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EDITORIAL

Short communications

This issue of JEB sees the first three articles in a new journal section: Short Communications. Introduced in response to author feedback, this brief (<2500 words) style of article aims to provide a venue for high-quality, hypothesis-driven, self-contained pieces of original research. The articles should not be preliminary reports or merely incremental studies but should augment the body of knowledge and be of significant and broad interest to the field of comparative physiology. Additionally, they may be opinionated and challenge existing theories and/or propose new theories or concepts based on existing research.

The three Short Communications in this issue cover the breadth of fields published in the journal, ranging from the repeatability of metabolic rate to the way ants use visual information to navigate to the role of insulin-related peptides in memory formation.

In the first of this new style of report, Craig White, Natalie Schimpf and Phillip Casey (p. 1763) conduct a meta-analysis to compare the contrasting results of two previously published JEB papers on metabolic measurements. In the first study, Nespolo and Franco (*J. Exp. Biol.* 210, 2000-2005) concluded that metabolic rate is generally a repeatable trait and that repeatability is not affected by the time between measurements. However, in a later study, Norin and Malte (*J. Exp. Biol.* 214, 1668-1675) found that repeatability of metabolic rate for a single species (brown trout) was high in the short term but declined to essentially nothing in the long term. White and colleagues carried out their own meta-analysis of all data for metabolic rate published to date, demonstrating that the repeatability of metabolic rate decreases with time for both ectotherms and endotherms. Confirming the generality of Norin and Malte's findings, this analysis has implications for studies testing for phenotypic associations among metabolic rate and other traits, because variation among individuals is the raw material on which natural selection acts, and inter-individual differences must be both consistent and genetically based for traits to respond to selection.

Challenging the perceived dogma about the information that ants store about their surroundings, Antoine Wystrach and colleagues propose an alternative method by which ants use visual information to navigate complex idiosyncratic routes to a discrete goal. Since the seminal work on ant navigation published by Cartwright and Collett in 1983 (*J. Comp. Physiol. A* 151, 521-543), the commonly held view is that ants rely on visual cues and store multiple 'snapshot memories' at discrete locations that are retrieved sequentially to break routes into sections. However, in their article on p. 1766, Wystrach and colleagues employ a computational model they have recently developed (Baddeley et al. *PLoS Comput. Biol.* **8**, e1002336) that uses a neural network to gather information from all experienced views and compile it into a single 'holistic memory', which can then be used to determine the most familiar heading at a given location. By applying this familiarity-based algorithm, the team was able to replicate behaviours observed in key behavioural studies and thus show that whatever information-processing architecture insects use for navigation, it does not require the tricky problem of learning, storing and using discrete snapshots sequentially.

In the last of our inaugural Short Communication studies, Etsuro Ito and colleagues continue their analysis of the role of insulin-related peptides in memory formation. Using the ability of the pond snail *Lymnaea* to learn taste aversion and to consolidate this learning into long-term memory (conditioned taste aversion), the international team has previously shown that molluscan insulin-related peptides (MIPs) are upregulated in snails exhibiting conditioned taste aversion and that exogenous application of MIPs to the isolated central nervous system evokes long-term synaptic enhancement at the synaptic connection between the cerebral giant interneuron and the B1 buccal motor neuron – key neurons in memory formation. Following on from this work, Jun Murakami and co-workers (p. 1771) now show that the synaptic enhancement – hypothesized to be the neural correlate of behavioural memory – is due to changes on the postsynaptic B1 neuron, emphasizing that both postsynaptic and presynaptic changes needs to be considered when studying the neuronal basis of memory formation in invertebrates. In addition, the study demonstrates that the cognitive enhancements brought about by insulin can be studied at the level of single neurons in invertebrates, which may help to further understand the function of insulin in the more complex mammalian brain.

Having launched this new article type for the communication of concise, self-contained studies, we look forward to receiving more submissions in this area. Further information about submitting a Short Communication to JEB can be found at http://jeb.biologists.org/site/author/article_types.xhtml#short.

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