

EDUCATION

- 2015 – 2020** **DPhil (PhD) in Interdisciplinary bioscience, University of Oxford**, United Kingdom
BBSRC-funded programme promoting an interdisciplinary approach to life sciences
- 2012 – 2015** **Diplôme d'Ingénieur** (Master of Engineering), **Ecole polytechnique**, Paris, France
France's Leading Engineering School. Specialisation: Biology at the interfaces
GPA : 3.81/4
- 2010- 2012** Lycée Sainte Geneviève, Versailles, France (French *Classe préparatoire*)

RESEARCH EXPERIENCE

- April 2020 - current** **Postdoctoral researcher** - Department of Zoology, University of Oxford
Supervisor: Craig MacLean. Developing mathematical models to study the impact of the ban on colistin use on the prevalence of resistance genes and MDR plasmids in China. Project part of DXC-HUB, a UK-China research consortium.
- May 2016 - January 2020** **PhD Project** – Department of Zoology, University of Oxford
Supervisors: Craig MacLean and Kevin Foster. Thesis title: *Quantifying the adaptive power of the mobile integron*. Project allying experimental evolution, genomics and computational modelling to study the evolution of an important antibiotic resistance driver.
Secondary project: *Why and when do bacteria take up DNA?*: computational modelling of the evolution of natural transformation in bacteria populations.
- 2018**
3 months **Outreach internship** - Mahidol Oxford Research Unit (Bangkok, Thailand)
Supervisor: Ben Cooper. Development and evaluation in schools of a boardgame, '**Drugs vs Bugs**' to raise awareness around antibiotic resistance. Game translated in English, Thai, and Russian, and available as a free educational resource (www.drugs-vs-bugs.com).
- 2016**
3 months **PhD rotation** – Dunn School of Pathology/Department of Physics, University of Oxford
Supervisors: Ervin Fodor and Achilles Kapanidis. Visualization of influenza virus ribonucleoproteins using super-resolution imaging
- 2015**
5 months **Research internship** - Institut Pasteur (Paris, France)
Supervisor: Jost Enninga. Impact of T3SS effectors on host-pathogen interactions in *Shigella Flexneri* through live fluorescence microscopy

ADDITIONAL WORK EXPERIENCE

- 2014**
6 weeks **Tropic Essences** (Managua, Nicaragua): essential oil producer – internship
Launched a small quality control laboratory to determine chia oil quality through chemical assays (developed methods, purchased equipment and trained future employee)
- 2012 – 2013**
6 months **DGA MNRBC** (Vert-le-Petit, France) research centre of the French Army against biohazards
Designed and evaluated qPCR detection tests against potential biohazard pathogens (*Francisella tularensis* and *Burkholderia pseudomallei*). In charge of pathogen load quantification during an international exercise of biohazards identification (EQADeBa).

RESEARCH SKILLS

Experimental skills: Experimental evolution, flow cytometry, microbiology, molecular biology (cloning, RT-qPCR), microscopy

Genomics: Whole genome data analysis – *de novo* assembly & variant calling of short-reads data

Mathematical modelling: Individual-based simulations & compartmental models (ODEs)

Programming: R, Matlab, Python, Julia, Bash, LateX

Software: Microsoft Office, Adobe Photoshop

Languages: French (Native speaker), English (fluent), German (professional capacity)

PUBLICATIONS

Peer-reviewed

- **Souque C**, Escudero JAE, MacLean RC, Integron activity accelerates the evolution of antibiotic resistance, **eLife** (resubmission after minor revisions) – pre-print available at <https://doi.org/10.1101/2020.08.07.237602>
- Weiner A, Mellouk N, Lopez-Montero N, Chang YY, **Souque C**, Schmitt C, Enninga J, Macropinosomes are Key Players in Early Shigella Invasion and Vacuolar Escape in Epithelial Cells, **PLoS Pathog.** 2016 May;12(5):e1005602.

Science communication

- *'Drugs vs Bugs': an antimicrobial resistance board game* – Blog post for the Microbiology society, most read post of 2019: <https://microbiologysociety.org/blog/bugs-vs-drugs-an-antimicrobial-resistance-board-game.html>
- *'Why resistance is common in antibiotics, but rare in vaccines'* – article for the newspaper The Conversation, also translated in French, reaching 16000+ views: <https://theconversation.com/why-resistance-is-common-in-antibiotics-but-rare-in-vaccines-152647>

GRANT & PRIZES

- 2019 MRF National PhD Training Programme in AMR Conference – **best poster prize**
- 2019 Department of Zoology Induction day – **best poster prize**
- 2019 Gordon Research Conference in Microbial Population Biology – **best poster prize**
- 2019 Oxford Interdisciplinary Bioscience Impact Awards - **Social Impact Winner**
- 2019 Doctoral Training Center **Public Engagement Prize**
- 2018 Worcester College Academic Expenses Grant (£750)
- 2015 **BBSRC 4-years Studentship** (£56 000)

TEACHING EXPERIENCE

- 2020/2021 **Demonstrator** – Statistics and Scientific Methods, 2nd year undergraduate
- 2018/2019 **Demonstrator** – Experimental evolution practicals, 2nd year undergraduate
- 2016 **Demonstrator** – Cells and Systems, Doctoral Training Center
- 2014 **Teaching assistant** in Chemistry - Lycée Sainte Geneviève

OUTREACH & VOLUNTEER WORK

2016 – current **Raising antibiotic resistance awareness through boardgames**

- Boardgame '*Drugs vs Bugs*': players become doctors treating patients infected with bacteria and viruses. After players use antibiotics, bacteria become harder and harder to treat. Introduce the importance of handwashing, vaccines and timely detection in the prevention of AMR. Played in Thailand and in the UK, reaching more than 300 students. Available online at www.drugs-vs-bugs.com
- Boardgame '*Superbug*' where players embody bacteria competing against each other. Used to showcase our lab research and the evolutionary concepts behind antibiotic resistance in activities organized by the Museum of the History of Science in Oxford.

2018 - 2019 Researcher at Polygeia, a student-led global health thinktank. Report on the use of **behavioral change techniques** to improve innovation uptake and commissioned by the NHS.

2015 – 2018 President / Vice-President / Social secretary of Worcester College MCR, representing the graduate body of Worcester College (200 students) and organizing graduate activities, leading a team of 15 committee members.

PRESENTATIONS

2020 EMBL (European Bioinformatics Institute) – invited **talk** (Zamin Iqbal lab)

2020 Harvard University – invited **talk** (Michael Baym lab)

2020 UK Plasmid virtual workshop – **talk**

2020 JAM talk (Junior Award for Microbiology), University of Birmingham, UK – selected talk

2020 STEM for Britain (presentations by UK researchers to members of the House of Parliament) - poster

2019 MRF National PhD Training Programme in AMR Research Annual Conference, Bristol, UK - poster

2019 Department of Zoology Induction day, Oxford – poster

2019 Gordon Research Conference & Seminar on Microbial Population Biology, Andover, NH, US - **talk** and poster

2019 29th European Congress of Clinical Microbiology & Infectious Diseases (ECCMID), Amsterdam, The Netherlands - **talk** on 'Gaming Infectious Diseases' presenting the 'Drugs vs Bugs' boardgame

2018 Second Joint Congress on Evolutionary Biology, Montpellier, France - poster

2018 Manchester Molecular and Genome Evolution Symposium, Manchester, UK - poster