

1.5 Muscular Tissue

158. Smooth muscle fibers are found in the:
- (a) pupil of the eye
 - (b) walls of blood vessels
 - (c) skin
 - (d) walls of the respiratory tract
 - (e) walls of the gall bladder.
159. Cells of smooth muscle:
- (a) are spindle-shaped
 - (b) have peripherally situated nuclei
 - (c) possess actin and myosin
 - (d) have distinct sarcomeres
 - (e) are in cell to cell contact by means of nexuses (gap junctions).
160. Smooth muscle fibers:
- (a) show cross-striations
 - (b) are voluntary
 - (c) are innervated by the autonomic nervous system.
 - (d) have a single nucleus in each fiber
 - (e) have cytoplasm that is stained acidophilic.
161. Which of the following are typical of smooth muscle
- (a) relatively slow and sustained contraction
 - (b) rhythmic contraction
 - (c) have a single nucleus in each fiber
 - (d) are innervated by the autonomic nervous system
 - (e) can participate in peristaltic waves of contraction.
162. Impulse for smooth muscle contraction may be induce
- (a) parasympathetic nerves
 - (b) nerves of the center nervous system
 - (c) oxytocin
 - (d) prostaglandins
 - (e) local stretching within an organ
163. The sheath surrounding each smooth muscle cell:
- (a) contains reticular fibers
 - (b) contains amorphous substance that stains well with periodic acid-schiff reagent (PAS)
 - (c) is simple in structure to the basal lamina of
 - (d) usually contains cell bodies of connective tissue
 - (e) is secreted by the muscle cell itself.

164. The sheath surrounding each smooth muscle cell is:
- (a) identical to the endomysium of skeletal muscle
 - (b) stained by impregnation with silver salts
 - (c) about 20-40 nm thick
 - (d) interrupted at intervals by tight junctions
 - (e) interrupted at intervals by gap junctions (nexus).
165. The sheath surrounding smooth muscle cell is most similar in structure and composition to:
- (a) endomysium
 - (b) perimysium
 - (c) epimysium
 - (d) basal lamina
 - (e) endothelium
166. Smooth muscle fibers as seen by electron micro-scopy possess:
- (a) thick and thin myofilaments
 - (b) invaginations of the sarcolemma (caveolae)
 - (c) mitochondria and glycogen
 - (d) Golgi bodies close to the poles of the nucleus
 - (e) Well-developed, sarcoplasmic reticulum throughout the sarcoplasm
167. Cardiac muscle fibers are:
- (a) involuntary
 - (b) syncytial
 - (c) composed of chains of cells each with a single nucleus
 - (d) striated
 - (e) branching
168. Cardiac muscle fibers have:
- (a) centrally-located nuclei
 - (b) large well-developed mitochondria
 - (c) much myoglobin
 - (d) glycogen
 - (e) frequent deposits of lipofuscin
169. Intercalated disks are:
- (a) found only in cardiac muscle
 - (b) found between vertebrae
 - (c) composed of cartilage
 - (d) visible by light microscopy
 - (e) sites of local concentrations of calcium

170. Intercalated disks:
- (a) contain zonulae occludens
 - (b) contain desmosomes
 - (c) contain gap junctions (nexuses)
 - (d) are straight structures as seen by electron micro-scropy
 - (e) are found at every Z-line
171. The cells of the conductive system of the heart are:
- (a) purkinje fibers
 - (b) striated muscle cells
 - (c) nerve cells
 - (d) smooth muscle cells
 - (e) richer in cytoplasm and glycogen than other myocardial cells
172. Impulse generation for myocardial contraction comes from:
- (a) atrioventricular node
 - (b) sinoatrial node
 - (c) cranial nerves
 - (d) purkinje fibers
 - (e) bundle of His
173. The cells of the sinoatrial (SA) node are:
- (a) specialized nerve cells
 - (b) modified cardiac muscle cells
 - (c) regular muscle cells
 - (d) the site of the so-called 'pacemaker'
 - (e) embedded in a network of dense connective tissue
174. The valves of the heart (cardiac valves):
- (a) are covered with endocardium
 - (b) contain a central layer of cardiac muscle
 - (c) have a rich blood supply within them
 - (d) are innervated at their base by elements of the 'heart skeleton'
 - (e) are identical histologically to valves of veins
175. The 'heart skeleton' is:
- (a) a site of attachment for muscle
 - (b) composed of modified muscle cells
 - (c) composed of dense connective tissue
 - (d) composed of cartilage-like tissue
 - (e) part of the impulse generating and conducting system

176. Each sarcomere of human skeletal (striated) muscle is a myofibrillar unit between:
- (a) two sets of transverse tubules
 - (b) two H-bands
 - (c) two Z-lines
 - (d) two M-bands
 - (e) two intercalated disks
177. In the I band of a sarcomere of voluntary muscle:
- (a) there are only thin myofilaments
 - (b) there are thick myofilaments
 - (c) there are both thin and thick myofilament
 - (d) there are no myofilaments whatsoever
 - (e) the Z-line is found
178. When voluntary muscle contracts is each sarcomere:
- (a) the thick myofilaments contract
 - (b) the thin myofilaments contract
 - (c) both thick and thin myofilaments contract
 - (d) the myofilaments retain their length
 - (e) the sarcomere becomes broader in diameter
179. During the contraction of voluntary muscle the microscope image of the sarcomere is altered and the:
- (a) Z-line are brought closer together
 - (b) A-band broadens
 - (c) H-zone becomes smaller and eventually disappears
 - (d) I-band widens
 - (e) A-band occupies all the sarcomere
180. Myosin of human skeletal muscle is:
- (a) a structural protein
 - (b) isotropic
 - (c) attached to the Z-line
 - (d) composed of light and heavy meromyosin
 - (e) present in the I-band
181. Actin of human skeletal muscle is:
- (a) a structural protein
 - (b) present predominantly in the A-band
 - (c) anisotropic (birefringent in the polarizing micro-scope)
 - (d) present in a globular form (G-actin)
 - (e) present in a fibrous form (F-actin)

182. Which of the following act as calcium binding proteins in skeletal muscle?
- (a) actin
 - (b) myosin
 - (c) troponin
 - (d) tropomyosin
 - (e) myoglobin
183. Which of following act as oxygen-binding proteins in skeletal muscle?
- (a) actin
 - (b) myosin
 - (c) troponin
 - (d) tropomyosin
 - (e) myoglobin
184. Myoglobin:
- (a) is a structural protein found in voluntary muscle
 - (b) is present in cardiac muscle
 - (c) has an oxygen – binding affinity
 - (d) gives the red color to muscle
 - (e) is present in erythrocytes
185. The T-system of human skeletal muscle is:
- (a) composed of tubular transverse invaginations of the sarcolemma
 - (b) found on the border between the A- and I bands
 - (c) found at the site of the Z-line
 - (d) involved in the initiation of myofibrillar contraction
 - (e) able to transmit impulses to deeply-situated myofilaments
186. The ‘triad’ in human skeletal muscle:
- (a) is visible in light microscope preparations
 - (b) is involved in the process of initiating muscle contraction
 - (c) includes part of the T-system
 - (d) includes terminal swellings of the sarcoplasmic reticulum
 - (e) is visible only by electron microscopy

187. Contraction of human skeletal muscle involves:
- (a) depolarization of the sarcolemma
 - (b) depolarization of the T-tubule membrane
 - (c) transfer of the impulse to terminal sacs of the sarcoplasmic reticulum via gap junctions
 - (d) release of stored calcium ions from the terminal sac of the sarcoplasmic reticulum to the sarcoplasm
 - (e) calcium binding to troponin
188. Which of the following typically present in the sarcoplasm of skeletal muscle?
- (a) glycogen
 - (b) myoglobin
 - (c) sarcoplasmic reticulum
 - (d) troponin
 - (e) mitochondria
189. Red striated muscle fibers (type I) compared to white striated muscle fibers (type II) have more abundant:
- (a) mitochondria
 - (b) myoglobin
 - (c) ATP-ase activity
 - (d) succinic dehydrogenase activity
 - (e) cytochrome enzyme activity
190. Which of the following structure usually are multinucleated?
- (a) cardiac muscle cells
 - (b) smooth muscle cells
 - (c) skeletal striated muscle fibers
 - (d) osteoclasts
 - (e) foreign body giant cells
191. Myoepithelial cells are:
- (a) ectodermal in origin
 - (b) mesodermal in origin
 - (c) present in mammary glands
 - (d) present in salivary glands
 - (e) present in sebaceous glands