

題號： 454

國立臺灣大學 109 學年度碩士班招生考試試題

科目： 分子生物學(A)

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※ 注意：請於試卷上「非選擇題作答區」內依序作答，並應註明作答之大題及其題號。

Part I: 50%

1. Please explain the following terms: (20%)

- (1) Yeast one-hybrid
- (2) Riboswitch
- (3) Heterochromatin protein 1 (HP1)
- (4) Histone deacetylase
- (5) *Xist*

2. Please describe the procedure of the maturation of mRNA in the eukaryote cell? (Your answer should include splicing, capping and polyadenylation). (15%)

3. Please describe the characteristics and differences of three classes of RNA splicing: nuclear splicing, group II splicing and group I splicing. (15%)

Part II: 50%, Short Answer (5% for each)

(1) How does Rb control the entry of the eukaryotic cell into the S phase?

(2) What are the functions of the products of *min* genes?

(3) What are the functions of helicases and SSB proteins?

(4) In *E. coli*, how are the Okazaki fragments of the lagging strands joined to create a complete DNA duplex?

(5) What is an episome?

(6) Describe the strand displacement mechanism for replication of linear adenovirus DNA.

(7) How can a yeast cell switch its mating type?

(8) What is the function of the RecBCD complex?

(9) What are the two distinct functions of the *E. coli* RecA protein?

(10) Describe the general process of excision repair.

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