國立成功大學

115學年度碩士班招生考試試題

編　號：181

系　所：微生物及免疫學研究所

科　目：分子生物學

日　期：0204

節　次：第 3 節

注　意：1.不可使用計算機
2.請於答案卷(卡)作答，於試題上作答，不予計分。

1. When a DNA sequence that might be translated into protein is found in the bacterial genome: (25%)
   (1) What sequence features can help us to speculate that the sequence can be translated into a protein? (10%)
   (2) What methods can be used to predict the **structure** and **function** of the putative (hypothetical) protein? (15%)

2. Please describe **two** molecular biology methods to reduce the RNA expression of a specific gene in a cell. (Please briefly explain the process, not just mention the method name) (20%, 10% for each method)

3. Please describe **two** possible timings that DNA homologous recombination may occur in eukaryotes (10%, 5% each), and the difference between homologous recombination and non-homologous end joining (NHEJ) (10%).

4. In eukaryotes, if a DNA mutation results in the decreased protein yield of a gene, please describe **two** possible mechanisms by which this mutation could lead to the observed phenotype (*decreased yield, not abolished the production). (20%, 10% for each mechanism).

5. Short-answer questions (15%)
   (1) Please explain what "RNA splicing" is and the biological phenomena it may cause. (5%)
   (2) Please explain what "cDNA (complementary DNA)" is and how it is produced. (5%)
   (3) Please list **two** types of non-coding RNA. (5%)