

Robbins Review Questions - Chapter 1

1. Euchromatin is transcriptionally _____ (active/inactive) while heterochromatin is transcriptionally _____ (active/inactive).
2. If the Q arm of a chromatid is visualized it is the _____ arm.
 - a. Short
 - b. Long
3. Noncoding RNA comprises the _____ (minority/majority) of the genome?
4. DNA is wrapped around proteins known as _____.
5. This process can both “open” or “condense” DNA to facilitate transcription.
 - a. Histone methylation
 - b. Histone phosphorylation
 - c. DNA methylation
 - d. RNA methylation
6. This process can either activate or silence transcription
 - a. Histone methylation
 - b. Histone phosphorylation
 - c. DNA methylation
 - d. RNA methylation
7. This process typically results in transcriptional silencing only
 - a. Histone methylation
 - b. Histone phosphorylation
 - c. DNA methylation
 - d. RNA methylation
8. Variants at single nucleotide positions (which are usually biallelic - ie only two choices exist at a given site within the population) are known as what?
9. Large contiguous stretches of DNA that are repeated and which vary from person to person are known as what?
10. What effect does microRNA have on transcription?
 - a. Pre-transcriptional initiation
 - b. Post-transcriptional silencing
 - c. Converts heterochromatin into euchromatin
 - d. All of the above
11. What is present in greater quantity, microRNA or long noncoding RNA (lncRNA) regions?
12. What effect does lncRNA have on gene expression?
 - a. Gene silencing through restricting RNA polymerase access to coding genes
 - b. Gene promotion through transcription enhancement
 - c. All of the above
 - d. None of the above
13. Proteins destined for the plasma membrane or a point beyond the cell are synthesized in the
 - a. Smooth endoplasmic reticulum
 - b. Rough endoplasmic reticulum
 - c. Golgi apparatus
 - d. Mitochondria

14. The Golgi apparatus fulfills what function?
 - a. Extracellular proteins synthesis
 - b. Intracellular protein synthesis
 - c. Synthesized lipids, phospholipids and steroids
 - d. Assembles/packages proteins destined for the plasma membrane or to be excreted
15. DNA transcription occurs in what intracellular structure?
 - a. Mitochondria
 - b. Nucleus
 - c. Golgi apparatus
 - d. Endoplasmic reticulum
16. The smooth endoplasmic reticulum differs from the rough endoplasmic reticulum because it synthesizes
 - a. Extracellular proteins synthesis
 - b. Intracellular protein synthesis
 - c. Synthesized lipids, phospholipids and steroids
 - d. Assembles/packages proteins destined for the plasma membrane or to be excreted
17. This organelle breaks down denatured proteins.
18. Cellular movement, including organelles and proteins within the cell and movement of the cell in its environment, is accomplished through the
 - a. Cytoskeleton
 - b. Desmin filaments
 - c. Mitochondria
 - d. Basolateral flagella
19. Desmin filaments are associated with which cell type?
20. Vimentin filaments are associated with which cell type?
21. The junction type that seals adjacent cells together to create a continuous barrier is known as a
 - a. Anchoring junction (desmosome)
 - b. Communicating junctions (gap junctions)
 - c. Occluding junctions (tight junctions)
 - d. Hemidesmosome
22. What is the function of desmosomes/anchoring junctions?
23. Differentiate between hemidesmosomes and spot desmosomes/macula adherens?
24. Plasma membranes are _____ (permeable/nonpermeable) to water.
25. Cells that signal other cells in their immediate vicinity use what form of signaling?
 - a. Paracrine
 - b. Autocrine
 - c. Synaptic
 - d. Endocrine
26. Due to its role in recycling proteins back to the ER, sorting protein and lipids and dispatching them to other organelles or to secretory vesicles destined for extracellular release, the Golgi complex is especially prominent in
 - a. Skin cells
 - b. Goblet cells of the intestine

- c. Bronchial epithelium
 - d. Plasma cells
27. What of the following is/are the main components of the ECM?
- a. Phospholipids
 - b. Collagen and elastin
 - c. Fibrillin
 - d. Oligosaccharides
28. Fibrillar collagens are the main component of what tissue?
- a. Skin
 - b. Bone
 - c. Connective tissue
 - d. All of the above
29. Mitochondrial DNA is entirely _____ (paternally/maternally) inherited.
30. Mitochondria play a central role in the _____ (intrinsic/extrinsic) pathway of apoptosis.
31. Leakage of _____ out of the mitochondria into the cytosol forms a complex with other proteins that ultimately activates caspases - the enzyme that induces apoptosis.
- a. Cytochrome a
 - b. Cytochrome b
 - c. Cytochrome c
 - d. Cytochrome d
32. Mitochondrial damage is a sign of
- a. Reversible cell injury or stress
 - b. Irreversible cell injury or stress
 - c. Hypoxia
 - d. All of the above
33. Which intracellular structure contains its own unique DNA?
- a. Golgi apparatus
 - b. Endoplasmic reticulum
 - c. Ribosomes
 - d. Mitochondria
34. Which of the following is the major angiogenic factor following injury and in tumors?
- a. VEGF
 - b. TDGF
 - c. HGF
 - d. TGF-beta
35. This type of collagen, along with laminin, is one of the major constituents of the basement membrane
- a. Type 1
 - b. Type 2
 - c. Type 3
 - d. Type 4
36. Cardiac valves, large blood vessels, uterus, skin, and ligaments are made up of this tissue which allows tissue recoil and shape recovery
- a. Collagen

- b. Elastin
 - c. Fibrillin
 - d. Proteoglycans and hyaluronan
37. This substance confers resistance to compressive forces and in joint cartilage, provide a layer of lubrication between adjacent bony surfaces
- a. Collagen
 - b. Elastin
 - c. Fibrillin
 - d. Proteoglycans and hyaluronan
38. Integrins allow cells to attach to the
- a. Cytoskeleton
 - b. ECM
 - c. Endothelium
 - d. Immune cells
39. Which phase of the cell cycle does DNA synthesis take place?
- a. G1
 - b. S
 - c. G2
 - d. M
40. Cyclins and cyclin-dependent kinases regulate what?
41. Explain the asymmetric division of stem cells and its importance.

1. Active. Inactive (pg 3) - you can “use” euchromatin so it’s transcriptionally active
2. B
3. Majority
4. Histones
5. B (pg 3)
6. A (pg 3)
7. C (pg 3)
8. Single nucleotide polymorphisms (pg 3)
9. Copy number variations (pg 3)
10. B (pg 4)
11. Long noncoding RNA (pg 5)
12. C (pg 5)
13. B (pg 6)
14. D
15. B (pg 6)
16. C (pg 6)
17. Proteasomes (pg 6)
18. A (pg 6)
19. Muscle cells (pg 11)
20. Mesenchymal cells (fibroblasts, endothelium) (pg 11)
21. C (pg 11)
22. They mechanically attach cells and their intracellular cytoskeletons to other cells or the ECM (pg 12)
23. Hemidesmosomes connect the cell to the ECM (pg 11-12)
24. Permeable (pg 9)
25. A (pg 16)
26. A (pg 12)
27. B (pg 12)
28. C (pg
29. Maternally (pg 14)
30. Intrinsic (pg 15)
31. C (pg 15)
32. B (pg 15)
33. D (pg 14)
34. A (pg 19)
35. A (pg 22)
36. B (pg 23)
37. D (pg 23)
38. B (pg 24)
39. B (pg 25)
40. The cell cycle (pg 25)
41. One daughter cell differentiates to become a mature cell while the other remains differentiated and retains its self-renewal capacity (pg 26)