

# Low doses of a red wine ingredient fight diabetes in mice

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Even relatively low doses of resveratrol—a chemical found in the skins of red grapes and in red wine—can improve the sensitivity of mice to the hormone insulin, according to a report in the October issue of *Cell Metabolism*. As insulin resistance is often characterized as the most critical factor contributing to the development of type 2 diabetes, the findings “provide a potential new therapeutic approach for preventing or treating” both conditions, the researchers said.

The research group also confirmed that increased levels of an enzyme called SIRT1, which earlier studies had linked to longevity, DNA repair, and insulin secretion, improve insulin sensitivity in mice. Resveratrol is known to activate the SIRT1 enzyme.

The results suggest that “red wine might have some benefits for insulin sensitivity, but it needs to be confirmed by further investigation,” said Qiwei Zhai of the Chinese Academy of Sciences. Given the potential complications of drinking alcohol, “an even better option may be to find other natural foods enriched with resveratrol or foods supplemented with resveratrol,” he added, noting that the chemical is also an active ingredient in other plants, including one called *Polygonum cuspidatum* used in traditional Chinese and Japanese medicine.

Diabetes mellitus, the most common endocrine disorder, currently affects more than 170 million people worldwide and is expected to affect more than 353 million by the year 2030, Zhai said. Type 2 diabetes, which accounts for more than 90 percent of diabetes cases, is

characterized by the resistance of body tissues to stimulation by the peptide hormone insulin. Insulin normally lowers blood glucose levels by facilitating the sugar's uptake, mainly into skeletal muscle and fat tissue, and by inhibiting glucose production in the liver. Currently, alleviating insulin resistance is still one of the key avenues to treating type 2 diabetes.

Earlier studies had reported a connection between SIRT1 and the processes of glucose metabolism and insulin secretion. However, whether SIRT1 was directly involved in insulin sensitivity remained largely unknown, the researchers said.

Now, the researchers report that SIRT1 levels are reduced in insulin-resistant cells and tissues and that treatments that block the enzyme's function lead to insulin resistance. Furthermore, increased SIRT1 activity improved insulin sensitivity. Similarly, resveratrol—at a dose of just 2.5 mg/kg/day—enhanced insulin sensitivity in cells. That low dose of resveratrol also reduced insulin resistance in animals fed a high-fat diet, the researchers showed.

“We found SIRT1 improves insulin sensitivity, especially under insulin-resistant conditions,” Zhai said. “Furthermore, we found that resveratrol, at a very low dose compared with many previous studies, improves insulin sensitivity via SIRT1.”

The findings suggest that those who drink red wine for the health-promoting benefits of resveratrol might “think about drinking less,” Zhai said. Previously, he noted, the effects of resveratrol seen in mice had implied that humans might need to drink about 120 liters of red wine each day to get enough resveratrol to enjoy the same benefit. “According to our findings, people might need to drink about three liters of red wine each day to get sufficient resveratrol—about 15 mg—for its biological effects.”

source: Cell Press

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