2026 年度
創価大学 大学院 理工学研究科【生命理学専攻】
博士後期課程　一般選抜試験問題

英　　語

開始時刻　午前 10 時 00 分
終了時刻　午前 11 時 00 分

【注意事項】

１．　答案用紙には受験番号、氏名を必ず記入してください。

２．　問題番号が明記された答案用紙を使用し、解答してください。

３．　試験終了後、答案用紙は必ず提出してください（問題用紙は提出しなくてよい）。

問題 1　以下の文章を読んで、各設問に答えなさい。

Read the following text and answer each question.

Japanese immunologist among three Nobel medicine prize winners①

Japanese immunologist Shimon Sakaguchi was awarded the Nobel Prize in physiology or medicine on Monday along with two other scientists for their discovery concerning peripheral immune tolerance.

Sakaguchi, 74, a professor at University of Osaka, discovered a new class of T cells called regulatory T cells②, which prevent immune cells from attacking our own body.

"Sakaguchi was swimming against the tide in 1995, when he made a key discovery,③" the Nobel Committee said in a tweet. "At the time, many researchers were convinced that immune tolerance only developed due to potentially harmful immune cells being eliminated in the thymus, through a process called central tolerance.

"Sakaguchi showed that the immune system is more complex and discovered a previously unknown class of immune cells, which protect the body from autoimmune diseases," it added.

The Nobel Assembly at the Karolinska Institute said the trio, which also included Americans Mary Brunkow, with the Institute for Systems Biology in Seattle, and Frederick Ramsdell, at Sonoma Biotherapeutics, identified the regulatory T cells — the immune system's security guards — laying the foundation for a new field of research.

The discoveries have also led to the development of potential medical treatments, raising hopes that we will be able to treat or cure autoimmune diseases, provide more effective cancer treatments and prevent serious complications after stem cell transplants, the Nobel Assembly said.

"Their discoveries have been decisive for our understanding of how the immune system functions and why we do not all develop serious autoimmune diseases," said Olle Kampe, chair of the Nobel Committee.

Brunkow and Ramsdell made the other key discovery in 2001, when they explained why a specific mouse strain was particularly vulnerable to autoimmune diseases. They discovered that the mice have a mutation in a gene, naming it Foxp3④. They also showed that mutations in the

human equivalent of this gene cause a serious autoimmune disease called IPEX.

Sakaguchi then followed up with another finding, showing that the Foxp3 gene controlled the development of the regulatory T cells that he discovered in 1995.

At a news conference at Osaka University, where he heads a lab at its Immunology Frontier Research Center, Sakaguchi expressed "joyous surprise" at the news of being awarded the top science prize.

"I feel extremely lucky and honored," he said, noting that only up to three people can share a year's Nobel physiology or medicine award.

Going forward, Sakaguchi, who has spent a long time studying the fundamental mechanism of regulatory T cells, said he hopes to develop medical therapies that use the cells' ability to control immune response.

"Regulatory T cells are a type of lymphocyte that restrains immune responses," he said. "So they can be used to treat various immunological diseases. On the other hand, if (the regulatory T cells) are reduced, immunity can be strengthened to boost the body's defense against cancer.

"Currently, 90% of people who die from cancer die from metastatic cancer. My hope is to help develop therapies that can prevent such cancer from happening, which can be used for any type of cancer, and which are safe, effective and economically feasible."

With Sakaguchi, Japan has produced a total of 29 Nobel Prize-winning individuals, including former nationals who became U.S. citizens. In the physiology or medicine category alone, Sakaguchi is the sixth winner, and the first since Kyoto University's Tasuku Honjo, another immunologist, received the prize in 2018, for his discovery of PD-1, a protein that puts the brakes on immune cells.

Last year, Japan's Hidankyo, an atomic bombing survivors group, won the Nobel Peace Prize for its efforts to achieve a world free of nuclear weapons.

Nobel Prize announcements will continue this week with the awarding of the physics prize on Tuesday and the chemistry prize on Wednesday.

(the Japan times Oct 7, 2025)

問1 下線部①の受賞理由を本文から探し、日本語もしくは英語で説明しなさい。
Find the reason for the award in the underlined section ① within the text and explain it in Japanese or English.

問2 下線部②の制御性 T 細胞について本文で書かれている有用性について日本語もしくは英語で説明しなさい。
Explain the usefulness of regulatory T cells (underlined part ②) in Japanese or English as described in the text.

問3 下線部③は比喩表現です。そのように表現される理由を本文から選び、日本語もしくは英語で説明しなさい。
The underlined part ③ is a metaphorical expression. Select the reason for this expression from the text and explain it in Japanese or English.

問4 下線部④Foxp3 に関して本文で書かれている特徴について日本語もしくは英語で説明しなさい。
Explain the characteristics of Foxp3 described in the text regarding the underlined part ④ in either Japanese or English.

問5 下線部②の制御性 T 細胞の研究の将来の展望に関して本文から探し、日本語もしくは英語で説明しなさい。
Find the future prospects for research on regulatory T cells (underlined part ②) in the text and explain them in Japanese or English.

問題 2　以下の文章を読んで、各設問に答えなさい。

Read the following text and answer the questions that follow.

Alzheimer's disease (AD) ① is a progressive neurodegenerative disorder in which neurons and neural circuits in the brain are gradually impaired. It is one of the major causes of dementia (a condition in which declines in cognitive functions, such as memory and thinking, interfere with activities of daily living). In the early phase, changes such as difficulty remembering recent events are often prominent; ②_____, as the disease progresses ③, deficits emerge across multiple domains, including language, attention, executive function, visuospatial cognition, and behavioral and psychological symptoms, ultimately affecting overall daily functioning, including activities of daily living (ADL) and instrumental activities of daily living (IADL). When symptoms are mild, the condition may be conceptualized as mild cognitive impairment (MCI), and early assessment and support are important.

From medical and biological perspectives ④, it is widely recognized that in the AD brain, amyloid-β (Aβ) accumulates extracellularly to form plaques, and tau aggregates abnormally intracellularly to produce neurofibrillary pathology. These processes can affect synaptic function and the maintenance of neural circuits; however, the causal link between Aβ and tau with clinical symptoms and the reason for substantial inter-individual variability remains unclear. Accordingly, many aspects are still being actively investigated, including the possibility that interactions among multiple factors, such as inflammatory responses and immune cells, including microglia, vascular factors, and metabolism, contribute to the development of the disease. Genetic contributions are not uniform; APOE ε4 is associated with an increased risk; however, some carriers never develop AD, and conversely, AD can occur in non-carriers. In addition, variants in specific genes, such as *APP, PSEN1,* and *PSEN2,* are known to be strongly associated with early onset cases, although such cases are infrequent.

In addition to symptomatic management, attempts have been made to intervene in the underlying disease processes. Anti-Aβ antibody therapeutics (e.g., lecanemab and donanemab) have been introduced primarily for MCI or mild-stage disease to slow progression. However, careful attention to adverse events, such as

amyloid-related imaging abnormalities (ARIA) (cerebral edema and microhemorrhage), is required, monitoring is necessary, and appropriate use is emphasized.

- dementia（認知症）
- cognitive functions（認知機能）
- interfere with（～を妨げる）
- deficits（障害・機能低下）
- executive function（遂行機能）
- visuospatial cognition（視空間認知）
- behavioral and psychological symptoms（行動・心理症状：BPSD）
- activities of daily living, ADL（日常生活動作：食事・更衣・移動などのこと）
- instrumental activities of daily living, IADL（手段的日常生活動作：買い物・金銭管理・交通利用など、より複雑な活動のこと）
- mild cognitive impairment, MCI（軽度認知障害）
- symptomatic management（対症療法）
- amyloid-related imaging abnormalities, ARIA（アミロイド関連画像異常）

問1 下線部① アルツハイマー病とは何か、またそれが認知症とどのように関連しているかについて、日本語もしくは英語で説明しなさい。

Based on the text (underlined ①), explain what Alzheimer's disease is and how it is related to dementia. Answer in English or Japanese.

問2 空欄②を埋めるのに最適な選択肢を１つ選び、文が文法的・論理的に適切になるようにしなさい。

Choose the best option to fill in the blank ② so that the sentence is grammatically and logically correct.

A. therefore　B. however　C. because　D. for example
E. similarly　F. in addition

問3 下線部③について、(i)アルツハイマー病（AD）の進行に伴い症状がどのように拡大するか、および(ii)この文脈における軽度認知障害（MCI）が何を意味するかを、日本語もしくは英語で説明しなさい。

According to the text (underlined ③), describe (i) how symptoms expand as AD progresses and (ii) what MCI implies in this context. Answer in English or Japanese.

問4 下線部④の内容を、(i) 広く認められている神経病理学的所見、および (ii) 研究中の知見、などについて、日本語もしくは英語で説明しなさい。

Explain the content of the underlined part ④, focusing on (i) widely recognized neuropathological findings and (ii) findings that remain under investigation (currently under study/research). Answer in Japanese or English.

問5 本文の内容によって明示的に裏付けられている記述を一つ選びなさい。
Choose the ONE statement that is explicitly supported by the text:

A. APOE ε4 is associated with an increased risk of AD; however, AD can occur in non-carriers.
B. APOE ε4 is the primary determinant of AD in all individuals.
C. Variants of *APP*, *PSEN1*, and *PSEN2* are strongly associated with late-onset AD.
D. Genetic contributions are uniform across all the individuals.
E. APOE ε4 has no association with AD risk.

問6 アルツハイマー病に対してどのような治療アプローチが行われているかを、本文に基づいてその具体例や現状を日本語もしくは英語で説明しなさい。
Based on the text, explain the therapeutic approaches used for AD, including specific examples and the current situation. Answer in Japanese or English.