

國立臺東大學 100 學年度
「生命科學系碩士班」招生考試試題

生命科學

- 注意事項：(1) 請用橫式作答。
(2) 答案請依序寫在答案卷上（需標示題號，不必抄題）。
(3) 試題隨同答案卷一併繳回。

壹、解釋名詞（每題 4 分，共 40 分）

1. Genetic drift
2. Molecular clock
3. Pheromones
4. Imprinting
5. Probiotic
6. Apoptosis
7. Restriction enzyme
8. Holoenzyme
9. Polymerase chain reaction (PCR)
10. Prion

貳、問答題（每題 15 分，共 60 分）

- 一、試比較以下生物間的交互作用 Mutualism、commensalism、parasitism。
- 二、請分別說明蛋白質的一、二、三、四級結構之特性與主要鍵結組成。
- 三、若指導教授發現有一株微生物可生成一具有抑制 HMG-CoA reductase 活性的物質 A，想做進一步的研究開發，請你設計一簡單的研究，包含計畫摘要與研究架構流程圖。

（請翻頁繼續作答）

四、請就下文摘要訂出一個適合的英文題目，並說明此摘要內容主要敘述之研究成果。

「Dietary supplements in polyunsaturated fatty acids (PUFA), particularly omega-3, are well known for their beneficial effects in preventing cardiovascular diseases (CVD). The aim of this study was to determine the role of PUFA on the modulation of apoptosis induced by hypochlorous acid oxidized LDL (HOCl-oxLDL) in U937 cells. Methods: We tested the effect of monocyte cell line U937 supplementation with eicosapentaenoic acid (EPA), docosahexaenoic acid (DHA), arachidonic acid (ARA) or oleic acid (OA) on the modulation of HOCl-oxLDL-induced apoptosis. Results: First, we showed the incorporation of fatty acids in the cellular membrane in U937 cells. Then, we showed that both EPA and ARA exerted a pro-apoptotic effect through the intrinsic mitochondrial apoptotic pathway including the dissipation of mitochondrial membrane potential followed by cardiolipin depletion, the downstream activation of caspase-3 and the increase in DNA fragmentation. The pro-apoptotic effect of EPA or ARA was completely blocked in U937/Bcl-2 cells. Conclusions: A new mechanism of dietary supplements in PUFA with likely consequences in apoptosis could be suggested through the mitochondrial pathway in monocytes.」

(本試題結束)