Prospects of application of stem cells in diseases of the thyroid gland

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Research in the field of application of stem cells in cell therapy has made a big push in the development and improvement, the cultivation and use of stem cells in veterinary medicine and medicine.

At present the scientific clarification in the use of stem cells in diseases of the endocrine glands. They produce hormones that enter the blood or lymph and spread throughout the body. Hormones are biologically active substances. They stimulate or inhibit the activity of organs or entire body systems, providing the basic functions of an organ or system in General. Provide metabolism, growth, development and reproductive function, i.e. the glands together with the nervous system to regulate and coordinate the activities of the body. Unlike the glands of external secretion ,have no excretory ducts and products of their activity are sent directly into the blood.

Thyroid function began to emerge since the surgeons Reverdin 1882 and Kocher 1883 noticed that after complete removal of the thyroid gland as it was done in the first place, such as when goiter (hypertrophy of the thyroid gland) or in malignant tumors it etc, there comes a series of painful seizures that usually end in death.

Thyroid gland (gl. thyreoidea) is unpaired, consists of left and right lobes and isthmus. The particles lie on the corresponding surfaces of the thyroid cartilage of the larynx and the first tracheal cartilage and connected by a neck ventral , horses and sheep may not be. In pigs, the isthmus is well developed , has the form of a plate, which is called the body . Iron has a red-brown color, dense texture and uneven surface . The mass of the thyroid gland varies considerably among different species and within the same species, due to the article, the external environment and condition of the animals (pregnancy, lactation, etc).

The thyroid gland is constructed of connective tissue stroma and parenchyma. Connective tissue stroma is formed by loose connective tissue in which blood and lymph vessels and nerves . It forms the capsule, from which trabeculae of dividing the gland into lobules . The parenchyma of the gland represented epithelial tissue, the epithelial cells which form bubbles — follicles and miflor Islands . The follicles have aspherical shape, their diameter ranges from 0.02 to 0.7 mm. Between them are

delicate layer of loose connective tissue containing many blood capillaries . In the follicle distinguish between a wall and a cavity, which is filled with colloid. The wall is formed by endocrinology called thyrocytes , and parafollicular cells and basement membrane.

The thyroid gland produces three hormones: thyroxine, triiodothyronine and thyrocalcitonin. The first Two are similar in chemical structure and physiological effect. The activity of thyroxine 3-5 times weaker. These hormones are synthesized with the participation of iodine, so this element more than anything in the thyroid gland (50% of the total number in the body), where its content is 300 times higher than the concentration in the blood. The cells of the secretory epithelium transform inorganic iodine in an organic compound that you the amino acid tyrosine in monoiodotyrosine and diyodtirosin. Due to the connection with the protein globulin formed thyroglobulin, which is stored in the vesicles of the gland. If necessary thyroglobulin by the enzyme protease PE - retargets in active form — thyroxine and triiodothyronine. The direct effect of these hormones is that they enhance the oxidative processes in cells, particularly in the mitochondria. By increasing their concentration in the blood of all given substances burn quickly, the body is depleted, the observed weight loss.

The removal of the thyroid gland is accompanied by a sharp slowdown in the growth of the animal. To a large extent this relates to the development of long bones, articular cartilages which do not develop quickly and turn into bone. Trophic changes occur in the skin, in particular there is thickening due to the accumulation of infiltration. The growth of the teeth is also slowing down, they easily crumble decay.

Key word: thyroid gland, hormones, thyroid disease, stem cells, mesenchymal stem cells, benign or malignant tumor, stem cell transplantation, stem cells thyroid.

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