IN VIVO AND IN VITRO APPROACHES TO DIRECT ASSESSMENT OF HYPOTHALAMIC RELEASE OF GONADOTROPIN RELEASING-HORMONE IN MARMOSETS

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Refinement of in vivo hypothalamic cannulation techniques and in vitro perifusion systems have enabled discrete and reliable quantitative assessment of pulsatile release of gonadotropin releasing-hormone (GnRH), the key neuroendocrine regulator of pituitary gonadotropin release, in marmosets. In contrast to most mammals, including Old World primates, but likely typical of New World primates, marmosets synthesize and release chorionic gonadotropin (CG) and not luteinizing hormone (LH) from pituitary gonadotropes in both adult males and females. In females, exogenous GnRH stimulates a slower onset of release of CG from the pituitary. Not surprisingly in this regard, endogenous episodic release of GnRH from the marmoset hypothalamus is not obviously concordant with CG release from the marmoset pituitary. This is in contrast to the distinct concordance found between episodic release of GnRH and LH in female rats. Intervals between episodic release of GnRH were greater in marmosets than rats, a distinction that is also found in males, and may reflect hypothalamic regulation of CG versus LH. In vivo marmoset GnRH release dynamics were confirmed by in vitro perifusion analyses. Interestingly, endogenous GnRH release dynamics did not differ between ovary-intact female marmosets and either ovariectomized marmosets (with elevated CG levels) or socially subordinate, anovulatory marmosets (with diminished CG levels).