

注意：解答用紙は2枚あります。それぞれに学籍番号と氏名を記入してください。

問題1

次の文章は"Researchers Testing New Cancer Treatment"と題した記事で、5つのパラグラフから構成されている。この英文に関する以下の間に、原文に則して日本語で答えなさい（直訳でなくてよいが、原文の内容を十分に踏まえて書くこと）。

Liver cancer is the sixth most common cancer in the world, and now researchers are developing new forms of treatment. If tests show you have liver cancer, there are several ways to treat the disease. One is removing the cancerous part of the liver. The other is having doctors replace the organ through a transplant operation.

Chemotherapy and radiation treatments are also used to treat liver and other cancers. Those treatments require the patient to take strong drugs or exposure to radiation. The drugs or radiation destroy the cancer cells. But then, the healthy cells around the tumor are damaged.

Now scientists are working on an experimental, minimally invasive treatment. They say it reduces the chances of harming the patient. This treatment involves the use of natural, non-poisonous chemicals from plants. That is why the researchers call it a "green" method for fighting cancer.

Kattesh Katti is a professor of radiology and physics at the University of Missouri's School of Medicine. For more than 10 years, he has studied the use of nanotechnology to fight cancer. Nanotechnology is the science of making things unimaginably small. For this study, Katti used extremely small objects to target and destroy precancerous tumor cells in the livers of mice and human cells in the laboratory.

Kattesh Katti used very small particles of gold. The gold was covered in a protective material called gum arabic. It comes from an acacia tree. He says the particles attract precancerous and cancer cells. Those cells are far more affected by lower levels of heat than healthy cells. Once the particles travel to and connect with the cells, they are heated with a laser. That destroys the cancer cells, but the healthy ones around them live.

chemotherapy – n. treatment for disease like cancer that uses strong chemicals to kill the disease

minimally invasive – adj. affecting the body in the smallest possible way

exposure – n. the fact or condition of being affected by someone or something else; public attention

precancerous – adj. tending to become cancerous

attract – v. to pull toward oneself or itself

(Science in the News, Voice of America Learning English 2017年1月8日の放送原稿より抜粋)

(1) 第1パラグラフにおいて、もし肝臓癌と診断されたら、どのような治療方法があると述べているのか、答えなさい。

(2) 化学療法と放射線治療には、どのような問題があると述べているのか、答えなさい。

(3) 研究者たちは新しい治療法のことを、なぜ green method と呼ぶのか、説明しなさい。

(4) Katti 教授が用いているナノテクノロジーとはどのようなものか、説明しなさい。

(5) Katti 教授が用いている方法で、なぜ癌細胞だけを破壊することができるのか、説明しなさい。

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問題2

Answer the following questions in English using more than 50 but less than 100 words for each question.

(1) Describe your research activities.

(2) What kind of practical use is expected when your research is completed ?

(3) How is your research related with the important challenges in this century (global warming, food crisis, population explosion, energy depletion, digital divide, etc.) ? If you cannot answer the question, you may describe one of these challenges.