Mechanisms of colour change in chameleon prawns - from genes to sensory ecology

Supervisory team:
Main supervisor: Prof Martin Stevens (University of Exeter)
Second supervisor: Dr Martin How (University of Bristol)
Prof Chris Bass (University of Exeter)

Host institution: University of Exeter (Penryn)

Project description:
Colour change and camouflage are two extremely common adaptations in nature, often used by prey to avoid being seen by predators. Colour change is often used by animals to tune their appearance over various timescales to match the prevailing background. It is very common in crustaceans, including crabs, prawns and others. We have an excellent understanding of why camouflage and colour change exists (its function) but very little understanding of many of the mechanisms that drive it. This project will utilise the widely studied and extremely colourful chameleon prawn found in the UK. It is an abundant species found locally in the rock pools Cornwall and an ideal system to study colour change because individuals can change from red, to green, to yellow, and even transparent to match different seaweed species. They are also capable of choosing to sit on backgrounds that match their coloration. They are highly amenable to study in the lab and field. The project will involve experiments to test what aspects of vision or other senses chameleon prawns used to guide their colour change and behaviour, and disentangle the sensory information used. It will also involve experiments to test what their visual system may be capable of perceiving, and how they respond to potential threats. The work will also aim to determine how changes in genes and molecular biology underpin colour change and behaviour, and vision. Ultimately, the project will shed light on how colour change in nature works and how behavioural choice for camouflage is guided.

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.