University of Bristol’s Cabot Institute for the Environment and Elizabeth Blackwell Institute for Health Research are looking to recruit a cohort of funded PhD students in the area of Climate Change and Health. This cohort will be supported by a cross-disciplinary team of academic staff who are experts in their fields. There are 4 potential projects in total, of which 3 will be funded. The following is one of the projects.

**Project:** Heat impacts on pregnancy outcomes: an interdisciplinary and cross-species approach

**Supervisory team:** Reflecting the highly interdisciplinary nature of this PhD, the supervisory team comprises researchers across three UoB faculties (Life Sciences, Science and Health Sciences).
- Dr Sinead English (School of Biological Sciences, Faculty of Life Sciences)
- Dr Kate Birchenall (Bristol Medical School, Faculty of Health Sciences)
- Dr Eunice Lo (Cabot Institute for the Environment, Faculty of Science)

**Type of award** PhD Research Studentship

**Department** Life Sciences

**Scholarship Details** Scholarships include a stipend at UKRI level of £17,668 p.a. in 2023/24 subject to confirmation of eligibility and award

**Duration** 4 years Eligibility Home / EU / Overseas students

**Start Date** October 2023

**Host institution** University of Bristol (School of Biological Sciences, with time also in Bristol Medical School and Cabot Institute)

**Project description:**

There is increasing appreciation that extreme weather events such as heatwaves increase mortality risks in humans and a range of organisms. Less well understood, however, is how such events affect other aspects of health, particularly those in potentially heat-vulnerable categories such as pregnant women. Recent research across a range of organisms has shown that fecundity outcomes are even more sensitive to temperature variation than survival. Moreover, there is emerging evidence that pregnant women exposed to heat are more likely to have miscarriages or give birth pre-term. We can gain powerful insights by using animal models to understand underlying physiological mechanisms in tandem with epidemiological studies in human populations. Heatwaves are increasing in frequency and intensity across the globe and miscarriage and pre-term birth have major consequences for short- and long-term wellbeing of mothers and children. Taken together, new understanding of how heat affects pregnancy outcomes is important for estimating how climate change will impact human health in the future.

We propose an exciting PhD project that will use an interdisciplinary approach to understand the consequences of heat exposure on pregnancy outcomes in humans and other organisms. This project will also investigate whether such effects depend on the timing in pregnancy (heat exposure around conception, or in a particular trimester). The aims are:

1. **Understand the physiological mechanisms by which heat affect pregnancy outcomes, and how these depend on the timing when these were experienced.**

The student will conduct heat simulation experiments in *Diploptera punctata* – a viviparous cockroach, and a non-human experimental model of pregnancy – to test how heat exposure affects both phenotypic (size and gestational age at birth) and molecular outcomes (DNA methylation and gene expression) in offspring, and any long-term consequences of such exposure.
Investigate how temperature variations are linked to pregnancy outcomes in humans.

The student will use large-scale human cohort studies such as ALSPAC and UK Biobank, and link these data with UK Met Office climate observations based on the participants' locations during their pregnancy, to establish how patterns of temperature are linked to pre-term birth and size for gestational age. Molecular insights into such associations will also be available by conducting both GWAS and EWAS studies.

Project future impacts to inform adaptation based on physiological and observational insights.

The student will combine both the biological and mechanistic insights gained from the experimental approach (Objective 1) and epidemiological analyses (Objective 2) to (i) project future birth outcomes and long-term morbidity patterns (due to, e.g., higher pre-term birth) in humans associated with climate change; (ii) develop potential heat adaptation strategies for pregnant women at stages of pregnancy when they are particularly vulnerable, for public health policy consideration.

Recommended background reading/references


Candidate experience and qualifications

- upper second-class honours degree (or equivalent) in biological sciences or related discipline

Useful links

- Dr Sinead English lab group homepage: [https://evelab.org](https://evelab.org)
- Bristol’s Climate Dynamics Group (Dr Eunice Lo): [https://www.climatebristol.org/research/](https://www.climatebristol.org/research/)

How to apply to the University of Bristol

When applying for this project please choose ‘Biological Sciences (PhD)’ in the ‘find a programme’ box. You should refer to the project title and supervisor in your application. Application deadline: midnight 28 February 2023 (UK time). Interviews will be held the week commencing 17 April 2023.

General Enquiries: Dr Eunice Lo ([eunice.lo@bristol.ac.uk](mailto:eunice.lo@bristol.ac.uk))