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Laboratory practicum

BASE OF PHYSIOLOGY

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The laboratory practicum on the basic discipline of the will: knowledge on General principles of functioning of the physiological systems of animals and humans; understanding the functional mechanisms of organ systems of animals and humans in phylogenesis and ontogenesis; the application of knowledge in research work, teaching practice and other branches of science application value; the ability to analyze the structure and functions of physiological systems of organs in norm and pathology; the theoretical basis for the solution of theoretical and practical problems of human and animal physiology and other basic Sciences of biology, ecology and biotechnology; the ability to compare and recognize the stages of formation, functioning of physiological systems at different stages of development of the organism.

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INTRODUCTION

Laboratory practicum is designed for students enrolled in the specialty «5B060700-Biology» and «5B070100-Biotechnology». The manual is intended for carrying out laboratory works in the study of basic disciplines «Human and animal's Physiology» and «Bases of animal's physiology». It is necessary for the formation of practical skills of work with laboratory animals, to develop scientific interests and to develop skills of work with scientific research equipment.

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Laboratory work № 1

OVERVIEW OF ORGAN SYSTEMS

Work purpose: know the names of each organ system and the organs in each

Task: 1. Find the following organs on torso models: heart, kidneys, lungs, trachea, brain, esophagus, blood vessels, adrenal glands, liver, stomach, small and large intestine, pancreas, gall bladder, ureters, bladder, spleen.

Task: 2. Know basic functions of organ systems

Devices and equipment:plaster casts and posters

Course of works. In the presented posters and models find the listed physiological systems and organs.

Table 1

Organ system and its function

Organ System	Major Organs	Functions
1	2	3
Integumentary	Skin, including epidermis and dermis; glands	Protect deeper organs; excrete wastes such as salt and urea; regulate body temperature; vitamin D production
Skeletal	Bones, cartilages, tendons, ligaments, joints	Support and protect internal organs; provide levers for muscle action; form blood cells in marrow
Muscular	Muscles	Contraction of muscles allows movement such as locomotion and facial expression; generate heat
Nervous	Brain, spinal cord, nerves, sensory receptors	Control system with rapid response, activates muscles and glands
Endocrine	Pituitary, thyroid, parathyroid, adrenal, and pineal glands; ovaries, testes, pancreas	Control system which acts through hormones

1	2	3
Cardiovascular	Heart, blood vessels, blood	Transport of various substances in blood, e.g., blood gases, nutrients, wastes, hormones, ions
Lymphatic	Lymphatic vessels, lymph nodes, spleen, thymus, tonsils, other lymphoid tissues	Return leaked fluids to blood; destroy pathogens and remove debris; house defense cells and provide a location for activating immune responses
Respiratory	Nasal passages, pharynx, larynx, trachea, bronchi, lungs	Obtain oxygen and remove carbon dioxide; pH balance
Digestive	Oral cavity, esophagus, stomach, small and large intestines, teeth, salivary glands, liver, gall bladder, pancreas	Digest and absorb nutrients; eliminate wastes
Urinary	Kidneys, ureters, bladder, urethra	Remove wastes from blood; maintain water, electrolyte and pH balance
Reproductive	Male: testes, scrotum, penis, duct system Female: ovaries, uterine tubes, uterus, vagina	Make gametes for reproduction; make hormones

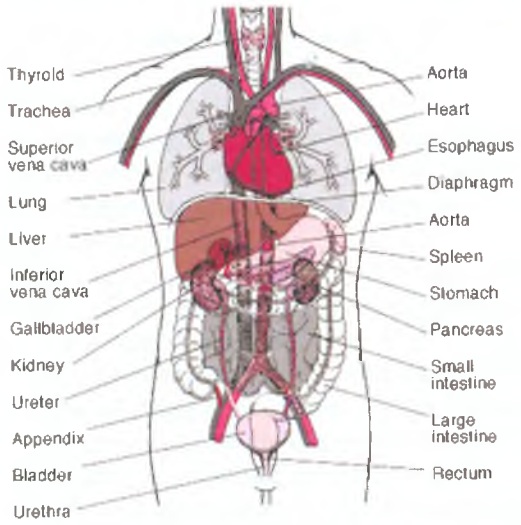

Figure 1. Overview of Organ Systems

F. Nerve centers virtually fatigue-free
Answer – A, B, E

Test № 299.
The phases of a single muscle contraction:
A. The leveling
B. The latent (hidden)
C. Abbreviations
D. Paradoxical
E. Brake
F. Relaxation
G. Isometric
Answer – B, C, F

Test № 300.
In the formation of intestinal juice are involved:
A. Liver
B. Brunnerov gland
C. Liberkyunov gland
D. Gall bladder
E. Enterocytes
Answer – B, C, E

REFERENCE

1. Wheater P.R., Burkitt H.G., Daniels V.G. Functional Histology / Longman Group, UK; 407 p.
2. Gretchen L., Humason W.H. Freeman A useful introduction on sample processing and staining methods is: Animal Tissue Techniques / Longman Group, UK http://www.md.huji.ac.il/gabi/blood/bloodmain.htm
3. http://www.funsci.com/heart

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