

## ZOOLOGY AND VETERINARY MEDICINE

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**Alfonso Filipp Maksimovich**

3rd year student,

Federal State Budgetary Educational Institution of Higher Education

“Moscow State Academy of Veterinary Medicine and Biotechnology - MVA named after K.I. Skryabin”,

Russian Federation

**Scientific adviser: Mukhtarova Olga Mikhailovna**

candidate of agricultural sciences, assistant of the

Department of Genetics and Animal Breeding named after V.F. Krasota

Federal State Budgetary Educational Institution of Higher Education

“Moscow State Academy of Veterinary Medicine and Biotechnology - MVA named after K.I. Skryabin”,

Russian Federation

## **NEUROENDOCRINE MECHANISMS OF REPRODUCTIVE FUNCTION REGULATION AND THEIRFORMATION IN ONTOGENESIS**

In the development biology, it is important to accurately consider the stage of ontogenesis under study, since it determines the timing of inclusion and the role of various humoral regulators of the body's development, including hormones.

Currently, the hormonal regulation of early development has been studied very imperfectly in humans, monkeys, some domestic animals (sheep, pig, cow) and much more in a number of laboratory animals (rat, rabbit, guinea pig). In all the studied species, the endocrine glands begin to function in prenatal life; the hormones produced by them turned out to be biologically identical to the hormones of the adult body. Only the testis in the embryonic period of development secretes a hormone other than the usual androgens, the production of which is not proven at maturity (this hormone causes resorption in the embryo of the Muller ducts). Only in males, the development of the reproductive system is controlled by the reproductive hormones of the testis, while the differentiation of the reproductive system by the type of female does not need

a hormonal signal. The sensitivity of target organs to a specific hormone regulator appears in the embryo, usually earlier than the concentration of this hormone in its blood reaches the threshold level.

In the system "hypothalamus-pituitary-gonads-receptors", the last link Matures partially in the prenatal period. Masculinization of the excretory sexual pathways occurs in the male occurs in the male under the influence of hormones of his testis before birth. At the same time, the masculinization of the centers that regulate gonadotropic secretion, which is caused by the androgens of the embryonic testis, is divided into two stages. One stage may also appear prenatally (for example, in humans): androgens, obviously, act on the principle of negative feedback, inhibiting gonadotropic activity in the male embryo compared to the female. Another stage of masculinization of the hypothalamus centers is manifested only in maturity – in the cyclic gonadotropic secretion in the female and its non-cyclical character in the male, as well as in the peculiarities of their sexual behavior. In this regard, the sexual differentiation of the hypothalamus that cause androgens of the testis of the embryo, but which appears only in maturity can be described as "delayed effect" to distinguish it from the action of androgens of the testis of the embryo on gonadotropin secretion in embryonic life, which is convenient to designate as "immediate effect" of the action of androgens, the embryonic testis.

Tropic hormones of the pituitary gland of the fetus do not play a triggering role in morphogenesis or activation of hormone synthesis in the endocrine glands, which are targets of these tropins at maturity [1, p. 142-144]. This is also true for the androgen secretion of the testis. However, the feedback between androgens and gonadotropin secretion, as shown by the presence of an "immediate effect" of their action, is established already in the embryo. A crucial role here is played by the presence of the so-called critical period of specific sensitivity of hypothalamic receptors to androgens. Neither in early ontogenesis, nor later, they do not have such sensitivity, so androgens cannot exert their masculinizing effect on these centers [2, p. 251]. In this case, the role of the stage of development is particularly clearly visible and there is no direct

connection with both the calendar age of the embryo and events that seem to be nodal in its life, such as the birth of a fetus. Androgens have their delayed effect, acting on the hypothalamus in a rabbit, guinea pig, sheep, monkey, human-prenatally, and in a rat or hamster-postnatally, but from the point of view of the development of the reproductive system, the germ of the pig and the baby rat are at the same stage at this time: in a critical period of specific sensitivity to these hormones of their hypothalamic receptors.

Only a comparison of adequate stages of development can lead to reasonable conclusions about the mechanisms of their regulation, although at present the picture of the formation of hormonal regulation of development is still too fragmentary, and we do not know much about the specific role of hormones at certain stages of ontogenesis in different species.

#### **References:**

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