

Skeletal muscles account for ~40% of body weight in men and ~30% in women. In response to insulin, this big compartment of skeletal muscles consumes large amounts of glucose and plays a crucial role in regulating the levels of this nutrient in the circulation. In the absence of insulin, which is the case in type 1 diabetes, glucose accumulates in the blood (hyperglycemia) causing damage to the kidney, heart, eyes, etc. Therefore, preserving the ability of skeletal muscles to utilize glucose is very important for the treatment and prevention of health complications caused by diabetes. In this study we tested whether a drug (AICAR) that mimics the effects of exercise and promotes glucose storage in skeletal muscles in an insulin-independent manner could prevent hyperglycemia in type 1 diabetes. Our novel findings indicate that even though AICAR did not lower blood glucose levels, it significantly improved the ability of skeletal muscles to use glucose and also normalized blood lipid levels in the absence of insulin. This opens the possibility of using exercise mimetic drugs in combination with insulin to improve metabolic control in type 1 diabetic patients.

Reference: Vitzel KF, Bikopoulos G, Hung S, Pistor KE, Patterson JD, Curi R, **Ceddia RB**. [Chronic treatment with the AMP-kinase activator AICAR increases glycogen storage and fatty acid oxidation in skeletal muscles but does not reduce hyperglucagonemia and hyperglycemia in insulin deficient rats.](#) PLoS One. 2013 Apr 19;8(4):e62190

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