

2026 年度

薬学研究科
博士前期課程
(薬科学専攻・医療栄養学専攻)
一般入学試験(秋期)

1 問選択して回答してください

※解答用紙の採点対象科目欄にチェックをつけてください

外国語

受験番号	
氏 名	

評 点	
-----	--

[試験科目] 英語 1

下記の英文を和訳しなさい。

Essential oils are mixtures of volatile secondary metabolites synthesised by a wide variety of aromatic plants. They possess distinctive odours and exhibit diverse bioactive properties, including antimicrobial, anticancer, antiageing, antioxidant, and insect-repellent activities. More than 300 types of essential oils have industrial applications. These oils are safe for ingestion, inhalation, and topical use at common doses, provided they are in solution, which explains their widespread incorporation into cosmetic formulations.

Essential oils are characterized by poor aqueous solubility and limited stability, and they are prone to degradation induced by temperature, light, oxidative processes, and volatilization, thereby greatly constraining their applications. To overcome these challenges, numerous studies have employed Cyclodextrins (CDs) as encapsulating agents to protect essential oils and their volatile constituents. Moreover, inclusion within CDs increases the energy barrier for volatilization, thereby enabling a slower and prolonged release of fragrance.

Some volatile aroma encapsulated in β -CD include vanillin, geraniol, jasmone, rose oil, apple fragrance, rosemary oil, and linalool (also encapsulated in HP- β -CD), among others. Encapsulation in CDs enables controlled odour release, facilitates conversion of liquid to solid forms, and improves both the stability and solubility of these compound.

volatile constituents (揮発性成分)、stability (安定性)、inclusion (包接)、topical use (外用)

出典(改変) : Cyclodextrin Applications in the Cosmetic Industry: A Review *Cosmetics* 2025, 12(6), 244; <https://doi.org/10.3390/cosmetics12060244> 引用 : 改変

受験番号	
氏 名	

評 点	
-----	--

試験科目] 英語 2

次の中樞神経系における化学伝達に関する①～⑩の文章を和訳しなさい。

①Cellular signaling links neurotransmitter receptor activation to downstream biological effects. A number of mechanisms have been identified that can be broadly classified into two main types of signaling, fast and slow neurotransmission. ②The most commonly seen postreceptor events are fast transmission resulting from rapid changes in ion flux through ion channels. ③Slow neurotransmission is primarily the role of a second major group of receptors, the G protein-coupled receptors, which interact with heterotrimeric GTP-binding proteins. ④There are additional and distinct mechanisms of signaling for growth factor receptor and for the nuclear receptors that transduce steroid hormone signaling. ⑤ Because the majority of cell-to-cell communication in the central nervous system involves chemical transmission, neurons require specialized cellular functions to mediate these actions:

- ⑥*Neurotransmitter synthesis*. Small-molecule neurotransmitters are synthesized in nerve terminals, whereas others, such as peptides, are synthesized in cell bodies and transported to nerve terminals.
- ⑦*Neurotransmitter storage*. Synaptic vesicles store transmitters, often in association with various proteins and frequently with ATP.
- ⑧*Neurotransmitter release*. Release of stored transmitter from the storage vesicle into the synaptic cleft occurs by exocytosis.
- ⑨*Neurotransmitter recognition*. Neurotransmitters diffuse from sites of release and bind selectively to receptor proteins to initiate intracellular signal transduction events within the postsynaptic cell.
- ⑩*Termination of action*. A variety of mechanisms terminate the action of synaptically released transmitters, including diffusion from the synapse, enzymatic inactivation, and uptake into neurons or glial cells by specific transporters.

(出典) Goodman & Gilman's The Pharmacological Basis of Therapeutics, 13th Edition

(注釈) neurotransmitter: 神経伝達物質、downstream: 下流の、broadly: 大まかに、flux: 流れ、heterotrimeric: ヘテロ三量体、distinct: 異なる、growth factor: 成長因子、transduce: 伝達する、vesicle: 小胞、synaptic cleft: シナプス間隙、recognition: 認識、diffuse: 拡散する、intracellular: 細胞内、transduction: 伝達、enzymatic: 酵素的に、glial cells: グリア細胞

①

②

③

④

⑤

⑥

⑦

⑧

⑨

⑩