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# Mail Online

## The vaccine that could save you from heart disease

By [Pat Hagan](#)

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A vaccine that stops cholesterol causing damage to arteries could slash heart disease by two-thirds.

The experimental jab, which is being pioneered by scientists at the Karolinska Institute in Sweden, works by stopping the body's own defence system from over-reacting to excess levels of cholesterol in the blood.

It is this over-reaction that leads to the lining of blood vessels becoming inflamed to the point where a clot forms, triggering a heart attack. The new jab works by blocking T cells, which are released by the immune system when it senses it's under attack. This is a natural defence mechanism designed to protect us against infection by bacteria and viruses.



**Heart attacker: Fatty plaque deposits (in red) clog an artery**

These cells are also dispatched once the immune system detects that so-called 'bad' cholesterol, called low-density lipoprotein, has started to stick to blood vessel walls.

But when the T cells arrive on the scene, they make the lining of arteries swell in a bid to expel the fatty deposits.

Unfortunately, this swelling increases the chances of a deadly blockage forming that can cut off blood supply to the heart.

The new vaccine, which is being tested on mice, could be given as a one-off jab to stop this inflammation and reverse most of the damage already done. If further trials on humans go well, it's hoped the jab might become available in three to five years.

Heart disease is Britain's biggest killer. Around 270,000 people a year suffer a heart attack and nearly one in three dies before reaching hospital.

A fatty diet, lack of exercise and smoking are all key risk factors. But it is the physical changes deep inside the blood vessels that actually lead to a heart attack.

These changes are mostly due to a process called atherosclerosis, caused largely by cholesterol.

A certain amount of cholesterol in the body is essential to ensure cells function normally. In healthy people, the liver produces just the right amount. But unhealthy lifestyles can lead to too much LDL, the bad cholesterol, and too little high-density lipoprotein (HDL), the 'good' cholesterol.

As excess LDL cholesterol circulates in the blood, it begins to stick to the lining of the arteries. These fatty deposits form 'plaques' that protrude and disrupt blood flow. Once the immune system senses damage is being done, it sends out T cells to repair it. But the inflammation caused by this attempted repair often makes the obstruction even worse.

Eventually, the plaque ruptures, triggering a blood clot and the artery becomes completely blocked, shutting off the blood flow to the heart.

The Swedish vaccine works by targeting a specific receptor found on the surface on an LDL cholesterol cell. This receptor is what the killer T cells aim for. It allows them to home in on the cholesterol cells, penetrate and destroy them. But by blocking this receptor, the vaccine stops T cells from hitting their target.

As a result, inflammation is significantly reduced and so is artery damage. In a report on their findings, the researchers said: 'This treatment significantly reduced atherosclerosis by 65 per cent.'

Now the researchers plan to set up human trials, in the hope that the jab could become a major weapon against heart disease.

Although there have been previous attempts at developing anti-cholesterol vaccines, these focused on firing up the immune system to wipe out fat cells, rather than switching it off as the latest one does.

Boosting the immune system in this way simply increased the rate of inflammation inside blood vessels.

Professor Jeremy Pearson, associate medical director at the British Heart Foundation, said that over the past 20 years there had been 'considerable interest' in the possibility that people could be immunised to reduce the development of heart disease. But until now there had been little success.

'These researchers have discovered an entirely novel way to interfere with the immune response, which substantially reduces the development of atherosclerosis in mice,' he added.

'If the same mechanism can be shown to occur in humans, it will open up the possibility of using immunisation to protect people from the development of atherosclerosis in the arteries that feed the heart, which would prevent most heart attacks.'

A five-minute saliva test could help doctors diagnose heart attacks. It works by looking for the presence of certain 'markers' in the saliva, released by cardiac muscle suffering a heart attack.

Usually, when patients with chest pain arrive at A&E, they have an electrocardiogram to measure the heart's electrical activity and a blood test to look for the same markers identified in the new saliva test.

But ECECGs fail to detect around one in three heart attacks, while blood tests can take several hours to process.

In the new test - carried out on patients in America - the saliva is wiped on to a tiny microchip, which is scanned by a portable high-tech 'analyser', yielding results in minutes.

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Yes! Inflammation plays a major role in heart disease. Cholesterol is the good guy. The main reason for heart disease is that the arteries and connective tissue are breaking down/inflammation b/c of lack of silica (also a natural anti-inflammatory) -- so the cholesterol comes in to reinforce the tissue. As people age they have lower stomach acid, so when they consume foods or water with silica, it doesn't convert to an absorbable form (orthosilicic acid) b/c of the reaction b/t the silica and stomach acid. Best thing to do is supplement with food grade Diatomaceous earth (by letting a small amount settle in a gallon of water or so) or a stabilized orthosilicic acid product. You don't need much!

- Christian, Charlotte, US, 10/6/2010 01:45

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Again cholesterol gets the blame for causing heart disease - IT DOESN'T - inflammation does.  
Debs, Burnley, 08/6/2010 09:52

You need to re-read this article. The vaccine is preventing inflammation, not reducing bad cholesterol. It works by blocking a receptor on LDL which cells involved in the inflammatory response (T cells). So the patient has the same level of LDL but it is not harmful because the inflammatory response to it has been blocked. Get it?

- me, aust, 09/6/2010 07:25

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Elizabeth, Gerrards Cross

I take it you are lucky enough to be in good health and that your body is working well! I don't know how old you are, but with most of us, when we age, things don't work how they should and as science has been able to help, I have accepted that help. If I hadn't, I would not be here typing this comment, having had two heart attacks!

So what would you advise me to do? My body cannot control cholesterol, so I need medication to help it, otherwise I would die, is that what you recommend?

I would hardly classify this vaccine with the flu one and there have been very few cases like that.

I hope, for your sake, you stay well and don't have to eat your words, I was a very fit man, still weight training in my late 50s, so mine wasn't through an unhealthy life style!

- Nigel, Somerset, 08/6/2010 10:49

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Again cholesterol gets the blame for causing heart disease - IT DOESN'T - inflammation does. What causes inflammation - high blood sugar, cortisol, high insulin levels, drugs, smoking, medications - you can't vaccinate against those, those are lifestyle problems.

They got it wrong again. The inflammation causes the damage, triggering the immune response and the production of cholesterol to repair the damage. The cholesterol is NOT causing the damage, it is there to repair it. Stop causing the damage and cholesterol is not needed. Why can't they see this or is there no money to be made in advising people to cut out sugar, keep their insulin levels low and avoid stress and vegetable oils.

- Debs, Burnley, 08/6/2010 09:52

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I hope this will be successful for many - too late for me - I had a multi bypass a year ago and still in pain but still alive!

- Les, Maidstone, Kent, 08/6/2010 09:43

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If we had better dental health, the rate of heart disease would be cut by half. Instead, we spend money on keeping the Pharmas in business.

- Jo, London, 08/6/2010 09:28

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