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Neuronal nitric oxide synthase in forebrain and mesencephalon is not affected by castration and testosterone therapy in Japanese quail

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Neuronal nitric oxide synthase (nNOS), the enzyme producing nitric oxide (NO), has been implicated, in mammals, in the control of various aspects of male sexual behavior. The expression of nNOS in rodents is regulated by gonadal hormones, in particular testosterone (T) and its aromatic metabolite estradiol. We analyzed here, in castrated male quail, the effects of a treatment with T, on brain nNOS immunoreactivity. Five week-old castrated males were treated for 4 weeks with Silastic implants filled with T or left empty as control. Sham-operated sexually mature birds received empty implants. In quail, the neuroanatomical distribution of nNOS immunoreactive (nNOS-IR) cells is largely comparable to the distribution described in mammals. However, there are important differences at the level of the hypothalamus and of associated limbic region (bed nucleus of the stria terminalis, BST, septal complex). Very few or no IR elements are present within the quail medial preoptic nucleus (POM) and paraventricular nucleus (PVN). In contrast, a large number of nNOS-IR elements are present within the ventromedial nucleus (VMN), as well as in the most lateral part of the BST, pars medialis (BSTm), two regions characterized by high levels of estrogen and androgen receptors. In the mesencephalon, nNOS-IR cells are also present in the area ventralis tegmentalis (AVT) and substantia grisea centralis (GC), which also express estrogen receptors. Detailed quantitative analyses revealed no significant effect of exogenous T on the number of nNOS-IR cells within the VMN, AVT, GC and BST. In conclusion, these data indicate that nNOS is poorly or not expressed in the POM and that the hypothalamic nNOS system of male quail is not under the control of T. This suggest that the role played in mammals by NO in the control of male sexual behavior, as well as other functions such as osmoregulation, may not be considered a general feature of vertebrates. *Support: Univ. Torino*

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