Abstract

The ability to produce regular rhythm and independence of nervous system and are some of the features of the cardiac conduction system. The conduction system comprises the sinoatrial node, internodal tracts, the atrioventricular node, the atrioventricular (His) bundle, its right and left branches, and the terminal network of Purkinje fibers. However, this system is frequently the cause of the cardiac rhythm disorders, i.e., arrhythmias. There are many unanswered questions about the conduction system, even though its development is closely connected to the growth of the whole heart. The heart undergoes many dramatic changes during its development, such as modification of linear heart tube into the mature four-chamber organ. Looping and forming chambers cause change of localization first “pacemaker” from the caudal end of the heart tube to the area of the right atrium. Prenatal growth of the heart is based upon cell proliferation or hyperplasia. The cell divisions are rapidly stopped soon after birth and the cells start to grow by increase in volume, i.e., hypertrophy. The cells of some species can expand hyperplasia or hypertrophy in early postnatal period. The mouse is one of the organisms with the cell expansion provided by combination of proliferation and hypertrophy. Most of the adult cardiomyocytes contain two nuclei; however, the binucleation of the cells is achieved a few days after the birth. The induction of Purkinje cells of the mouse can be provided by the transcription factors, e.g., endothelin and neuregulin.