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**ÖMER HALİSDEMİR UNIVERSITY FACULTY OF MEDICINE**

**FIRST YEAR PHASE-V**

**CELL BIOLOGY-II PHASE**

**AIM:**

At the end of this phase, first year students will have learnt the major and trace elements of the body, the bone joints and muscles that make up the locomotor system, some basic materials used in laboratories, the events that occur during cell growth and death, and perform some operations applied to the patient or wounded, on models.

**INTENDED LEARNING OUTCOMES:**

At the end of this phase, first year students will be able to:

1. Define the structure of nucleotides, their numbering, and the shape of DNA,

2. Describe how DNA synthesis occurs in prokaryotes and eukaryotes,

3. Describe how RNA synthesis can be performed in prokaryotes and eukaryotes,

4. Define the reactions in the synthesis and degradation of purines, diseases related to the relevant enzymes, and gut disease,

5. Define the reactions in the synthesis and degradation of pyrimidines, diseases related to the relevant enzymes, and gut disease,

6. Describe PCR, its components, recombinant DNA technology and the related methods,

7. Know the classification, general properties and functions of the elements, factors affecting their necessity and absorption, as well as evaluate the properties, distribution, absorption, disposal, function, inadequacy, redundancy, resources and requirements of some macro-elements (Na, K, Cl, Ca, P, Mg and S),

8. Regarding trace elements (Cu, Fe, Zn, B, Co, I, Se, Mn, Mo, Cr and F), learn their distribution, absorption, disposal, functions, inadequacy, redundancy, resources and requirements,

9. Define and classify vitamins and coenzymes, describe their functions, diseases or deficits that their lack or excess amount cause, define the chemical structures, absorption, storage, excretion, functions, sources and requirements of water-soluble vitamins such as Vitamin B1, B2, niacin, Vitamin B6, pantothenic acid, biotin, Vitamin B12, folic acid, choline, inositol and Vitamin-C, and the biochemical functions of the coenzyme structures together with examples and learn the important consequences of their deficiency,

10. Comprehend the properties, chemical structures, absorption, storage, excretion, functions, inadequacy, resources and necessity of vitamin A, D, E and K in nature,

11. Learn the working principle of a colorimetry and use it in the practical application,

12. List the anatomical parts of the nervous system,

13. Learn the terminology and the general knowledge about muscles, understand topographical and functional information about the muscles in the body, as well as understand, identify and indicate anatomical details about each muscle,

14. List the names of the peripheral nerves exiting from the plexuses of the spinal nerves and show them,

15. List and show the veins feeding the extremities and the nerves underneath,

16. Show Fossa axillaris and cubuti and their borders on cadavers and models,

17. Show the muscles on human hand,

18. Show the muscles in human foot, trigonome femorale, and fossa popliteay on models and cadavers,

19. List the methods used in molecular genetics,

20. Define for which purposes each of the genetic diagnosis tests (prenatal, postnatal, molecular, FISH) are performed,

21. Describe the methods and therapies in genetic diseases,

22. Describe the Mendelian rules, which are one of the main topics of Genetics,

23. Define genetic applications currently used in medicine,

24. Distinguish the chromosomes on the metaphase plate in laboratory samples,

25. Extract DNA from various tissues,

26. Describe bacterial genetics and bacteriophages,

27. Learn about oven, Pasteur oven and autoclave,

28. Use light microscopy,

29. Explain the mechanism of membrane potential restoration,

30. Describe the mechanism of action potential generation and diffusion,

31. Explain cell membrane receptors and signal transduction mechanisms,

32. Explain intracellular reporters and their functions,

33. Perform practical applications using theoretical information,

34. Explain the structure of organelles containing membranes in the cell,

35. Explain the structure of organelles without membranes in the cell,

36. Learn the structure and functions of cytoskeletal elements,

37. Understand the structure of cell nuclei, cell death mechanisms, and their relation to diseases.