

摂南大学 薬学研究科医療薬学専攻 博士課程
2026年度 入学試験問題<第2回>

科目名	外国語《英語》	問題番号	1	受験番号	
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【No. 1-A】

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【No. 1-A】

問 次の英文を和訳しなさい。

Selenium undergoes various changes in the cell and is incorporated into proteins such as selenocysteine, a rare amino acid in which the sulfur atom of cysteine is replaced with selenium. The human genome encodes 25 types of selenocysteine-containing proteins, also known as selenoproteins, which include important reductases such as thioredoxin reductase (TrxR) and glutathione peroxidase (GPx). These enzymes possess selenocysteine as their catalytic center and are essential for the maintenance of cellular redox status, thus, an appropriate concentration of selenium is necessary for life. Selenoprotein P (SeP) is an extremely unique selenoprotein that contains 10 selenocysteines per molecule, and is mainly synthesized in the liver and then secreted into plasma. The majority (53%) of the selenium present in plasma is contained in SeP. Extracellular SeP can bind to apolipoprotein E receptor 2 (ApoER2), an LDL receptor, and be taken up by cells via endocytosis. Incorporated SeP is readily degraded by lysosomes and acts as a source of selenium, supplying selenocysteine to cells. In other words, SeP is responsible for supplying selenium from the liver to the entire body. Epidemiological studies revealed that plasma SeP levels increased in type 2 diabetes, and this increase has a significant correlation with insulin resistance.

thioredoxin reductase : チオレドキシンレダクターゼ, redox status : 酸化還元状態, apolipoprotein E : アポリポプロテイン E, endocytosis : エンドサイトーシス, lysosomes : リソソーム, epidemiological studies : 疫学研究

【引用】 Xinying Ye et. al., Sulforaphane decreases serum selenoprotein P levels through enhancement of lysosomal degradation independent of Nrf2. *Communications Biology*, 6,1060 (2023). <DOI: 10.1038/s42003-023-05449-y>

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科目名	外国語《英語》	問題番号	2	受験番号	
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【No. 2-A】

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【No. 2-A】

問 次の英文を和訳しなさい。

The discovery of the rapid antidepressant effects of the anaesthetic ketamine, an N-Methyl-D-Aspartate receptor antagonist, is probably the most important breakthrough in depression research in the last 50 years. Ketamine remains an off-label treatment for treatment-resistant depression with factors that limit widespread use including its dissociative effects and abuse potential.

Ketamine is a racemic mixture, composed of equal amounts of (S)-ketamine and (R)-ketamine. An (S)-ketamine nasal spray has been developed and approved for use in treatment-resistant depression in the United States and Europe; however, some concerns regarding efficacy and side effects remain. Although (R)-ketamine is a less potent N-Methyl-D-Aspartate receptor antagonist than (S)-ketamine, increasing preclinical evidence suggests (R)-ketamine may have more potent and longer lasting antidepressant effects than (S)-ketamine, alongside fewer side effects. Furthermore, a recent pilot trial of (R)-ketamine has demonstrated rapid-acting and sustained antidepressant effects in individuals with treatment-resistant depression.

anaesthetic; 麻酔、麻酔性の, off-label; 適応外, dissociative; 解離性

Ketamine: A tale of two enantiomers. J Psychopharmacol. 2021; 35: 109-123. より一部改変

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科目名	外国語《英語》	問題番号	3	受験番号	
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【No. 3-A】

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【No. 3-A】

問 次の英文を和訳しなさい。

Per- and polyfluoroalkyl substances (PFAS) are a group of over 14,000 synthetic chemicals used in industry and consumer products worldwide for over 70 years. One concerning characteristic of PFAS is their persistence; many break down very slowly and can accumulate in people, animals, and the environment.

Current research suggests that exposure to certain PFAS may lead to adverse health outcomes. Among the most widely recognized are increased risks of cancer, elevated cholesterol levels, and impaired immune response. In addition, disruption of thyroid hormone regulation has also gained attention, although the evidence is not yet conclusive. In studies of pregnant individuals, PFAS exposure has been linked to thyroid hormone dysfunction, although findings have been mixed, with both positive and negative correlations reported. Similar inconsistencies have been observed among non-pregnant adults, suggesting that PFAS effects may depend on population characteristics, timing of exposure, or the combinations and concentrations of PFAS involved.

Mechanistically, various PFAS interfere with thyroid hormone synthesis through multiple pathways, including inhibition of iodide uptake via the Na^+/I^- symporter and reduction of thyroid peroxidase levels. Despite these insights, the full extent of PFAS-induced thyroid disruption and its implications for human health remain unclear.

Per- and polyfluoroalkyl substances (PFAS) 有機フッ素化合物, symporter 共輸送体

米国疾病予防管理センターWeb サイト「PFAS and Worker Health」<https://www.cdc.gov/niosh/pfas/about/index.html> (参照 2025年8月20日)、および Sci Rep, 2025, 15(1), 12502. を元に一部編集