

COMPREHENSIVE BIBLIOGRAPHY

Al-Ja'fari, A.-H.; Vila, R.; Freixa, B.; Tomi, F.; Casanova, J.; Costa, J.; Cañigüeral, S. *Phytochemistry (Elsevier)* **2011**, *72*, 1406–1413.

Alireza, M. *J. Med. Plant Res.* **2012**, *6*, 820–824.

Armarego, W. L. F.; Chai, C. L. L. *Purification of Laboratory Chemicals*. Elsevier Science: Burlington, MA, 2003; 5th Edition, p 284.

Audenaert, F.; De Keukeleire, D.; Vandewalle, M. *Tetrahedron* **1987**, *43*, 5593–5604.

Bakkeren, F. J. A. D.; Schröer, F.; de Gelder, R.; Klunder, A. J. H.; Zwanenburg, B. *Tetrahedron Lett.* **1998**, *39*, 9527–9530.

Baktharaman, S.; Afagh, N.; Vandersteen, A.; Yudin A. K. *Org. Lett.* **2010**, *12*, 240–243.

Begue, J.-P.; Bonnet-Delpon, D.; Crousse, B. *Synlett* **2004**, 18–29.

Behenna, D. C.; Liu, Y.; Yurino, T.; Kim, J.; White, D. E.; Virgil, S. C.; Stoltz, B. M. *Nature Chem.* **2012**, *4*, 130–133.

Behenna, D. C.; Mohr, J. T.; Sherden, N. H.; Marinescu, S. C.; Harned, A. M.; Tani, K.; Seto, M.; Ma, S.; Novák, Z.; Krout, M. R.; McFadden, R. M.; Roizen, J. L.; Enquist, J. A., Jr.; White, D. E.; Levine, S. R.; Petrova, K. V.; Iwashita, A.; Virgil, S. C.; Stoltz, B. M. *Chem.—Eur. J.* **2011**, *17*, 14199–14223.

Behenna, D. C.; Stoltz, B. M. *J. Am. Chem. Soc.* **2004**, *126*, 15044–15045.

Bélangier, É.; Cantin, K.; Messe, O.; Tremblay, M.; Paquin, J.-F. *J. Am. Chem. Soc.* **2007**, *129*, 1034–1035.

Bélangier, É.; Houzé, C.; Guimond, N.; Cantin, K.; Paquin, J.-F. *Chem. Commun.* **2008**, 3251–3253.

- Bélangier, É.; Pouliot, M.-F.; Courtemanche, M.-A.; Paquin, J.-F. *J. Org. Chem.* **2012**, *77*, 317–331.
- Bélangier, É.; Pouliot, M.-F.; Paquin, J.-F. *Org. Lett.* **2009**, *11*, 2201–2204.
- Bennett, N. B.; Hong, A. Y.; Harned, A. M.; Stoltz, B. M. *Org. Biomol. Chem.* **2012**, *10*, 56–59.
- Berkowitz, W. F.; Wu, Y. *J. Org. Chem.* **1997**, *62*, 1536–1539.
- Bisai, V.; Sarpong, R. *Org. Lett.* **2010**, *12*, 2551–2553.
- Blankenstein, J.; Pfaltz, A. *Angew. Chem. Int. Ed.* **2001**, *40*, 4445–4447.
- Blasdel, L. K.; Myers, A. G. *Org. Lett.* **2005**, *7*, 4281–4283.
- Bordwell, F. G. *Acc. Chem. Res.* **1988**, *21*, 456–463.
- Braun, M.; Meier, T. *Angew. Chem., Int. Ed.* **2006**, *45*, 6952–6955.
- Burger, E. C.; Tunge, J. A. *Org. Lett.* **2004**, *6*, 4113–4115.
- Chattopadhyay, K.; Jana, R.; Day, V. W.; Douglas, J. T.; Tunge, J. A. *Org. Lett.* **2010**, *12*, 3042–3045.
- Chen, H.-D.; He, X.-F.; Ai, J.; Geng, M.-Y.; Yue, J.-M. *Org. Lett.* **2009**, *11*, 4080–4083.
- Christoffers, J.; Baro, A. *Adv. Synth. Catal.* **2005**, *347*, 1473–1482.
- Chung, Y. K.; Lee, B. Y.; Jeong, N.; Hudecek, M.; Pauson, P. L. *Organometallics* **1993**, *12*, 220–223.
- Comins, D. L.; Dehghani, A. *Tetrahedron Lett.* **1992**, *33*, 6299–6302.
- Cool, L. G. *Phytochemistry (Elsevier)* **2001**, *58*, 969–972.
- Crimmins, M. T.; Dedopoulou, D. *Synth. Commun.* **1992**, *22*, 1953–1958.

Dall'Acqua, S.; Linardi, M. A.; Maggi, F.; Nicoletti, M.; Petitto, V.; Innocenti, G.; Basso, G.; Viola, G. *Bioorg. Med. Chem.* **2011**, *19*, 5876–5885.

Dall'Acqua, S.; Maggi, F.; Minesso, P.; Salvagno, M.; Papa, F.; Vittori, S.; Innocenti, G. *Fitoterapia* **2010**, *81*, 1208–1212.

Day, J. J.; McFadden, R. M.; Virgil, S. C.; Kolding, H.; Alleva, J. L.; Stoltz, B. M. *Angew. Chem. Int. Ed.* **2011**, *50*, 6814–6818.

De Broissia, H.; Levisalles, J.; Rudler, H. *Bull. Chim. Soc. Fr.* **1972**, 4314.

De Broissia, H.; Levisalles, J.; Rudler, H. *J. Chem. Soc., Chem. Commun.* **1972**, 855.

Demole, E.; Enggist, P.; Borer, M. C. *Helv. Chim. Acta* **1971**, *54*, 1845–1864.

Desmaële, D.; d'Angelo, J. *J. Org. Chem.* **1994**, *59*, 2292–2303.

Do, N.; McDermott, R. E.; Ragan, J. A. *Org. Synth.* **2008**, *85*, 138–146.

Donnelly, D. M.; Finet, J. P.; Rattigan, B. A. *J. Chem. Soc., Perkin Trans. 1* **1993**, 1729–1735.

Donnelly, D. M. X.; Finet, J.-P.; Rattigan, B. A. *J. Chem. Soc., Perkin Trans. 1* **1993**, 1729–1735.

Dubinina, G. G.; Chain, W. J. *Tetrahedron Lett.* **2011**, *52*, 939–942.

Dubovyk, I.; Pichugin, D.; Yudin, A. K. *Angew. Chem. Int. Ed.* **2011**, *50*, 5924–5926.

Enquist, J. A., Jr.; Stoltz, B. M. *Nature* **2008**, *453*, 1228–1231.

Enquist, Jr., J. A.; Virgil, S. C.; Stoltz, B. M. *Chem. Eur. J.* **2011**, *17*, 9957–9969.

Ephritikhine, M. *Chem. Commun.* **1998**, 2549–2554.

Fairlamb, I. J. S.; Kapdi, A. R.; Lee, A. F. *Org. Lett.* **2004**, *6*, 4435–4438.

- Feldmann, A. *Liebigs Ann. Chem.* **1865**, 135, 236–247.
- Fenain, F.; Médebielle, M.; Rocher, M.; Onomura, O.; Okada, E.; Shibata, D. *J. Fluorine Chem.* **2007**, 128, 1286–1299.
- Flick, A. C.; Padwa, A. *ARKIVOC* **2009**, 4–14.
- Flick, A. C.; Padwa, A. *Tetrahedron Lett.* **2008**, 49, 5739–5741.
- Foley, D. A.; Maguire, A. R. *Tetrahedron* **2010**, 66, 1131–1175.
- Foley, D. A.; O’Leary, P.; Buckley, N. R.; Lawrence, S. E.; Maguire, A. R. *Tetrahedron* **2013**, 69, 1778–1794.
- Foster, J. E.; Nicholson, J. M.; Butcher, R.; Stables, J. P.; Edafiogho, I. O.; Goodwin, A. M.; Henson, M. C.; Smith, C. A.; Scott, K. R. *Bioorg. Med. Chem.* **1999**, 7, 2415–2425.
- Frankel, J. J.; Julia, S.; Richard-Neuville, C. *Bull. Soc. Chim. Fr.* **1968**, 4870–4875.
- Galal, A. M.; Abourashed, E. A.; Ross, S. A.; ElSohly, M. A.; Al-Said, M. S.; El-Feraly, F. S. *J. Nat. Prod.* **2001**, 64, 399–400.
- Gartshore, C. J.; Lupton, D. W. *Angew. Chem. Int. Ed.* **2013**, 52, 4113–4116.
- Geissman, T. A.; Armen, A. *J. Am. Chem. Soc.* **1952**, 74, 3916–3919.
- Geng, Z.; Chen, B.; Chiu, P. *Angew. Chem.* **2006**, 118, 6343–6347; *Angew. Chem. Int. Ed.* **2006**, 45, 6197–6201.
- Ghisalberti, E. L. *Phytochemistry (Elsevier)* **1994**, 37, 597–623.
- Gillingham, D. G.; Hoveyda, A. H. *Angew. Chem., Int. Ed.* **2007**, 46, 3860–3864.
- Greenhill, J. V. *Chem. Soc. Rev.* **1977**, 6, 277–294.
- Grieco, P. A.; Marinovic, N. *Tetrahedron Lett.* **1978**, 19, 2545–2548.

Guerry, P.; Neier, R. *Synthesis* **1984**, 485–488.

Habermehl, G. G.; Wippermann, I. *Zeitschrift fuer Naturforschung, B.: Chemical Sciences* **1991**, *46*, 1421–1424.

Hansen, K. B.; Hsiao, Y.; Xu, F.; Rivera, N.; Clausen, A.; Kubryk, M.; Krska, S.; Rosner, T.; Simmons, B.; Balsells, J.; Ikemoto, N.; Sun, Y.; Spindler, F.; Malan, C.; Grabowski, E. J. J.; Armstrong, J. D., III *J. Am. Chem. Soc.* **2009**, *131*, 8798–8804.

Hashidoko, Y.; Tahara, S.; Mizutani, J. *Phytochemistry (Elsevier)* **1991**, *30*, 3729–3739.

Hasidoko, Y.; Tahara, S.; Mizutani, J. *Phytochemistry (Elsevier)* **1993**, *32*, 387–390.

Hayahi, T.; Kanehira, K.; Hagihara, T.; Kumada, M. *J. Org. Chem.* **1988**, *53*, 113–120.

Hemmerling, H.-J.; Reiss, G. *Synthesis* **2009**, 985–999.

Herrmann, W. A.; Brossmer, C.; Öfele, K.; Reisinger, C.-P.; Priermeier, T.; Beller, M.; Fischer, H. *Angew. Chem. Int. Ed. Engl.* **1995**, *34*, 1845–1848.

Herrmann, W. A.; Brossmer, C.; Öfele, K.; Reisinger, C.-P.; Priermeier, T.; Beller, M.; Fischer, H. *Angew. Chem. Int. Ed. Engl.* **1995**, *34*, 1845–1848.

Hong, A. Y.; Bennett, N. B.; Krout, M. R.; Jensen, T.; Harned, A. M.; Stoltz, B. M. *Tetrahedron* **2011**, *67*, 10234–10248.

Hong, A. Y.; Krout, M. R.; Jensen, T.; Bennett, N. B.; Harned, A. M.; Stoltz, B. M. *Angew. Chem., Int. Ed.* **2011**, *50*, 2756–2760.

Hong, A. Y.; Stoltz, B. M. *Angew. Chem., Int. Ed.* **2012**, *51*, 9674–9678.

Horiguchi, Y.; Kataoka, Y.; Kuwajima, I. *Tetrahedron Lett.* **1989**, *30*, 3327–3330.

Jankowska, R.; Mhehe, G. L.; Liu, H.-J. *Chem. Commun.* **1999**, 1581–1582.

Jin, Z.; Fuchs, P. L. *J. Am. Chem. Soc.* **1994**, *116*, 5995–5996.

Jun, C.-H.; Moon, C. W.; Lim, S.-G.; Lee, H. *Org. Lett.* **2002**, *4*, 1595–1597.

Katritzky, A. R.; Hayden, A. E.; Kirichenko, K.; Pelphrey, P.; Ji, Y. *J. Org. Chem.* **2004**, *69*, 5108–5111.

Kauffmann, T.; Abel, T.; Beirich, C.; Kieper, G.; Pahde, C.; Schreer, M.; Toliopoulos, E.; Wiescholiek, R. *Tetrahedron Lett.* **1986**, *27*, 5355–5358.

Kauffmann, T.; Ennen, B.; Sander, J.; Wiescholiek, R. *Angew. Chem.* **1983**, *95*, 237–238; *Angew. Chem., Int. Ed. Engl.* **1983**, *22*, 244–245.

Kauffmann, T.; Fiegenbaum, P.; Wiescholiek, R. *Angew. Chem.* **1984**, *96*, 500–501; *Angew. Chem., Int. Ed. Engl.* **1984**, *23*, 531–532.

Kauffmann, T.; Möller, T.; Rennefeld, H.; Welke, S.; Wiescholiek, R. *Angew. Chem.* **1985**, *97*, 351–352; *Angew. Chem., Int. Ed. Engl.* **1985**, *24*, 348–350.

Keith, J. A.; Behenna, D. C.; Mohr, J. T.; Ma, S.; Marinescu, S. C.; Oxgaard, J.; Stoltz, B. M.; Goddard, III, W. A. *J. Am. Chem. Soc.* **2007**, *129*, 11876–11877.

Keith, J. A.; Behenna, D. C.; Sherden, N.; Mohr, J. T.; Ma, S.; Marinescu, S. C.; Nielsen, R. J.; Oxgaard, J.; Stoltz, B. M.; Goddard, III, W. A. *J. Am. Chem. Soc.* **2012**, *134*, 19050–19060.

Kiapars, A.; Huang, X.; Buchwald, S. L. *J. Am. Chem. Soc.* **2002**, *124*, 7421–7428.

Kim, D.; Shin, K. J.; Kim, I. Y.; Park, S. W. *Tetrahedron Lett.* **1994**, *35*, 7957–7960.

Kim, H.; Bae, H.; Kim, S.; Kim, D.; Lee, D.; Paton, R. S. *Tetrahedron* **2011**, *67*, 10017–10025.

Krout, M. R. Progress Toward the Asymmetric Total Synthesis of Variocolin and Gas-Phase Studies of the Twisted Amide 2-Quinuclidone. Ph.D. Dissertation, California Institute of Technology, CA, September 2009.

- Krout, M. R.; Mohr, J. T.; Stoltz, B. M. *Org. Synth.* **2009**, *86*, 181–193.
- Kuwano, R.; Ito, Y. *J. Am. Chem. Soc.* **1999**, *121*, 3236–3237.
- Kuwano, R.; Uchida, K.; Ito, Y. *Org. Lett.* **2003**, *5*, 2177–2179.
- Lee, B. H.; Clothier, M. F.; Pickering, D. A. *Tetrahedron Lett.* **1997**, *38*, 6119–6122.
- Lee, K. Y.; GowriSankar, S.; Kim, J. N. *Tetrahedron Lett.* **2004**, *45*, 5485–5488.
- Levine, S. R.; Krout, M. R.; Stoltz, B. M. *Org. Lett.* **2009**, *11*, 289–292.
- Li, Z.; Zhang, S.; Wu, S.; Shen, X.; Zou, L.; Wang, F.; Li, X.; Peng, F.; Zhang, H.; Shao, Z. *Angew. Chem. Int. Ed.* **2013**, *52*, 4117–4121.
- Lightfoot, A.; Schnider, P.; Pfaltz, A. *Angew. Chem. Int. Ed.* **1998**, *37*, 2897–2899.
- Liu, P.; Guo, H.; Wang, W.; Zhang, J.; Li, N.; Han, J.; Zhou, J.; Hu, Y.; Zhang, T.; Liu, Z.; Guo, D. *J. Nat. Prod.* **2007**, *70*, 533–537.
- Lombardo, L. *Tetrahedron Lett.* **1982**, *23*, 4293–4296.
- Love, B. E.; Jones, E. G. *J. Org. Chem.* **1999**, *64*, 3755–3756.
- Luche, J. L. *J. Am. Chem. Soc.* **1978**, *100*, 2226–2227.
- Lund, H.; Bjerrum, J. *Chem. Ber.* **1931**, *64*, 210–213.
- Lutkeke, G.; AlHussainy, R.; Wrigstedt, P. J.; Hue, B. T. B.; de Gelder, R.; van Maarseveen, J. H.; Hiemstra, H. *Eur. J. Org. Chem.* **2008**, 925–933.
- Mahmood, T.; Shreeve, J. M. *Inorg. Chem.* **1986**, *25*, 3830–3837.
- Mander, L. N.; Sethi, S. P. *Tetrahedron Lett.* **1983**, *24*, 5425–5428.
- Marcos, I. S.; Oliva, I. M.; Díez, D.; Basabe, P.; Lithgow, A. M.; Moro, R. F.; Garrido, N. M.; Urones, J. G. *Tetrahedron* **1995**, *51*, 12403–12416.

Marcos, I. S.; Oliva, I. M.; Moro, R. F.; Díez, D.; Urones, J. G. *Tetrahedron* **1994**, *50*, 12655–12672.

Marinescu, S. C.; Nishimata, T.; Mohr, J. T.; Stoltz, B. M. *Org. Lett.* **2008**, *10*, 1039–1042.

Marson, C. M.; Khan, A.; Porter, R. A. *J. Org. Chem.* **2001**, *66*, 4771–4775.

Maruyama, K.; Nagai, N.; Naruta, Y. *J. Org. Chem.* **1986**, *51*, 5083–5092.

McDougal, N. T.; Streuff, J.; Mukherjee, H.; Virgil, S. C.; Stoltz, B. M. *Tetrahedron Lett.* **2010**, *51*, 5550–5554.

McDougal, N. T.; Virgil, S. C.; Stoltz, B. M. *Synlett* **2010**, 1712–1716.

McFadden, R. M.; Stoltz, B. M. *J. Am. Chem. Soc.* **2006**, *128*, 7738–7739.

McUliffe, C. A.; Hosseiny, A.; McCullough, F. P. *Inorg. Chim. Acta.* **1979**, *33*, 5–10.

Médebielle, M.; Onomura, O.; Keirouz, Okada, E.; Yano, H.; Terauchi, T. *Synthesis* **2002**, 2601–2608.

Mehta, G. *Pure Appl. Chem.* **1990**, *62*, 1263–1268.

Mehta, G.; Krishnamurthy, N. *Synth. Commun.* **1988**, *18*, 1267–1274.

Menges, F.; Pfaltz, A. *Adv. Synth. Catal.* **2002**, *344*, 40–44.

Miski, M.; Mabry, T. J. *J. Nat. Prod.* **1986**, *49*, 657–660.

Mohr, J. T.; Behenna, D. C.; Harned, A. M.; Stoltz, B. M. *Angew. Chem. Int. Ed.* **2005**, *44*, 6924–6927.

Mohr, J. T.; Krout, M. R.; Stoltz, B. M. *Nature* **2008**, *455*, 323–332.

Mohr, J. T.; Nishimata, T.; Behenna, D. C.; Stoltz, B. M. *J. Am. Chem. Soc.* **2006**, *128*, 11348–11349.

Mohr, J. T.; Stoltz, B. M. *Chem. Asian J.* **2007**, *2*, 1476–1491.

Mukherjee, H. McDougal, N. T.; Virgil, S. C.; Stoltz, B. M. *Org. Lett.* **2011**, *13*, 825–827.

Naegeli, P.; Kaiser, R. *Tetrahedron Lett.* **1972**, *13*, 2013–2016.

Nakamura, M.; Hajra, A.; Endo, K.; Nakamura, E. *Angew. Chem. Int. Ed.* **2005**, *44*, 7248–7251.

Nakashima, K.; Fujisaki, N.; Inoue, K.; Minami, A.; Nagaya, C.; Sono, M.; Tori, M. *Bull. Chem. Soc. Jpn.* **2006**, *79*, 1955–1962.

Nakashima, K.; Inoue, K.; Sono, M.; Tori, M. *J. Org. Chem.* **2002**, *67*, 6034–6040.

Nanchen, S.; Pfaltz, A. *Chem.—Eur. J.* **2006**, *12*, 4550–4558.

Nasveschuk, C. G.; Rovis, T. *Angew. Chem. Int. Ed.* **2005**, *44*, 3264–3267.

Nasveschuk, C. G.; Rovis, T. *J. Org. Chem.* **2008**, *73*, 612–617.

Nasveschuk, C. G.; Rovis, T. *Org. Biomol. Chem.* **2008**, *6*, 240–254.

Negishi, E.-i.; Tan, Z.; Liou, S.-Y.; Liao, B. *Tetrahedron* **2000**, *56*, 10197–10207.

Nickel, A.; Maruyama, T.; Tang, H.; Murphy, P. D.; Greene, B.; Yusuff, N.; Wood, J. L. *J. Am. Chem. Soc.* **2004**, *126*, 16300–16301.

Pangborn, A. B.; Giardello, M. A.; Grubbs, R. H.; Rosen, R. K.; Timmers, F. J. *Organometallics* **1996**, *15*, 1518–1520.

Park, Y. S.; Little, R. D. *J. Org. Chem.* **2008**, *73*, 6807–6815.

Petrova, K. V.; Mohr, J. T.; Stoltz, B. M. *Org. Lett.* **2009**, *11*, 293–295.

Piers, E.; Grierson, J. R.; Lau, C. K.; Nagakura, I. *Can. J. Chem.* **1982**, *60*, 210–223.

Pigulevskii, G. V.; Kivaleva, V. I. *Doklady Akad. Nauk S.S.S.R.* **1961**, *141*, 1382.

Ponaras, A. A.; Meah, Md. Y. *Tetrahedron Lett.* **1986**, *27*, 4953–4956.

Pouliot, M.-F.; Angers, L.; Hamel, J.-D.; Paquin, J.-F. *Tetrahedron Lett.* **2012**, *53*, 4121–4123.

R. Sebesta, M. G. Pizzuti, A. J. Boersma, A. J. Minnaard, B. L. Feringa, *Chem. Commun.* **2005**, 1711–1713.

Ragan, J. A.; Makowski, T. W.; am Ende, D. J.; Clifford, P. J.; Young, G. R.; Conrad, A. K.; Eisenbeis, S. A. *Org. Process Res. Dev.* **1998**, *2*, 379–381.

Ragan, J. A.; Murry, J. A.; Castaldi, M. J.; Conrad, A. K.; Jones, B. P.; Li, B.; Makowski, T. W.; McDermott, R.; Sitter, B. J.; White, T. D.; Young, G. R. *Org. Process. Res. Dev.* **2001**, *5*, 498–507.

Ramesh, N. G.; Klunder, J. H.; Zwanenburg, B. *J. Org. Chem.* **1999**, *64*, 3635–3641.

Reeves, C. M.; Eidamshaus, C.; Kim, J.; Stoltz, B. M. *Angew. Chem. Int. Ed.* doi: 10.1002/anie.201301815.

Rinderhagen, H.; Mattay, J. *Chem. Eur. J.* **2004**, *10*, 851–874.

Rodríguez, A. D.; Vera, B. *J. Org. Chem.* **2001**, *66*, 6364–6368.

Rösecke, J.; Pietsch, M.; König, W. A. *Phytochemistry (Elsevier)* **2000**, *54*, 747–750.

Sauers, R. R.; Hagedorn, III, A. A.; Van Arnum, S. D.; Gomez, R. P.; Moquin, R. V. *J. Org. Chem.* **1987**, *52*, 5501–5505.

Sawamura, M.; Nagata, H.; Sakamoto, H.; Ito, Y. *J. Am. Chem. Soc.* **1992**, *114*, 2586–2592.

Sawamura, M.; Sudoh, M.; Ito, Y. *J. Am. Chem. Soc.* **1996**, *118*, 3309–3310.

Schnider, P.; Koch, G.; Prétôt, R.; Wang, G.; Bohnen, F. M.; Krüger, C.; Pfaltz, A. *Chem.—Eur. J.* **1997**, *3*, 887–892.

Seto, H.; Fujimoto, Y.; Tatsuno, T.; Yoshioka, H. *Synth. Commun.* **1985**, *15*, 1217–1224.

Seto, M.; Roizen, J. L.; Stoltz, B. M. *Angew. Chem. Int. Ed.* **2008**, *47*, 6873–6876.

Sherden, N. H.; Behenna, D. C.; Virgil, S. C.; Stoltz, B. M. *Angew. Chem. Int. Ed.* **2009**, *48*, 6840–6843.

Sheridan, H. Butterly, S.; Walsh, J. J.; Cogan, M.; Jordan, M.; Nolan, O.; Frankish, N. *Bioorg. Med. Chem.* **2008**, *16*, 248–254.

Snider, B. B.; Ke, Y. *Tetrahedron Lett.* **1989**, *30*, 2465–2468.

Snider, B. B.; Yang, K. *J. Org. Chem.* **1990**, *55*, 4392–4399.

Soucek, M. *Coll. Czech. Chem. Comm.* **1962**, *27*, 2929.

Stork, G.; Danheiser, R. L. *J. Org. Chem.* **1973**, *38*, 1775–1776.

Streuff, J.; White, D. E.; Virgil, S. C.; Stoltz, B. M. *Nature Chem.* **2010**, *2*, 192–196.

Takai, K.; Kakiuchi, T.; Kataoka, Y.; Utimoto, K. *J. Org. Chem.* **1994**, *59*, 2668–2670.

Tamemoto, K.; Takaishi, Y.; Chen, B.; Kawazoe, K.; Shibata, H.; Higuti, T.; Honda, G.; Ito, M.; Takeda, Y.; Kodzhimatov, O. K.; Ashurmetov, O. *Phytochemistry (Elsevier)* **2001**, *58*, 763–767.

Tani, K.; Behenna, D. C.; McFadden, R. M.; Stoltz, B. M. *Org. Lett.* **2007**, *9*, 2529–2531.

Tietze, L. F.; Bergmann, A.; Brill, G.; Brüggemann, K.; Hartfiel, U.; Voß, E. *Chem. Ber.* **1989**, *122*, 83–94.

Tietze, L. F.; Schimpf, R.; Wichmann, J. *Chem. Ber.* **1992**, *125*, 2571–2576.

Tilstam, U.; Weinmann, H. *Org. Proc. Res. Dev.* **2002**, *6*, 906–910.

Trost, B. M.; Bream, R. N.; Xu, J. *Angew. Chem. Int. Ed.* **2006**, *45*, 3109–3112.

Trost, B. M.; Dong, L.; Schroeder, G. M. *J. Am. Chem. Soc.* **2005**, *127*, 2844–2845.

Trost, B. M.; Jiang, C. *Synthesis* **2006**, 369–396.

Trost, B. M.; Pissot-Soldermann, C.; Chen, I. *Chem. Eur. J.* **2005**, *11*, 951–959.

Trost, B. M.; Pissot-Soldermann, C.; Chen, I.; Schroeder, G. M. *J. Am. Chem. Soc.* **2004**, *126*, 4480–4481.

Trost, B. M.; Radinov, R.; Grenzer, E. M. *J. Am. Chem. Soc.* **1997**, *119*, 7879–7880.

Trost, B. M.; Schöffner, B.; Osipov, M.; Wilton, D. A. A. *Angew. Chem. Int. Ed.* **2011**, *50*, 3548–3551.

Trost, B. M.; Schroeder, G. M. *Chem. Eur. J.* **2005**, *11*, 174–184.

Trost, B. M.; Schroeder, G. M. *J. Am. Chem. Soc.* **1999**, *121*, 6759–6760.

Trost, B. M.; Schroeder, G. M.; Kristensen, J. *Angew. Chem. Int. Ed.* **2002**, *41*, 3492–3495.

Trost, B. M.; Waser, J.; Meyer, A. *J. Am. Chem. Soc.* **2007**, *129*, 14556–14557.

Trost, B. M.; Xu, J. *J. Am. Chem. Soc.* **2005**, *127*, 2846–2847.

Trost, B. M.; Xu, J.; Schmidt, T. *J. Am. Chem. Soc.* **2009**, *131*, 18343–18357.

Tsuda, Y.; Kaneda, M.; Tada, A.; Nitta, K.; Yamamoto, Y.; Iitaka, Y. *J. Chem. Soc., Chem. Commun.* **1978**, 160–161.

Tsuji, J.; Minami, I. *Acc. Chem. Res.* **1987**, *20*, 140–145.

Tsuji, J.; Minami, I.; Shimizu, I. *Tetrahedron Lett.* **1983**, *24*, 1793–1796.

Tsuji, J.; Shimizu, I.; Minami, I.; Ohashi, Y.; Sugiura, T.; Takahashi, K. *J. Org. Chem.* **1985**, *50*, 1523–1529.

Tunge, J. A.; Burger, E. C. *Eur. J. Org. Chem.* **2005**, 1715–1726.

Ukai, T.; Kawazura, H.; Ishii, Y.; Bonnet, J. J.; Ibers, J. A. *J. Organomet. Chem.* **1974**, *65*, 253–266.

Urones, J. G.; Marcos, I. S.; Garrido, N. M.; Teresa, J. D. P.; Martin, A. S. F. *Phytochemistry (Elsevier)* **1989**, *28*, 183–187.

Vandewalle, M.; De Clercq, P. *Tetrahedron* **1985**, *41*, 1765–1831.

Volchkov, I.; Park, S.; Lee, D. *Org. Lett.* **2011**, *13*, 3530–3533.

Weaver, J. D.; Recio, A., III; Grenning, A. J.; Tunge, J. A. *Chem. Rev.* **2011**, *111*, 1846–1913.

White, D. E.; Stewart, I. C.; Grubbs, R. H.; Stoltz, B. M. *J. Am. Chem. Soc.* **2008**, *130*, 810–811.

White, D. E.; Stewart, I. C.; Seashore-Ludlow, B. A.; Grubbs, R. H.; Stoltz, B. M. *Tetrahedron* **2010**, *66*, 4668–4686.

Xu, T.; Li, C.-c.; Yang, Z. *Org. Lett.* **2011**, *13*, 2630–2633.

Yamasaki, M. *J. Chem. Soc., Chem. Commun.* **1972**, 606b–607.

Yang, S.-P.; Cai, Y.-J.; Zhang, B.-L.; Tong, L.-J.; Xie, H.; Wu, Y.; Lin, L.-P.; Ding, J.;

Yue, J.-M. *J. Med. Chem.* **2008**, *51*, 77–85.

Yang, S.-P.; Dong, L.; Wang, Y.; Wu, Y.; Yue, J.-M. *Bioorg. Med. Chem.* **2003**, *11*, 4577–4584.

Yang, Z.; Li, Y.; Pattenden, G. *Tetrahedron* **2010**, *66*, 6546–6549.

You, S.-L.; Hou, X.-L.; Dai, L.-X.; Zhu, X.-Z. *Org. Lett.* **2001**, *3*, 149–151.

Yu, J.-Q.; Wu, H.-C.; Corey, E. J. *Org. Lett.* **2005**, *7*, 1415–1417.

Zalkow, L. H.; Clower, M. G., Jr.; Gordon, M. M.; Gelbaum, L. T. *J. Nat. Prod.* **1980**, *43*, 382–394.

Zalkow, L. H.; Clower, M. G., Jr.; Smith, M. G. J.; VanDerveer, D.; Bertrand, J. A. *J. Chem. Soc., Chem. Commun.* **1976**, 374–375.

Zhang, W.; Pugh, G. *Tetrahedron* **2003**, *59*, 3009–3018.

INDEX

1

14-*p*-anisoyloxydauc-4,8-diene 699, 701, 713, 730

9

9-epi-presilphiperfolan-1-ol 231

A

acid..... 704, 706, 708

acoradiene..... 706

acorane..... 703

acylation..... 8, 19, 211, 231, 718–19

acylcyclopentene 698, 706, 721

 derivatization 226–32

 synthesis..... 216–25

aldol reaction 715, 721

allocyathin B₂..... 14

allyl enol carbonate..... 3

amide

 Weinreb 227

Aspergillus terreus 703

aspidospermidine 15

aspterric acid..... 703

B

Baylis–Hillman reaction..... 19

biogenesis..... 702

bisabolane 703

Buchwald 8

C

carbazolone..... 15

carotol702, 709, 727, 728, 768

carvone..... 708

CeCl₃ 223, 234, 714, 720

Claisen rearrangement706, 708

Comins' reagent 229

crotonaldehyde 227

cycloaddition

[2 + 2] 705, 709, 710

Diels–Alder228, 231

cycloheptanedione..... 211

cycloheptanones

β-hydroxycycloheptanones 215–17

cycloheptenone..... 215, 715, 716

derivatization238–41, 724–25

synthesis..... 233–38

D

Dai..... 4

daucenal..... 699, 700, 729

daucene..... 699, 700, 704–13

daucol 709

Daucus carota 702

Dean–Stark 211

dehydrolinalool 706

Desmaële.....	8, 25
Dess–Martin periodinane (DMP).....	19
Diels–Alder.....	228, 231
dihydropyridinone.....	12–13, 51–64
dione	
acyclic.....	224, 715, 721
cyclic	211, 223, 718, 719
diosphenol ether.....	20–21, 77–90

E

effects

stereoelectronic	2, 20
steric	2, 17, 20, 21
π -stacking.....	20

electron

poor/withdrawing group	5, 7, 8, 11, 15, 17
rich group	5, 11, 12, 15, 17
enaminone	7–12, 25–50
enone.....	20–21, 40, 77–90
epoxidation	724–25, 726
epoxydaucenal A	700, 729
epoxydaucenal B.....	699, 700, 726, 729

F

Feldmann.....	700
---------------	-----

functional group

acetyl	8, 11, 17
benzoyl.....	5, 8, 17, 18, 19

benzyl	15
benzyloxy	18
Boc.....	8, 14, 15
cyclohexoyl	17
methyl.....	18
naphthoyl.....	17
phenyl.....	14
pivaloyl.....	17
tosyl	8
a'-functionality.....	2, 17

G

Ghisalberti	700, 703
Grob fragmentation.....	710

H

hamigeran B	14
hamigerans C and D.....	229
Hashidoko	700, 729
Hayashi	4
Heck.....	227, 229
Herrmann–Beller palladacycle.....	229
hexane–toluene	5, 9
Hiemstra	8
Hou	4
hybridization	17
hydrazone	227
hydride reduction	

DIBAL	220, 222
LiAlH ₄	215, 722
Luche	222, 233, 707, 730
I	
imide	2, 5, 18, 69–76
indolone	15
iodoenone	8, 19, 33, 79
isotope studies	
¹³ C	703
¹⁴ C	702, 703
Ito	4
K	
Kaiser	703, 704, 706
Kauffmann	728
ketone	2, 3
α-hydroxyketone	728
β-hydroxyketone	215–17, 714, 716, 728
β-ketoester	3–4, 210–11
kopsihainanine A	15
Kuwajima	717
L	
lactam	2, 5, 7, 64–69
Levisalles	704, 708
limonene	706, 707
Lindlar's catalyst	706, 707

	909
liphigal	209
lithium naphthalenide	725, 727
Little.....	705, 711
Lombardo olefination	728
Love.....	377
Lupton	15

M

McMurry coupling	729
mechanism	216, 224, 235
Meerwein–Ponndorf–Verley reduction	710
Mehta	704, 707
metathesis.....	228, 238, 239, 714, 721, 725
Grubbs 2nd generation catalyst.....	238
Grubbs–Hoveyda 2nd generation catalyst	238, 721
Grubbs–Hoveyda 3rd generation catalyst	228
methyl vinyl ketone.....	227
Miski.....	701

N

Naegeli	703, 704, 706
natural products	
14- <i>p</i> -anisoyloxydauc-4,8-diene	699, 701, 730
9 β -presilphiperfolan-1 α -ol	232
acoradiene	706
alloyathin B2.....	14
aspidospermidine.....	15
aspterric acid	703

carotol.....	702, 709, 727, 728
daucenal	699, 700, 729
daucene	699, 700
daucol.....	709
epoxydaucenal A.....	700, 729
epoxydaucenal B	699, 700, 726, 729
hamigeran B.....	14
kopsihainanine A.....	15
liphigal.....	209
tormesol	722, 726
nerolidyl diphosphate	703
Nozaki–Hiyama–Kishi coupling	19

O

organometallic addition	223, 234, 707
Grignard reagent.....	706, 708, 709, 714, 716
organolithium reagent	712, 726
oxime.....	227

P

palladium	
Pd ₂ (dba) ₃	3
Pd ₂ (pmdba) ₃	212
Pauson–Khand reaction.....	241
PHOX	1, 9, 21, 40, 41, 59, 212, 245, 277, 285
(S)-(CF ₃) ₃ - <i>t</i> -BuPHOX.....	2, 5, 212
(S)- <i>t</i> -BuPHOX.....	1, 3, 5, 212
glyPHOX.....	279

naphthyl ligand 67	213, 282
PPTS	211
presilphiperfolan-1-ol.....	231

Q

quaternary stereocenter

 α -quaternary

carbazolone	15
enone	19
indolone	15
ketone.....	1, 3, 5
vinyllogous ester	13, 231
γ -quaternary	218, 233, 237
acylcyclopentene	210
cycloheptenone.....	210, 716

R

regioselectivity	19, 720
retro-aldol.....	216, 224, 705, 709, 714, 720, 725, 727
retrosynthetic analysis	704–5, 713
ring contraction	216–25
Rubottom oxidation.....	231

S

samarium diiodide	725, 727
screen	
enaminone	9–12, 40
lactam	5
ring contraction.....	218

selenium dioxide	722, 726, 729
semipinacol rearrangement.....	704, 708
Seto.....	705, 709
Shao.....	15
siloxenone	710, 717–21
silyl enol ether	3–4, 718
sodium hydride	8, 719
Soucek.....	702
Stoltz.....	1, 4
Stork–Danheiser	210, 215
substitution	
β -position	
acylcyclopentene	223, 227
cycloheptenone.....	234–37
T	
TBME.....	5, 9, 11
TFE.....	218, 220, 222, 224, 715, 725
THF.....	5, 9
toluene	5, 9
tormesol.....	722, 726, 758
triisopropylsilyl triflate.....	719
Trost.....	4, 13
Trost ligands.....	4, 13
Tsuda	702
Tsuji.....	3

U

- unusual reactivity 215, 240, 727
Urones 721, 722–23

V

- Vandewalle 705, 710
vinylogous
 amide *See* enaminone, dihydropyridinone, carbazolone, or indolone
 ester 7–12, 13–14, 41, 210–14, 215
 thioester 7, 12, 13–14

W

- Wagner–Meerwein rearrangement 704, 709
Wilkinson's catalyst 227, 726, 729
Wittig olefination 231, 726, 728
work-up parameters 234–37, 716

Y

- Yamasaki 704, 706

ABOUT THE AUTHOR

Nathan Bruce Bennett was born in Arlington, VA to Dr. Bruce and Karen Bennett and is the oldest of four children. His family moved to California when he was eight. From a young age, Nathan loved school and learning and decided to study chemistry while a student at Moorpark High School.

Nathan attended Brigham Young University (BYU) for his undergraduate education. Following his freshman year, he took a two-year hiatus to volunteer as a full time missionary for his church in Arizona. Upon returning to BYU, he began research in the lab of Profs. Noel Owen and Steven Wood where he isolated bioactive metabolites generated by endophytic fungi and bacteria found in a poisonous plant (Black Henbane). With the retirement of Prof. Owen and the completion of the sophomore organic series, he transitioned to Prof. Steven Fleming's group and investigated a photochemical rearrangement of cinnamyl acetate. This project introduced him to organic synthesis and mechanistic studies as he prepared an isotopically labeled compound that was analyzed by NMR spectroscopy. Together, these research experiences fostered a connection between bioactive natural products and organic synthesis, ultimately directing his graduate emphasis of study. Nathan graduated magna cum laude with a B.S. in Chemistry from BYU in 2008.

Upon completion of his bachelor's degree, Nathan moved to the California Institute of Technology where he pursued his Ph.D. under the guidance of Professor Brian M. Stoltz. His graduate research focused on the development of new palladium-catalyzed allylic alkylation methodology and application of these methods toward various molecular architectures and the total synthesis of several daucane sesquiterpenes. While at Caltech, Nathan met and married his wife, Chanel, and their son Eli was born a few years later. In July 2013, Nathan will begin a postdoctoral position in the laboratories of Prof. Vy Dong at UC Irvine.