Human Physiology 3rd edition Derrickson Test Bank

SKU: 9781119822332-TEST-BANK

Package Title: Test Bank
Course Title: Derrickson 3e
Chapter Number: 1

Question Type: Multiple Choice

1) All the following are subdisciplines of human physiology EXCEPT:

a) immunology
b) endocrinology
c) exercise physiology
d) anatomy

Answer: d

Difficulty: Easy
Bloom's: Comprehension
Learning Objective 1: LO 1.1 Define physiology, identifying several of its subdisciplines.
Section Reference: 1.1 Physiology Defined

2) An ancient human skeleton is discovered. What physiology can you detect about the skeleton?

a) a small skull was present
b) four limbs included two upper limbs and two lower limbs
c) compact bone on the outside of the skeleton provided bone strength
d) bones of the skull, torso, and four limbs were present but the skin was absent

Answer: c

Difficulty: Medium
Bloom's: Application
Learning Objective 1: LO 1.1 Define physiology, identifying several of its subdisciplines.
Section Reference: 1.1 Physiology Defined

3) Which is an example of physiology?

a) identification of a new bone
b) documenting the physical area where a heart is damaged
c) tracing the blood vessels used from an organ to the heart
d) explaining how a neuron conducts a signal

Answer: d

Difficulty: Medium
Bloom's: Application
Learning Objective 1: LO 1.1 Define physiology, identifying several of its subdisciplines.
Section Reference: 1.1 Physiology Defined

Human Physiology 3rd edition Derrickson Test Bank

Question type: Text Entry

4) Someone who studies the kidneys would be a/an ____ physiologist.

Answer: renal

Difficulty: Easy
Bloom's: Knowledge
Learning Objective 1: LO 1.1 Define physiology, identifying several of its subdisciplines.
Section Reference: 1.1 Physiology Defined

Question type: Multiple choice

5) Which is an INCORRECT pairing of a structure-function relationship?

a) a thick layer of cells in an organ allowing exchange
b) a wide tube in an area where lots of flow is needed
c) strong bones in an area that bears more weight
d) elastic tissue in areas that stretch frequently

Answer: a

Difficulty: Medium
Bloom's: Application
Learning Objective 1: LO 1.1 Define physiology, identifying several of its subdisciplines.
Section Reference: 1.1 Physiology Defined

6) Select the molecule(s) from the options below.

a) N
b) H_2O
c) O_2
d) H_2O and O_2

Answer: d

Difficulty: Medium
Bloom's: Application
Learning Objective 1: LO 1.2 Explain how the organization of the human body affects its functions and life processes.
Learning Objective 2: LO 1.2.1 Describe the levels of organization that make up the human body.
Section Reference: 1.2 Levels of Organization in the Body

Question type: True/False

Human Physiology 3rd edition Derrickson Test Bank

7) Proteins and RNA are examples of individual atoms.

Answer: False

Difficulty: Easy
Bloom's: Comprehension
Learning Objective 1: LO 1.2 Explain how the organization of the human body affects its functions and life processes.
Learning Objective 2: LO 1.2.1 Describe the levels of organization that make up the human body.
Section Reference: 1.2 Levels of Organization in the Body

Question type: Multiple choice

8) Place the levels of organization in order from MOST to LEAST complex.

a) organismal, system, organ, tissue, cell, molecule, atom
b) organ, system, cell, atom, molecule, organismal, tissue
c) atom, molecule, cell, tissue, organ, system, organismal
d) cell, tissue, organ, organismal, system, atom, molecule

Answer: a

Difficulty: Easy
Bloom's: Knowledge
Learning Objective 1: LO 1.2 Explain how the organization of the human body affects its functions and life processes.
Learning Objective 2: LO 1.2.1 Describe the levels of organization that make up the human body.
Section Reference: 1.2 Levels of Organization in the Body

Question type: Text Entry

9) The surface of the skin is an example of ___ tissue.

Answer: epithelial

Difficulty: Medium
Bloom's: Application
Learning Objective 1: LO 1.2 Explain how the organization of the human body affects its functions and life processes.
Learning Objective 2: LO 1.2.1 Describe the levels of organization that make up the human body.
Section Reference: 1.2 Levels of Organization in the Body

Question type: Multiple choice

10) Upon stimulation, what tissue type causes movement of the arm to lift above the head?

a) epithelial tissue
b) connective tissue
c) muscle tissue
d) nervous tissue

Answer: c

Difficulty: Medium
Bloom's: Application
Learning Objective 1: LO 1.2 Explain how the organization of the human body affects its functions and life processes.
Learning Objective 2: LO 1.2.1 Describe the levels of organization that make up the human body.
Section Reference: 1.2 Levels of Organization in the Body

11) Organs are composed of two or more different ____.

a) atoms
b) cells
c) molecules
d) tissues

Answer: d

Difficulty: Easy
Bloom's: Knowledge
Learning Objective 1: LO 1.2 Explain how the organization of the human body affects its functions and life processes.
Learning Objective 2: LO 1.2.1 Describe the levels of organization that make up the human body.
Section Reference: 1.2 Levels of Organization in the Body

12) If fluids are not circulating properly in the body, then the problem is most likely caused by the ____ systems.

a) muscular and endocrine
b) cardiovascular and lymphatic
c) immune and skeletal
d) respiratory and digestive

Answer: b

Difficulty: Medium
Bloom's: Application
Learning Objective 1: LO 1.2 Explain how the organization of the human body affects its functions and life processes.
Learning Objective 2: LO 1.2.1 Describe the levels of organization that make up the human body.

Section Reference: 1.2 Levels of Organization in the Body

13) The gonads, epididymis, vas deferens, uterus, and vagina are all organs that are part of the _____ system, of which the main function of is _____.

a) endocrine; formation of gametes
b) reproductive; formation of gametes
c) urinary; removal of wastes
d) integumentary; protects the body

Answer: b

Difficulty: Easy
Bloom's: Comprehension
Learning Objective 1: LO 1.2 Explain how the organization of the human body affects its functions and life processes.
Learning Objective 2: LO 1.2.1 Describe the levels of organization that make up the human body.
Section Reference: 1.2 Levels of Organization in the Body

Question type: Text Entry

14) An emergent property of the ____ system is physical breakdown and absorption of nutrients.

Answer: digestive

Difficulty: Medium
Bloom's: Application
Learning Objective 1: LO 1.2 Explain how the organization of the human body affects its functions and life processes.
Learning Objective 2: LO 1.2.1 Describe the levels of organization that make up the human body.
Section Reference: 1.2 Levels of Organization in the Body

Question type: Multiple choice

15) Integration between the ____ systems allows the body to maintain pH homeostasis.

a) respiratory and urinary
b) endocrine and cardiovascular
c) immune and lymphatic
d) integumentary and immune

Answer: a

Difficulty: Medium
Bloom's: Application

Learning Objective 1: LO 1.2 Explain how the organization of the human body affects its functions and life processes.
Section Reference: 1.2 Levels of Organization in the Body

16) Which of the following situations would have the greatest increase in catabolic reactions in the body?

a) an athlete enduring pre-season conditioning
b) a person ceasing to eat during a hunger strike
c) a child having a rapid growth spurt
d) an individual maintaining a healthy eating and exercise plan

Answer: b

Difficulty: Medium
Bloom's: Analysis
Learning Objective 1: LO 1.3 Identify the important life processes of the human body.
Section Reference: 1.3 Life Processes

17) You are watching a cooking show when your stomach suddenly rumbles. This is an example of the life process of:

a) responsiveness
b) movement
c) differentiation
d) reproduction

Answer: a

Difficulty: Easy
Bloom's: Comprehension
Learning Objective 1: LO 1.3 Identify the important life processes of the human body.
Section Reference: 1.3 Life Processes

18) Movement occurs at the ____ level.

a) intracellular
b) organismal
c) organ
d) All the choices are correct.

Answer: d

Difficulty: Easy
Bloom's: Comprehension
Learning Objective 1: LO 1.3 Identify the important life processes of the human body.
Section Reference: 1.3 Life Processes

19) Growth and reproduction both occur when ____.

a) an individual cell increases in size
b) the total number of cells increase
c) two half-cells merge
d) the substances around the cells increase in volume

Answer: b

Difficulty: Medium
Bloom's: Analysis
Learning Objective 1: LO 1.3 Identify the important life processes of the human body.
Section Reference: 1.3 Life Processes

20) Many compounds in our body are regulated to maintain homeostatic levels. Which of the following is NOT maintained in homeostasis?

a) oxygen
b) glucose
c) temperature
d) carbon dioxide
e) All the choices are normally maintained in homeostasis.

Answer: e

Difficulty: Easy
Bloom's: Knowledge
Learning Objective 1: LO 1.4 Explain how homeostasis is maintained in the body's internal and external environments.
Learning Objective 2: LO 1.4.1 Define homeostasis.
Section Reference: 1.4 Homeostasis

21) The urinary and respiratory systems rely on the cardiovascular system to circulate blood with which they exchange wastes and gases. This reliance is an example of:

a) equilibrium
b) emergent properties
c) integration
d) differentiation

Answer: c

Difficulty: Medium
Bloom's: Application
Learning Objective 1: LO 1.2 Explain how the organization of the human body affects its functions and life processes.
Section Reference: 1.2 Levels of Organization in the Body

Human Physiology 3rd edition Derrickson Test Bank

22) What is the correct sequence of fluids from HIGHEST to LOWEST quantity in the body?

a) intracellular fluid, interstitial fluid, plasma
b) interstitial fluid, intracellular fluid, plasma
c) plasma, interstitial fluid, intracellular fluid
d) All the choices are found in relatively equal quantities.

Answer: a

Difficulty: Medium
Bloom's: Analysis
Learning Objective 1: LO 1.4 Explain how homeostasis is maintained in the body's internal and external environments.
Learning Objective 2: LO 1.4.3 Distinguish between the body's internal environment and external environment.
Section Reference: 1.4 Homeostasis

23) About how many pounds of intracellular fluid is in a 100-pound lean female?

a) 40
b) 8
c) 16
d) 66

Answer: a

Difficulty: Medium
Bloom's: Analysis
Learning Objective 1: LO 1.4 Explain how homeostasis is maintained in the body's internal and external environments.
Learning Objective 2: LO 1.4.3 Distinguish between the body's internal environment and external environment.
Section Reference: 1.4 Homeostasis

24) The body's internal environment is composed of:

a) intracellular fluid
b) extracellular fluid
c) air surrounding the body
d) gases in the blood

Answer: b

Difficulty: Easy
Bloom's: Knowledge
Learning Objective 1: LO 1.4 Explain how homeostasis is maintained in the body's internal and external environments.
Learning Objective 2: LO 1.4.3 Distinguish between the body's internal environment and external environment.

Section Reference: 1.4 Homeostasis

25) Blood capillaries have anatomical features to increase the transfer between plasma and interstitial fluid to maintain homeostasis. What structural features would you expect to facilitate this process?

a) few capillaries
b) great distance between cells and capillaries
c) thin walls
d) fewer capillaries with thin walls

Answer: c

Difficulty: Medium
Bloom's: Application
Learning Objective 1: LO 1.4 Explain how homeostasis is maintained in the body's internal and external environments.
Section Reference: 1.4 Homeostasis

26) The body uses the nervous and endocrine systems to regulate homeostatic changes. Why does the endocrine system respond slower than the nervous system?

a) hormones travel via neurons, which only go to a few places in the body
b) hormones travel via blood, and it takes longer for the blood to reach all the cells of the body
c) hormones travel via the lungs, so they can only reach the body during inspiration
d) hormones travel as electrical signals, and they disappear quickly, so not all signals reach the organs

Answer: b

Difficulty: Easy
Bloom's: Comprehension
Learning Objective 1: LO 1.4 Explain how homeostasis is maintained in the body's internal and external environments.
Section Reference: 1.4 Homeostasis

27) Feedback systems maintain homeostasis by monitoring and responding to changes in a parameter. The monitored parameter maintained in a homeostatic state is called the _____.

a) effector
b) receptor
c) control center
d) controlled variable

Answer: d

Difficulty: Easy
Bloom's: Knowledge
Learning Objective 1: LO 1.4 Explain how homeostasis is maintained in the body's internal and external environments.

Learning Objective 2: LO 1.4.5 Describe how homeostasis is regulated by feedback systems and feedforward control.
Section Reference: 1.4 Homeostasis

Question type: Text entry

28) A disruption to a controlled variable is called a stimulus. The stimulus interacts with a/an _____ to activate a feedback system.

Answer: receptor

Difficulty: Easy
Bloom's: Comprehension
Learning Objective 1: LO 1.4 Explain how homeostasis is maintained in the body's internal and external environments.
Learning Objective 2: LO 1.4.5 Describe how homeostasis is regulated by feedback systems and feedforward control.
Section Reference: 1.4 Homeostasis

Question type: Multiple choice

29) Oxygen levels have decreased during a period of exercise, leading to an increase in respiration rate. In the feedback system that regulates blood gasses, the lungs are acting as the _____.

a) receptor
b) control center
c) stimulus
d) effector

Answer: d

Difficulty: Medium
Bloom's: Application
Learning Objective 1: LO 1.4 Explain how homeostasis is maintained in the body's internal and external environments.
Learning Objective 2: LO 1.4.5 Describe how homeostasis is regulated by feedback systems and feedforward control.
Section Reference: 1.4 Homeostasis

30) In a feedback system, the effector typically affects the variable that served as a stimulus. Based on that, which of these is NOT an example of a feedback system?

a) increasing the rate of respiration in response to a decrease in oxygen levels
b) decreasing the rate of glycogenesis in response to decreased glucose levels
c) increasing contraction strength in response to the baby's head pushing on the cervix
d) decreasing blood pressure in response to a large blood volume loss

Human Physiology 3rd edition Derrickson Test Bank

Answer: d

Difficulty: Medium
Bloom's: Analysis
Learning Objective 1: LO 1.4 Explain how homeostasis is maintained in the body's internal and external environments.
Learning Objective 2: LO 1.4.5 Describe how homeostasis is regulated by feedback systems and feedforward control.
Section Reference: 1.4 Homeostasis

Question type: True/False

31) A negative feedback loop maintains homeostasis.

Answer: True

Difficulty: Easy
Bloom's: Comprehension
Learning Objective 1: LO 1.4 Explain how homeostasis is maintained in the body's internal and external environments.
Learning Objective 2: LO 1.4.5 Describe how homeostasis is regulated by feedback systems and feedforward control.
Section Reference: 1.4 Homeostasis

Question type: Multiple choice

32) How is a positive feedback system different from a negative feedback system?

a) the effector causes a change to a controlled variable
b) positive feedback systems have no controlled variable
c) positive feedback systems increase the initial change in the variable
d) positive feedback systems oppose the initial change in the variable

Answer: c

Difficulty: Medium
Bloom's: Analysis
Learning Objective 1: LO 1.4 Explain how homeostasis is maintained in the body's internal and external environments.
Learning Objective 2: LO 1.4.4 Relate the concept of mass balance to homeostasis.
Section Reference: 1.4 Homeostasis

33) In the positive feedback system of childbirth, the "receptor" is found in the _____.

a) brain

b) cervix
c) uterus
d) fetus

Answer: b

Difficulty: Easy
Bloom's: Knowledge
Learning Objective 1: LO 1.4 Explain how homeostasis is maintained in the body's internal and external environments.
Learning Objective 2: LO 1.4.4 Relate the concept of mass balance to homeostasis.
Section Reference: 1.4 Homeostasis

34) If blood pressure decreases, then the heart and blood vessels (effectors) will respond by _____.

a) increasing heart rate and constricting
b) increasing heart rate and dilating
c) decreasing heart rate and constricting
d) decreasing heart rate and dilating

Answer: a

Difficulty: Easy
Bloom's: Comprehension
Learning Objective 1: LO 1.4 Explain how homeostasis is maintained in the body's internal and external environments.
Learning Objective 2: LO 1.4.4 Relate the concept of mass balance to homeostasis.
Section Reference: 1.4 Homeostasis

35) An athlete has been working out for several hours and is sweating profusely but has now stopped even though she continues to exercise. Where is the most likely source of the problem?

a) thermoreceptors are no longer sensing her temperature
b) neurons have suddenly stopped producing the action potentials for communication
c) the brain is no longer regulating temperature
d) sweat glands can no longer produce sweat due to dehydration

Answer: d

Difficulty: Medium
Bloom's: Analysis
Learning Objective 1: LO 1.4 Explain how homeostasis is maintained in the body's internal and external environments.
Learning Objective 2: LO 1.4.4 Relate the concept of mass balance to homeostasis.
Section Reference: 1.4 Homeostasis

36) Pavlov's dog was given food every time a tone sounded. Eventually, the dog increased salivation rates just by hearing the tone, even if food was not given to it. The increase is salivation rates occurs through _____.

a) negative feedback systems
b) positive feedback systems
c) feedforward controls
d) homeostatic imbalances

Answer: c

Difficulty: Medium
Bloom's: Application
Learning Objective 1: LO 1.4 Explain how homeostasis is maintained in the body's internal and external environments.
Learning Objective 2: LO 1.4.5 Describe how homeostasis is regulated by feedback systems and feedforward control.
Section Reference: 1.4 Homeostasis

37) A disorder of the respiratory system can be diagnosed by which of the following symptoms?

a) fever
b) increased blood pressure
c) increased respiratory rate
d) sense of breathlessness

Answer: d

Difficulty: Medium
Bloom's: Application
Learning Objective 1: LO 1.4 Explain how homeostasis is maintained in the body's internal and external environments.
Section Reference: 1.4 Homeostasis

38) Hippocrates originally believed that disease was due to an imbalance in _____.

a) homeostasis
b) blood pressure
c) the four humors
d) feedback systems

Answer: c

Difficulty: Easy
Bloom's: Knowledge
Learning Objective 1: LO 1.5 Explain the development of physiology as a scientific discipline.
Learning Objective 2: LO 1.5.1 Describe the history of physiology.
Section Reference: 1.5 Physiology as a Science

39) Which Greek historical figure is credited with recognizing that the function of a part can be determined by its structure?

a) Hippocrates
b) Aristotle
c) Erasistratus
d) Galen

Answer: b

Difficulty: Easy
Bloom's: Knowledge
Learning Objective 1: LO 1.5 Explain the development of physiology as a scientific discipline.
Learning Objective 2: LO 1.5.1 Describe the history of physiology.
Section Reference: 1.5 Physiology as a Science

40) When did the Scientific Revolution occur?

a) the 5th and 6th centuries (BC) with Greek philosophers
b) the 16th and 17th centuries coinciding with the European Renaissance
c) the 18th and 19th centuries with English and German scientists
d) the 20th century with English, German, and American scientists

Answer: b

Difficulty: Easy
Bloom's: Knowledge
Learning Objective 1: LO 1.5 Explain the development of physiology as a scientific discipline.
Learning Objective 2: LO 1.5.1 Describe the history of physiology.
Section Reference: 1.5 Physiology as a Science

41) Cell Theory (stating that the cell is the basic unit of life) was soundly established by the mid_____.

a) 5th century
b) 17th century
c) 19th century
d) 20th century

Answer: c

Difficulty: Easy
Bloom's: Knowledge
Learning Objective 1: LO 1.5 Explain the development of physiology as a scientific discipline.
Learning Objective 2: LO 1.5.1 Describe the history of physiology.
Section Reference: 1.5 Physiology as a Science

42) Claude Bernard first suggested that multicellular organisms have a constant "milieu interieur" that allow them to thrive. This process was later termed ____ by Walter B. Cannon.

a) Cell Theory
b) Structure-Function Relationships
c) The Frank-Starling Law
d) homeostasis

Answer: d

Difficulty: Easy
Bloom's: Comprehension
Learning Objective 1: LO 1.5 Explain the development of physiology as a scientific discipline.
Learning Objective 2: LO 1.5.1 Describe the history of physiology.
Section Reference: 1.5 Physiology as a Science

43) Key areas of current physiological research include the following EXCEPT:

a) genomics
b) proteomics
c) organ system functions
d) integration

Answer: c

Difficulty: Easy
Bloom's: Knowledge
Learning Objective 1: LO 1.5 Explain the development of physiology as a scientific discipline.
Learning Objective 2: LO 1.5.1 Describe the history of physiology.
Section Reference: 1.5 Physiology as a Science

44) Your text describes an experiment designed to test the hypothesis that exercise increases the levels of HDLs in the bloodstream. Assuming the results supported the hypothesis, the graph of the data would show:

a) time on the x-axis, HDL levels on the y-axis and lines sloping up
b) time on the x-axis, HDL levels on the y-axis and lines sloping down
c) HDL levels on the x-axis, time on the y-axis and lines sloping up
d) HDL levels on the x-axis, time on the y-axis and lines sloping down

Answer: a

Difficulty: Hard
Bloom's: Synthesis
Learning Objective 1: LO 1.5 Explain the development of physiology as a scientific discipline.
Learning Objective 2: LO 1.5.2 Identify the steps of the scientific method.
Section Reference: 1.5 Physiology as a Science

Human Physiology 3rd edition Derrickson Test Bank

45) If exercise does increase HDL levels in the blood, then which of these correctly states the relationship between the experimental and control groups?

a) both experimental and control groups show similar increases in HDL levels
b) both experimental and control groups show stabilization of HDL levels
c) the experimental group would show a significant increase in HDL levels compared to the control group
d) the experimental group would show a significant decrease in HDL levels compared to the control group

Answer: c

Difficulty: Medium
Bloom's: Analysis
Learning Objective 1: LO 1.5 Explain the development of physiology as a scientific discipline.
Learning Objective 2: LO 1.5.2 Identify the steps of the scientific method.
Section Reference: 1.5 Physiology as a Science

Question type: True/False

46) If an experiment is run using animal models, the data generated can be applied directly to humans.

Answer: False

Difficulty: Easy
Bloom's: Comprehension
Learning Objective 1: LO 1.5 Explain the development of physiology as a scientific discipline.
Learning Objective 2: LO 1.5.2 Identify the steps of the scientific method.
Section Reference: 1.5 Physiology as a Science

Question type: Multiple choice

47) Often both quantitative and qualitative data are collected during an experiment. Which of the following questions would be about qualitative data?

a) What are the subject's blood glucose levels?
b) What is the subjects blood pressure?
c) What is the maximum weight lifted?
d) What symptoms does the subject have at this time (fatigue, nausea)?

Answer: d

Difficulty: Medium
Bloom's: Application
Learning Objective 1: LO 1.5 Explain the development of physiology as a scientific discipline.
Learning Objective 2: LO 1.5.2 Identify the steps of the scientific method.
Section Reference: 1.5 Physiology as a Science

Human Physiology 3rd edition Derrickson Test Bank

48) What is the difference between the scientific method and scientific inquiry?

a) the number of subjects involved
b) the type of data (qualitative vs quantitative) collected
c) the level of training the main investigator has acquired
d) the order of steps followed

Answer: d

Difficulty: Easy
Bloom's: Knowledge
Learning Objective 1: LO 1.5 Explain the development of physiology as a scientific discipline.
Learning Objective 2: LO 1.5.2 Identify the steps of the scientific method.
Section Reference: 1.5 Physiology as a Science

49) You have been asked to write a report over the most recent research on Ebola treatments. What is the most reliable source for your research?

a) peer-reviewed journals
b) non-peer-reviewed journals
c) recently published textbook
d) various internet sites

Answer: a

Difficulty: Easy
Bloom's: Knowledge
Learning Objective 1: LO 1.5 Explain the development of physiology as a scientific discipline.
Learning Objective 2: LO 1.5.3 Explain the importance of scientific literature.
Section Reference: 1.5 Physiology as a Science

50) Physiologists most often answer questions using the ____ approach.

a) mechanistic
b) teleological
c) philosophical
d) historical

Answer: a

Difficulty: Easy
Bloom's: Knowledge
Learning Objective 1: LO 1.5 Explain the development of physiology as a scientific discipline.
Learning Objective 2: LO 1.5.4 Discuss the mechanistic approach to explaining body function.
Section Reference: 1.5 Physiology as a Science

Human Physiology 3rd edition Derrickson Test Bank

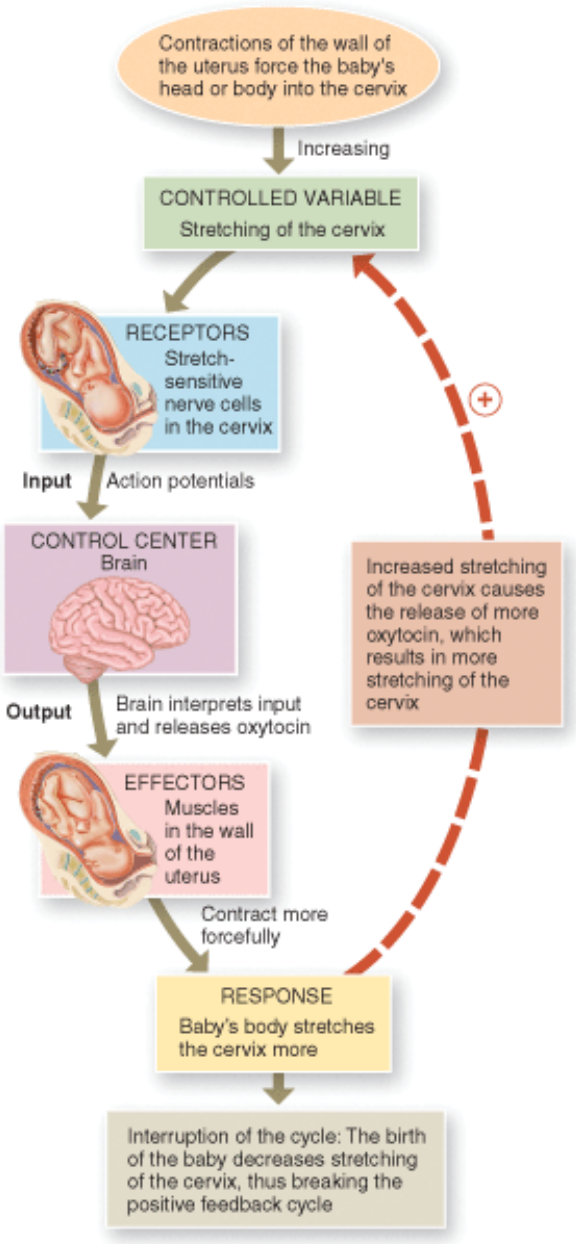
51) Which of the following would be a mechanistic answer to the question “Why are sprinters fast over short distances?”

a) sprints cannot exceed 200 yards
b) because sprinters use all their energy
c) because sprinters have a high concentration of muscle fibers that produce a large amount of power, but fatigue quickly
d) because sprinters become mentally fatigued over longer distances and quit running.

Answer: c

Difficulty: Medium
Bloom’s: Application
Learning Objective 1: LO 1.5 Explain the development of physiology as a scientific discipline.
Learning Objective 2: LO 1.5.4 Discuss the mechanistic approach to explaining body function.
Section Reference: 1.5 Physiology as a Science

52) Referring to the flow chart, what directly causes the muscles of the uterus to contract more forcefully?



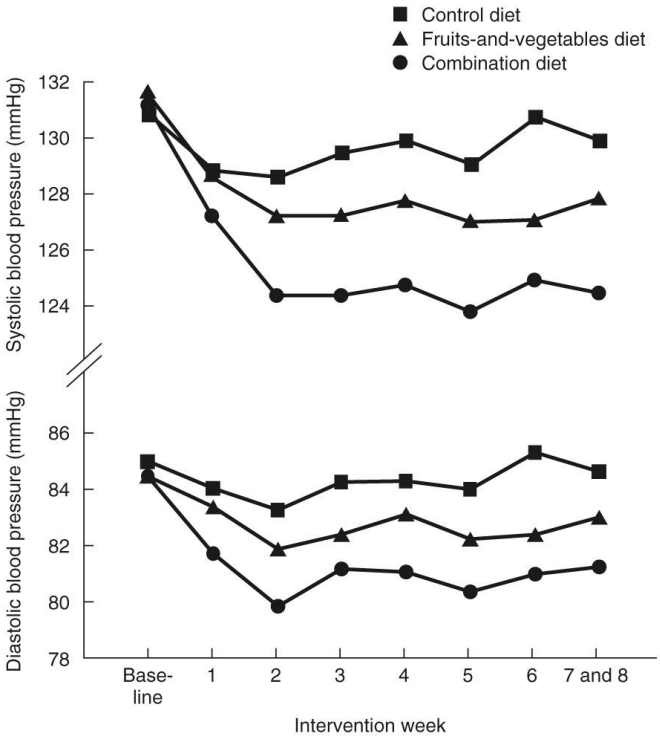
a) cervical stretch
b) action potentials in cervical nerve cells
c) oxytocin from the brain
d) the baby's body pushing on the cervix

Answer: c

Difficulty: Easy
Bloom's: Application
Learning Objective 1: LO 1.4 Explain how homeostasis is maintained in the body's internal and external environments.

Learning Objective 2: LO 1.4.5 Explain feedforward control.
Section Reference: 1.4 Homeostasis

53) Based on the graph, the greatest change in diastolic blood pressure occurred during:



a) the first two weeks
b) the last two weeks
c) the fourth week
d) It is impossible to say, as the change appears to occur at a constant rate.

Answer: a

Difficulty: Medium
Bloom's: Analysis
Learning Objective 1: LO 1.5 Explain the development of physiology as a scientific discipline.
Section Reference: 1.5 Physiology as a Science

54) Which systems work together with the respiratory system in the process of respiration?

a) cardiovascular and lymphatic
b) endocrine and renal
c) digestive and integumentary
d) muscular and nervous

Answer: d

Difficulty: Easy

Bloom's: Knowledge
Learning Objective 1: LO 1.6 Identify the key themes of physiology.
Section Reference: 1.6 Key Themes of Physiology

55) Today the most basic level at which physiologists can describe the mechanism of action is the ____ level.

a) organ
b) system
c) molecular
d) molecular and organ

Answer: c

Difficulty: Easy
Bloom's: Knowledge
Learning Objective 1: LO 1.6 Identify the key themes of physiology.
Section Reference: 1.6 Key Themes of Physiology

56) A chemical released into the blood fails to communicate with its receptor on/in a target organ or cell. Where do you suspect the issue is?

a) neurotransmitter
b) local modulator
c) hormone
d) enzyme

Answer: c

Difficulty: Easy
Bloom's: Comprehension
Learning Objective 1: LO 1.6 Identify the key themes of physiology.
Section Reference: 1.6 Key Themes of Physiology

Human Physiology 3rd edition Derrickson Test Bank

FROM RESEARCH TO REALITY

Oats and Blood Pressure

Reference
Raj, P. et al. (2020). The effects of oat ingredients on blood pressure in spontaneously hypertensive rats. *Journal of Food Biochemistry*. 44:e13402.

Can oats impact your blood pressure?



The saying goes "You are what you eat." Is this true when you talk about blood pressure? Could a change in your diet change your blood pressure? Could adding oats to your diet help decrease high blood pressure?

Article description:
Oats are found in a variety of foods that we eat. Oats consist of several components, including beta-glucan (a type of soluble fiber) and a substance called avenanthramide C. Beta-glucan has been shown to decrease blood cholesterol, and avenanthramide C has been shown to protect against atherosclerosis. Researchers wanted to know if these two oat ingredients could also lower blood pressure. This study investigated the blood pressure lowering effects of avenanthramide C and beta-glucan in spontaneously hypertensive rats. Spontaneously hypertensive rats received avenanthramide C or beta-glucan alone or a combination of the two over a period of 15 weeks. The blood pressure of each rat was monitored to see if the oat ingredients had any effect on blood pressure. Spontaneously hypertensive rats were used in this study because these rats have been bred to have hypertension and, therefore, serve as the ideal animal model for hypertension research. Wistar-Kyoto rats, which are rats that have been bred to have a normal blood pressure, were also used in this study as a control.

Human Physiology 3rd edition Derrickson Test Bank

Questions

1. **What are a few examples of foods that contain oats?**

Oatmeal, granola bars, whole grain bread, and some cereals are a few examples.

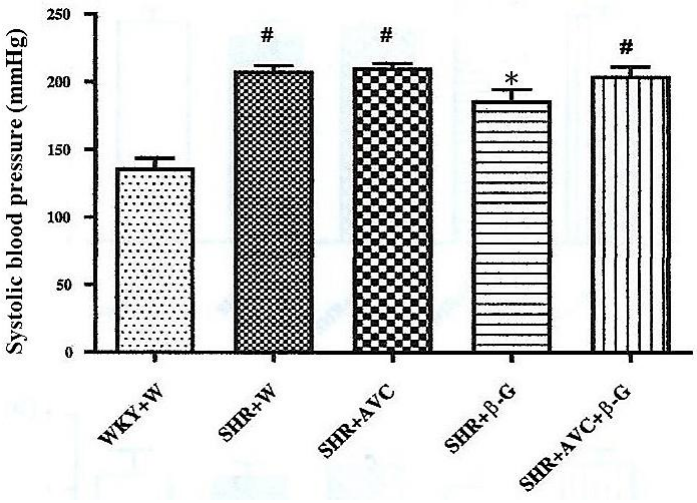
2. **Why were spontaneously hypertensive rats chosen as the animal model for this study?**

Spontaneously hypertensive rats are rats that have been bred to have hypertension; they are ideal animal models for hypertension studies because they have a stable set point for high blood pressure.

3. **Why were Wistar-Kyoto rats used as a control for this study?**

Wistar-Kyoto rats were used as a control for this study because these rats have been bred to have a normal blood pressure, which means that the blood pressure in these animals can be used as the baseline for what the normal blood pressure should be.

Use the following graph to answer questions 4-6:



Systolic blood pressure at 15 weeks of treatment.

Helpful information about the graph:

WKY + W = Wistar-Kyoto rats treated with water.

SHR + W = Spontaneously hypertensive rats treated with water.

SHR + AVC = Spontaneously hypertensive rats treated with avenanthramide C.

SHR + β-G = Spontaneously hypertensive rats treated with beta-glucan.

SHR + AVC + β-G = Spontaneously hypertensive rates treated with avenanthramide C and beta-glucan.

Systolic blood pressure = The highest blood pressure attained in arteries when the hearts contracting.

= Result is statistically significant compared to WKY +W.

* = Result is statistically significant compared to SHR +W.

Human Physiology 3rd edition Derrickson Test Bank

4. **Did treatment with avenanthramide C alone significantly change the systolic blood pressure in the spontaneously hypertensive rats (SHR)? Explain your answer.**

No; the systolic blood pressure in SHR treated with avenanthramide C by itself was not significantly different than the systolic blood pressure in SHR treated with only water.

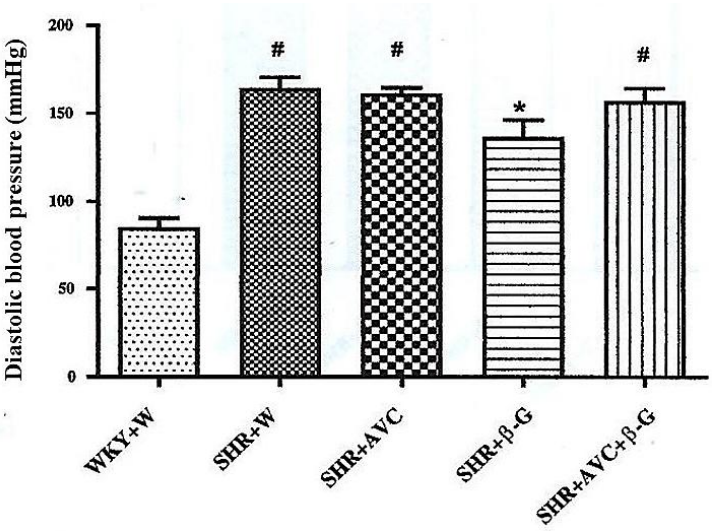
5. **Did treatment with beta-glucan alone significantly change the systolic blood pressure in the spontaneously hypertensive rats (SHR)? Explain your answer.**

Yes; the systolic blood pressure in SHR treated with beta-glucan by itself was significantly lower than the systolic blood pressure in SHR treated with only water.

6. **Did treatment with avenanthramide C and beta-glucan together significantly change the systolic blood pressure in the spontaneously hypertensive rats (SHR)? Explain your answer.**

No; the systolic blood pressure in SHR treated with both avenanthramide C and beta-glucan was not significantly different than the systolic blood pressure in SHR treated with only water.

Use the following graph to answer questions 7-9:



Diastolic blood pressure at 15 weeks of treatment.

Helpful information about the graph:

WKY + W = Wistar-Kyoto rats treated with water.

SHR + W = Spontaneously hypertensive rats treated with water.

SHR + AVC = Spontaneously hypertensive rats treated with avenanthramide C.

SHR + β-G = Spontaneously hypertensive rats treated with beta-glucan.

SHR + AVC + β-G = Spontaneously hypertensive rates treated with avenanthramide C and beta-glucan.

Diastolic blood pressure = The lowest blood pressure attained in arteries when the heart is relaxing.

= Result is statistically significant compared to WKY +W.

* = Result is statistically significant compared to SHR +W.

Human Physiology 3rd edition Derrickson Test Bank

7. **Did treatment with avenanthramide C alone significantly change the diastolic blood pressure in the spontaneously hypertensive rats (SHR)? Explain your answer.**

No; the diastolic blood pressure in SHR treated with avenanthramide C by itself was not significantly different than the diastolic blood pressure in SHR treated with only water.

8. **Did treatment with beta-glucan alone significantly change the diastolic blood pressure in the spontaneously hypertensive rats (SHR)? Explain your answer.**

Yes; the diastolic blood pressure in SHR treated with beta-glucan by itself was significantly lower than the diastolic blood pressure in SHR treated with only water.

9. **Did treatment with avenanthramide C and beta-glucan together significantly change the diastolic blood pressure in the spontaneously hypertensive rats (SHR)? Explain your answer.**

No; the diastolic blood pressure in SHR treated with both avenanthramide C and beta-glucan was not significantly different than the diastolic blood pressure in SHR treated with only water.

Use all of the information that you have learned from this study to answer question 10-11:

10. **What do the results of this study indicate?**

The results of this study indicate that treatment with beta-glucan alone does significantly decrease both systolic and diastolic blood pressures in spontaneously hypertensive rats. However, treatment with avenanthramide C alone or avenanthramide C and beta-glucan together does not significantly change the systolic or diastolic blood pressures in these rats.

11. **How can the results of this study be applied to selecting the best food options for helping to lower high blood pressure?**

There are different types of oats (oat brans, rolled oats, and Swedish oats). The beta-glucan content in oats can vary, depending on the type of oats and how they are processed. For example, the beta-glucan content in 3 to 5 % in oat brans, 4 % in rolled oats, and 6 to 32% in Swedish oats. Perhaps eating oats with a very high beta-glucan content could help lower blood pressure. Other possible options include eating other foods rich in beta-glucan (such as barley) or taking beta-glucan supplements. Note that before making any dietary changes to treat high blood pressure, a physician should be consulted.

Human Physiology 3rd edition Derrickson Test Bank