

- **BIOMEDICAL SCIENCES 136 – BIOLOGY OF HUMAN SEXUALITY**
- **REVIEW SHEET FOR 1st LECTURE EXAM**

THIS REVIEW SHEET IS MEANT TO BE AN AID TO YOU IN YOUR STUDIES FOR THE EXAM. IT DOES NOT NECESSARILY INCLUDE ALL OF THE INFORMATION WHICH WAS PRESENTED IN LECTURE AND LAB FOR THE EXAM. THIS REVIEW SHEET IS NOT A SUBSTITUTE FOR REGULAR, DILIGENT STUDY OF THE COURSE MATERIAL.

SOME REVIEW QUESTIONS:

1. Draw a simple flowchart diagram to show the basic hierarchy of life from atom to population.
2. List 3 basic tenets of the cell theory? Who first coined the term “cell”? Name 2 other scientists involved in developing the cell theory?
3. Define the following terms: physiology, homeostasis, tissue, organ, negative feedback.
4. If the level of testosterone made up the testes increased greatly what would happen to the level of LH released from the brain (from the pituitary)? (would it increase or decrease).
5. If the level of LH released by the brain increased, what would happen to the level of testosterone made by the testes? (would it increase or decrease)
6. What are the four primary tissue types that make up the human body?
7. List all of the organ systems in the human body.
8. Proteins, carbohydrates (polysaccharides), lipids (fats) and nucleic acids are all macromolecules (polymers) made of smaller units (monomers). What are the smaller units (chemical building blocks) of each of these types of macromolecules.
9. What is a hormone? List 4 types (classes) of hormones based on their chemical structure.
10. What is an organelle? Briefly describe the basic functions of the cell nucleus, cell membrane, mitochondrion, rough endoplasmic reticulum, cell cytoskeleton and a flagellum.
11. Which organelles are found in animal cells? Which are found in bacterial cells?
12. How does a prokaryotic cell differ from a eukaryotic cell? What are bacteria? Animal cells? (are they eukaryotic or prokaryotic)?
13. What are two different types of nucleic acids?
14. Why is DNA copied during S phase before mitosis or meiosis?
15. What is transcription? What enzyme catalyzes the process of transcription?
16. What is translation and where does it occur in cells? What enzyme catalyzes the process of translation?
17. What is interphase with regard to the cell cycle? Is S phase a part of interphase?
18. Name in order the phases of mitosis. Briefly, what occurs during each phase?
19. Define the following: chromatin, centromere, single chromosome, duplicated chromosome, haploid cell, diploid cell, gamete.
20. How does mitosis differ from meiosis with regard to the number of cells produced, the chromosome number in each cell and the function of each type of cell division (where does mitosis occur in the body versus meiosis)?
21. What is crossing over? What does it allow for with regard to the genes on the chromosomes?
22. During which phase of the cell cycle does crossing over occur?
23. Does chromosome duplication occur between meiosis I and meiosis II?
24. Briefly describe how the chromosomes line up along the equator during Metaphase I and Metaphase II of Meiosis (how are they different)?
25. Is DNA condensed into chromosomes during Interphase? If not, what is the DNA called in the cell nucleus during Interphase.
26. What is cytokinesis?
27. How does a haploid cell differ from a diploid cell?
28. What is a zygote?
29. What is an homologous pair of chromosomes?
30. What are the sex chromosomes in humans and the genotypes of males and females?
31. What causes Down’s Syndrome? What is nondisjunction? What causes Turner’s Syndrome?
32. Draw diagrams to show the basic events that occur during each of the steps of mitosis.
33. Is DNA double or single stranded? RNA? Where in the cell are each of these types of nucleic acids found?
34. List the bases found in DNA and the bases found in RNA.
35. Show complementary base pairing between two strands of DNA.
36. Show complementary base pairing between a strand of DNA and a strand of RNA.

37. What would the complementary **RNA** base pair sequence be if the DNA sequence was TACTGCACGTGA?
38. What would the complementary **DNA** base pair sequence be if the DNA sequence was ATGCAGTGCTAT?
39. Other than the different bases, name one other difference in the molecular structure of RNA and DNA.
40. What is the genetic code?
41. How many copies of each gene are present in a cell that has undergone S phase? In humans, how many chromosomes are found in a cell that has undergone S phase? Are these chromosome single or duplicated?
42. In cells, what are the functions of the organelles called the Golgi apparatus and the mitochondrion?
43. What is cell differentiation?
44. Draw a basic, simplified diagram of the human life cycle. On your diagram, indicate when each of the following takes place: meiosis, fertilization, mitosis, cell differentiation, pregnancy and puberty.
45. What is a gene? What is an allele?
46. What do the terms homozygous recessive, heterozygous, and homozygous dominant mean?
47. Use a Punnett square to show that the probability of a man and a woman having a son is always 50% (assume everyone is normal).
48. What is a mutation? List at least three physical, chemical or biological factors/agents that can lead to mutations (mutagens).
49. What is cancer?
50. What are the two basic functions of the testes?
51. What are the two basic functions of the ovary?
52. Other than crossing over, what is another way to cause genetic recombination in the offspring of animals (humans)?
53. What is an endonuclease enzyme? Why are they useful to molecular biology and biotechnology?
54. Can DNA from another animal be inserted into a human cell and still function to code for a protein in the human cell?
55. Given what we discussed in lecture, would it be possible to insert a human gene into a plant and have that plant produce a human protein?
56. What is a stem cell? Why might stem cells be useful to medical and infertility researchers.
57. What is cloning? Define the term clone.
58. What is reproductive cloning versus therapeutic cloning?
59. What is nuclear transfer or transplantation?
60. Briefly describe how Dolly the sheep was "cloned". What is the name of the technique used to remove the nucleus from one cell and insert it into an egg cell?
61. Based on data from the Human Genome Project, what is the estimated number of different genes found in a human cell?