Lift weights, eat mustard, build muscles?

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New research in The *FASEB Journal* suggests that rats fed homobrassinolide, found in the mustard plant, produced an anabolic effect, and increased appetite and muscle mass, as well as the number and size of muscle fibers.

Bethesda, MD—If you are looking to lean out, add muscle mass, and get ripped, a new research report published in The *FASEB Journal* suggests that you might want to look to your garden for a little help. That's because scientists have found that when a specific plant steroid was given orally to rats, it triggered a response similar to anabolic steroids, with minimal side effects. In addition, the research found that the stimulatory effect of homobrassinolide (a type of brassinosteroid found in plants) on protein synthesis in muscle cells led to increases in lean body mass, muscle mass and physical performance.

"We hope that one day brassinosteroids may provide an effective, natural, and safe alternative for age- and disease-associated muscle loss, or be used to improve endurance and physical performance," said Slavko Komarnytsky, Ph.D., a researcher involved in the work from the Plants for Human Health Institute, FBNS at North Carolina State University in Kannapolis, N.C. "Because some plants we eat contain these compounds, like mustards, in the future we may be able to breed or engineer these plants for higher brassinosteroid content, thus producing functional foods that can treat or prevent diseases and increase physical performance."

To make this discovery, Komarnytsky and colleagues exposed rat

skeletal muscle cells to different amounts of homobrassinolide and measured protein synthesis in cell culture. The result was increased protein synthesis and decreased protein degradation in these cells. Healthy rats then received oral administration of homobrassinolide daily for 24 days. Changes in body weight, food consumption, and body composition were measured. Rats receiving homobrassinolide gained more weight and slightly increased their food intake. Body composition was measured using dual-emission X-ray absorptiometry analysis and showed increased lean body mass in treated animals over those who were not treated. This study was repeated in rats fed high protein diet and similar results were observed. Additionally, researchers used surgically castrated peri-pubertal rat models to examine the ability of homobrassinolide to restore androgen-dependent tissues after androgen deprivation following castration. Results showed increased grip strength and an increase in the number and size of muscle fibers crucial for increased physical performance.

"The temptation is to see this discovery as another quick fix to help you go from fat to fit," said Gerald Weissmann, M.D., Editor-in-Chief of The FASEB Journal, "and to a very small degree, this may be true. In reality, however, this study identifies an important drug target for a wide range of conditions that cause muscle wasting."

More information: Debora Esposito, Slavko Komarnytsky, Sue Shapses, and Ilya Raskin. Anabolic effect of plant brassinosteroid. FASEB J. 2011 25:3708-3719; doi:10.1096/fj.11-181271

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