

Hard Genetics Fact-Check

Genetics · Answer Key · 25 Questions

1. In which year did Oswald Avery, Colin MacLeod, and Maclyn McCarty publish their paper proving that DNA is the substance that causes bacterial transformation?

- A) 1944**
- B) 1952
- C) 1941
- D) 1953

2. How many base pairs are contained in the approximate haploid human genome length as determined by the Human Genome Project?

- A) 2.5 billion
- B) 3.2 billion**
- C) 4.1 billion
- D) 1.8 billion

3. Barbara McClintock was awarded the Nobel Prize in Physiology or Medicine in 1983 for the discovery of what genetic phenomenon, first observed in the 1940s?

- A) Epigenetic imprinting
- B) Transposable elements**
- C) Alternative splicing
- D) Telomere shortening

4. The Hershey-Chase experiment, which confirmed DNA as the genetic material using bacteriophages, was conducted in which year?

- A) 1950
- B) 1953
- C) 1952**
- D) 1948

5. What is the exact number of chromosomes typically found in a normal human diploid somatic cell?

- A) 48
- B) 44
- C) 46**
- D) 23

6. In Gregor Mendel's 1866 paper 'Experiments on Plant Hybridization', how many distinct pea plant traits did he meticulously document and cross-breed?

- A) 5
- B) 7**
- C) 9
- D) 12

7. James Watson and Francis Crick published their seminal paper on the double-helix structure of DNA in the journal Nature on what specific date?

- A) April 25, 1953**
- B) February 28, 1953
- C) May 15, 1953
- D) March 7, 1953

8. How many codons are there in the standard genetic code?

- A) 20
- B) 64**
- C) 48
- D) 128

9. The first genetically modified organism, a bacterium resistant to antibiotics, was created by Herbert Boyer and Stanley Cohen in which year?

- A) 1971
- B) 1973**
- C) 1975
- D) 1979

10. Frederick Sanger developed the chain-termination method for DNA sequencing in which year?

- A) 1977**
- B) 1980
- C) 1974
- D) 1982

11. What is the total number of amino acids standardly encoded by the genetic code for protein synthesis?

- A) 22
- B) 20**
- C) 18
- D) 24

12. In 1902, Walter Sutton proposed the Chromosomal Theory of Inheritance; in which year did Theodor Boveri independently arrive at similar conclusions?

A) 1902

B) 1904

C) 1906

D) 1908

13. The International Human Genome Sequencing Consortium officially announced the completion of the 'finished' version of the human genome sequence in what year?

A) 2001

B) 2003

C) 2005

D) 2007

14. How many hydrogen bonds are present between a Guanine-Cytosine base pair in DNA?

A) 1

B) 2

C) 3

D) 4

15. Marshall Nirenberg and Heinrich Matthaei identified the first codon (UUU for phenylalanine) in which year?

A) 1961

B) 1959

C) 1963

D) 1965

16. What is the approximate percentage of the human genome that consists of coding sequences (exons)?

A) 1.5%

B) 5%

C) 10%

D) 20%

17. The enzyme DNA polymerase I was first isolated by Arthur Kornberg in which year?

A) 1955

B) 1957

C) 1959

D) 1961

18. In humans, the mitochondrial genome consists of how many base pairs?

A) 16,569

B) 12,450

C) 20,100

D) 8,200

19. Which scientist discovered the 'transforming principle' in *Streptococcus pneumoniae* in 1928?

A) Oswald Avery

B) Frederick Griffith

C) Alfred Hershey

D) Martha Chase

20. The polymerase chain reaction (PCR) technique was invented by Kary Mullis in which year?

A) 1981

B) 1983

C) 1985

D) 1987

21. Thomas Hunt Morgan won the Nobel Prize in 1933 for his work on which model organism?

A) *Caenorhabditis elegans*

B) *Drosophila melanogaster*

C) *Mus musculus*

D) *Arabidopsis thaliana*

22. How many rings does a purine base have in its chemical structure?

A) 1

B) 2

C) 3

D) 4

23. In 1941, George Beadle and Edward Tatum proposed the 'one gene-one enzyme' hypothesis based on experiments with which organism?

A) *Neurospora crassa*

B) *Saccharomyces cerevisiae*

C) *Escherichia coli*

D) *Zea mays*

24. The Human Genome Project was officially launched by the U.S. government in which year?

A) 1988

B) 1990

C) 1992

D) 1994

25. How many stop codons exist in the standard genetic code?

A) 1

B) 2

C) 3

D) 4