

國立嘉義大學九十六學年度  
微生物與免疫學系碩士班招生考試試題

科目：分子生物學

一、申論題：(80分)

1. A scientist has discovered a green fluorescent-emitting organism from deep ocean water, which is not irradiated by directly sunlight. From the morphological analysis, this organism appears lack of cell wall and negative for Gram stain.
  - A) How do you determine this organism is prokaryote or eukaryote? (8分)
  - B) If you want to study and use of such green-fluorescence organism in biotechnology industry, what is your purpose in study of this organism? Why? (8分)
  - C) If you want to study the regulation mechanism of this green-fluorescence organism, how do you design the procedure to study the genes responsible for green fluorescence? (8分)
  - D) If this fluorescence is NOT located in the cytoplasm of such organism, what are you going to change in previous experimental design? Why? (8分)
  - E) If you want to study genome of such organism, please draw the experimental flowchart with defined techniques in each step? (8分)
2. The following DNA fragment was isolated from the beginning of a gene:  
ACACCCTACGCCTATCAGGTT  
TGTGGGATGCGGATAGTCCAA
  - A) Determine which strand is transcribed. (4分)
  - B) Indicate the polarity of the two DNA strands. (4分)
  - C) Give the sequence of bases in the resultant messenger RNA and its polarity. (6分)
  - D) Give the anticodons on the transfer RNAs by making use of wobble rules. (6分)
3. How do prokaryotic and eukaryotic ribosomes recognize the 5' end of messenger RNAs? (15分) Could eukaryotic messenger RNAs be polycistronic? (5分)

二、解釋名詞：(每題4分，共20分)

1. conserved sequence
2. consensus sequence
3. signal peptide
4. holiday junction
5. group I introne