

Intrinsic and extrinsic factors underlying immunity in a long-lived seabird

Starting date: April 2019 (the exact date is flexible)

Duration: 5 months (also flexible)

One basic component of studying life-history biology is identifying trade-offs originating from life-history strategies, which can be highly variable not only between, but also within, species, and can not only differ between individuals within a population, but also change throughout the life of each individual. In addition to survival, growth and reproduction, the immune system appears to be involved in complex trade-offs which are still relatively little understood. Moreover, the multiple and complex immune functions of vertebrates can be traded off against each other as well.



Banter See colony

We study common terns (*Sterna hirundo*) at a long-term study population located in the Banter See at Wilhelmshaven on the German North Sea coast. Since 1992, all locally hatched birds have been marked with a transponder shortly prior to fledging. We use antennae at resting places and around nests to identify both breeding and non-breeding individuals. Combined with 3-times-weekly checks of nests to record reproductive parameters and to mark offspring, our methods enable the systematic and remote documentation of individual presence and reproductive performance at the colony. Once birds have established themselves as Banter See breeders, their re-sighting probability is almost 100% and their return rate is 90%, such that we can collect data over long individual life cycles.

In 2017 and 2018, we collected blood samples from adults of known age. Blood samples were obtained using a non-invasive technique, using blood-sucking bugs (*Dipetalogaster maximus*). Different immune pathways, both humoral and cellular, were assessed, and at present, the immune parameters of more than 200 individual birds are available for further investigation.



Blood-sucking bug



A common tern couple at the nest

For the proposed project, we are searching for (a) dedicated student(s) who can start in April 2019, is/are enthusiastic about spending lots of time in a large colony of seabirds to continue collecting blood samples, as well as to participate in all other research projects and the general monitoring of the breeding population. The aim of the project is to investigate whether the intra- and inter-individual immune parameters correlate with intrinsic (age, sex, reproductive success...) and/or extrinsic factors (breeding density, food availability, weather, climate...). Because the common terns in the breeding colony are habituated to research, fieldwork will involve a lot of close interaction with the birds. No prior experience with birds or fieldwork is required.

Knowledge about statistics and R, however, would be useful. The student(s) need(s) to enjoy working in an international team, happy to use English as the main working language and willing to wake up early to collect blood samples using bugs (which includes handling those bugs).

For more information, please contact **Dr. Coraline Bichet** (coraline.bichet@ifv-vogelwarte.de) or **Dr. Sandra Bouwhuis** (sandra.bouwhuis@ifv-vogelwarte.de), Institute of Avian Research, Wilhelmshaven, Germany.