國立政治大學九十 六 學年度研究所(博/碩)士班入學考試命題紙

考試科目	分子生物學	8151 所別	生命科學研究所	考試時間	3 月 18 日 星期 日 第三節

10 points for each question

1. DNAs can be separated by agarose gel electrophoresis. What kind of chemical compound that scientists usually use to visualize DNA bands in gels? Please describe the molecular mechanism.

2. To separate proteins, scientists usually use sodium dodecyl sulfate (SDS) polyacrylamide-gel electrophoresis. Please explain the function of SDS.

3. Please explain the "Tm" value of a DNA oligonucleotide and describe an experiment in which Tm value is crucial.

4. What is the polymerase chain reaction (PCR) that is frequently used in molecular biology experiments? Please describe how it works.

5. What is the "DNA microarray"? What information can we get from applying this technique?

6. Describe the signaling transduction pathway activated by binding of epidermal growth factor to its receptor.

7. Describe the ionic mechanisms underlying the generation of action potential in neuron.

8. The neurotransmitter glutamate binds to two receptors, NMDA and AMPA receptors. Describe the differences between these two types of receptors.

9. Antibodies are useful in study of cell biology. Please describe three experiments that antibodies are used.

10. Protein and protein interactions are important for cellular function. There are two proteins X and Y. Design experiments to test if there is a direct interaction between protein X and protein Y.

備考	試題隨卷繳交

命題委員： 083 （簽章） 96 年 2 月 10 日

命題紙使用說明：1.試題將用原件印製，敬請使用黑色墨水正楷書寫或打字（紅色不能製版請勿使用）。
2.書寫時請勿超出格外，以免印製不清。
3.試題由郵寄遞者請以掛號寄出，以免遺失而示慎重。