Exhibit 1

CLAYTON H. HEATHCOCK

Curriculum vitae

Addresses

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Education

San Antonio Public Schools, graduated from Brackenridge High School, 1954 Abilene Christian College; Abilene, TX; B.S., 1958 University of Colorado; Boulder, CO; Ph.D., 1963 Columbia University; New York City; Postdoctoral Fellow, 1963-64



Professional history

Champion Paper & Fibre Company, Pasadena, TX; 1958-60

University of California; Berkeley, CA; Assistant Professor, 1964-70; Associate Professor, 1970-75; Professor, 1975-2004 Vice-Chairman, 1972-77; Chairman, 1986-89; Dean, College of Chemistry, 1999-2005, Interim Dean, 2008; Gilbert Newton Lewis Professor, 2003-05; Chief Scientist, QB3 Berkeley, California Institute for Quantitative Biosciences, 2005-2008; Miller Research Professor, 1982-83, 1991-92; Emeritus Professor, 2005-present

Merck, Sharp & Dohme, Rahway, NJ; Consultant, 1968-78

Abbott Laboratories, Abbott Park, IL; Scientific Advisory Committee, 1986-1997

Medicinal Chemistry A Study Section (NIH); Member, 1979-81; Chair, 1981-83

Organic Chemistry Division of the American Chemical Society; Executive Committee, 1976-79, 1984-86; Chair, 1985

Organic Syntheses Editorial Board, 1980-88; Editor-in-Chief, 1986; Board of Directors, 1992-present

Chair, 1986 Gordon Conference on Stereochemistry

Editor-in-Chief, Journal of Organic Chemistry, 1989-1999

Chair, Chemistry Division, American Association for the Advancement of Science, 2000

Plexxikon, Scientific Advisory Board, 2002-2011

Honors

National Science Foundation Predoctoral and Postdoctoral Fellow, 1961-64

Alfred P. Sloan Foundation Fellow, 1967-69

Humboldt United States Senior Scientist Award, 1978

Miller Research Professor, UC Berkeley, 1982-83, 1991-92

Ernest Guenther Award, American Chemical Society, 1986

Award for Creative Work in Synthetic Organic Chemistry, American Chemical Society, 1990

A. C. Cope Scholar Award, American Chemical Society, 1990

Prelog Medal, ETH, 1991

Fellow of the American Academy of Arts and Sciences, 1991

Pfizer Award in Synthetic Organic Chemistry, 1993

Fellow of the National Academy of Sciences, 1995

Centenary Medal, Royal Society of Chemistry, 1996

H. C. Brown Award, American Chemical Society, 2002

Paul Gassman Award for Distinguished Service, American Chemical Society, 2004

Fellow of the American Chemical Society (Inaugural Class), 2009



Lectureships

Georgia Institute of Technology, DuPont Visiting Professor, 1975

University of Idaho, ITT Rayonier Lecturer, 1976

Rutgers University, Martin Friedman Lecturer, 1977

Emory University, Timmie Lecturer, 1978

University of New Hampshire, Iddles Lecture, 1982

University of Colorado, Liebig Lecture, 1982

University of Montreal, Merck Lecture, 1982

Texas Christian University, Dow Lecturer, 1983

University of Notre Dame, 1985 Reilly Lecturer

Yale University, Bergmann Lecturer, 1987

Greater Manchester Lectureship, University of Salford, 1987

Hope College, 1988 Parke-Davis Lecturer

Swiss Federal Institute of Technology, 1991 Prelog Lecturer

Massachusetts Institute of Technology, 1992 George Büchi Lecturer

University of Virginia; 1992 Robert Lutz Lecturer

Nottingham University 1992 SmithKline Beecham Lecturer

University of Rochester, Victor Chambers Lecturer, 1993

University of Illinois, 1994 C. S. Marvell Lectureship

University of Nebraska, Phi Lamda Upsilon, Rho Chapter Lectureship Award, 1995

University of Michigan, Warner-Lambert Lectureship, 1995

Royal Society of Chemistry Centenary Lecture, Edinburgh, Scotland, 1996

University of Sherbrooke, Bio-Mega/Boehringer Ingelheim Lecture, 1997

R. W. Johnson Research Institute, 1997 PRI Chemistry Lecture, 1997

Texas A&M, Frontiers in Science Lectures, 1997

University of Sydney & University of New South Wales, 1998 Howard Lectures

Kansas University, 50th Frank Burnett Dains Memorial Lecture, 1998

Texas Tech University, 1st Henry Shine Lecture, 1999

Ohio State University, Mack Memorial Award Lecture, 2000

University of Puerto Rico, Pfizer Lecture, 2000

University of California, Davis, R. B. Miller Memorial Lecturer, 2001

University of Texas, Mahler Lecture, 2002

Nagoya University, Hirata Memorial Symposium, 2002

A. I. Meyers Memorial Symposium, 2008

Presiding Officer, 100th Anniversary Symposium of the Organic Chemistry Division of the ACS, 2008

Research interests

Total synthesis of natural products, biomimetic synthesis, development of new synthetic methods, acyclic stereocontrol

Publications

286. C. E. Wagner, Q. Wang, A. Melamed, C. R. Fairchild, R. Wild, C. H. Heathcock, "Synthesis and Biological Evaluation of Analogs of Altohydrin C (Spongistatin 2)," *Tetrahedron*, **2008**, *64*, 124-136.

285. H. S. Christie and C. H. Heathcock, "Total Synthesis of (±)-Halichlorine, (±)-Pinnaic Acid and (±)-Tauropinnaic Acid," *Proc. Natl. Acad. Sci. USA*, **2004**, *101*, 12,079-12,084.

284. M. Brito-Arias, R. Pereda-Miranda and C. H. Heathcock, "Synthesis of Tricolorin F," J. Org. Chem. 2004, 69, 4567-4570.

283. C. H. Heathcock, M. McLaughlin, J. Medina, J. L. Hubbs, G. A. Wallace, R. Scott, M. M. Claffey, C. J. Hayes and G. L. Ott; "Multigram Synthesis of the C29-C51 Subunit and Completion of the Total Synthesis of Altohyrtin C (Spongistatin 2)," *J. Am. Chem. Soc.* **2003**, *125*, 12,844-12,849.

282. J. L. Hubbs and C. H. Heathcock; "A Second-Generation Synthesis of the C1-C28 Portion of the Altohyrtins (Spongistatins)," *J. Am. Chem. Soc.* 2003, 12,836-12,843.

281. B. Kedrowski and C. H. Heathcock, "Thiazoline Ring Formation From 2-Methylcysteines And 2 Halomethyl-



- 280. D. Skyler and C. H. Heathcock, "The Pyridoacridine Family Tree A Useful Scheme for Designing Synthesis and Predicting Undiscovered Natural Products," *J. Nat. Prod.* **2002**, *65*, 1573 1581.
- 279. J. D. Fell and C. H. Heathcock, "Oxidative Fragmentation of Pregna-14,16-dien-20-ones to 14-Hydroxyandrost-15-en-17-ones," *J. Org. Chem.* **2001**, 67, 4742-4746.
- 278. C. M. Blazey and C. H. Heathcock, "Regiochemistry in 1,3-Dipolar Cycloadditions of the Azomethine Ylide Formed from Diethyl Aminomalonate and Paraformaldehyde," *J. Org. Chem.* **2002**, *67*, 298-300.
- 277. D. Skyler and C. H. Heathcock, "A Simple Biomimetic Synthesis of Styelsamine B," Org. Lett. 2001, 3, 4323-4324.
- 276. M. M. Hinman and C. H. Heathcock, "A Synthetic Approach to the *Stemona* Alkaloids", *J. Org. Chem.*, **2001**, *66*, 7751-7756.
- 275. G. A. Wallace and C. H. Heathcock, "Further Studies of the *Daphniphyllum* Alkaloid Polycyclization Cascade," *J. Org. Chem.* **2001**, *66*, 450-454.
- 274. G. A. Wallace, R. W. Scott and C. H. Heathcock, "Synthesis of the C29-C44 Portion of Spongistatin 1 (Altohyrtin A)", *J. Org. Chem.* **2000**, *65*, 4145-4152.
- 273. K. Yamamoto and C. H. Heathcock, "α,β-Epoxy Vinyl Triflates in Pd-Catalyzed Reactions," *Org. Lett.* **2000**, 2, 1709-1712.
- 272. M. A. Toczko and C. H. Heathcock, "Total Synthesis of (±)-Aspidospermidine, "J. Org. Chem. 2000, 65, 2642-2645.
- 271. B. Raimundo and C.H. Heathcock, "Synthesis of a Model for C7-C13 of Lankamycin," Org. Lett. 2000, 2, 27.
- 270. G. R. Ott and C. H. Heathcock, "A Method for Constructing the C44-C55 Side Chain of Altohyrtin C, "Org. Lett. 1999, 1, 1475.
- 269. J. L. Hubbs and C. H. Heathcock, "Total Synthesis of (±)-Isoschizogamine," Org. Lett. 1999, 1, 1315.
- 268. M. M. Claffey, C. J. Hayes and C. H. Heathcock, "Synthesis of the C1-C28 Portion of Spongistatin 1 (Altohyrtin A)," *J. Org. Chem.* **1999**, *64*, 8267.
- 267. J. F. Liu and C. H. Heathcock, "Total Synthesis of (±)-Cylindricines A and B," J. Org. Chem. 1999, 64, 8263.
- 266. S. Chi and C. H. Heathcock, "Total Synthesis of Preussomerins G and I," Org. Lett. 1999, 1, 3.
- 265. A. K. Mapp and C. H. Heathcock, "Total Synthesis of Myxalamide A," J. Org. Chem. 1999, 64, 23.
- 264. K. M. Aubart and C. H. Heathcock, "A Biomimetic Approach to the Discorhabdin Alkaloids: Total Syntheses of Discorhabdins C and E and Dethiadiscorhabdin D," *J. Org. Chem.* **1999**, *64*, 16.
- 263. D.J. Denhart, D. A. Griffith and C. H. Heathcock, "Synthesis of the Tricyclic Core of Sarain A. Use of Formaldehyde in an Intramolecular Grigg Azomethine Ylid Cyclization," *J. Org. Chem.* **1998**, *63*. 9616.
- 262. R. W. Scott, J. Epperson and C. H. Heathcock, "Total Synthesis of Petrosin, Petrosin A and Petrosin B," *J. Org. Chem.* **1998**, *63*, 5001.
- 261. C. H. Heathcock, R. C. D. Brown and T. Norman, "Total Synthesis of Petrosin C and D," *J. Org. Chem.* **1998**, *63*, 5013.
- 260. P.W. Crawford, J. Gross, K. Lawson, C. C. Cheng, Q. Dong, F. Liu, Y. L. Luo, B. G. Szczepankiewicz and C. H. Heathcock, "Electrochemical Properties of Some Biologically Active Quinone Derivatives. Furanquinones, Pyridoquinones and Diplamine, A Cytotoxic Pyridoacridine Alkaloid," *J. Electrochemical Soc.* **1997**, *144*, 3710.
- 259. D. P. Larson and C. H. Heathcock, "The Total Synthesis of Tricolorin A," J. Org. Chem. 1997, 62, 8406.



Case 3:14-cv-05499-PGS-LHG Document 41-4 Filed 07/07/15 Page 5 of 17 PageID: 390

- 258. B. G. Szczepankiewicz and C. H. Heathcock, "A Novel Method for Suppression of the Abnormal Fischer Indole Synthesis," *Tetrahedron* **1997**, *53*, 8853.
- 257. C. J. Hayes and C. H. Heathcock, "A Method for Constructing the C18-C28 Dispiroacetal Moiety of Altohyrtin A," *J. Org. Chem.* **1997**, *62*, 2678.
- 256. R. Parsons and C. H. Heathcock, "Total Synthesis of (-)-Tantazole B," Synlett. 1996, 12, 1168.
- 255. K. A. Marshall, A. K. Mapp and C. H. Heathcock, "Synthesis of a 2,7-Dioxatricyclo[4.2.1.0^{3,8]}nonane; A Model Study for Possible Application in a Synthesis of Dictyoxetane," *J. Org. Chem.* **1996**, *61*, 9135.
- 254. S. Caron, D. Stoermer, A. K. Mapp and C. H. Heathcock, "Total Synthesis of Zaragozic Acid A (Squalestatin S1). Synthesis of a Relay Compound," *J. Org. Chem.* **1996**, *61*, 9126.
- 253. D. Stoermer, S. Caron and C. H. Heathcock, "Total Synthesis of Zaragozic Acid A (Squalestatin S1). Degradation to a Relay Compound and Reassembly of the Natural Product," *J. Org. Chem.* **1996**, *61*, 9115.
- 252. C. H. Heathcock, "Nature Knows Best; An Amazing Reaction Cascade is Uncovered by Design and Discovery," *Proc. Natl. Acad. Sci. USA*, **1996**, *93*, 14323.
- 251. M. C. Claffey and C. H. Heathcock, "A Method for Constructing the C2-C12 Dispiroacetal Moiety of Altohyrtin A," *J. Org. Chem.* **1996**, *61*, 7646.
- 250. R. W. Scott and C. H. Heathcock, "An Efficient Synthesis of 3,4,6-tri-*O*-benzyl-2-*C*-methyl-D-glucal," *Carbohydrate Research*, **1996**, *291*, 205-208.
- 249. M. A. Brimble, C. H. Heathcock and G. N. Nobin, "Synthesis and Ene Reactions of Di-(-)-menthyl Diazene-dicarboxylate," *Tetrahedron: Asymmetry*, **1996**, *7*, 2007.
- 248. D. P. Larson and C. H. Heathcock, "Synthesis of the Macrolactone Disaccharide Subunit of Tricolorin A," *J. Org. Chem.* **1996**, *61*, 5208.
- 247. C. H. Heathcock, "As We Head Into the 21st Century, is There Still Value in Total Synthesis of Natural Products as a Research Endeavor?," in Chemical Synthesis: Gnosis to Prognosis, eds. C. Chatgilialoglu and V. Snieckus, Kluwwer: Dordrecht, 1996.
- 246. S. Caron, A. I. McDonald and C. H. Heathcock, "An Improved Synthesis of 1,6-Anhydro-2,3-di-*O*-benzyl-β-D-glucopyranos-4-ulose," *J. Carbohydrate Res.* **1996**, *281*, 179.
- 245. T. S. McDermott, A. Mortlock and C. H. Heathcock, "Total Syntheses of (-)-Papuamine and (-)-Haliclonadiamine," *J. Org. Chem.* **1996**, *61*, 700.
- 244. B. C. Raimundo and C. H. Heathcock, "Further Studies on the *Anti*-Aldol Reaction of Chiral Imides," *Synlett.* **1995**, 1213.
- 243. C. H. Heathcock, M. Clasby, D. A. Griffith, B. R. Henke and M. J. Sharp, "Progress Toward the Synthesis of Sarain A," *Synlett.* **1995**, 467.
- 242. S. Caron, A. I. McDonald and C. H. Heathcock, "Synthesis of 1-Substituted and 1,4-Disubstituted 2,3-di-*O*-benzyl-1,6-anhydrogalactofuranoses," *J. Org. Chem.* **1995**, *61*, 2780.
- 241. D. A. Griffith and C. H. Heathcock, "Progress Toward the Synthesis of Sarain A: An Unanticipated Rearrangement," *Tetrahedron Letters*, **1995**, *36*, 2381.
- 240. C.H. Heathcock, J. C. Kath and R. B. Ruggeri, "*Daphniphyllum* Alkaloids 16. Total Synthesis of (+)-Codaphniphylline," *J. Org. Chem.* **1995**, *60*, 1120.
- 239. C. H. Heathcock and D. Joe, "Daphniphyllum Alkaloids 17. A Possibly Biomimetic Transformation of the Secodaphnane to the Daphnane Skeleton," J. Org. Chem. 1995, 60, 1131.



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