

Bristlecone Med-fitness

"Damaging truth, I prefer it to advantageous error. Truth heals the pain which perhaps it evokes." -Goethe

"Forskolin the Green Light Herb!"

If you've done a **Bundle**, you know the significance of the "Red Light/Green Light" cell diagram. We anxiously await our blood spot fatty acid profile knowing that an AA/EPA ratio above 5 gives us a cellular, "RED LIGHT!" However, those with a ratio below 5 have a "GO" at the cell level. Adding enough EPA through fish oil will dramatically drop our ratio into the desired "GREEN LIGHT" zone.

What's the significance? It's all about turning on the right second messenger within the cell.

Second messengers are responsible for cell communication and the execution of multiple diverse cellular functions. When the cell is healthy and prime, it is characterized by the second messenger cAMP, cyclic adenosine monophosphate. This is a cellular "Green" light because cAMP increases the effectiveness and efficiency of cell function. The decline of cAMP and presence of IP3, DAG, the bad second messengers, decreases the cell's efficiency. This is a cellular "Red" light.

Many diseases are characterized by decreased intracellular levels of cyclic AMP. These include: asthma, eczema, psoriasis, angina, obesity, diabetes, cancer and hypertension. In fact, many drugs used to treat these conditions are designed to increase cAMP levels.

The Ancient Herb

Supplementing adequate levels of the essential fatty acids EPA and DHA through fish oil, will promote more cAMP and improve cellular communication. However, there is another powerful way to help your cells flip on the "Green Light!." It's through the ancient herb Forskolin. Forskolin is an extract from the plant, Coleus Forsakenly. Coleus has been traditionally used in Holistic medicine for a variety of conditions; the effects of Forskolin have been extensively researched in animal, human and in vitro clinical studies.

Forskolin acts by activating the enzyme adenylate cyclase, which results in increased levels of cAMP in the cells. Forskolin, unlike many of the synthetic drug act-alikes, *works directly to increase cAMP.* Most pharmaceuticals used to treat low cAMP are designed to inhibit the enzyme phosphodiesterase, which breaks down cAMP. This is the flip side of forskolin's action which makes it a perfect addition to most traditional treatments.

cAMP or DAG/IP3

An increase in cellular cAMP is characterized as a healthy "green light" within the cell based on its numerous health benefits. Increasing cyclic AMP has a broad range of physiological and biochemical effects, including: inhibition of platelet activation (reduced risk of blood clots), reduced release of histamine (decreased allergy symptoms), increased force of contraction of the heart, relaxation of the arteries and other smooth muscles, increased thyroid function, and increased fat burning. (YES! Remember turning the green light on in the cell at the autocrine level is primary to achieving insulin balance within the endocrine system!).

In the never ending journey to understand the physiology of sustained fat burning, cAMP is a big player! If we can turn on the green light of the cell at the autocrine level, and increase our cAMP, we will automatically burn more fat. In fact, scientists at Penn State University College of Medicine have confirmed that obese people have lower than normal cAMP production.

Here's how it works together with the endocrine system...cAMP activates an enzyme called hormone-sensitive lipase (HSL). HSL then breaks down stored body fat (triglycerides) into free fatty acids. The free fatty acids leave the fat cell and are carried by the blood to the muscles, where they are burned for energy!

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Glucagon to the Rescue!

Sound familiar? Yes, our friend glucagon, the fat burning hormone, facilitates this entire process. cAMP and glucagon are long time friends; however, as we age (and gain weight) they rarely join forces! Insulin blocks HSL from breaking down fat.; they play a game of metabolic tug of war. Insulin inhibits fat burning by antagonizing HSL within the cell.

Insulin will always prefer the esterification of fat, the process of locking it away within the cell! If we revisit the physiology of the Randle Cycle, you'll remember the 3 musketeers of fat storage...high glucose, high insulin and a molecule called *glycerol phosphate*. Glycerol phosphate is produced when sugar is oxidized rather than fat. This occurs when our diet is perpetually high in carbs.

GLYCEROL PHOSPHATE

The significance of this molecule is in the formation of triglycerides, the storage form of fat. Glycerol phosphate borrows its glycerol molecule to bind up 3 fatty acids; it's like tying a ribbon around the FFA's. It forms a TRIGLYCERIDE! So, when insulin is high and we're eating high carb, our free fatty acids don't have a chance to escape and be used for energy. Instead, they are quickly tied into triglycerides and locked away into fat storage. A triglyceride is "locked" because it is too large to slip through the fat cell membrane, unlike FFA's that slip in and out. *Thus, at the heart of the matter, cAMP activates the enzyme (HSL) which fights the molecule (glycerol phosphate) to keep us lean!*

Forskolin has many other far reaching benefits to complement its facilitation of fat burning. The following actions of Forskolin are attributed to its cAMP-elevating ability. Coleus forskolii has traditionally been used to treat hypertension, congestive heart failure and angina. Forskolin's basic cardiovascular action is to lower blood pressure while simultaneously increasing the contractility of the heart. It also increases cerebral blood flow in the prevention and recovery of stroke. Scientists at Brown University also confirmed that forskolin is a potent inhibitor of cancerous tumor growth in mice. They suggested that forskolin could find a significant place in the prevention of tumor metastases.

HEAL FROM THE INSIDE

Skin disorders such as eczema and psoriasis are characterized by a relative decrease in cAMP compared to other second messengers. This imbalance results in a tremendous increase in cell division causing thick patches of dry, flaky skin. Forskolin helps to normalize the cAMP ratio within the cell. Developments in the treatment of depression are focusing a drug called Rolipram which acts by increasing the cAMP (by an action very similar to forskolin). Researchers stated clearly that, "elevated brain cAMP levels are closely linked to antidepressant activity."

Forskolin has also demonstrated the ability to increase thyroid hormone production and stimulate thyroid hormone release. This mechanism may be one way forskolin promotes normal body weight. *With the current focus on reactionary medicine, it's refreshing to discover ways to prevent disease and heal our bodies from the inside-out. You can find forskolin at most health food stores or on-line. The recommended dosage for weight loss or cell repair is 50-100mg/day in divided doses.*

~Kelly & Julie