. Bacteriol.* 189:3996-4013.
119. Grünschow S., Buchholz T.J., Seufert W., Dordick J.S., and Sherman D.H. 2007. Substrate profile analysis and ACP-mediated acyl transfer in *Streptomyces coelicolor* type III polyketide synthases. *Chembiochem.* 8:863-868.
120. Grünschow S., Chang L.C., Mao Y., and Sherman D.H. 2007. Hydroxyquinone O-methylation in mitomycin biosynthesis. *J. Amer. Chem. Soc.* 129:6470-6476.
121. Kwon S. J., Lee M.-Y., Ku B., Sherman D. H., and Dordick J. S. 2007. High-throughput, microarray-based synthesis of natural product analogs via *in vitro* metabolic pathway construction. *ACS Chemical Biology* 2:419-25.
122. Sitachitta N., Lopanik N. B., Mao, Y., Sherman D.H. 2007. Analysis of a parallel branch in the mitomycin biosynthetic pathway involving the *mitN*-encoded aziridine N-methyltransferase. *J. Biol. Chem.* 282:20941-7.
123. Oh, H.-S., Yun, J.-S., Nah, K.-H., Kang, H.-Y. and Sherman D. H. 2007. Synthesis of the tetraketide lactones from the pikromycin biosynthetic pathway. *Eur. J. Org. Chem.* 3369–3379.
124. Jayapal, K.P., Lian, W., Glod, F., Sherman, D.H. and Hu, W.S. 2007. Comparative genomic hybridizations reveal absence of large *Streptomyces coelicolor* genomic islands in *Streptomyces lividans*. *BMC Genomics* 2007 Jul 10;8(1):229.

125. Beck Z. Q., Burr D. A. and Sherman D. H. 2007. Characterization of the β -methylaspartate- α -decarboxylase (CrpG) from the cryptophycin biosynthetic pathway. *ChemBioChem* 8: 1373-1375.
126. Kittendorf J. D., Beck B. J., Buchholz T. J. and Sherman D. H. 2007. Interrogating the molecular basis for multiple macrolactone ring formation by the pikromycin polyketide synthase. *Chemistry & Biology* 14: 944-954.
127. Seufert, W., Beck, Z. Q. and Sherman, D. H. 2007. Enzymatic release and macrolactonization of cryptophycins from safety-catch solid support. *Angewandte Chemie Int. Ed.* 46: 9298-9300.
128. Li, S., Podust, L. M. and Sherman, D. H. 2007. Engineering and analysis of a self-sufficient biosynthetic cytochrome P450 PikC fused to the RhFRED reductase domain. *J. Amer. Chem. Soc.* 129: 12940-12941.
129. Geders, T. W., Gu, L. C., Mowers, J. C., Liu, H., Gerwick, W. H., Håkansson, K., Sherman, D. H., Smith, J. L. 2007. Crystal structure of the ECH₂ catalytic domain of CurF from *Lyngbya majuscula*: Insights into a decarboxylase involved in polyketide chain β -branching. *J. Biol. Chem.* 282: 35954-35963.
130. Gu, L. C., Geders, T. W., Wang, B., Gerwick, W. H., Håkansson, K., Smith, J. L., Sherman, D. H. 2007. GNAT-like strategy for polyketide chain initiation. *Science* 318: 970-974.
131. Buchholz, T. J., Kittendorf, J. D., and Sherman, D. H. 2008. Polyketide biosynthesis, modular polyketide synthases. *Wiley Encyclopedia of Chemical Biology*. John Wiley and Sons, LTD.
132. [Lee, J.Y., Sherman, D. H., Hwang, B. K.](#) 2008. In vitro antimicrobial and in vivo antioomycete activities of the novel antibiotic thiobutacin. *Pest Manag. Sci.* 2008 Feb;64(2):172-7.
133. Lian, W., Jayapal, K. P., Charaniya, S., Mehra, S., Glod, F., Kyung, Y.S., Sherman, D.H., Hu, W.-S. 2008. Genome-wide transcriptome analysis reveals that a pleiotropic antibiotic regulator, AfsS, modulates nutritional stress response in *Streptomyces coelicolor* A3(2). *BMC Genomics*, Jan 29:9(1): 56. doi:10.1186/1471-2164-9-56
134. Ding, Y., Seufert, W., Beck, Z.Q., and Sherman, D.H. 2008. Analysis of the cryptophycin P450 epoxidase reveals substrate tolerance and cooperativity. *J. Amer. Chem. Soc.* 130(16):5492-5498.
135. Miller, K.A., Welch, T.R. Greshock, T.J., Ding, Y., Sherman, D.H., and R. M. Williams. 2008. Biomimetic total synthesis of malbrancheamide and malbrancheamide B. *J. Org. Chem.* 73(8):3116-3119.

136. Ding, Y., Williams, R.M., and Sherman, D.H. 2008. Molecular analysis of a 4-dimethylallyltryptophan synthase from *Malbranchea aurantiaca*. *J. Biol. Chem.* 283(23):16068-76.
137. [Jayapal, K. P., Philp, R. J., Kok, Y. J., Yap, M. G., Sherman, D. H., Griffin, T. J., Hu, W.-S.](#) 2008. Uncovering genes with divergent mRNA-protein dynamics in *Streptomyces coelicolor*. *PLoS ONE*. May 7;3(5):e2097.
138. Smith, J. L. and Sherman, D. H. 2008. An enzyme assembly line. *Science* 321:1304-1305.
139. Ding, Y., Gruschow, S., Greshock, T. J., Finfield, J., Sherman, D. H., and Williams, R. M. 2008. Isolation of VM55599 and Pre-paraherquamide from *Aspergillus japonicus* and *Penicillium fellutanum*. Biosynthetic Implications. *J. Nat. Prod.* 71:1574–1578.
140. Anzai, Y., Li, S., Chaulagain, M. R., Kinoshita, K., Kato, F., Montgomery, J., and Sherman, D. H. 2008. Functional analysis of MycCI and MycG, cytochrome P450 enzymes involved in biosynthesis of mycinamicin macrolide antibiotics. *Chem. Biol.* 15:950-959.
141. Hur, Y.-A., Choi, S.-S., Sherman, D. H., and Kim, E.-S. 2008. Identification of TmcN as a pathway-specific positive regulator of tautomycetin biosynthesis in *Streptomyces* sp. CK4412. *Microbiology* 154: 2912-2919.
142. Ding, Y., Greshock, T. J., Miller, K. A., Sherman, D. H. and Robert M. Williams, R. M. 2008. Premalbrancheamide: Synthesis, isotopic labeling, biosynthetic incorporation, and detection in cultures of *Malbranchea aurantiaca*. *Org. Lett.* 10:4863-4866.
143. Pflieger, B. F., Kim, Y., Nusca, T. D., Maltseva, N., Lee, J. Y., Rath, C. M., Scaglione, J. B., Janes, B. K., Anderson, A. C., Bergman, N. H., Hanna, P. C., Joachimiak, A., and Sherman, D. H. 2008. Structural and functional analysis of AsbF: Origin of the stealth 3,4-dihydroxybenzoic acid subunit for petrobactin biosynthesis. *Proc. Nat'l. Acad. Sci. USA.* 105:17133–17138. [Editors' Choice, 28 NOVEMBER 2008 VOL 322 SCIENCE www.sciencemag.org]
144. Lopanik, N. B., Shields, J. A., Buchholz, T. J., Rath, C. M., Hothersoll, J., Haygood, M. G., Håkansson, K., Thomas, C. M., and Sherman, D. H. 2008. *In vivo* and *in vitro* trans-acylation by BryP, the putative bryostatin pathway acyltransferase derived from an uncultured marine symbiont. *Chem. Biol.* 15:1175–1186. (Cover article)

145. Kittendorf, J. D., Sherman, D.H. 2009. The methymycin/pikromycin pathway: A model for metabolic diversity in natural product biosynthesis. *Bioorg. Med. Chem.* 17: 2137–2146.
146. Buchholz, T. J., Geders, T. W., Bartley, F. E., Reynolds, K. A., Smith, J. L., and Sherman, D. H. 2009. Structural basis for binding specificity between subclasses of modular polyketide synthase docking domains. *ACS Chem. Biol.* 4:41-52.
147. Li, S., Ouellet, H., Sherman, D. H., and Podust, L. M. 2009. Analysis of transient and catalytic desosamine binding pockets in cytochrome P450 PikC from *Streptomyces venezuelae*. *J. Biol. Chem.* 284:5723-5730.
148. Chamberland, S., Grüşchow, S., Sherman, D.H., Williams, R.M. 2009. Synthesis of potential early-stage intermediates in the biosynthesis of FR900482 and mitomycin C. *Org. Lett.* 11:791-794.
149. Auerbach, T., Mermershtain, I., Bashan, A., Davidovich, C., Rozenberg, H., Sherman, D. H. and Yonath, A. 2009. Structural basis for the antibacterial activity of the 12-membered-ring mono-sugar macrolide methymycin. *Biotechnologia* 84:11-22.
150. Gu, L., Wang, B., Kulkarni, A, Geders, T. W., Grindberg, R. V., Gerwick, L., Håkansson, K., Wipf, P., Smith, J. L., Gerwick, W. H. and Sherman, D. H. 2009. Metamorphic enzyme assembly in polyketide diversification. *Nature* 459:731-735.
151. Jones, A. C., Gu, L., Sorrels, C. M., Sherman, D. H. and Gerwick, W. H. 2009. New tricks from ancient algae: Natural products biosynthesis in marine cyanobacteria. *Curr. Op. Chem. Biol.* 13:216–223.
152. Li, S., Anzai, Y., Kinoshita, K., Kato, F., and Sherman, D. H. 2009. Functional analysis of MycE and MycF, two *O*-methyltransferases involved in biosynthesis of mycinamicin macrolide antibiotics. *ChemBioChem.* 10:1297-1301.
153. Sharp, K., Arthur, K. E., Gu, L., Ross, C., Harrison, G., Gunasekera, S. P., Meickle, T., Matthew, S., Luesch, H., Thacker, R. W., Sherman, D. H., Paul, V. J. 2009. Phylogenetic and chemical diversity of three chemotypes of bloom-forming *Lyngbya* (Cyanobacteria: Oscillatoriales) from reefs of southeast Florida. *Appl. Env. Microbiol.* 75:2879–2888.
154. Yan, J., Gupta, S., Sherman, D. H. and Reynolds, K. A. 2009. Functional dissection of a multimodular polypeptide of the pikromycin polyketide synthase into monomodules using a matched pair of heterologous docking domains. *ChemBioChem.* 10:1537-1543.
155. Park, S. H., Choi, S. S., Kim, Y. J., Chang, Y. K., Sherman, D. H., Kim, E. S. 2009. Functional expression of SCO7832 stimulates tautomycin production via

- pathway-specific regulatory gene overexpression in *Streptomyces* sp. CK4412. *J. Ind. Microbiol. Biotechnol.* 36:993-998.
156. Hu, P. J. and Sherman, D. H. 2009. DANSing with *Caenorhabditis elegans*. *Proc. Nat'l. Acad. Sci. USA.* 106:7685-7686.
 157. Li, H. T., Ung, P. M., Zajkowski, J., Garneau-Tsodikova, S., and Sherman, D. H. 2009. Automated genome mining for natural products. *BMC Bioinformatics* 10(1):185. doi: 10.1186/1471-2105/10/185
 158. Kim BG, Lee MJ, Seo J, Hwang YB, Lee MY, Han K, Sherman DH, Kim ES. 2009. [Identification of functionally clustered nystatin-like biosynthetic genes in a rare actinomycetes, *Pseudonocardia autotrophica*](#). *J. Ind. Microbiol. Biotechnol.* 36(11):1425-1434.
 159. Li, S., Chaulagain, M. J., Knauff, A. R., Podust, L. M., Montgomery, J. and Sherman, D. H. 2009. Selective oxidation of carbolide C-H bonds by an engineered macrolide P450 monooxygenase. *Proc. Natl. Acad. Sci. USA.* 106(44):18463-18468.
 160. Mortison, J. D., Kittendorf, J. D. and Sherman, D. H. 2009. Synthesis and biochemical analysis of complex chain-elongation intermediates for interrogation of the erythromycin and pikromycin modular polyketide synthases. *J. Amer. Chem. Soc.* 131(43):15784-15793.
 161. Gu, L., Wang, B., Kulkarni, A., Gehret, J., Lloyd, K., Gerwick, L., Gerwick, W., Wipf, P., Håkansson, K., Smith, J. L. and Sherman, D. H. 2009. Polyketide decarboxylative chain termination preceded by *O*-sulfonation in curacin A biosynthesis. *J. Amer. Chem. Soc.* 131(44):16033-16035
 162. Sherman, David H. 2009. Enzyme's black box cracked open. *Nature* 461:1068-1069.
 163. Carlson, J. C., Li, S., Burr, D. A., and Sherman, D. H. 2009. Isolation and characterization of tirandamycins from a marine-derived *Streptomyces* sp. *J. Nat. Prod.* 72(11):2076-2079.
 164. Akey, D. L., Razelun, J. R., Tehranisa, J., Sherman, D. H., Gerwick, W. H. and Smith, J. L. 2010. Crystal structures of dehydratase domains from the curacin polyketide biosynthetic pathway. *Structure* 18(1):94-105.
 165. Carlson, J., C., Fortman, J. L., Anzai, Y., Li, S., Burr, D. A., and Sherman, D. H. 2009. Identification of the tirandamycin biosynthetic gene cluster from *Streptomyces* sp. 307-9. *ChemBioChem.* 11(4):564-572.

166. Park, S.-H., Choi, S.-S., Sherman, D. H., and Kim, E.-S. 2009. A global positive regulator *afsR2* stimulates tautomycetin production via pathway-specific regulatory gene over-expression in *Streptomyces* sp. CK4412. *Process Biochemistry* 44:1298-1301.
167. Tsukada, S.-I., Anzai, Y., Li, S., Kinoshita, K., Sherman, D. H., and Kato, F. 2010. Gene targeting for *O*-methyltransferase genes, *mycE* and *mycF*, on the chromosome of *Micromonospora griseorubida* producing mycinamicin with disruption cassette containing bacteriophage ϕ C31 *attB* attachment site. *FEMS Microbiol. Letters* 304: 148–156.
168. Carlson, P. E., Dixon, S. D., Janes, B. K., Carr, K. A., Nusca, T. D., Anderson, E. C., Keene, S. E., Sherman, D. H., Hanna, P. C. 2010. Genetic analysis of petrobactin transport in *Bacillus anthracis*. *Mol. Microbiol.* 75(4):900-909.
169. Scaglione, J. B., Akey, D. L., Sullivan, R., Kittendorf, J. D., Rath, C. R., Kim, E.-S., Smith, J. L., and Sherman, D. H. 2010. Biochemical and structural characterization of the tautomycetin thioesterase: analysis of a stereoselective polyketide hydrolase. *Angew. Chem. Intl. Ed. Eng.* 49:5726-5730.
170. Jones, A. C., Monroe, E. A., Eisman, E. B., Gerwick, L., Sherman, D. H., and Gerwick, W. G. 2010. The unique mechanistic transformations involved in the biosynthesis of modular natural products from marine cyanobacteria. *Nat. Prod. Rep.* 27(7):1048-1065.
171. Rath, C.M., Scaglione, J.B., Kittendorf, J. D., and Sherman, D.H. 2010. Hybrid PKS/NRPS natural product biosynthesis (Chapter). In *Comprehensive Natural Products II: Chemistry and Biology*; Lew Mander, Hung-Wen Liu Editors; Elsevier: Oxford; volume 1:453-492.
172. Ding, Y., and Sherman, D. H. 2010. The role of synthesis and biosynthetic logic. In *Comprehensive Natural Products II: Chemistry and Biology*; Lew Mander, Hung-Wen Liu Editors; Elsevier: Oxford; volume 2: 559-579.
173. McAfoos, T. J., Li, S., Tsukamoto, S., Sherman, D. H. and Williams, R. M. 2010. Studies on the biosynthesis of the stephacidins and notoamides. Total synthesis of notoamide S. *Heterocycles* 82:461-472.
174. Ding, Y., de Wet, J. R., Cavalcoli, J., Li, S., Greshock, T.J., Miller, K. A., Finefield, J. M., Sunderhaus, J. D., McAfoos, T., Tsukamoto, S., Williams, R. M. and Sherman, D. H. 2010. Genome-based characterization of two prenylation steps in the assembly of the stephacidin and notoamide anticancer agents in a marine-derived *Aspergillus* sp. *J. Amer. Chem. Soc.* 32(36):12733-12740.
175. Buchholz, T. J., Rath, C. M., Lopanik, N. B., Gardner, N. P., Håkansson, K., and Sherman, D. H. 2010. Polyketide β -branching in bryostatin biosynthesis:

identification of surrogate acetyl-ACP donors for BryR, an HMG-ACP synthase. *Chem. Biol.* 17: 1092–1100.

176. Mortison, J. D. and Sherman, D. H. 2010. Frontiers and opportunities in chemoenzymatic synthesis. *J. Org. Chem.* 75, 7041–7051.
177. Khare D., Wang B., Gu L., Razelun J., Sherman D.H., Gerwick W.H., Hakansson K., Smith J.L. Conformational switch triggered by α -ketoglutarate in a halogenase of curacin A biosynthesis. *Proc. Natl. Acad. Sci. U. S. A.* 2010;107(32):14099-14104.
178. Gu, L., Eisman, E. B., Dutta, S., Franzmann, T. M., Walter, S., Gerwick, W. H., Skinnotis, G., and Sherman, D. H. 2011. Tandem acyl carrier proteins in the curacin pathway promote consecutive multienzyme reactions with a synergistic effect. *Angew. Chem. Intl. Ed.* 50(12):2795-2798.
179. Gehret, J. J., Gu, L., Gerwick, W. H., Wipf, P., Sherman, D. H., Smith, J. L. 2011. Terminal alkene formation by the thioesterase of curacin A biosynthesis: structure of a decarboxylating thioesterase. *J. Biol. Chem.* 286(16):14445-14454.
180. Sunderhaus, J. D., Sherman, D. H., and Williams, R. M. 2011. Studies on the biosynthesis of the stephacidin and notoamide natural products: A stereochemical and genetic conundrum. *Isr. J. Chem.* 51: 442 – 452.
181. Williams, R. M., Finefield, J. M., Tsukamoto, S., Sherman, D. H. 2011. Studies on the biosynthesis of the notoamides: synthesis of an isotopomer of 6-hydroxydeoxybrevianamide E and biosynthetic incorporation into notamide J. *J. Org. Chem.* 76(15):5954-5958.
182. Singh, S., Chang, A., Goff, R., Bingman, C. A., Grüşchow, S., Sherman, D. H., Phillips Jr., G.N., and Thorson, J. S. 2011. Structural characterization of the mitomycin 7-O-methyltransferase MmcR. *Proteins* 79(7):2181-2188.
183. Carlson, J. C., Li, S., Gunatilleke, S. S., Anzai, Y., Burr, D. A., Podust, L. M., and Sherman, D. H. 2011. Tirandamycin biosynthesis is mediated by co-dependent oxidative enzymes. *Nature Chemistry* 3(8):628-633.
184. Lee, J.Y.; Passalacqua, K. D., Hanna, P. C., Sherman, D. H. 2011. Regulation of petrobactin and bacillibactin biosynthesis in *Bacillus anthracis* under iron and oxygen variation. *PLoS One* 6(6): e20777. doi:10.1371/journal.pone.0020777.
185. Finefield J. M., Kato H., Greshock T. J., Sherman D. H., Tsukamoto S., Williams R. M. 2011. [Biosynthetic studies of the notoamides: isotopic synthesis of stephacidin A and incorporation into notoamide B and sclerotiamide.](#) *Org. Lett.* 13(15):3802-3805.

186. Fribley, A. M., Lopez, P. C., Miller, J. R., Callaghan, M. U., Cai, P., Narula, N., Neubig, R. R., Showalter, H. D., Larsen, S. D., Kirchhoff, P. D., Larsen, M. J., Burr, D. A., Schultz, P. J., R. Jacobs, R. R., Tamayo-Castillo, G., Sherman, D. H., and Kaufman, R. J. 2011. Complementary cell-based high throughput screens identify novel modulators of the unfolded protein response. *J. Biomol. Screen* 16:825-835.
187. Ding, Y., Rath, C. M., Bolduc, K. L., Håkansson, K., Sherman, D. H. 2011. Chemoenzymatic synthesis of cryptophycin anticancer agents by an ester bond-forming non-ribosomal peptide synthetase module. *J. Amer. Chem. Soc.* 133:14492-14495.
188. Rath, C. M., Janto, B., Earl, J., Ahmed, A., Hu, F. Z., Hiller, L., Dahlgren, M., Kreft, R., Yu, F., Wolff, J. J., Kweon, H. K., Christiansen, M. A., Håkansson, K., Williams, R. M., Ehrlich, G. D., Sherman, D. H. 2011. Meta-omic characterization of the marine invertebrate microbial consortium that produces the chemotherapeutic natural product ET-743. *ACS Chem. Biol.* 6: 1244–1256.
189. Akey, D. L., Li, S., Konwerski, J., Confer, L., Bernard, S. M., Anzai, Y., Kato, F., Sherman, D. H. and Smith, J. L. 2011. Identification and characterization of a new structural form in the SAM/metal-dependent *O*-methyltransferase from the mycinamycin macrolide pathway. *J. Mol. Biol.* 413(2):438-450.
190. Bonnett, S. A. Rath, C. M., Shareef, A. R., Joels, J. R., Chemler, J. A., Håkansson, K., Reynolds, K. A., Sherman, D. H. 2011. Acyl-CoA subunit selectivity in the pikromycin polyketide synthase PikAIV: steady-state kinetics and active-site occupancy analysis by FTICR-MS. *Chem. Biol.* 18(9):1075-1081.
191. Cruz, P.G., Auld, D. S., Schultz, P. J., Lovell, S., Battaile, K. P., MacArthur, R., Shen, M., Tamayo, G., Inglese, J., Sherman, D. H. 2011. Titration-based screening for evaluation of natural product extracts: identification of an aspulvinone family of luciferase inhibitors. *Chem. Biol.* 18: 1442-1452.
192. Shareef, A.-R. Sherman, D. H., and Montgomery, J. 2012. Nickel-catalyzed regiodivergent approach to macrolide motifs. *Chem. Sci.* 3:892-895.
193. Finefield, J. M., Greshock, T. J., Sherman, D. H., Tsukamoto, S., Williams, R. M. 2011. Notoamide E: Biosynthetic incorporation into notoamides C and D in cultures of *Aspergillus versicolor* NRRL 35600. *Tetrahedron Lett.* 52(16):1987-1989.
194. Busche, A. E., Gottstein, D., Hein, C., Ripin, N., Pader, I., Tufar, P., Eisman, E. B., Gu, L., Walsh, C. T., Loehr, F., Sherman, D. H., Güntert, P., Dötsch, V. 2012. *ACS Chem. Biol* 7(2):378-386.

195. Gehret, J. J., Gu, L., Geders, T. W., Brown, W. C., Gerwick, L., Gerwick, W. H., Sherman, D. H. and Smith, J. L. 2012. Structure and activity of DmmA, a marine haloalkane dehalogenase. *Protein Sci.* 21(2):239-248.
196. Li, S., Finefield, J. M., Sunderhaus, J. D., McAfoos, T. A., Williams, R. M., and Sherman, D. H. 2012. Biochemical characterization of NotB as a flavin dependent oxidase in the biosynthesis of notoamide indole alkaloids. *J. Amer. Chem. Soc.* 134(2):788-791.
197. Nusca, T. D., Kim, Y., Maltseva, N., Lee, J. Y., Eschenfeldt, W., Stols, L., Schofield, M., Scaglione, J. B., Dixon, S. D., Oves-Costales, D., Challis, G. L., Hanna, P. C., Pfleger, B. F., Joachimiak, A., and Sherman, D. H. 2011. Functional and structural analysis of AsbB through reconstitution of the multi-component petrobactin biosynthetic pathway from *Bacillus anthracis*. *J. Biol. Chem.* 287(19):16058-16072.
198. Li, S., Anand, K., Tran, H., Yu, F., Finefield, J. M., Sunderhaus, J. D., McAfoos, T. J., Tsukamoto, S., Williams, R. M., and Sherman, D. H. 2012. Comparative analysis of the biosynthetic systems for fungal bicyclo[2.2.2]diazaoctane indole alkaloids: the (+)/(-)-notoamide, paraherquamide and malbrancheamide pathways. *Med. Chem. Commun.*, 3:987-996.
199. Chemler, J. A., Buchholz, T. J., Geders, T. W., Akey, D. L., Rath, C. M., Chlipala, G. E., Smith, J. L., and Sherman, D. H. 2012. Biochemical and structural characterization of germicidin synthase: analysis of a type III polyketide synthase that employs acyl-ACP as a starter unit donor. *J. Amer. Chem. Soc.* 134(17):7359-7366.
200. Anzai, Y., Tsukada, S.-i., Sakai, A., Masuda, R., Harada, C., Domeki, A., Li, S., Kinoshita, K., Sherman, D. H., and Kato, F. 2012. Function of the cytochrome P450 enzymes MycCI and MycG in *Micromonospora griseorubida*, a producer of the macrolide antibiotic mycinamicin. *Antimicrob. Agents Chemother.* 56(7):3648-3656.
201. Bolduc, K. L., Larsen, S. D., and Sherman, D. H. 2012. Efficient, divergent synthesis of cryptophycin unit A analogues. *Chem. Comm.* 48: 6414–6416.
202. Li, S., Kells, P. M., Rutaganira, F. U., Anzai, Y., Kato, F., Sherman, D. H., and Podust, L. M. 2012. Substrate recognition by the multifunctional cytochrome P450 MycG in mycinamicin hydroxylation and epoxidation reactions. *J. Biol. Chem.* 287(45):37880-37890.
203. Podust, L. M., Sherman, D. H. 2012. Diversity of P450 enzymes in the biosynthesis of natural products. *Nat. Prod. Rep.* 29(10):1251-1266.

204. McCarthy, J. G., Eisman, E. B., Kulkarni, S., Gerwick, L., Gerwick, W. H., Wipf, P., Sherman, D. H., Smith, J. L. 2012. Structural basis of functional group activation by sulfotransferases in complex metabolic pathways. *ACS Chem. Biol.* 7(12):1994-2003.
205. Majmudar, C. Y., Højfeldt, J. W., Arevang, C. J., Pomerantz, W. C., Gagnon, J. K., Schultz, P. J., Cesa, L. C., Doss, C. H., Rowe, S. P., Vásquez, V., Tamayo-Castillo, G., Cierpicki, T., Brooks, C. L. 3rd, Sherman, D. H., Mapp, A. K. Sekikaic acid and lobaric acid target a dynamic interface of the coactivator CBP/p300. 2012. *Angew. Chem. Int. Ed. Engl.* 51(45):11258-11262.
206. Kim, D., Nah, J. H., Choi, S. S., Shin, H. S., Sherman, D. H., Kim, E. S. 2012. Biological activities of an engineered tautomycetin analogue via disruption of *tmcR*-encoding hydroxylase in *Streptomyces sp.* CK4412. *J. Ind. Microbiol. Biotechnol.* 39(10):1563-8. Epub 2012 Jun 26.
207. Jacob, R. T., Larsen, M. J., Larsen, S. D., Kirchhoff, P. D., Sherman, D. H., Neubig, R. R. 2012. MScreen: an integrated compound management and high-throughput screening data storage and analysis system. *J. Biomol. Screen.* 17(8):1080-1087.
208. Finefield, J. M., Sherman, D. H., Kreitman, M., Williams, R. M. 2012. Enantiomeric natural products: occurrence and biogenesis. 2012. *Angew. Chem. Int. Ed. Engl.* 51(20):4802-4836.
209. Finefield, J. M., Frisvad, J. C., Sherman, D. H., Williams, R. M. 2012. Fungal origins of the bicyclo[2.2.2]diazaoctane ring system of prenylated indole alkaloids. *J. Nat. Prod.* 75(4):812-833.
210. Lee, M. J., Kong, D., Han, K., Sherman, D. H., Bai, L., Deng, Z., Lin, S., Kim, E. S. 2012. Structural analysis and biosynthetic engineering of a solubility-improved and less-hemolytic nystatin-like polyene in *Pseudonocardia autotrophica*. *Appl. Microbiol. Biotechnol.* 95(1):157-168.
211. Kim, E. J., Lee, J. H., Choi, H., Pereira, A. R., Ban, Y. H., Yoo, Y. J., Park, J. W., Sherman, D. H., Gerwick, W. H., Yoon, Y. J. 2012. Heterologous production of 4-*O*-demethylbarbamide, a marine cyanobacterial natural product. *Org. Lett.* 14(23):5824-5827.
212. Sunderhaus, J. D., McAfoos, T. J., Finefield, J. M., Kato, H., Li, S., Tsukamoto, S., Sherman, D. H., Williams, R. M. 2013. Synthesis and bioconversions of notoamide T: A biosynthetic precursor to stephacidin A and notoamide B. *Org. Lett.* 15(1):22-25
213. Narayan, A. R., Sherman, D. H. 2013. Chemistry. Re-engineering nature's catalysts. *Science* 339(6117):283-284.

214. Zhang, W., Fortman, J. L., Carlson, J. C., Yan, J., Liu, Y., Bai, F., Guan, W., Jia, J., Matainaho, T., Sherman, D. H. and Li, S. 2013. Characterization of the bafilomycin biosynthetic gene cluster from *Streptomyces lohii*. *ChemBioChem*. 14(3):301-306.
215. Schofield, M.M., Sherman, D.H. 2013. Meta-omic characterization of prokaryotic gene clusters for natural product biosynthesis. *Curr. Op. Biotechnol.* 24:1151–1158.
216. Hansen, D. A., Rath, C. M., Eisman, E. B., Narayan, A. R. H., Kittendorf, J. D., Mortison, J. D., Yoon, Y. J., and Sherman, D. H. 2013. Biocatalytic synthesis of pikromycin, methymycin, neomethymycin, novamethymycin, and ketomethymycin. *J. Amer. Chem. Soc.* 135(30):11232-11238.
217. Raveh, A., Delekta, P. C., Dobry, C. J., Schultz, P. J., Blakely, P. K., Tai, A. W., Matainaho, T., Irani, D. N., Sherman, D. H., and Miller, D. H. 2013. Discovery of potent broad spectrum antivirals derived from marine actinobacteria. *PLoS One* 8(12) e82318.
218. Whicher, J. R., Smaga, S. S., Hansen, D. A., Brown, W. C., Gerwick, W. H., Sherman, D. H. and Smith, J. L. 2013. Cyanobacterial polyketide synthase docking domains, a new tool for engineering natural product biosynthesis. *Chem. Biol.* 20(11):1340-1351
219. Larsen, M. J., Fribley, A., Grembecka, J., Homan, K., Larsen, S. D., Mapp, A., Haak, A., Nikolovska-Coleska, Z., Stuckey, J. A., Sun, D., and Sherman, D. H. 2013. The role of HTS in drug discovery at the University of Michigan. *Combinatorial Chemistry & High Throughput Screening* 83(4):440-449. doi: 10.1111/cbdd.12259. PMID:24409957
220. Coates, R. R., Podell, S., Korobeynikov, A., Lapidus, A., Pevzner, P., Sherman, D. H., Allen, E. E., Gerwick, L., Gerwick, W. H. 2013. Characterization of cyanobacterial hydrocarbon composition and distribution of biosynthetic pathways. *PLoS One* 8(12):e82318. doi: 10.1371/journal.pone.0082318.
221. Tripathi, A.; Schofield, M.M.; Chlipala, G.E.; Schultz, P.J.; Yim, I.; Newmister, S.A.; Nusca, T.D.; Scaglione, J.B.; Hanna, P.C.; Tamayo-Castillo, G.; Sherman, D.H. 2014. Baulamycins A and B, broad-spectrum antibiotics identified as inhibitors of siderophore biosynthesis in *Staphylococcus aureus* and *Bacillus anthracis*. *J. Amer. Chem. Soc.* 136(4):1579-1586. doi: 10.1021/ja4115924.
222. Zhang, W., Liu, Y., Yan, J., Cao, S., Bai, F., Yang, Y., Huang, S., Yao, L., Anzai, Y., Kato, F., Podust, L. M., Sherman, D. H., Li. S. 2014. New reactions and products resulting from alternative interactions between the P450 enzyme and redox partners. *J. Am. Chem. Soc.* 136(9):3640-3646. doi: 10.1021/ja4130302.

223. Negretti, S., Narayan, A. R. H., Chiou, K. C., Kells, P. M., Stachowski, J. L., Hansen, D. A., Podust, L. M., Montgomery, J., and Sherman, D. H. 2014. Directing group-controlled regioselectivity in an enzymatic C-H bond oxygenation. *J. Amer. Chem. Soc.* 136(13):4901-4904.
224. Walter, G. M., Raveh, A., Mok, S. A., McQuade, T. J., Arevang, C. J., Schultz, P. J., Smith, M. C., Asare, S., Cruz, P. G., Wisen, S., Matainaho, T., Sherman, D. H., Gestwicki, J. E. 2014. High-throughput screen of natural product extracts in a yeast model of polyglutamine proteotoxicity. *Chem. Biol. Drug Des.* 83(4):440-449. doi: 10.1111/cbdd.12259.
225. Newmister, S. A., and Sherman, D. H. 2014. Crystal structures of acyl carrier protein in complex with two catalytic partners visualize dynamic role in cellular metabolism. *ChemBioChem*. DOI: 10.1002/cbic.201402095.
226. Delekta, P. C., Raveh, A., Sherman, D. H., and Miller, D. J. 2014. Discovery of alphavirus inhibitors derived from natural products, *Curr. Top. Virol.* 11:1-17.
227. Dutta, S., Whicher, J. R., Hansen, D. A., Hale, W. A., Chemler, J. A., Congdon, G. R., Narayan, A. R., Håkansson, K., Sherman, D. H., Smith, J. L., and Skiniotis, G. 2014. Structure of a modular polyketide synthase. *Nature* 510(7506):512-517.
228. Whicher, J. R., Dutta, S., Hansen, D. A., Hale, W. A., Chemler, J. A., Congdon, G. R., Narayan, A. R., Håkansson, K., Sherman, D. H., Smith, J. L., and Skiniotis, G. 2014. Structural rearrangements of a polyketide synthase module during its catalytic cycle. *Nature* 510(7506):560-564.
229. Raveh, A., Schultz, P. J., Aschermann, L., Carpenter, C., Tamayo-Castillo, G., Cao, S., Jon Clardy, J., Neubig, R. R., Sherman, D. H. and Sjögren, B. 2014. Identification of PKC activation as a novel mechanism for RGS2 protein up-regulation through phenotypic screening of natural product extracts. *Mol. Pharm.* 86(4):406-416.