Adaptations to the Physical Environment: Temperature
Study Guide

TEXT READINGS

pp. 43-49

VOCABULARY

convection  radiation  evaporation  conduction
ectotherm  endotherm  poikilotherm  homeotherm
eurythermal  stenothermal  countercurrent exchange
lower critical temp.  basal metabolic rate  concurrent exchange
vasoconstriction  torpor  hibernation
dormancy  migration  acclimatization
cryoprotectant  heat-shock protein

STUDY QUESTIONS


2. Contrast the following pairs of terms: ectotherm and endotherm; homeotherm and poikilotherm; and eurythermal and stenothermal.

3. Describe the various mechanisms whereby organisms thermoregulate. In particular, how do birds and mammals thermoregulate?

4. Explain the costs and benefits of being a thermoregulator.

5. Contrast concurrent heat exchangers with countercurrent heat exchangers. Give mechanistic examples of countercurrent heat exchangers in the following examples: marine birds, dolphins, great white shark, and bluefin tuna.

6. Describe and explain thermoregulatory adaptations in marine mammals.

7. Some animals (e.g., insects and reptiles) classically described as ectothermic poikilotherms may actually exhibit some degree of thermoregulation. How can they do this? Provide examples.

8. Define torpor. Explain how torpor may be used by some animals to cope

9. Contrast adaptation with acclimation. Provide an example of acclimatization.

10. What happens to the metabolic rate of a poikilotherm as the temperature changes. What happens to the metabolic rate of a homeotherm as the temperature changes.