Jessie Renton

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Research Interests

I am broadly interested in mathematical modelling of biological and social processes. My PhD research has focused on invasion dynamics of mutant cells in epithelia, considering how the structure and dynamics of the tissue affect evolutionary outcomes. This is relevant to oncogenesis as pre-cancerous cells must obtain a number of mutations in order to become malignant. For my masters I undertook a project on the social evolution of language, looking at effects of population structure and how it can lead to dialects.

Education

University College London — *London, UK*

PhD Mathematics — *Sep. 2016 - PRESENT*

- Thesis supervised by Prof. Karen Page – "Evolutionary dynamics in epithelia"

University of Washington — *Seattle, USA*

Junior honours year of MPhys Mathematical Physics — *Sep. 2013 - May 2014*

- Study abroad programme

University of Edinburgh — *Edinburgh, UK*

MPhys Mathematical Physics: 1st class — *Sep. 2011 - May 2016*

- MPhys project supervised by Prof. Richard Blythe – "The effect of population structure on spontaneous dialect formation"
- Modules include advanced statistical physics, biological physics, modelling and visualisation in physics and dynamical systems
- Awarded pre-honours certificate of merit

Awards & Funding

2019 **Sir George Jessel Studentship:** £1800 prize awarded by UCL during PhD.
2016-20 **EPSRC PhD Studentship:** full PhD funding for four years covering fees, stipend & travel.
2013 **Certificate of merit:** awarded by the University of Edinburgh during MPhys.

Publications

1. Jessie Renton and Karen M. Page. The effect of contact inhibition on the evolution of co-operation in epithelia. *In progress.*

2. Jessie Renton and Karen M. Page. Evolution of cooperation in an epithelium. *Journal of the Royal Society Interface*, 16:20180918, 2019.

Teaching

University College London

Postgraduate teaching assistant *2016-2020*

- **First-year tutorials.** *Sep. 2017- May 2018.*
  Taught small group tutorials covering material from first-year modules: applied maths, mathematical methods and Newtonian mechanics.
- **Python labs.** *Jan. 2017 - May 2019.*
  Running computer lab sessions for an introductory Python module and marking final projects.
- **Marking.** *Jan. 2017- Jan. 2020.*
  Various marking duties including courses on mathematical methods, biomathematics and python.

Conferences & talks

Mar. 2019 **Physical biology circle meeting,** *EMBL Heidelburg.*
Apr. 2019 **British applied mathematics colloquium,** *University of Surrey.*
Mar. 2019 **Institute for the Physics of Living Systems meet-up,** seminar talk, *UCL.*
Jul. 2018 **Mathematical models in ecology and evolution,** poster, funded by the London Mathematical Society, *City, University of London.*
May 2018 **Physical biology circle meeting,** *Francis Crick Institute.*
Jul. 2018 **European conference on theoretical and mathematical biology.** *University of Lisbon.*
Apr. 2019 **Evolution evolving.** *University of Cambridge.*
Jul. 2019 **Society of mathematical biology,** poster, *University of Montreal.*

Activities & work experience

2018-19 **Postgraduate seminar series:** organised the UCL Mathematics postgraduate seminars.
2015-16 **Freelance science writing:** wrote articles for the science dissemination magazine 'International Innovation' on a variety of topics in physics, mathematics, engineering and computer science. Communicated complex ideas to an intended audience of scientists who are non-specialists in the field.
2015-16 **Mentoring:** took part in a mentoring scheme for first and second year physics students while in my masters year at the University of Edinburgh.
2010-11 & 2015 **Administration:** worked in the Psychology office at the University of East London and later in the Physics office at the University of Edinburgh.

Other skills

Computer skills: Proficiency in MS Office, Apple products and LaTeX. Coding in Python and Java. Experience with cluster computing e.g. using Slurm job scheduling.
Languages: Intermediate Spanish.