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Neurons, Hormones & Behavior : from insects to mammals

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Physiologie de la Reproduction et des Comportements

SBN Society for Behavioral Neuroendocrinology

P1.8 Isotocin and vasotocin modulation of aggression and stress response in Betta splendens
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Isotocin (IT) and vasotocin (AVT) are two nonapeptides highly conserved across taxa and they are well known for their involvement in the regulation of different types of behavior, such as sociality, aggression, and stress. However, the mechanisms underlying their action are still not fully understood, and opposite results for behavioral modulation have been reported in the literature. Here, we investigated the effect IT and AVT system changes on the endocrine and behavioral response in two context-specific situations, namely aggression and stress, in adult males of the Siamese fighting fish Betta splendens. The action of IT and AVT was blocked through pharmacological administration at different dosages of specific receptor antagonists, namely L-368,899 for IT and the Manning compound for AVT. For aggression, a 30 min response to a mirror-challenge was analyzed and post-fight plasma levels of the androgen 11-ketotestosterone (KT) quantified. For stress, the response to a 10 min looming stimulus and the recovery behavior after this for a period of 30 min was assessed, with plasma cortisol (F) levels being quantified at the end of the trial. Preliminary analysis of the aggression test shows a reduction of post-fight KT levels with Manning, regardless of dosage, and a similar trend for aggressive behavior. The looming stimulus induced an acute freezing response in most fish and the appearance of horizontal “stress-stripes”, suggesting this is an appropriate test to induce stress in this species. Results are discussed according to the roles described for IT/oxytocin and AVT/vasopressin in aggression and stress across vertebrates.

P1.9 Calling activity modulations in a south American treefrog: from physical factors to hypothalamic nonapeptides
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In some vertebrates, calling activity is an attribute used by males to attract females during courtship. This behavior can be modulated by exogenous (physical) and endogenous (hypothalamic nonapeptides; Vasopressin/Vasotocin (AVT)) factors. During breeding, males of Boana pulchella, a South American hylid frog, congregate in choruses and emit three distinct note types. In this study, first we did continued recordings of calling activity, temperature, light intensity and rainfall using dataloggers during one year in a chorus of B. pulchella. Second, we looked for the presence of AVT in the brain of B. pulchella males through immunohistochemistry; and third, we performed pharmacological experiments in the field by injecting AVT in calling males. In the chorus, calling activity was more frequent in warmer seasons and not evenly distributed during the night. It peaked between 11 pm and 2 am and decreased significantly 2 hours before sunrise. Temperature and photoperiod, but not rainfall, were correlated with calling activity. We identified AVT neurons in the preoptic area using immunostaining and classified them into three types: parvocells, magnocells, and gigantocells. Our preliminary results show no change in call rate of males after AVT injection.

P1.10 Rapid evolution of social cognition and divergent patterns of forebrain activation in a zebrafish artificially selected line for sociality
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We have conducted an artificial selection experiment for sociality in zebrafish in which individuals have been phenotyped, using video-playbacks, for social preference for a conspecific shoal (of 4 fish) vs. preference for a non-social stimulus (4 circles animated with non-biological motion). We have used a founder population of Tuebingen wild-type strain from which 4 selection lines were created, each with 2 replicates (200 fish/ generation for each replicate): a Shoal line, selected for preference to associate with conspecifics; a Circles line, selected for preference to associate with circles; a no preference line,