The Cardiovascular system

Flow of blood through the heart

Points of auscultation are points where the beating of the heart can be heard. There are four of these such locations; the aortic area, the pulmonary area, the tricuspid area and the mitral area.

Cardiac muscle

Three layers of heart muscle, endocardium (inner), myocardium (middle) and epicardium (visceral). Heart is composed of cardiac muscle cells, or myocytes/myofibers. These cells have singular central nuclei, unlike skeletal muscle which has multiple nuclei. Cytoplasm, also known as sarcoplasm, is dominated with contractile elements, myofibrils, arranged in an organised manner, reflected in the striations seen. There is connective tissue around every cell, this is called endomysium. This helps tether the contractile force along the fibre. Look at long and transverse sections. Brown spots in the transverse sections is lypofuxum, aka rubbish of the cell. This is a waste product of lysosomal degradation, accumulated during aging. Cells are joined together by desmosomal structures (or spot welds) that connect actin filaments.

Impulses

The heart is myogenic in vertebrates; impulses are not generated in the heart, you can cut it up and it will still beat. Invertebrates impulses are generated within the heart some muscle cells lose the ability to contract, instead gaining the ability to propagate an impulse. Propagation starts at two areas, the sinus node and the atrioventricular node. Purkinje fibres are the muscle cells that propagate the impulse Purkinje cells no longer have contractile fibres.

Receptors of the heart

Baroreceptors are pressure sensors in the aorta and internal carotid arteries. The vagus nerve slows the heart rate. Chemo receptors regulate blood pH and carbon dioxide in the aortic arch, carotid arteries and the medulla. The carotid sinus is the location for monitoring the blood pressure, pH.