千葉大学大学院医学薬学府 修士課程

Chiba University Graduate School of Medical and Pharmaceutical Sciences Master's Program

医科学専攻

Division of Medical Sciences

令和８年４月入学第２回

Entry in April 2026. 2nd

入 学 試 験 問 題

The questions for the entrance examination

【英　語】

English

注　意　事　項　(Notes：)

１．この冊子は、監督者から解答を始めるよう合図があるまで、開いてはいけません。
You do not open this booklet until there are directions of the starting test by a test proctor.

２．すべての解答用紙に受験番号を忘れずに記入してください。
Please fill in all the answer sheets with your examinee's number.

３．この問題冊子は、試験終了後、持ち帰って結構です。
You may take this booklet with you after the examination.

令和８年４月入学第２回

医学薬学府修士課程医科学専攻入学試験問題　Question Sheet

英　語　English　　2026.1.27（Tue）実施

Read the text below and answer the questions in English.

著作権の都合上、公開できません。

出典：Gupta A, Osadchiy V, Mayer EA. Brain-gut-microbiome interactions in obesity and food addiction. *Nat Rev Gastroenterol Hepatol*. 2020 Nov;17(11):655-672. doi: 10.1038/s41575-020-0341-5. を一部引用改変。

著作権の都合上、公開できません。

Questions:

Q1. In your own words, explain how early-life factors and modern food environments interact to increase vulnerability to food addiction. **Your answer should be within 40 words.**

Q2. Describe two distinct pathways—one peripheral and one central—that constitute the BGM axis contributes to maladaptive eating behaviour. **Your answer should be written in two sentences, one for each pathway.**

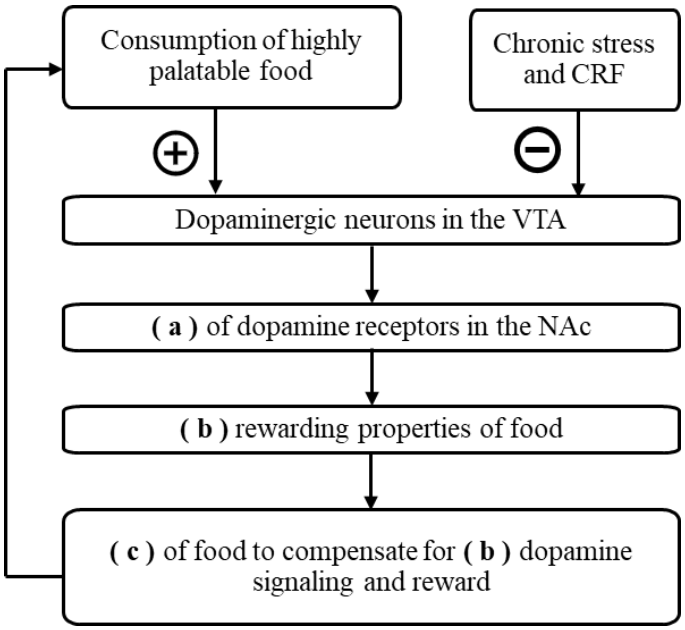
Q3. Based on Figure 1 (as described in the passage), answer the following:

(A) Identify one orexogenic signal and one anorexogenic signal mentioned in the passage.

(B) Which environmental factor can override homeostatic control mechanisms of food intake?

1. Increased enteroendocrine cell activity
2. Lack of gut microorganisms
3. Reduced dopamine levels
4. Food advertisements and cues
5. Absence of psychosocial stress

Q4. Based on the simplified diagram below, fill in the blanks (a)–(c) with the most appropriate terms from the passage.



Q5. Based on the mechanisms described in the passage, propose one potential intervention that might reduce vulnerability to food addiction. Explain its biological rationale using information from the text. **Your answer should be within 100 words.**

令和８年４月入学第２回
医学薬学府修士課程医科学専攻入学試験問題
「英　語」

＜　解答例　＞

Q1.

Early-life influences can prime the infant gut microbiome and brain for vulnerability to food addiction, which may be further reinforced by increased antibiotic usage and dietary patterns throughout adulthood.

Q2.

Peripheral pathway:

Microbial metabolites alter the release of orexogenic and anorexogenic peptides from enteroendocrine cells, modifying vagal afferent signalling and hypothalamic regulation of appetite.

Central pathway:

The dopaminergic reward system becomes dysregulated. Reduced VTA-NAc dopamine signalling and stress-induced CRF/glucocorticoid release weaken reward processing and promote compulsive eating.

Q3.

(A)　Orexogenic: ghrelin, or insulin

（Inflammatory signals: lipopolysaccharides or tryptophan metabolites も可とする）

Anorexogenic: GLP-1, PYY, or CCK

(B)　4. Food advertisements and cues

Q4.

(a) downregulation

(b) reduced

(c) overconsumption

Q5.

One possible intervention is increasing dietary fiber intake while reducing consumption of highly palatable foods. Fiber promotes microbial production of metabolites that enhance anorexigenic peptide release, strengthening homeostatic signaling. Reducing palatable food exposure also limits overstimulation of dopaminergic reward circuits, helping restore balance between hedonic and homeostatic pathways.

＜　出題意図　＞

脳腸連関と摂食行動・肥満・食への依存に関するレビュー論文から出題した。

１．科学英文の精読力
　　高度な生命科学テキストを正確に読み取る力を評価する。
２．メカニズム理解
　　Brain-Gut-Microbiome 軸の末梢・中枢メカニズムを文章から抽出する能力を測る。
３．図表読解力（Figure 1）
　　テキスト情報を図表に対応させて理解できるかを測る。
４．統合的思考・応用力
　　生理学的メカニズムをもとに介入策を考案できるかを測る（Q5）。
５．学術的英文記述能力
　　限られた語数で論理的に説明する力を測る（Q1、Q5）。