How do dogs respond to changes in cortisol levels in conspecifics and humans?

Supervisory team:
Main supervisor: Dr Nicola J Rooney (University of Bristol)
Second supervisor: Dr Carsten T Muller (Cardiff University)
Non-academic supervisor: Dr Claire M Guest (Medical Detection Dogs)
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Collaborators: Prof Michael Mendl (University of Bristol)

Host institution: University of Bristol
CASE partner: Medical Detection Dogs

Project description:
This project aims to understand whether and how dogs detect changes in cortisol levels in dogs and humans. This phenomenon may have evolved because of the selective advantage an animal has, if it can avoid danger detected by other animals, in addition to its own perception. However, this ability has potential welfare and training implications.   Charities have started to train dogs to assist patients living with Addison's disease; a condition resulting in low cortisol levels. Dogs are trained to alert their owner to the onset of an adrenal crisis initially using in-vitro samples, which suggests that dogs can discriminate cortisol levels via scent.

Working with a world-leading medical alert dog charity, this project will take a multidisciplinary approach to quantify the performance of Addison alert dogs and assess the emotional contagion effect(s) of conspecific and interspecific stress. We will use sweat samples, taken when trained dogs alert their owners, to assess sensitivity and specificity of their response and use mass-spectrometry to identify critical compounds that trigger alerting behaviour.

We will also conduct a series of experiments presenting naive dogs with urine samples from humans and dogs of previously quantified cortisol levels, collected at times of varying naturally occurring stress. Using tests of trainability and affective state, developed and validated at University of Bristol, we will explore the effect of these samples on the receiver dog. The project has the potential both to improve understanding of emotional contagion and signalling and to potentially improve the welfare and working ability of dogs.

The student will have the unique opportunity to join a strong cross-institutional, multidisciplinary collaboration. They will be primarily based at the world renowned Animal Welfare and Behaviour group at Bristol Veterinary School and will work in Dr Muller's laboratory at the Cardiff School of Biosciences to learn methods of collection, analysis, interpretation and evaluation of volatile organic compounds, as used in vertebrate chemical ecology. The placement with Medical Detection Dogs, a world leader in training dogs for medical alert and bio-detection function will complement the training.

The student will gain skills across disciplines in behavioural observation, and measuring working dog performance and welfare, scent analysis, data processing and evaluation.

The applicant should have a strong first degree or masters in a biological science, biological chemistry, psychology or veterinary science. Experience of laboratory work and/or an aptitude to learn new techniques such as mass spectrometry is needed, as are strong quantitative analysis skills.