

Exercise in a pill: have scientists really found a drug that's as good for you as a 10km run?

Level 2: Intermediate

1 Warmer

a. Discuss these questions.

1. Why is it good to do exercise and eat healthily?
2. Is it easy to do regular exercise and choose healthy food to eat? Why / why not?
3. What is the easiest way to stay healthy that you can imagine?

2 Key words

a. Match the correct word to each definition. Then find and highlight them in the article to read them in context.

- | | |
|-------------------------|---|
| 1. appetite | a. describes something that is useful or helpful |
| 2. beneficial | b. material that is solid, liquid or gas |
| 3. endurance | c. to have the same qualities as something else |
| 4. free fatty acids | d. parts of a cell that are passed on from a parent to a child |
| 5. full-body | e. the ability to keep doing something difficult or painful for a long time |
| 6. genes | f. describes someone who is extremely overweight |
| 7. high-intensity | g. lifting heavy objects for exercise, especially to improve strength |
| 8. mimic | h. when something moves from one person or group to another |
| 9. obese | i. describes an exercise that is extreme or very strong |
| 10. resistance training | j. source of energy in our body that comes from oils and animal fats |
| 11. substance | k. the feeling someone has when they want to eat food |
| 12. transfer | l. describes something that affects all of the body's systems and not just part of the system |

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b. Complete the sentences with words from the previous activity. You might have to change the form of the word.

1. I'll be over there on the weight machines. Today is my day for _____.
2. Be careful when handling acid. It can be a very dangerous _____.
3. There are examples of viruses which _____ from animals to humans.
4. You really need to develop your _____ if you want to run a marathon.
5. Changing from vegetable oil to olive oil can reduce the amount of _____ in your diet.
6. Swimming is possibly the best _____ exercise because you use your upper and lower body at the same time.
7. Your dad's _____ must be very strong. You look exactly like him!
8. Sprinting is a _____ exercise you can do almost anywhere.
9. The cake looks delicious, but I just don't have much of a(n) _____ today.
10. Even just walking for fifteen minutes a day can be _____ for your health.
11. As an actor, he was famous for his impressions. He could _____ almost anyone.
12. If he doesn't start to move more and improve his diet, he could easily become _____.

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Just how excited should we be about LaKe, the substance discovered by researchers at Denmark's Aarhus University?

Joel Snape

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- 1 Can a pill really create all the beneficial effects of exercise? You'd think so from some of the stories about substances that "could make going to the gym unnecessary". There was another set of stories a few weeks ago, when researchers from Aarhus University in Denmark announced that a drug called LaKe "brings the body into a metabolic state similar to running 10km at high speed on an empty stomach". But what's going on here?
- 2 First things first: the most common term for drugs like LaKe is "mimetics", because what they typically do is mimic the biological effects of working out. The idea has been around for a while: in 2008, San Diego's Salk Institute introduced a drug called GW501516 (516 for short), which tells key genes to burn fat instead of sugar, helping one of the rodent test subjects (a pair of rodents called Couch Potato Mouse and Lance Armstrong Mouse) run for longer.
- 3 In tests, both mice had the same diet high in fat and sugar and did the same amount of daily physical activity. However, Lance Armstrong Mouse was given the drug 516. This increased the mouse's endurance and kept it much slimmer than Couch Potato Mouse. Compound 14, first announced in 2015, started as a way to treat other diseases, before researchers discovered that it could promote weight loss in obese mice. Since then, we've also seen research on Lac-Phe, a chemical made in the body during resistance training, and a new molecule known as SLU-PP-332. This increases metabolism and endurance, helping rodents run 50% further than they previously could. SLU-PP-332 tells skeletal muscle to make the type of changes you see with endurance training. That has the potential to help dieters maintain muscle mass during weight loss.
- 4 LaKe is still in the rat-study stage of development, so it's not certain that the results will transfer over to humans. But what it seems to do is first create a quick increase in lactate in the body – mimicking what happens after high-intensity exercise. Then there is a more gradual increase of a chemical called beta-hydroxybutyrate (BHB). BHB is a ketone, a chemical that gives the body energy when it doesn't have enough glucose.
- 5 Between them, these two changes seem to lower the level of free fatty acids in the blood and also reduce appetite – which are effects you'd expect from fasted exercise (working out without eating). They also help to reduce heart disease, stroke and type 2 diabetes. And the pill seems to show no signs of toxicity – unlike early versions of 516, which generated cancer cells. So is it really that simple?
- 6 Well, it's tough to say. Exercise affects almost all of the body's systems, often in ways that are difficult to understand. But any drug has its limits: exercise is a full-body experience. It also improves mood while reducing stress. All of these impacts might be the result of a large number of biological effects. Even if science could mimic them all with pills, it would be tough to create the psychological advantages of running a 5k with friends.
- 7 We're still a long way from finding safe drugs that can create exercise's most beneficial effects in humans. When they exist, they'll probably be most useful for people who are elderly, ill or not able to do the real thing. For the rest of us, the benefits of a gentle walk are difficult to mimic with pills, and easy to get without them. One day, perhaps we'll be able to take our exercise in pill form – but right now, it's much easier to hit the road.

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3 Comprehension check

a. Answer the questions using information from the article.

1. When was the first mimetic developed?
2. How many mimetics are mentioned in the article?
3. How did Lance Armstrong Mouse compare to Couch Potato Mouse after using 516?
4. Which two kinds of animals are used to test these mimetics?
5. How do changes to the levels of lactate and beta-hydroxybutyrate affect the body?
6. How is LaKe safer than 516?
7. What are the mental health benefits of exercise?
8. In the opinion of the author, which people should use mimetics?
9. Why is it currently easier to get healthier by walking or running?
10. Is the author in favour of or against the use of mimetics?

4 Key language

a. Complete the table using the correct phrases from the box.

a few weeks ago	before	for a while	since then
after	first things first	right now	then

Phrases describing <i>when</i> or <i>how long</i>	Phrases describing order of events

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b. Complete the sentences using the phrases from the table.

1. _____, I saw my cousin getting on the bus with her new boyfriend.
2. _____ she arrives home from work, she takes off her shoes and puts on the TV.
3. As soon as he wakes up, he always brushes his teeth even _____ breakfast.
4. I really want to hear about your day but _____, let me make you a cup of tea.
5. When my mum arrived in the country, she lived with her sister _____ about three weeks.
6. I loved ice skating as a child but _____, I don't think I've been on the ice once.
7. If we don't leave _____, we will miss our train!
8. Check the car is not in gear. _____ switch on the engine.

c. Write two personalised sentences using one phrase for when or how long and one phrase for the order of events.

1. _____
2. _____

5 Discussion

a. Discuss these statements.

- 'Developing a safe drug for weight loss is the most important area of medical research'.
- 'Only through the use of drugs like these will people be able to control their weight'.
- 'There are many more benefits of using drugs like these than disadvantages'.

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6 In your own words

- a. List the advantages and disadvantages of pills like LaKe. Consider what the long term effects might be using this kind of pill.

Use these questions to guide your ideas.

- Are these drugs good for short-term solutions or long-term solutions?
- Are there people who cannot easily benefit from diet and exercise?
- Do these drugs help people to learn how to eat healthily? Why? Why not?
- Do these drugs help build healthy habits of exercise? Why? Why not?
- Could these drugs develop addictive behaviours?
- What psychological effects could these drugs have?

- b. Present your ideas to the class. Talk about the current state of the research and what the future could be. Explain what you think the consequences might be.

Here are some phrases to help you during your presentation.

- *The main points I'll be discussing ...*
- *I'll be talking about ...*
- *Equally ...*
- *Similarly ...*
- *However ...*
- *Even so ...*
- *Therefore ...*
- *Consequently ...*