WWTF Project CS18-042

Coping with change: The influence of early experience, nutrition and stress on behavioral flexibility

Abstract

Organisms have to adapt to changing environments in order to survive and behavioral flexibility via learning plays an important role in adaptation within an individual's life time. Stress reactivity is a key factor influencing flexibility. The physiological stress response is an adaptive mechanism that prepares an organism to adverse conditions (e.g. predator attacks) by providing extra energy. Brief stress may enhance attention and memory formation, which are major components of flexibility. However, long-lasting disturbance results in chronic stress activation, which may in turn impair flexibility. Both early-life experiences and nutritional state modulate how animals cope with stressful events. Theory predicts that well-nourished animals can compensate for the extra-energetic demand preventing them to reach the energetic threshold for an "emergency response". They will remain in a chronically activated state, which may impair learning and flexibility. Using a cichlid fish model we will test how early environment, nutrition and variable stress exposure influence cognition and behavioral flexibility. Using an interdisciplinary approach, we will measure components of flexibility and reactivity of the stress axis at a behavioral, physiological and neuromolecular level. Combining approaches from cognitive biology, endocrinology and molecular neurobiology will further our understanding of the evolutionary conserved physiological pathways regulating behavioral flexibility.

Scientific disciplines:
501030 - Cognitive science (40%) | 106048 - Animal physiology (30%) | 106025 - Neurobiology (30%)

Keywords:
behavioural flexibility, early environment, stress axis, glucocorticoid receptors

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Status: Ongoing (01.04.2019 - 31.03.2023) 48 months

Funding volume: EUR 584,700

Further links about the involved persons and regarding the project you can find at
https://archiv.wwtf.at/programmes/cognitive_sciences/CS18-042