南華大學九十九學年度 碩士班 招生考試試題卷

系所組別：自然醫學研究所	科目編號：D52-1
科　目：生理學	試題紙第 1 頁共 2 頁

解釋名詞：30% (每題 5 分)

Homestasis

Negative feedback

Tolerance

Frank-Starling law

Insulin-Resistance

Nonspecific Immune Defenses

問答題:

1. 腦電波圖 (electroencephalogram, EEG) 是偵測何種生物體? 其原理爲何? 10%
2. 分別舉例說明不同性質及大小之分子在細胞膜運送的機制。 10%
3. 試述在人體不同狀態下(如飢餓、飽食、壓力下)，相關激素如何調控血糖之恆定? 10%
4. 試述細胞外的刺激如何經由活化 receptor 引起細胞內之訊息傳遞，並進而調控基因表現 (gene expression)? 10%
5. 試說明心電圖(ECG)中，P, QRS , T waves 分別代表心搏週期的何種過程? 10%

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6. 請根據下列的研究背景與結果作成結論並回答問題。 20%

[Background] Because studies have shown that 17beta-estradiol (E2) produces anti-inflammatory effects after various adverse circulatory conditions, we examined whether administration of E2 before spinal cord injury (SCI) has any salutary effects in reducing SCI.

[Material & Method] Mice were randomly allocated into the following groups: (1) saline + SCI group, in which mice received saline subcutaneously and were subjected to SCI (n = 40); (2) E2 group, the same as the saline + SCI group, but E2 was also administered subcutaneously at a dose of 300 μg/kg 1 h before SCI and 3 and 6 h after SCI (n = 40); (3) ICI group, which was the same as the E2 group, but they received ICI 182,780 at a dose of 500 μg/kg subcutaneously 1 h before the administration of E2 (n = 40); (4) saline + sham group, (n = 40); (5) sham + E2 group, identical to sham + saline group, but they received an administration of E2; and (6) sham +ICI group, identical to sham + E2 group except that they received an administration of ICI 182,780 (n = 40). To gain a better insight into the mechanism of action of the anti-inflammatory effects of E2, the following end points of the inflammatory process were evaluated: (1) spinal cord inflammation and tissue injury (histological score); (2) neutrophil infiltration (myeloperoxidase activity); (3) expression of iNOS, nitrotyrosine, and COX-2; (4) apoptosis (TUNEL staining and Bax and Bcl-2 expression); and (5) tissue TNF-α, IL-6, IL-1β, and monocyte chemoattractant protein 1 levels. In another set of experiments, the pretreatment or post-treatment with E2 significantly ameliorates the recovery of limb function (evaluated by motor recovery score).

[Results] Taken together, our results clearly demonstrate that administration of E2 before SCI reduces the development of inflammation and tissue injury associated with spinal cord trauma. To elucidate whether the protective effects of E2 were mediated via the estrogen receptors, we investigated the effect of an estrogen receptor antagonist, ICI 182,780, on the protective effects of E2. ICI 182,780 (500 μg/kg, s.c., 1 h before treatment with E2) significantly antagonized the effect of the E2 and abolished the protective effect against SCI.

Q1 . Conclusion :

Q2. 使用 ICI 182,780 的目的為何?