Robert James Clegg

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Profile

As a Postdoctoral Research Fellow developing theoretical models of microbial systems, I apply strong analytic skills to real-world problems on a daily basis. My research has also given me the opportunity to develop other skills, notably programming (Java, Python), presentation (posters and talks), and collaboration with scientists/engineers of very different training and approach to my own. I am the lead developer of the software iDynoMiCS, upon which much of my research is based. I aim to start my next challenge in June 2016.

Publications

Clegg RJ, Dyson RJ, Kreft JU (2014). Repair rather than aging is the optimal aging strategy. *BMC Biology* 12: 52.

Career and Education

Sept 2014 – May 2016 **Postdoctoral Research Fellow**, University of Birmingham
Supervisors: Dr Jan-Ulrich Kreft (CCB), Dr Shan He (Comp Sci), Prof Chris Thomas (Biosci). Funding: National Centre for the Replacement, Refinement & Reduction of Animals in Research.
Development of a software package for simulation of microbial-host dynamics in the digestive tract, i.e. an "electronic gut" (eGUT). The project involves an overhaul of the iDynoMiCS software package and integration of host-specific mechanisms, such as the immune system. The software is aimed at a wide range of users, so making it accessible (e.g. with a GUI) and teaching will be important. I lecture on the undergraduate course 'Quantitative Skills for Biologists', and regularly co-supervise Master's students.

Oct 2010 – Aug 2014 **Doctoral Researcher**, University of Birmingham
Supervisors: Dr Jan-Ulrich Kreft (CCB), Dr Rosemary Dyson (Maths). Funding: Natural Environment Research Council. Research focused on the evolution of cooperation between bacteria - whether immediate kin or wholly different species - as a survival strategy. One project on quantifying the benefit of replicative ageing and repair in microbes is published, and soon I hope to publish work on a statistical tool for *in-situ* estimation of solute exchange rate in spatially (un)structured populations. I often assisted undergraduate teaching on 'Quantitative Skills for Biologists', and co-supervised two Master's students, one of whom has since started a PhD.

Oct 2005 – Jun 2009 **MMath (Hons) Mathematics (First Class)**, University of Exeter
Undergraduate Master's degree. Institute of Mathematics and its Applications (IMA) Prize awarded for performance in the final year. Modules included: Computation and Numerical Analysis, Dynamical Systems and Chaos, Mathematical Biology and Ecology, Mathematics of Climate Change. Final-year project comparing models of bacterial growth and dispersion (first class awarded). Elective courses in Spanish (advanced) and German (intermediate).

Jul-Sep 2008 **Exmoor National Park Authority (ENPA)**
A placement consisting mainly of fieldwork and data analysis of a hedgerow survey. This started with a crash-course in botany and wild-flower identification and then went straight into data collection and analysis. It was helpful to learn and apply real-

life ecology, as much could be related back to the theory I studied.

Various 2005 - 2007 — **Student Associate Scheme,** University of Exeter
This yearly scheme, run by the University to increase student interest in teaching, was comprised of 10 lectures during term and then 3 weeks' teaching in a local school each year. I completed both stages of the scheme, which aided my decision not to go directly into teaching.

Feb-Mar 2005 — **El Buen Samaritano**, Guatemala
Volunteering at this community project involved teaching Primary subjects in Spanish, and English at Secondary level.

Sep-Dec 2004 — **Josca's** [now **Abingdon**] **Preparatory School**, Oxfordshire
My role as a Teaching Assistant was mostly sport-related, but I took every opportunity to be involved in all areas of the school.

Sept 1999 – Jul 2004 — **Abingdon School**, Oxfordshire
A-levels: Mathematics (A), Further Mathematics (A), Physics (A), Spanish (B).
11 GCSE's, including Mathematics (A*), English (B) and 3 modern languages.

Notable Conferences and Workshops

June 2015 — **Process Modelling in Environmental Biotechnology**, DTU Copenhagen, Denmark. A PhD summer school of around 20 attendees, where I was invited to teach a one-day course on Agent-based Modelling of Biofilms.

June 2014 — **9th European Conference on Mathematical and Theoretical Biology**, Gothenburg, Sweden. "Repair and not segregation of damage is the optimal unicellular ageing strategy" [Talk]. "Microbiology's N-body problem: How should we estimate the rate of metabolite exchange in spatially structured populations?" [Talk].

June 2014 — **Leading Academics**, University of Birmingham
A series of sessions exploring the routes to leadership in academia and in industry.

May 2014 — **Simplifying Assumptions in Models of Complex Systems**, University of Birmingham. A one-day workshop that I organised and ran, together with one other PhD student. Approximately 40 delegates attended from 7 universities. "Microbiology's N-body problem: metabolite diffusion within spatially distributed populations" [Talk].

Aug 2012 — **International Symposium on Microbial Ecology**, Copenhagen, Denmark
"Aging and Repair in Bacteria: an Individual-based Modeling approach" [Talk].

Jul 2012 — **Postgraduate Enterprise Summer School**, University of Birmingham
As member of a team of five, I took a pivotal role in developing a business plan to launch a café at Nechells Regeneration Project.

References

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