平成24年度入学試験問題

医　学　科（前期）

英　　語

（注　意）

1. 問題冊子及び解答用紙は試験開始の合図があるまで開かないでください。
2. 問題は全部で3問題あります。
3. 問題冊子は表紙を除いて7ページ，解答用紙は1枚です。
4. 監督者の指示に従い，解答用紙の所定欄に受験番号・氏名をはっきり記入してください。
5. 解答は，必ず解答用紙の指定されたところに横書きで記入してください。
6. 問題冊子は，持ち帰ってかまいません。
7. 下書きは，問題冊子の余白部分を使用してください。

I 次の文章を読み，下の設問に答えなさい。

At age 51, Wayne Joseph was a successful black professional who had worked hard to make a life for himself and his family. He went to a black high school, married a black woman, and raised both his daughter (named Kenya) and son to be proud of their black heritage. Working through the public high school hierarchy to become a principal, he was a pillar of the African-American community. But at the same time, he looked forward to a day where race would not be such a focus of attention, publishing a somewhat controversial article in *Newsweek*, "Why I Dread Black History Month," in which he argued that (1) it would be more useful for black people to promote a color-blind society than separate out their accomplishments.

When Wayne saw an advertisement from a company called AncestryByDNA, he was intrigued by the claim that it would help him discover his original heritage in sub-Saharan Africa. And he thought it might make a good topic for another essay. So he signed up.

When the results came back, (2) Wayne was shaken to his foundation. His DNA analysis report indicated that he was 57 percent Indo-European, 39 percent Native American, 4 percent East Asian, and ZERO percent African.

He had heard that his mother's family included people who "crossed the color line," but zero percent African? He checked to be sure the company had not mixed up any samples — it had not.

He then concluded that he must be adopted — but when he confronted his mother, she quickly disabused him of that idea. He found his birth certificate; in the box for race it said "Negro." And his coffee-colored skin certainly fit with (3) that assumption. But as he learned more about his family's history in New Orleans, it became clear that there were many interesting and diverse roots to his family tree — and perhaps none from Africa after all.

The reaction of others to this news was disbelief. "They wanted to (4) [in, same, keep, had, box, I, me, the] always occupied," he told me. His mother said, "I'm still a colored woman, I'm too old and too tired to change." Wayne's brother said that the test hadn't been done on *his* DNA, so therefore he was still black. Wayne's son and daughter were shocked. Some of his black friends teased him about his essay in *Newsweek* from a few years earlier: "We should have known you weren't really black," they said. High school students seeking to disregard his instructions on their proper conduct were heard saying, "He never seemed black to us." Most dramatically, Wayne's second wife, who was white, said, "You have to be black; I defied my mother to marry you!"

(5) Over the five years since this news reached him, Wayne has gradually come to peace with

his identity — but he says it helped that he was already 51 years old when he learned this information, and that he "would have needed therapy" if he had made the discovery 30 years earlier. Not long after his discovery, his mother, his wife, and his best friend all died within a period of nine months. Wayne noted that none of them talked about their race when they were dying; it just didn't matter very much.

Wayne has attempted to use his own experience with DNA testing in conversations with students in the black high school to argue that race is irrelevant — but identification with race is important to them, and they are not ready to give it up.
(6)

〔註〕

defy：反抗する

disabuse：(迷い・誤解などを)解く

hierarchy：階層制，序列

intrigue：興味(関心)を抱かせる

pillar：(活動などの)中心となる人物

設　問

1. 下線部(1)を日本語に直しなさい。
2. 下線部(2)の理由を具体的に日本語で説明しなさい。
3. 下線部(3)の内容を具体的に日本語で説明しなさい。
4. (4)の〔　〕内の下線部の語を正しく並べ替えなさい。
5. 下線部(5)を日本語に直しなさい。("this news"は具体的に訳すこと。)
6. 下線部(6)を日本語に直しなさい。("them" "they" "it"の内容が分かるように訳すこと。)

Ⅱ 次の文章を読み，下の設問に答えなさい。

Henrietta's cells went up in the second satellite ever in orbit, which was launched by the Russian space program in 1960, and almost immediately afterward, NASA shot several vials of the cells into space in the *Discoverer XVIII* satellite. Researchers knew from simulated zero-gravity studies using animals that space travel could cause cardiovascular changes, degradation of bone and muscle, and a loss of red blood cells. They also knew radiation levels were higher beyond the ozone layer. But they didn't know what effects any of this would have on humans: Would it cause cellular changes, or even cell death?

When the first humans went into orbit, Henrietta's cells went with them so researchers could study the effects of space travel, as well as the nutritional needs of cells in space, and how cancerous and noncancerous cells responded differently to zero gravity. What they found was disturbing: in mission after mission, noncancerous cells grew normally in orbit, but Henrietta's cells became more powerful, dividing faster with each trip.

And Henrietta's cells weren't the only ones behaving strangely. Since the start of the decade, researchers had been noticing two new things about all cultured cells. First, it seemed that all normal cells growing in culture eventually died or underwent spontaneous transformation and became cancerous. This phenomenon was exciting for researchers trying to understand the mechanisms of cancer, because it suggested that they might be able to study the moment a normal cell becomes malignant. But it was disturbing for those trying to use cell culture to develop medical therapies.

George Hyatt, a Navy doctor working with the National Cancer Institute, had experienced this phenomenon firsthand. He'd cultured human skin cells for treating badly burned soldiers, then created a wound on a young volunteer officer's arm and smeared the cells across it, hoping they'd grow to form a new layer of skin. If it worked, it might mean doctors could use skin-cell transplants to treat wounds in the field. The cells did grow, but when Hyatt biopsied them a few weeks later, they were all cancerous. He panicked, removed the cells, and hadn't tried transplanting skin cells since.

The other unusual thing scientists had noticed about cells growing in culture was that once they transformed and became cancerous, they all behaved alike — dividing identically and producing exactly the same proteins and enzymes, even though they'd all produced different ones before becoming malignant. Lewis Coriell, a renowned cell culturist, thought he might have an explanation. He published a paper suggesting that perhaps "transformed" cells behaved the same not because they'd become cancerous, but because they'd been contaminated by something — most likely a virus or bacterium — that made them behave

(1) (2) (3)

similarly. Almost as an aside, he pointed out one possibility that other researchers hadn't considered: all transformed cells seemed to behave identically to Henrietta's cells, he wrote, which could mean that the Henrietta's cells were the contaminants.

Soon after his paper was published, Coriell and a few other top tissue culturists called an urgent meeting to talk about the state of their field, which they worried was becoming a disaster. They'd mastered the techniques of cell culture and simplified them to such a degree that, as one researcher put it, they'd "made it possible for even the rank amateur to grow a few cultures."

In recent years, using tissue samples from themselves, their families, and their patients, scientists had grown cells of all kinds — prostate cancer, appendix, even bits of human cornea — often with surprising ease. Researchers were using that growing library of cells to make (4) historic discoveries: that cigarettes caused lung cancer; how X-rays and certain chemicals transformed normal cells into malignant ones; why normal cells stopped growing and cancer cells didn't. And the National Cancer Institute was using various cells, including Henrietta's cells, to screen more than thirty thousand chemicals and plant extracts, which would yield several of today's most widely used and effective chemotherapy drugs, including Vincristine and Taxol.

〔註〕

appendix：虫垂

aside：余談

biopsy：採取する，生検を行う

cancerous：癌の

cardiovascular：心臓血管の

cellular：細胞の

chemotherapy：化学療法

contaminate：汚染する

contaminant：汚染物質

cornea：角膜

culture：培養する，培養

degradation：衰え

enzyme：酵素

malignant：悪性の

prostate：前立腺の

renowned：有名な

screen：選別する

simulate：模擬実験をする

smear：塗る

Taxol：タクソール(イチイから得られる抗がん剤)

tissue：組織

vial：小型の薬瓶

Vincristine：ビンクリスチン(急性白血病などの治療に用いる薬)

設　問

1. 下線部(1)を日本語に直しなさい。("this"は具体的に訳すこと。)
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3. 下線部(3)の内容を具体的に日本語で説明しなさい。
4. 下線部(4)の内容を具体的に日本語で説明しなさい。

Ⅲ 次の文章の空欄(1)～(8)に入る最も適切な語を下の語群から選び，必要に応じて適切な形にして，解答用紙に書き入れなさい。(同じ語を2度以上使わないこと。)

Neuroscientists weren't the first to discover that (1)ing your eyes on something is no guarantee of seeing it. Magicians figured this out long ago, and perfected ways of leveraging this knowledge. By directing your attention, magicians perform sleight of hand in full view. Their actions *should* (2) away the game — but they can rest assured that your brain processes only small bits of the visual scene, not everything that hits your retinas.

This fact helps to explain the colossal number of traffic accidents in which drivers hit pedestrians in plain view, collide with cars directly in front of them, and even intersect unluckily with trains. In many of these cases, the eyes are in the right place, but the brain isn't seeing the stimuli. Vision is more than (3)ing.

We often know one feature about a stimulus while simultaneously being unable to answer others. Say I were to ask you to look at the following and tell me what it is composed of: ||||||||||||. You would correctly tell me it is composed of vertical lines. If I were to ask you *how many* lines, however, you would be (4) for a while. You can see *that* there are lines, but you cannot tell me *how many* without considerable effort. You can know some things about a scene without knowing other aspects of it, and you (5) aware of what you're missing only when you're asked the question.

What is the position of your tongue in your mouth? Once you are asked the question you can answer it — but presumably you were not aware of the answer until you asked yourself. The brain generally does not need to know most things; it merely knows how to go out and retrieve the data. It computes on a *need-to-know basis*. You do not continuously (6) the position of your tongue in consciousness, because that knowledge is useful only in rare circumstances.

In fact, we are not conscious of much of anything until we ask ourselves about it. What does your left shoe feel like on your foot right now? What pitch is the hum of the air conditioner in the background? As we saw with change blindness, we are unaware of most of what should be obvious to our senses; it is only after deploying our attentional resources onto small bits of the scene that we become aware of what we were missing. Before we (7) our concentration, we are typically not aware that we are not aware of those details. So not only is our perception of the world a construction that does not accurately (8) the outside, but we additionally have the false impression of a full, rich picture when in fact we see only what we need to know, and no more.

〔註〕

collide：ぶつかる，衝突する

colossal：けた外れの，とてつもない

deploy：有効に利用する

intersect：交わる，交差する

leverage：活用する

neuroscientist：神経科学者

retina：網膜

retrieve：検索する，引き出す

sleight：手練，術策

〔語　群〕

become	engage	give	look
place	represent	stick	track