A New Approach to Diabetes

Isohumolones: Peroxisome Proliferator activators

Isohumulones are bitter compounds from hops and are responsible for the bitter taste of beer - where they are found in minute concentrations.[1] Isohumulones have been shown to improve blood lipid profiles and glucose levels in mice[2,3] and have ameliorated hemoglobin A1c and blood glucose levels in mildly diabetic patients.[4] The health benefits associated with Isohumulones are imparted by their ability to bind to and activate peroxisome proliferator-activated receptors (PPAR) α and γ.[5,6] PPAR are cellular receptors sensitive to blood lipid levels which allow the transcription of certain genes responsible for lipid utilization and breakdown.[7,8] This is a significant benefit for diabetics because the metabolism of free fatty acids and sugar are closely related. Indeed, free fatty acids compete with glucose and elevations in free fatty acid levels prevent the entry of glucose into cells.[9,10] This phenomenon through which fat inhibits glucose utilization is known as the glucose fatty-acid cycle and is central to insulin resistance as seen in diabetes type 2.[11,12]

Activation of the PPAR, leads to the cellular production and activation of a wide range of enzymes that are required for the utilization of fatty acids.[13] In turn, these enzymes improve lipid metabolism, lower circulating levels of lipids, and improve insulin sensitivity.[14] Activation of the PPAR is an ideal target for diabetics because the activation of the receptor improves insulin sensitivity, lowers blood lipid levels and may even have a weight-lowering effect.[15,16]

Isohumulones activate both PPAR α and γ. Treatment with isohumulones in mice prevented the development of diabetes, reduced plasma triglyceride levels by 62%, free fatty acid levels by 73% and plasma glucose levels by 65%. The same animal study also demonstrated that supplementation with isohumulones prevents the onset of insulin resistance in high fat diets.[17] Similar ameliorations in blood lipid profiles were confirmed in another animal study with demonstrated reductions in triglyceride levels.[18] Isohumulones have also been shown to increase HDL-cholesterol in mice.[19] HDL-cholesterol is the fraction of cholesterol that has a protective effect on the development of arterial plaque. Furthermore, the addition of isohumulones to the diet leads to weight reductions in animal studies.[20,21] Preliminary studies in diabetic patients have been very promising with significant reductions in both glycated hemoglobin and blood glucose levels.[22]

Isohumulones activate PPAR α and γ which:

- Lowers blood lipid levels
- Improves insulin sensitivity
- Has a weight lowering effect in animals
- Prevents the development of arterial plaque and diabetes in mice
- Lower glycated hemoglobin and blood glucose levels in type 2 diabetics

Reduce your glycemic load with ß-glucans

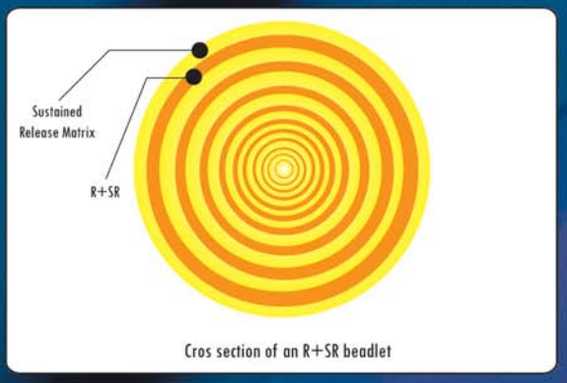
The health benefits of dietary fiber are considerable. Fiber slows down the gastrointestinal absorption of food, reduces the glycemic load of a meal, reduces cholesterol levels and is an important factor in feelings of satiety. All of those factors are essential in the maintenance of normal blood glucose levels.

ß-glucans:

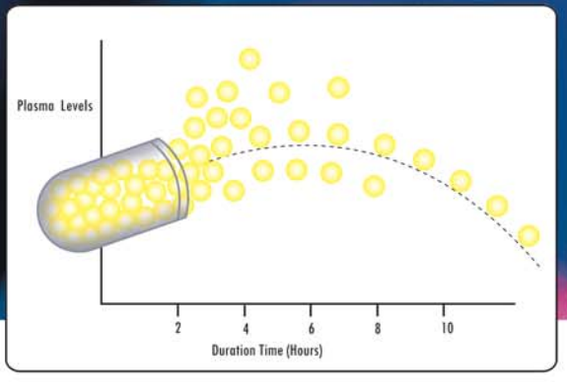
- Slow down absorption
- Reduce the glycemic index of food
- Diminish blood glucose levels
- Lower blood cholesterol levels
- Help regulate appetite

ß-glucans are large polysaccharides that cannot be digested. They absorb water and become viscous. The health benefits associated with ß-glucans are related to their viscosity.[23] Indeed, they bind to bile salts in the small

Time IS on your side



Lipoic Acid in a truly useable form



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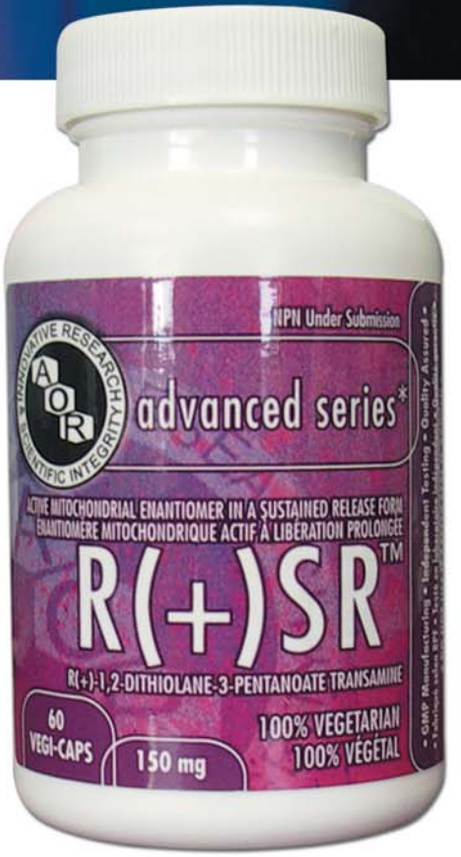
Both the racemate and R(+) have a short plasma half life of around 22 mins. R+SR with a more stable and bioavailable matrix has a longer half life of 8-10 hours through its unique **sustained release formulation**. Two capsules per day are all that is required to afford you a full 24 hour protection and keep your blood at a high steady state level. R (+) SR is the most effective means to keep a high NAD+/NADH ratio and optimal functioning of your cellular power house, the mitochondria.

*These statements have not been evaluated by the Food and Drug Administration. This product is not intended to diagnose, treat, cure, or prevent any disease.

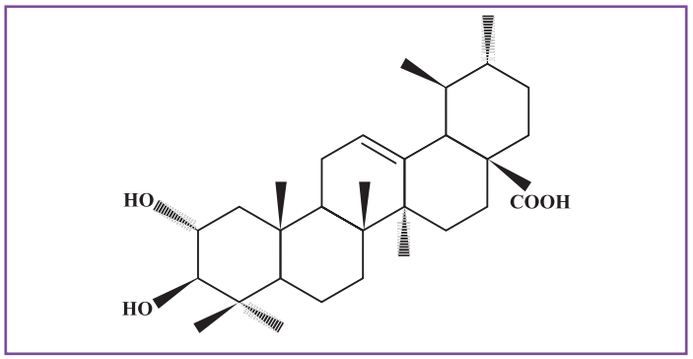


intestine preventing the reabsorption of cholesterol.[24] A significant payback as elevated fatty acid levels decrease glucose utilization eventually leading to insulin resistance.[25]

Tissue exposure to elevated glucose concentrations increases the risk of developing diabetes.[26] Refined sugars and processed cereal grains are more and more prevalent in developed countries.[27] Their rapid breakdown and quick absorption leads to a higher tissue exposure to glucose and a corresponding elevation of insulin produced by the pancreas, eventually leading to metabolic disorders such as type 2 diabetes,[28] obesity[29] and cardiovascular disease.[30] ß-glucans interfere with carbohydrate absorption, reduce gastric emptying and slow down the digestion and absorption of food, lowering the glycemic index of foodstuff (a measure of a food's effect on blood sugar).[31] Two separate clinical studies have demonstrated that ß-glucans reduce plasma glucose and insulin levels after a meal.[32,33]

Corosolic acid

Corosolic acid is extracted from banaba. The extract contains a polyphenol known for its glucose lowering effect.[34] Supplementation with the extract has reduced blood sugar elevations in animal studies[35,36] and two recent clinical trials in humans have established the extract's effectiveness at improving glycemia. The latest study on corosolic acid looked at the ability of the extract to improve blood glucose levels after a glucose tolerance test (a test designed to evaluate the body's response to glucose).[37] A significant improvement was revealed 90 minutes after the individuals were given 75 g of glucose.[38]



Corosolic Acid

In an earlier randomized clinical trial, corosolic acid was given to patients suffering from type 2 diabetes. After 15 days of treatment with 160 to 480 mcg of corosolic acid per day reductions in fasting blood glucose levels reached 30% in the group receiving 480 mcg per day of corosolic acid in a soft gel preparation.[39]

Cinnamon

New research supports the efficacy of cinnamon for healthy glucose maintenance. Known as a spice in Western countries, cinnamon is used as a medicine in Asia. Cinnamon mimics and amplifies the effects of insulin and helps to regulate blood glucose and improves glucose utilization.[40-42] Cinnamon contains a hydroxychalcone known as the cinnamon methylhydroxychalcone capable of up regulating glucose uptake and glycogen synthesis by cells. Both processes are essential for blood sugar regulation.[43] Cinnamon may also help reduce blood lipid levels through its action on the liver.[44] Two human studies in diabetics have shown a significant improvement with cinnamon supplementation. In the first study blood glucose levels dropped by 18-29%, triglycerides levels were reduced by 23-30%, LDL cholesterol lowered by 7-27% and total cholesterol by 26% after 40 days of cinnamon supplementation in patients with poorly controlled type 2 diabetes.[45] In the second study, 4 months of supplementation with a cinnamon extract in diabetes patients led to a moderate but significant reduction in blood glucose levels; decreases were above and beyond the reductions achieved through diet and medication alone.[46]

Cinnamon

- Activates insulin receptors
- Increases cellular glucose uptake
- Enhances glycogen production (glycogen is stored glucose)
- Potentiates the action of insulin

Rapid Aging

Diabetes is often referred to as the disease of "rapid aging". The pillar of disease prevention is the maintenance of normal tissue and optimal metabolic function. In essence, disease prevention strives to extend life through healthy lifestyle and dietary habits which in turn maintain strong blood vessels, encourages normal cellular differentiation, gives rise to optimal cognition and incites normal metabolism and glycemia. Enough is known about diabetes to curb the onslaught of the disease. The benefits of natural treatments with demonstrated efficacy in the maintenance of normal blood glucose levels should not be overlooked.

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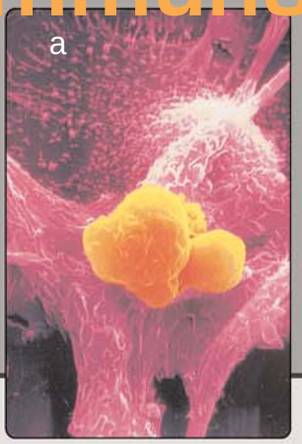

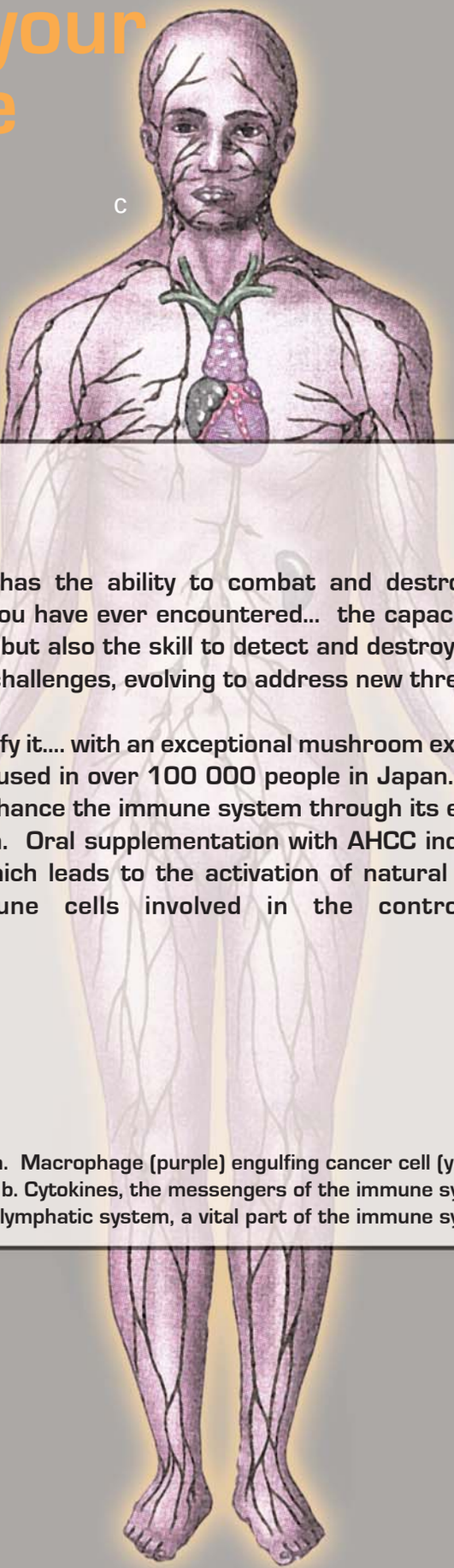

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An approach that focuses on health, not disease...

a. Macrophage (purple) engulfing cancer cell (yellow).
b. Cytokines, the messengers of the immune system.
c. The lymphatic system, a vital part of the immune system.

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