

## *Curriculum Vitae*

### **DAVID HOWARD SHERMAN**

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#### *Education*

B.A. in Chemistry (with Honors) from the University of California, Santa Cruz, CA: 1975 - 1978  
Research Advisor: Professor Phil Crews

Ph.D. in Organic Chemistry from Columbia University, New York City, NY; 1978 - 1981  
Research Advisor: Professor Gilbert Stork

#### *Professional Appointments*

1981 - 1982	Postdoctoral, Yale University, New Haven, CT (R.E. Handschumacher)
1982 - 1984	Postdoctoral, Massachusetts Institute of Technology, Cambridge, MA (H.N. Eisen)
1984 - 1987	Research Scientist, Biogen Research Corp., Cambridge, MA
1987 - 1990	Research Scientist, John Innes Institute, Norwich, U.K.
1990 - 1995	Assistant Professor, University of Minnesota, Department of Microbiology and BioTechnology Institute
1995 - 2000	Associate Professor, University of Minnesota, Department of Microbiology and BioTechnology Institute
1996 - 1998	Director, University of Minnesota, Center for Microbial Physiology and Metabolic Engineering
1997	(sabbatical) Senior Director, ChromaXome Corporation, San Diego, CA
1998 - 2001	Director, Microbiology, Immunology and Cancer Biology Graduate Program
1999 - 2007	Founder and Chief Technical Consultant, Acera Biosciences, Inc.
2000 - 2003	Director, UMN-NIGMS Biotechnology Training Program
2000 - 2003	Professor, University of Minnesota, Department of Microbiology and BioTechnology Institute
2003 - 2007	J. G. Searle Professor, University of Michigan, Department of Medicinal Chemistry
2004 - 2014	Director, Center for Chemical Genomics, Life Sciences Institute, University of Michigan
2003 - present	Professor, University of Michigan, Department of Chemistry
2003 - present	Professor, University of Michigan, Department of Microbiology & Immunology
2007 - present	Hans W. Vahlteich Professor, University of Michigan, Department of Medicinal Chemistry
2011 - 2016	Associate Dean for Research and Graduate Education (College of Pharmacy)
2016 - present	<i>Microbiology Spectrum</i> Advisory Board, American Society for Microbiology Press

- 2017 – present Member Editorial Board, *Journal of Biological Chemistry*, American Society for Biochemistry and Molecular Biology
- 2021 – present Associate Editor, *Engineering Microbiology* (Elsevier Press)

### ***Honors and Awards***

- 1978 American Chemical Society Award for Excellence in Undergraduate Research
- 1978 University of California, Santa Cruz, Honors in the Major (Chemistry)
- 1981 Pegram Award for Excellence in Graduate Research, Columbia University
- 1982 - 1984 National Institutes of Health Postdoctoral Fellowship
- 1984 - 1986 Myron A. Bantrell Postdoctoral Research Fellowship in Molecular Biology
- 1990 - 1992 Eli Lilly Life Sciences Award
- 1992 - 1995 Procter & Gamble University Exploratory Research Program
- 2003 - 2007 John Gideon Searle Jr. Professorship, University of Michigan
- 2005- Co-chair, University of Miami Oceans and Human Health Center External Advisory Committee
- 2007- Hans W. Vahlteich Professorship, University of Michigan
- 2008 Elected Fellow, American Association for the Advancement of Science
- 2009 A. C. Cope Scholar Award, American Chemical Society
- 2009 Charles Thom Award, Society for Industrial Microbiology
- 2015 American Society for Microbiology Distinguished Lecturer (2015-2017)

### ***Select Named Lectureships and Major Symposia:***

- 2006 Gordon Cragg Symposium Lecture, Missouri Botanical Garden
- 2007 Abbott Laboratories Distinguished Lecture, Notre Dame Univ., Dept. of Chemistry & Biochemistry
- 2010 Joseph F. Bunnett Lecture, UC Santa Cruz Department of Chemistry and Biochemistry
- 2010 National Academy of Sciences Peru (Lima, Peru)
- 2012 J. Clarence Karcher Lecture, Department of Chemistry and Biochemistry, University of Oklahoma
- 2012 Plenary Lecture, Korean Society for Microbiology (Seoul, Korea)
- 2012 Plenary Lecture, International Symposium for Natural Product Research, (New York, NY)
- 2012 Plenary Lecture, Directing Biosynthesis III, (Nottingham, UK)
- 2012 Foster Colloquium Lecture, University of Buffalo, Department of Chemistry
- 2012 Plenary Lecture, University of Colorado Symposium on Translating Structural Biology to Medicine
- 2013 Plenary Lecture, Drexel Univ. School of Medicine, Symposium on Metagenomics & Synthetic Biology
- 2014 C. Richard Hutchinson Lecture, University of Wisconsin-Madison
- 2015 Distinguished Organic Research Lecture, University of British Columbia
- 2015 Madeleine Joullié Lecture, University of Pennsylvania, Department of Chemistry
- 2016 Melvin Calvin Lecture, University of California, Berkeley, Department of Chemistry
- 2016 Plenary Lecture, Genetics of Industrial Microorganisms Symposium (Wuhan, China)
- 2017 Plenary Lecture, International Symposium for the Biology of Actinomycetes (Jeju, Korea)
- 2017 Plenary Lecture, Bristol-Myers Squibb Company Green Chemistry Symposium

- 2017 4<sup>th</sup> Annual General Electric Santé Lecture in Biochemistry, McGill University (Montreal, Canada)
- 2019 Keynote Speaker, Copenhagen Bioscience Conference; Natural Products Discovery, Biosynthesis and Application (Novo Nordisk Foundation, Copenhagen, Denmark)
- 2020 Leonard Katz Symposium, University of California, Berkeley (Berkeley, CA)
- 2020 Plenary Lecture, Korean Society for Biotechnology and Bioengineering (virtual via Zoom)
- 2020 Indiana University/Purdue University Indianapolis, Corteva, Eli Lilly Symposium (virtual via Zoom)

### ***Research Experience and Interests***

Undergraduate Research (U.C. Santa Cruz): A novel GC/MS method was developed for the identification and characterization of polysaccharide natural products from marine alga.

Graduate Research (Columbia University): A general method was developed for construction of trans-hydrindanone ring systems, and the total synthesis of 11-keto steroids using an intramolecular Diels-Alder approach.

Postdoctoral Research (Yale University): Studies of the immunosuppressive drug cyclosporin A were performed to determine its effects on thymocyte populations in mice.

Postdoctoral Research (MIT): Studies were conducted on non-H-2 class I molecules of the mouse major histocompatibility complex. Our work showed that specific subpopulations of T cells expressed structurally diverse molecules encoded in the Qa-2 locus.

Biogen Research Corporation (Cambridge, MA): A molecular genetic study was conducted on insulin-specific, class II MHC restricted T cell receptors in mice. Further biochemical and molecular genetic studies were conducted on Qa-2 encoded MHC molecules.

John Innes Institute (Norwich, U.K.): A molecular genetic analysis of type II polyketide synthase systems was conducted to explore the identity and mechanism of construction of complex secondary metabolites in *Streptomyces*.

University of Michigan (Ann Arbor, MI): Research interests include synthetic chemistry, bioorganic and biochemical studies of natural product biosynthetic pathways from marine and terrestrial microbes. Metabolic engineering and microbial genomic and proteomic technologies are being developed and utilized for analysis and production of novel biologically active molecules and identification of drug targets.

### ***Professional Memberships***

- 1978 - Present American Chemical Society
- 1982 - Present American Association for the Advancement of Science
- 1987 - Present American Society for Microbiology
- 2000 – Present Society for Industrial Microbiology
- 2015 – Present American Association of Pharmaceutical Scientists
- 2015 – Present American Society for Pharmacognosy
- 2016 – Present American Heart Association

## **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. PMID: PMC344721
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. PMID: PMC2187513
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. PMID:3926542
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* 233:437-443.
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. PMID: PMC365290
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<sup>b</sup>) encoding the Qa-2 alloantigen," *Journal of Experimental Medicine* 165:1358-1370. PMID: PMC2188306
10. Sherman, David H., Gerald L. Waneck, and Richard A. Flavell. 1988. "Qa-2 antigen encoded by Q7<sup>b</sup> 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. PMID:3335777
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. PMID: PMC279594
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. PMID: PMC401279
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. PMID:2088174
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 glaucescens*," *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. PMID:1508151
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. PMID: PMC207686
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. PMID:1416602
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. PMID: PMC204504
21. Malmberg, L.-H., Hu, W.-S. and D.H. Sherman, 1993. "Precursor flux control through targeted chromosomal insertion of the lysine  $\alpha$ -aminotransferase gene in cephamycin C biosynthesis." *J. Bacteriol.* 175:6916-6924. PMID: PMC206817
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.

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