國立嘉義大學九十五學年度

生物藥學研究所碩士班招生考試試題

科目：專業英文

I. Reading Exam

Please read the following articles abstracted from a scientific journal, write down the central theme of the abstract in one sentence and briefly explain the content of the article in few sentences.

(A) Methanol extracts of propolis from six different places, five in Rio de Janeiro state and one in Sao Paulo state, both in the southeast of Brazil, were investigated using high-temperature high resolution gas chromatography (HT-HRGC) and HT-HRGC-mass spectrometry. The main purpose of the study was to eastablish the applicability of HT-HRGC as an analytical method for systematic studies of polar propolis fractions. Several compounds, including carbohydrates, phenolic acid derivatives, and high molecular weight compounds (e.g. wax esters of long chain fatty alcohols) could be readily characterized in the crude extracts by HT-HRGC-MS. HT-HRGC and HT-HRGC-MS were shown to be quick and informative tools for rapid analysis of crude polar extracts without cleanup. (J. Agric. Food Chem. 2000) (15%)

(B) We studied the effect of antioxidants from chocolate, cacao liquor polyphenol (CLP) on human immune functions *in vitro*. CLP is an enriched polyphenol fraction purified from cacao liquor that is a major component of chocolate. It has been shown that polyphenols have antioxidant activity, and reactive oxygen species (ROS) are involved in immune responses. CLP inhibited both hydrogen peroide and superoxide anion, typical ROS production by phorbol myristate acetate-activated granulocytes. CLP also inhibited menadione-induced production of both hydrogen peroxide and superoxide anion in normal human peripheral blood lymphocytes (PBL). CLP treatment of normal PBL *in vitro* inhibited mitogen-induced proliferation of T cells and polyclonal Ig production by B cells in a dose-dependent manner. CLP treatment inhibited both IL-2 mRNA expression and IL-2 secretion by T cells. These results suggest that antioxidant CLP has immunoregulatory effects. (Cellular Immunology 1997) (15%)

II. Translation Exam

Please translate the following short paragraphs into Chinese. Any particular word that you do not recognize, you can write it down in English in your translated sentences.

(A) The molecular size of drugs varies from very small (MW < 10) to very large (MW > 50,000). However, the vast majority of drugs have molecular weights between 100 and 1000. The lower limit of this narrow range is probably set by the requirements for specificity of action. In order to have a good "fit" to only one type of receptor, a drug molecule must be sufficiently unique in shape, charge, etc, to prevent its binding to other receptors. To achieve such selective binding, it appears that a molecule should in most cases be at least 100 MW units in size. (15%)

(B) Prehistoric people undoubtedly recognized the beneficial or toxic effects of many plant and animal materials. The earliest written records from China and from Egypt list remedies of many types, including a few still recognized today as useful drugs. Most, however, were worthless or actually harmful. In the 2500 years or so preceding the modern era there were sporadic attempts to introduce rational methods into medicine, but none were successful owing to the dominance of systems of thought that purported to explain all of biology and disease without the need for experimentation and observation. (15%)

背面尚有試題

III. Please read the following English abstracts and write the answer of each article as follows:

1. Write the Chinese summary briefly and do not over 30 characters, and
2. write an appropriate English title of each abstract.

(A) ASM News 2005, 71(5):215 (10%)

Genomic sequencing of the parasitic amoeba *Entamoeba histolytica* reveals an unexpectedly complex repertoire of sensory genes plus a variety of genes like those of bacteria, according to Brendan Loftus and Neil Hall of the Institute for Genomic Research (TIGR) in Rockville, Md., and their collaborators there and at the Wellcome Trust Sanger Institute in the United Kingdom. Although its genome is "reduced" in some ways, in others it is enriched with genes encoding membrane receptors and other surface proteins for evading host immune responses, an "unprecedented" number of transfer RNA (tRNA) genes, and a variety of genes for metabolic processes that appear to derive from horizontal transfers from bacteria. Although its many receptor proteins likely are used for sensing and responding to its environment in the human gut, the significance of its long arrays of tRNA genes escapes explanation for now. This human pathogen, which lacks mitochondria, a Golgi apparatus, or an endoplasmic reticulum, infects an estimated 50 million people and causes as many as 100,000 deaths a year, making it second only to malaria as a cause of morbidity and mortality from a protist. A report of the TIGR-Wellcome genomic analysis appears in the 24 February 2005 issue of *Nature*.

(B) ASM News 2004, 70(8):354 (10%)

The discovery of ancestral hemoglobin in two archaeal species may help scientists understand how the Earth's earliest inhabitants used oxygen, says Maqsudal Alam, a University of Hawaii microbiologist. Alam and collaborators at the Maui High Performance Computing Center and the University of Texas Southwestern Medical Center reported in the April 27, 2004 issue of the *Proceedings of the National Academy of Sciences* that they found oxygen-carrying proteins in *Aeropyrum pernix*, an obligately aerobic hyperthermophile, and in *Methanosarcina acetivorans*, a strictly anaerobic methanogen. Hemoglobins occur in eukaryotes and bacteria, but this is the first evidence of a comparable protein in *Archaea*. Although both archaeal species respond to oxygen in similar ways in ligand-binding studies, the ultimate fate of the oxygen in their systems is not yet known, says Alam. He speculates that oxygen was toxic to early life on Earth, and that special proteins arose in microbes that could capture molecular oxygen and prevent it from killing them. The researchers postulate that the archaeal globins they found "are the ancestors of contemporary hemoglobins."

(C) ASM News 2005, 70(2):51 (10%)

Researchers led by Gary Nabel at the National Institute of Allergy and Infectious Diseases (NIAID) in Bethesda, Md., late last year launched a clinical trial of a vaccine designed to prevent Ebola infection. This component of an experimental DNA vaccine, which is manufactured by Vical Inc., of San Diego, Calif., contains inactivated versions of genes based on those from the Ebola virus. It is the "priming" part of a two- stage vaccination strategy, called prime-boost, that eventually will entail also inoculating individuals with modified, non-disease-causing cold viruses that encode selected Ebola proteins. In a separate development, Thomas Geisbert and collaborators at the Army Medical Research Institute of Infectious Diseases at Fort Detrick, Md., report encouraging results evaluating a recombinant nematode anticoagulant protein c2 (rNAPc2) as an experimental treatment against Ebola virus infections. The factor protected several virus-infected rhesus monkeys against Ebola's lethal effects, and also temporarily delayed death in several other animals. The factor works by inhibiting tissue factor-initiated blood coagulation, thereby blocking a key physiological effect of, but not actual infections by, the virus.

(D) ASM News 2004, 70(1):7 (10%)

A plant gene, called BOS1, may hold the regulatory key for withstanding stress, including assaults by the fungus *Botrytis cinerea*, which can cloak fruits and vegetables with a gray and fuzzy mold, according to biologist Tesfaye Mengiste of Purdue University in West Lafayette, Ind., and his collaborators at Syngenta Biotechnology Inc. in Research Triangle Park, N.C. The *Arabidopsis* BOS1 gene, which encodes a protein that serves as a transcription factor, not only restricts the growth of this pathogen on such plants but also protects them from stresses, such as drought and salinity. "The most cost-effective and environmentally sound approach to preventing this disease is through genetic resistance," Mengiste says. "If we can use the same gene we found in *Arabidopsis* in other plants that are hosts of *Botrytis,* then BOS1 can be utilized to prevent this fungus and other similar plant diseases."