★★★ ＜第37回知的財産翻訳検定試験【第18回英文和訳】＞ ★★★
≪１級課題 -バイオテクノロジー-≫

【解答にあたっての注意】
１．問題の指示により和訳してください。
２．解答語数に特に制限はありません。適切な箇所で改行してください。
３．課題文に段落番号がある場合、これを訳文に記載してください。
４．課題は４題あります。それぞれの課題の指示に従い、４題すべて解答してください。

問１．以下の背景技術を日本語に翻訳してください。

Almost all organisms on Earth apply an internal biological timer to anticipate changes that accompany the daily solar cycle. The possession of such an internal timer allows organisms to inherently “know” where in the daily solar cycle they are, absent of external cues. Such internally generated daily rhythms are called “circadian rhythms”, and are endogenous to the organism.
The mechanisms underlying circadian rhythms involve circadian oscillations in processes such as gene expression and protein modifications. A core clock controls these circadian oscillations by signal generation.
The mammalian circadian clock in the brain conveys 24-hour rhythmicity to rest-activity cycles, temperature, sleep, and virtually all other behavioural and physiological processes. The imposition of an internal temporal framework is an essential part of an organism's biology; it allows all of the internal processes to work in harmony, such as gene expression, cell division and metabolism. In order for such rhythms to be adaptive, they must be synchronised, or entrained, to the external environment, predominantly produced by the 24 hour light/dark cycle due to the rotation of the Earth, and/or to other entraining signals, known as “time givers” or zeitgebers.

問２．以下の実施の形態を日本語に翻訳してください。

The default mode network, as referred to herein, refers to a neural network that provides an offline processing mode during resting behavioral states and is reciprocal in function to the active processes of the salience network. The function of the default mode network allows the brain to stay on-line without other parts of the brain, such as those associated with cognition, being active. In healthy individuals, activation of the default mode network is normally reduced during cognitively intense activity, such as memory encoding, but the default mode network is more active during states where cognition and memory functions are not actively engaged. The default mode network may be thought of as an idling process, whereby in a healthy brain the nuclei/locations/clusters of the default mode network are active while the cognitive areas of the brain are relatively inactive. The default mode network may be particularly active when a person is conscious but is not currently entertaining a conscious thought or prevailing perception. A person who has mindlessly stared at a wall or lost his or her train of thought for a period of time may have activation of his or her default mode network during these episodes.

問３．以下の実施例を日本語に翻訳してください。

The endothelial integrin ligand VCAM-1 and the selectins E- and P-selectin are expressed by endothelial cells in blood vessels, including meningeal vessels and first layers of the cortex and hippocampal vessels of 5×FAD and 3×TG mouse models during early phases of disease of Alzheimer's disease and are not expressed in normal brain. Neutrophils/myeloid cells were observed (using immunohistochemistry of sections) adhered inside blood vessels and migrated into the parenchyma mainly in the meninges in deep cortical layers, and also in the choroid plexus and in close proximity to the hippocampus and amygdala in both mouse models of AD but not in normal healthy mice. GR1+ cells, quantitated using

flow cytometry, were increased in AD mice as early as 2 months, peaked at approximately 4 months in 5×FAD mice and 5-6 months in the 3×TG model, and declined gradually but remained well above the levels observed in normal mice out to the last time-point observed (10 months).

We describe for the first time the behavior of neutrophils inside cerebral vessels and inside CNS parenchyma in animal models of AD.

問４．以下の請求項６５～７０を、図７Ａに記載の実施形態を参考にして、日本語に翻訳してください。図７Ａ及びその説明文は翻訳する必要がありません。

65. A method comprising:
a) providing
i) endothelial cells,
ii) astrocytes, and
iii) a microfluidic device, said microfluidic device comprising a gel, said gel comprising a surface;
b) embedding said astrocytes in said gel;
c) seeding pericytes on said surface of said gel;
d) seeding endothelial cells on said surface of said gel such that they adhere to said surface;
e) culturing said endothelial cells under flow conditions to create a layer of endothelial cells on said gel; and
f) culturing said astrocytes such that said astrocytes extend processes toward said endothelial cells.
66. The method of claim 65, wherein said microfluidic device further comprises a channel, wherein said gel is in said channel.
67. The method of claim 65, wherein said gel comprises collagen.
68. The method of claim 65, wherein said astrocytes are primary human brain astrocytes.
69. The method of claim 65, wherein said layer of endothelial cells comprises VE-cadherin-containing junctions.

70. The method of claim 65, wherein said endothelial cells comprise primary human brain-derived microvascular endothelial cells.

（翻訳不要）

・・・・・以下、図７Ａ及びその説明文

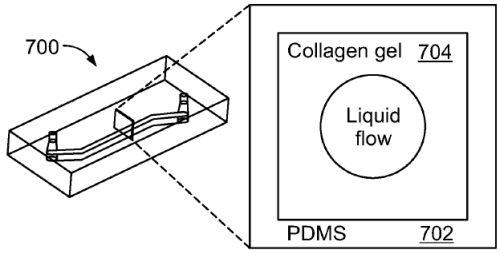

FIG. 7A

FIG. 7A illustrates a schematic diagram of a polydimethylsiloxane (PDMS) structure used to generate a three-dimensional blood brain-barrier (BBB) chip 700 (left) and an illustration of a cross-section through the chip 700 showing the PDMS channel 702 containing a collagen gel 704 made with viscous fingering and a central lumen (right).