

TEST Z JEZYKA ANGIELSKIEGO DLA KANDYDATÓW DO SZKOŁY DOKTORSKIEJ BIOMEDCHEM UŁ 2025

I: Listen to an interview about joining a gym and decide if the statements below are True or False. You will hear it twice. (20 points)

1. The man has only recently decided to join the gym.
2. The woman says the gym will make sure it has the lowest price in the city.
3. The woman says that other gyms charge people when they leave.
4. The man had been aware of the cancellation fee policy of the gym before.
5. The gym used to be open for 24 hours, but it was too busy.
6. The gym can book a personal trainer session for the man in advance.
7. The personal trainer will tell you what and what not to eat.
8. The personal trainer doesn't cost anything at all.
9. The man is not convinced at the end of the conversation.
10. The gym offers a sample visit.

Source: <https://learnenglish.britishcouncil.org/skills/listening/b2-listening/joining-gym>

II: Listen to five people talking about alternative medicine. Match what each speaker says. You will hear it twice. (10 points)

- | | |
|----------------------|--|
| 1. Speaker 1 (Tony) | thinks that the research shows that the treatment works |
| 2. Speaker 2 (Katie) | was amazed that they were able to have the treatment more than once |
| 3. Speaker 3 (Jen) | thinks that they didn't have the treatment at the right time |
| 4. Speaker 4 (Chris) | thinks that using alternative treatments can have serious consequences |
| 5. Speaker 5 (Mary) | was rather discouraged by the cost and the process of the treatment |

Source: *English File, OUP, 2018*

III: Read the text and do the tasks:

Insect protein blocks bacterial infection

Inspired by flea-jumping protein, researchers have developed a bacteria-busting coating that could help stop deadly infections on medical implants. The resilin-based surface repels bacteria by physically tearing them apart, no antibiotics required.

Study lead author Professor Namita Roy Choudhury said the finding is a critical step towards their goal of creating smart surfaces that stop dangerous bacteria, especially antibiotic-resistant ones like MRSA, from growing on medical implants. "This work shows how these coatings can be adjusted to effectively fight bacteria - not just in the short term, but possibly over a long period," she said.

Bacteria are often found on implants following surgery, despite sterilization and infection controls. Such conditions require antibiotics, but with antibiotic resistance becoming more common, new preventative measures are needed. "Antibiotic resistance has prompted greater interest in the area of self-sterilizing materials and easy preparation of antibacterial surfaces," Choudhury said.

"Therefore, we designed this surface to completely prevent the initial attachment of the bacteria and biofilm formation to decrease the infection rates," Choudhury said potential applications could include spray coatings for surgical tools, medical implants, catheters, and wound dressings.

Resilin to the rescue

Resilin, a protein found in insects, is known for its remarkable elasticity - it enables fleas to jump more than a hundred times their height in microseconds - but it's also extremely resilient and biocompatible. "These exceptional properties and non-toxic nature make resilin and resilin-mimetic proteins ideal for many applications requiring flexible, durable materials and coatings," Choudhury said. "These applications range from tissue engineering and drug delivery to flexible electronics and sports equipment, but this is the first work published on its performance as an antibacterial coating."

The team created several types of coating made from altered forms of resilin, then tested their interactions with E.coli bacteria and human skin cells in lab conditions. The study showed how the altered proteins in nano-droplet form, known as coacervates, were 100% effective at repelling the bacteria, while still integrating well with healthy human cells, a critical part of medical implant success. Study lead author from RMIT, Dr Nisal Wanasingha, said the nano droplets' high surface area made them especially good at interacting with and repelling bacteria.

"Once they come in contact, the coating interacts with the negatively charged bacterial cell membranes through electrostatic forces, disrupting their integrity, leading to leakage of cellular contents and eventual cell death," he said. Wanasingha said the resilin-based coatings not only showed 100% effectiveness in stopping bacteria from attaching to the surface but also offered several advantages compared to traditional approaches. "Unlike antibiotics, which can lead to resistance, the mechanical disruption caused by the resilin coatings may prevent bacteria from establishing resistance mechanisms," he said. "Meanwhile, resilin's natural origin and biocompatibility reduce the risk of adverse reactions in human tissues and, being protein-based, are more environmentally friendly than alternatives based on silver nanoparticles."

Next steps

Study co-author Professor Naba Dutta said resilin-mimetic protein is highly responsive to stimuli and changes in its environment, making it potentially tunable for many functions. "These early results are very promising as a new way to help improve infection control in hospitals and other medical settings, but now more testing is needed to see how these coatings work against a wider range of harmful bacteria," Dutta said. Future work will include incorporating additional antimicrobial agents to broaden the spectrum of activity. Transitioning from lab research to clinical use will require ensuring the formula's stability and scalability, conducting extensive safety and efficacy trials, while developing affordable production methods for widespread distribution.

a) Decide if the statements are True or False. (10 points)

1. The resilin-based surface of medical implants will have bacteria-busting properties.
2. MRSA is a type of bacteria that can't be cured with antibiotics.
3. Antibiotic resistance is said to have led to increased interest in developing materials with self-sterilizing and antibacterial properties.
4. Resilin proteins found in fleas can be used to make sports equipment, but there has been no research into this area yet.
5. Coacervates fulfill an important condition for successful medical implants as they are able to repel healthy human cells.
6. The high surface area of nano droplets is due to their considerable size.
7. Resilin-based coatings make the E. coli bacterial cell wall break.
8. According to the text, no E. coli bacteria could resist the electrostatic forces and retain their integrity.
9. Clinical trials will precede tests on other bacteria.
10. The scientists want to make resilin-based coatings cheap and widely available.

b) Find synonyms for the following in the text. Write ONE word in each space. (20 points)

1. ripping up, breaking –
2. regulated, tuned –
3. designed to stop undesirable effects from happening –
4. able to withstand pressure and recover quickly, tough –
5. characteristics, features –
6. outflow –
7. final –
8. other options, substitutes –
9. environments, conditions –
10. make wider –

IV: Fill in the gaps with the words listed below. There is one word you will not need. Place it in the space provided. (6 points)

DEMONSTRATES INVESTIGATES DECREASE RESPONSES INCREASE ANALYSES

This study 1) _____ the efficacy of Immunib in modulating immune 2) _____ in a murine model of autoimmune disease. Current treatments often present significant side effects. We hypothesize that Immunib will mitigate inflammatory markers without broad immunosuppression. Utilizing flow cytometry, ELISA, and histological 3) _____ on spleen and joint tissues from treated and untreated mice, we assessed changes in cytokine profiles, leukocyte infiltration, and tissue pathology. Results indicate a significant reduction in pro-inflammatory cytokines e.g., TNF- α , IL-6 and a 4) _____ in immune cell infiltration in affected tissues. Immunib 5) _____ potential as a targeted therapeutic agent for autoimmune conditions, warranting further investigation in preclinical and clinical settings.

Unnecessary word: 6) _____

Va: Language elements. Choose the correct option. (10 points)

1. If the experiment ____ correctly, the results would have been more accurate.

- a) is conducted
- b) had been conducted
- c) was conducted
- d) conducted

2. Each of the variables ____ carefully monitored throughout the process.

- a) were
- b) was
- c) have been
- d) are

3. I won't listen to what he has to say, and neither ____.

- a) won't you
- b) will you
- c) you won't
- d) you will

4. Not only ____ the algorithm faster, but it also improved accuracy.

- a) it made
- b) it makes
- c) did it make
- d) does it makes

5. The professor explained the concept clearly so that the students ____ understand it.

- a) can
- b) could
- c) will
- d) should

6. By the time the conference starts, we ____ all the necessary data.

- a) will have collected
- b) collected
- c) will collect
- d) would collected

7. No sooner ____ the simulation stopped than they identified a critical error in the input data.

- a) had
- b) was
- c) has
- d) did

8. They introduced too many variables, ____

- a) what was a mistake.
- b) which was a mistake.
- c) it was a mistake.
- d) Which was mistaken.

9. Only after the data had been thoroughly verified ____ submitted to the peer review board.

- a) it was
- b) was it
- c) it had
- d) had it

10. Could you tell me where ____

- a) did the conference take place?
- b) the conference took place?
- c) does the conference took place?
- d) the conference take place?

Vb: Complete each sentence with the correct word derived from the words in capitals. (9 points)

1. The new drug was shown to be _____ effective in reducing tumor size, with observable improvements in patient outcomes. **CLINIC**
2. Genetic testing revealed a chromosomal _____ that correlated with the patient's developmental delays. **ABNORMAL**

3. During embryonic development, stem cells undergo _____ to specialize into various tissue types, such as neurons or muscle cells. **DIFFERENT**
4. While our study showed promising results in mice, it's important to be cautious when attempting to _____ these findings directly to human physiology. **GENERAL**
5. The _____ population is particularly susceptible to neurodegenerative diseases, highlighting the need for increased research into age-related cellular decline. **AGE**
6. Our _____ about the durability of the material were wrong. **ASSUME**
7. Prolonged _____ to high levels of radiation can lead to significant DNA damage and an increased risk of cancer. **EXPOSE**
8. The initial treatment proved _____ to eradicate the infection, requiring a stronger antibiotic regimen. **ADEQUATE**
9. Individuals who are severely _____ often exhibit insulin resistance and an elevated risk of developing type 2 diabetes. **OBESITY**

VI: Complete the letter by choosing the correct word or phrase. Write your answers in the spaces provided. (15 points)

To Whom It May Concern,

I am writing 1) _____ **to provide / providing** an overview 2) _____ **in / of** my academic and professional profile as a current doctoral student in the bio-medical sciences program at Lodz University.

My journey in this field has been 3) _____ **drawn / driven** by a profound interest in understanding the complexities of human health and disease, and I am committed to 4) _____ **advancing / advance** research that can lead to innovative solutions in medicine.

Currently, I am 5) _____ **engaged / looking** in research focused on antibiotic resistance. This work has not only deepened my understanding of critical biological processes but has 6) _____ **very / also** enhanced my skills in laboratory techniques of cell culture. I 7) _____ **have been / was rather** fortunate to present my findings at several conferences, which has enriched my ability to communicate complex ideas effectively.

In addition 8) _____ **of / to** my research, I have actively participated in various collaborative projects, working alongside esteemed faculty and fellow students. These experiences have strengthened my teamwork and leadership skills, 9) _____ **though / as** I believe that interdisciplinary collaboration is essential for groundbreaking discoveries in bio-medical sciences.

I am also 10) _____ **dedicated / fascinated** to community outreach, participating in programs that educate the public on health-related topics. This aspect of my work 11) _____ **reflects / enables** my commitment to bridging the gap between scientific research and community health. As I continue my doctoral studies, I am 12) _____ **interested / eager** to explore opportunities that will allow me 13) _____ **applying / to apply** my knowledge in real-world settings while contributing to advancements in medical science.

I look forward to any opportunities 14) _____ **in / for** collaboration or further discussion regarding my work.

Thank you for your time and consideration.

Yours 15) _____ **truly / faithfully**,

Robert Wagner