

Rapamycin may exacerbate age-related arthritis despite life-extending benefits

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New research to be presented this week virtually at the American Physiological Society's (APS) annual meeting at Experimental Biology 2021 explores the positive and negative effects of lifespan-extending drugs on mitochondrial function and age-related osteoarthritis (OA).

Decreased function of mitochondria—the energy centers of the cells—is a hallmark characteristic of aging. Maintaining [mitochondrial function](#) during the aging process while delaying age-related diseases, such as OA, could be a key to extending lifespan. Previous research has found that metformin, primarily used to treat type 2 diabetes, and rapamycin, a drug used to prevent organ transplant rejection, can extend lifespan and maintain physiological function in many animal models.

In a new study, researchers from the University of Wisconsin-Madison explored the effects of rapamycin, metformin or a regimen of both medications on a guinea pig model of OA. These drugs were chosen because they have been shown to expand lifespan and healthspan through positive change in the mitochondria. The research team found that the animals treated with rapamycin and the two-drug combination had lower mitochondrial content in their muscles and the function of the mitochondria was impaired. In addition to changes in mitochondrial function, rapamycin treatment also led to a rise in [blood glucose levels](#) and worsened OA scores, a measure of disease severity.

These results suggest "there may be an indirect connection between impaired skeletal muscle mitochondrial function to exacerbated OA after rapamycin treatment," said Christian Elliehausen, first author of the study. More research is needed to examine if it is possible to "harness the positive effects of rapamycin while minimizing the [negative effects](#)," Elliehausen explained.

More information: Abstract title: "Skeletal muscle mitochondrial bioenergetics in a model of primary osteoarthritis after treatment with rapamycin and/or metformin"

Provided by Experimental Biology

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