

國立虎尾科技大學九十七學年度研究所（碩士班）入學試題

所別：生物科技系碩士班

科目：考試科目 1 (生物化學)

注意事項：

- (1) 本試題共有十題，每題配分如題目所述，合計一百分。
- (2) 請依序作答在答案卷上並註明題號。

1. 請解釋何謂氫鍵(hydrogen bond)、離子交互作用(ionic interaction)、凡德瓦爾力(van der Waals interaction)及疏水性交互作用(hydrophobic interaction)並說明上述作用力在生物系統中的角色。 10%
2. 請說明酵素活性部位與基質作用時產生之結合能(binding energy)對酵素催化反應的影響。 10%
3. 請說明下列多醣類之生理功能。 10%
Chitin, Hyluronate, Glycogen, Peptidoglycan, Agarose
4. 請比較說明有氧(aerobic)及無(缺)氧(anaerobic)兩種狀態下，葡萄糖代謝路徑的差異。 10%
5. 請列舉說明氧化磷酸化(Oxidative Phosphorylation)與光磷酸化(Photophosphorylation)反應相同與相異之處。 10%
6. 請說明下列名詞的意義。 10%
 - (a). salting out
 - (b). ion-exchange chromatography
 - (c). chaperones
 - (d). Two-dimensional electrophoresis
 - (e). ELISA (enzyme-linked immunosorbent assay)
7. 何謂 RNA Interference (RNAi)? 請說明它的機轉及未來它在生物科技上的應用和發展? 10%
8. What modifications are effected in the primary mRNA transcript? Describe its effect? 10%
9. How dose the twisting into a helix contribute to the stability of the overall structure of DNA? 10%

10. Pyruvate and ATP are the end products of glycolysis. Inactive muscle cells, pyruvate is converted to lactate. Lactate is transported in the blood to the liver where it is recycled by gluconeogenesis to glucose, which is transported back to muscle for additional ATP production. Why don't active muscle cells export pyruvate, which can also be converted to glucose via gluconeogenesis? 10%