2023年10月第2週　高校生ニュース教材　単語テスト　　　　　 　　　

音声を聴いて、次の単語（熟語）を書きとって下さい。また、その意味を日本語で書いて下さい。

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|  | words/phrases | meaning |
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・・・・・・・・・・・・・・・・切　り　取　り　・・・・・・・・・・・・・・・・・・

1. vaccine ワクチン 　　　　＊アメリカ発音は［væksíːn］　イギリス発音は[vǽksi:n]
2. vaccination 予防接種
3. distribute 配布する
4. immune 免疫
5. response 反応
6. genetic 遺伝子の
7. cell　　　 細胞
8. protein　　　　　　　　　　たんぱく質
9. antibody　　　　　　　　　抗体
10. infection　　　　　　　　　感染
11. unstable　　　　　　　　　不安定な
12. allergy　　　　　　　　　　　アレルギー

Nobel Prize won by scientists who developed mRNA Covid vaccines

１　This year’s Nobel Prize in physiology or medicine was awarded to a Hungarian-American biochemist Katalin Karikó and an American immunologist Drew Weissman for their efforts for ①the rapid development of effective mRNA vaccines against COVID-19.  The two scientists developed the technology which led to Pfizer/BioNTech and Moderna vaccines.

２　Usually it takes years to develop a new drug or vaccine, however, by late 2020, less than a year into the COVID-19 pandemic, mRNA vaccines began being distributed to the general public in many countries.

The Nobel Assembly said: "The laureates contributed to the ( ア ) rate of vaccine development during one of the greatest threats to human health in modern times."

３　Katalin Karikó specializes in messenger RNA(mRNA).  From 2013 to 2022, she developed vaccines at [BioNTech](https://en.wikipedia.org/wiki/BioNTech), first as a vice president, and later, she was promoted to senior vice president in 2019.  In 2022, she left BioNTech but has been an external consultant for the company.

４　BioNTech and Pfizer have jointly conducted research and development activities to advance mRNA-based vaccines. Traditional vaccines use dead or weakened germs to trigger an immune response in our body. (　イ　), mRNA vaccines use a completely different approach.

５　mRNA is a genetic material that carries DNA information in a cell’s nucleus into other cells to give instructions to create proteins. mRNA vaccines tell the body to make a protein that produces an immune response, which releases antibodies. As a result, after vaccination, when coronavirus tries to enter your cells, antibodies attack and destroy it.  ( ウ ), you can prevent infection and keep yourself from getting seriously ill.

physiology生理学　　 medicine医学 biochemist生化学者　　 immunologist免疫学者 assembly会議 laureate受賞者　　 contribute貢献する　　　threat脅威 specialize in～：～を専門とする　　　external consultant社外顧問　　　germ細菌 trigger引き起こす　　　　 in contrast対照的に

material物質　　　　nucleus核 instruction命令・指示　　　★( )

Q1 Did you take a COVID-19 vaccine? Where is the vaccine from?

Q2 Who are Katalin Karikó and Drew Weissman? Where are they from?

Q3 What did they develop?

Q4 下線①：　mRNAワクチンは、通常のワクチンと比較して、どのくらい速いスピードで開発されたか説明しましょう。

Q5 カリコ教授は(1)どの会社で、 (2)どのような役職を務めましたか。

Q6　 How can you make traditional vaccines?

Q7 mRNAの役割を説明しましょう。

Q8　After getting an mRNA vaccine, when coronavirus tries to enter your cells, what happens to?

Q9 空欄に当てはまる語を選びましょう。

1. a) unacceptable b) undocumented c) unprecedented d) unidentified
2. a) In other words b) In particular c) In general d) In contrast
3. a) In addition b) In this way c) In short d) In return

６　mRNA vaccines have been studied and tested for influenza and rabies since 1990s. However, the use of mRNA vaccines was considered unrealistic for two reasons. First, the mRNA molecule is incredibly unstable and so easy to break down. Second, mRNA caused inflammatory reactions because the immune system sees the mRNA as an invader and overreact.

７　These obstacles did not discourage Karikó. During the early 1990s when she was an assistant professor at the University of Pennsylvania, she and her new colleague Drew Weissman discovered that when they swap out uridine for pseudouridine, mRNA can get their message to cells without triggering inflammations.

８　The COVID-19 pandemic brought more attention to the mRNA vaccines, Karikó said.  One of the most exciting aspects of mRNA technology is how rapidly it can be developed to target a particular virus. While traditional vaccines can take years, creating an mRNA vaccine that targets a new virus can be accomplished in a short period of time (even days to weeks). This greatly speeds up vaccine development.  Now, scientists are trying out mRNA approaches for cancer, allergies and other diseases.

rabies狂犬病 molecule分子　　　inflammatory炎症性の　 invader侵入者 overreact過剰反応する　　 obstacle障害物　　colleague同僚　　　　swap取り替える　　uridineウリジン　　pseudouridineシュードウリジン　　 inflammation炎症　　　aspect面　　　target～(動詞)：～を目標にする　　　accomplish仕上げる・完成させる

try out試してみる・試用する

Q10 Since when have scientists studied and tested mRNA vaccines?

Q11 mRNAワクチンの実用が現実的でないと考えられていた理由を、２つ説明しましょう。

Q12 According to the discovery of Karikó and Weissman, how can they reduce the inflammatory reactions of the mRNA vaccines?

Q13 How long does it take to create an mRNA vaccine for a new virus?

Q14 What are the diseases that scientists are trying out mRNA approaches for?.

★参考動画

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|  | 【ノーベル生理学・医学賞】カリコ氏 "喜びの声" メッセンジャーRNAでコロナワクチンに貢献ノーベル賞受賞直後に、日本人のアナウンサーさんがカリコ博士にインタビューしています。 |
|  | Scientists Katalin Kariko, Drew Weissman win Nobel Prize in medicine for work on mRNA vaccines［CBS News/3分］　ノーベル賞受賞者の発表の瞬間から始まり、カリコさんとワイズマンさんの功績をアナウンサーがまとめています。 |
|  | What is mRNA, and how does it work?［UNSW／１分］　　mRNAの働きについて説明してくれる動画です。 |

Never Give Up: Dr. Karikó’s dream as a scientist

１　Karikó began her career in her native country Hungary in the 1970. She earned her PhD at the University of Szeged and studied mRNA at its Biological Research Center. But the university’s research program ran out of money and she lost her job in 1985. She decided to go to the U.S. after she got an invitation from Temple University in Philadelphia to pursue her research.

２　In 1985, Karikó, her husband and her young daughter left Hungary for the U.S.  At that time, people living in the Eastern European countries were not allowed to take more than $100 out of the country so that the citizens would not emigrate to foreign countries. Karikó’s family had to sell their car on the black market for about $1200. Karikó unstitched the back of her daughter’s teddy bear, carefully put the money inside, sewed it back up, and the family flew to the U.S. with the teddy bear.

３　Karikó’s daughter Susan Francia is a two-time Olympic gold medalist rower. She won gold medals at the Beijing games in 2008 and the London games in 2012. She says she is proud of her mother, and it was her mother that inspired her to win Olympic gold medals. "Sport is a lot like science ( ア ) you have a passion for something and you just go and you train, and attain your goal, whether it was making this discovery that you truly believe in, or for me, it was trying to be the best in the world," Francia said.

４　“Now that I'm a parent, I think about what I ( イ ) if I had to pick my family up and move somewhere entirely new, especially with those kinds of political restrictions on me. It makes me really proud of how courageous they were for doing that. ①We came over (to the U.S.) with so little, and ②even though the streets are not paved with gold here, you can have incredible success if you work hard.”

PhD博士号　　　　pursue追求する　　　so that S will/can V：～が～する(できる)のように　　　　emigrate移住する

unstitchほどく　　　sew縫う　　　rowerボート選手(row:漕ぐ)　　　attain達成する political政治的な

restriction制限　　　courageous勇敢な　　　★( )

Q1 What caused Karikó to decide to go to the United States?

Q2 Why were Hungarian people prohibited to carry more than $100 out of the country?

Q3 Give an example of an Eastern European country under socialism.

Q4 How did she carry $1200 when she left Hungary with her family?

Q5 What is Karikó’s daughter Susan Francia famous for?

Q6 According to Susan, who inspired her to win the Olympics gold medals?

Q7 空欄(ア)に当てはまる語を選びましょう。 a)as if b) in case c) in that d) so that

Q8 Susanさんによれば、スポーツと科学はどんな点で似ていますか。

Q9　空欄(イ)に当てはまる語句を選びましょう。　　a) will do b) would do c) would have done d) did

Q10 下線①は、具体的にどんなことを指していますか。(※littleとは、何がほとんどなかったのですか。)

Q11　“gold”が何の比喩かを明らかにしながら、下線②を訳しましょう。

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|  | クマのぬいぐるみにお金隠し渡米…「mRNA」でノーベル賞　カリコ氏の“数奇な半生”(2023年10月2日)［ANNnewsCH］　　カリコさんのインタビュー（日本オリジナル）や、渡米時にお金を隠したクマのぬいぐるみが映し出されます。 |

Q12　What do you think about the news?

★次の文を３回ずつ読んで、暗唱しましょう。

１）Katalin Karikó and Drew Weissman were awarded the Nobel Prize in Physiology or Medicine for their efforts for the rapid development of effective mRNA vaccines against COVID-19.

２）mRNA vaccines tell the body to make a protein that produces an immune response, which releases antibodies.

３）Second, mRNA caused inflammatory reactions because the immune system sees the mRNA as an invader and overreact.

４）She says she is proud of her mother, and it was her mother that inspired her to win Olympic gold medals.

（和訳）

1. カタリン・カリコとドリュー・ワイズマンは、新型コロナウィルスに効果的なmRNAワクチンを迅速に開発した努力のため、ノーベル生理医学賞を受賞した。
2. mRNAワクチンは、免疫反応を産み出すたんぱく質を作るように体に命令を与えることができ、その免疫反応によって抗体が出される。

３）第二に、mRNAワクチンは炎症反応を引き起こしていた。なぜなら、免疫システムがmRNAを侵入者と判断し、
過剰反応するからである。

４）彼女は、母親を誇りに思う、そして、オリンピックでゴールドメダルをとるように彼女を勇気づけたのは、母親だったと語る。