Philip T. **Leftwich**

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Education

PhD — *Norwich*
University of East Anglia — *2009 - 2013*
- Thesis: Male Reproductive Success and Population Control in the Mediterranean Fruit Fly.

BSc (Hons) / Zoology — *Durham*
Durham University — *2004 - 2008*

Employment

Associate Professor of Genetics and Data Science — *Norwich*
Biological Sciences, University of East Anglia — *2022 - Current*

Lecturer — *Norwich*
Biological Sciences, University of East Anglia — *2019 - 2022*

Postdoctoral Researcher/Project Manager — *Pirbright*
Arthropod Genetics Group, Pirbright Institute — *2016 - 2019*

Lecturer in Ecology and Biodiversity — *Norwich*
Biological Sciences, University of East Anglia — *2015 - 2016*

Postdoctoral Researcher — *Norwich*
Biological Sciences, University of East Anglia — *2012 - 2015*

Qualifications

HEA Fellow — *York*
Higher Education Academy — *2016*

Teaching

Module organiser	Data Science for Biologists; Genetics
Lecturer	Genes, Genomes and Genomics; Science Communication; Skills for Biologists; Microbiology;Biodiversity; Evolution, Behaviour and Ecology; Medical Entomology (LSHTM)
Tutor	Field Ecology; Evolution, Health and Disease
Outreach	Bioinformatics Virtual Coordination Network (https://biovcnet.github.io/); The Brilliant Club, Villier's Park Educational Trust, Royal Society Summer Science

Administrative Duties

Chair of Extenuating Circumstances Panel — *University of East Anglia*
School of Biological Sciences — *2021-present*

Statistician - Animal Welfare Ethical Review Body — *University of East Anglia*
Faculty of Science — *2021-present*

Student Partnership Officer — *University of East Anglia*
School of Biological Sciences — *2019-present*

Professional Service

Article reviews	Behavioural ecology and sociobiology; BMC biology; Insects; Journal of Evolutionary Biology; Phil. Transactions of the Royal Society; PLoS Genetics; Proceedings of the Royal Society; Molecular Ecology
Grant reviews	BBSRC Fellowships; GWIS National Fellowships
Professional memberships	Genetics Society; Royal Statistical Society; Vectorbite; Nationwide Network of BioScience Educators; Advance HE; SORTEE
Panel memberships	Open University Programme Validation; SORTEE Education and Outreach Committee

Consultancy

OUP *Oxford*

Author *2020-present*

- Maths Skills for A-level Biology 2nd Edition: a practical handbook: https://amzn.to/3xjUUlN
- The Scientific Method and Experimental Design (In prep) - part of the Oxford Biology Primers book series

Benchling *San Francisco*

Consultant and content developer *2020-2022*

- Consultancy and speaking
- Content developer: https://www.benchling.com/educators/

Physalia Courses *Online*

Instructor *2019-present*

- An Introduction to Population Genomics: analysing NGS data and SNP calling
- An introduction to R and Statistics for Ecologists

OCR *Oxford*

Programme Developer *2016-present*

- Maths for Biology: Online workshops for secondary school teachers

Presentations

Education

Heads of University Biosciences *Norwich*

Speaker *2022*

- "The fundamentals of data management and analysis"

AMSCUE *Online*

Speaker *2021*

- "Online molecular biology labs"

OCR Science Forum *Online*

Speaker *2021*

- The impact of COVID-19, present and future

HUBS Bio-Summit *Online*

Speaker *2020*

- "Using electronic lab notebooks to improve reflective practises in learning"

Dry Labs Real Science *Online*

Speaker *2020*

- "Molecular biology tools for online teaching"

Higher Education Academy Talks *Online*

Invited Speaker *2020*

- "Synchronous on-line teaching in the biomedical sciences - Discovering how coronavirus PCR testing works"

Research

UNIPI International Workshop on Multidisciplinary studies for sustainable agriculture *Pisa*

Speaker *2021*

- "Evolutionary biology and genetic pest control"

UEA CEEC Rebellion *Online*

Plenary *2021*

- "Genetic pest management: knocking out pest species with applied genetics"

Entomological Society of America *Vancouver*

Invited Speaker *2018*

- "Localised gene drives for insect population control"

Society of Molecular Biology & Evolution *Vienna*

Speaker *2015*

- "The microbiome of the Mediterranean fruit fly"

Department of Genetics *Cambridge*

Invited Speaker *2014*

- "An introduction to genetic pest management"

Evolution *Ottawa*

Speaker *2012*

- "What makes a successful male? Strategies for improved insect pest management"

Grants

BBSRC *University of East Anglia*

Gifts that keep on giving: maternal effects and insect pest control *2020*

- PhD studentship
- Co-supervisor
- Funding amount 100,000 GBP

BBSRC *University of East Anglia*

CRISPR Cas9 based sex-conversion gene drives for pest insect management *2019*

- PhD studentship
- Co-supervisor
- Funding amount 100,000 GBP

Entomological Society of America *Pirbright Institute*

Entomology Program Enhancement *2018*

- Travel
- Funding amount 1000 GBP

Infravec *Pirbright Institute*

Introduction to bioinformatics resources for vector genomics studies *2018*

- Training
- Funding amount 460 GBP

BBSRC *University of East Anglia*

Colonization, Domestication and Population control in pest insects *2012*

- Research grant
- Researcher Co-I
- Funding amount 376,000 GBP

Publications

Google Scholar metrics:

h-index: 14

publications: 25

Refereed Journal Papers

Darrington, M., **Leftwich,** P., Holmes, N., Friend, L., Clarke, N., Worsley, S., Margaritopolous, J., Hogenhout, S., Hutchings, M., & Chapman, T. (2022). Characterisation of the symbionts in the Mediterranean fruitfly gut. *Microbial Genomics*.

Siddall, A., Harvey-Samuel, T., Chapman, T., & **Leftwich,** P. T. (2022). Manipulating insect sex determination pathways for genetic pest management: Opportunities and challenges. *Frontiers in Bioengineering and Biotechnology*, *10*.

Xu, X., Harvey-Samuel, T., Siddiqui, H. A., Ang, J. X. D., Anderson, M. E., Christine M Reitmayer, E. L., **Leftwich,** P. T., You, M., & Alphey, L. (2022). Toward a CRISPR-Cas9-based gene drive in the diamondback moth *Plutella xylostella*. *The CRISPR Journal*.

Harvey-Samuel, T., Xu, X., Lovett, E., Dafa'alla, T., Walker, A., Norman, V., Carter, R., Teal, J., Akilan, L., **Leftwich,** P., & Alphey, L. (2021). Engineered expression of the invertebrate-specific scorpion toxin AaHIT reduces adult longevity and female fecundity in the diamondback moth *Plutella xylostella*. *Pest Management Science*, *77*(7), 3154–3164.

Leftwich, P., Spurgin, L., Harvey-Samuel, T., Thomas, C., Paladino, L., Edgington, M., & Alphey, L. (2021). Genetic pest management and the background genetics of release strains. *Philosophical Transactions of the Royal Society B*, *376*(1818).

Tully, B., Buongiorno, J., Cohen, A., Cram, J., Garber, A., Hu, S., Krinos, A., **Leftwich,** P., Marshall, A., Sieradzki, E., Speth, D., Suter, E., Trivedi, C., Valentin-Alvarado, L., Weissman, J., Lee, M., Alexander, H., Collins, R., Pachiadaki, M., Rhodes, A., & Decatur, W. (2021). The Bioinformatics Virtual Coordination Network: An open-source and interactive learning environment. *Frontiers in Education*.

Anderson, M., Purcell, J., Verkuijl, S., Norman, V., **Leftwich,** P., Harvey-Samuel, T., & Alphey, L. (2020). Expanding the CRISPR toolbox in Culicine mosquitoes: In vitro validation of pol III promoters. *ACS Synthetic Biology*, *9*(3), 678–681.

Leftwich, P., Edgington, M., & Chapman, T. (2020). Transmission efficiency drives host–microbe associations. *Proceedings of the Royal Society B*, *287*(1934).

Tng, P., Paladino, L., Verkuijl, S., Purcell, J., Merits, A., **Leftwich,** P., Fragkoudis, R., Noad, R., & Alphey, L. (2020). Cas13b-dependent and Cas13b-independent RNA knockdown of viral sequences in mosquito cells following guide RNA expression. *Communications Biology*, *3*(1), 1–9.

Leftwich, P., Nash, W., Friend, L., & Chapman, T. (2019). Contribution of maternal effects to dietary selection in Mediterranean fruit flies. *Evolution*, *73*(2), 278–292.

Redford, K., Brooks, T., Macfarlane, N., Adams, J., Alphey, L., Bennet, E., Delborne, J., Eggermont, H., Esvelt, K., Kingirl, A., Kokotovich, A., Kolodziejczyk, B., Kuiken, T., Mead, A., Oliva, M., Perello, E., Slobodian, L., Thizy, D., Tompkins, D., Winter, G., Campbell, K., Elsensohn, J., Holmes, N., Farmer, C., Keitt, B., **Leftwich,** P., Maloney, T., Masiga, D., Newhouse, A., Novak, B., … Oppen, M. (2019). *Genetic frontiers for conservation: An assessment of synthetic biology and biodiversity conservation*.

Leftwich, P., & Chapman, T. (2018). Testing for assortative mating by diet in *Drosophila melanogaster*. *Bio-Protocol*, *8*(20).

Leftwich, P., Clarke, N., Hutchings, M., & Chapman, T. (2018). Gut microbiomes and reproductive isolation in *drosophila* (vol 114, pg 12767, 2017). *Proceedings of the National Academy of Sciences*, *115*(10).

Leftwich, P., Clarke, N., Hutchings, M., & Chapman, T. (2018). Reply to obadia et al.: Effect of methyl paraben on host–microbiota interactions in *Drosophila melanogaster*. *Proceedings of the National Academy of Sciences*, *201805499*.

Leftwich, P., Edgington, M., Harvey-Samuel, T., Paladino, L., Norman, V., & Alphey, L. (2018). Recent advances in threshold-dependent gene drives for mosquitoes. *Biochemical Society Transactions*, *46*(5), 1203–1212.

Leftwich, P., Hutchings, M., & Chapman, T. (2018). Diet, gut microbes and host mate choice: Understanding the significance of microbiome effects on host mate choice requires a case by case evaluation. *Bioessays*, *40*(12).

Leftwich, PT., Clarke, NV. E., Hutchings, MI., & Chapman, T. (2018). Reply to rosenberg et al.: Diet, gut bacteria, and assortative mating in *Drosophila melanogaster*. *Proceedings of the National Academy of Sciences, Https://Doi.org/*, *10*.

Leftwich, P., Nash, W., Friend, L., & Chapman, T. (2017). Adaptation to divergent larval diets in the medfly, *Ceratitis capitata*. *Evolution*, *71*(2), 289–303.

Longdon, B., Day, J., Schulz, N., **Leftwich,** P., Jong, Ma., Breuker, C., Gibbs, M., Obbard, D., Wilfert, L., Smith, S., McGonigle, J., Houslay, T., Wright, L., Livraghi, L., Evans, L., Friend, L., Chapman, T., Vontas, J., Kambouraki, N., & Jiggins, F. (2017). Vertically transmitted rhabdoviruses are found across three insect families and have dynamic interactions with their hosts. *Proceedings of the Royal Society B: Biological Sciences*, *284*(1847).

Leftwich, P., Bolton, M., & Chapman, T. (2016). Evolutionary biology and genetic techniques for insect control. *Evolutionary Applications*, *9*(1), 212–230.

Leftwich, P., Koukidou, M., Rempoulakis, P., Gong, H.-F., Zacharopoulou, A., Fu, G., Chapman, T., Economopoulos, A., Vontas, J., & Alphey, L. (2014). Genetic elimination of field-cage populations of Mediterranean fruit flies. *Proceedings of the Royal Society B: Biological Sciences*, *281*(1792).

Alphey, L., Ant, T., Koukidou, M., **Leftwich,** P., Rempoulakis, P., Vontas, J., Economopoulos, A., & Chapman, T. (2012). Genetic improvements to sterile-male control of tephritid fruit flies. *Tephritid Workers of Europe and Middle East (TEAM), Https://Nucleus.iaea.org/Sites/Naipc/Twd/Newsletters/11th*, *2*.

Leftwich, P., Edward, D., Alphey, L., Gage, M., & Chapman, T. (2012). Variation in adult sex ratio alters the association between courtship, mating frequency and paternity in the lek-forming fruitfly *Ceratitis capitata*. *Journal of Evolutionary Biology*, *25*(9), 1732–1740.

Working Papers under Revision or Review

Anderson, M. A. E., Gonzalez, E., Edgington, M. P., De Ang, J. X., Purusothaman, D.-K., Shackleford, L., Nevard, K., Verkuijl, S. A., Harvey-Samuel, T., **Leftwich,** P. T., Esvelt, K., & Alphey, L. (2022). A multiplexed, confinable CRISPR/Cas9 gene drive propagates in caged aedes aegypti populations. *bioRxiv*.

Books

Penny, J., & **Leftwich,** P. (2018). *Maths skills for A-level biology* [Book]. OUP (Oxford).

Skills

Programming	R (advanced); Python (Intermediate); Julia
Reproducible Reports	Markdown/RMarkdown; R Shiny Apps, LaTex, Binder, Pandoc
DevOps	Git, AWS
Front-End	HTML/CSS, WordPress
Back-end	Unix/Linux Shell
Quantitative	Linear Mixed Modelling; Supervised/Unsupervised Machine Learning; Bayesian; High-throughput data analysis, Dimensionality Reduction; Amplicon analysis; SNP analysis
Lab skills	Insect rearing; Behavioural Analysis; Transgenics; CRISPR/Cas9; Molecular cloning; Cell Culture; Microbiology

- This CV is a reproducible project; all the source code behind this CV is available on this GitHub repo.