Diabetes drug metformin corrects mitochondrial metabolism in familial cancer disorder

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Individuals with Li-Fraumeni syndrome are at an increased risk for a number of cancers, including breast and bone cancer. Li-Fraumeni syndrome is an inherited cancer disorder caused by mutations in the tumor suppressing protein p53, which are also linked to increases mitochondrial metabolism. It is not clear whether targeting these metabolic changes can effectively reduce the risk of cancer associated with p53 mutations.

In this issue of the *JCI*, research led by Paul Hwang at the National Heart, Lung, and Blood Institute discovered that treatment with the commonly-prescribed diabetes medication metformin treatment blocked increases in mitochondrial metabolism in a mouse model of Li-Fraumeni syndrome, leading to a lower rate of tumor formation and increased survival time.

Furthermore, in a pilot study involving Li-Fraumeni patients, metformin treatment produced a similar inhibition of mitochondrial metabolism and activated of anti-proliferation signaling.

The finding that this FDA-approved drug can ameliorate abnormal mitochondrial metabolism suggests that it may be a potential strategy for tumor prevention in Li-Fraumeni syndrome.

More information: Ping-yuan Wang et al, Inhibiting mitochondrial respiration prevents cancer in a mouse model of Li-Fraumeni syndrome, *Journal of Clinical Investigation* (2016). DOI: 10.1172/JCI88668