

Thomas M. Houslay

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Nationality: British

Education

Ph.D. Biology, 2010-2014.
'Causes of adaptive differences in age-dependent reproductive effort'
Awarded 2014.
University of Stirling.
Advisor: Dr Luc F. Bussière.

M.Sc. Bioinformatics, 2004.
Awarded with distinction.
University of Manchester.

B.Sc. (Hons) Computer Science, 2002.
Upper second class.
University of Lancaster.

Employment history

Associate research fellow, May 2015 – *present.*
Wilson Group, Centre for Ecology and Conservation.
University of Exeter.

My postdoctoral research focuses on the evolutionary genetics of the vertebrate stress response. I use the Trinidadian guppy, *Poecilia reticulata*, with studies of behaviour and hormones to determine phenotypic, among-individual and genetic variances and correlations among traits.

Statistics course instructor, Dec 2014 – *present.*
'Advancing in R', various venues.
PR Statistics.

Alongside Dr. Luc Bussière, I teach a 5-day residential workshop on statistical analysis using R, aimed at ecologists and evolutionary biologists. The course bridges the gap between basic R coding and more advanced statistical modelling, providing an introduction to model selection and simplification, mixed effects models, generalised linear models, and nonlinear models. I write and deliver course material, and provide instruction and assistance to attendees.

Research assistant, Nov 2014 – April 2015.
Butterfly Genetics Laboratory, Dept. of Zoology.
University of Cambridge.

I am curating a research database for the study of *Heliconius* butterflies, involving checking taxonomic and geographic records, finding and correcting errors in existing data.

Editorial research assistant (part-time), Oct – Dec 2014.
Large Animal Research Group, Dept. of Zoology.
University of Cambridge.

I assisted Prof. Tim Clutton-Brock with final edits and organisation of his forthcoming 'Mammalian

Societies' textbook. My role consisted mainly of sourcing, editing and gaining permissions for figures, in addition to general proofreading and referencing of the text.

Technician (part-time), Sept – Nov 2014.

Evolutionary Genetics Laboratory.

University of Cambridge.

My role in Dr. Frank Jiggins' lab was to provide technical support, focusing on an artificial selection experiment on *Drosophila* immune response. I also assisted in a large-scale project studying population dynamics of viruses in different host species, involving both field and molecular work on *Pararge aegeria* butterflies.

Computational biologist, 2006–2010.

Advanced Science & Technology Laboratory.

AstraZeneca UK.

As a member of a high-throughput screening laboratory, my focus was on writing custom algorithms for the phenotypic profiling and analysis of cellular, tissue section, and angiogenesis images. I also developed algorithms for analysing time-series and 3D image data.

Research assistant, 2005–2006.

Bioinformatics Research Centre.

University of Glasgow.

In addition to providing general bioinformatics support within the Institute of Biomedical and Life Sciences, I pursued a research project on computational protein-ligand docking, and designed and implemented a secure, web-based, multi-user electronic lab-book system for stem cell researchers.

Analyst programmer, 2004.

Bioinformatics Group.

Novartis CH.

As a research project contributing a large part of my M.Sc. degree, I developed an online interface for a major bioinformatics resource. After completion of my degree, I was retained for an additional period at the Novartis headquarters in Basel to work on several different types of projects.

Publications

Relevant peer-reviewed publications:

Houslay, T. M., J. Hunt, M. C. Tinsley, L. F. Bussière. (2015). Sex differences in the effects of juvenile and adult diet on age-dependent reproductive effort. *Journal of Evolutionary Biology* 28: 1067–1079.

Houslay, T. M. and L. F. Bussière. (2012). Sexual Selection and Life History Allocation. *eLS 2012, John Wiley & Sons, Ltd: Chichester.*

Other peer-reviewed publications:

Isherwood, B. J., R. E. Walls, M. Roberts, T. M. Houslay, S. R. Brave, S. T. Barry, N. O. Carragher. (2013). High-content analysis to leverage a robust phenotypic profiling approach to vascular modulation. *Journal of Biomolecular Screening* 18(10), 1246-1259.

Caie, P. D., R. E. Walls, A. Ingleston-Orme, S. Daya, T. M. Houslay, R. Eagle, M. E. Roberts, N. O. Carragher. (2010). High-content phenotypic profiling of drug response signatures across distinct cancer cells. *Molecular Cancer Therapeutics* 9(6), 1913–1926.

Xu T. R., G. S. Baillie, N. Bhari, T. M. Houslay, A. M. Pitt, D. R. Adams, W. Kolch, M. D. Houslay, G. Milligan. (2008). Mutations of beta-arrestin 2 that limit self-association also interfere with interactions with the beta(2)-adrenoceptor and the ERK1/2 MAPKs: implications for beta(2)-adrenoceptor signalling via the ERK1/2 MAPKs. *Biochemical Journal* 413, 51–60.

Smith, K. J., G. S. Baillie, E. I. Hyde, X. Li, T. M. Houslay, A. McCahill, A. J. Dunlop, G. B. Bolger,

- E. Klussmann, D. R. Adams, M. D. Houslay. (2007). H-1 NMR structural and functional characterisation of a cAMP-specific phosphodiesterase-4D5 (PDE4D5) N-terminal region peptide that disrupts PDE4D5 interaction with the signalling scaffold proteins, arrestin and RACK1. *Cellular Signalling* 19(12), 2612–2624.
- Baillie, G. S., D. R. Adams, N. Bhari, T. M. Houslay, S. Vadrevu, D. Meng, X. Li, A. Dunlop, G. Milligan, G. B. Bolger, E. Klussmann, M. D. Houslay. (2007). Mapping binding sites for the PDE4D5 cAMP-specific phosphodiesterase to the N- and C-domains of beta-arrestin using spot-immobilized peptide arrays. *Biochemical Journal* 404, 71–80.
- Huston, E., I. Gall, T. M. Houslay, M. D. Houslay. (2006). Helix-1 of the cAMP-specific phosphodiesterase PDE4A1 regulates its phospholipase-D-dependent redistribution in response to release of Ca²⁺. *Journal of Cell Science* 119(18), 3799–3810.
- Huston, E., T. M. Houslay, G. S. Baillie, M. D. Houslay. (2006). cAMP phosphodiesterase-4A1 (PDE4A1) has provided the paradigm for the intracellular targeting of phosphodiesterases, a process that underpins compartmentalized cAMP signalling. *Biochemical Society Transactions* 34, 504–509.
- Wallace, D. A., L. A. Johnston, E. Huston, D. MacMaster, T. M. Houslay, Y. F. Cheung, L. Campbell, J. E. Millen, R. A. Smith, I. Gall, R. G. Knowles, M. Sullivan, M. D. Houslay. (2005). Identification and characterization of PDE4A11, a novel, widely expressed long isoform encoded by the human PDE4A cAMP phosphodiesterase gene. *Molecular Pharmacology* 67(6), 1920–1934.

Talks & presentations

- Houslay, T. M. (2016). How does danger affect personality? Talk presented at the 30th Congress of the International Society for Behavioural Ecology, Exeter, UK.
- Houslay, T. M. (2015). Savings plans or budget constraints? Causes and consequences of age-dependent allocation patterns in sexual signalling. Talk presented at the 15th Congress of the European Society for Evolutionary Biology, Lausanne, Switzerland.
- Houslay, T. M. (2014). Savings plans or budget constraints? Causes and consequences of age-dependent allocation patterns in sexual signalling. Invited talk at the Evolutionary Genetics Laboratory, University of Cambridge, UK (host: Dr. Ben Longdon).
- Houslay, T. M., L. F. Bussière. (2014). Causes and consequences of resource storage and allocation to a sexually selected display. Talk presented at the Scottish Ecological Ageing Research Group Meeting, Glasgow, UK.
- Houslay, T. M., L. F. Bussière. (2014). Savings accounts and ready cash: resource storage and allocation to a sexually selected behavioural display. Talk presented at the Scottish Animal Behaviour Conference, Edinburgh, UK.
- Houslay, T. M., J. Hunt, M. C. Tinsley, L. F. Bussière. (2013). Does phenotypic plasticity undermine the reliability of sexual advertisement or help sustain adaptive mate choice? Poster presented at the 14th Congress of the European Society for Evolutionary Biology, Lisbon, Portugal; the Royal Entomological Society International Symposium, St Andrews, UK.
- Houslay, T. M. and L. F. Bussière. (2013). Does phenotypic plasticity undermine the reliability of sexual advertisement or help sustain adaptive mate choice? Invited talk at the University of Basel, Switzerland (host: Dr. Lukas Schärer).
- Houslay, T. M. and L. F. Bussière. (2012). The effect of juvenile and adult diet on age-dependent reproductive effort and mortality. Talk presented at the 1st Joint Congress on Evolutionary Biology, Ottawa, Canada; the Scottish Ecological Ageing Research Group Meeting, Durham, UK; the Scottish Animal Behaviour Conference, Stirling, UK.
- Houslay, T. M. and L. F. Bussière. (2012). The effect of diet on ageing and reproductive effort in the decorated cricket *Grylloides sigillatus*. Invited talk given as part of the Behavioural Ecology seminar series,

University of St Andrews, UK (host: Dr. Nathan Bailey).

Houslay, T. M., J. Hunt, M. C. Tinsley, L. F. Bussière. (2011). The condition-dependence of calling effort in decorated crickets (*Gryllobates sigillatus*). Poster presented at the 13th Congress of the European Society for Evolutionary Biology, Tuebingen, Germany.

Teaching

Instructor, 'Advancing in R' workshop.

5-day residential workshop teaching statistical analysis using R, aimed at ecologists and evolutionary biologists.

Teaching assistant, University of Stirling.

Animal physiology; Biodiversity; Evolution & genetics; Field and lab techniques; Phylogenetics; Proteomics; Statistics and data visualisation in R.

Overseas field course instructor, University of Stirling.

Ecology and animal biology in the Swiss Alps.

Skills

Statistical programming in R.

Including mixed-effects models and random regression, analysis of longitudinal datasets, multivariate modelling, and Bayesian inference.

Quantitative genetics.

Experience of quantitative genetic analyses (including the estimation of the heritability of traits, genetic correlations between traits, and genotype-by-environment interactions) using both maximum likelihood and Bayesian approaches.

Image analysis.

Trained to 'expert' level with the Definiens Developer XD system.

Computer programming.

Working knowledge of multiple programming languages, including Java and Python.

Organisational skills.

Experience of running large-scale animal behaviour experiments, including quantitative genetic designs.

Workshops & courses attended

Mathematical modeling in evolutionary ecology. (2012).

Workshop at the 1st Joint Congress on Evolutionary Biology, Ottawa, Canada.

Communicating science to society. (2012).

Workshop at the 1st Joint Congress on Evolutionary Biology, Ottawa, Canada.

Evolutionary quantitative genetics. (2012).

Two-week residential course at Uppsala University, Sweden.

Standing up for science in the media. (2011).

Workshop organised by Sense about Science at the Royal Society of Edinburgh, UK.

R for biologists. (2011).

One-week course at the University of Stirling, UK.

Evolutionary biology in the Alps. (2011).

One-week residential course in Arolla, Switzerland.

Funding awarded

ESEB Outreach Initiative. (2014).

€900 awarded for the project 'Breaking Bio: video and audio podcasts with leading scientists.'

Public outreach

I am active amongst the scientific community on Twitter, and I also maintain a blog on my personal website where I write about various topics including statistics, sexual selection and mating systems. As a keen wildlife photographer specialising in macrophotography, I often illustrate articles with my own photographs of interesting behaviour and morphology. I have previously written as a guest blogger for the 'Nothing in Biology Makes Sense' website.

I previously co-hosted the 'Breaking Bio' podcast, in which we interview academics of all career stages about their research. I am a firm believer in the importance of public engagement with science, and have volunteered at events such as the BBC's 'Bang Goes the Theory' exhibition at the Edinburgh Science Festival.

Service to the profession

Invited and hosted external speakers, including Dr. Nathan Bailey (University of St. Andrews, UK), Dr. Susan Johnston (University of Edinburgh, UK), Dr. David Shuker (University of St. Andrews, UK), and Prof. Douglas Futuyma (State University of New York at Stony Brook, USA).

Assisted with the organisation of the 30th Congress of the International Society for Behavioural Ecology.

Ad hoc reviewer for the following journals: Animal Behaviour, Behavioural Ecology, Journal of Evolutionary Biology, Proceedings of the Royal Society B: Biological Sciences.