Polly-Anne Jeffrey

March 2021

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CURRENT POSITION

Final year, EPSRC/AstraZeneca funded Smith Institute CASE PhD student.
Department of Applied Mathematics, University of Leeds, UK.

RESEARCH

The focus of my PhD project is to use mathematical modelling to learn about biological systems. In particular I work with models based around the interactions between cellular receptors and other small molecules. I am interested in both deterministic (ordinary differential equation) and stochastic (Markov process) mathematical modelling. I also use techniques from Bayesian statistics, such as parameter inference and model selection.

EDUCATION

University of Leeds — Leeds, UK
PhD in Applied Mathematics — October 2017 – Present

University of Leeds — Leeds, UK
BSc Mathematics (Industrial) — October 2013 – June 2017
1st Class Hons

King Edward VI high school — Morpeth, UK
A-levels — September 2011 – June 2013
Mathematics (A), Biology (A), Chemistry (A)

PUBLICATIONS

Competitive binding of STATs to receptor phospho-Tyr motifs accounts for altered cytokine responses in autoimmune disorders
Wilmes, S.*, **Jeffrey, P.A.***, Martinez-Fabregas, J., Hafer, M., Fyfe, P., Pohler, E., Gaggero, S., López-García, M., Lythe, G., Taylor, C. and Guerrier, T.
Elife, 2021. (: first co-authorship)*

On exact and approximate approaches for stochastic receptor-ligand competition dynamics—an ecological perspective.
Jeffrey, P.A., López-García, M., Castro, M., Lythe, G. and Molina-París, C.
Mathematics, 2020.

Receptor tyrosine kinases regulate signal transduction through a liquid–liquid phase separated state.
Lin, C.C., Suen, K.M.*, **Jeffrey, P.A.***, Wieteska, L., Stainthorp, A., Seiler, C., Koss, H., Molina-París, C., Miska, E., Ahmed, Z. and Ladbury, J.E.
Molecular Cell, in revision (: second co-authorship)*
bioRxiv doi: https://doi.org/10.1101/783720

EMPLOYMENT

Covance Clinical Research Leeds, UK

Student bio-statistician July 2015 – July 2016

Responsibilities included, statistical programming and analysis, generating statistical documents and providing training to new starters.

TEACHING

Tutor, Department of Mathematics January 2019 - March 2020

Module: Probability and Statistics 1 and 2

Responsibilities included running tutorial classes to groups of undergraduate students and coursework marking.

CONFERENCES

Probability in the North East January 2021

Conference (Online), *Invited talk*

British Early Career Mathematicians' Colloquium July 2020

Conference (Online), *Contributed talk*

The mathematics of biology and medicine September 2019

Conference (University of Leeds), *Organiser*

Stochastic modelling in health and disease September 2019

Conference (University of Leeds), *Attendee*

Mathematical modelling in immunology May 2019

Conference (BSI, Cambrdige), *Attendee*

Statistics and modelling in infectious disease July 2018

Workshop (University of Washington), *Attendee*

Cancer cell signalling July 2018

Conference (University of Leeds), *Invited talk*

In silico systems biology June 2018

Workshop (EMBL-EBI, Cambridge), *Poster*

OUTREACH

College research projects September 2019 – March 2020

This outreach activity with a local Sixth Form College involved leading a small group of students to develop their research, writing, teamwork and presentation skills, through a multi-disciplinary project.

Medicine, not just about medics December 2018/2019

I delivered several interactive sessions, on the topic of mathematical biology, to classes of year 10 and 11 students who were on a day visit to Leeds University.

Leeds festival of science March 2019

I visited two local schools and delivered workshops to students ranging from year 7 to year 11, using computer software to make the sessions interactive for the students. The topic was the mathematics of cell division.

RELEVANT EXPERIENCE

I am proficient in the use of Python and LaTeX, and also have experience with the programming languages R, MatLab and SAS. I am competent in public engagement, through the running of outreach activities which school children. I have excellent teamwork and organisation skills which I have demonstrated through co-organising and running a multi-disciplinary conference, aimed at postgraduate students at Leeds University. I have experience tutoring undergraduate students and also supporting the research of newly recruited PhD students in the mathematical biology group.