★★★ ＜第22回知的財産翻訳検定試験【第12回和文英訳】＞ ★★★
≪１級課題-バイオテクノロジー-≫

【問 1】
BACKGROUND ART

Fatigue is defined as “a condition characterized by decreased workload, the reduced efficiency of performance and the like after physical or mental activity” or “a condition in which functional abilities are transiently impaired as a result of physical or mental activity”. It is generally classified into physical fatigue and mental fatigue. They are not, however, separated from each other and intimately associated to produce the condition of fatigue. Recovery from fatigue is considered to be usually possible by rest, sleep, or the like, but chronicity of fatigue or easy fatigability, i.e., a condition in which fatigue is easily induced, or, if proceeded, difficulty of recovery from fatigue is induced depending on the level of physical or mental activity or by prolonged fatigue or addition of other factor such as stress. Fatigue is a major factor which reduces QOL (Quality of life) and a disturbing factor for healthy life. How to recover from fatigue is much more sought than before, because those who complain of fatigue have increased year by year due to the issues in the modern society, such as severer competition in the society, computerization of the society, or super aging of the society.

【問 2】
DESCRIPTION OF EMBODIMENTS

In this invention, the forced expression of an oncogene or a Polycomb gene described later in detail in cells at a differentiation stage of interest can be achieved by introducing either of the genes into the “cells at a differentiation stage of interest” and forcibly expressing the gene in the cells; by introducing either of the genes into progenitor cells of the “cells at a differentiation stage of interest”, forcibly expressing the gene in the cells, allowing the differentiation to proceed while maintaining the expression, and maintaining the forced expression of the gene in the “cells at a differentiation stage of interest”; or by introducing either of the genes into progenitor cells of the “cells at a differentiation stage of interest” and inducing the expression when the cells differentiate into the “cells at a differentiation stage of interest”. For example, in the case where megakaryocyte progenitor cells before multinucleation are grown as the “cells at a differentiation stage of interest”, an

oncogene or a Polycome gene may be introduced into hematopoietic progenitors (described later) at a pre-differentiation stage and be forcibly expressed in the cells. In the case where an oncogene and a Polycomb gene are forcibly expressed in cells at a differentiation stage of interest, the oncogene and the Polycomb gene may be introduced in the cells simultaneously or at a different timing.

【問 3】

The peptide (5 mg) and hemocyanin (10 mg) were dissolved in 4 ml of 0.2 M phosphate buffer (pH 7.3), and 400 µl of 2.5% glutaraldehyde chilled in ice water was added dropwise to the solution. After stirring under ice-cooling for 3 hours, a peptide-hemocyanin conjugate was obtained by dialyzing the solution against distilled water.

BSA (132 mg) was dissolved in 3 ml of 0.1 M phoshpate buffer (pH 7.5) (Solution A). Eleven point two mg of GMBS was dissolved in 200 µl of dimethylformamide (Solution B). Solution B was added dropwise to Solution A. After the mixture was reacted for 30 minutes at 30°C, bovine serum albumin into which a maleimide group is introduced was obtained. The peptide (5 mg) was dissolved in 0.1 M phosphate buffer-5 mM EDTA, and the maleimide-introduced BSA (20 mg) was added thereto to a total volume of 5 ml or less. The mixture was reacted for 60 minutes at 30°C. PBS was added to the solution up to 12 ml, and a peptide-BSA conjugate was obtained.

The pepitde-hemocyanin conjugate was mixed with complete Freund's adjuvant, and the mixture was injected into a rabbit. Thereafter, the peptide-BSA conjugate was mixed with incomplete Freund's adjuvant, and the mixture was injected into the same rabbit every two weeks. Human BTC peptide antibody was obtained from blood collected from the immunized rabbit.

【問 4】

1. A polypeptide selected from the following (1) to (4):
(1) a polypeptide comprising an amino acid sequence from position 32 to 412 of SEQ ID NO: 2;
(2) a polypeptide consisting of the amino acid sequence from position 32 to 412 of SEQ ID NO: 2;
(3) a polypeptide consisting of an amino acid sequence in which one or a few amino acids are substituted, deleted, added and/or inserted in the amino acid sequence of the

polypeptide (1) or (2), and having lysine-ketoglutarate reductase (LKR) and/or saccharopine dehydrogenase (SDH) activity; and
(4) a polypeptide consisting of an amino acid sequence having at least 70% homology with the amino acid sequence of the polypeptide (1) or (2), and having LKR and/or SDH activity.

4. A polynucleotide encoding the polypeptide according to any one of claims 1 to 3.

5. A method for selecting a substance that modifies LKR and/or SDH activity of the polypeptide according to claim 1, comprising

bringing a test substance into contact with the polypepitde, and

analyzing the LDK and/or SDH activity of the polypepide.