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In this issue

Life Extension Update Exclusive

More exciting findings for resveratrol

Health Concern

Getting the most from exercise

Featured Products

Optimized Carnitine with GlycoCarn™

Dual-Action Cruciferous Vegetable Concentrate with Resveratrol & Cat's Claw

What's Hot

B vitamins may improve athletic performance

Life Extension Update Exclusive

More exciting findings for resveratrol

Readers of *Life Extension Update* will recall the November 4, 2006 issue which reported the findings of David Sinclair on the positive effects of resveratrol on the health and survival of overweight older mice on high calorie diets. Now, researchers at the Institute of Genetics and Molecular and Cellular Biology in Illkirch, France have found that resveratrol boosts the exercise capacity of muscles in mice and protects against diet-induced insulin resistance and obesity. The research was published online on November 16, 2006 in the journal *Cell*.

Johan Auwerx and colleagues gave mice 200 or 400 milligrams per kilogram resveratrol daily combined with a high fat diet or regular chow diet for fifteen weeks. Mice who received the chow combined with resveratrol tended to gain less weight than animals who did not receive the compound. Predictably, mice who received the high fat diet gained significantly more weight than mice on the regular chow, yet those who received resveratrol weighed almost the same as mice on the unsupplemented chow diet over the course of the study.

The researchers determined that the decrease in weight was due to a reduction in body fat, with resveratrol-fed mice having smaller fat cells than those who did not receive it. This finding was not due to a decrease in food intake, as all mice on the high fat diet were found to have consumed a similar amount of calories per day, and had similar fecal lipid content. It was discovered that animals who received resveratrol had greater energy expenditure, with enhanced mitochondrial activity in brown adipose tissue and muscle. In an endurance test, mice who received resveratrol were able to run twice the distance that untreated mice ran before experiencing exhaustion. Similar results were obtained for endurance tests conducted with the groups who were fed the chow diets, showing that the significant difference in weight among the high-fat diet groups was not a factor in the increased resistance to muscle fatigue experienced by resveratrol-fed mice.

Although fasting glucose levels were not affected by resveratrol administration, mice that received the compound had significantly reduced fasting insulin levels, indicating improved insulin sensitivity. In another experiment with genetically obese mice on high fat diets, resveratrol improved glucose tolerance and fasting glucose levels without affecting weight, which suggests that resveratrol's antidiabetic effects may be independent of its effects on body weight.

In agreement with previous research, the team concluded that resveratrol increases the activity of the gene Sirt1, which has been associated with increased life span. In an experiment with humans, they demonstrated an association between genetic variation in the Sirt1 gene and whole body energy expenditure.

"This work is significant because it shows that a SIRT1 activator can protect against metabolic disease, highlighting the therapeutic potential of sirtuins," Dr Auwerx stated. "Resveratrol, a compound found in the skin of red grapes and hence in red wine, could very well explain the French Paradox."

Getting the most from exercise

A number of supplements have been shown to promote strength by supporting muscle function. These include the following:

Carnitine, an amino acid, helps transport fat into mitochondria, where it is metabolized. Exercise capacity is increased among people with arterial disease following carnitine supplementation (Barker GA et al 2001). In addition, studies show that carnitine supplementation increases muscle function and exercise capacity in people with kidney disease (Brass EP et al 1998).

Carnosine is found in high amounts in skeletal muscle; muscle levels of carnosine are elevated during peak activity (Suzuki Y et al 2002). Among other reported advantages, carnosine scavenges free radicals, which is important because exercise produces abundant free radical activity (Boldyrev AA et al 1997; Wang AM et al 2000; Yuneva MO et al 1999; Nagasawa T et al 2001). Additionally, carnosine protects against cross-linking and advanced glycation end product formation, both of which damage protein (Hipkiss AR et al 1995; Munch G et al 1997). Carnosine also acts as a pH buffer, protecting muscles from oxidation during strenuous exercise (Burcham PC et al 2000).

Studies show that creatine supplementation effectively increases lean muscle mass and strength (Nissen SL et al 2003; Kreider RB 2003; Gotshalk LA et al 2002). Creatine donates a phosphate molecule to adenosine diphosphate in order to produce more ATP for energy demands. The buildup of lactic acid may also be delayed after creatine supplementation.

http://www.lef.org/protocols/lifestyle_longevity/exercise_01.htm

Featured Products

Optimized Carnitine with GlycoCarn™

Diminished cellular energy production is an inevitable consequence of aging. As adults mature, the cellular power plants known as the mitochondria become dysfunctional. The resulting slowdown in energy production manifests in numerous health problems.

Nutritional researchers have discovered that the amino acid carnitine promotes the burning of fat for fuel in the mitochondria, thus promoting youthful levels of cellular energy production. Researchers have now identified several optimized, next-generation forms of carnitine that not only help boost cellular energy production, but also may confer targeted benefits for the brain, heart, muscles, and central nervous system.

<http://www.lef.org/newshop/items/item00916.html>



Dual-Action Cruciferous Vegetable Concentrate with Resveratrol & Cat's Claw

Scientists have identified specific extracts from cruciferous vegetables (broccoli, cauliflower, Brussels sprouts, etc.) that modulate hormones in a way to help maintain healthy cell division. For instance, animal studies have shown that the cruciferous vegetable extract indole-3-carbinol (I3C) modulates estrogen hormones by favorably changing the ratio of protective 2-hydroxyestrone versus the damaging 16-hydroxyestrone. Indole-3-carbinol also induces phase I and II detoxifying enzymes that can help neutralize estrogen metabolites and xenobiotic estrogen-like environmental chemicals.

<http://www.lef.org/newshop/items/item00855.html>



What's Hot

B vitamins may improve athletic performance

The October, 2006 issue of the *International Journal of Sport Nutrition and Exercise Metabolism* published a report which concluded that athletes who are deficient in B vitamins may experience diminished performance during high-intensity exercise and reduced ability to repair and grow muscle compared with those whose diets are nutrient replete. The B vitamins thiamin,

riboflavin, and vitamin B-6 are used by the body's energy producing pathways, and vitamin B12 and folate are needed for the synthesis of new cells and to repair those that are damaged.

<http://www.lef.org/whatshot/index.html#bvmi>

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