

DOI: 10.36648/2471-8157.7.4.125

## A Short Note on Adult Heart Tissue and the Cardiomyocytes Contraction

Jyothi Kolla\*

Department of Cardiology, Narayana Medical and Sciences, Nellore, India

### Abstract

The recognition of the origin of cardiomyocytes are of critical consequence for the development of strategies capable of enhancing the growth response of the myocardium; in fact, cell therapy for the decompensated heart must be based on the acquisition of this fundamental biological knowledge areas.

Cardiomyocytes are belonging to the family of muscle cells; however, they are highly different from other muscle cells in the human body. For instance, they lack my satellite cells that are associated with regular muscle cells and are used for repair and healing. Additionally, cardiomyocytes are typically imposed branch out whereas regular muscle cells are do not and instead form singular fibers.

**Keywords:** Adult heart tissue; Cardiomyocytes; Myofibril; Cardiac cells

\*Corresponding author:

Jyothi Kolla

[kollajyothi64@gmail.com](mailto:kollajyothi64@gmail.com)

Tel: +91 7386325335

Department of Cardiology, Narayana Medical and Sciences, Nellore, India

**Citation:** Kolla J (2021) A Short Note on Adult Heart Tissue and the Cardiomyocytes Contraction. *Interv Cardiol J* Vol.7 No.4:125

**Received:** April 06, 2021; **Accepted:** April 20, 2021; **Published:** April 27, 2021

### Introduction

Cardiomyocytes are relatively smaller in size, wide range, long and in their mature stage, they typically express a single central nucleus along with an organized myofibril and aligned sarcomeres tumor that produce striations. However, cardiomyocytes are completely different from skeletal muscle cells in that they are almost completely aerobic stage, because those are containing elevated numbers of the mitochondrial portions and huge myoglobin reserves that serve as an oxygen storage unit center. The T-tubules, extensions of the sarcoplasm that infiltrate the cytoplasm, are also shorter in the cardiomyocytes than in skeletal muscle and do not bond to the sarcoplasmic reticulum. The circulatory system of the myocardium is larger than it is for regular muscle cells, to supply of the myocardium's is greater need for oxygen source. Cardiomyocytes also contract autonomously and rhythmically, without directions from the nervous system signals.

Cardiomyocytes are directly connected by intercalated discs, a complex cell junction unique to cardiac cells. The intercalated disc is almost relatively in appearance and function to finger-joints used in wood construction and they fit together to creates a

strong physical, chemical, and electrical connection between adjacent cells formation. They are like the Z-disks that connect the actin filaments within the myocyte as they bind to the myofibrils of the cells at a specialized location, and it is termed as the fascia adherents and thus transfer contractile forces across the disc. This force allows the cells to pull together and those are effectively uniting them into a single continuous contractile element. The jagged appearance of the intercalated discs that are caused by strong attractive forces between the sarcolemma of the joining myocytes, which are bound together by desmosomes. Each intercalated disc has several desmosomes, also called macula adherents, along its surface. Desmosomes are the local adhesion sites which can easily attach to the cytoskeleton of the muscle cell myocytes and they can resist the shear forces between the intercalated discs incurred by the contraction force of the cardiomyocytes, thus the maintains of the 3D structure of the tissue. The surfaces of the adjacent cells at the intercalated disc are generally separated by approximately 25 nm scale, but the gap is separated and measures to about 3 nm at zones called gap junctions. These gap junctions are bridged by the ion channels to allow an electrical and chemical transportation between the myocyte's origin.

## Conclusion

The two basic methods for culturing adult ventricular myocytes as termed as originally by Jacobson and Piper procedures. The first maintains myocytes in a serum-supplemented medium, usually they are without cell attachment to the culture surface area. Under these conditions' myocytes remain in the suspension and become rounded shape, losing they are in-vivo rod-shaped

morphology characters. After 2 to 4 days in suspension the cells are attached to the culture surface and start to spread, sending out pseudopodia-like projections in different directions.

The second culture technique has been called as the "rapid attachment" method. The culture surface is pre-treated with attachment individuals and the myocytes are plated out in a serum-free medium. Cells adhere to the culture surface within 3 h of being played out.