## Introduction

Cognition is defined as the processes by which animals gather, preserve, and use information from their environment through perception, learning, memory, and decision making ([Shettleworth 2010](#ref-shettleworth)). These cognitive processes underpin several aspects of animals’ ecology such as foraging, mate choice, antipredatory strategies, and/or social behaviours, that are crucial for the survival and reproduction of animals ([Dukas 2004](#ref-dukas_evolutionary_2004)). Particularly, learning - the acquisition of neuronal representations of new information ([Dukas 2004](#ref-dukas_evolutionary_2004)) - is seen as fundamental for coping with environmental changes by enabling individuals to create new associations between events ([Dukas 2004](#ref-dukas_evolutionary_2004); [Leal and Powell 2012](#ref-leal_behavioural_2012); [Buchanan et al. 2013](#ref-buchanan_condition_2013)). However, the capacity of individuals to acquire new information exhibits natural variation influenced by factors like age, sex, gut microbiota, or the environment where animals develop ([Szuran et al. 1994](#ref-szuran_water_1994); [Lemaire et al. 2000](#ref-lemaire_prenatal_2000); [Zhu et al. 2004](#ref-zhu_prenatal_2004); [Amiel and Shine 2012](#ref-amiel_hotter_2012); [Amiel et al. 2014](#ref-amiel_egg_2014); [Carazo et al. 2014](#ref-carazo_sex_2014); [Noble et al. 2014](#ref-noble_age-dependent_2014); [Alemohammad et al. 2022](#ref-alemohammad_2022_microbiota_learning)). The developmental environment, in particular, plays a pivotal role, as the brain is especially susceptible to environmental influences during early stages of development ([Zhu et al. 2004](#ref-zhu_prenatal_2004)). Hence, investigating the effects of the developmental environment on learning can be essential to understand the evolution of learning and predict animals’ responses towards environmental change.