

## **A comparative investigation of sentience assays in mammals and invertebrates: Investigating the biological origins of affective consciousness**

### **Supervisory team:**

**Main supervisor:** Dr Elizabeth Paul (University of Bristol)

**Second supervisor:** Prof Michael Mendl (University of Bristol)  
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**Collaborators:** Dr Sarah Dalesman (University of Aberystwyth)

**Host institution:** University of Bristol

### **Project description:**

Public and political concern for animal welfare is based on the assumption that many animals are sentient; that they have the capacity for feelings, and may, therefore, experience suffering. But for many years, the study of sentience was thought to be outside the scope of scientific research; the subjective experiences of animals were seen as private and inaccessible to objective scrutiny. With the rise of consciousness science and affective neuroscience (the study of emotion-like, 'affective' states in animals), however, researchers have now begun to regard sentience as an important and tractable field of biological research.

This PhD will address the question of animal sentience directly, developing and refining methods for assessing sentience in animals. In recent years, a number of different tests of sentience have been proposed, each of which assess animals' capacities for particular types of information processing (decision making) that are believed to be dependent on consciousness in humans. But these tests vary greatly in terms of which species they are suitable for, and whether they focus on conscious cognition or conscious affective states.

The aim of this PhD project is to search for evidence of affective sentience in diverse phyla, in order to begin the process of tracking the evolutionary origins of the use of both conscious and non-conscious affective states in decision-making. The student will design and develop translational tasks that allow similar assessments to be made in very different species; then, using established mathematical models of decision making, the components of the decision processes of these animals will be compared. The species to be studied will be rodents (*Rattus norvegicus*), whose emotional/affective systems and decision-making processes are already well-studied within affective neuroscience, and molluscs (*Lymnaea stagnalis*; *Cornu aspersum*). Invertebrates have recently gained significant attention in terms of whether they are sentient and possess consciousness, but methodology is currently lacking to effectively allow direct comparison with species already deemed sentient.

The successful candidate is expected to have a background in zoology, biological sciences or experimental psychology. An existing interest in/experience of evolutionary biology and/or sentience will be advantageous but not essential. They will learn about animal behaviour and cognitive science, the design and running of decision-making tasks, mathematical modelling, animal care, and the experimental and philosophical challenges facing contemporary sentience research.

**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.**