Behavioral effect of octadecaneuropeptide and neuropeptide Y related to feeding regulation in goldfish

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Goldfish has several merits as a laboratory animal model, and we have extensively identified the regulatory mechanisms of neuropeptides on food intake in this species. For example, octadecaneuropeptide (ODN), which is derived from diazepam-binding inhibitor, decreases while neuropeptide Y (NPY) increases food intake via the metabotorpic endozepine receptor- and the Y1 receptor-signaling pathways, respectively. Recent studies have revealed that neuropeptides are widely distributed in the brain in key areas of emotional regulation. In rodents, psychomotor activity and/or emotional behavior are affected by neuropeptides involved in the regulation of feeding, suggesting that these neuropeptides play psychophysiological roles, and that feeding and emotional regulations are closely linked by neuropeptides. The scototaxis protocol (white/black background areas preference test) has proven to be a valuable model for evaluating the psychophysiological effects of neuropeptides in fish. Using this test, we have found that, in goldfish, ODN acts as an anxiogenic neuropeptide via central-type benzodiazepine receptor while NPY exerts an anxiolytic-like effect through activation of the Y4 receptor. These data indicate that, in goldfish as in rodents, ODN and NPY, which are implicated in the regulation of food intake, are also involved in the control of locomotor and psychomotor activities.