

Neurones à kisspeptine et oestrogènes. Etude chez le poisson zèbre et le loup de mer.

Kisspeptin neurones and their relationships with estrogens. Study in two fish species the zebrafish and the sea bass.

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Kisspeptins are fascinating actors in the neuroendocrine regulation of reproduction. In vertebrates, the number of *kiss* genes varies from none to three. This study aims to characterize kisspeptin systems in two fish species commonly used for reproductive studies: a freshwater Cypriniform, the zebrafish (*Danio rerio*) and marine Perciform fish, the European sea bass (*Dicentrarchus labrax*). Both fish have two *kiss* genes, *kiss1* and *kiss2*, and two kiss receptors (GPR54 or Kissr), *kiss1r* and *kiss2r*. To elucidate the organization of kiss systems in zebrafish, antibodies were raised against the zebrafish preproKiss1 and preproKiss2 sequences. Immunohistochemical findings were fully confirmed by *in situ* hybridization data. *Kiss1*-expressing neurons are exclusively located in the habenula in zebrafish and sea bass, exactly where *kiss1r* mRNA-containing cells are also detected. During the breeding season sea bass shows an additional *kiss1* population into the mediobasal hypothalamus, where *kiss2*-containing cells are shown in zebrafish. Nevertheless, the main *kiss2* mRNA-positive population is observed in both species in the dorsal hypothalamus and in the preoptic area. Immunohistochemistry reveals that *kiss2*-expressing cells in zebrafish project widely into the forebrain and midbrain. These regions also strongly expressed the *kiss2r* mRNA in zebrafish, as well as in sea bass. Moreover, in both species *kiss2* fibers or *kiss2r*-expressing cells of the preoptic region make close appositions with the respective hypophysiotrophic GnRH neurons of each species (GnRH3 in zebrafish and GnRH1 in sea bass). *Kiss2* populations of the ventral and caudal hypothalamus are estrogen sensitive in juvenile zebrafish, whereas in sea bass it is the *kiss1* population of the mediobasal hypothalamus that expresses ER α and slightly ER β 2. Furthermore, in this latter species during the breeding season, a strong *kiss1* expression is observed in the pituitary FSH β immunopositive cells. Altogether our results suggest that *kiss1* in sea bass and *kiss2* in zebrafish could participate in the regulation of reproduction through the hypothalamic kiss population sensitive to estrogens, proving that kisspeptin systems show evident species specific differences.

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