

**This is a short, highly simplified write-up introducing our fat prevention/burning product. For those of you who enjoy a deeper read, an extensive write-up detailing each system involved and dietary suggestions will follow with more citations.**

DCP is an effective combination of TetradecylThioacetic Acid (250mg), Salvia Miltiorrhiza Extract (standardized for 40% Mixed Tanshinones) (250mg), Propionyl-L-Carnitine (300mg), Potassium Pyruvate (300mg), and Raspberry Ketones (100mg). You may have seen some of these ingredients in other products, but let's look at why we chose them specifically to work in concert to help you become the lean, mean, muscle building machine you want to be.

The center ingredient in which our product is based off of is TetradecylThioacetic Acid (TTA). TTA is a 3-thia fatty acid which increases mitochondrial activity, which in itself provides numerous benefits. Insulin resistance is strongly linked to the reduction of glucose oxidation in mitochondria and a subsequent build up of glycolysis byproducts. Adipocytes also contribute hormones when fat is stored in them, so, the more fat you are carrying, the more inhibition of mitochondrial function you have (1). Mitochondria proteins function mainly to produce ATP, enhancing their function will, in short, burn more fuel. TTA enhances mitochondrial oxidative capacity and reduces free fatty acid and triglyceride levels as described below.

The peroxisome proliferator-activated receptors (PPARs) are transcription factors regulated by fatty acid derivatives, among others. These receptors are intimately involved in glucose regulation, cellular proliferation and differentiation, inflammation, and most important to us, fat metabolism. There are at present three types of PPARs: alpha, gamma, and delta. The liver is the main site where fatty acids are stored or burned for energy, depending on calorie intake. When fasting, fuel sources switch from carbohydrates and fats to mainly fats, and fatty acids are released from adipocytes. In the liver, they are either reesterified to triglycerides and form very low-density lipoproteins (VLDL), which then go on to rest in adipocytes or go to cardiac and skeletal muscle for energy. They can also be broken down through beta-oxidation to form ketones. PPAR-alpha mediates the genes controlling fatty acid uptake, beta-oxidation, and gamma-oxidation, which are upregulated when in a fasted state. TTA is a PPAR-alpha agonist, meaning it activates these receptors. Thus, you experience the same benefits even if you are in a fed state (9,15-18). PPAR-alpha also down-regulates apolipoprotein C-III which inhibits triglyceride hydrolysis, further enhancing lipid oxidation (2).

However, long term supplementation with TTA will force the body to compensate by upregulating fat storing enzymes. This discovery was the inspiration for DCP, and an explanation why TTA supplemented by itself for extended periods of time may lose its efficacy. Diacylglycerol acyltransferase (DGAT) stores fat, and is increased when TTA is consumed regularly (3). Enter Salvia Miltiorrhiza. Salvia Miltiorrhiza is a traditional Chinese herbal medicine commonly used to treat liver diseases for centuries, and contains constituents called tanshinones, which inhibit DGAT, preventing fat storage (4). Even though this could be the end of Salvia's role in DCP, let's take a brief look at some of its other underrated benefits. In rat studies, it may be neuroprotective (5), a free radical scavenger (6), anti-tumor (7), and anti-inflammatory (8), to name a few.

TTA also increases the activity of enzymes of the carnitine palmitoyltransferase (CPT) system (9), which shuttles the newly freed up fatty acids into mitochondria to be burned for fuel (10). This system is highly underestimated in a fat loss quest, and its activity is depressed with increased fat. Propionyl-L-Carnitine (PLCAR) was added to further stimulate the CPT system (11), and is converted into propionyl-coenzyme A and free carnitine (12). PLCAR has also been suspected to scavenge free radicals, as well as protect DNA from UV damage (12). PLCAR also has some interesting performance enhancements, specifically on endurance, from anecdotal feedback and possible mechanisms will be elucidated in the extended write-up.

Pyruvate is involved in another complex system called the Pyruvate Dehydrogenase Complex (PDC), which interacts with the CPT system (13). Pyruvate is a Krebs Cycle intermediate, which is rate controlled by the amount of acetyl-CoA that enters the cycle, one of the conversions from pyruvate (13). For simplicity's sake, the result is an ATP/energy enhancement from the mitochondria and an increase in fuel consumption. The electrolyte potassium form was added to attenuate cramping issues

observed from previous TTA products.

Raspberry Ketones (RK) add the finishing touch to DCP. RK is similar in structure to capsaicin and synephrine, and also has been shown to modulate fat metabolism. RK stimulates the release of norepinephrine (NE), a catecholamine with many functions. Most importantly to us is its role in the sympathetic nervous system. NE, having a great affinity on beta and alpha-1 adrenoreceptors in the body, activates lipolysis that normally only occurs during exercise or other intensive activity. This results in an increase of free fatty acids which will be burned via methods described above (14).

As you can see, DCP attacks fat from many angles. It can be especially effective when bulking to prevent fat storage and also has appetite suppressive properties in some users, or used in a cut to potentiate the body's fasting enzymatic response. Take control of your body with Damage Control Protocol!

## Citations

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