

Controversy 2

Why Do Our Bodies Grow Old?

1. The maximum human life span is approximately:
 - A) 77 years
 - B) 82 years
 - C) 100 years
 - *D) 120 years
 - E) 150 years

2. The time-dependent biological process that involves functional loss and susceptibility to disease and death is called:
 - A) The Gompertz law
 - *B) Normal aging
 - C) Successful aging
 - D) The wear-and-tear theory of aging
 - E) The Hayflick limit

3. Which of the following are considered to be “wear-and-tear” theories of aging?
 - A) Somatic mutation theory of aging
 - B) Error accumulation theory of aging
 - C) Accumulative waste theory of aging
 - *D) All of the above
 - E) A and B above

4. According to the cellular theory of aging, which of the following processes occurs?
 - A) Free radical damage eventually gives rise to the symptoms we know as aging.
 - B) Cross-linking compounds in the collagen begin to accumulate and eventually impair cellular function.
 - C) The body's immune system begins to weaken and can no longer distinguish between bodily tissues and foreign tissues.
 - *D) The capacity for cell division weakens over time.
 - E) None of the above

5. The Hayflick Limit refers to which of the following processes?
 - A) HeLa cells continue to divide and grow.
 - *B) Normal human cells grown in tissue culture go through a limited number of cell divisions.
 - C) Aging is regulated by glandular cells, perhaps of the hypothalamus, thymus, or pituitary gland.
 - D) Waste products and other harmful substances build up in the cells.
 - E) None of the above

6. “Compression of morbidity” refers to which of the following processes?
- A) The acceleration of the inverse relationship of morbidity and mortality
 - *B) When illness is pushed further into old age
 - C) An increase in the maximum life span
 - D) Whenever the natural life span is exceeded
 - E) None of the above
7. According to Hayflick, when does aging begin?
- A) At conception
 - B) At birth
 - *C) Following the reproductive period
 - D) When the animal becomes independent of its parents
 - E) None of the above
8. According to Fries and Crapo, all of the following are true except:
- *A) The number of extremely old persons will increase.
 - B) The percentage of a typical life spent in dependency will decrease.
 - C) The period of adult vigor will be prolonged.
 - D) The need for intensive medical care will decrease.
 - E) The cost of medical care will decrease.
9. Explanations for the improvement in functioning of current cohorts of older persons include:
- A) Increases in the educational levels of newer cohorts of elders
 - B) Decreases in the frequency of obesity
 - C) Improvements in medical interventions
 - D) All of the above are true.
 - *E) Both A and C are true.
10. According to de Grey, the therapies being developed by the SENS (Strategies for Engineered Negligible Senescence) project to prevent and cure aging will be available for mice in _____ years and for humans in _____ years.
- A) 50, 75
 - B) 50, 50
 - C) 25, 25
 - D) 25, 20
 - *E) 10, 20
11. Although cultural stereotypes suggest that women are more biologically fragile than men, the Gompertz law indicates that women and men are equally likely to die.
- A) True
 - *B) False
12. Many biologists believe that aging may be explained by a single cause.
- *A) True
 - B) False

13. The maximum life span for a species is unalterable.
A) True
*B) False
14. Research in the area of cryobiology has found that raising and maintaining a higher body temperature can increase the life span in fruit flies and some vertebrates.
A) True
*B) False
15. Over the 20th century both life expectancy and lifespan increased.
A) True
*B) False
16. Hayflick likens aging to the ticking on of a cheap watch that eventually results in its failure.
*A) True
B) False
17. According to Hayflick, scientists have made significant progress during the last century in uncovering the fundamental cause of aging.
A) True
*B) False
18. Like other biomedical goals, discovering the processes that cause aging or determine our lifespan would have a strictly positive value.
A) True
*B) False
19. According to Fries and Crapo, average life expectancy has increased while life span has remained the same.
*A) True
B) False
20. According to Fries and Crapo, if all disease and trauma were eliminated, death would still occur.
*A) True
B) False
21. Premature deaths resulting from violence will comprise a smaller proportion of total premature deaths, according to Hayflick.
A) True
*B) False
22. According to Mor, the compression of morbidity hypothesis is now generally accepted as valid.

- *A) True
- B) False

23. The concepts of morbidity and disability can be used interchangeably—they mean the same thing when considering the compression of morbidity hypothesis.

- A) True
- *B) False

24. “Disability free” or “active” life expectancy is the number of years an individual can expect to live beyond age 65 without significant functional impairment due to disability or chronic illness.

- *A) True
- B) False

25. A challenge in determining the need for care in the older population is that population surveys on health in later life measure health status in multiple ways.

- *A) True
- B) False

26. Even if the compression of morbidity continues, there will still be an increase in health care resources needed because the size of the older population is increasing.

- *A) True
- B) False

27. International research on health trends in later life provides consistent results across countries.

- A) True
- *B) False

28. According to de Grey, even though it may be possible for people to live to be 1,000 years of age, none of the added life span will be lived in frailty, debility, or dependence.

- *A) True
- B) False

29. de Grey argues that the first person to live to 1,000 years of age has not yet been born.

- A) True
- *B) False

30. The various therapies that will be able to repair all the types of molecular and cellular damage that occur over time will have to be implemented before that damage is evident.

- A) True
- *B) False

31. Olshansky agrees with de Grey (“We will be able to live to 1,000”) that with sufficient resources devoted to research, we can find a cure for aging.

A) True

*B) False

32. Olshansky finds that throughout much of human history, many individuals have believed that physical immortality was soon within reach.

*A) True

B) False

33. Olshansky argues that research on aging should focus on improved physical health and mental functioning, and not on the search for a cure to aging.

*A) True

B) False

34. Olshansky concedes that the science of aging has significantly advanced in recent decades such that gerontology is close to discovering the key to physical immortality.

A) True

*B) False

Type: E

35. According to the various biological theories of aging, is the maximum human life span really finite? Explain.

*A) Varies

Type: E

36. In your opinion, how much emphasis should be placed on promoting health versus curing diseases in old age? Explain.

*A) Varies

Type: E

37. What if medical technology succeeds in significantly prolonging the human lifespan? What are the implications for health care economics?

*A) Varies

Type: E

38. What hope do we have for compressing morbidity or extending longevity according to Hayflick? Would these discoveries necessarily have positive consequences? Explain.

*A) Varies

Type: E

39. Describe what is meant by the “rectangular curve.” How does the rectangular curve assist us in our understanding of human aging and future changes in life expectancy?

*A) Varies

Type: E

40. Mor suggests that the compression of morbidity may turn out to be a cohort effect and not a lasting improvement in the functioning of older adults. What does Mor base his argument on? Do you agree or disagree with his thinking?

*A) Varies

Type: E

41. Parker and Thorslund suggest that trends in compression of morbidity are more complex than initially thought—the general trend seems to be that older sectors of the population report more diseases and health problems, at the same time that their functional ability is maintained for longer periods. How do the authors explain this trend? Do you think this trend will continue into the 21st century?

*A) Varies

Type: E

42. Do you agree or disagree with de Grey that developing therapies that would dramatically increase life expectancy is tantamount to “playing God”?

*A) Varies

Type: E

43. Compare and contrast de Grey's “We Will Be Able to Live to 1,000” and Olshansky's views on the likelihood of preventing and curing aging. What evidence does Olshansky use to refute de Grey's argument?

*A) Varies

Type: E

44. There is increasing evidence of social inequalities in longevity and the potential for experiencing a healthy old age. Discuss the factors that are important to consider in the compression-of-morbidity discussion.