

# Advanced Human Biology Challenge

Human Biology · Answer Key · 25 Questions

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**1. Which specific region of the brain is primarily responsible for the regulation of the body's circadian rhythms?**

- A) Hippocampus
- B) Suprachiasmatic nucleus**
- C) Amygdala
- D) Medulla oblongata

**2. During cellular respiration, what is the primary role of the electron transport chain?**

- A) To produce glucose
- B) To create a proton gradient to drive ATP synthesis**
- C) To break down proteins into amino acids
- D) To release oxygen into the bloodstream

**3. Which hormone is secreted by the alpha cells of the pancreatic islets of Langerhans?**

- A) Insulin
- B) Somatostatin
- C) Glucagon**
- D) Gastrin

**4. What is the functional unit of the human kidney responsible for the filtration of blood?**

- A) Nephron**
- B) Alveolus
- C) Glomerulus
- D) Ureter

**5. Which type of leukocyte is most abundant in a healthy human body?**

- A) Eosinophil
- B) Basophil
- C) Neutrophil**
- D) Monocyte

**6. In protein synthesis, which molecule carries the genetic code from the DNA to the ribosome?**

- A) tRNA
- B) rRNA
- C) mRNA**
- D) siRNA

**7. Which cranial nerve is responsible for the movement of the muscles involved in facial expression?**

- A) Trigeminal nerve
- B) Facial nerve**
- C) Vagus nerve
- D) Glossopharyngeal nerve

**8. What is the primary function of the surfactant produced by Type II alveolar cells in the lungs?**

- A) To kill bacteria
- B) To reduce surface tension and prevent alveolar collapse**
- C) To increase oxygen binding to hemoglobin
- D) To stimulate the diaphragm

**9. Which structure in the inner ear is responsible for converting mechanical vibrations into nerve impulses?**

- A) Semicircular canals
- B) Stapes
- C) Organ of Corti**
- D) Eustachian tube

**10. What is the specific name for the process by which white blood cells engulf and destroy pathogens?**

- A) Pinocytosis
- B) Exocytosis
- C) Phagocytosis**
- D) Osmosis

**11. Which layer of the skin contains the melanocytes responsible for pigment production?**

- A) Stratum corneum
- B) Stratum basale**
- C) Dermis
- D) Hypodermis

**12. In the human cardiac cycle, which valve prevents the backflow of blood from the left ventricle to the left atrium?**

- A) Mitral valve**
- B) Aortic valve
- C) Tricuspid valve
- D) Pulmonary valve

**13. Which mineral is essential for the structure of hemoglobin molecules?**

- A) Calcium
- B) Iron**
- C) Magnesium
- D) Zinc

**14. What is the term for the movement of molecules from an area of higher concentration to lower concentration across a semi-permeable membrane without energy?**

- A) Active transport
- B) Osmosis
- C) Facilitated diffusion
- D) Simple diffusion**

**15. Which part of the neuron is primarily responsible for receiving incoming signals from other neurons?**

- A) Axon
- B) Myelin sheath
- C) Dendrite**
- D) Synaptic terminal

**16. What is the primary site of hematopoiesis (blood cell formation) in an adult human?**

- A) Liver
- B) Red bone marrow**
- C) Spleen
- D) Lymph nodes

**17. Which immunoglobulin is the most abundant in the human bloodstream and can cross the placenta?**

- A) IgA
- B) IgM
- C) IgE
- D) IgG**

**18. What is the function of the enzyme pepsin in the human digestive system?**

- A) To emulsify fats
- B) To break down proteins into peptides**
- C) To neutralize stomach acid
- D) To convert starch into maltose

**19. Which endocrine gland is often referred to as the 'master gland' due to its regulation of other glands?**

- A) Thyroid
- B) Adrenal
- C) Pituitary**
- D) Pineal

**20. What type of muscle tissue is found in the walls of the gastrointestinal tract and blood vessels?**

- A) Skeletal
- B) Cardiac
- C) Smooth**
- D) Striated

**21. Which neurotransmitter is most commonly associated with the 'reward' pathway in the brain?**

- A) Acetylcholine
- B) Dopamine**
- C) Serotonin
- D) GABA

**22. In the genetic code, what does a 'codon' consist of?**

- A) Two nitrogenous bases
- B) Three nitrogenous bases**
- C) Four nitrogenous bases
- D) Five nitrogenous bases

**23. Which bone is the longest and strongest in the human body?**

- A) Tibia
- B) Fibula
- C) Femur**
- D) Humerus

**24. What is the primary function of the lymphatic system in the human body?**

- A) To transport oxygen
- B) To filter blood and return interstitial fluid to circulation**
- C) To produce digestive enzymes
- D) To regulate body temperature

**25. Which molecule serves as the primary energy currency of the cell?**

- A) ADP
- B) GTP
- C) ATP**
- D) AMP