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Intracerebral Injections of Morphiceptin into the Medial Preoptic Nucleus Inhibit Male Rat Copulatory Behavior

Leslie Matuszewich
Illinois Wesleyan University

Wayne Dornan, Faculty Advisor
Illinois Wesleyan University

INTRACEREBRAL INJECTIONS OF MORPHICEPTIN INTO THE MEDIAL PREOPTIC NUCLEUS INHIBIT MALE RAT COPULATORY BEHAVIOR

Leslie Matuszewich, Dept. of Psychology, IWU, Wayne Dornan*

A richly interconnected, sexually dimorphic circuit which includes the medial amygdala (MA), the bed nucleus of the stria terminalis (BnST), and the medial preoptic-anterior hypothalamic area (MPOA) has been reported to be an important pathway for the expression of male sexual behavior in rodents. One of the fundamental questions that remains to be answered is the identity of the neurotransmitter (s) within this circuit that regulates male sexual behavior. There is much speculation in the literature about the possible effects on male copulatory behavior associated with selective activation of opioid receptors. Presently, however, it is not clear which receptor type within the MPOA mediates the inhibition of male copulatory behavior following central administration of opioid agonists. Therefore, in this study we examined the effects of the highly selective mu receptor agonist, morphiceptin, on male rat copulatory behavior.

Adult male Long-Evans rats were used. Each male was anesthetized with Somnotol and received a pair of stereotaxically implanted 22-gauge stainless steel guide cannulae, aimed 2mm above the medial preoptic nucleus (MPN) (AP = +2.2; ML = -0.5; and DV = -6.3). One week following surgery, the males were tested for mating behavior (baseline). One week following baseline tests, all animals received bilateral injections of 1000, 500, 10 or 0 ng of morphiceptin into the MPN. A variety of parameters of male sexual behavior were then measured. All three doses, 10ng, 500ng and 1000ng, produced a dramatic delay in the initiation of male copulatory behavior. In some rats, a complete suppression of copulatory behavior was observed. No other parameters were affected. Pretreatment with naloxone (1mg/kg) 20 minutes prior to intracerebral injections of morphiceptin completely blocked the inhibitory effect of morphiceptin on male copulatory behavior. Taken together these results indicate that the inhibition of male copulatory behavior observed following administration of systemic or central injections of opioid agonists is partly mediated via mu receptors located within the MPN.