

系所組別： 臨床醫學研究所

考試科目： 生命科學

考試日期：0307，節次：3

※ 考生請注意：本試題 可 不可 使用計算機**PART I**

1. 2009 Nobel Prize in Physiology or Medicine was awarded jointly to Elizabeth H. Blackburn, Carol W. Greider, and Jack W. Szostak. Describe briefly their important discoveries? What are its significance and impact on biomedical research? (10%)
2. "Translational Medicine", or "Translational Research", is growing in importance in the healthcare and biomedical research. Describe what you know about Translational Research. Design a research to study Translational Medicine. (10%)
3. Gene ICM is located in human chromosome 3 and is required for embryonic development. Human genetic studies identified that Gene ICM is associated with human diabetes. Describe what method might be used to define the previous association study in humans? Design a series of experiments to address the causative role of Gene ICM in the pathogenesis of diabetes. (10%)
4. All cells/tissues are exposed to harsh conditions. Even normal developmental or nutritional changes exert stresses as systems try to re-establish homeostasis. Describe the following stress and discuss what actions cells/tissues may respond to protect against this stress.
  - (1) Hypoxia (4%)
  - (2) ER stress (4%)
  - (3) Autophagy (4%)
  - (4) Oxidative stress (4%)
  - (5) Inflammation (4%)

(背面仍有題目,請繼續作答)

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1. Currently, the pandemic variant influenza A (H1N1) causes severe infection and health concern in Taiwan. Vaccination is vital for prevention and public health safety.
  - 1-1. Please classify the VACCINATION used to prevent H1N1 infection. (5%)
  - 1-2. In addition to vaccine treatment, please give other strategies for preventing H1N1 infection or H1N1-induced damage in host. (5%)
  - 1-3. Please identify the term "H1N1". (5%)
  
2. Hotchkiss RS, Strasser A, McDunn JE, Swanson PE. 2009. Cell death. N. Engl. J. Med. 361(16):1570-83. 「All multicellular organisms require apoptosis, the controlled death of cells. Without apoptosis, 2 tons of bone marrow and lymph nodes and a 16-km intestine would probably accumulate in a human by the age of 80. Investigations into apoptosis have revealed complex interconnections between various cell-death programs, and these networks could affect the treatment of a wide range of diseases. The most widely used classification of mammalian cell death recognizes two types: apoptosis and necrosis. Autophagy, which has been proposed as a third mode of cell death, is a process in which cells generate energy and metabolites by digesting their own...」.
  - 2-1. Please define the term "APOPTOSIS". (5%)
  - 2-2. Please define the term "NECROSIS". (5%)
  - 2-3. Please define the term "AUTOPHAGY". (5%)
  - 2-4. Please figure out the implication for apoptosis, necrosis, and autophagy in tumorigenesis. (10%)
  - 2-5. Intracellular organelles such as mitochondria, endoplasmic reticulum, and lysosome are important for cell fate. Please identify their roles in apoptosis, necrosis, and autophagy. (10%)