

Diabetes drug modulates cholesterol levels

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Besides affecting the blood sugar levels, the substance Metformin, also has an impact on blood fat levels. This was elucidated by an interdisciplinary team of the German Center for Diabetes Research (DZD) headed by Dr. Rui Wang-Sattler of the Helmholtz Zentrum München. Especially the harmful LDL cholesterol can be reduced. The results have recently been published in the journal *Diabetes Care*.

The DZD-researchers at Helmholtz Zentrum München and German Diabetes Center Düsseldorf analyzed more than 1.800 [blood](#) samples of participants, who joined the German large-scale study KORA. Using a comprehensive approach, the scientists investigated metabolic products (metabolites) as well as genetics of these participants. They found that the administration of Metformin in patients suffering from Type 2 Diabetes led to a change in metabolite levels. According to the authors, this was associated with a significantly decreased level of LDL [cholesterol](#), which is under strong suspicion to promote cardiovascular diseases by causing atherosclerosis.

Metformin affects blood fat levels via AMPK signaling pathway

Together with colleagues in the Netherlands, the scientists aligned the metabolite concentrations with the genetic information, thereby identifying metabolites and genes involved in the respective pathways. "We speculate that Metformin intake affects the levels of LDL cholesterol via AMPK, leading to a down-regulation of the genes FADS1 and 2. This is also supported by the fact that three lipid metabolites,

which are dependent on FADS, are decreased. Presumably, this is the mechanism how the production of LDL cholesterol is repressed by Metformin.", reports Dr. Rui Wang-Sattler, head of the group 'Metabolism' in the Research Unit of Molecular Epidemiology at the Institute of Epidemiology II of the Helmholtz Zentrum München.

"Our study suggests that Metformin might indeed have an additional beneficial effect with regards to cardiovascular diseases among the Diabetes patients", says first author Dr. Tao Xu. Moreover, the Helmholtz scientists aim to elucidate how Metformin, which is used in the clinic for over 50 years, works on the molecular level. "Until now the exact mechanism is unclear. Thus, we want to continue our contribution to its decryption", co-first author Dr. Stefan Brandmaier adds.

More information: "Effects of metformin on metabolite profiles and LDL cholesterol in type 2 diabetes patients." *Diabetes Care*, [DOI: 10.2337/dc15-0658](https://doi.org/10.2337/dc15-0658)

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