

# 中山醫學大學 100 學年度碩士班入學招生考試試題

口腔科學研究所碩士班 (乙組)

考試科目：生物化學

時間：80 分鐘

※請注意本試題共( 2 )張，如發現頁數不足，應當場請求補齊，否則缺頁部份概以零分計算。 第 ( 1 ) 頁

本試題共三大題，總分 100 分。

一、選擇題：(每題 3 分)(6%)

1. At the air-water interface, amphipathic molecules are:
  - (A) Aligned with the hydrophobic tail in the water and the polar head group in the air.
  - (B) Aligned with the polar head group in the water and the hydrocarbon tail in the air.
  - (C) Freely soluble in water and do not accumulate at the air-water interface.
2. A catalyst accelerates a chemical reaction by:
  - (A) increasing the equilibrium constant for the reaction.
  - (B) increasing the activation of energy for the reaction.
  - (C) decreasing the activation energy for the reaction.
  - (D) decreasing the equilibrium constant for the reaction.

二、配合填充題：(每格 3 分)(24%)

Use the words to complete the sentences about protein structural organization.

Tertiary structure  
Interior  
Amino acid sequence  
Quaternary structure  
Hydrogen bonds  
Nonpolar  
Secondary structure  
Subunits

Protein primary structure is the amino acid sequence.

\_\_\_\_(1)\_\_\_\_ is the folding of the polypeptide backbone chain and is stabilized by \_\_\_\_ (2) \_\_\_\_.  
\_\_\_\_(3)\_\_\_\_ is the overall three-dimensional structure of the polypeptide chain and is stabilized, in part, by placing \_\_\_\_ (4) \_\_\_\_ side chains in the \_\_\_\_ (5) \_\_\_\_ of the protein.  
\_\_\_\_(6)\_\_\_\_ is the spatial arrangement of the \_\_\_\_ (7) \_\_\_\_ of a multi-subunit protein.  
The \_\_\_\_ (8) \_\_\_\_ is responsible for the secondary, tertiary, and quaternary structure of a protein.

# 中山醫學大學 100 學年度碩士班入學招生考試試題

口腔科學研究所碩士班（乙組）

考試科目：生物化學

時間：80 分鐘

※請注意本試題共( 2 )張，如發現頁數不足，應當場請求補齊，否則缺頁部份概以零分計算。 第 ( 2 ) 頁

## 三、問答題：(每題 10 分)(70%)

1. 試說明真核細胞與原核細胞之異同，可繪圖說明。
2. 分析一段約三百個胺基酸的蛋白質序列，發現序列中重複出現七次『極性-非極性』的片段。請推測這個蛋白質的化學性質、構造及任何可能的功能。
3. 細菌獲得外來 DNA 有何重要性？試舉出細菌獲得外來 DNA 的 3 種途徑。
4. Would eating a candy bar with high sugar content just prior to a race be a good idea or a bad idea for a bicyclist?
5. The consumption of alcohol after prolonged exercise leads to low blood glucose and elevated blood lactic acid. Why?
6. In most enzymes the active site consists of only a few residues. Why is the rest of the protein necessary?
7. Why are many herbicides targeted toward enzymes involved in the biosynthesis of essential amino acids?