

旭川医科大学  
平成 25 年度一般入試前期日程

英 語 問 題 紙

注 意 事 項

1. 試験開始の合図があるまで、この問題紙を開いてはいけません。
2. 英語の問題紙は、10 ページあります。
3. 解答用紙は 4 枚あります。
4. 受験番号は、監督者の指示に従って、全ての解答用紙の指定された箇所に必ず記入しなさい。
5. 受験番号および解答以外のことを解答用紙に書いてはいけません。
6. 解答はすべて解答用紙の指定された欄に書くこと。裏面に書かないこと。
7. 解答用紙のみを提出しなさい。問題紙は持ち帰りなさい。

問題 1 以下の英文を読み、問いに日本語で答えなさい。

### The Laws of Adiposity

The fate of the laboratory rat is rarely enviable. The story I'm about to tell offers no exception. Still, we can learn from the rat's experience, as scientists do.

In the early 1970s, a young researcher at the University of Massachusetts named George Wade set out to study the relationship between sex hormones, weight, and appetite by removing the \*ovaries from rats (females, obviously) and then monitoring their subsequent weight and behavior. (1)The effects of the surgery were suitably dramatic: the rats would begin to eat voraciously and quickly become obese. If we didn't know any better, we might assume from this that the removal of a rat's ovaries makes it a glutton. The rat eats too much, the excess calories find their way to the fat tissue, and the animal becomes obese. This would confirm our preconception that overeating is responsible for obesity in humans as well.

But Wade did a revealing second experiment, removing the ovaries from the rats and putting them on a strict postsurgical diet. Even if these rats were ravenously hungry after the surgery, even if they desperately wanted to be gluttons, they couldn't satisfy their urge. In the \*lingo of experimental science, this second experiment *controlled* for overeating. (2)The rats, postsurgery, were only allowed the same amount of food they would have eaten had they never had the surgery.

What happened is not what you'd probably think. The rats got just as fat, just as quickly. But these rats were now completely sedentary. They moved

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\*ovary: 卵巣

\*lingo: 専門用語

only when movement was required to get food.

If we knew only about the second experiment, this, too, might confirm our preconceptions. Now we would assume that removing a rat's ovaries makes it lazy; it expends too little energy, and this is why it gets fat. In this interpretation, once again we have support for our belief in the primacy of calories-in/calories-out as the determining factor in obesity.

Pay attention to both experiments, though, and the conclusion is radically different. Removing the ovaries from a rat literally makes its fat tissue absorb calories from the \*circulation and expand with fat. If the animal can eat more to compensate for the calories that are now being \*stashed away as fat (the first experiment), it will. If it can't (the second), then it expends less energy, because it now has fewer calories available to expend.

The way Wade explained it to me, the animal doesn't get fat because it overeats, it overeats because it's getting fat. (3)The cause and effect are reversed. Both gluttony and sloth are effects of the drive to get fatter. They are caused fundamentally by a defect in the regulation of the animal's fat tissue. The removal of the ovaries literally makes the rat stockpile body fat; the animal either eats more or expends less energy, or both, to compensate.

To explain why this happens, I'm going to have to get technical for a moment. As it turns out, removing the rats' ovaries serves the function of removing \*estrogen, the female sex hormone that is normally \*secreted by the ovaries. (When estrogen was infused back into the rats postsurgery, they did not eat voraciously, become slothful, or grow obese. They acted like perfectly normal rats.) And one of the things that estrogen does in rats (and humans)

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\*circulation: 血流

\*stash: 蓄える

\*estrogen: エストロゲン, 卵胞ホルモン

\*secrete: 分泌する

is influence an \*enzyme called \*lipoprotein lipase — LPL, for short. What LPL does in turn, very simplistically, is to pull fat from the bloodstream into whatever cell happens to “express” this LPL. If the LPL is attached to a fat cell, then it pulls fat from the circulation into the fat cell. The animal (or the person) in which that fat cell resides gets infinitesimally fatter. If the LPL is attached to a muscle cell, it pulls the fat into the muscle cell, and the muscle cell burns it for fuel.

Estrogen happens to suppress or “inhibit” the activity of LPL on fat cells. The more estrogen around, the less LPL will be pulling fat out of the bloodstream and into the fat cells, and the less fat those cells will accumulate. Get rid of the estrogen (by removing the ovaries) and (4) fat cells blossom with LPL. The LPL then does what it always does — pull fat into the cells — but now the animal gets far fatter than normal, because now the fat cells have far more LPL doing that job.

The animal has the urge to eat voraciously because it’s now losing calories into its fat cells that are needed elsewhere to run its body. The more calories its fat cells \*sequester, the more it must eat to compensate. The fat cells, in effect, are hogging calories, and there aren’t enough to go around for other cells. (5) Now a meal that would previously have satisfied the animal no longer does. And because the animal is getting fatter (and heavier), this increases its caloric requirements even further. So the animal is ravenous, and if it can’t satisfy its newfound hunger, it has to settle for expending less energy.

(6) The only way (short of more surgery) to stop these animals from getting fat — dieting has no effect, and we can be confident that trying to force them to exercise would be futile — is to give them their estrogen back. When

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\*enzyme: 酵素

\*lipoprotein lipase: リポタンパク(質)リパーゼ

\*sequester: 隔離する

that is done, they become lean again, and their appetite and energy levels return to normal.

So removing the ovaries from a rat literally makes its fat cells fatten. And (7)this, very likely, is what happens to many women who get fat when they have their ovaries removed or after \*menopause. They secrete less estrogen, and their fat cells express more LPL.

(From *Why We Get Fat: And What to Do About It*, by Gary Taubes)

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\*menopause: 月経閉止(期), 閉経(期)

問 1. 下線部(1)の内容を本文に即して述べなさい。

問 2. 下線部(2)を日本語に訳しなさい。

問 3. 下線部(3)の内容を本文に即して述べなさい。

問 4. 下線部(4)の内容を本文に即して述べなさい。

問 5. 下線部(5)を日本語に訳しなさい。

問 6. 下線部(6)が指示する内容を述べなさい。

問 7. 下線部(7)が指示する内容を述べなさい。

**問題 2** The passage below is adapted from a story about a woman named Gail.

Read the story and answer the questions in English.

It took me a long, long time to become who I am today. When the children were small, I was so busy with their swim teams, lacrosse, basketball, and homework it didn't bother me as much that I was often left alone. As the kids turned into absent teenagers, the fact that my husband was often gone became a source of sadness for me. I would throw these little \*tantrums out of loneliness. When you are married to a doctor, you can expect the phone calls that say, "I'm going to be late" or "We need to cancel our plans." Oncology, of course, is even more unpredictable. It is constant, and though I have enormous sympathy for his patients — many of whom over the years have been friends of mine with breast cancer — it did put a distance between us in our early years. I am very proud of Stan in his work. But a doctor's wife is generally not on the top of her husband's list; some days you don't even make the list.

In the early years of our marriage, I was just too dependent on him and his schedule. He'd say, "I'll be home for dinner at six thirty," then show up at eight thirty. Since we both believed in family dinners, we'd all wait for him, hungry and upset. It was like being stood up for a date every night of my life. It didn't occur to me that I needed to create my own life and that could help ease my blaming him for my own unhappiness.

In spite of an overwhelming schedule, Stan was a very good father to our kids. Although he didn't have time for swim meets after school like I did, he would take our son and daughter and their friends on weekend camping trips. Our kids know how to hunt and fish because of Stan, and to this day it is seldom that we eat any meat or fish that someone in our family didn't catch.

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\*tantrum: 腹を立てること

We have enough moose, duck, venison, caribou, salmon, and halibut in the freezer to feed our neighbors for months.

I am fortunate to be with someone who has given us a wonderful lifestyle, and I know there isn't a lot to complain about. The biggest problem in our marriage was that I was always put in a position where I was waiting for Stan. This changed when the kids went to college, and it was a real turning point for me. We had a neighbor across the street, and she knew that I was alone a lot. She asked me to go to an \*ashram with her in California, a trip that would cost five thousand dollars for the week. Stan said, "No way am I paying that amount of money. Can't you find somewhere less expensive?"

I could have found somewhere cheaper, but I was drawn to this ashram; it was a time about twenty-five years ago when I began to get serious about yoga. Because of Stan's hesitation, I decided I needed to start making my own money. I went back to painting seriously, something I hadn't done in a big way since getting my master's in art in 1963. I started selling my work and teaching art classes. It felt good to become self-sufficient financially and be able to take any trip I wanted to take.

I grabbed back my independence, really grabbed back my whole self, when I got into painting again. I love my husband, and we have many things in common, including four grandchildren, my son's children, who live in Anchorage. We spend about three weeks a year in Alaska visiting them, and this is a very binding time for Stan and me. It makes up for all the time back home we spend apart.

I still tell Stan thank you for refusing to pay for the ashram trip. In order to stay married for a really long time, you have to be yourself, which I really wasn't in the early years. Then my work began to get recognized and I

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\*ashram: (ヒンズー教徒等を対象とした)修行道場または宿泊施設



started getting commissions, and I became confident and strong. In retrospect, I was blaming my marriage for my feelings of emptiness when it really was me that was unfulfilled. In 1986, I got an appointment to be the artist-in-residence for the University of Georgia summer program based in \*Cortona, between Florence and Rome. For six weeks, I would paint in a studio on the top floor of a fourteenth-century palace, with a stunning view of the rooftops and countryside. I would look out over a patchwork of fields of crops and vineyards and sunflowers and corn. The sunflowers move their faces to the sun as the sun passes overhead, and that is an amazing sight to see.

From my summers in Italy, I have become nearly fluent in the language and a different person, which has been a real surprise to have happened at midlife. Stan built me a studio adjacent to our home, and with no children living there anymore it meant I could continue painting for prolonged stretches of time during the year as well, with no interruptions. In order to do what I do, you literally need to shut out the world. You can't answer the phone. You can't check your e-mails. You have to be vigilant about claiming your solitude, and your friends and family need to learn to respect that.

I found my voice through those summers in Italy; my work really was transformed. I was trained in still lifes and figure painting, and my focus now is much more evocative of the passing of time. I am very aware now that I want to create works that are weathered, paintings that look like time has altered the surface like the walls of Cortona. I am an artist who deeply feels the passing of time, and the work is a metaphor for aging. I am certainly aware that time alters the human surface, too.

(From *The Secret Lives of Wives: Women Share What It Really Takes to Stay Married*, by Iris Krasnow)

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\*Cortona: コルトーナ(イタリア中部トスカーナ州にある町)

Question 1. When did the woman, Gail, start feeling sad?

Question 2. What was the event that led Gail to decide to start painting again?

Question 3. What kind of artist does Gail see herself as?

Question 4. Read the following statements and mark T for true or F for false according to the text.

- A. Gail is free to paint in her studio and black out all distractions.
- B. The absence of her husband bothered Gail more when her children were small.
- C. Gail now believes that her feelings of emptiness were because of her marriage.
- D. Gail feels that as time passes, people change.
- E. The time Gail spends with her husband in Alaska is not enough to make up for the number of times he has been absent from her life.
- F. Even if Stan and his children caught fish, they seldom ate it.

**問題 3** Do you agree with the following statement?

University students aged 20 and over should be allowed to drink alcohol on campus during school festivals.

Write an essay in English. If you agree, explain the advantages. If you disagree, explain the disadvantages. Use reasons and examples when giving your opinion.