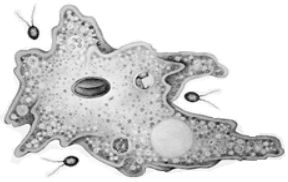
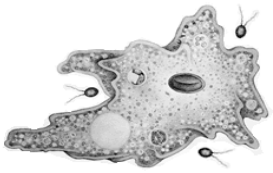
MCDB 2222 coreBIO: Practice exam for FINAL - Spring 2018



Carefully read each question to determine what the question wants you to do.



Q1. How are non-mendelian traits different from mendelian ones; how would you recognize / distinguish them?

Q2. How does the inheritance of mitochondria lead to maternal inheritance? What would happen if mitochondria did not have their own genomic DNA?

Q3. Describe the "life-cycle" of imprinting - where and when does it occur, what are its effects. What would happen if imprinting were not erased?

Q4. How would you describe what happens when an allele displays genetic anticipation? In what sense are such alleles sexually dimorphic?

Q5: Why are sex-linked genes (in mammals) non-mendelian?

Q6: What kinds of effects can the appearance of a mutation in the soma have on the organism? How is inactivation of the X-chromosome in female mammals like a mutation, how is it different?

Q7: What types of methods can be used to determine whether a gene is expressed in a particular tissue or cell? What are their strengths and limitations.

Q8. How is the evolution of a cancer like the evolution of antibiotic resistance in a bacteria? how is it different?

Q9. Be able to draw a pedigree over three generations of various mendelian and non-mendelian alleles.

Q10. How well can (must) a trait be defined, versus how well can its genetic influences be determined. Why is exome data not always adequate for a GWAS study (what genomic information is in exomic sequence, what is missing?

Q11. How might non-exomic variation influence a trait?

Q12. Why do you need to have large numbers of people for a GWAS study.

Q13. What are the issues around DIY genetic engineering? How you design the genetic modification of an adult tissue, what would you need to do, and how would it depend upon the nature of the gene product?