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## MCQ in Cell Biology

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1. Which of the following is not true of the nuclear envelope? A. The nuclear envelope is exactly like other cellular membranes.  
B. The nuclear envelope separates the genetic material from the cytoplasm.  
C. The nuclear envelope is a pair of concentric membranes.  
D. The nuclear envelope is studded with pores.
2. Which cytoplasmic fibrils are most like the nuclear lamins? A. Microtubules  
B. Microfilaments  
C. intermediate filaments  
D. actomyosin
3. What kind of molecules must pass between the nucleus and the cytoplasm? A. DNA  
B. Protein  
C. Lipids  
D. Carbohydrates
4. Which statement best characterizes the nuclear localization signal? A. The NLS is typically a small molecular weight metabolic intermediate.  
B. The NLS is a stretch of hydrophobic amino acids on a protein's N terminus.  
C. The NLS is one or two stretches of basic amino acids on a protein's C-terminus.  
D. The NLS is a steroid that binds to DNA.
5. Which sequence represents increasing levels of chromosomal organization, from most dispersed to most condensed? A. nucleosomes–30 nm filaments–supercoiled loops–mitotic chromosomes  
B. nucleosomes–supercoiled loops–30 nm filaments–mitotic chromosomes  
C. nucleosomes–30 nm filaments–mitotic chromosomes–supercoiled loops  
D. mitotic chromosomes–30 nm filaments–supercoiled loops–nucleosomes
6. When chromatin is treated with nonspecific nucleases, what is the length of the resulting pieces of DNA? A. random numbers of base pairs  
B. about 60 base pairs  
C. about 8 base pairs  
D. about 200 base pairs
7. Which of the following statements about histones is not true? A. Histones are very similar between species.  
B. Histones have many basic amino acids.  
C. Histones are rich in lysine and arginine.  
D. Each histone has one single gene that codes for it.
8. In mammalian cells, the DNA of the centromere is characteristic of: A. facultative heterochromatin.  
B. constitutive heterochromatin.  
C. Euchromatin.  
D. dispersed chromatin.
9. Why are adult women genetic mosaics? A. Inactivated X chromosomes are all derived from the male parent.  
B. Inactivated X chromosomes are all derived from the female parent.  
C. Inactivated X chromosomes can be from either the male or the female parent.  
D. None of these are correct.
10. What do telomeres do? A. They protect the chromosomes from degradation by nucleases.  
B. They prevent the ends of chromosomes from fusing with one another.  
C. They are required for complete chromosomal replication.  
D. All of these are correct.
11. When all or a piece of a chromosome becomes attached to another chromosome, the aberration is called a(n): A. inversion.  
B. translocation.  
C. deletion.  
D. duplication.
12. If there were a mutation in the regulatory gene of an inducible promoter rendering the protein incapable of binding to the repressor, then: A. the structural genes would always be expressed.  
B. the structural genes would never be expressed.  
C. the structural genes would only be expressed in the presence of the inducer.  
D. the structural genes would only be expressed in the absence of the inducer.
13. Which of the following is a difference between inducible versus repressible operons? A. In an inducible operon, the inducer binds to the regulator protein.  
B. In a repressible operon, the corepressor-regulator complex binds to the operator.  
C. In a repressible operon, all the structural gene products have related functions.  
D. In an inducible operon, RNA polymerase binds to the promoter.

14. Which of the following is not a characteristic of transcription factors? A. Transcription factors always have two fold rotational symmetry.  
B. Active transcription factors are commonly dimers.  
C. Transcription factors are rich in basic amino acids.  
D. Transcription factors have one of a few DNA-binding motifs.
15. Eukaryotes regulate gene expression at all of the following levels except: A. transcription.  
B. translation.  
C. RNA processing.  
D. All of these are correct.
16. To stimulate transcription, enhancer sequences: A. must be within a few base pairs of the gene they enhance.  
B. must be within a few hundred base pairs of the gene they enhance.  
C. can be tens of thousands of base pairs away from the genes they enhance.  
D. will not function if they are moved experimentally.
17. Coactivators assist in transcriptional activity by: A. interacting with general transcription factors.  
B. modifying the activity of RNA polymerase II directly.  
C. Changing chromatin structure to make transcription of certain genes more accessible.  
D. All of these are correct.
18. Alternate splicing means that: A. the same gene can code for several different proteins.  
B. several different genes can code for the same protein.  
C. gene expression can be regulated at the level of transcription.  
D. pieces of DNA can move around within the genome.
19. Which of the following statements is true? A. A cell can potentially make fewer different proteins than the number of different genes it contains.  
B. A cell can potentially make only the same number of different proteins as the number of different genes it contains.  
C. A cell can potentially make more different proteins than the number of different genes it contains.  
D. None of these are correct.
20. The longevity of mRNA is related to: A. the length of the poly (A) tail.  
B. the 5' cap on the mRNA.  
C. All of these are correct.  
D. None of these are correct

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## Responses

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