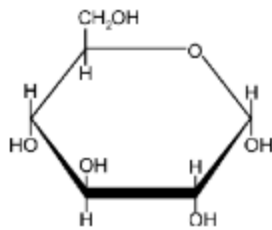


Biochemistry Study Guide

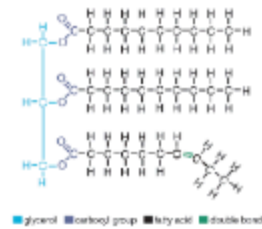
1. Why do we study chemistry in Biology?
2. What makes a compound Organic?
3. What is a Macromolecule?
4. Fill in the chart below

4 Macromolecules	Monomer	Different Polymers of that molecule
Carbohydrate	5.	6.
Lipid	7.	8.
Protein	9.	10.
Nucleic Acid	11.	12.

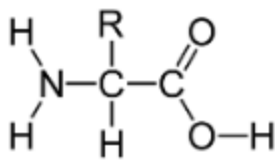
A.



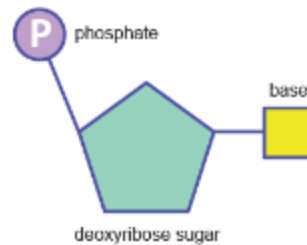
B.



C.



D.



Match each monomer in the picture to the description

- | | |
|---|-------------------------------------|
| _____ 4. protein | _____ 12. found in pasta and breads |
| _____ 5. used for short-term energy | _____ 13. nucleic acid |
| _____ 6. used to store energy long-term | _____ 14. lipids |
| _____ 7. used in cell membranes | _____ 15. found in nucleus of cells |
| _____ 8. stores genetic information | _____ 16. Carbohydrates |
| _____ 9. polypeptide | _____ 17. found in meats and eggs |
| _____ 10. forms a double helix | _____ 18. polysaccharides |
| _____ 11. found in fats and oils | _____ 19. builds muscle |

Give the symbols for the elements that make up the following:

20. _____ carbohydrates
21. _____ proteins
22. _____ nucleic acids
23. _____ lipids

Classify each as a carbohydrate, protein, or lipid.

- | | |
|-----------------------------|---------------------------|
| 24. _____ starch | 31. _____ glucose |
| 25. _____ cholesterol | 32. _____ phospholipid |
| 26. _____ steroid | 33. _____ glycerol |
| 27. _____ glycogen | 34. _____ monosaccharide |
| 28. _____ enzyme | 35. _____ cellulose |
| 29. _____ saturated fat | 36. _____ amino acid |
| 30. _____ polypeptide chain | 37. _____ unsaturated fat |

Identify the specific molecule (use the above terms) from each description. Some terms may be used more than once.

- 38. _____ provides long-term energy storage for animals
- 39. _____ provides immediate energy
- 40. _____ sex hormones
- 41. _____ provides short-term energy storage for plants
- 42. _____ animal and plant structures
- 43. _____ forms the cell membrane of all cells
- 44. _____ speeds up chemical reactions by lowering the activation energy
- 45. _____ one sugar
- 46. _____ monomer of proteins
- 47. _____ provides long-term energy storage for plants
- 48. _____ steroid that makes up part of the cell membranes
- 49. _____ 3-carbon “backbone” of a fat
- 50. _____ provides short-term energy storage for animals
- 51. _____ many sugars

Which macromolecule (protein, carbohydrate, lipid) is each food mostly made of?

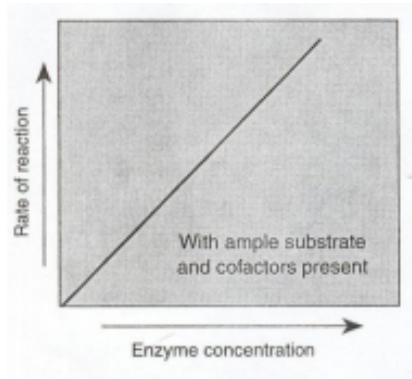
- | | |
|------------------------|-----------------------|
| 52. _____ almond | 57. _____ celery |
| 53. _____ beef jerky | 58. _____ soy beans |
| 54. _____ bacon | 59. _____ cranberries |
| 55. _____ noodles | 60. _____ egg white |
| 56. _____ orange juice | 61. _____ table sugar |
| 57. _____ cheese | 62. _____ popcorn |
| 56. _____ wheat | 63. _____ lobster |

Which food molecule (monosaccharide, polysaccharide, lipid, protein) would you eat if...

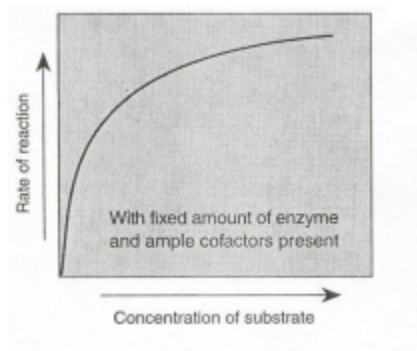
64. ...you needed a quick boost of energy? _____
65. ...you wanted to grow strong nails? _____
66. ...you haven't eaten in days? _____
67. ...you wanted to grow healthy hair? _____
68. ...you had a race tomorrow afternoon? _____
69. ...you were getting ready for hibernation? _____
70. ...you wanted to get bigger muscles? _____
71. ...your next meal will be in a week? _____

Enzymes:

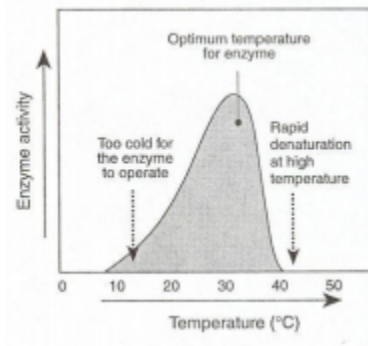
72. Outline the key features of the 'lock and key' model of enzyme action:



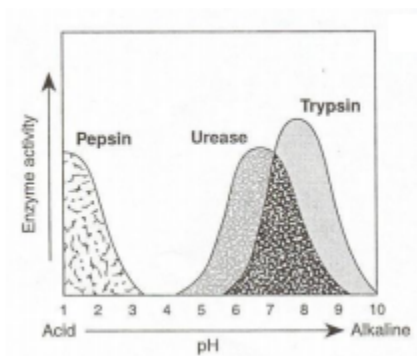
73. Describe the change in the rate of reaction when the enzyme concentration is increased (assuming that substrate and cofactors are not limiting):



74. Describe the change in the rate of reaction when the substrate concentration is increased (assuming a fixed amount of enzyme and ample cofactors) and explain why the rate changes the way it does



75. Higher temperatures speed up all reactions, but few enzymes can tolerate temperatures higher than 50-60°C. The rate at which enzymes are denatured (change their shape and become inactive) increases with higher temperatures. Describe what is meant by an optimum temperature for enzyme activity:



76. Like all proteins, enzymes are denatured by extremes of pH (very acid or alkaline). Within these extremes, most enzymes are still influenced by pH. Each enzyme has a preferred pH range for optimum activity. State the optimum pH for each of the enzymes:

Pepsin: _____

Trypsin: _____

Urease: _____