CELL AND MOLECULAR BIOLOGY 020 MIDTERM TEST BANK

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CHAPTER 1

1. Cell biology is reductionist means that it:-

A. Is based on the premise that studying the parts of the whole can explain the character of the whole

B. Is related to animals

C. Is a complex study field

D. requires creative instruments and techniques.

Answer:A

2. Cellulose-containing cell walls are present in:-

A. Prokaryotic cells

B. Plants cells

C. Bacteria

D. Animal cells

Answer:B

3. The cell theory was articulated in the by Matthias Schleiden, Theodor Schwann and Rudolf Virchow. One of these statements isn't a cell theory tenet

A. All organisms are composed or one or more cells.

B. The cell is the structural unit of life.

C. Cells arise only by division from a pre-existing cell

D. Cells Are Highly Complex and Organized

ANSWER:D

4. Halophiles are a type of Archaea that

A. Convert CO2 and H2 gases into methane

B. Live in extremely salty environments, like the Dead Sea or deep sea brine
. pools with salinity equivalent to 5M MgCl2

C. Live at very high temperatures.

D. Acid-loving prokaryotes that thrive at a pH as low as 0.

ANSWER:B

5. What is the purpose of the cell division:

A. Growth

B. Repair

C. Gives rise to variation

D. Involved in sexual reproduction by giving rise to gametes

E. All of the above

ANSWER:E

6. DNA in prokaryotes:

A. Circular form

B. Double helix structure

C. Present in the central area called nucleoid

D. A+C

E. B+C

Answer: D

7.Cell division in Eukaryotes requires :

A. Microtubules for nuclear division

B. Actin and myosin for cytokinesis

C. Actin filaments for nuclear division

D. A+B

E. B+C

Answer: D

8. The first culture of human cells was begun by George and Martha Gey of Johns Hopkins University in 1951). The cells were obtained from a malignant tumor and named _____ cells after the donor, _____.

A. HeLa, Herbert Lane

B. HeLa, Henrietta Lacks

C.Roberts, John Roberts

D. MaLe, Martin Lewis

E. HeLa, Helen Lassiter

Answer: B

9. Virtually all chemical changes that take place in cells require_____, molecules that greatly increase the rate at which a chemical reaction occurs.

A. DNAs

B. carbohydrates

C. proteins

D. enzymes

E. emzymes

Answer: d

10. Bacteria will often pass a piece of DNA from a donor bacterial cell to a recipient bacterial cell presumably through a structure called a pilus. What is this process called?

A. Confirmation

B. Transduction

C. Transformation

D. Conjugation

E. Fission

Answer: d

11. Which of the following is not a model organism?

A. Mus musculus

B. Drosophila melanogaster

C. Homo sapiens (means humankind)

D. Arabidopsis thaliana

E. Caenorhabditis elegans

Answer: c

12. Common characteristics of prokaryotes and eukaryotes :

A. Plasma membrane of common composition

B. Presence of genetic material

C. Similar mechanism for gene expression

D. Transcription and translation mechanism

E. All of the above

Answer: E

13. Which of the following about bacteria is correct:

A. It lacks ribosomes as they are membraned organelles

B. Some bacteria are multicellular

C. mycoplasma has no cell wall

D. the genetic material in bacteria is surrounded by nuclear envelope

E. none of the above

Answer:C

14. Unicellular protists are more complex than animal and plant cells.

A. TRUE

B.FALSE

ANSWER:A

CHAPTER 8

1. Which of the following is a function of membranes?

A. Compartmentalization

B. Selectively permeable barrier

C. Mediates intercellular interactions

D. helps cells respond to external stimuli

E. All of these are correct.

Answer: E

2. What are the building blocks of a phosphoglyceride, specifically phosphatidic acid?

A. Glycerol + 2 phosphate groups + 1 fatty acid

B. Glycerol + 1 phosphate group + 2 fatty acids

C. Glycerol + 1 phosphate group

D. Glycerol + 3 fatty acids

E. Glycerol + 1 phosphate group + 3 fatty acids

Answer: B

3. How are the new "stealth liposomes" protected from immune system phagocytes?

A. They are kept cold before use.

B. They are coated with carbohydrates.

C. They are given a synthetic polymer coating that protects them from immune destruction.

D. They are loaded with radioactive isotopes.

E. They are colored red.

Answer: c

4. People who have the A blood type possess _____.

1) An enzyme that adds an N-acetylgalactosamine to the end of the oligosaccharide chain on RBC membrane glycolipids

2) An enzyme that adds a galactose to the end of the oligosaccharide chain on RBC membrane glycolipids

3) An enzyme that adds phospholipids to the end of the oligosaccharide chain on RBC membrane glycolipids

4) No enzymes capable of attaching galactose or N-acetylgalactosamine to the end of the oligosaccharide chain on RBC membrane glycolipids

a) 1

b) 2

c) 3

d) 4

e) 1 and 2

Answer: a

5. What kind of membrane protein is found entirely outside the bilayer on either the extracellular or cytoplasmic surface? These proteins are covalently linked to a membrane lipid situated within the bilayer.

A.integral protein

B. lipid-anchored protein

C. peripheral proteins

D. carbohydrate-anchored protein

E. Transmembrane

Answer: B

6. Which of the following statements is correct:

A- Addition of carbohydrates to proteins occurs in RER

B- Addition of carbohydrates to proteins occurs in SER and Golgi apparatus

C- Addition of carbohydrates to lipids occurs in RER

D- Addition of carbohydrates to lipids occurs in SER and Golgiapparatus

E- B&C

F-A&D

Answer: F

7. Which of the following is not a function of peripheral proteins?

A. mechanical support for membrane

B. Enzymes

C. receptors

D. Anchor for integral proteins

E. Factors that transmit transmembrane signals

Answer: c

8. The temperature at which a lipid bilayer shifts from a fluid state to a crystalline gel is called the _____.

A. Transition temperature

B. Temperature optimum

C. Transition series

D. PH optimum

E. Gelation temperature

Answer: A

9. What directly or indirectly determines the transition temperature?

A. the ability of lipid molecules to be packed together

B. whether the fatty acid chains of the lipids are saturated or unsaturated

C. the extent to which the fatty acid chains of the lipids contain double bonds

D. the length of the fatty acid chains

E. All of these are correct.

Answer: E

10. Which of the following cell processes depend on the movement of membrane components and would probably not be possible if membranes were rigid, nonfluid structures?

A. cell movement

B. cell division

C. formation of intercellular junctions

D. endocytosis

E. All of these are correct.

Answer: E

11. Phosphatidylethanolamine is concentrated in the inner leaflet of the plasma membrane and tends to promote the curvature of the membrane, which is important in _____.

A. membrane budding

B. membrane fragmentation

C. membrane fusion

D. signal transduction

E. both membrane budding and membrane fusion

Answer: E

12. Enzymes that move certain phospholipids between leaflets have also which of the following properties?

A. Play a role in establishing and maintaining membrane lipid asymmetry

B. Interacts with neighboring epithelial cells, or the basal membrane

C. Blocks post-synaptic membrane

D. Transport proteins

E. All of the above

Answer: A

13. Why are the proteins being separated on an SDS polyacrylamide gel attracted equally to the positive electrode?

a) They carry a relatively uniform positive charge distribution

b) They carry a relatively uniform negative charge distribution.

c) They are all the same molecular weight.

d) They are all the same size.

e) They all have the same degree of hydrophobicity.

Answer: b

14. True/False QUESTION:

Triglycerides don't have the ability to assemble into bilayer :

A- true

B- false

Answer: A

(Triglycerides consist of one glycerol and 3 fatty acid chains so it can not assemble into bilayer without hydrophilic portions)

15. Which protein in the red blood cell membrane appears to be responsible for the exchange of bicarbonate ions and chloride ions across the red blood cell membrane?

a) glycophorin A

b) glycophorin D

c) band 3

d) glyceraldehyde 3-phosphate

e) alpha-actinin

Answer: c

16. A channel that opens in response to changes in ionic charge across a membrane is called a _____.

a) voltage-gated channel

b) charge-gated channel

c) ligand-gated channel

d) positive-gated channel

e) electric-gated channel

Answer: a

17. What is the distinguishing characteristic of a P-type pump?

a) It must be pumped during the cycle.

b) It must be phosphorylated during the cycle.

c) It must be protonated during the cycle.

d) It must be deprotonated during the cycle.

e) It must be potassiumated during the cycle.

Answer: b

18. In the Na+/glucose cotransporter, _____ moving down its gradient drives the transport of _____ against its gradient.

a) Na+ ions, K+ ions

b) Na+ ions, glucose

c) glucose, Na+ ions

d) glucose, K+ ions

e) K+ ions, glucose

Answer: b

19. Which of the following is present in equal amounts on both sides of the membrane:?

a) Phosphatidylcholine

b) cardiolipin

c) sphingomyelin

d) cholesterol

Answer: d

20. Cholesterol is NOT found in which of the following

a) Bacteria

b) Fungi cells

c) Animal cells

d) Plant cells

e) a+d

Answer:E

21. What protects liposomes against phagocytic cells of the immune system:

a) a coat of polyethylene glycol on the outer surface of the liposome membrane.

b) antibodies on the outer surface of the liposome membrane.

c) specific drug molecules that are wedged between the phospholipid bilayer.

d) (A+C)

Answer: a

22. Caelyx is an example of a stealth liposome that contains a

chemotherapy drug used to treat:

a) lung cancer

b) Brain cancer

c) skin cancer

d) metastatic breast cancer.

Answer: D

23. The molecule which marks the cell for destruction macrophages is:

a) phosphatidylcholine

b) phosphatidylserine

c) phosphatidylethanolamine

d) phosphatidylinositol

Answer: b

24. A person's blood type is determined by carbohydratesthat are found on:

a. Glycolipids on the surface of white blood cells

b. Glycoproteins on the surface of red blood cells

c. Glycoproteins on the surface of white blood cells

d. Glycolipids on the surface of red blood cells

Answer: d

25. what are the factors that determine which substances penetrate the plasma membrane or not?

a) only polarity.

b) only size of substance.

c) size and polarity.

d) none of the above

Answer :c

26. if substance dissolves in the in large amount in the lipids then it has :

a) Large partition coefficient

b) Small partition coefficient

c) There is not any relationship between polarity and partition coefficient

d)zero partition coefficient

Answer: a

27. which of the following an example of facilitated diffusion?

a) glucose transporter (GLUT)

b) Sodium-potasium pumps.

c)Na+/H+ transporter

d)osmosis

e) all of the above.

Answer: a

28. which of the following export glycogen?

a) the liver.

b) the muscles.

c)any cell in your body can export glycogen by channels.

d)you take glycogen directly from food. your body cannot storage it.

e) none of the above

Answer :a

29. In sodium -potassium pump, and in E2 conformation which of the following is true?

a) the pump has high affinity for sodium.

b) the pump has high affinity for potassium.

c) it is in equilibrium state.

d)very low affinity for potassium

Answer : b

30.Halobacterium salinarium uses which of the following for the active transport of ions to induce purple color?

a) ATP

b) voltage

c) chemical energy

d) light energy

e) Na+ gradient

Answer: d

CHAPTER 9

1. What advantage do the cristae confer on the mitochondria?

A. They allow the mitochondria to shrink.

B. They greatly increase the surface area for aerobic respiration . . . . . machinery.

C. They confer resiliency on the cells.

D. They allow swelling of mitochondria.

E. They activate the matrix.

Answer: B

2. The balance between fusion and fission is likely a major determinant of_____.

A. Number

B. Length

C. Color

D. Degree of interconnection

E. Number, length and degree of interconnection

Answer: E

3. When fusion of mitochondria becomes more frequent than fission, the mitochondria tend to become _____.

A. more elongated

B. More interconnected

C. more numerous

D. more distinct

E. more elongated and more interconnected

Answer: e

4. The presence of Ca^{2+} ion transport molecules in the inner mitochondrial membrane is consistent with the mitochondrion's role in _____.

A. Muscle contraction

B. Regulating cytosolic Ca^{2+} ion concentration

C. ATP manufacture

D. ADP manufacture

E. control of membrane fusion

Answer: B

5. Mitochondria are sites of the _____.

A. synthesis of certain amino acids

B. Synthesis of heme groups

C. Uptake of Ca^{2+} ions

D. Release of Ca^{2+} ions

E. All of these are correct.

Answer: E

6. The number of mitochondria in our cells:

A. Small and differ from one cell to another.

B. Large and differ from one cell to another.

C. The same number in all cells.

D. It depends on function of the cell.

Answer : d

7. The inner boundary membrane is particularly rich in which of the following?

A. protons

B. proteins responsible for the import of mitochondrial proteins

C. Krebs cycle enzymes

D. enzymes of the glycolytic pathway

E. glycosaminoglycans

Answer: B

8. Peroxisomal enzymes _____.

A. Produce hydrogen peroxide

B. Break down hydrogen peroxide

C. Include catalase

D. A and B

E. A, B and C

Answer: E

9. Which organelle below is not found in both plants and animals?

A. Cell membrane

B. mitochondria

C. Peroxisomes

D. glyoxysomes

E. vacuoles

Answer: D

10. An unusual type of phospholipid is found in the myelin sheath that insulates brain axons; abnormalities in the synthesis of this phospholipid can lead to severe neurological dysfunction.

What are these phospholipids called?

A. Plasmins

B. Sphingolipids

C. Plasmalogens

D. Insulins

E. luciferases

Answer: C

11. When fission of mitochondria becomes more frequent than fusion, the mitochondria tend to become _____.

A. more elongated

B. more interconnected

C. more numerous

D. more distinct

E. more numerous and more distinct

Answer: E

12. which of the following organelle can be viewed with light microscopy :

A. mitochondria

B. Golgi

C. ER

D. Ribosome

ANSWER:A

13. Which genetic disorder is associated with dysfunction of peroxisomes?

A. Prkinson's disease

B. Down's syndrome

C. Premature aging phenotype

D. Zellwager syndrome

E. Bubble boy syndrome

ANSWER:D

14. Human mitochondrial DNA encodes for:

A. 2 rRNAs

B. 5 rRNAs

C. 1 rRNAs

D. 3 rRNAs

E. 4 rRNAs

ANSWER:A

15. Porins are present in …….:

A. Outer membrane

B. Inner membrane

C. Intermembrane space

D. Both inner and outer membrane

E. Matrix

ANSWER:A

CHAPTER 12

1. Which of the following is an example of endocytosis:

A. A plasma membrane engulfing large materials so that they can enter the
. Cell.

B. A vesicle transporting materials out of the cell

C. A vesicle transporting materials into a cell

D. Light and carbon dioxide being converted into carbohydrate and oxygen

E. A+C

.Answer:C

2.The Mannose 6- phosphate signal in the lysosomal enzymes is recognized and captured by :

A. MPR

B. KDEL

C. GGAs

D. B and C

E. None of the above

.Answer:A

3.The vesicles that the lysosomal enzymes are transported in are coated in :

A. COP 1

B. Clathrin

C. Cop 2

D. GGAs

E. A and C

Answer: b

4. Which of the following normally gets exocytosis from the cells : (important)

A. DNA

B. RNA

C. Integral membrane proteins

D. Neurotransmitters molecules

E. all of the above

Answer: d

5. Which of the following enzymes are typically found in lysosomes?

A. hydrolytic enzymes (acid hydrolases)

B. oxidoreductases

C. transferases

D. lyases

E. ligases

Answer: a

6. Which pH below would be most likely to favor the operation of a lysosomal enzyme?

A. 8.5

B. 7.6

C. 4.5

D. 11.3

E. 6.5

Answer: c

7. What is thought to shield lysosomal membranes against attack by their enclosed enzymes?

A. DNA

B. basic RNA

C. carbohydrate chains attached to integral membrane proteins

D. carbohydrate chains attached to peripheral membrane proteins

E. the lipid bilayer itself

Answer: c

8. What process is responsible for organelle turnover in the cell and carries out the regulated destruction of the cell's own organelles for the purpose of recycling the components of which they are made?

A. Autolysis

B. Autophagolysosome

C. Apoptosis

D. Autophagy

E. Autonomy

Answer: d

9. Which of the following play a key role in vesicle targeting by recruiting specific cytosolic tethering proteins to specific membrane surface:

A. COP2

B. RABs

C. Residual body

D. Coated pits

E. c + b

Answer: B

10.Movement of protein from the RER to the Golgi complex takes place in which of the following cell components?

(A) A caveolin-coated vesicle

(B) A clathrin-coated vesicle

(C) A COP-I–coated vesicle

(D) A COP-II vesicle

(E) An early endosome

Answer: D

11)Which of the following strategies is used by Mycobacterium tuberculosis, the bacterium responsible for tuberculosis, to avoid being destroyed by phagocytosis?

A. The bacterium crystallizes the enzymes in the phagolysosome.

B. The bacterium inhibits fusion of the phagosome with a lysosome.

C. The bacterium allows fusion with the lysosome, but neither the acidic pH nor the lysosomal enzymes can destroy it.

D.The bacterium produces proteins that destroy lysosomal membrane integrity so that the bacterium can escape into the cell cytosol.

E. The bacterium neutralizes the enzymes in the lysosome

ANSWER:B

12.Which of the following strategies is used by Listeria monocytogenes, a bacterium that causes meningitis, to avoid being destroyed by a lysosome's fusion with the phagosome in which it was ingested?

A. The bacterium allows fusion with the lysosome, but the acidic pH cannot destroy it.

B. The bacterium inhibits fusion of the phagosome with a lysosome.

C. The bacterium allows fusion with the lysosome, but the lysosomaL ….. enzymes cannot destroy it.

D.The bacterium produces proteins that destroy lysosomal membrane integrity so that the bacterium can escape into the cell cytosol.

E.The bacterium neutralizes the enzymes in the lysosome

ANSWER:D

13. structure & function are always related, according to this which one of these pairs isn't correctly matched

A. Storing calcium ions - SER

B. Modifying different synthesized molecules - Golgi apparatus

C. Plays crucial role in endocytosis and exocytosis – vesicles

D. Tagging cells and cell- cell recognition - phospholipids

E. None of the above

ANSWER:D

14. Exocytosis occurs as a mechanism of secretion in many cells, fusion between vesicles and the plasma membrane in exocytosis leads to which of the following:

A. both the luminal and the cytosolic surfaces of the vesicles become part of the cytosolic surface of the membrane

B. The luminal surface of the vesicle becomes part of the inner (cytosolic) surface of the plasma membrane and the cytosolic surface becomes part of the outer surface of the plasma membrane

C. The luminal surface of the vesicle becomes part of the outer surface of the plasma membrane and the cytosolic surface becomes part of the inner surface of the PM

D. both the luminal and the cytosolic surfaces of the vesicles become part of the outer surface of the PM

E. the answer depends on the type of the vesicle

ANSWER:C

15. If a human has a mutation which causes a disability in the process of attaching GTPs to Rabs(Gproteins)which of the following mechanisms will be affected:

A. Recruiting specific cytosolic tethering proteins to specific membrane surfaces

B. Attachment of clathrin to MPR6

C. Recruiting motor proteins that move membranous vesicles through the cytoplasm

D.A & C are correct

E. All of the above

ANSWER:D

16. Detoxification happens mostly in liver cells in the sER, it mostly carried out by oxygenates, one of which is the _____ and they are known for _____

A. Peroxisomal enzymes ; Digestion

B. Acyltransferases ; substrate specifity

C. Cytochrome P450 family ; lack of substrate specifity

D. None of the above

Answer: C

17. Addition of sugars to an oligosaccharide is catalyzed by which enzyme?

A. Glycosyltransferases

B. Oligosaccharyltransferase

C. Glucocerebrosidase

D. Flippase

E. 3afretase (Hhhhhh)

Answer: A

18. What model describing the movement of materials through the Golgi complex is currently in use?

A. Vesicular transport model

B. Cisternal maturation model

C. None of the above

D. Similar to B but with A retrograde transport

E. The Golgi vesicular maturation model.

Answer:D

19. The three-legged assembly of protein chains that makes up a clathrin molecule and that can assemble into a network of polygons resembling a honeycomb is called a(n) _____.

A. Trigeminy

B. Triskeleton

C. Trigellium

D. Triskelion

E. Triskellium

Answer: D

20. Steroid hormones synthesis in endocrine cells is the function of:

A. RER .

B. SER .

C. A+B .

ANSWER: B

21.The coat for the vesicles that moves between the Golgi complex and the plasma membrane?

A. Clathrin

B. COP2

C. COP1

D. B+C

E. None of the above

Answer: A

22.The coated pits are coated on their cytosolic side with a lattice of:

A. Lipoproteins

B. Glycoproteins

C. Clathrin

D. Transferrin

E. A, C and B are correct.

Answer: C

23.The core of LDLs has a single copy of large protein , which binds specifically to LDL receptors on the surface of the cell, it is called:

A. Apolipoprotein B-100

B. Actin

C. HDL

D. c only

E. None of the above

Answer: A

24. The cholesterol- transporting agent in the blood that brings back excess cholesterol back again to the liver is :

A. KDEL

B. KKXX

C. HDL

D. LDL

E. d only

Answer: C

25.Which of the following is important for dynamin ring disassembly in the formation of clathrin coated vesicle:

A. GTP hydrolysis

B. ATP

C. ADP

D. B only

E. B+C

Answer: a

26.Which is the correct sequence for the transport mediated by clathrin coated vesicle:

1) Vesicle formation

2) Receptor- ligand binding

3) Removal of clathrin coat

4) Adaptor complex and clathrin triskelion are recruited

A. 4,2,3,1

B. 4,2,1,3

C. 2,4,3,1

D. 2,4,1,3

Answer: D

27.Which of the following type of proteins that normally reside in the ER may contain a signal – anchor sequence?

A. Soluble proteins

B. Membrane proteins

C. Beta 2 agonist

D. Alpha 1 agonist

E. a + b

ANSWER:B

28. Signaling receptors are usually marked for endocytosis and subsequent destruction by the covalent attachment of a "tag" to the cytoplasmic tail of the receptor while it resides at the cell surface. What is the name of the "tag"?

A. Ubiquitin

B. transferrin

C. opsonin

D. chaperonin

E. complexin

Answer: A

(This question is from DR.ZIAD'S lecture)

29. Which endosomes are typically located near the peripheral region of the cell?

A. late endosomes

B. early endosomes

C. medial lysosomes

D. medial endosomes

E. intellosomes

Answer: B

30. Drugs that lower blood LDL levels are referred to as _____.

A. Olefins

B. Statins

C. Ancestrins

D. Cholestrins

E. Cholestrans

Answer: B

31. What protein is associated with LDL particles?

A. Large LDL particle B-100

B. LDLenin

C. Apolipoprotein B-100

D. Statin

E. Apolipoprotein A-1

Answer: C

32. The process of membrane fusion and subsequent content discharge is called _____ and is usually triggered by a release of _____.

A. Exocytosis, K+ ions

B. Exocytosis, Ca2+ ions

C. Endocytosis, Ca2+ ions

D. Endocytosis, K+ ions

E. Secretion, K+ ions

Answer: B

33. Particle A is observed to be brought into the cell through endocytosis, this means that the destination of particle A is most likely:

A. One of the membrane-bound organelles because it is transported via a . . vesicle

B. The cytosol because vesicles aren't involved

C. One of the membrane-bound organelles because vesicles aren't involved

D. The cytosol because it is transported via a vesicle

E. B and C only

Answer: A

CHAPTER 6

1. With what structure is the outer membrane of the nuclear envelope continuous?

A. RER

B. SER

C. Golgi complex

D. the spindle

E. the plasma membrane

Answer:A

2. The thin filamentous meshwork within the nucleus that is bound by integral membrane proteins of the inner surface of the nuclear envelope in animal cells is called the _____.

A. basement lamina

B. basal lamina

C. nuclear lamina

D. nucleon

E. nuclear limulus

Answer: c

3. A transport receptor that moves macromolecules from the cytoplasm to the nucleus is called a(n) ____.

A. Exhalin

B. Exportin

C. Importin

D. Transportin

E. Receptin

Answer: c

4. What is the type of bond between histones and DNA?

A.Covelant bond

B.disulfide bond

C.ionic bond

D.Van der waals

Answer: C

5. The function of FG (phenylalanine-glycine) in the nuclear pore complex is:

A. Tag MRNA and RRNA with Nuclear Export Signals

B. Prevent macromolecules from entering the cell

C. Act as exportins

D. Act as importins

E. Prevent hydrogen bonding with the NPC

Answer:B

6.The histone that act as a linker is:

A.H1

B.H2A

C.H2B

D.H3

E.H4

Answer:A

7. The protein that maintain replicated DNA loops together during mitosis is :

A. dynein

B. kinesin

C. selectin

d. cohesin

E.cadherin

Answer:d

CHAPTER 13

1. What is the name of the protein that make up the nuclear lamina and of what protein superfamily are they a member?

A. Actin, microfilaments

B. Lamins, intermediate filaments

C. Lamins, laminins

D. Keratin, laminins

E. Keratin, intermediate filaments

Answer: B

2. Microvilli are composed of :

A. red blood cells

B. myosin

C. white blood cells

D. actin

Answer: D

3. Which type of actin-binding protein is known to decrease cytoplasmic viscosity by breaking existing actin filaments into two or more pieces?

A. Cross-linking proteins

B. End-blocking proteins

C. Actin-filament depolymerizing proteins

D. Filament-severing proteins

E. Monomer-polymerizing proteins

Answer:D

4. Which type of cytoskeletal element is characterized as a hollow, rigid cylindrical tube with walls composed of tubulin subunits?

A. microfilaments

B. microtubules

C. intermediate filaments

D. all of these choices

E. Minitubules

Answer: B

5. Which element of the cytoskeleton is found in the cytoplasm and the nucleus?

A. microfilaments

B. microtubules

C. intermediate filaments

D. macrofilaments

E. indeterminate filaments

Answer: c

6. which of the following is a function performed by the cytoskeleton?

A. Provides structural support that determines cell shape and resists deforming forces

B. positions various organelles within the cell interior

C. provides a network of tracks over which materialslike mRNA and organelles move within cells

D. serves as a force-generating apparatus that moves cells from one place to another

E. All of these choices

Answer: E

7. Which of the following appears to be the most extensible?

A. intermediate filaments

B. microtubules

C. microfilaments

D. spindle fibers

E. microtubules and spindle fibers

Answer: A

8. The microtubule wall is composed of globular proteins arranged in longitudinal rows called _____.

A. microfilaments

B. protofilaments

C. prototubules

D. prototubulins

E. microtubular units

Answer: B

9. In a normal microtubule, how many protofilaments make up its cylindrical wall?

A, 13

B. 15

C. 11

D. 9

E. 17

Answer: A

10. Structures that move from the cell body of a neuron down the axon toward the neuron terminals are said to move in a(n) _____ direction.

A. retrograde

B. anterograde

C. astronomical

D. radial

E. intergrade

Answer: B

11. Which of the following molecular motors is associated with microfilaments?

A. kinesins

B. dyneins

C. myosins

D. kinesins and dyneins

E.kinesins and myosins

Answer: c

12. To which end of microtubules are tubulin subunits primarily added in vitro?

A. The minus end

B. The N-terminal end

C. The plus end

D. The C-terminal end

E. The 5'-end

Answer: c

13. The core of a cilium is called the _____.

A. Troponeme

B. Dynomeme

C. Cilioneme

D. Axoneme

E. Flagelloneme

Answer: D

14. Of what protein are the arms attached to the A microtubule of the axoneme composed?

A. tubulin

B. actin

C. dynein

D. keratin

E. myosin

Answer: C

15. Which property below is most characteristic of intermediate filaments?

A. Elastic

B. Highly resistant to shrinkage

C. Springy

D. Ability to absorb mechanical stresses applied by the extracellular . . . . environment

E. Hyper flexible

Answer: D

16. How are intermediate filaments different from actin filaments and microtubules?

A. Principle component of cytoskeleton in the cell.

B. It has the largest diameter.

C. It connects microtubules to actin filaments.

D. It is highly polarized.

Answer: c

17. How many polypeptide chains does myosin II molecule have?

A. Five polypeptide chains

B. six polypeptide chains

C. four polypeptide chains

D. two polypeptide chains

Answer: B

18. What is the direct source of energy that powers molecular motors?

a) hydrolysis of GTP

b) hydrolysis of ATP

c) a proton gradient

d) a H+ gradient

e) condensation of ATP

Answer: b

CHAPTER 11

1. Which of the following proteins are abundant in the extracellularmatrix:

A.. Tubulin

B. Myosin

C. Actin

D. Collagen

Answer: D

2. Which of the following proteins is a transmembrane protein responsible for anchoring the extracellular matrix :

A. Integrins

B. Laminin

C. Fibronectin

D. Collagen

Answer: A

3. Which of the following is the primary structural component of the basal lamina?

A. Type IV collagen

B. Entactin

C. Laminin

D. Integrins

Answer: A

4. Which of the following is not related to proteoglycan :

A. Polypeptides

B. Microfilaments

C. Hyaluronic acid

D. Glycosaminoglycans

E. H2O

Answer: B

5. What is not a function of extracellular matrix of animal cells?

A. Cell adhesion

B. Cell division

C. Cell motility

D. Cell differentiation

E. DNA replication

Answer: E

6. What substance joins proteoglycans together into gigantic complexes called proteoglycan aggregates?

A. Laminin

B. Hyaluronic acid

C. Proteoglycase

D. Fibronectin

E. Hyaluronidase

Answer: B

7. Focal adhesions

A. Transmit information to the cell interior that may lead to changes in cell adhesion, proliferation or survival

B. Contain integrins that develop transient interactions with theextracellular matrix

C. Have been implicated in cell locomotion

D. Collect information about the chemical properties of the extracellular environment

E. All of these are correct

Answer: E

8. Which of the following mediate the interactions between the leukocytes and blood vessel endothelial cells?

A. Selections

B. Immunoglobulin super family proteins

C. Focal adhesion

D. Calmodulins

E. Cadherins

Answer: A

9. The ECM components attached to cell membrane by?

A. protein

B. phospholipid

C. glycoprotein

D. glycolipid

Answer: A

10. what is the importance of integrin?

A. Cell substratum interaction

B. Cell signaling pathway

C. Act as enzymes

D. A and B

E. A and B and C

Answer: D

(PERIPHERAL proteins that act as enzymes not integral)

11. What is the difference between (selectin and cadherrins)?

A. Selectin formed between different types of cells but the cadherins . . . . between same types

B. Selectin formed between same cells but cadherins between different . . . cells

C. No difference between them

D. it depends on the location of thecells

Answer: a

12. An abnormal thickening of the basement membranes surrounding the glomeruli may cause :

A. Zellweger syndrome

B. Kidney failure

C. Adrenoleukodystrophy

D. Blindness

ANSWER:B

13. Which of these isn't a function of glycocalyx?

A. Cell-cell interactions.

B. Protection of cell surface from ionic stress.

C. Protection of cell surface from mechanical stress.

D. Barrier for microorganisms.

E. Decrease concentration of cholesterol in the plasma membrane.

ANSWER:E

14. What is the bond that connect between 2 similar polypeptide of fibronectin?

A. covalent

B. disulfide

C. polar covalent

D. ionic

e. No connection

Answer: B

15. The degradation of the extracellular matrix, along with cell surface proteins, is accomplished mostly by a _____-containing enzyme family called _____.

A. copper, matrix metalloproteinases

B. copper, MMPs

C. zinc, matrix metalloproteinases

D. magnesium, matrix metalloproteinases

E. manganese, MMPs

Answer: c

16. If experimentally linked α/β heterodimer integrin subunits are separated, what happens?

A. The molecules bind their ligand tightly

B. The molecules are unable to bind a ligand.

C. The molecules are cleaved.

D. The molecules denature their ligand.

E. The molecules are denatured and degraded.

Answer: B

17. Why do cells flatten out as they make contact with a surface?

A. They lose water.

B. They extrude cytoplasm.

C. They send out projections that make increasingly stable attachments.

D. Their membranes stiffen.

E. They make focal assignations.

Answer: C

18. Epidermolysis bullosa, an inherited blistering disease, is caused by _____:

A. Production of antibodies against hemidesmosome plaque proteins

B. Production of autoantibodies

C. Production of antibodies against spot desmosome plaque proteins

D. genetic alterations in any one of a number of hemidesmosomal proteins

E. production of antibodies against connexins

Answer: D

19. In which disease do individuals produce antibodies that bind to proteins present in hemidesmosmes? It causes the lower layer of the epidermis to lose attachment to the underlying basement membrane and thus to the underlying connective tissue layer of the dermis. The leakage of fluid into the space beneath the epidermis results in severe blistering of the skin.

A. epidermolysis bullosa

B. bullous pemphigoid

C. blisterosis

D. hemidesmosomosis

E. eczema

Answer: B

20. While most IgSF members are involved in various aspects of immune function, some of them mediate _____ cell-cell adhesion.

A. calcium-dependent

B. calcium-independent

C. magnesium-dependent

D. manganese-dependent

E. iron-independent

Answer: B

21. What is the function of most IgSFs?

A. cell adhesion

B. cell division

C. mediating specific interactions of epithelial cells with cells needed for immune response

D. mediating specific interactions of lymphocytes with cells needed for the immune response

E. cell fusion

Answer: D

22. What kind of molecule does not pass through a gap junction?

A. ions

B. cAMP

C. inositol phosphates

D. Ribosomes

E. cGMP

Answer: D

(large molecules do not pass throw gap junctions)

23. Attachment of an integrin to its ligand can induce which of the following responses within a cell?

A. Changes in cytoplasmic pH

B. Changes in cytoplasmic C2+ ion concentration

C. Protein phosphorylation

D. Gene expression

E. All of these are correct.

Answer: E

24. Each connexon in a gap junction is constructed of ___ connexin subunits.

A. 2

B. 4

C. 6

D. 8

E. 10

Answer: C

CHAPTER 15

1. How do cells in the body of a multicellular organism usually communicate with each other?

a) intracellular messenger molecules

b) direct connection by cells through long projections

c) extracellular messenger molecules

d) electrical signals between cells

e) ion transport between cells

Answer: c

2. Sometimes an enzyme is activated by a receptor and brings about the cellular response by generating a second messenger. Such an enzyme is called a(n) _____.

a) Activator

b) Effector

c) Affector

d) Refractor

e) Generator

Answer: b

3.Which of the following enzymes is responsible for lipid splitting:

A-phospholipids kinase

B- phosphatase

C-phospholipase

D-nuclease

E-more than one of the above

Answer: C

4. No matter how the signal initiated by the binding of an extracellular ligand is, what is the outcome of that signal?

a) A protein in the middle of an intracellular signaling pathway is activated.

b) A protein at the top of an intracellular signaling pathway is activated.

c) A protein at the top of an extracellular signaling pathway is activated.

d) A protein at the top of an intracellular signaling pathway is deactivated.

e) A protein at the bottom of an intracellular signaling pathway is activated.

Answer: b

5.What kinds of responses are not initiated when signals traveling down signaling pathways reach their target proteins?

a) A change in gene expression

b) A change in ion permeability

c) Cessation of DNA synthesis and degradation of DNA

d) The death of the cell

e) An alteration of the activity of metabolic enzymes

Answer: c

6. Most protein kinases transfer phosphate groups to which amino acid(s)?

1) glutamate

2) threonine

3) serine

4) tryptophan

a) 1

b) 2

c) 3

d) 4

e) 2 and 3

Answer: e

7. Which molecule below is unlikely to act as either a neurotransmitter or hormone?

a) glucose

b) glycine

c) dopamine

d) eicosanoids

e) thyroid hormone

Answer: a

8. Which signaling molecules are nonpolar molecules containing 20 carbons that are derived from a fatty acid named arachidonic acid?

a) Eicosanoids

b) Steroids

c) Acetylcholine

d) Acetylsalicylic acid

e) Epinephrine

Answer: a

9. What role do activated steroid receptors play in the cell?

a) Activation of inactive enzymes

b) Inactivation of active enzymes

c) ligand-regulated transcription factors

d) Opening of specific ion channels

e) Activation of cytoplasmic proteins

Answer: c

10. What is the largest protein superfamily encoded by animal genomes?

a) G-protein coupled receptors

b) RTKs

c) steroid receptors

d) tubulin superfamily

e) ligand-gated channels

Answer: a

11. Which of the following are not natural ligands that bind to G-protein coupled receptors?

a) hormones

b) neurotransmitters

c) chemoattractants

d) opium derivatives

e) steroid hormones

Answer: e

12. Place the events below in the correct order.

1) G protein binds to activated receptor forming a receptor-G protein complex

2) Release of GDP by the G protein

3) Change in conformation of the cytoplasmic loops of the receptor

4) Binding of GTP by the G protein

5) Increase in the affinity of the receptor for a G protein on the cytoplasmic surface of the membrane.

6) Binding of a hormone or neurotransmitter to a G-protein coupled receptor

7) Conformational shift in the 'a' subunit of the G protein

a) 6 – 3 – 5 – 1 – 2 – 4 – 7

b) 3 – 6 – 5 – 1 – 7 – 2 – 4

c) 6 – 3 – 5 – 1 – 7 – 2 – 4

d) 6 – 7 – 3 – 5 – 1 – 2 – 4

e) 6 – 3 – 5 – 1 – 7 – 4 – 2

Answer: c

13. Place the following events in the proper order.

1) Activation of one or more cellular signaling proteins.

2) Dissociation of Gα from the G protein complex.

3) Production of a second messenger, like cAMP.

4) Replacement of GDP by GTP on the Gα after interaction with an activated GPCR.

5) Conformational change in the Gα subunit causing a decreased affinity for the Gβ γ subunit.

6) Gα-subunit with its attached GTP activates an effector like adenylyl cyclase.

a) 4 – 5 – 2 – 6 – 3 – 1

b) 5 – 4 – 2 – 6 – 3 – 1

c) 4 – 6 – 2 – 5 – 3 – 1

d) 4 – 5 – 2 – 3 – 1 – 6

e) 1 – 5 – 2 – 4 – 3 – 6

Answer: a

14. Which heterotrimeric G proteins couple receptors to adenylyl cyclase via the activation of GTP-bound Gα subunits?

a) Gs family

b) Gq family

c) Gi family

d) G12/13 family

e) Gr family

Answer: a

15. The process that blocks active receptors from turning on additional G proteins is called _____.

a) hypersensitization

b) desensitization

c) hyposensitization

d) deactivation

e) sensitivitization

Answer: b

16. In order to begin desensitization, the _____ domain of the activated G protein-coupled receptor is phosphorylated by a specific enzyme called a(n)_____.

a) extracellular, G protein-coupled receptor kinase

b) extracellular, G protein-coupled receptor phosphatase

c) cytoplasmic, G protein-coupled receptor kinase

d) cytoplasmic, G protein-coupled receptor phosphatase

e) extracellular, GRK

Answer: c

17. What recruits cytoplasmic GRKs (G protein-coupled receptor kinases) to the plasma membrane?

a) inhibition of certain G proteins

b) destruction of the GPCRs

c) activation of GPCRs

d) inhibition of the GPCRs

e) destruction of the hormone

Answer: c

18. How is signaling by an activated Gα subunit terminated?

a) The bound GTP is hydrolyzed to GMP.

b) The bound GDP is hydrolyzed to GTP.

c) The bound GTP is hydrolyzed to GDP.

d) The bound GDP is phosphorylated to GTP.

e) The Gα subunit releases GDP and binds GTP.

Answer: c

19. What group of enzymes phosphorylates most of the carbons on inositol?

a) phospholipases

b) phosphoinositide kinases

c) phosphorylases

d) phosphodiesterases

e) phosphatases

Answer: b

20. What enzyme below does diacylglycerol (DAG) recruit and activate?

a) phosphatidylinositol (PI)-specific phospholipase C-β

b) protein kinase A

c) protein kinase C

d) glycogen phosphorylase

e) phosphorylase kinase

Answer: c

21._____ are enzymes that phosphorylate specific tyrosine residues on protein substrates.

a) Protein tyrosinases

b) Protein-tyrosine kinases

c) Tyrosine pronases

d) Proteokinases

e) Tyrokinases

Answer: b

22. Which of the following features would be a requirement for a receptor that exhibits ligand-mediated dimerization?

a) The ligand has only one binding site for receptors.

b) The ligand has two binding sites for receptors.

c) The receptor must have a phenylalanine residue in a specific location.

d) The receptor must have a molecular weight of 50,000 daltons.

e) Ligand binding causes a conformational shift that reveals a binding site . . for another receptor.

Answer: b

23. Once the kinase domain of receptor protein-tyrosine kinase has been activated, what does the activated receptor protein-tyrosine kinase do?

a) The receptor subunits denature.

b) Each receptor subunit phosphorylates its partner on tyrosine residues . . found in regions adjacent to the kinase domain.

c) Each receptor subunit phosphorylates itself on tyrosine residues found . . in regions adjacent to the kinase domain .

d) The receptor subunits dephosphorylate each other.

e) The receptor subunits refold into a more effective conformation.

Answer: b

24. What event is usually responsible for terminating signal transduction by RTKs?

a) dephosphorylation of the receptor

b) degradation of the ligand

c) receptor internalization

d) phosphorylation of the receptor

e) acetylation of the receptor

Answer: c

25. What is the name of an extracellular messenger protein that is named for its ability to kill tumor cells and also serves as an apoptotic stimulus?

a) tumor angiogenesis factor

b) tumor death factor

c) tumor necrosis factor

d) necromancer factor

e) tumorigenic factor

Answer: c

26. IP3 is a second messenger which aim to increase the concentration of calcium ions in the cytoplasm by binding to calcium channels on the surface of:

A-RER

B-Golgi apparatus

C-nucleus

D-SER

E-A&D

Answer: D

27.(important) Which of the following increases glucose mobilization (glycogenhydrolysis):

A-a decrease in cAMP concentration

B- the binding of glucagon and epinephrine with their receptor on the target cell's surface

C- an increase in cAMP concentration

D- an increase in insulin secretion

E- B&C

Answer: E

28. One of the following kinases plays a crucial role in the regulationof blood glucose:

A- protein kinase A

B- protein kinase B

C-protein kinase C

D- A&C

E-all of the above

Answer: A

29. Which of the following is correct about apoptosis ?

A-the extrinsic pathway of apoptosis is initiated by DNA damage

B- diabetes type 2 is linked to elevated apoptosis

C- phosphatidylserine is moved to the outer leaflet of the PM to attract . . . . macrophages

D- apoptosis isn't needed in the embryonic development

E- none of the above

Answer: C

30. Cytochrome c, cytoplasmic factors and procaspase 9 form:

A-executioner caspases

B- executioner procaspases

C- initiator caspase 8

D- apoptosomes

E-A&B

Answer: D