Lecture no. 10 – **Muscle tissue**

Elaboration of questions is voluntary, and you needn't to hand them in. But they can help you for better understanding and orientation. Use the presentation uploaded into the Study materials folder in the IS, recommended literature or electronic atlases available in the webpages of the Department. You can also use any information resource from the internet, but in that case, please use in the same time your critical thinking. If you have questions to the topic, please use the Discussion groups in the IS or the HistoClub.

1. What are the typical features of muscle tissue in comparison with other principal tissue types?
2. Why are the skeletal and cardiac muscle tissues striated? What is the difference between smooth and striated muscle tissues at the ultrastructural level?
3. What is the function and classification of connective tissue in muscles?
4. Explain the terms: muscle fiber, sarcolemma, sarcoplasmic reticulum, t-tubule, diad, triad, myofibril, myofilament, sarcomere.
5. What is the structure of sarcomere and its parts: A-band, I-band, H-zone, M-line, Z-line?
6. How does the skeletal muscle cell contract at the sarcomere level? To what extent the sarcomere shortens during contraction?
7. How is the sarcomere stimulated to contract? How does the stimulus get from the neuromuscular junction (motor-end plate) to actin and myosin fibers?
8. What is the role of troponin complex?
9. What is the role of acetylcholine and acetylcholine esterase in the motor-end plate,
10. What happens if acetylcholine a) is not released from synaptic vesicles, b) is not degraded by acetylcholine esterase, c) has its receptors blocked e.g. by curare?
11. How are the myofibrils attached to sarcolemma? What are the costameres?
12. Why is a mutation in dystrophin gene so devastating in muscle tissue?
13. How do the muscle fibers perceive the biomechanical forces at myotendinous junctions and within the muscle fibers?
14. What is the structural and functional difference between skeletal and cardiac muscle tissue?
15. What is the ultrastructure of smooth muscle cells and how does it contract? Why is the calcium important? What is its source?