

Zoological and Environmental Medicine Facts

Medicine · Answer Key · 17 Questions

1. Which marine mammal's blubber has historically been a significant source of Vitamin D, and in some cultures, was used to treat rickets?

- A) Dolphin
- B) Seal
- C) Whale**
- D) Sea otter

2. The venom of the Deathstalker scorpion (*Leiurus quinquestriatus*) contains a peptide, chlorotoxin, which has shown potential in research for its ability to bind to specific ion channels implicated in which neurological condition?

- A) Parkinson's disease
- B) Alzheimer's disease
- C) Epilepsy**
- D) Multiple sclerosis

3. Certain species of *Cordyceps* fungus, known for their parasitic relationship with insects, are extensively studied in traditional medicine for compounds believed to possess immunomodulatory and anti-cancer properties. Which insect order is most commonly infected by these fungi?

- A) Coleoptera (beetles)
- B) Lepidoptera (butterflies and moths)**
- C) Hymenoptera (ants, bees, wasps)
- D) Diptera (flies)

4. The discovery of penicillin, the first antibiotic, was serendipitous and involved a common mold. This mold, *Penicillium notatum*, was observed to inhibit the growth of which type of bacteria in laboratory cultures?

- A) Staphylococcus aureus**
- B) *Escherichia coli*
- C) *Streptococcus pneumoniae*
- D) *Mycobacterium tuberculosis*

5. The plant *Artemisia annua* is the source of artemisinin, a key compound used in the treatment of malaria. This plant is native to which continent?

- A) Africa
- B) Asia**
- C) North America
- D) South America

6. Bio-prospecting for new pharmaceuticals often involves examining organisms from extreme environments. Organisms found in deep-sea hydrothermal vents have yielded enzymes that are heat-stable and useful in molecular biology techniques, such as PCR. These are examples of extremophiles, a type of which biological kingdom?

- A) Plantae (plants)
- B) Animalia (animals)
- C) Fungi (fungi)

D) Monera (bacteria and archaea)

7. The anticoagulant drug warfarin, a common medication, was originally isolated from spoiled sweet clover. This plant was found to cause hemorrhagic disease in cattle, a condition where the blood fails to clot properly. What was the precursor compound identified in the spoiled clover?

- A) Dicoumarol
- B) Warfarin
- C) Coumarin

D) Bishydroxycoumarin

8. Certain types of slime mold, like *Physarum polycephalum*, have demonstrated an ability to find the shortest path through mazes and even replicate the topology of transportation networks, showcasing a form of biological intelligence. In medicine, research has explored their potential for modeling which aspect of disease spread?

- A) Genetic mutation rates
- B) Cellular communication pathways

C) Epidemic diffusion patterns

- D) Drug resistance mechanisms

9. The anesthetic properties of nitrous oxide (N₂O) were first demonstrated in the late 18th century. This gas is produced naturally through denitrification by certain microorganisms in which part of the environment?

- A) Upper atmosphere
- B) Deep ocean trenches

C) Soil and aquatic sediments

- D) Volcanic magma chambers

10. The venom of the cone snail *Conus magus* contains a potent analgesic peptide called conotoxin M VII A. This conotoxin targets specific types of ion channels and has been developed into a drug for severe chronic pain. Which class of ion channels does it primarily block?

- A) Potassium channels
- B) Sodium channels
- C) Calcium channels**
- D) Chloride channels

11. The Pacific Yew tree (*Taxus brevifolia*) is the source of the chemotherapy drug paclitaxel (Taxol). The bark of the tree contains taxanes, which interfere with cell division. Due to its importance, efforts have focused on developing sustainable methods for its production, including cultivating it from which plant part?

- A) Roots
- B) Seeds
- C) Leaves**
- D) Flowers

12. The compound epibatidine, isolated from the skin of the Ecuadorian poison frog (*Epipedobates tricolor*), is a potent analgesic. It acts as an agonist at nicotinic acetylcholine receptors. However, its direct clinical use is limited due to its toxicity profile. Which class of neurotransmitter receptors does it primarily interact with?

- A) Serotonin receptors
- B) Dopamine receptors
- C) GABA receptors
- D) Nicotinic acetylcholine receptors**

13. The anti-malarial drug chloroquine, once a cornerstone of malaria treatment, is derived from compounds found in the Cinchona tree bark. The active alkaloid originally isolated from the bark was:

- A) Quinine**
- B) Quinidine
- C) Cinchonine
- D) Artemisinin

14. Certain species of ants produce formic acid, which has antiseptic properties. In some ecological contexts, this acid is used by the ants for what purpose?

- A) Attracting mates
- B) Dissolving prey
- C) Defending their colony**
- D) Communicating with larvae

15. The remarkable regenerative abilities of planarian flatworms have made them a model organism for studying stem cell biology and tissue repair. Their ability to regenerate an entire body from even a small fragment is attributed to a population of undifferentiated cells known as:

A) Mesenchymal stem cells

B) Neoblasts

C) Chondrocytes

D) Oligodendrocytes

16. The bioluminescent properties of certain marine organisms, like jellyfish and dinoflagellates, are being explored for medical applications, particularly in imaging and diagnostics. The light production is typically a result of an enzymatic reaction involving a substrate and an enzyme. What is the common name for the light-emitting molecule?

A) Phycocyanin

B) Luciferin

C) Carotenoid

D) Anthocyanin

17. The discovery of heparin, a potent anticoagulant, was a significant advancement in preventing blood clots. This polysaccharide was initially isolated from which animal tissue source?

A) Shark liver

B) Pig intestine

C) Cow pancreas

D) Chicken bone marrow