

科目

# 外国語(英語)

医学部医学科

## 注 意

1. 開始の合図があるまで、この問題冊子を開いてはいけません。
2. 問題は1ページから11ページにわたっています。問題冊子に不備がある場合は、直ちにその旨を監督者に申し出てください。
3. 解答用紙は3枚で、問題冊子とは別になっています。解答は、すべて解答用紙の所定の欄に記入してください。指定された以外の解答欄・解答用紙に記入した場合は、評価(採点)の対象としません。
4. 受験番号は、3枚の解答用紙のそれぞれの上部の欄に記入してください。
5. 解答用紙は持ち帰ってはいけません。
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1

Read the following passage and answer the questions that follow. All questions must be answered in English. Words marked with an asterisk \* are defined at the end of this passage in the Notes section.

I lost my previous husband to cancer when he was 36, followed by my mother. I, too, am a cancer survivor. My husband died six months after he was diagnosed with cancer—after a lung removal, a second **thoracic**\* surgery, three brain operations, radiation, and **chemotherapy**\*. His suffering was so unbearable that he asked me to do what he couldn't do for himself after he became paralyzed on one side—he begged me to bring our gun from home and shoot him. His doctors argued fiercely in front of us over [him / treatments / to / subject / more experimental / whether to]<sup>(A)</sup>. He died blind, deaf, paralyzed, and half the man he had been in weight.

There was so much wrong with what he experienced. I felt there had to be other ways to ( B ) cancer and cancer treatment. I was extremely ( C ) by Azra Raza's 2019 book *The First Cell* and her honest portrayal of her life in cancer research and treatment. It was one of the most honest books on cancer I had ever read.

Raza started her career studying a kind of **leukemia**\*. Today she is a professor of medicine at Columbia University in New York City. She caused a defensive firestorm in cancer medicine with the publication of her book.<sup>(D)</sup> She took to task the fact that with many cancers, treatments have not progressed past the same standard protocol used a hundred years ago—chemotherapy, radiotherapy, or a combination of the two—what she calls the “primitive treatments of cut, poison, and burn.” The side effects are pain, toxicity to organs, weakened **immune system**\*, the risk of secondary tumors, and, too often, inadequate **palliative care**\*, anguish, and death.

Raza has been ( E ) for cutting the overall mortality rate of cancer by restricting its growth through prevention and early detection—by finding the first cell. She's built an impressive consensus about the idea of early detection. She put together ‘The **Oncology**\* Think Tank’ with 30 members that include some of the most important institutions and individuals in cancer research. She has not only raised awareness; she has raised millions, \$18 million in fact. She's reached out to over 6,000 biotechnology companies and given over 150 talks in the past year alone. Her plan is to “[chasing / finding / the cancer paradigm / to / the last cell / turn / the first / from]<sup>(F)</sup> and eliminating it within three years through this coalition and careful scientific research.” I recently ( G ) up with Raza to learn more.

**Nalls**\*: Although your book is called *The First Cell*, you say cancer doesn't start with one

cell—it starts with two. Can you explain that?

**Raza:** When I was a teenager reading about cancer, what enchanted me intellectually was the fact that our bodies give birth to a cell that has found the key to immortality. It becomes a new species. It now follows the Darwinian principles and evolves by natural selection and survival of the fittest. No other life form has broken this code and become immortal. A cancer cell has. I was totally convinced that once we unlock the secret of the cancer cell, we will find the key to agelessness. We can live forever.

For practically 50 years I have been obsessed with the question of how this feat <sup>(H)</sup> is accomplished by the first cell. Here's what I have concluded. [ ① ]. There must be a stressful environment pushing cells to develop strategies to survive. Change or die. Until one changes. It does not have time to evolve and slowly modify its behavior. It must do a lot very suddenly. One way to do it is to hijack another cell and combine forces to develop into a new species.

This whole idea of the first cell resulting from fusion is similar to what the great **Lynn Margulis\*** proposed regarding the fusion of two unicellular organisms to form the first multicellular one. [ ② ]. After existing as one-celled creatures for several billion years, like tiny bacteria, two of them fused. Now a multi-celled, hybrid creature was born. This First Cell combining two cells has given rise to the millions of animal and plant species we see today. The proof of this symbiotic merger is the presence of mitochondria in our cells. When Margulis first proposed her theory, she was ridiculed and ignored.

**Nalls:** What's your theory?

**Raza:** I am proposing a similar scenario. Cancer is such a dramatically different cell compared to its normal counterpart that its initiation might involve as dramatic a step as a merger of two cells.

I imagined something like a chronic **hepatitis B or C virus\*** infection of the liver. It produces a lot of inflammation in the area. Like wounds that don't heal, normal liver cells are being killed in massive waves by the virus. They are profoundly stressed and so develop a new survival strategy or die. To escape the horrific, poisonous micro-environment of the liver, the cell needs a hiding place. Where? A new arrival is the blood cells whose job is to engulf and chop up such stressed cells. [ ③ ]. A stressed liver cell engulfed by the blood **macrophage\*** for destruction instead ends up fusing with the host. The liver cell not only manages to survive inside the blood cell, it fuses its **chromosomes\*** with those of the host and **re-engineers\*** them.

Such a hybrid cell then becomes a giant cell with multiple **nuclei**\* and eventually gives birth to a series of smaller cells that stream out and represent the cancer. The early giant cells are reduced to a very few, and the vast majority are the smaller cells. When cancer is diagnosed, only rare giant cells are detectable. By studying advanced cancers, we have missed all the early events associated with cancer initiation. If treatment kills off the small cells, cancer **relapse**\* occurs with the appearance of giant cells once again, and the whole cycle is repeated. Was there fusion again, or did the original giant cells survive?

**Nalls:** You write that cancer is “vicious and self-obsessed” and that it learns to grow faster, stronger, and smarter with each successive division. But do we really know what’s happening?

**Raza:** No. The bottom line is that nobody knows for sure how cancer begins. Some people think it’s one or two genes, at most four or six. Other people think it’s the whole genome, it’s all chromosomes, which contain thousands of genes. Other people think, “No, it has nothing to do with the cell itself. It’s the microenvironment, the tissue of field theory.” I mean, nobody really knows. Nobody knows if it starts in one cell or two cells. We don’t know.

**Nalls:** What’s the difference between a normal cell and a cancer cell?

**Raza:** The most important differences between a normal and a cancer cell are that cancer cells can evade growth inhibitory signals and continue to divide unchecked, evading the immune system. They can travel out of their organ of origin and land in other organs, a process called metastasis.

So, how does a normal cell take so radical a turn? For all our significant investment in research, we can’t answer even the most basic questions about **carcinogenesis**\*. To explain how a cancer cell acquires these dramatic **malignant**\* characteristics, we urgently need a new way to look at the entire cancer paradigm. The new way is to be less reductionist. And to give complexity its due. Cancer is a spectacularly complicated problem.

Cancer is a silent killer. By the time of diagnosis, there are already millions and millions of cells. We are planning a revolution. A whole new approach is evolving as we speak. We plan to find these first cells by repeatedly screening people who don’t have cancer yet but who are at high risk of developing one. Only <sup>(1)</sup>[able to / will / we / we / the cells / be / after / have caught] see how their programs differ from normal cells.

(Gayil Nalls, April 13, 2022, *Nautilus*, extracted and slightly modified.)

**\*Notes:**

thoracic: relating to the chest

chemotherapy: the use of chemical medicine to treat or control cancer

leukemia: cancer of the blood

immune system: a system that protects the body from invading foreign substances

palliative care: medical treatment of pain, not to cure a disease

oncology: the branch of medicine concerned with the study and treatment of tumors

Nalls: Gayil Nalls, the author of this passage

Lynn Margulis (1938-2011): an American evolutionary theorist and biologist

hepatitis B or C virus: viruses that cause inflammation of the liver

macrophage: a large immune cell that surrounds and digests debris and small cells  
invading from outside the body

chromosome: a threadlike strand of DNA in the cell nucleus

re-engineer: change or improve

nuclei: the plural form of a nucleus, the specialized part of the cell containing DNA and  
responsible for growth and reproduction

relapse: the return of disease

carcinogenesis: the development of a cancer

malignant: very dangerous or harmful in influence or effect

(1) Put the words in the square brackets of (A), (F), and (I) into the correct order.

(2) Fill in each blank, ( B ), ( C ), ( E ), and ( G ) with the most appropriate word from the list below. Change the word form if necessary. Use each word only once.

press

break

take

estimate

address

gather

distract

complicate

catch

(3) Select the meaning most likely to correspond to (D) She caused a defensive firestorm in cancer medicine with the publication of her book in the context of this passage. Write the letter of the meaning you have selected.

- (a) Her book described a novel cancer treatment that people cast a dubious glance at.
- (b) For better or worse, the oncological society paid remarkable attention to her.
- (c) Her book was so influential on cancer treatment that the medical society praised her.
- (d) The cancer treatment in her book was so provocative that the readers were quite angry about it.
- (e) She created a huge controversy because of her criticism of current cancer treatment.

(4) What does (H) this feat refer to? Complete the underlined part on the answer sheet within 10 words.

(5) Select the most appropriate sentence for each blank [ ① ] through [ ③ ] from the list below. Write the letter corresponding to the sentence on the answer sheet.

- (a) Monitor wellness to find illness
- (b) Cooperation rather than competition brought a revolution
- (c) What is wrong is that we are waiting too long to find cancer
- (d) The first cell does not arise out of nowhere
- (e) This is where the union can happen



- (6) The following summarizes the similarities between Raza's theory of cancer cell birth and liver tissue infected by hepatitis B or C virus. Fill in each blank ( a ) through ( d ) below with an appropriate word or words from the passage to complete this summary. Change the word form if necessary.

A ( a ) is likely to force a normal cell to become cancerous then the first cancer cell is born. This change is accomplished by ( b ) another cell and merging with it to become a different cell. Similarly, when the virus attacks liver cells, they are in such a ( a ) that those liver cells escape to the ( c ). There, liver cells survive, with their ( d ) fusing with those in the ( c ), and change their genetic structure.

- (7) Select all the sentences that correspond to the passage's story. Write the corresponding letter(s) on the answer sheet.

- (a) The author's previous husband died of cancer half a year after her mother passed away.
- (b) It is difficult to see how cancer begins.
- (c) The reappearance of cancer cells is responsible for the fusion of different types of cells.
- (d) More light should be shed on cancer initiation than on the advanced stages of cancer.
- (e) Cancer cells continue to divide unchecked, often traveling to distant locations.
- (f) Cancer cells don't follow Darwinian principles.

2

Read the passage below and answer the questions. The words with an asterisk \* are defined in the Notes section.

On a cold December morning in 2007, Michael Clemons donned a white beard, red suit and black boots and went to an orphanage in Tokyo to hand out Christmas gifts.

“Prior to that visit, I’d never thought about orphans,” says Clemons, who comes from California. “But I couldn’t help but notice that most of the kids were of mixed heritage. I hoped that was not the reason they were in the home.”

While the Santa suit is long gone, the joy he felt handing out presents and the sincere gratitude he received from the kids inspired Clemons to learn about the more than 40,000 children living in Japan’s so-called institutional homes. Many of the children who live in institutional homes are victims of abuse or neglect. While some are true orphans whose extended family can’t or won’t take them in, many more have been abandoned due to poverty, special needs or health issues.

Clemons spent 10 years volunteering with various NPOs and through corporate social responsibility activities at his former workplace, Barclays. In 2018, he founded YouMeWe, a nonprofit organization that works directly with roughly 300 orphans to prepare them for a successful, independent existence. Through his work with these institutionalized children, who are often pitied as “*suterareta kodomo* (throwaway children)” by society, Clemons has come to believe that they do not need our pity but ( A ) our respect. He views them as hidden assets.

“They are getting on with their lives and don’t feel sorry for themselves,” he says. “While they are in that safe environment, we have a chance to teach them things that empower them.”

To Clemons, empowerment begins with technology, but few children in institutional homes have regular access to computers. Through YouMeWe, he partners with banks, businesses and software firms to not only supply computers to the homes but also guide them through programs that will teach the children to become responsible global citizens. It starts with the youngest of them: YouMeWe partners with the Japanese distributors of the robot toy Cubetto to teach computer basics to kindergarten-aged children, and the online program Night Zookeeper helps English-speaking children maintain their first language while improving their overall skills in writing and critical thinking.

## Continued learning

YouMeWe’s coaching adapts as the children get older, gradually increasing the focus on computer programming and business skills as well as preparing the children for independent life after they age out of the system at 18. They use MoneyConnection, a financial literacy program designed by Shinsei Bank to teach budgeting and money management, and Benesse career assessment to explore professions best suited to their skills and interests.

“You can hear the delight right away in their voices,” Clemons says. “I can be a teacher! I can be a banker!’ It’s really opening their eyes to their potential.”

[ B ] In 2021, The Ministry of Health, Labor and Welfare released findings from a survey of “care leavers,” a term for children who have aged out of the system. The study revealed that 36% of respondents enrolled in some form of higher education after leaving an institutional home, but only 2% graduated from a four-year university program, while 10.6% finished junior college or **vocational school**\*. This is a marked contrast from the general population, where enrollment is 80% with a completion rate of 93%. On top of that, a majority of the respondents were **living paycheck to paycheck**\* or in debt.

Clemons [digital expertise / on / lift / poverty / expects / YouMeWe’s / teaching / out of / these children / will / emphasis]<sup>(C)</sup> by developing marketable skills for whatever job they aspire to, and he has already seen some success. Fifty percent of the kids YouMeWe supports have enrolled in higher education and 48% have found work. The NPO also has a partnership with the global networking company Colt—YouMeWe’s first donor—to offer mentoring and tutoring, as well as jobs to qualified candidates.

## The legacy of trauma

Many children placed in institutional homes suffer from lingering trauma. Transitioning to a high-pressure work environment or independent living can aggravate that trauma, so Clemons offers some care leavers temporary work in a comfortable, familiar environment that allows them to develop a work ethic at their own pace.

“Nobody asked to be born, but when they are born they deserve everything life has to offer,” says Clemons, adding that the children have plenty to offer society in return.

[ D ] He tosses out ideas for making their lives more valued by the broader population, like a farmer sowing seeds.

“Since Japan has so many people over 65 and so few under 15,” he says, outlining one idea, “we asked ourselves, ‘Can this upside-down triangle be turned over? Can we get the kids to teach the elderly about computers?’”

With every idea offered, Clemons is careful to stress that these are still kids we're talking about, and having fun is as important as developing marketable skills. [ E ] During the summer, many children take vacations with their families. Those living in institutional homes do not, and Clemons says this puts them at a disadvantage. Children with families grow up with memories of their travels, photos of their growth and experiences that develop character. These experiences introduce them to new interests, enhance their abilities and provide connections with other people.

For nearly 15 years, Clemons and various partners have addressed this ( F ) through Designing Artists Academy (DAA), a summer camp where artists from around the world offer children from institutional homes the opportunity to paint, dance, cook and create via a range of artistic outlets. The camp is first and foremost a fun getaway, but it adds an additional element to the **STEM education**\* taught at school and the digital emphasis of YouMeWe. Since the children's talents are diverse, DAA is an opportunity for them to explore various interests while producing tangible memories. This year, about 50 kids will participate in the DAA summer camp from August 1 to 5, hosted by the British School in Tokyo.

### **The family you choose**

Despite the gifts, skill development and summer camp, Clemons says the children are most grateful for the attention they receive from YouMeWe volunteers, which makes them feel like their lives matter. Staff at the homes come and go. Besides the nuns at the Catholic-run homes, YouMeWe's volunteers are often the only consistency the children have throughout their adolescence. It is not surprising, then, that some return to the NPO for help. Under the umbrella term Empower Village, Clemons offers an online "home" where care leavers can find support as varied as accompaniment to a doctor's appointment to counseling to navigating food banks.

Clemons' long-term goal is for society to invest more in parenting-skills training. That would not only be a step to reuniting some families, but it could reduce incidences of abuse and prevent children from being placed in the homes in the first place.

In 2007, Clemons played Santa for a day and gave the kids some presents. Since then, he and YouMeWe have offered the children tools and experiences that allow them to flourish and understand that their lives do, indeed, matter. And that gift lasts a lifetime.

(Linda Gould, 25 April 2022, *The Japan Times*, slightly modified)

**\*Notes:**

vocational school: a school that teaches skills that are necessary for particular jobs

living paycheck to paycheck: using one's entire earning for living and having nothing left over to save

STEM education: education in science, technology, engineering and mathematics

(1) Select the most appropriate word for each blank ( A ) and ( F ) from the list below. Write the letter corresponding to the word on the answer sheet.

( A ) : (a) offer  
(b) show  
(c) demand  
(d) promote  
(e) deserve

( F ) : (a) suffering  
(b) fault  
(c) emphasis  
(d) discrepancy  
(e) venue

(2) Select the most appropriate sentence for each blank, [ B ], [ D ], and [ E ] from the list below. Write the letter corresponding to the sentence on the answer sheet.

- (a) On the other hand, YouMeWe volunteers help children develop their computer skills.
- (b) He repeatedly returns to the term “throwaway children” and gets offended at its short-sightedness.
- (c) Even in play, though, Clemons sees a chance for empowerment.
- (d) It is most important for institutionalized children to aspire to be successful in business.
- (e) Without a family network, turning those possibilities into realities can seem impossible.

(3) Put the words in the square brackets of (C) into the correct order.

(4) Answer these questions about the underlined part (G) in English.

(a) What does the underlined phrase (G) the only consistency mean in this passage?  
Complete the underlined part on the answer sheet in about 20 words.

(b) What does the consistency enable some children to do after leaving an institutional home? Complete the underlined part on the answer sheet.

(5) Write an English essay of about 250 words in response to both of the following questions

(a) and (b). If you need to quote what is written in the article, use single quotation marks ( ' ') to indicate the parts you quote.

(a) What interests you most regarding Clemons' activities and beliefs? Why?

(b) What do you think is most important for the futures of institutionalized children?  
Why?



