Cellular Nucleus and Nucleolus Biology

Cytology · Answer Key · 20 Questions

1. Which organelle is the largest in the cell and contains the genetic information?

A) Mitochondria
B) Nucleus
C) Golgi apparatus
D) Lysosome

2. What is the typical shape of a cell nucleus?

A) Square
B) Triangular
C) Spherical
D) Irregular

3. Which blood cells lack a nucleus when mature?

A) White blood cells
B) Platelets
C) Red blood cells
D) Plasma cells

4. What type of dye is hematoxylin?

A) Acidic
B) Neutral
C) Basic
D) Lipophilic

5. What is the nuclear envelope composed of?

A) Single membrane
B) Double membrane
C) Triple membrane
D) No membrane

6. What is the function of the perinuclear space?

A) Protein synthesis
B) Separating inner and outer membranes
C) DNA storage
D) Lipid storage

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7. Which protein network supports the spherical shape of the nucleus?

A) Nuclear lamina
B) Actin filaments
C) Microtubules
D) Intermediate filaments

8. What is the diameter of nuclear pores?

A) 10-20 nm
B) 50-60 nm
C) 70-120 nm
D) 200-300 nm

9. How many granules typically form the annulus of a nuclear pore?

A) Four
B) Six
C) Eight
D) Ten

10. Approximately how many pores does a typical mammalian cell nucleus contain?

A) 100-500
B) 3000-4000
C) 10000-15000
D) 20000-50000

11. Which molecules are exported from the nucleus to the cytoplasm?

A) DNA
B) mRNA and ribosomal subunits
C) Lipids
D) Glucose

12. What is the main function of the nucleolus?

A) DNA replication
B) Synthesis of ribosomal subunits
C) Protein digestion
D) Energy production

13. The nucleolus is basophilic due to the high concentration of what?

A) DNA
B) rRNA
C) Proteins
D) Lipids

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14. Which region of the nucleolus contains primary transcripts of rRNA genes?

A) Pars fibrosa
B) Pars granulosa
C) Nucleolar organizer DNA
D) Nuclear lamina

15. What is the term for the network formed by pars fibrosa and pars granulosa?

A) Chromatin
B) Nucleonema
C) Nuclear matrix
D) Nucleoplasm

16. Where are ribosomal subunits assembled?

A) Cytoplasm
B) Nucleolus
C) Endoplasmic Reticulum
D) Golgi

17. What attaches to the outer membrane of the nuclear envelope?

A) Lysosomes
B) Ribosomes
C) Vacuoles
D) Centrioles

18. What are the protein complexes that make up nuclear pores called?

A) Nucleoporins
B) Histones
C) Lamins
D) Tubulins

19. Which cells are described as binucleate?

A) Skeletal muscle cells
B) Cardiac muscle cells
C) Osteoclasts
D) Red blood cells

20. What is the primary role of DNA in the nucleus?

A) Energy storage
B) Structural support
C) Storing genetic information
D) Synthesizing lipids

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