

★★★ <第28回知的財産翻訳検定試験【第15回和文英訳】> ★★★
《 1 級課題 -バイオテクノロジー- 》

【問 1】

Insects are broadly classified into holometabola and hemimetabola depending on the mode of their development. While morphogenesis of holometabola such as *Drosophila* and the like has been well studied, not much research has been carried out on hemimetabola. However, harmful insects include hemimetabolous insects such as grasshoppers, locusts, and cockroaches, and genetic recombination techniques are indispensable as countermeasures against these insects. Furthermore, genetic recombination techniques are also indispensable when utilizing hemimetabolous insects as natural enemy insects.

One type of genetic recombination technique is a transgenic method involving the introduction of certain exogenous genes, and in this method it is necessary to use special means in order to improve the incorporation efficiency because of the low efficiency of incorporating exogenous DNA into genomic DNA. Currently, DNA-type transposons are widely used as a means for achieving this. DNA-type transposons are excised from DNA by a transposase and inserted into a target sequence of another DNA.

【問 2】

After the extraction, the mixture of the crushed matter and the solvent may be separated into solid and liquid by a known method, and only the liquid extract may be recovered.

In addition, an extract containing ergosterol peroxide can be obtained, if necessary, by drying the liquid extract with a drying agent such as anhydrous sodium sulfate and then distilling off the solvent. The extract thus obtained can be further fractioned appropriately by a technique such as column chromatography, including liquid chromatography, extraction or fractional precipitation, and fractions can be thus obtained. Such fractions with increased purity can be used in place of the extract.

The activating agent for neuronal cells contains ergosterol peroxide as an active ingredient. The active ingredient content can vary depending on the age or the weight of the subject who takes it, but it contains the ergosterol peroxide such that an adult can take preferably 0.1-1,000 mg/kg per day, more preferably 1-100 mg/kg per day, and most preferably 5-50 mg/kg per day.

【問 3】

<Estrogen Administration Test 1: administration to juvenile pufferfish>

Estrogen is administered to pufferfish during the period where gonads have sexual plasticity, and the effect of estrogen on the gonads is examined. Synthetic estradiol was used as the estrogen, and *Takifugu rubripes* was used as the pufferfish. The estradiol was periodically added to the breeding water in the form of an ethanol solution of the estradiol dissolved in ethanol. As for the test sections, a plurality of test sections with different amounts of estrogen added were set up. More specifically, a total of eight sections were set up, including test sections in which the estrogen concentrations of the breeding water were set at 1 ppb by weight (1 ng/g) for test section 1, 5 ppb by weight (5 ng/g) for test section 2, 10 ppb by weight (10 ng/g) for test section 3, 25 ppb by weight (25 ng/g) for test section 4, 50 ppb by weight (50 ng/g) for test section 5, and 100 ppb by weight (100 ng/g) for test section 6, and further including untreated control section 1 to which nothing was further added, as well as control section 2 to which ethanol only was added (an estradiol concentration of 0 ppb by weight). The amounts of ethanol in the individual sections were set to be identical.

【問 4】

Claims:

1. A method for inducing a cataract, the method comprising an injuring step of injuring DNA of a lens of a non-human organism or DNA of a collected lens.
3. A method for inducing a cataract according to Claim 1 or 2, wherein the DNA is injured by applying a stimulus of a certain intensity to the lens of

a non-human organism or the collected lens in the injuring step, and wherein the stimulus has an intensity level at which only a part of a cross-sectional surface of the lens becomes opaque after the stimulus has been applied.

4. A method for inducing a cataract according to any one of Claims 1 to 3, wherein the injuring step comprises the following (i) and/or (ii):

(i) irradiating the lens of a non-human organism or the collected lens with ultraviolet light or radiation;

(ii) bringing a substance that induces DNA injury into contact with the lens of a non-human organism or the collected lens.

5. A model organism with a cataract, wherein the organism can be obtained with a method according to any one of Claims 1 to 4.