

平成17年度大学院医学研究科（1回目）

医学・生物学一般試験（問題用紙1枚、解答用紙2枚）

以下の4問題から2問題を選択して解答しなさい。1問題につき1枚の解答用紙を使用すること。紙面不足の場合は裏面使用も可。

1. 昨年はSARS、今年は鶏インフルエンザなどの感染症が社会問題となっている。また、特異な感染症であるBSEも、アメリカ産の牛肉輸入禁止措置がとられるなど、やはり大きな社会問題と化している。これらの新興感染症の特徴を述べて、その対策に関する考察をしなさい。
2. DV (domestic violence) について知るところを述べなさい。
3. 疾病を内因（素質）と外因（環境因子）の二面から論じなさい。
4. 生体は生命の維持と機能の発現のためにその内部環境を一定に保とうとする。Walter B. Cannon (1929) はこれを「生体の恒常性 homeostasis」と呼んだ。生体の恒常性維持のために働いている機構の具体例を1つ挙げ、説明しなさい。

(Japanese)

Read the following sentences and answer the questions below in Japanese.

Francis Crick died on 28 July at the age of 88

Biological research in the late 1940s was moving in several different directions, but making little progress. A central, unsolved problem was how genetic information is transmitted from an organism to its offspring. There was little awareness in the community at large that this problem could be attacked at the molecular level, and most scientists thought that genes were proteins. In the mid-1940s, Oswald Avery and colleagues had presented evidence that DNA might be the hereditary material, but that conclusion was not widely accepted. What was needed was a catalytic event.

That event was the arrival of Jim Watson at Cambridge in 1951. Crick was then 35 years old and Watson 23, but both shared a passion for understanding the molecular basis of genetics. They were convinced that DNA was the genetic material.

What happened next is widely known.

Crick's familiarity with the X-ray diffraction patterns produced by helical structures, the access to DNA diffraction patterns taken by Rosalind Franklin, and Watson's intuitive attempts to pair nucleotide bases, facilitated by Jerry Donohue's critical intervention regarding their correct structure, led to the double-helical model of DNA in an astonishing few weeks. Their method, largely adopted from Linus Pauling, involved using accurate metal skeletal atoms to assemble a double helix, with its component chains running in opposite directions and joined by complementary base pairs in the centre. The complementarity of the two strands in the structure provided a mechanism for inheritance, in that each single strand could act as a template for assembling its complement - leading to two identical duplex molecules. The information is in the sequence of the bases.

In a paper circulated in the mid-1950s, Crick pointed out that nucleic acids seem to associate naturally with other nucleic acids. Thus he proposed that there might be 20 classes of 'adaptor' RNA molecules, which could line up along a template nucleic acid and each bind to a specific amino acid. Although most people were sceptical, such molecules, now called transfer RNAs, were soon discovered by Mahlon Hoagland and Paul Zamecnik. Thus, by logical deduction and intuition, Crick uncovered a key link between the RNA copy of DNA (messenger RNA) and the amino acids in protein synthesis.

Crick was a theorist rather than an experimentalist, and he believed strongly that theory is necessary in biology not only to organize and explain phenomena, but also to define the questions that need to be answered. After defining such questions, he then stimulated (sometimes nagged) experimentalists to answer them. Although he was devoted to theory, generally his theoretical notions were not especially quantitative. Rather, he sought to abstract the essential and very simple mechanisms from the detail.

Francis said, famously, about his work with Watson that, "It's true that by blundering about, we stumbled on gold, but the fact remains that we were looking for gold".

Q1. Describe the collaboration of the team that led to the finding of the double-helical model of DNA.

Q2. Explain how could the information housed in DNA be used to produce protein.

Q3. What kind of theorist was Crick?

Q4. Describe briefly your objective to apply for admission to Graduate School of Medical Sciences, Nagoya City University.

平成17年度大学院医学研究科 (1回目)
外国語試験問題・解答用紙 (日本人)

受験番号

1/2

問 パラグラフ A) から E) よりなる文章を読み、以下の設問に答えなさい。

A) I live in northern Tochigi Prefecture, in the Nasu highlands, just a 20-minute drive from the Shikanoyu hot spring. Several times a year, I take advantage of the short distance and spend some time immersed in the spa's smelly, milk-white waters, which are laden with sulfur compounds and other minerals. The strong "rotten egg" odor and the horrific taste of the waters leave no doubt that this is a very genuine mineral spa. Despite the smell, and the cramped conditions, most people love a soak in those waters as a way to relax and unwind.

B) Much to their dismay, many people have learned recently that the hot springs they had bathed in were not, in fact, mineral springs. Rather, they were just heated tap water, despite signs to the contrary. In some cases, chemicals were even being added to the water by hotel staff to simulate a natural mineral spa. The authorities have taken action and are warning such places to properly identify their waters.

C) However, should the customers have been worried about water composition in the first place? Of course, soaking in hot water can help ease muscle and joint pain by boosting circulation and certain types of spring may improve some skin conditions. But many of the claims about the medicinal benefits of hot springs go much farther. For example, the Web site for the spas in Nasu mentions, among other things, that the waters can help cure chronic diarrhea, gastrointestinal disorders, tuberculosis, cerebrovascular diseases, hydrogen intoxication (whatever that is) and "female health problems."

D) Frankly, I'm quite skeptical that any of that is true. There is simply no solid scientific evidence that soaking in a mineral hot spring is any more beneficial for internal ailments like these than soaking in the bathtub at home. But it's almost impossible to make a fair study of this because hot springs tend to be located in gorgeous areas and have extensive facilities that provide a pleasurable and relaxing experience regardless of what's in the water. One is completely refreshed, both mentally and physically. It's hard not to believe that you're getting better somehow when you sit in one.

E) For centuries, people around the world have believed in the medicinal properties of hot springs. For most people, however, the water compositions of the spa that they are soaking have not been a serious issue. People may have been smartly and even scientifically taking advantage of the placebo effect, believing "unconsciously" in its actually medicinal properties. Even if you're feeling great already, why not find some time this week to hit a local spa and unwind from any stress in your life? Just make sure you take any posted claims about water content or health benefits with a grain of salt!

設問1. 次のパラグラフを挿入するとすれば何処が適切か。適切なものに○をつけよ。

This is related to the placebo effect, a well-documented medical phenomenon. Give a sick person a sugar pill, but tell them it's a powerful medicine. More often than not, they'll tell you the next day that they feel better. Also, any physician can tell you that a patient's state of mind is also very important to treating disease. So in that regard, a daily trip to soak for an hour in a "rotenburo" surrounded by gorgeous mountains or overlooking the ocean is no doubt a prescription that would help just about any sick person feel better!

- () Aの前
- () AとBの間
- () BとCの間
- () CとDの間
- () DとEの間
- () Eの後

設問2. パラグラフDに it's almost impossible to make a fair study of this とあるが、これを検証するにはどのようなデザインの研究が必要かを述べなさい。

設問3. パラグラフEに believing "unconsciously" とあるが、なぜ "unconsciously" なのかを説明しなさい。

設問4. この文章で著者が述べようとしていることを100文字以内（「、」「。」も含める）で要約しなさい。

(Over sea)

Read the following sentences and answer the questions below either in English or Japanese.

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Biological research in the late 1940s was moving in several different directions, but making little progress. A central, unsolved problem was how genetic information is transmitted from an organism to its offspring. There was little awareness in the community at large that this problem could be attacked at the molecular level, and most scientists thought that genes were proteins. In the mid-1940s, Oswald Avery and colleagues had presented evidence that DNA might be the hereditary material, but that conclusion was not widely accepted. What was needed was a catalytic event.

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Question 1. Check the most appropriate place to insert the paragraph below.

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- () Before A
- () Between A and B
- () Between B and C
- () Between C and D
- () Between D and E
- () After E

Question 2. In paragraph D, it says that it's almost impossible to make a fair study of this. What kind of study is necessary for examining this?

Question 3. In paragraph E, it says believing "unconsciously". Why does the author say "unconsciously" here?

Question 4. Make one-sentence summary of what the author wants to say by this document.

平成 17 年度大学院医学研究科 (1 回目)
外国語試験問題・解答用紙 (外国人-英語)

受験番号

論

1/2

Read the following paragraphs (A to E) of a document and answer the questions.

A) I live in northern Tochigi Prefecture, in the Nasu highlands, just a 20-minute drive from the Shikanoyu hot spring. Several times a year, I take advantage of the short distance and spend some time immersed in the spa's smelly, milk-white waters, which are laden with sulfur compounds and other minerals. The strong "rotten egg" odor and the horrific taste of the waters leave no doubt that this is a very genuine mineral spa. Despite the smell, and the cramped conditions, most people love a soak in those waters as a way to relax and unwind.

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