Chapter 1. Basic Concepts in the Biology of Aging

Biogerontology: The Study of Biological Aging

1.1. Biogerontology is defined as:

a. the scientific investigation of the biological processes that occur inside living things as they age.

b. the study of aging and its associated problems.

c. the integration of research from fields of biophysics, genetics, evolutionary biology, medicine, and gerontology.

d. the scientific investigation of the diseases of aging.

Answer: a

1.2. True or false: Gerontology is defined as the study of human aging and the problems associated with aging.

Answer: True

1.3. Prior to the beginning of the twentieth century, the primary cause of death in human populations was:

a. infant mortality.

b. infectious diseases.

c. cancer.

d. heart disease.

Answer: b

1.4. The creation of which two professional societies marked the beginning of organized aging research in the United States?

a. National Institutes of Health (NIH) and Gerontological Society of America

b. American Geriatrics Society and National Institutes of Health (NIH)

c. Gerontological Society of America and American Geriatrics Society

d. National Institute on Aging (NIA) and American Geriatrics Society

Answer: c

1.5. Finish the sentence: Longevity is

Answer: the potential maximum life span that an individual of a particular species can obtain.

1.6. What was the primary reason that the sciences paid so little attention to the mechanisms of aging and longevity prior to the 1930s?

a. The government did not fund research before 1950.

b. There were no evolutionary theories supporting the rise of aging in the population.

c. Aging was an unimportant problem for biologists, because humans had relatively short life spans.

d. The science of genetics had not yet been established.

Answer: c

1.7. Choose the best definition of life span.

a. the potential maximum life span of an individual of a species

b. total length of life of an individual

c. average length of life in a population

d. average length of life of the longest lived 10% in a population

Answer: b

1.8. True or false: The branch of medicine that deals with the problems and diseases of old age and aging people is called geriatrics.

Answer: True

1.9. The institute within the National Institutes of Health that is responsible for providing funding for aging research is the:

a. Center for Aging Research.

b. Gerontological Society of America.

c. American Geriatrics Society.

d. National Institute on Aging.

Answer: d

1.10. True or false: Wild animals cannot be used as models for aging research because aging does not occur in the wild.

Answer: False

Definitions of Biological Aging

1.11. A definition of aging such as “biological aging is characterized by an increase in mortality rate” is most useful for:

a. small laboratory animal populations.

b. large human populations.

c. wild animal populations.

d. individuals.

Answer: b

1.12. True or false: Genes regulate the aging process.

Answer: False

1.13. What is/are the limitation(s) of functional-based and mortality-based aging definitions?

a. Neither addresses aging at a cellular level.

b. Neither addresses aging of a population.

c. Neither addresses aging events that occur prior to maturation.

d. Both a and c are correct.

Answer: d

1.14. The stage of the life span during which functional change is generally positive is defined as:

a. maturity.

b. senescence.

c. development.

d. puberty.

Answer: c

1.15. What characteristic marks the transition from maturity to senescence?

a. The organism or molecule can no longer reproduce.

b. The organism or molecule no longer has the capacity to resist the force of entropy.

c. The organism loses 50% of its function compared with the development stage.

d. The organism or molecule no longer has the capacity to resist the force of enthalpy.

Answer: b

1.16. Fill in the blank: \_\_\_\_\_\_ is the post-reproductive period and manifests as negative changes in vitality and function.

Answer: Senescence

1.17. Choose the best statement concerning aging and disease.

a. Disease occurs in every species that reaches a fixed size.

b. The process of biological aging abides by the normal laws of physiology; disease does not.

c. Aging, unlike disease, has been observed only during the past 200 years.

d. Aging occurs only in animate objects.

Answer: b

1.18. Degradation of the matter in the universe to an ultimate state of inert uniformity is defined as:

a. enthalpy.

b. aging.