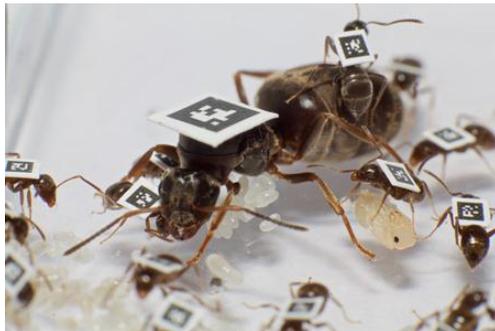


Post-doc position in collective behaviour and epidemiology at the University of Fribourg (Switzerland)

A 2-year post-doc position is available in the research group of Professor Nathalie Stroeymeyt in the Department of Biology, University of Fribourg, to study the **effect of social network properties on disease transmission dynamics in ant colonies**.

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 a raised investment in personal immunity to highly coordinated collective sanitary actions ('social immunity'). Recent studies have shown that social groups can also adopt organizational features, such as the subdivision into well-separated subgroups, which reduce epidemic risk through transmission bottleneck effects. However, the importance of organizational immunity features in disease risk management by real animal groups is still poorly understood. Our research adopts an empirical approach based on the experimental manipulations of garden ant colonies (*Lasius niger*) to (i) quantify the effect of social organization on disease transmission and test key predictions from network epidemiology, and (ii) evaluate the relative of importance of personal immunity, collective sanitary actions and organizational features under different environmental conditions and at different stages of development (for more detail see <https://stroeymeyt-lab.ch/research>).

The project

The goal of this project will be to experimentally manipulate the social network topology of ant colonies (e.g. by manipulating nest architecture) to quantify the effect of network properties on disease transmission and test key predictions from network epidemiology. The candidate will use a combination of automated behavioural tracking, social network analysis, simulation of disease transmission, monitoring of the transmission of pathogenic and non-pathogenic agents, and fitness measurements to produce an integrative understanding of the effect of social organization and network structure on epidemic risk.

Desired profile

We are looking for candidates with a strong quantitative background and solid experience in programming, exploratory analysis of large biological datasets, social network analysis and/or epidemiological simulations. As the project will involve an important experimental component, the candidates would ideally have a good working knowledge of statistics and experimental design and prior experience with social insects. Experience with laser-cutting or 3D-printing software and tools 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. A PhD will be required prior to taking up the position.

The position

The position will be part of an overall project team consisting of two PhD students and two post-doctoral researchers (<https://stroeymeyt-lab.ch/open-positions/>) and will be fully funded for two years by an ERC Starting Grant. The salary will be set according to the guidelines of the University of Fribourg (c. 75'000 CHF per year).

Location

The Department of Biology at the University of Fribourg is a highly dynamic, international and interdisciplinary environment, spanning a wide range of research in evolution and ecology, behaviour, population genomics, and bioinformatics, developmental genetics, neurobiology, biochemistry and proteomics, across 27 groups (<https://www3.unifr.ch/bio/en/>).

Expected starting date

The starting date is flexible; the earliest possible start will be May 1st, 2019.

How to apply

Please send your application by email to Nathalie.Stroeymeyt@gmail.com. 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 main research interests and your relevant skillsets, how they developed, and how they relate to the proposed research project, (iii) the names and contact details of at least two referees, and (iv) copies of (or links to) your publications and/or your PhD thesis (if available). Evaluation of candidates will begin on **February 15th, 2019**, and continue until the position is filled.

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.