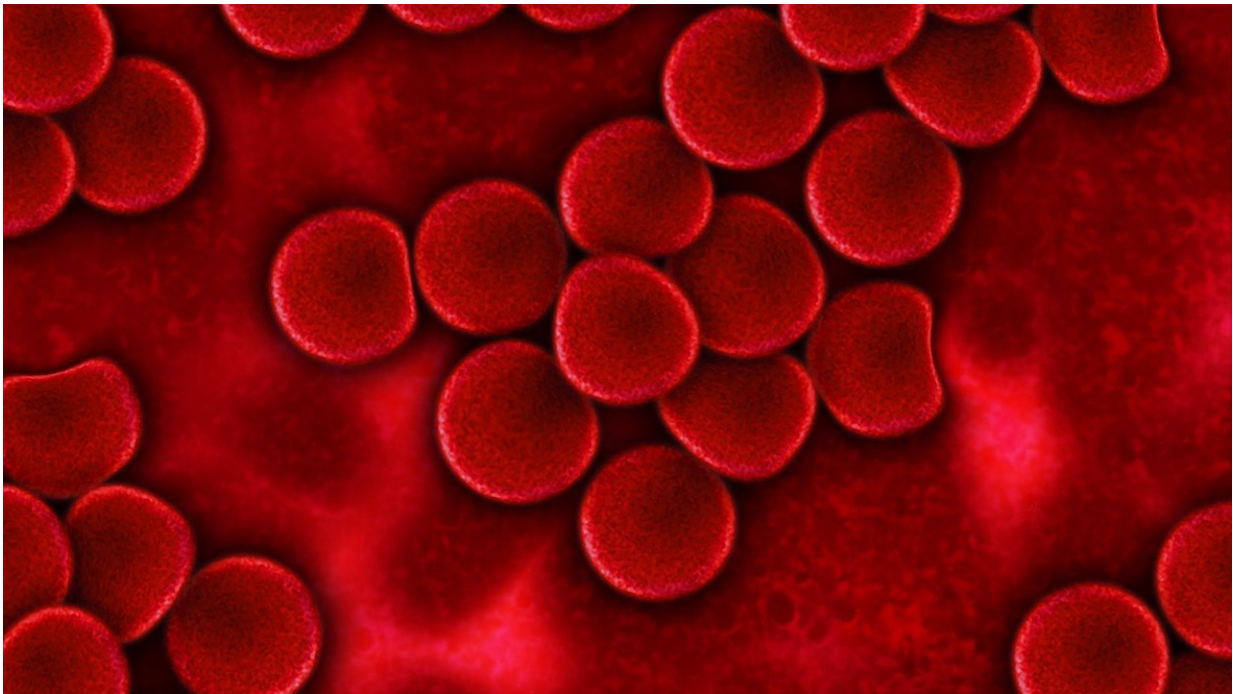


Lack of important molecule in red blood cells causes vascular damage in type 2 diabetes

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Altered function of the red blood cells leads to vascular damage in type 2 diabetes. Results from a new study in cells from patients with type 2 diabetes and mice show that this effect is caused by low levels of an important molecule in red blood cells. The study by researchers at Karolinska Institutet in Sweden has been published in the journal *Diabetes*.

It is well known that patients with type 2 [diabetes](#) have an increased risk of cardiovascular disease. Over time, type 2 diabetes may damage [blood vessels](#), which could lead to life-threatening complications such as heart attack and stroke. However, the disease mechanisms underlying cardiovascular injury in type 2 diabetes are largely unknown and there is currently a lack of treatments to prevent such injuries.

In recent years, research has shown that the [red blood cells](#), whose most important job is to transport oxygen to bodily organs, become dysfunctional in type 2 diabetes and can act as mediators of vascular complications. In the current study, researchers at Karolinska Institutet have in [cells](#) from patients with type 2 diabetes and mice examined which molecular changes in the red blood cells could explain these harmful effects in type 2 diabetes.

The researchers found that levels of the small molecule microRNA-210 were markedly reduced in red blood cells from 36 patients with type 2 diabetes compared with red blood cells of 32 healthy subjects. MicroRNAs belong to a group of molecules that serve as regulators of vascular function in diabetes and other conditions. The reduction in microRNA-210 caused alterations in specific vascular protein levels, and impaired blood vessel endothelial cell function. In laboratory experiments, restoration of microRNA-210 levels in red blood cells prevented the development of vascular injury via specific molecular changes.

"The findings demonstrate a previously unrecognized cause of vascular injury in type 2 diabetes," says Zhichao Zhou, researcher at the Department of Medicine, Solna, Karolinska Institutet, who conducted the study in collaboration with among others Professor John Pernow at the same department. "We hope that the results will pave the way for new therapies that increase red [blood](#) cell microRNA-210 levels and thereby prevent vascular injury in patients with type 2 diabetes."

More information: "Downregulation of erythrocyte miR-210 induces endothelial dysfunction in type 2 diabetes", *Diabetes* (2021). [DOI: 10.2337/db21-0093](https://doi.org/10.2337/db21-0093)

Provided by Karolinska Institutet

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