Physiological mechanisms of social ageing in European rabbits

Supervisory team:
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Project description:
Loneliness in older age is an established and significant social challenge. Loneliness is linked to reduced wellbeing and health, especially in older individuals. Importantly, it is becoming increasingly clear that increasing social isolation with age is not unique to humans, and is in fact widespread across animals. However, the causes of these changing patterns of social behaviour with age remain largely unknown.

An important mechanism that has been proposed, but remains untested, is that physiological changes with age drive changes in social behaviour. For example, muscular degeneration with age (e.g. loss of muscle mass, muscle strength, muscle efficiency) might drive different social decisions. Reduced mobility means for example that individuals should travel less far to forage or forage in safer areas- changing who they associate with. Age linked changes in diet could also drive social changes. Efficiency in nutrient absorption declines with age. Older individuals may therefore need to spend longer foraging, or forage on different foods, to compensate for this loss, which will in turn drive changes in patterns of social association.

To understand how physiological changes drive changes in social behaviour requires a short-lived, active, social species to allow behaviours to be studied across the life course. This project will use a population individually-identifiable wild European Rabbits on the University of Exeter campus as model to understand how physiological changes underlie social changes in animals.

This study will use observational and experimental methods in the field in a wild population to answer the research questions. The project will run alongside other projects also studying different but complimentary questions in the rabbits on campus. Although the project has several aims, there is considerable scope for the student to explore other questions and directions as they arise.

Specific Aims
1. Quantify age-linked changes in muscular degeneration and dietary preferences in wild rabbits using veterinary and physiological measurements, behavioural observations and field experiments.
2. Investigate how social structure changes with age in rabbits using observations and Bayesian statistical modelling.
3. Establish the extent to which age-linked changes in social structure in wild rabbits are driven by changes in physiology and dietary preferences.

Our aim as the SWBio DTP is to support students from a range of backgrounds and circumstances. Where needed, we will work with you to take into consideration reasonable project adaptations (for example to support caring responsibilities, disabilities, other significant personal circumstances) as well as flexible working and part-time study requests, to enable greater access to a PhD. All our supervisors support us with this aim, so please feel comfortable in discussing further with the listed PhD project supervisor to see what is feasible.