

Syllabus

in Cytology, General Histology and Embryology

for Students in Medicine

CYTOLOGY

1. Cell. Microscopic and ultrastructural components of the cell.
2. Biomembranes - structural, ultrastructural and chemical organization.
3. Plasma membrane (plasmalemma) - structural, ultrastructural and chemical organization.
4. Cell contacts - ultrastructure and function.
5. Specialization the cell surface - cilia, flagella, microvilli, basolateral folds.
6. Transport of the substances through the cell membrane. Endocytosis and exocytosis.
7. Endoplasmic reticulum – types, structural, ultrastructural and functional characteristics. Ribosomes.
8. Goigi apparatus (complex) - structural, ultrastructural and functional characteristics.
9. Mitochondria - structural, ultrastructural and functional characteristics.
10. Membrane bound vesicles. Lysosomes. Peroxisomes.
11. Cytoskeleton - microtubules. Centrioles. Cytocenter.
12. Cytoskeleton - microfilaments, intermediate filaments.
13. Specialized cell organelles. Structural, ultrastructural and functional characteristics.
14. Metabolic inclusions in the cell. Types, structural, ultrastructural and functional characteristics.
15. Nucleus in interphase.
16. Cell division. Mitosis.
17. Synthesis and secretion in the cell.
18. Movement in the cell- role of the cilia, flagella and miofibrils.

GENERAL HISTOLOGY

1. Tissues- general characteristics. Histogenesis and classification.
2. Epithelial tissue. Histogenesis. General characteristics. Classification.
3. Unistratified epithelia. Structural, ultrastructural and functional characteristics. Examples.
4. Multistratified epithelia .Structural, ultrastructural and functional characteristics. Examples.
5. Gland epithelia. Structural, ultrastructural and functional characteristics. Examples.
6. Connective tissue. Histogenesis. General characteristics. Classification.
7. Intercellular substance of the connective tissue. Fibres - structural, ultrastructural, chemical and functional characteristics.
8. Ground substance of connective tissue. Structural, chemical and functional characteristics.

9. Histogenesis of the intercellular substance of the connective tissue – biosynthesis of collagen.
10. Connective tissue cells. Types, structural, ultrastructural and functional characteristics.
11. Fibrous connective tissue. Types, structural, ultrastructural and functional characteristics.
12. Cartilage. Types, structural, ultrastructural and functional characteristics.
13. Bone. Structural, ultrastructural and functional characteristics.
14. Osteogenesis (ossification). Types and structural characteristic.
15. .Specialized connective tissue: adipose tissue, reticular tissue, pigmented tissue.
16. .Blood tissue. General characteristics. Classification.
17. .Histogenesis of blood tissue. Scheme of the histogenesis.
18. Erythrocytes – structural, ultrastructural and functional characteristics. Erythropoiesis.
19. Granulocytes – types, structural, ultrastructural and functional characteristics. Granulocytopoiesis.
20. Agranulocytes – types, structural, ultrastructural and functional characteristics. Lymphocyto - and monocytopenesis.
21. Blood platelets (thrombocytes) - structural, ultrastructural and functional characteristics. Thrombocytopoiesis.
22. Interstitial (reactive blood) cells. Types, histogenesis. Structural, ultrastructural and functional characteristics.
23. Muscle tissue. Histogenesis. General characteristics. Classification.
24. Smooth muscle tissue. Structural, ultrastructural, chemical and functional characteristics.
25. Cardiac striated muscle tissue. Structural, ultrastructural, chemical and functional characteristics.
26. Skeletal striated muscle tissue. Structural, ultrastructural, chemical and functional characteristics.
27. Nervous tissue. Histogenesis. General characteristics. Classification.
28. Nervous fibres. Types, structural, ultrastructural, chemical and functional characteristics.
29. Neuroglia. Types, structural, ultrastructural, and functional characteristics. Histogenesis.
30. Reproductive tissue. Spermatogenesis. Spermatozoa.
31. Reproductive tissue. Oogenesis. Oocytes.

GENERAL EMBRYOLOGY

32. Insemination. Fertilization. Factors that influence the processes.
33. Initial development of human embryo. Segmentation. Blastocysts. Morulla. Embryoblast. Trophoblast.
34. Implantation. Structural, ultrastructural and functional characteristics of the uterine endometrium during proliferative phase.
35. Early development (gastrulation) of human embryo. Formation of the germ layers. Embryonic disc. Chorion.
36. Late development (gastrulation) of human embryo. Formation of the mesoderm and the mesenchyme. Primitive organs.

37. Germ layers and their derivatives.
38. Yolk sac. Chorion. Alantoic diverticulum. Vitelline haemopoiesis. Vitelline circulation.
39. Umbilical cord. Formation. Fetal circulation.
40. Placenta. Formation, structure, functions and blood circulation. Blood - placental barrier (placental membrane).
41. Amnion. Amniotic cavity. Amnio-chorionic membrane.
42. Twinning. Monozygotic. Dizygotic.
43. Abnormalities in the embryonic development. Teratogenic factors.

Textbooks

1. Junqueira, Carneiro. Histology, 4 edition, Springer, 1997
2. Stevens, Lowe, Human Histology, 2 edition, Chapman and Hall, 1997
3. Textbook of Human Histology, I. Singh
4. Human Embryology, I. Singh, 6 edition
5. Clinical and Functional Histology for Medical Students, R. Snell
6. Histology, Leeson&Leeson
7. Sobotta, Histology, Atlas, 6 edition

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