

# 大同大學 101 學年度研究所碩士班入學考試試題

考試科目：生物化學

所別：生物工程研究所

第1/1頁

註：本次考試 不可以參考自己的書籍及筆記； 不可以使用字典； 不可以使用計算器。

1. What is **blue/white screening**? What is the key feature of a plasmid that is used for it?
2. What is the **puromycin**? Would puromycin or chloramphenicol be useful for the treatment of a virus infection? Why?
3. Margarine is made from vegetable oils by **partial** hydrogenating polyunsaturated fatty acids. Why is the margarine a solid but are vegetable oils liquid?
4. Explain the function of histidine-57 in the mechanism of chymotrypsin.  
An inhibitor, N-tosyl-L-phenylalanyl chloromethyl ketone, can be used to identify that the histidine-57 is one of the key role in active site of chymotrypsin. How would you modify the structure of this inhibitor to label the active site of **trypsin**?
5. Please draw the Haworth projection formulas for following disaccharides:  
(a) maltose; (b) cellobiose; (c) sucrose.
6. What is the Bohr effect? And explain the effect of 2, 3-biophosphoglycerate on the binding of oxygen by hemoglobin.
7. Give the major functions of the following metabolic pathways  
(a) Glycolysis, (b) Gluconeogenesis, (c) TCA cycle, (d) Pentose monophosphate pathway
8. Why is the actual free energy ( $\Delta G$ ) of hydrolysis of ATP in the cell different from the standard free energy ( $\Delta G^\circ$ )?
9. What information can be obtained from (a) Southern blotting, (b) Northern blotting, and (c) Western blotting?
10. What information can be obtained from the following tools? (1) Polyacrylamide gel electrophoresis, (2) Agrose gel electrophoresis, (3) Centrifuge, (4) Polymerase chain reaction.