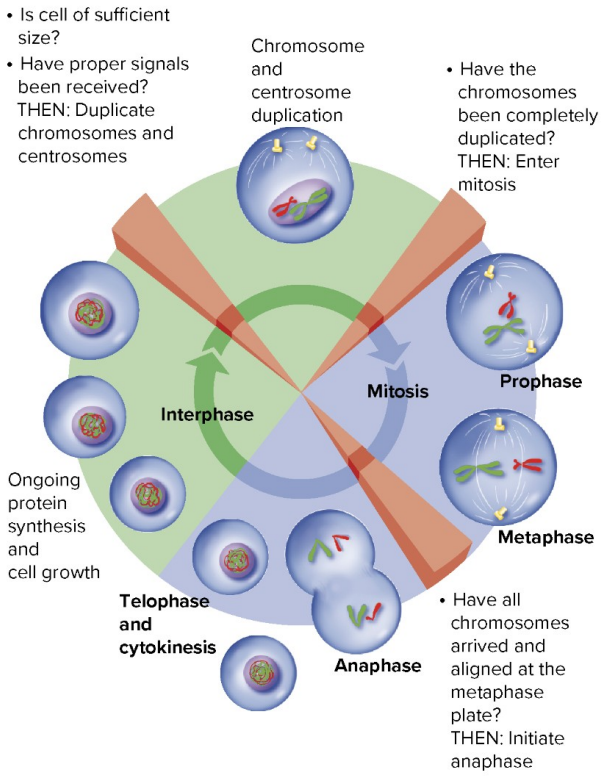
NYU TANDON SCHOOL OF ENGINEERING

Introduction to Cell and Molecular Biology
BMS-UY 1003
Summer 2023

Good Luck ☺
Feel free to use any resources (PPT slides, PubMed, google) for this quiz
This is due on (or before) August 16 ☺

1. The image below (which comes from a Genetics textbook) has a mistake (that has to do with the way the elements of the image are drawn, not so much with the statements written around the image). Can you identify it?



2. Na^+ moves from high to low concentration, across the plasma membrane, through a protein channel that is **permanently** open. Which statement is true about this process?
   A. It does not require ATP
   B. It is a form of active transport
   C. Movement is against the concentration gradient of Na^+
   D. The channel probably allows many different molecules and ions to cross

3. Which statement is true about noncompetitive inhibition?
   A. Binding of the inhibitor occurs to the active site of the enzyme
   B. Inhibition is irreversible
   C. Increasing the amount of substrate does **not** reverse the inhibition
   D. We talked about it in context of aspirin inhibiting blood clotting

4. The bonds that are broken down inside the proteasome are:
   A. Hydrogen bonds
   B. Ionic bonds
   C. Disulfide bridges
   D. Peptide bonds

5. During electron transport and ATP synthesis in eukaryotes, the H^+ gradient accumulates in:
   A. The cytosol
   B. The mitochondrial matrix
   C. The mitochondrial intermembrane space
   D. Outside the mitochondria

6. How many carbon atoms are present in pyruvate?
   A. 12
   B. 6
   C. 3
   D. 2

7. The citric acid cycle occurs in the:
   A. Cytosol
   B. Mitochondrial matrix
   C. Inner membrane of the mitochondria
   D. Nucleus

8. Cyanide inhibits an enzymatic complex located in the:
   A. Nucleus
   B. Inner mitochondrial membrane
   C. Outer mitochondrial membrane
   D. Cytosol

9. Pyruvate, formed from glycolysis, is generated in the:
   A. Cytosol
   B. Nucleus
   C. Mitochondrial matrix
   D. Inner mitochondrial membrane

10. Which statement about the ATP synthase is **false**?
   A. It is a rotary machine
   B. It is located in the inner mitochondrial membrane
   C. It can make ATP, or it can break ATP down
   D. It only contains membrane-embedded regions

11. Which of the following is a correct way of measuring the Michaelis constant K_M?
   A. Seconds
   B. Molecules/second
   C. Microliters (μl)
   D. Micromolar (μM)

12. The process of oxidative phosphorylation occurs in the:
   A. Cytosol
   B. Mitochondrial matrix
   C. Intermembrane space
   D. Inner mitochondrial membrane

13. The final electron acceptor in the electron transport chain is:
   A. NADH
   B. $FADH_2$
   C. O_2
   D. ATP

True/false

14. Fermentation generates more ATP per molecule of glucose than aerobic respiration.

15. No instances of anaerobic respiration exist in the human body.

16. Fermentation in yeast cells generates ethanol.

17. Glycerol cannot be used for a cell's energy needs.

18. ATP synthase can break down ATP but it can also make ATP.

19. The acetyl-CoA molecule has three carbon atoms.

20. Cancer cells can use NADH to make electrons flow in the electron transport chain.