

ROBIN THOMPSON

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RESEARCH POSITIONS

- Oct 2017** – Christ Church, University of Oxford
Present *Junior Research Fellowship in the Sciences*
Conducting independent research programme in biomathematics
- Mar 2016** – Department of Zoology, University of Oxford
Sep 2017 *Postdoctoral research assistant in Evolutionary Epidemiology*
Building and analysing mathematical models for the transmission and evolution of infectious diseases, with application to HIV (working with Dr Katrina Lythgoe)
- Dec 2015** – Department of Computer Science, University of Oxford
Feb 2016 *Postdoctoral research assistant in Computational Biology*
Developer of Lung Chaste, a computational model of the respiratory system (working with Professor David Kay and Dr Rafel Bordas)

EDUCATION

- Oct 2011** – Gonville and Caius College, University of Cambridge
Nov 2015 *PhD in Mathematical Biology*
Thesis title: Parameter inference and outbreak modelling for forecasting and optimising control of invading infectious diseases (Supervisors: Dr Nik Cunniffe and Professor Chris Gilligan, Department of Plant Sciences)
- Oct 2007** – Worcester College, University of Oxford
Jun 2011 *MMath in Mathematics, first class honours*
Dissertation title: Modelling cell migration and adhesion during development (Supervisors: Professor Ruth Baker and Dr Christian Yates)

PUBLICATIONS

Journal articles

17. **Thompson RN**, Stockwin JE, van Gaalen RD, Polonsky JA, Demarsh PA, Dahlgvist E, Li S, Miguel E, Jombart T, Lessler J, Cauchemez S, Cori A. Improved inference of time-varying reproduction numbers during infectious disease outbreaks. Submitted to *Epidemics*
16. **Thompson RN**, Wymant C, Spriggs RA, Raghwani J, Fraser C, Lythgoe KA. Link between the numbers of virus particles and variants founding new HIV-1 infections depends on the timing of transmission. Under review at *Virus Evol*
15. **Thompson RN**, Morgan OW, Jalava K. A simple rule of thumb for declaring an Ebola outbreak over. Submitted to *Emerg Inf Dis*

14. Abdullah N, Graham SC, Birch J, Kelly J, Goncalves-Carneiro D, Mitchell T, **Thompson RN**, Lythgoe KA, Logan N, Hosie MJ, Bavro VN, Willett BJ, Heaton MP, Bailey D. Structure-guided identification of a pathogen with pandemic potential. Submitted to *PNAS*
13. Somveille M, Firth JA, Aplin LM, Farine DR, Sheldon BC, **Thompson RN**. Movement and conformity interact to establish local behavioural traditions in animal populations. Submitted to *PLoS Comp Biol* (preprint available on bioRxiv)
12. Obolski U, Gori A, Lourenço J, Thompson C, **Thompson RN**, French N, Heyderman R, Gupta S. Identifying *Streptococcus pneumoniae* genes associated with invasive disease using pangenome-based whole genome sequence typing. Submitted to *Sci Rep* (preprint available on bioRxiv)
11. Suffert F, **Thompson RN**. Some reasons why the latent period should not always be considered constant over the course of a plant disease epidemic. *Plant Pathol*. In Press
10. **Thompson RN**, Hart W. Effect of confusing symptoms and infectiousness on forecasting and control of Ebola outbreaks. *Clin Inf Dis*, ciy248, 2018
9. Obolski U, Lourenço J, Thompson C, **Thompson RN**, Gori A, Gupta S. Vaccination can drive an increase in frequencies of antibiotic resistance among non-vaccine serotypes of *Streptococcus pneumoniae*. *Proc Natl Acad Sci* 1: 201718712, 2018
8. **Thompson RN**, Gilligan CA, Cunniffe NJ. Control fast or control smart: when should invading pathogens be controlled? *PLoS Comp Biol* 14: e1006014, 2018
7. Raghwani J, **Thompson RN**, Koelle K. Selection on non-antigenic gene segments of seasonal influenza A virus and its impact on adaptive evolution. *Virus Evol* 3: vex034, 2017
6. Kraemer MUG, Faria NR, Reiner Jr RC, Golding N, Nikolay B, Stasse S, Johansson MA, Salje H, Faye O, Wint GRW, Niedrig M, Shearer FM, Hill SC, **Thompson RN**, Bisanzio D, Taveira N, Nax HH, Pradelski BSR, Nsoesie EO, Murphy NR, Bogoch II, Khan K, Brownstein JS, Tatem AJ, de Oliveira T, Smith DL, Sall A, Pybus OG, Hay SI, Cauchemez S. Spread of Yellow Fever Virus outbreak in Angola and the Democratic Republic of Congo 2015-2016: a modelling study. *Lancet Inf Dis* 17: 330-338, 2016
5. ***Thompson RN**, Gilligan CA, Cunniffe NJ. Detecting presymptomatic infection is necessary to forecast major epidemics in the earliest stages of infectious disease outbreaks. *PLoS Comp Biol* 12: e1004836, 2016
4. **Thompson RN**, Cobb RC, Gilligan CA, Cunniffe NJ. Management of invading pathogens should be informed by epidemiology rather than administrative boundaries. *Ecol Model* 324: 28-32, 2016
3. **Thompson RN**, Yates CA, Baker RE. Modelling cell migration and adhesion during development. *Bull Math Biol* 74: 2793-2809, 2012
2. Tappin SJ, Howard TA, Hampson MM, **Thompson RN**, Burns CE. On the autonomous detection of coronal mass ejections in heliospheric imager data. *J Geophys Res* 117: A05103, 2012

* This publication was awarded the PLoS Computational Biology Research Prize 2017 for its public impact in highlighting the need for accurate diagnostic tests for Ebola

Magazine articles

1. **Thompson RN**. The importance of π in mathematics and mathematical biology. *Biophysical Society*. Available online.

PRIZES AND GRANTS

- Aug 2018** *Japan Society for the Promotion of Science (JSPS) Postdoctoral Fellowship (£4,962)*
To undertake research for two months at the University of Hokkaido, Japan, with Professor Hiroshi Nishiura
- Apr 2018** *London Mathematical Society vacation bursary (£1,440)*

For undergraduate student Francesca Lovell-Read to undertake the project “The canary in the coal mine: using mathematics to improve surveillance of plant pathogens”

- Mar 2018** *EPSRC vacation bursary (£2,380)*
For undergraduate student Leonhard Hochfilzer to undertake the project “Multi-scale models of infectious disease epidemics”
- Mar 2018** *EPSRC vacation bursary (£2,380)*
For undergraduate student Thomas Critchley to undertake the project “Optimal targeting of HIV-1 interventions towards at-risk populations in coastal Kenya”
- Nov 2017** *PLoS Computational Biology Research Prize 2017 (£1800)*
For research paper in PLoS Computational Biology with highest public impact
- Jun 2017** *Oxford University student-led teaching award nominee*
Nominated in the “Outstanding Tutor” category
- Feb 2017** *Keystone Future of Science Award (£1000)*
For modelling HIV-1 transmission between hosts, to permit travel to the Keystone symposium “Modeling Viral Infections and Immunity” in USA
- Apr 2016** *EPSRC vacation bursary (£2,254)*
For undergraduate student William Hart to undertake the project “Choosing appropriate mathematical models for planning control of invading pathogens”
- Apr 2016** *Wellcome Trust Summer Research Experience Placement bursary (£1750)*
For undergraduate student Lauren Enright to undertake the project “Incorporating host heterogeneity into models of virus evolution”
- Dec 2012** *University of Lincoln academic grant (£2000)*
For a research visit to Lincoln, New Zealand, to work with Professor Don Kulasiri
- Nov 2012** *Frank Smart studentship (£1000)*
Research award for studying the spread of citrus greening disease in Florida
- May 2012** *Best talk prize, SIAM student conference, Manchester*
- Oct 2011** *BBSRC Doctoral Training award*

PRESENTATIONS

Conferences

- Mar 2018** British Applied Maths Colloquium, St Andrews (invited talk)
- Jul 2017** Mathematical Models in Ecology and Evolution, London
- Jun 2017** Mathematical and Computational Evolutionary Biology, France
- May 2017** Modeling Viral Infections and Immunity Keystone symposium, USA (talk and poster)
- June 2013** Society for Mathematical Biology Annual Meeting, USA
- Aug 2012** Models in Population Dynamics and Ecology, Brazil
- May 2012** SIAM National Student Conference, Manchester

Dec 2010 American Geophysical Union fall meeting, USA (poster)

Workshops

Mar 2018 R Epidemics Consortium meeting, London

Aug 2016 ICERM Predictive Policing Workshop, USA

Jun 2016 Hackout 3: analysis and modelling tools for emergency outbreak response, USA

Aug 2014 Dynamics of Infectious Diseases Summer School, Finland

Aug 2013 International Epidemiology Workshop, China (poster)

Jul 2013 Gates' Epidemiology Workshop, Cambridge

Seminars

Jan 2018 WCMB mathematical biology meeting, Oxford

Apr 2017 Department of Zoology infectious diseases seminar, University of Oxford

Mar 2017 University of Bath mathematics seminar

Feb 2015 Lady Margaret Hall mathematics seminar, Oxford

Jul 2014 Department of Plant Sciences mathematical epidemiology seminar, Cambridge

Aug 2013 International Congress of Plant Pathology, China

Jan 2013 University of Lincoln mathematics seminar, New Zealand

Jul 2012 Department of Plant Sciences mathematical epidemiology seminar, Cambridge

Jan 2011 Worms and Bugs lecture series, Cambridge

Outreach

Jun 2018 Oxford University undergraduate open day

Apr 2018 Christ Church mathematics lecture

Mar 2018 Further Maths – What Next? Oxford University outreach lecture

TEACHING

Lectures

Apr 2014 – *Part IA Mathematical Biology Lecturer, University of Cambridge*

Jun 2014 Delivered seven matrix modelling lectures (to 200 students) and ran associated computer programming practicals. Received top feedback from students since the course began

Feb 2014 – *Lecturer in Mathematical Epidemiology, Wellcome Trust*

Mar 2015 Delivered three epidemiological modelling lectures in each year to policymakers and epidemiologists, and ran two computing practicals

Tutorials/classes

Oct 2017 – *Mathematics Tutor, Christ Church, University of Oxford*

Present Delivering weekly tutorials on first and second year undergraduate applied mathematics courses. Other responsibilities involve conducting admissions interviews, setting/marking internal examinations and giving talks at undergraduate open days

Oct 2014 – *Stipendiary Lecturer in Mathematics, Lady Margaret Hall, University of Oxford*

- Sep 2017** Delivered weekly tutorials on first and second year undergraduate applied mathematics courses including Differential Equations, Calculus of Variations, Fluid Dynamics and Mathematical Biology. Other responsibilities involved conducting admissions interviews, setting/marking internal examinations and pastoral care of 10 undergraduates per year
- Oct 2011 – Sep 2013** *Non-Stipendiary Lecturer in Mathematics, Worcester College, University of Oxford*
Delivered weekly tutorials on first year undergraduate applied mathematics courses
- Oct 2011 – Sep 2014** *Mathematical Biology Tutor, University of Cambridge*
Conducted weekly supervisions in Part IA Mathematical Biology (ten students per year), and assisted the running of associated computer programming practicals

Research

- To begin** *DPhil supervisor, University of Oxford*
- Oct 2018** “Using multi-scale models for infectious disease epidemic forecasting and control” (William Hart – to begin Oct 2018)
- Oct 2016 – Present** *MMath dissertation supervisor, University of Oxford*
2017-18: “Efficient analysis of epidemiological models in which the infectiousness of each infected host is time-dependent” (William Hart)
2016-17: “The role of host heterogeneity in HIV evolution” (Lauren Enright)
- Jun 2015 – Present** *Undergraduate summer project research supervisor, University of Oxford*
2018: The canary in the coal mine: using mathematics to improve surveillance of plant pathogens (Francesca Lovell-Read)
2018: Multi-scale models of infectious disease epidemics (Leonhard Hochfilzer)
2018: Optimal targeting of HIV-1 interventions towards at-risk populations in coastal Kenya (Thomas Critchley, co-supervised by Professor Helen Byrne)
2017: A user-friendly interface for inferring pathogen transmissibility (Jake Stockwin)
2016: Choosing appropriate mathematical models for planning control of invading pathogens (William Hart)
2016: Incorporating host heterogeneity into models of virus evolution (Lauren Enright)
- Oct 2015 – Present** *Visiting student project research supervisor, University of Oxford*
2018: Modelling hidden infections in infectious disease epidemics (Liane Solomon)
2015: Modelling major epidemics of invading pathogens (Brandi Henri)
- Jun 2013 – Sep 2015** *Part II/III Dissertation and Summer Project Co-supervisor, University of Cambridge*
2012: Modelling pathogen invasion in a heterogeneous landscape (Ben Price)
2013-14: Detection of invading pathogens in environments containing multiple host types (Oliver Watson)
2014-15: Optimising the timing of control of invading pathogens (Fiona Hampshire)

WORK EXPERIENCE

- Nov 2015** *Data analyst, Outer Temple Chambers, London*

Conducted data analysis for a high-profile court case

- Jun 2014** – *Intern, Department for Environment, Food and Rural Affairs, UK Government*
Sep 2014 Wrote several papers for Chief Scientific Advisor about UK-China Sustainable Agriculture Innovation Network
- Jun 2011** – *Quantitative analyst intern, Macquarie Securities Group, London*
Aug 2011 Learnt about using mathematical modelling in finance, and developed predictive model
- Jun 2010** – *Undergraduate summer intern, SouthWest Research Institute, Colorado*
Aug 2010 Wrote a computer program to track coronal mass ejections from the Sun to Earth

POSITIONS OF RESPONSIBILITY

- Jul 2018** *Guest editor, Philosophical Transactions of the Royal Society B*
Editor of the issue “Detection, forecasting and control of infectious disease epidemics: modelling outbreaks in human, animals and plants” with Dr Ellen Brooks-Pollock and Prof. Sunetra Gupta
- Jan 2017** – *Editor, Society for Mathematical Biology (SMB) Newsletter*
Present Wrote articles, conducted research interviews, edited and distributed SMB newsletter to readership of 2,500
- May 2017** – *Examiner, University of Oxford*
Present Examined DPhil viva (Susan Hawkins), two DPhil Transfer of Status vivas, and examined two MMath Part C dissertations
- Feb 2013** – *Research grant and publication reviewer*
Present Reviewed research grant for Medical Research Council, and publications for journals including Scientific Reports, Theoretical Population Biology, Journal of Biological Systems and Journal of Nonlinear Science