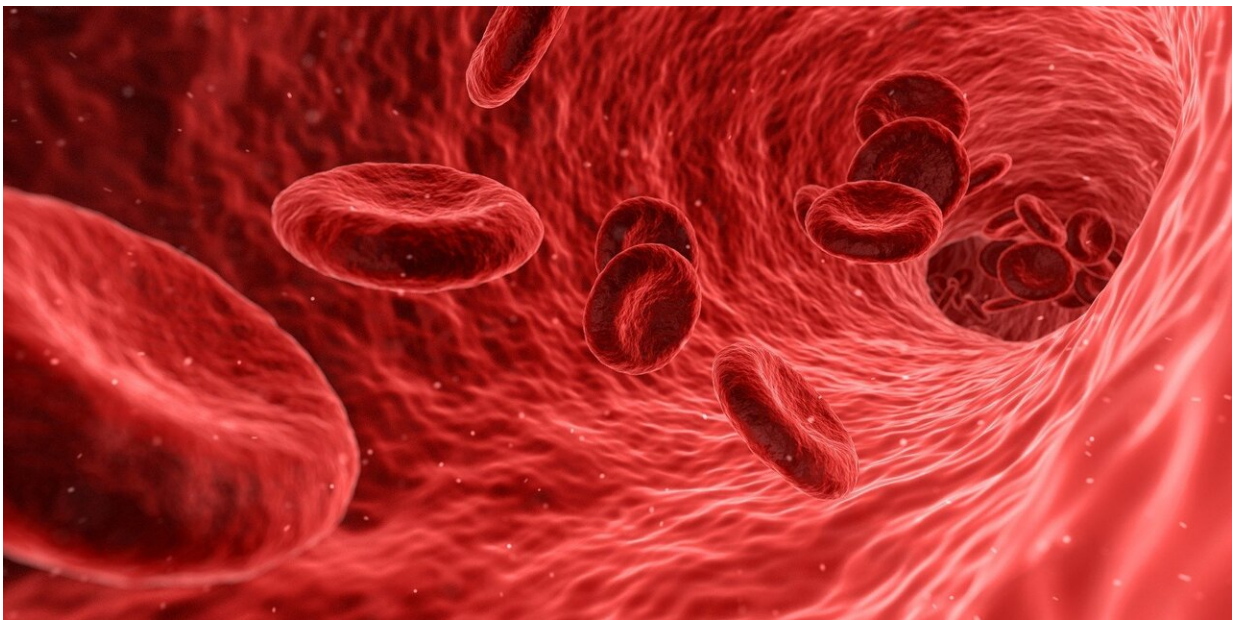


Muscle pain and energy-rich blood: Cholesterol medicine affects the organs differently

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600,000 Danes take medicine containing statins. Statins lower the cholesterol level and thus helps prevent cardiovascular disease and blood clots. But there is a different side to the coin.

Treatment with statins may also have [negative side effects](#), some of which are so severe that people suffering from elevated cholesterol

choose to stop treatment. One of the main side effects is muscle pain, also called myalgia, which may lead to reduced quality of life, pain and inactivity due to the pain.

Statins inhibit the production of cholesterol in the cell, but it also inhibits an important element in the [energy](#) production in the cells' mitochondria. Mitochondria are small, energy-producing organelles found in almost all cells in the body. Statins are suspected of lowering the energy level in the cells, thus causing myalgia in muscle cells.

The researchers therefore wished to determine whether statins also inhibited the [energy production](#) in blood cell mitochondria. And research from the Center for Healthy Aging at the Faculty of Health and Medical Sciences now shows that statins do not have the expected effect.

"We can see that long-term treatment with statins at the recommended dose increases the blood cells' ability to produce energy. These are surprising results. We had expected statins to behave the same way that they do in muscle cells, but in fact they do the exact opposite here," says Executive Director and Professor at the Center for Healthy Aging Lene Juel Rasmussen.

Statins Do Both Good and Bad

Even though the surprising results challenge the theory that statins lower the energy level, this does not necessarily mean that statins do not have adverse effects on some organs.

Because the results say nothing about whether the statins are responsible for affecting the energy level or it is the body that does that to compensate for the change caused by the statins.

"Statins are quite mysterious, as they can have both positive and negative

consequences depending on the part of the body," says Lene Juel Rasmussen.

"Our results show an increase in the energy level in the blood cells, but whether that is good or bad, we cannot say. It can either mean that the statins improve the blood cells' ability to produce energy, which would be a good thing, or that the statins do damage and that the body consequently raises the [energy level](#) to mend that damage," she explains.

Different Effects on Different Parts of the Body

Even though the mechanism behind statins' effect on the blood remains unknown, the new results provide brand new insight into the effect of statins: Contrary to expectation, statins behave differently in different parts of the body.

"Previous studies suggest that statins have a potentially beneficial effect on some forms of cancer and possibly also on some forms of dementia. If we are able to produce new knowledge on the effect of statins on various parts of the body, we can use this knowledge to design drugs based on the beneficial effects. If statins have a [positive effect](#) on the brain, for example, we can focus on using them in the design of drugs for dementia," Lene Juel Rasmussen explains.

More information: Jon Ambæk Durhuus et al, Simvastatin improves mitochondrial respiration in peripheral blood cells, *Scientific Reports* (2020). [DOI: 10.1038/s41598-020-73896-2](https://doi.org/10.1038/s41598-020-73896-2)

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