

Louis C. Morrill: CV & Publications List (Updated February 2020)

Group Webpages: <https://blogs.cardiff.ac.uk/themorrigroup/>

Mailing Address: School of Chemistry, Cardiff University, Main Building, Park Place, Cardiff, CF10 3AT, UK.

Contact Details: MorrillL.C@cardiff.ac.uk, 029208 75840

Date of Birth: 22nd May 1987, Wick, UK

Summary of Education & Career:

08/2018 – Present Senior Lecturer in Synthetic Organic Chemistry, Cardiff University, UK

06/2015 – 07/2018 University Research Fellow in Synthetic Organic Chemistry, Cardiff University, UK

06/2014 – 06/2015 Postdoctoral Research Associate in Synthetic Organic Chemistry, UC Berkeley, USA

10/2010 – 06/2014 PhD in Organic Chemistry and Catalysis, University of St Andrews, UK

10/2005 – 06/2010 MChem (Hons) 1st Class, Chemistry with Industrial Experience, University of St Andrews, UK

Research Area Summary:

Research in the Morrill group is focused on inventing new reactions in organic chemistry and developing sustainable catalytic methodologies for synthesis. The utility and impact of our research will ultimately be exemplified through its application in the total synthesis of natural products and molecules of biological significance.

Core Research Areas:

- Synthetic organic electrochemistry
- Borrowing hydrogen catalysis
- Main group catalysis (in collaboration with Dr Rebecca Melen)
- Cyanamide chemistry (in collaboration with Syngenta)

Collaborations:

- Enabling tools (flow and mechanochemistry) for catalysis (collaboration led by Dr Duncan Browne)
- Organocatalytic artificial enzymes (collaboration led by Dr Louis Luk)

Current Research Group Members:

- 2 x Postdoctoral research associates
- 10 x PhD students

Former Group Members:

- 2 x Postdoctoral research associates
- 2 x PhD students
- 3 x Catalysis CDT research sabbatical students
- 18 x Final-year BSc/MSc/MChem project students
- 7 x Cardiff undergraduate internship students
- 7 x International visiting students

Research Grant Income:

Attracted ~£1.2M of external funding (~£950k as PI/Host) to support 4 postdoctoral research associates (EPSRC, Leverhulme Trust, Royal Society), 4 PhD studentships (KESS 2, AstraZeneca iCASE, Schlumberger Foundation, British Council) and multiple undergraduate research students (RSC, IBCarb, RISE) since becoming PI at Cardiff University (06/2015). External funding includes:

- 2020-2023, Newton-Mosharafa Fund, British Council
£118,340 (Elsherbeni as Scholar, Morrill as Host, 1 x 3-year PhD studentship and consumables)
- 2019-2022, Schlumberger Foundation Faculty for the Future Scholarship
£113,683 (Kustiana as Scholar, Morrill as Host, 1 x 3-year PhD studentship and consumables)
- 2019-2022, AstraZeneca CASE Award
£29,400 (Morrill as PI, 1 x 3.5-year PhD studentship and consumables)
- 2019-2021, The Royal Society Newton International Fellowship (NIF\R1\180099)
£100,500 (Verma as Fellow, Morrill as Host, 1 x 2-year postdoctoral research associate, equipment and consumables)
- 2018-2021, KESS 2 Knowledge Economy Skills Scholarships
£49,873 (Browne as PI, Morrill as Col, 1 x 3-year PhD studentship and consumables)

- 2017-2020, EPSRC Standard Research Grant (EP/R006504/1)
£395,968 (Morrill as PI, Browne and Wirth as Col, 1 x 3-year postdoctoral research associate, equipment, consumables and funds for conference organisation on enabling technologies)
- 2017-2020, The Leverhulme Trust Research Project Grant (RPG-2017-195)
£179,600 (Luk as PI, Morrill as Col, 1 x 3-year postdoctoral research associate and consumables)
- 2016-2019, The Leverhulme Trust Research Project Grant (RPG-2015-361)
£175,992 (Morrill as PI, Melen as Col, 1 x 3-year postdoctoral research associate and consumables)
- 2016-2018, Various undergraduate studentships (RSC, IBCarb, RISE)
£6,100 (Morrill as PI or Col, stipends for 2-3 month undergraduate student placements)
- 2016-2017, The Royal Society Research Grant (RG150466)
£11,665 (Morrill as PI, Chiral HPLC columns for analysis of scalemic mixtures)

Recognition:

- 2017-2018, Nominated for Enriching Student Life Awards – Most Effective Teacher (2017), Most Uplifting Member of Staff (2018) and Personal Tutor of the Year (2018 and 2019)
- 2010-2014, Carnegie Trust PhD Studentship
- 2012, Syngenta Postgraduate Scholarship
- 2010, Miller Prize for “Highest Achieving Student in the Faculty of Science”, University of St Andrews
- 2010, Irvine Jubilee Prize for “Highest Achieving Student in Honours Chemistry”, University of St Andrews
- 2010, F. D. Gunstone Prize for “Best MChem Organic Chemistry Project”, University of St Andrews

Teaching:

- Module coordinator of 1st year organic chemistry
- 1st year organic chemistry: *Substitution and Elimination Reactions* (*New Course*, 8 lectures)
- 2nd year organic chemistry: *Carbonyl and Alkene Chemistry* (*New Course*, 8 lectures)
- Final-year/taught postgraduate organic chemistry: *Organocatalysis* (*New Course*, 6 lectures)
- MRes Catalysis CDT: *Organocatalysis* (*New Course*, 3-hour workshop)
- MChem and BSc final-year undergraduate research project supervisor
- Tutorial support for 1st, 2nd and 3rd year organic chemistry courses
- Industrial placement/year abroad supervisor for undergraduate students

Administration and other positions of responsibility:

- Member of working panel to restructure the undergraduate organic chemistry course at Cardiff University (years 1-4)
- Personal tutor for undergraduate and postgraduate students
- Molecular Synthesis section representative on the Safety Committee, School Seminar Programme Committee, Learning & Teaching Committee and the Cardiff Chemistry Conference Committee
- Lead academic organiser for the annual Cardiff International Catalysis Summer School
- Lead organiser of the Molecular Synthesis Seminar Series
- Grant peer reviewer for EPSRC, MRC, ANR and FWF.
- Publication peer reviewer for various journals including *Science*, *J. Am. Chem. Soc.*, *Angewandte Chemie*, *ACS Catal.*, *Nat. Catal.*, *ChemSusChem.*, *Org. Lett.*, *Chem. Commun.* and *Adv. Synth. Catal.*
- Regular participation in school open days and UCAS days
- Served as external examiner (PhD = 5, MSc = 1) and internal examiner (PhD = 5, MPhil = 2)

Invited Lectures

38. Departmental Seminar, AstraZeneca, Macclesfield, UK, 11th November 2020.
37. Departmental Seminar, University of Greenwich, UK, 23rd September 2020.
36. Departmental Seminar, University of Bath, UK, 15th September 2020.
35. Departmental Seminar, University of Leicester, UK, 6th November 2019.
34. Gregynog Synthesis Workshop, Newtown, UK, 11-13th September 2019.
33. DaM Annual Meeting, University of York, UK, , 4th July 2019.
32. CDT Catalysis Annual Conference, Cardiff University, UK, 5th June 2019.
31. Departmental Seminar, Imperial College London, UK, 29th January 2019.
30. Departmental Seminar, GSK, Stevenage, UK, 13th December 2018.
29. Departmental Seminar, Nottingham University, UK, 14th November 2018.
28. Departmental Seminar, Nottingham Trent University, UK, 7th November 2018.
27. Gregynog Synthesis Workshop, Newtown, UK, 12-14th September 2018.
26. UNICAMP International Research Workshop, Campinas, Brazil, 5-9th March 2018.

25. Departmental Seminar, Technische Universität Berlin, Germany, 16th February 2018.
24. RSC Organic Division South West Regional Meeting, University of Bristol, UK, 17th January 2018.
23. Departmental Seminar, Queen Mary University of London, UK, 3rd November 2017.
22. Xiamen International Workshop, Xiamen, China, 18-22nd September 2017.
21. Gregynog Synthesis Workshop, Newtown, UK, 13-15th September 2017.
20. Enabling Technologies for Synthesis DaM Event, Loughborough University, UK, 4-5th September 2017.
19. Departmental Seminar, University of Manchester, UK, 23rd June 2017.
18. Supporting Synthesis & Self-Assembly DaM ECR Event, Liverpool, UK, 19-20th June 2017.
17. 253rd ACS National Meeting & Exposition, San Francisco, USA, 4th April 2017.
16. 253rd ACS National Meeting & Exposition, San Francisco, USA, 3rd April 2017.
15. Departmental Seminar, Theravance Biopharma, San Francisco, USA, 31st March 2017.
14. Departmental Seminar, Aarhus University, Denmark, 23rd February 2017.
13. 15th Cardiff Chemistry Conference, Cardiff University, UK, 10th May 2016.
12. 3rd Molecular Synthesis Section Meeting, Cardiff University, UK, 14th April 2016.
11. Gregynog Synthesis Workshop, Newtown, UK, 9-11th September 2015.
10. IX J-NOST Conference, IISER Bhopal, India, 4-6th December 2013.
9. Final Year PhD Symposium, University of St Andrews, UK, 5th September 2013.
8. 23rd International Symposium: Synthesis in Organic Chemistry, Oxford University, UK, 22-25th July 2013.
7. 14th Tetrahedron Conference, Vienna, Austria, 25-28th June 2013.
6. 24th Regional Postgraduate Symposia on Organic Chemistry, Dundee University, UK, 16th April 2013.
5. 41st RSC Scottish Regional Organic Division Meeting, St Andrews University, UK, 12th December 2012.
4. Syngenta Postgraduate Scholarship Awards Meeting, Bracknell, UK, 11th December 2012.
3. RSC Organic Division Poster Symposium, Burlington House, London, UK, 3rd December 2012.
2. ISACS7: Challenges in Organic Chemistry, Edinburgh University, UK, 12-15th June 2012.
1. Lilly Organic Chemistry Postgraduate Prize Day, Erl Wood Manor, Windlesham, UK, 3rd October 2011.

Published Work:

Total citations ~1.2k; average citations per paper = 29; papers cited >50 times = 9; H-index = 19.
Independent and Collaborative Publications (Cardiff University):

40. "Manganese-Catalyzed One-Pot Conversion of Nitroarenes into N-Methylarylamines Using Methanol", B. G. Reed-Berendt, N. Mast and L. C. Morrill*, *Eur. J. Org. Chem.*, 2020, DOI: 10.1002/ejoc.201901854. [Invited contribution to the YourJOC Talents Special Issue]. (Citations = 0)
39. "N-Heterocyclic Carbene Acyl Anion Organocatalysis by Ball-Milling", W. I. Nicholson, A. C. Seastram, S. A. Iqbal, B. G. Reed-Berendt, L. C. Morrill* and D. L. Browne*, *ChemSusChem*, 2020, **13**, 131-135. [Hot Topic: Organocatalysis]. (Citations = 0)
38. "Manganese-Catalyzed Electrochemical Deconstructive Chlorination of Cycloalkanols via Alkoxy Radicals", B. D. W. Allen, M. D. Hareram, A. C. Seastram, T. McBride, T. Wirth, D. L. Browne* and L. C. Morrill*, *Org. Lett.*, 2019, **21**, 9241-9246. (Citations = 1)
37. "One-Pot Conversion of Allylic Alcohols to α -Methyl Ketones via Iron-Catalyzed Isomerization-Methylation", D. E. Latham, K. Polidano, J. M. J. Williams and L. C. Morrill*, *Org. Lett.*, 2019, **21**, 7914-7918. (Citations = 1)
36. "Iron-Catalyzed Borrowing Hydrogen β -C(sp³)-Methylation of Alcohols", K. Polidano, J. M. J. Williams and L. C. Morrill*, *ACS Catal.*, 2019, **9**, 8575-8580. [Highlighted in *Synfacts*, 2019, 15, 1280] (Citations = 7)
35. "Iron-Catalyzed Borrowing Hydrogen C-Alkylation of Oxindoles Using Alcohols", M. B. Dambatta, K. Polidano, A. D. Northey, J. M. J. Williams and L. C. Morrill*, *ChemSusChem*, 2019, **12**, 2345-2349. (Citations = 6)
34. "Manganese-Catalyzed N-Alkylation of Sulfonamides Using Alcohols", B. G. Reed-Berendt and L. C. Morrill*, *J. Org. Chem.*, 2019, **84**, 3715-3724. [Highlighted in *Organic Chemistry Portal*]. (Citations = 8)
33. "Recent Advances in Homogeneous Borrowing Hydrogen Catalysis Using Earth-Abundant First Row Transition Metals", B. G. Reed-Berendt, K. Polidano and L. C. Morrill*, *Org. Biomol. Chem.*, 2019, **17**, 1595-1607. [Invited contribution to the New Talent special issue]. (Citations = 52)
32. "FLP-Catalyzed Transfer Hydrogenation of Silyl Enol", I. Khan, B. G. Reed-Berendt, R. L. Melen* and L. C. Morrill*, *Angew. Chem. Int. Ed.*, 2018, **57**, 12356-12359. (Citations = 14)

31. "Synthesis and Reactivity of N-Allenyl Cyanamides", J. N. Ayres, M. T. J. Williams, G. J. Tizzard, S. J. Coles, K. B. Ling and L. C. Morrill*, *Org. Lett.*, 2018, **20**, 5282-5285. (Citations = 5)
30. "Reactivity and Selectivity of Iminium Organocatalysis Improved by a Protein Host", A. R. Nödling, K. Świderek, R. Castillo, J. W. Hall, A. Angelastro, L. C. Morrill, Y. Jin, Y-H. Tsai, V. Moliner* and L. Y. P. Luk*, *Angew. Chem. Int. Ed.*, 2018, **57**, 12478-12482. (Citations = 7)
29. "Iron-Catalyzed Methylation using the Borrowing Hydrogen Approach", K. Polidano, B. D. W. Allen, J. M. J. Williams and L. C. Morrill*, *ACS Catal.*, 2018, **8**, 6440-6445. (Citations = 58)
28. "Exploring Tandem Ruthenium-Catalyzed Hydrogen Transfer and S_NAr Chemistry", K. Polidano, B. G. Reed-Berendt, A. Basset, A. J. A. Watson, J. M. J. Williams and L. C. Morrill*, *Org. Lett.*, 2017, **19**, 6716-6719. (Citations = 2)
27. "Frustrated Lewis Pair (FLP)-Catalyzed Hydrogenation of Aza-Morita-Baylis-Hillman Adducts and Sequential Organo-FLP Catalysis", I. Khan, M. Manzotti, G. J. Tizzard, S. J. Coles, R. L. Melen* and L. C. Morrill*, *ACS Catal.*, 2017, **7**, 7748-7752. (Citations = 9)
26. "Deoxycyanamidation of Alcohols using N-Cyano-N-phenyl-p-methylbenzenesulfonamide (NCTS)", J. N. Ayres, M. W. Ashford, Y. Stöckl, V. Prudhomme, K. B. Ling, J. A. Platts and L. C. Morrill*, *Org. Lett.*, 2017, **19**, 3835-3838. (Citations = 11)
25. "N-Cyanation of Secondary Amines using Trichloroacetonitrile", J. N. Ayres, K. B. Ling and L. C. Morrill*, *Org. Lett.*, 2016, **18**, 5528-5531. (Citations = 8)

Postdoctoral Publications (UC Berkeley with Prof. Richmond Sarpong):

24. "A Benzyne-Insertion Approach to Hetisine-Type Diterpenoid Alkaloids: Synthesis of Cossonidine (Davisine)", K. G. M. Kou, J. J. Pflueger, T. Kiho, L. C. Morrill, E. L. Fisher, K. Clagg, T. P. Lebold, J. K. Kisunzu* and R. Sarpong*, *J. Am. Chem. Soc.*, 2018, **140**, 8105-8109. [Highlighted in *Synfacts*, **2018**, **14**, 890] (Citations = 22)
23. "A Magnesiate Addition/Ring-Expansion Strategy to Access the 6-7-6 Tricyclic Core of Hetisine-type C20-Diterpenoid Alkaloids", J. J. Pflueger, L. C. Morrill, J. N. deGruyter, M. A. Perea and R. Sarpong*, *Org. Lett.*, 2017, **19**, 4632-4635. (Citations = 4)
22. "Palladium-catalyzed β -Selective C(sp³)-H Arylation of N-Boc-Piperidines", A. Miller and O. Baudoin*; Checked by L. C. Morrill and R. Sarpong, *Org. Synth.*, 2015, **92**, 76-90. (Citations = 2)

Postgraduate Publications (University of St Andrews with Prof. Andrew D. Smith):

21. "Catalytic Generation of Ammonium Enolates and Related Tertiary Amine-Derived Intermediates, Mechanism and Stereochemical Models (n to π)", K. N. Van, L. C. Morrill, A. D. Smith and D. Romo, Booke Chapter within "Lewis Base Catalysis in Organic Synthesis", ed. E. Vedejs and S. E. Denmark, Wiley, Weinheim, 2016. (Citations = 15)
20. "Enantioselective Synthesis of 3,5,6-Substituted Dihydropyranones and Dihydropyridinones using Isothiourea-Mediated Catalysis", D. G. Stark, L. C. Morrill, D. B. Cordes, A. M. Z. Slawin, T. J. C. O'Riordan and A. D. Smith*, *Chem. Asian J.*, 2016, **11**, 395-400. [Special Issue: Catalysis and Transformation of Complex Molecules]. (Citations = 12)
19. "Asymmetric Isothiourea-Catalysed Formal [3+2] Cycloadditions of Ammonium Enolates with Oxaziridines", S. R. Smith, C. Fallan, J. E. Taylor, R. McLennan, D. S. B. Daniels, L. C. Morrill, A. M. Z. Slawin and A. D. Smith*, *Chem. Eur. J.*, 2015, **21**, 10530-10536. (Citations = 27)
18. "Organocatalytic Michael Addition-Lactonisation of Carboxylic Acids using α,β -Unsaturated Trichloromethyl Ketones as α,β -Unsaturated Ester Equivalents", L. C. Morrill, D. G. Stark, J. E. Taylor, S. R. Smith, J. A. Squires, A. C. A. D'Hollander, C. Simal, P. Shapland, T. J. C. O'Riordan and A. D. Smith*, *Org. Biomol. Chem.*, 2014, **12**, 9016-9027. [Highlighted in *Synfacts*, **2015**, **11**, 315]. [Part of themed collection: 2014 Hot Articles in Organic and Biological Chemistry]. (Citations = 22)
17. "Organocatalytic Lewis base functionalisation of carboxylic acids and esters via ammonium/azolium enolates", L. C. Morrill and A. D. Smith, *Chem. Soc. Rev.*, 2014, **43**, 6214-6226. [One of the most accessed articles in *Chem. Soc. Rev.* during June 2014]. (Citations = 91)

16. "Lewis Base Catalysed Asymmetric [2+2] Cycloadditions", A. D. Smith, J. Douglas, L. C. Morrill and E. Richmond, Book Chapter within "Methods and Applications of Cycloaddition Reactions in Organic Synthesis", ed. N. Nishiwaki, Wiley, New York, 2014. (Citations = 1)
15. "Isothiourea-Mediated Asymmetric Functionalization of 3-Alkenoic Acids", L. C. Morrill, S. M. Smith, A. M. Z. Slawin and A. D. Smith*, *J. Org. Chem.*, 2014, **79**, 1640-1655. (Citations = 50)
14. "2-Arylacetic anhydrides as ammonium enolate precursors", L. C. Morrill, L. A. Ledingham, J-P. Couturier, J. Bickel, A. Harper, C. Fallan and A. D. Smith*, *Org. Biomol. Chem.*, 2014, **12**, 624-636. (Citations = 37)
13. "Isothiourea-Mediated One-Pot Synthesis of Functionalized Pyridines", D. G. Stark, L. C. Morrill, P-P. Yeh, A. M. Z. Slawin, T. J. C. O'Riordan and A. D. Smith*, *Angew. Chem. Int. Ed.*, 2013, **52**, 11642-11646. [Selected as a Hot Paper] [Highlighted in *Synfacts*, **2013**, 9, 1344] [Highlighted in *Org. Chem. Highlights*, **2014**, June 23]. (Citations = 84)
12. "Isothiourea-mediated asymmetric Michael-lactonisation of trifluoromethylenones: a synthetic and mechanistic study", L. C. Morrill, J. Douglas, T. Lebl, D. J. Fox, A. M. Z. Slawin and A. D. Smith*, *Chem. Sci.*, 2013, **4**, 4146-4155. [One of the most accessed articles in *Chem. Sci.* during August 2013]. [Part of themed collection: Celebrating the 2014 RSC Prize and Award Winners]. (Citations = 77)
11. "Stereospecific Asymmetric N-Heterocyclic Carbene (NHC)-Catalyzed Redox Synthesis of Trifluoromethyl Dihydropyranones and Mechanistic Insights", A. T. Davies, J. E. Taylor, J. Douglas, C. J. Collett, L. C. Morrill, C. Fallan, A. M. Z. Slawin and A. D. Smith*, *J. Org. Chem.*, 2013, **78**, 9243-9257. (Citations = 52)
10. "Catalytic asymmetric α -amination of carboxylic acids using isothiureas", L. C. Morrill, T. Lebl, A. M. Z. Slawin and A. D. Smith*, *Chem. Sci.*, 2012, **3**, 2088-2093. (Citations = 66)
9. "Organocatalytic Functionalisation of Carboxylic Acids: Isothiourea-Catalysed Asymmetric Intra- and Intermolecular Michael Addition-Lactonisations", D. Belmessieri, L. C. Morrill, C. Simal, A. M. Z. Slawin and A. D. Smith*, *J. Am. Chem. Soc.*, 2011, **133**, 2714-2720. [Highlighted in *Synfacts*, **2011**, 4, 436]. (Citations = 216)

Undergraduate Publications (University of St Andrews):

8. "Regiodivergent Lewis base-promoted O- to C-carboxyl transfer of furanyl carbonates", C. D. Campbell, C. Joannesse, L. C. Morrill, D. Philp and A. D. Smith*, *Org. Biomol. Chem.*, 2015, **13**, 2895-2900. [Part of themed collection: 2015 Hot Articles in *Organic and Biological Chemistry*]. (Citations = 3)
7. "Efficacious, inhaled PDE4 inhibitors with low emetic potential and long duration of action for the treatment of COPD", C. De Savi*, R. J. Cox*, D. Warner, A. R. Cook, M. R. Dickinson, A. McDonough, L. C. Morrill, B. Parker, G. Andrews. S. Young, P. S. Gilmour, R. Riley and M. S. Dearman, *J. Med. Chem.*, 2014, **57**, 4661-4676. (Citations = 20)
6. "Isothiourea-Mediated Asymmetric O- to C-Carboxyl Transfer of Oxazolyl Carbonates: Structure-Selectivity Profiles and Mechanistic Studies", C. Joannesse, C. P. Johnston, L. C. Morrill, P. A. Woods, M. Kieffer, T. A. Nigst, H. Mayr, T. Lebl, D. Philp, R. A. Bragg and A. D. Smith*, *Chem. Eur. J.*, 2012, **18**, 2398-2408. (Citations = 31)
5. "Isothiourea-catalyzed asymmetric O- to C-carboxyl transfer of furanyl carbonates", C. Joannesse, L. C. Morrill, C. D. Campbell, A. M. Z. Slawin and A. D. Smith*, *Synthesis*, 2011, 1865-1879. (Citations = 19)
4. "Isothiourea-Catalyzed Asymmetric C-Acylation of Silyl Ketene Acetals", P. A. Woods, L. C. Morrill, R. A. Bragg and A. D. Smith*, *Chem. Eur. J.*, 2011, **17**, 11060-11067. (Citations = 29)
3. "Isothiourea-Mediated Stereoselective C-acylation of Silyl Ketene Acetals", P. A. Woods, L. C. Morrill, T. Lebl, A. M. Z. Slawin, R. A. Bragg and A. D. Smith*, *Org. Lett.*, 2010, **12**, 2660-2663. (Citations = 43)
2. "Unexpected Rearrangement Leading to Formation of a 1,3-Bis(triphenylphosponio)prop-1-en-3-ylidyl Carboxylate", R. A. Aitken*, L. P. Cleghorn, R. M. Leitch, L. C. Morrill and A. M. Z. Slawin, *Eur. J. Org. Chem.*, 2010, **17**, 3211-3214. (Citations = 4)

1. "*N-heterocyclic carbene catalysed O- to C-carboxyl transfer of indolyl and benzofuranyl carbonates*", J. E. Thomson, A. F. Kyle, C. Concellón, K. A. Gallagher, P. Lenden, L. C. Morrill, A. J. Miller, C. Joannesse, A. M. Z. Slawin and A. D. Smith*, *Synthesis*, 2008, 2805-2818. (Citations = 37)