PhD studentship:
Genomic analysis of host-microbe interactions in Antarctic fur seals.

With Prof Joe Hoffman (Bielefeld University, Germany), Prof Michael Schloter (Technische Universität München, Germany), Dr Jaume Forcada (British Antarctic Survey, UK) and Dr Gábor Á. Czirják (IZW, Germany).

An outstanding opportunity is available for a PhD student to work on the genomic analysis of host-microbe interactions in Antarctic fur seals. The position is available in Joe Hoffman's research group (www.thehoffmanlab.com) at the Department of Animal Behaviour at Bielefeld University. The project will be co-supervised by Michael Schloter (www.helmholtz-muenchen.de/comi) and carried out in collaboration with Jaume Forcada (https://www.bas.ac.uk/profile/jfor) and Gábor Czirják (https://www.izw-berlin.de/de/gabor-czirjak-de.html). The PhD studentship is fully funded for three years.

The project

Vertebrates are inhabited by vast numbers of microorganisms that are increasingly emerging as key players in their host's biology and evolution. These microbial communities carry orders of magnitude more genes than their hosts and support functions that are not encoded in the host's genome. Consequently, the microbiome is of fundamental importance to host function. This PhD project will combine an outstanding natural system, Antarctic fur seals, with state-of-the-art multi-omics approaches to investigate the structure and function of the vertebrate gut microbiota and its effects on host fitness in a changing environment. It will use an exceptionally rich and multifaceted dataset to investigate how intrinsic and extrinsic factors influence the structure and function of host-associated microbial communities. From there, it will elucidate the fitness consequences of gut microbes by linking microbial community structure and function to fitness components such as growth, survival and maturation of the immune system. This project will provide multi-layered insights into the importance of host-microbe interactions in a wild vertebrate population that is declining in response to climate change.

Applicant's profile

We seek a bright and highly motivated student who holds a good first degree and an M.Sc. or equivalent in a relevant topic (e.g. microbial ecology, molecular ecology, bioinformatics). The ideal candidate will have some experience of working in a genetics lab as well as strong quantitative skills, including proficiency in working in R and writing custom scripts. Practical experience of working with next generation sequence data would be advantageous, but full training will be provided. The candidate should also be able to work both independently and as part of a team. A high standard of spoken and written English is required.

The working environment

The first 6–9 months of the PhD will be spent learning and implementing laboratory and data analysis workflows in microbiome analysis in Michael Schloter's group at the Technische Universität München, Germany (www.helmholtz-muenchen.de/comi). The group is one of the leading institutions for microbiome analysis in Germany and has been involved in the development of various national and international SOPs in the field. The group is well equipped with high throughput sequencing instruments for long- and short

read, sequencing. Subsequent bioinformatics are done on a 100 knot server, which enables the analysis of metabarcoding as well as metagenomics data. The pre-alpine landscape around Munich makes this area as one of the most attractive ones in Germany.

Afterwards, the PhD student will be based at the Department of Animal Behaviour at Bielefeld University, Germany (www.uni-bielefeld.de/biologie/vhf/index.html). The department is the oldest of its kind in Germany and currently hosts seven principal investigators, nine postdocs and 15 PhD students. It offers a stimulating, supportive and highly international environment as well as an excellent research infrastructure. The working language of the department is English. Bielefeld is a city of 325,000 inhabitants with an attractive historical centre and easy access to the Teutoberger Wald for hiking and other outdoor pursuits. It is an affordable and pleasant city to live in and is well connected to most major European cities.

The successful applicant will thus benefit from an integrative, multidisciplinary training that will prepare her/him very well for a scientific career in microbial ecology / molecular ecology / conservation science.

Remuneration

This generous PhD studentship is funded by the German Science Foundation (DFG) for a period of three years and includes health insurance. The pay scale is TVL E13 (65%). Funding will also be available for travel and for the student to attend workshops and conferences.

Application procedure

To apply for this position, please provide: (i) a letter of motivation including a maximum 2-page statement of your research interests, relevant skills and experience; (ii) a CV including publication list; (iii) names and contact details of two referees willing to write confidential letters of recommendation; and (iv) please also state where you saw the position advertised. All materials should be emailed **as a single PDF** to: joseph.hoffman@uni-bielefeld.de with '**PhD application**' in the subject line.

The application deadline is **1st November 2022** and online interviews will take place shortly afterwards. The position should start as soon as possible, although there is scope for flexibility depending on the timeframe of the most qualified applicant. For further information, please see www.thehoffmanlab.com. We also encourage you to contact Joe Hoffman (joseph.hoffman@uni-bielefeld.de) or Michael Schloter (schloter@tum.de) with any informal inquiries.

Bielefeld University has received a number of awards for its achievements in the provision of equal opportunity and has been recognized as a family friendly university. The University welcomes applications from women. This is particularly true with regard both to academic and technical posts as well as positions in Information Technology and Trades and Craft. Applications are handled according to the provisions of the state equal opportunity statutes. Applications from suitably qualified handicapped and severely handicapped persons are explicitly encouraged.

Representative publications

Metwaly, A. et al. (2020) Integrated microbiota and metabolite profiles link Crohn's disease to sulfur metabolism. Nat Com., 11: 4322.

Berg, G. et al. (2020). Microbiome definition re-visited: Old concepts and new challenges. Microbiome 8:103.

Groβer, S. et al. (2019). Fur seal microbiota are shaped by the social and physical environment, show mother-offspring similarities and are associated with host genetic quality. Mol. Ecol., 28: 2406–2422.

Forcada, J. & Hoffman, J.I. (2014). Climate change selects for heterozygosity in a declining fur seal population. Nature, 511: 462–465.

For further relevant publications and downloadable PDFs, please see www.thehoffmanlab.com.