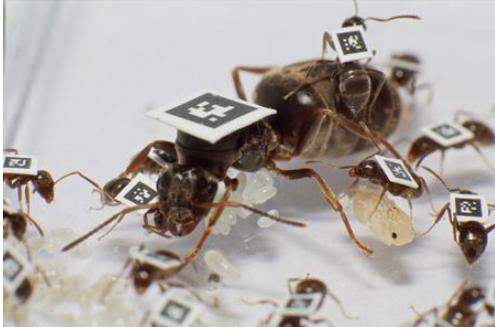


## PhD position in collective behaviour and social immunity at the University of Bristol (UK)

A fully funded PhD position is available in the Ant Lab headed by Dr Nathalie Stroeymeyt at the School of Biological Sciences, University of Bristol (UK), to investigate the **strategies used by ants to decrease epidemic risk in environments with high pathogen pressure.**

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### Background



Group living offers favourable conditions for the spread of infectious diseases, because high population densities and frequent social contacts facilitate pathogen transmission. To mitigate that risk, social animals have evolved a variety of defence mechanisms to prevent the entry and propagation of pathogens within the group, ranging from raised investment in **personal immunity** to highly coordinated collective sanitary actions conferring **social immunity**. Recent studies have shown that social groups can also adopt organisational features, such as the subdivision into well-separated subgroups, which reduce epidemic risk through transmission bottleneck effects. However, the importance of such **organisational immunity** features in disease risk management by real animal groups is still poorly understood. Research in our group adopts an empirical approach based on the experimental manipulations of garden ant colonies (*Lasius niger*) to (i) quantify the effect of social organisation on disease transmission and test key predictions from network epidemiology, and (ii) evaluate the relative of importance of personal immunity, collective sanitary actions and organisational features under different environmental conditions and at different stages of development (for more detail see <https://stroeymeyt-lab.ch/research>).

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### The project

The goal of this PhD project will be to **understand how ant colonies adjust different components of their disease defences (personal immunity, collective sanitary actions and transmission-inhibiting social organisation) in response to repeated disease challenges.** The project will involve a combination of controlled pathogen inoculations, behavioural experiments (automated tracking of individually marked ants), molecular work (physiological assays and immune gene expression analysis), and computational analyses of tracking data (social network analyses and simulations). The project will aim to elucidate whether ants use changes in spatial and social organisation as an active strategy to decrease epidemic risk.

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### Desired profile

We are looking for candidates with experience in quantitative behavioural analysis and programming and/or molecular biology techniques, and a willingness to apply a variety of approaches (behavioural tracking, writing own code to analyse the data, and lab work). A good working knowledge in statistics and experimental design is also desirable. Experience with social insects and insect immunity would be a plus. Candidates must be creative, motivated and passionate about science, have excellent oral and written communication skills, and be at ease working both independently and as part of a team.

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### The position

The position will be part of an overall project team consisting of two PhD students and two post-doctoral researchers and will be fully funded for 3.5 years by an ERC Starting Grant. The candidate will receive a maintenance stipend at the minimum UKRI rate and home (UK/EU) tuition fees will be covered by the grant.

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### Location

The School of Biological Sciences at the University of Bristol is a highly dynamic, international and interdisciplinary environment, spanning a wide range of research in Evolutionary Biology, Animal Behaviour and Sensory Ecology, Plant and Agricultural Sciences, and Ecology and Environmental Changes (<http://www.bristol.ac.uk/biology/research/>).

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### Expected starting date

May 1<sup>st</sup> 2020 (flexible)

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### How to apply

Please send your application by email to [nathalie.stroeymeyt@bristol.ac.uk](mailto:nathalie.stroeymeyt@bristol.ac.uk). Your application should consist of a single merged pdf file including:

- (i) a full CV and publication list;
- (ii) a 1-2 page research statement describing your past research experience, current research interests, and why you are a suitable candidate for this project;
- (iii) a short proposal (0.5-1 page) on how you would address the project's goal;
- (iv) the names and contact details of at least two referees;
- (v) copies of (or links to) your publications and/or your Master's thesis (if available).

Evaluation of candidates will begin on **February 15<sup>th</sup>, 2020** and continue until the position is filled.

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### References

- Stroeymeyt *et al.* (2014). Organisational immunity in social insects. *Current Opinion in Insect Science* 5, 1.  
Stroeymeyt *et al.* (2018). Social network plasticity decreases disease transmission in a eusocial insect. *Science* 362, 941.