

TEST II

Bio 425
Fall 2007

Name

1. Fill in the Blank (2 points each)

1. Bacteria that can only grow in reduced oxygen levels are called ____.
2. An average mesophile grows fastest at a temperature of ____C.
3. A(n) ____ is a bacterium capable of growing in high salt concentrations.
4. To counteract acid production, many bacteriological media contain ____.
5. A bacterium that respire in the presence of oxygen and ferments in its absence is called a(n) ____ anaerobe.
6. ____ bacteria are able to grow at extremely low water availability.
7. A(n) ____ bacterium is able to grow on the top of jam that is left uncovered.
8. ____ culture refers to the process of growing bacteria by inoculating a sterile container of medium, growing the bacteria to a high concentration, and then harvesting the bacteria.
9. A(n) ____ agent is able to prevent the growth of bacteria which may or may not be lethal.
10. A(n) ____ is an antimicrobial agent designed for use on inanimate surfaces.
11. ____ is a gas commonly used to cold sterilize heat sensitive materials such as plastics.

40. ____ is the process where the rate of translation can affect the transcription of a molecule.

II. Briefly Define (2 points each)

41. MIC

42. decimal reduction time

43. transposons

44. DNA melting

45. Auxotrophs

46. Allosteric sites

III. List

47. List at least 4 differences between eukaryotic and prokaryotic chromosomes. (**4 points**)

IV Discussion

48. Describe in detail how bacteria replicate their DNA. (6 points)

TEST II

Bio 425
Spring 2007

Name

1. Fill in the Blank (2 points each)

1. The gas, ____, is a potential substrate for bacterial chemolithotrophy.
2. Nitrate can act as the final electron acceptor during ____.
3. In the laboratory *E. coli* is able to replicate every ____ (time).
4. Secondary metabolite are produced during the ____ phase of the bacterial growth curve.
5. Some gram positive bacteria have a very short death phase because of the buildup of the enzyme, ____.
6. ____ dilution counts bacteria by simply diluting them and then observing bacterial growth.
7. A(n) ____ is a mesophile that is able to grow at cold temperatures.
8. A chemostat is a device used to maintain bacteria in ____ culture.
9. ____ anaerobic bacteria can grow in the presence or absence of oxygen.
10. The ____ reduction time is the time need to reduce a bacterial population tenfold.
11. Flash pasteurization requires ____ C for ____ (time).

repressor and binds to the ____.

26. In attenuation, the rate of transcription determines whether ____ continues.

27. ____ sensing is used to detect proper population densities to turn so that bioluminescence bacteria can be turn on simultaneously.

28. In two component regulation the ____ kinase detects the environmental.

29. Diauxic growth is also called ____.

30. During ____ the end-product of the reaction blocks the activity of the first enzyme in the synthetic pathway...

31. Alternative ____ factors can act as a global control turn on and off different sets of genes.

32. During ____ selection the rapidly growing prototroph are killed and the auxotrophs remained dormant and can be rescued later.

33. The conversion of an auxotroph to a prototroph is an example of a ____ mutation.

34. The natural mutation rate for RNA is 1 per ____ bases.

35. A(n) ____ is where the orientation of a piece of DNA is reversed in the genome.

36. A(n) ____ lethal mutations allow scientists to turn off essential genes to study them while keeping the parent culture from being lost.

37. A(n) ____ agent is a mutagen that works by inserting itself between the base pairs of DNA.

38. The ____ test detects carcinogens by measuring the rate at which auxotroph mutate into prototrophs.

39. Competent cells are used to increase the rate of bacterial ____.

40. ____ requires bacteriophage to transfer DNA between 2 different bacteria.

41. The lost of a plasmid from a host is called ____.

II. Briefly Define (2 points each)

42. Cold sterilization

43. selective toxicity

44. polyproteins

45. allosteric sites

III Draw (6 points)

46. Draw a bacterial chromosome undergoing replication. Be sure to include a replication fork and label the parts

IV Discussion (4 points)

46. Which are 2 of the most common ways to count bacteria and what are the advantages and disadvantage of each technique?

TEST II

1. Fill in the Blank (2 points each)

1. ____ bacteria require oxygen to grow but grow best at reduced oxygen levels.
2. ____ bacteria require high levels of salts to grow.
3. The ____ technique uses extinction dilution and statistic to estimate bacteria numbers.
4. Most psychrophilic bacteria grow fastest at ____ C.
5. ____ is an instrument which measures turbidity to estimate bacterial concentrations.
6. In the laboratory, *E. coli* cultures can double every ____ minutes.
7. ____ counting chambers are used to perform direct microscopic counts of bacteria.
8. A(n) ____ anaerobe can grow in the presence or absence of oxygen.
9. Many bacteriological media contain ____ to counter the production of acid which occurs with bacterial growth.
10. ____ culture refers to the process of growing bacteria by inoculating a sterile container of medium, growing the bacteria to a high concentration, and then harvesting the bacteria.
11. An autoclave requires ____ C for ____ minutes to sterilize.
12. An antimicrobial agent is said to be

a(n)___ if it functions by blocking bacterial growth rather than killing the bacteria directly.

13. ___ is a gas commonly used to cold sterilize heat sensitive materials such as plastics.

14. Quinolones work by blocking the enzyme ___

15. ___ are growth factor analogs which block folic acid synthesis.

16. Cephalosporin all share a common functional structure called ___.

17. A(n) ___ is an antimicrobial agent designed for use on inanimate objects.

18. ___ is a nonspecific antiviral agent produced by infected cells that protects uninfected cells.

19. Viruses and ___ have monocistronic messages which produce polypeptides.

20. ___ are extrachromosomal genetic elements which are nonessential to the host cell.

21. Because the backbones of the DNA molecules run in different directions, they are said to be ___.

22. Inverted repeats can lead to the formation of hairpins or ___.

23. ___ are enzymes which break and then seal strands of DNA to permit unwinding.

24. The largest transposable elements are a ___.

25. The ___ strand is produced continually during bacteria DNA replication and is

limited only by the availability of template.

26. ____ polymerase is also called transcriptase.

27. Transcription begins when the sigma factor attaches to the ____ region and the core enzyme comes together.

28. ____ are proteins involved in the removal of exons and the splicing together of introns.

29. The area between the first start codon after a Shine-Dalgrano region and the stop codon on a DNA molecule is called a(n) ____.

30. The 50S subunit of the bacterial ribosome is made up of ____S and ____ S RNA molecules and 34 proteins.

31. The side group of the amino acid, ____, allows it to sit at the P site of the ribosome to begin translation.

32. Molecular ____ are molecules that are critical in insuring the appropriate folding of newly formed protein molecules.

33. ____ inhibition is where the product of the metabolic pathways builds up in the cytoplasm and then inhibits the initial enzyme in the pathway.

34. In 2 component regulation, the ____ senses a signal on the exterior of the cell and then phosphorylates a molecule on the inside of a cell.

35. During enzyme repression, the repressor molecule binds to the operator when ____ is present.

36. A nutritional wild type bacterium is called a(n) ____.

37. The ____ test measures back mutation rates to determine if a chemical is a mutagen.

38. RNA generally has a mutation rate of 1 per ____ .

39. ____ is the process in bacteria where a piece of DNA can reverse it's orientation in the genome and change the phenotype of the bacterium.

40. During ____ transduction, only genes near the insertion site of the virus can be transferred.

41. Cells that are ____ have a much higher success rate to be transformed

42. Plasmids that exist in high numbers in their host cells are said to have high ____ numbers.

II. Briefly Define (2 points each)

43. selective toxicity

44. operon

45. allosteric sites

46. penicillin selection method

III Draw (4 points)

47. Draw and label the part of a bacterial growth curve.

IV Discuss (4 points)

48. Describe catabolite repression and explain how it works.

TEST 2

Bio 425

Fall 2006

Name

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13. ___ is a gas commonly used to cold sterilize heat sensitive materials such as plastics.
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14. Quinolones work by blocking the enzyme ___
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16. Cephalosporin all share a common functional structure called ___.
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17. A(n) ___ is an antimicrobial agent designed for use on inanimate objects.
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19. Viruses and ___ have monocistronic messages which produce polyproteins.
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20. ___ are extrachromosomal genetic elements which are nonessential to the host cell.
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21. Because the backbones of the DNA molecules run in different directions, they are said to be ___.
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