TEST I

Bio 425
Fall 2007

_____
Name

1. Fill in the Blank (2 points each)

_____ 1. Phycology is the study of ___.

_____ 2. Prokaryotes are divided into 2 domains (Kingdoms), the bacteria and ___.

_____ 3. ___ and Milstein developed the first monoclonal antibodies.

_____ 4. ___ was the first person to develop an antimicrobial agent, which was called Salvarsan or agent 606.

_____ 5. Craig Ventor and ___ were the first to sequence an entire bacterial genome.

_____ 6. The maximum useful magnification of a compound light microscope is ___ X.

_____ 7. A laser___ scanning microscope uses computer technology to collect sharp 3 dimensional images.

_____ 8. Electron microscopes achieve higher magnifications because electron beams have smaller ___ than visible light.

_____ 9. ___ electron microscopes are used to view the surface of specimens at very high magnifications.

_____ 10. Pairs of spherical shaped bacteria are called ___.

_____ 11. Rigid helical shaped bacteria are called ___.

_____ 12. The process of group translocation is poisoned if ___ is present on the outside of the cell.

_____ 13. The backbone of peptidoglycan is made up of n-acetylmuramic acids joined by β 1-4 bonds to ___.

_____ 14. Diamino acids such as d-alanine and ___ permit the formation of peptide cross links between chains of peptidoglycan.

_____ 15. Enzymes called ___ are used to cut peptidoglycan to permit gram positive bacterial cells to divide.

_____ 16. The space between the inner and outer membrane in a gram negative cell envelope is called the ___ space.

_____ 17. ___ are inert holes in the outer membrane of gram negative envelopes.

_____ 18. The ability of bacteria to swim toward light is called___.

_____ 19. Flagellin comes together by the process of ___ to form bacterial flagella.

_____ 20. ___ is a general term for any non-protein group associated with a functional enzyme.

_____ 21. ___ is the process of gaining electrons.

_____ 22. During ___, the substrate acts both as the electron donor and the final electron acceptor.

_____ 23. ___ is the name of the glycolytic pathway found in human cells.

_____ 24. Instead of ATP, bacteria use ___ as the energy source to transport glucose through the membrane.

_____ 25. The ___ site of an enzyme is the site were the substrate attaches to the enzyme.

_____ 26. A positive oxidase test detects the presence of a terminal ___ oxidase.

_____ 27. Enzymes speed up chemical reactions by lowering the ___ needed for the reaction to occur.

_____ 28. Bacteria that gain their energy from chemical reactions and use carbon dioxide for their carbon sources are called ___.

_____ 29. Food that we consume can be thought of as our primary electron ___.

_____ 30. The production of ATP during glycolysis is an example of ___ phosphorylation.

_____ 31. Some inorganic compounds such as nitrate can be terminal electron acceptors in ____ respiration.

_____ 32. The log phase of the bacterial growth curve is also called the ___ phase.

_____ 33. The log phase of the bacterial growth curve is also called the ___ phase.

_____ 34. Biosynthetic pathways are also called ___ pathways.

_____ 35. The most abundant end product of the Krebs cycle is ___.

_____ 36. *E. coli* is capable of doubling about every ___ minutes.

_____ 37. After the death phase some bacteria exhibit ____ growth.

_____ 38. Some bacteria stored excess polyphosphate in visible clusters called ___.

II. Briefly Define (2 points each)

39. Petroff Hauser

40. α ketoglutarate

III List

41. Koch postulates **(8 points)**

42. List starting from the oldest to the newest the time in which the following historical characters mad their contributions: Alexander Fleming, Edward Jenner Robert Lister, Antoni van Leeuwenhoek, Selman Waksman, and Kary Mullis **(6 points)**

IV. Draw

43. Draw typical eukaryotic and prokaryotic cells and include a virus. Draw to scale. **(2 points)**

V. Discussion

44. Describe Pasteur's chicken cholera experiment. Be sure to explain how the experiment was conducted and the significance of the conclusions made from the experiments. **(4 points)**

TEST I

Bio 425
Spring 2007

_____
Name

1. Fill in the Blank (2 points each)

_____ 1. Phycology is the study of ___.

_____ 2. ___ technique is used to handle bacterial cultures without contamination.

_____ 3. The ___ is the most important differential stain in bacteriology.

_____ 4. ___ introduced variolation to England in 1718.

_____ 5. ___ discovered streptomycin in 1942.

_____ 6. The human genome project was declared finished in the year, ___.

_____ 7. ____ was a physician who in 1850 suggested that doctors should wash their hand in between patients.

_____ 8. "Wee animalcules" was the descriptive term used by ___ who was the first to see and draw bacteria.

_____ 9. ___ developed a box with glass walls and a baffle to show that dust particles carry germs that can contaminate solutions.

_____ 10. "Chance favors the prepared mind" is a quote made famous by the microbiologist, ____.

_____ 11. The maximum useful magnification of a convnetial compound bright field microscope is ____X.

_____ 12. The higher the ___ of a microscope's

objectives and condenser the better it resolution.

_____ 13. Electron microscopes have higher magnification then light microscopes because of the shorter ___ of the electron beam.

_____ 14. Phase and interference ___ microscopes permit visualization of unstained bacteria.

_____ 15. Endotoxins are found in the ___ of gram negative bacterial cell envelope.

_____ 16. ___ are enzymes that if they accumulate in the medium of a gram positive bacterium can lead to the cells death.

_____ 17. ___ flagella are located along the entire length of the bacterial cell.

_____ 18. The largest known bacterium is ___ µm long.

_____ 19. An average bacterium is approximately ___ µm long.

_____ 20. Glucose transferred through the cell membrane by ___ is converted to glucose 6 phosphate.

_____ 21. In addition to peptidoglycan, gram positive bacteria have abundant ___ acid in their cell wall.

_____ 22. Magnetotactic bacteria have inclusion bodies called ___ in their cytoplasm.

_____ 23. The outer surface of some bacteria contain tubular structures either helical shaped flagella or rod shaped ____.

_____ 24. Chemotaxis works using a series of runs and ___.

_____ 25. Peptidoglycan consists of n-

acetylglucosamine joined to ___ by β 1-4 bonds.

_____ 26. Some enzymes contain tightly attached cofactors called ___.

_____ 27. Enzymes speed up chemical reactions by lowering the ___ needed for the reaction to occur.

_____ 28. The ATP generated by glycolysis is an example of ___ phosphorylation.

_____ 29. The end products of glycolysis are ATP, pyruvate, and ___.

_____ 30. Another name for the Citric acid cycle is ___.

_____ 31. ___ uses an inorganic molecule other than oxygen as the terminal electron acceptor.

_____ 32. Charge separation during electron transport system lead to the formation of a(n) ___ motive force which is used in ATP formation.

_____ 33. Reduced coenzyme and carbon dioxide are the primary produces of the ___cycle.

_____ 34. ___ are metabolic pathways that use energy to make complex molecules from simpler molecules.

II. Briefly Define (2 points each)

35. Conofocal scanning laser microscope

36. diaminopimelic acid

37. O polysaccharide

38. Prokaryotic chromosome

39. complex media

40. chemoorganotroph

41. oxidase

III. List

42. Koch's postulates **(4 points**)

IV. Draw

43. Draw a typical eukaryotic cell, a prokaryotic cell, and a virus to scale. **(4 points)**

V. Discussion

44. Describe Pasteur's chicken cholera experiment. Be sure to explain how the experiment was conducted and the significance of the conclusions made from the experiment. **(6 points**)

45. What type Citric acid cycle do anaerobic bacteria have and why do they have them.
(4 points)

TEST I

Bio 425
Fall 2006

_____
Name

1. Fill in the Blank (2 points each)

_____ 1. Sterilization by repeated boiling and incubation is called___.

_____ 2. ___ brought the process of variolation to England.

_____ 3. Agent 606, salvarsan, was discovered by ___.

_____ 4. Kary Mullis developed the ___ technique in 1988.

_____ 5. ___ and Hamilton Smith sequenced the first bacterial genome in 1995.

_____ 6. Stanley Prusiner won the Nobel prize in 1981 for his work with ___.

_____ 7. Streptomycin was discovered in the year ___.

_____ 8. Small pox vaccination was introduced in England in 1798 by ____.

_____ 9. ___ was the first person ever saved by the rabies vaccine.

_____ 10. ___ electron microscope gives a detailed picture of the specimens' surface.

_____ 11. ___ microscopes visualize the image produced when invisible UV light excites a pigment and produces a visible image.

_____ 12. Useful ___ is limited by the resolving power of a microscope.

_____ 13. Numerical aperture is determined by the wavelength of light and the ____ of the lens.

_____ 14. Oil immersion lens permit better resolution because they increase the ___ of a microscope.

_____ 15. ___ scanning laser microscope permits clear images of thick complex specimens.

_____ 16. The most important differential stain bacteriology is the ____ stain.

_____ 17. An average bacterium is about ____ μm long.

_____ 18. With rare exception bacterial membranes lack ___.

_____ 19. Group translocation transport glucose into cells using energy derived from ___.

_____ 20. Flagellin comes together by the process of ___ to form flagella.

_____ 21. The outer surface of the gram negative envelope contains a group of polysaccharides called, ___, which are used to classify bacteria.

_____ 22. In peptidoglycan, n-acetylmuramic acid is bound to n-acetylglucosamine by ____ bonds.

_____ 23. ___ and ___ are 2 amino acid capable of form the cross link between n-acetylmuramic acid in petidoglycan.

_____ 24. The enzyme, ___, is able to digest peptidoglycan to form protoplast.

_____ 25. Another name for the toxic lipopolysaccharde found in gram negative

cell envelopes is ____.

_____ 26. The space between the outer and inner membrane of a gram negative bacteria is called the ___.

_____ 27. The thick peptidoglycan layer in gram positive bacteria is called ___.

_____ 28. In peptidoglycan, n acetylmuramic acids molecules are linked together by ___.

_____ 29. ___ is the metabolic process in which complex molecules are broken down into simpler molecule to produce energy.

_____ 30. Enzymes are organic catalysts that speed up chemical reactions by lowering ____.

_____ 31. Enzymes sometimes contain loosely bound cofactors called ____.

_____ 32. Reduction potential is a measure of the ability of a compound to accept ____.

_____ 33. The end products of glycolysis are pyruvate, water, ATP and ____.

_____ 34. The type of glycolytic pathway found in human mitochondria is called the ____ pathway.

_____ 35. During ___, the substrate acts as both the electron donor and the acceptor.

_____ 36. The second step in glycolysis involves the conversion of glucose 6 phosphate to ____.

_____ 37. In our diet food can be considered the primary electron ___.

_____ 38. Anaerobic respiration uses final electron acceptors such as ____.

II. Briefly Define (2 points each)

39. Charles Chamberlain

40. Swan neck flask

41. Phase contrast microscope

42. chemolithotrophy

III. List

43. Koch's postulates **(4 points**)

IV. Draw

44. Draw a eukaryotic cell, a bacterial cell and a viral particle to scale. **(4 points)**

45. Draw and label streptococcus, sprillum, staphylococcus, and diplobacillus.
(4 points)

V. Discussion

46. Explain why some anaerobic bacteria have incomplete Krebs cycles. **(4 points**)

TEST I

Bio 425
Spring 2006

_____
Name

1. Fill in the Blank (2 points each)

_____ 1. ___ is the study of algae.

_____ 2. Domagk discovered prontosil which belongs to a group of antimicrobial agents which we now call ___.

_____ 3. ___ technique refers to the process by which microbiologists handle bacterial cultures without contamination.

_____ 4. Antoni van Leeuwenhoek was the first person to see and describe "wee animalcules" in the year ___.

_____ 5. Pasteur was the first to associate microorganisms with diseases in his study of___.

_____ 6. Pasteur did his famous experiments disproving spontaneous generation in the year ___.

_____ 7. The maximum useful magnification of a conventional compound brightfield microscope is ___ X.

_____ 8. ____ stain is the most important taxonomic test in bacteriology.

_____ 9. A(n) ___scanning laser microscope permits a sharp focused image of thick specimens.

_____ 10. When a gram positive bacterium is treated with lysozyme it forms a(n) ___.

_____ 11. Pseudopeptidoglycan is found in ___.

_____ 12. Tufts of polar flagella on a bacterium are called ____.

_____ 13. ____ bacteria will swim toward the North pole.

_____ 14. Flagella grow without the use of enzymes in a process called ___.

_____ 15. Endospores have extremely tough cell walls which contain Calcium ___.

_____ 16. Metachromatic granules are made up of ____.

_____ 17. A bacterium that uses light to obtain energy and carbon dioxide for their carbon source is called a(n) ____.

_____ 18. Biosynthetic pathways are called ___ pathways.

_____ 19. Tightly attached enzyme cofactors are called ___.

_____ 20. The end products of glycolysis are ATP, pyruvate and ___.

_____ 21. The ATP produced during glycolysis are said to be produced by ___ phosphorylation.

_____ 22. The first step in the electron transport chain is the oxidation of NADH and the reduction of ____.

_____ 23. The catalase and ___ tests are taxonomic tests which measure part of the bacterial electron transport system.

_____ 24. Charge separation at the membrane creates the ___ motive force which is used to make ATP

_____ 25. ____ respiration uses a final electron acceptor other than oxygen.

_____ 26. During the Krebs cycle, the high energy compound ___ is produced and it can be used to make an ATP.

_____ 27. Carbon monoxide and cyanide are ___ of oxidative phosphorylation.

_____ 28. The most abundant product of the Krebs cycle is ___.

II. Briefly Define (2 points each)

29. Joseph Meister

30. Darkfield microscope

31. group translocation

32. Fermentation

33. Embden-Meyerhof pathway

III. List

34. Koch's postulates **(8 points**)

IV. Draw

35. Draw a small portion peptidoglycan and label the parts **(8 points)**

36. Draw and label a portion of a gram negative and a gram positive cell wall. Label the parts **(4 points)**

37. Draw bacteria that are streptobacillus **(2 points)**

V. Discussion

38. Describe Pasteur's chicken cholera experiment and how it influenced modern vaccine devolvement. (6 **points**)

46. Discuss the limits of useful magnification that are imposed on a light microscope. **(6 points)**