

國立彰化師範大學 100 學年度碩士班招生考試試題

系所：生物學系

組別：乙組

科目：細胞學

☆☆請在答案紙上作答☆☆

共 3 頁，第 1 頁

一、選擇題：單選，不倒扣（每題 3 分，共 30 分）

1. Cells receiving signals went through which three processes:

- (A) Response→Reception→Transduction
- (B) Reception→Transduction→Response
- (C) Reception→Response→Transduction
- (D) Transduction→Reception→Response
- (E) Transduction→Response→Reception

2. Most signal receptors are

- (A) plasma membrane proteins
- (B) DNA
- (C) RNA
- (D) lipid
- (E) fatty acid

3. What is the function of receptor tyrosine kinases?

- (A) synthesis of tyrosin
- (B) breakdown tyrosin
- (C) crosslinke tyrosin with proteins
- (D) attach phosphates to tyrosines
- (E) remove phosphates to tyrosines

4. What enzyme can convert ATP to cAMP?

- (A) Polymerase
- (B) Phosphatases
- (C) Amylase
- (D) reductase
- (E) adenylyl cyclase

5. Apoptosis is a process of ?

- (A) DNA synthesis
- (B) Apo protein synthesis
- (C) fibrinolytic system
- (D) phosphorylation
- (E) programmed or controlled cell suicide

6. Apoptosis is NOT triggered by?

- (A) an extracellular death-signaling ligand
- (B) DNA damage in the nucleus
- (C) protein misfolding in the endoplasmic reticulum

國立彰化師範大學 100 學年度碩士班招生考試試題

系所：生物學系

組別：乙組

科目：細胞學

☆☆請在答案紙上作答☆☆

共 3 頁，第 2 頁

- (D)RNA accumulation in the cell
 - (E)None of the above
7. The function of caspases in apoptosis is
- (A)cleavage DNA
 - (B)cleavage RNA
 - (C)cleavage protein
 - (D)cleavage lipid
 - (E)cleavage free radicals
8. Which disease is caused by abnormal apoptosis?
- (A)diabetes
 - (B)Hemophilia A
 - (C)AIDS
 - (D)Parkinson's disease
 - (E)hypoglycaemia
9. Which is the most widely used second messenger?
- (A) cAMP
 - (B) ATP
 - (C) phosphate
 - (D) glucose
 - (E) sulfate
10. The process of converting a normal cell to a cancerous cell is called?
- (A)transformation
 - (B)proliferation
 - (C)division
 - (D)transduction
 - (E)amplification

二、簡答題（每小題 5 分，共 10 分）

1. Please describe how a ligand-gated ion channel receptor works.
2. There are two ways to limit cell growth. One is density-dependent inhibition and the other is anchorage dependence. Please explain these two events.

三、簡答題（每小題 10 分，共 40 分）

1. Microtubular cytoskeleton 上的 Motor proteins 主要有哪兩類，其功能有何差異？
2. 動物的 peroxisomes 功能為何？植物類似 peroxisomes 的胞器是何者？其功能為何？

國立彰化師範大學 100 學年度碩士班招生考試試題

系所： 生物學系

組別： 乙組

科目： 細胞學

☆☆請在答案紙上作答☆☆

共 3 頁，第 3 頁

3. ECM(extracellular matrix)的 Integrins 之構造及功能為何？ Interaction of cells with other cells 是靠哪些 glycoproteins 作用？
4. ER 蛋白質合成過程的運輸囊胞 (types of vesicle transport) 有哪三類型？功能為何？其辨識蛋白質的方式為何？

四、簡譯題：(8 分)

本題請依下文摘要說明其含意(摘自 Banghart *et al.*(2006), *Biochemistry* 45 ,p.p.15129-15141)
Nicotinic Acetylcholine Receptor. The nicotinic acetylcholine receptor (nAChR1) plays a crucial role in the peripheral nervous system as the only ionotropic receptor at the neuromuscular junction. Acetylcholine released from motor neuron terminals opens this ligand-gated channel, which results in a depolarization of muscle cells. Long before the advent of cloning and site-directed mutagenesis, a pioneering biophysical investigation of the muscle nAChR by Erlanger, Wasserman, and Lester resulted in the first light-gated ion channel. At the time, the muscle nAChR was the best characterized ion channel and the ability to render it light sensitive provided an opportunity to study the kinetics of channel gating with unprecedented temporal resolution.

五、填充題 (每小題 4 分，共 12 分)

1. Desmosomes 的功能為 _____
， Gap junctions 的構造為 _____。
2. 細胞的 Use of technique of autoradiography 研究中，chase 是指 _____處理，
而 pulse 是指 _____處理。
3. The Davson-Danielli model of membrane 是指 _____之膜構造，The Davson-Danielli model failed to explain many aspects of membrane behavior，就膜的厚度而言，實測值較為小，因為 _____。