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MUSCLE TISSUE. DIFFERENTIATION BETWEEN SKELETAL AND CARDIAC MUSCLES

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Relevance

Muscle tissue occupies a special place among tissues in terms of types, functions and histological structure. Muscle tissue fibers and their movement and control have been a source of difficulty and interest to this day. It is surprising that muscle fibers with the same structure have different movements or that although the fibers are arranged in different ways in appearance, they belong to the same group in terms of function.

Keywords

muscle tissue, skeletal muscle, cardiac muscle, sarcomere, satellite, myoepicardial.

МЫШЕЧНАЯ ТКАНЬ. РАЗЛИЧИЕ МЕЖДУ СКЕЛЕТНЫМИ И СЕРДЕЧНЫМИ МЫШЦАМИ

Актуальность

Мышечная ткань занимает особое место среди тканей с точки зрения типов, функций и гистологической структуры. Мышечные волокна, их движение и контроль до сих пор остаются источником трудностей и интереса. Удивительно, что мышечные волокна с одинаковой структурой имеют разные движения, или что, несмотря на различное внешнее расположение волокон, они относятся к одной группе по функциям.

Ключевые слова

мышечная ткань, скелетная мышца, сердечная мышца, саркомер, сателлит, миоэпикардиальный.

Main part: the basis of striated muscle tissue is long, multinucleated black and white discs. The fibers are cylindrical in shape, with rounded ends, and some are branched. Their length is from 100 mm to 12 cm. Their diameter is from several microns to 100 μm. Each fiber is surrounded by a sarcolemma. The sarcolemma consists of three layers: 1) the inner layer is 50-100 A thick; 2) the middle or intermediate layer is 150-250 A thick; 3) the outer basophilic layer is 300-500 A thick. Precollagen fibers are attached to each muscle fiber from the upper side in a reticular pattern. They are covered from above by a basement membrane. The basement membrane, which consists of thin fibrils, is held together by an amorphous substance and is connected to the collagen and argyrophil fibers of the connective tissue surrounding the muscle fiber.

Smooth muscle is found in the walls of hollow organs throughout the body. Smooth muscle contraction is a voluntary movement triggered by impulses transmitted to smooth muscle tissue by the autonomic nervous system. The arrangement of cells in smooth muscle tissue allows it to contract and relax with great elasticity.

Although the structure of the heart muscle is transversely striated, it is classified as a smooth muscle in terms of function and contraction because it contracts involuntarily.

Striated muscles are muscles located in the ventricles of the heart. They are attached to the two-layer (mitral) and three-layer valves located between the atria and ventricles by tendon-like cords and contract to prevent inversion or prolapse of these valves during systole (ventricular contraction). Striated muscles make up approximately 10% of the total heart mass

There are five spiracles in the heart; 3 in the right ventricle and 2 in the left ventricle. The spiracles of the anterior, posterior, and septal regions of the right ventricle are attached to the three-cusp valve by tendons. The anterolateral and posterior-medial spiracles of the left ventricle are attached to the mitral valve by tendons. Function of the spiracles The spiracles of the right and left ventricles begin to contract shortly before ventricular contraction and maintain full tension. This strengthens the septal and interventricular valves against prolapse and prevents ventricular blood from flowing back into the ventricular cavities under the influence of high pressure in the ventricles.

Muscles are organs of the human and animal body; they consist of tissue (muscle tissue) that has the property of contracting under the influence of nerve impulses. Smooth, striated, and cardiac muscles together make up the muscular system of the body. They play a major role in movement. They are divided into striated and smooth muscles. Smooth muscles form the muscle membranes of internal organs, the walls of blood and lymph vessels, and the muscles of the skin. Smooth muscles contract involuntarily, therefore they are called involuntary muscles. Smooth muscle arises exclusively from the mesenchyme. The muscle fiber consists of a longitudinally elongated muscle cell, has a thin elastic membrane - sarcolemma, cytoplasm - sarcoplasm, many nuclei and organoids. The contractile structure of the muscle fiber is a long thread-like myofibrils extending from one end of the fiber to the other. Skeletal muscles include skeletal muscles and cardiac muscle (myocardium). The structure of striated muscles is subject to human will.

Conclusion: Muscle tissue is divided into 3 groups, and they themselves are divided into several groups. The structure of cardiac muscle fibers is unique, containing 5 types of striated muscles. Although the length of skeletal muscle fibers is only mm thick, it is amazing that they can control the function of internal organs and the movement of the entire body. This appearance occurs due to the dense arrangement of satellite cells in muscle fibers and the membrane that tightly surrounds the fibers.