# 國立中興大學108學年度碩士班招生考試試題

科目：獸醫病理學　　系所：獸醫病理生物學研究所甲組

**本科目不得使用計算機**　　本科目試題共1頁

1. 請問病理名詞 “autopsy” 與 “necropsy”之定義 (10%)

2. 請比較肝臟之脂肪變性(fatty change)與肝醣堆積(glycogen deposition)之肉眼及組織病理變化有何差異?(請繪出組織病變圖，並標識輔助說明) (10%)

3. 類澱粉沉著症(amyloidosis)形成之原因? 若發生於腎臟，請描述腎臟發生部位之組織病理變化，並繪圖輔助說明(13%)。

4. 請問 Feline upper respiratory disease complex 主要是由哪些病毒性病原共同感染或以階段性混合感染所導致? 並說明其感染機制與主要呈現的病理變化? (15%)

5. 病理獸醫師依據解剖病變，初步診斷送檢豬隻可能罹患沙氏桿菌感染症(Salmonellosis)，但又不排除有非洲豬瘟(African swine fever)、或是典型豬瘟(Classical swine fever)感染的可能性，請問病理獸醫師所觀察的臨床與解剖病變可能有哪些? (15%)

6. 請說明 thrombus、embolus (emboli)、embolism 三者的定義與致病機制(pathogenesis)，及其在循環系統中的因果關係。(17%)

7. 請敘述惡性腫瘤轉移(metastasis)的路徑包括那些? 以表皮鱗狀上皮細胞瘤(squamous cell carcinoma)為例，請說明其遠端肺轉移的侵入機制。(20%)

# 國立中興大學108學年度碩士班招生考試試題

科目：微生物學　　系所：獸醫病理生物學研究所甲乙組

本科目不得使用計算機　　本科目試題共 2 頁

一、請翻譯本篇短文。（12%）

African swine fever (ASF) is a highly contagious viral disease of swine which causes high mortality, approaching 100%, in domestic pigs. ASF is caused by a large, double stranded DNA virus, ASF virus (ASFV), which replicates predominantly in the cytoplasm of macrophages and is the only member of the Asfarviridae family, genus Asfivirus. The infection of ASFV in its reservoir hosts is usually asymptomatic and develops a persistent infection. In contrast, infection of domestic pigs leads to a lethal hemorrhagic fever for which there is no effective vaccine. Identification of ASFV genes involved in virulence and the characterization of mechanisms used by the virus to evade the immune response of the host are recognized as critical steps in the development of a vaccine. Moreover, the interplay of the viral products with host pathways, which are relevant for virus replication, provides the basic information needed for the identification of potential targets for the development of intervention strategies against this disease. (Adapted and modified from Viruses. 2017 May; 9(5): 103.)

二、（1）請簡單敘述一個完整病毒顆粒的基本結構（2%）
（2）造成豬口蹄疫的病毒是 RNA 病毒或是 DNA 病毒？(2%)
（3）請敘述造成非洲豬瘟能夠存活於外在環境比口蹄疫病毒更久之可能原因？（4%）

三、請各舉出二種偵測（1）RNA 病毒核酸，（2）DNA 病毒核酸以及（3）病毒蛋白質之方法。(6%)

四、解釋下列名詞(請由以下 7 個名詞當中，選擇 3 個)：(每小題 3%，共 9%)
(1) Multiplicity of infection
(2) Pathogenesity
(3) Nonstructural protein of virus
(4) Inclusion bodies
(5) Syncytium
(6) Antigenic drift (genetic drift)
(7) Antigenic shift (genetic shift)

五、請翻譯本篇短文。（15%）

Many bacterial infections are hard to treat and tend to relapse, possibly due to the presence of antibiotic-tolerant persisters. In vitro, persister cells appear to be dormant. After uptake of *Salmonella* species by macrophages, nongrowing persisters also occur, but their physiological state is poorly understood. In this work, we show that *Salmonella* persisters arising during macrophage infection maintain a metabolically active state. Persisters reprogram macrophages by means of effectors secreted by the *Salmonella* pathogenicity island 2 type 3 secretion system. These effectors dampened pro-inflammatory innate immune responses and induced anti-inflammatory macrophage polarization. Such reprogramming allowed non-growing *Salmonella* cells to survive for extended periods in their host. Persisters undermining host immune defenses might confer an advantage to the pathogen during relapse once antibiotic pressure is relieved. (Adapted from Science. 2018;362(6419):1156-1160)

六、請說明細菌之內毒素與外毒素的相同及相異之處？（10%）

七、請說明細菌基因水平轉移 (horizontal gene transfer)的機制？（10%）

本科目不得使用計算機　　本科目試題共 2 頁

八、一些細菌具躲避體內免疫反應的能力，請舉例說明。（10%）

九、若你欲研究細菌和其抗藥性，請自行訂一研究題目，說明其重要性及合理性，研究方法，假設結果及其意義。（20%）

# 國立中興大學 108 學年度碩士班招生考試試題

科目：普通動物學　　系所：獸醫病理生物學研究所乙組

本科目不得使用計算機　　本科目試題共 3 頁

一、請翻譯本篇短文。

1. Lung cancer has been the most common cancer for decades. Worldwide, lung cancer causes nearly one in five cancer deaths, about 1.59 million deaths annually. This heavy burden is largely a result of a high prevalence of cigarette smoking, the leading cause of lung cancer; advanced stage at diagnosis; and poor survival, especially among those with advanced stage disease. Accordingly, interventions have focused on reduction of tobacco use, early-stage diagnosis, and improved treatment. Although progress has been made in each area, lung cancer survival remains stubbornly poor suggesting that novel approaches are needed. A promising approach is identifying and intervening on modifiable determinants of survival; however, little research attention has been directed to determinants beyond smoking. One modifiable determinant of emerging interest is ambient air pollution. (Adapted and modified from Thorax. 2016 Oct; 71(10): 891–898.) (15%)

2. Epithelial–mesenchymal transition (EMT) is a cellular programme that is known to be crucial for embryogenesis, wound healing and malignant progression. During EMT, cell–cell and cell–extracellular matrix interactions are remodelled, which leads to the detachment of epithelial cells from each other and the underlying basement membrane, and a new transcriptional programme is activated to promote the mesenchymal fate. In the context of neoplasias, EMT confers on cancer cells increased tumour-initiating and metastatic potential and a greater resistance to elimination by several therapeutic regimens. (Adapted from *Nature Reviews Molecular Cell Biology* (2018)). (10%)

二、簡答題

1. 請簡述實驗動物操作的 3R 原則為何。(5%)
2. 請詳述真核細胞轉錄(transcription)的過程。(10%)
3. 請描述 CRISPR/Cas9 如何應用於基因編輯(gene editing)。(10%)
4. 2001 年的諾貝爾生理醫學獎由三位研究細胞周期的學者榮獲。請說明細胞周期，並說明什麼是檢查點。(10%)
5. 根據細胞週期請自行設計一對癌細胞形成原因或治療方向的研究，說明其重要性及合理性，研究方法，假設結果及其意義。(20%)

三、選擇題：（請選擇一最適當之答案）(20%)

1. 下列何者不是人類有絲分裂 (mitosis)的功能?
   (A) 生長。　(B) 受傷的組織修補。
   (C) 胚胎發生。　(D) 血球的取代。
   (E) 配子(生殖細胞)的產生。

2. 穿越 $G_1$ 限制點 (restriction point)的細胞最可能發生何事?
   (A) 進入 $G_0$。
   (B) 剛完成胞質分裂 (cytokinesis)。
   (C) 進行染色體複製 (chromosome replication)。
   (D) 唯有其為癌細胞時才會繼續分裂。
   (E) MPF 的濃度下降。

3. 人類的肝細胞、肌細胞和神經細胞明顯不同，主要是因為
(A) 存在於每一種細胞內之基因的種類有所不同。
(B) 它們表現不同的基因。
(C) 它們使用不同的遺傳密碼 (genetic code)。
(D) 它們所含有的基因數目各不相同。
(E) 它們各自具有獨特的核醣體。

4. 人體所攝入的大部分葡萄糖 (glucose)在何處被吸收?
(A) stomach。　(B) colon。
(C) salivary glands。　(D) small intestine。
(E) esophagus。

5. 血栓 (thrombus)
(A) 會因鈣化而導致動脈粥狀硬化 (arteriosclerosis)。
(B) 會在動脈 (artery)中之斑 (plaque)區處形成。
(C) 會引起高血壓 (hypertension)。
(D) 往往和血液中高密度脂蛋白 (HDLs)的含量高有關。
(E) 是一種循流性栓塞 (traveling embolism)，會引起心臟病或休克。

6. 下列哪一種人類病症和激素的配對不正確?
(A) 末端巨大症 (acromegaly) – 生長激素 (growth hormone)。
(B) 糖尿病 (diabetes) – 胰島素 (insulin)。
(C) 呆小症 (cretinism) – 甲狀腺素 (thyroid hormone)。
(D) 痙攣 (tetany) – 副甲狀腺素 (PTH)。
(E) 腦下腺機能不足之侏儒症 (pituitary dwarfism) – 促腎上腺皮質素 (ACTH)。

7. 腸肽酶(enteropeptidase)是一種由小腸所分泌的酵素，它具有下列何種功能？
(A) 抑制膽汁(bile)的分泌
(B) 抑制十二指腸的分泌作用(duodenal secretion)
(C) 抑制胃的蠕動(pertistalsis)
(D) 致活胰酶(pancreatic enzymes)
(E) 使食糜(chime)的酸鹼度(pH)增高

8. 下列有關胰泌素(secretin)的敘述，何者正確？
(A) 由胰臟細胞(pancreatic cells)所分泌
(B) 可刺激膽囊(gallbladder)的收縮
(C) 由十二指腸(duodenum)之黏膜細胞所分泌
(D) 可刺激肝臟(liver)分泌膽汁
(E) 具有使脂質分解為脂肪酸與甘油的催化能力

9. 在外科手術切除發炎的膽囊(gallbladder)之後，病患最應該注意哪一類飲食的攝取？
(A) 脂肪(fat)
(B) 蛋白質(protein)
(C) 澱粉(starch)
(D) 糖類(sugar)

10. 下列器官與其功能之配對，何者錯誤？
    (A) 口腔－澱粉之消化
    (B) 小腸－養分之吸收
    (C) 胰臟－消化酵素之生產
    (D) 胃－蛋白質之消化
    (E) 大腸－膽色素之製造