

Researchers find potential for new uses of old drug

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(Phys.org) -- Researchers in Canada, Scotland and Australia have discovered that salicylate, the active ingredient in aspirin, directly increases the activity of the protein AMPK (AMP-activated protein kinase), a key player in regulating cell growth and metabolism. AMPK which is considered a cellular fuel-gauge is switched on by exercise and the commonly used anti-diabetic medication metformin.

The research from scientists at McMaster University, the University of Dundee and the University of Melbourne will be published in today's issue of the journal *Science*.

"We're finding this old dog of [aspirin](#) already knows new tricks," said Dr. Greg Steinberg, a co-principal investigator of the study. "In the current paper we show that, in contrast to exercise or metformin which increase AMPK activity by altering the cells energy balance, the effects of salicylate is totally reliant on a single Ser108 amino acid of the beta 1 subunit.

"We show that salicylate increases fat burning and reduces liver fat in [obese mice](#) and that this does not occur in genetically modified mice lacking the beta1 subunit of AMPK," he said. Steinberg is an associate professor of medicine in the Michael G. DeGroote School of Medicine at McMaster University and the Canada Research Chair in Metabolism and Obesity.

These findings are important as a large clinical trial is currently

underway testing whether salicylate (a well-tolerated aspirin derivative), can prevent [Type 2 diabetes](#).

Salicylate, which is derived from willow bark, and is the active ingredient in aspirin, is believed to be one of the oldest drugs in the world with first reports of its use dating back to an Egyptian papyrus in 1543 BC.

An anti-inflammatory drug first used as a painkiller more than a century ago, aspirin is now given to people at risk of heart attacks and strokes as well as patients with vascular disease. McMaster scientists played a key role in that previous research.

Three studies published last month in the medical journal The Lancet reported that taking an aspirin every day may significantly reduce the risk of many cancers and prevent tumors from spreading. The unanswered question was how this anti-cancer benefit occurs.

With many recent studies showing that metformin may be important for cancer prevention the authors' study raise the interesting possibility that aspirin may also be working in a similar manner; however, further studies are needed as the concentrations of salicylate used in the current study were higher than the cancer trials. Nonetheless, the researchers' results show the one thing that salicylates and metformin hold in common is their ability to activate AMPK.

Provided by McMaster University

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