

# SWITCH YOUR METABOLISM BACK ON



*the  
Natural  
Way*



*“Relying on the wisdom and holistic approach of Traditional Chinese Medicine, Western Natural Therapies, and a 6000 year unbroken history of Herbal Medicine, I offer a healing system that focuses on the cause of disease, not merely the suppression of symptoms.*

*My goal is to discover the individuality of your health problem, treat its cause, and stimulate your body to heal itself as soon as possible.”*

## ***Dennis Vander Kraats***

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### ***Personal History***

Dennis Vander Kraats was born in Toronto, Canada and grew up with a passion for distance running. He represented Canada nationally and internationally on a number of occasions, including the 1979 World Cross Country Championships. His success in athletics earned him a scholarship from the prestigious University of Notre Dame (USA).

After arriving in Australia, Dennis and his wife Marion successfully operated a health food store and this stimulated Dennis's desire to further his knowledge of natural therapies.

After eight more years of study, Dennis graduated from the Melbourne College of Naturopathy and Homoeopathy, the Nanjing College of Acupuncture, and the Australian Acupuncture College (Victorian University of Technology) to become a qualified Naturopath and Acupuncturist.

Dennis is now in private practice, and the director of Vander Kraats & Associates, evidence based natural medicine in Western Australia.

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# *What if you could turn your metabolism back on and lose weight the natural way?*

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*I used to have a metabolism  
like a hummingbird...*



Hummingbirds are thought to have the fastest metabolism of all animals eating 2 to 3 times their own body weight in a day. Rarely are they not eating!

I remember when I was young and my metabolism was like a hummingbird's. I could run around all day and play extreme sports and not suffer from aches and pains.

I used to sleep like the dead, a minimum of 8 hours without waking. And when I awoke my sleep was so deep it felt that my dreams were chasing me into consciousness.

People used to admire my complete abandonment of inhibitions when it came to eating and drinking. Portion size was just "more please".

Food tasted so good and the taste buds danced. A few hours later I was feasting again.

The concept of laxatives was unintelligible to me. More regular than a Rolex, complete, without fuss, and satisfying. Heartburn, reflux, bloating, weight gain, arthritis...well that was just old people talking.

Those were the days...when I had a metabolism!

## ***What if you could turn your metabolism back on?***

What if there was a natural medicine which worked with your body to...

- Accelerate fat burning
- Preserve lean muscle while burning fat
- Improve blood sugar levels
- Reduce glucose production in the liver
- Reduce insulin resistance in the muscles
- Improve immunity
- Improve liver function
- Improves circulation and blood flow
- Improves energy levels

*Well, now there is....*

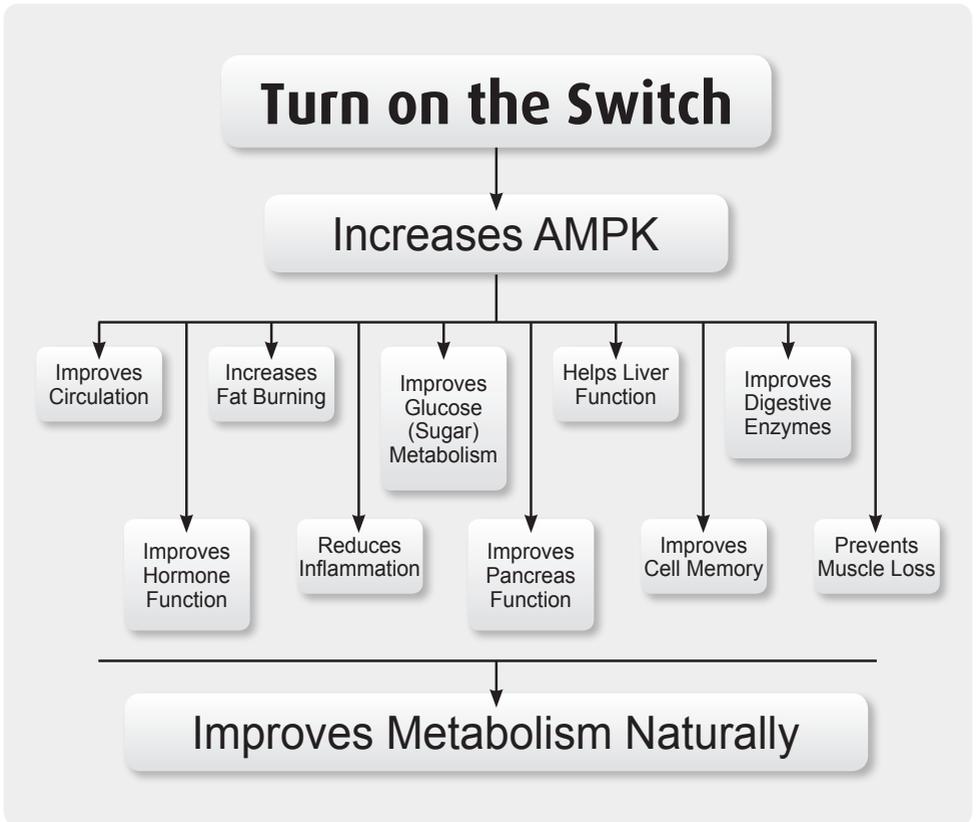
*NO caffeine, artificial stimulants, no elevation of heart rate.*

***AMPK - the master metabolic switch.***

## ***The AMPK Story***

AMPK or its chemical name, “5’ adenosine monophosphate-activated protein kinase” is an enzyme that plays a crucial role in cellular energy homeostasis.

AMPK acts as a metabolic master switch regulating a number of systems inside your cells which control how your body uses energy. Increasing AMPK stimulates a biochemical cascade of reactions in the body which improves metabolism. This biochemical cascade is extremely complex but can be simplified in the following chart.



***“If you can’t explain it simply, you don’t understand it well enough” Albert Einstein***

Explaining how AMPK works requires a complex understanding of cell biology, physiology, and biochemistry. But by explaining two major mechanisms of how cells work, I think we can get a good understanding conceptually of what is happening.

## ***Cell signalling:***

Much of current day medical research is focused on better understanding cell signalling in the development of new medicines. Cell signalling is part of a complex system of communication that governs and coordinates cell function. Cells need to listen to what's going on around them in order to react appropriately.

When listening to your car radio, if the station is not tuned in properly or if your antenna is broken, your radio cannot receive the message or instructions from the radio signals.

In a similar way, if the quality of instructions is poor, and/or the cell has an inability to receive the instruction, disease can result. Many diseases such as cancer, autoimmunity, and diabetes are thought to be related to errors in cell signalling. AMPK is a very important cell signaller which can not only “tune in the channel” but also “turn up the volume.”

## ***Gene expression:***

*“A gene is just a small part of a chromosome and a chromosome is just a small part of a person's DNA.”*

***or...***

*“A gene is like a sentence, a chromosome is like a chapter, DNA is the whole book.”*

Gene expression is the process by which information from the gene is used to make the “spare parts” or “building blocks” that keep the machinery of life going. The original information or genetic code comes from the DNA.

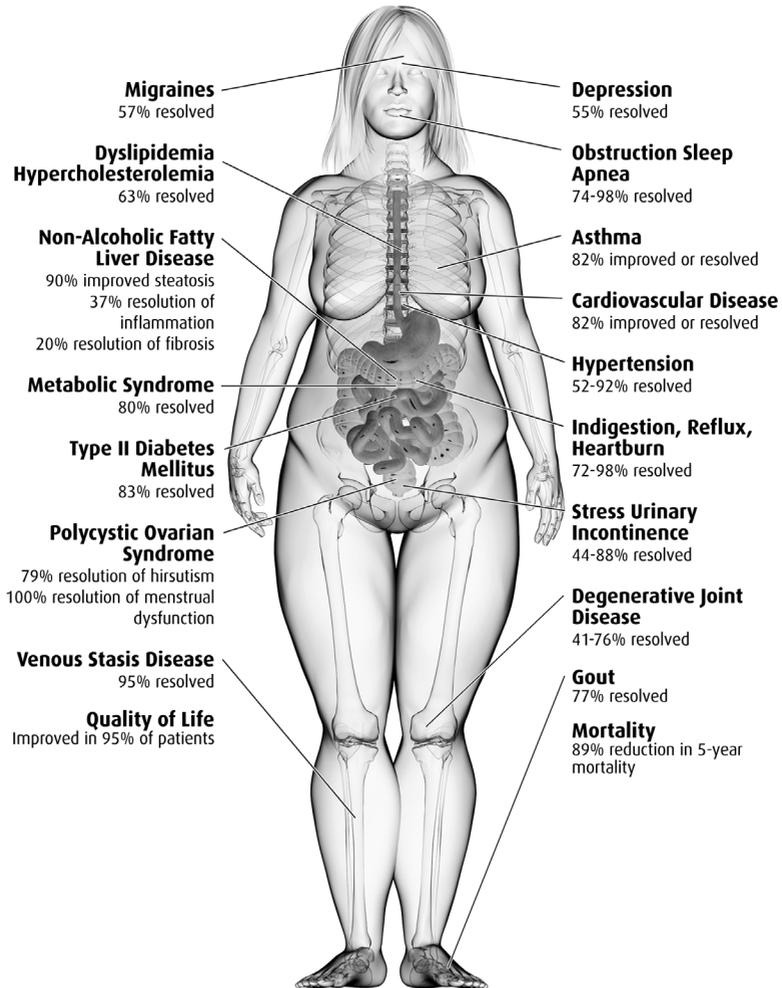
Just like a builder who relies on an architect's blueprint to build your home, we rely on our genetic code and gene expression to have a healthy body.

Ideally, our blueprints should be of good quality so they can be easily read...who can read one that has been chewed by the dog? Likewise, if our DNA or genes are damaged, information to maintain and heal the body will be compromised.

Since everyone at the building site needs a copy of the blueprints, we have to make sure that the photocopier is working properly. The first step of gene expression, called transcription, is the copying of the information from the gene to be used in building and repairing the body.

AMPK stimulates many of the processes involved in gene expression which are necessary for a healthy metabolism.

# When You Lose Fat



## *Avoid the high carbs and sugars for an athletic body*

Athletes have known for decades that the way to shed unwanted fat and maintain lean muscle is to avoid the high carbohydrate and sugar foods. Having a smart diet enhances the effect of AMPK.

The other important principle is to have adequate protein to make sure that the body does not lose muscle in the fat burning phase. Muscle is obviously important for strength and mobility, but also plays an important role in the immune system and blood sugar regulation.

Think of muscle as the armour of the body...and AMPK helps you keep it.

## ***Studies showing the advantages of avoiding high carbohydrate to burn fat and preserve muscle***

<b>Very-low-carbohydrate diets decrease fat mass, spare lean body mass</b>										
STUDY	YEAR	DIET	SUBJECTS	DURATION (DAYS)	ENERGY (KCAL)	CHO (G)	BODY MASS CHANGE (KG)	FAT MASS CHANGE (KG)	LEAN BODY MASS CHANGE (KG)	METHOD
Benoit et al <sup>11</sup>	1965	Fasting	7 M, obese	10	0	0	-9.6	-3.4	-6.2	UWW
		VLCD		10	1,000	10	-6.6	-6.4	-0.2	
Young et al <sup>9</sup>	1971	VLCD	2 M, obese	63	1,800	104	-11.2	-8.4	-2.8	K40
		VLCD	3 M, obese	63	1,800	60	-12.3	-10.2	-2.1	
		VLCD	3 M, obese	63	1,800	30	-15.6	-14.9	-0.7	
Phinnet et al <sup>22</sup>	1980	VLCD	5 F, 1 M, obese	42	500-750	0	-10.6	-7.1	-3.5	UWW
Willi et al <sup>12</sup>	1998	VLCD	6, obese	56	650-725	25	-15.4	-16.8	1.4	DXA
Volek et al <sup>13</sup>	2002	VLCD	12 M, lean	42	2,335	46	-2.2	-3.3	1.1	DXA
		Control	8 M, lean	42	2,190	330	0.4	0.0	0.4	DXA

CHO = Carbohydrate, M = male, F = female, UWW = underwater weighing, VLCD = very-low-carbohydrate diet, K40 = potassium-40, DXA = dual energy x-ray absorptiometry

### ***Don't rely on BMI***

Body Mass Index abbreviated BMI, is a mathematical tool for assessing body shape based on one's weight and height. It is determined by dividing your weight in kilograms by your height in metres squared. It is often used medically to determine ideal weight and degree of obesity.

Since it doesn't actually measure body composition, that is, bone, fat and muscle content, it is often a very poor indicator of ideal weight. This is particularly true if a person carries a lot of muscle weight or is "big boned".

### ***The Holistic Approach***

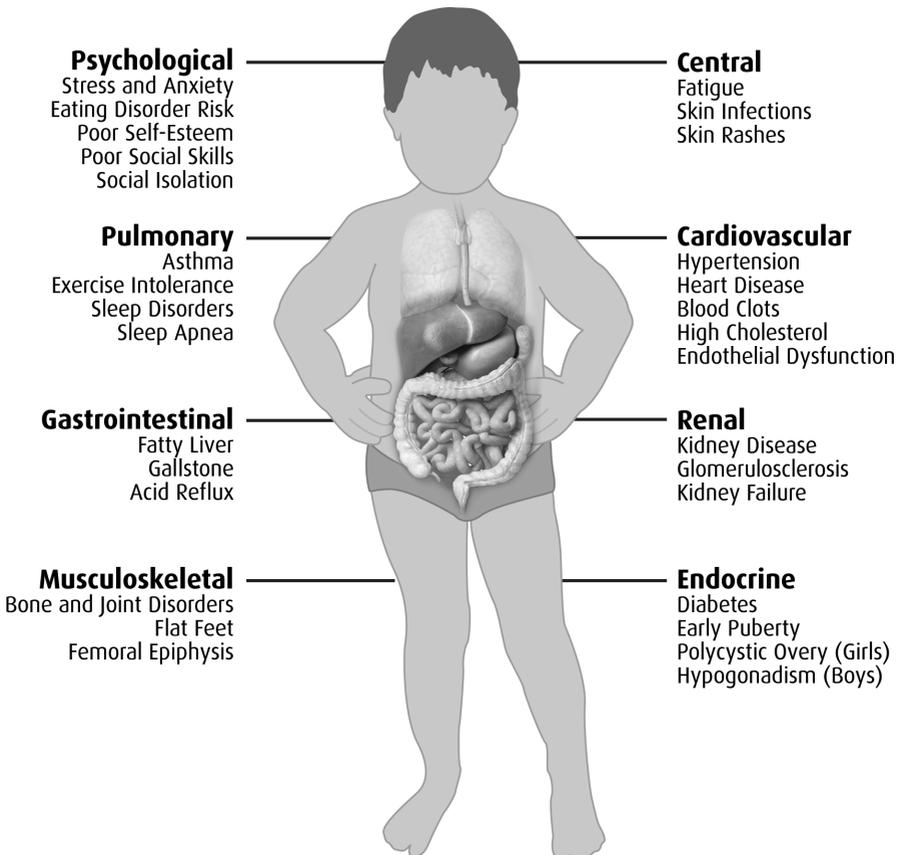
Other major factors affecting metabolism are...

- Thyroid hormones  
(see Measuring Basal Metabolic Rate)
- Estrogen and testosterone levels
- Cortisol (the stress hormone) levels
- Level of inflammation
- Quality and duration of sleep
- Digestive and bowel function
- Toxicity levels
- Water consumption
- Muscle mass
- Exercise
- Healthy glutathione levels

## *Suggestions for enhancing the effects of AMPK*

- Have a portion of protein with each meal.
- Stick to the low to moderate carbohydrate and sugar foods as much as possible.
- Apart from protein, the rest of your food should consist of vegetables and salads. Raw or lightly cooked.
- Eat fruit sparingly. (Berries are best)
- Avoid all grains as much as possible.
- Say “NO” to alcohol.
- Learn to love green tea.

## **Childhood Obesity Complications**



## ***Hypothyroidism; The Undiagnosed Epidemic***

The vast majority of people who suffer from thyroid problems suffer from hypothyroidism... that is, an under active thyroid. The thyroid produces hormones which affect almost all the cells in your body. It is no wonder then, that a disorder of the thyroid can cause literally hundreds of different problems in your body including:

*Fatigue, decreased libido, candida, dry skin, premature aging, infertility, constipation, mood swings, frequent infections, headaches, blood pressure problems, endometriosis, diabetes, cancer, nervousness, insomnia, heart attack, weight loss or weight gain, stroke, hair loss, high cholesterol, intolerance to heat, muscle weakness, low immune system, arthritis, gout, depression, osteoporosis, joint pain, muscle pain, heart palpitations, cystic breasts, ovarian cysts, intolerance to cold, insulin resistance.*

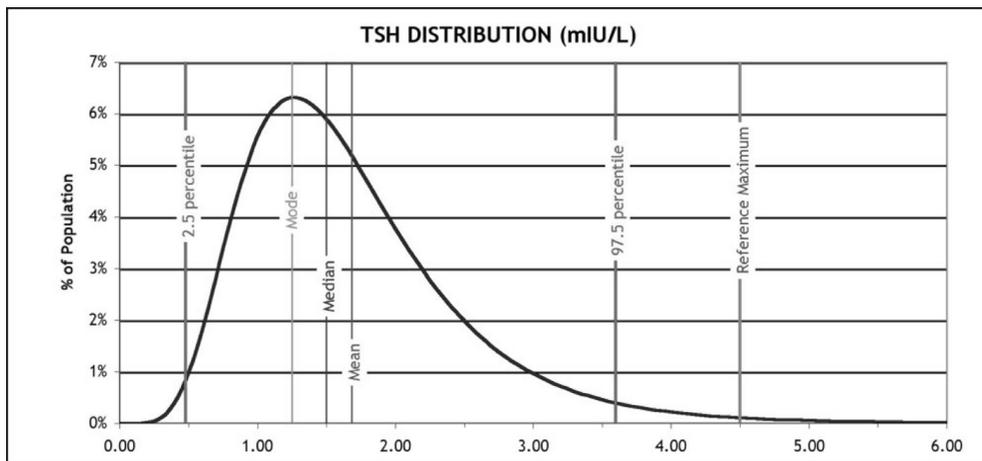
What makes matters worse, is that there are many people who suffer from hypothyroidism that remain undiagnosed. There are a number of reasons for this that you should understand to empower you to take steps to see if you are one of the many who are suffering without knowing that your thyroid is underactive.

The most common medical test for measuring the function of the thyroid is a blood test which measures the level of Thyroid Stimulating Hormone (TSH or thyrotropin) that your anterior pituitary gland produces. In a sense, this is a conversation between the pituitary gland and your thyroid gland. When your thyroid is being lazy and not producing enough thyroid hormones, the pituitary gland produces more TSH as a signal to encourage the thyroid gland to start working harder and produce more hormones. The converse is also true. That is, if the thyroid is overproducing hormones the pituitary produces less TSH in an attempt to down regulate thyroid hormones production.

There are a number of potential shortcomings of the TSH as a measurement of thyroid function.

Firstly, the reference range that most Australian pathology companies use is outdated according to medical experts overseas. The so called "normal" range goes from .4 to 4 and in some cases, .4 to 5. Many pathology companies have narrowed this range to .4 to 2.5 Some doctors believe that a TSH of 1.0 is ideal for many people.

This means that if your TSH is greater than 2.5 and less than 5, in Australia you would be classified as “normal” whereas under the stricter range you would be diagnosed as suffering with hypothyroidism. The more narrow range could be described as the “ideal” or most healthy range. A recent study of 65,000 healthy people without thyroid disease found that the most common TSH reading (Mode) was 1.25 and the Median Value was 1.50 (that is, over half the population in the study had a reading below 1.50). The average (Mean Value) was 1.68. Eighty-five percent of the group had a TSH under 2.35 (See Chart).



## References

1. T Björro et al, 'Prevalence of thyroid disease, thyroid dysfunction and thyroid peroxidase antibodies in a large, unselected population. The Health Study of Nord-Trøndelag (HUNT).' *European Journal of Endocrinology* 2000 143 639-647
2. J Stockigt, 'Subclinical Hypothyroidism or Mild Thyroid Failure: How important is early diagnosis and what treatment is optimal?' Interview With Sigma Pharmaceutical 2001  
<http://www.thyroid.org.au/Information/Stockigt.html>. Accessed 30 December 2001.

The second and perhaps more significant problem with interpreting the TSH reading is to remember that it is only the “dialogue” between the pituitary gland and the thyroid. This “dialogue” helps regulate the production of thyroid hormones, but it provides no information as to whether the thyroid hormones are being effective in their “target tissues”. This is where “the rubber meets the road!” To understand this, we must realize that hormones are chemical “messengers” that have instructions to deliver to cells. This instruction tells cells what to do. The transfer of “information” from the thyroid hormone (indeed all hormones) takes place at the cell membrane (cell wall). Hormones are like “keys” that fit into locks

(receptor sites). When the “key” fits the receptor site, the information is taken on board the cell to stimulate cell function and often initiate gene expression.

The problem occurs when there are adequate amounts of thyroid hormones circulating in the blood, but the exchange of information and instructions does not occur at the cell membrane. It’s as though the hormones don’t exist since the cells are “resisting” (ie not listening) to the hormones’ instruction. This ineffectiveness of the hormone’s ability to transfer information to the cell has been named, “Type 2 Hypothyroidism”.

As an aside, a similar concept occurs with insulin and blood sugars, known as “insulin resistance”. In this case, there is plenty of insulin (a hormone) in the bloodstream, but poor receptor site health at the cell wall, likewise ignoring the instructions of insulin.

Another potential undiagnosed problem occurs with the lack of conversion of T4 to T3. The main hormone that the thyroid produces is called T4. T4 is relatively inactive and must be converted by the body to the more active form called T3. If for various reasons T4 cannot be converted efficiently to T3, hypothyroidism can result.

## ***Measuring Basal Metabolic Rate***

An extremely prevalent symptom of hypothyroidism is a lowering of body temperature. A lower body temperature is a sign of a decreased metabolism. Cold hands and feet are often part of the symptom picture. People can also feel “hot” yet still have a lowered body temperature.

Temperature should be taken first thing in the morning before getting out of bed. Excess bed clothing or blankets can give a high reading as can an abnormal sleep pattern the night before. It is ideal to measure after a good or average night’s sleep.

Mercury thermometers are the best for measuring basal metabolic rate but are no longer made. There are alternative liquid based thermometers on the market which are better than the digital ones.

Place the thermometer under your armpit for 10 minutes before rising first thing in the morning. Digital thermometers are much quicker...just wait for the “beep”.

Temperature readings between 36.6 C and 36.8 C are considered normal. Any reading lower than 36.6 strongly suggests hypothyroidism. This test can also be an

indication when the thyroid has been successfully treated since body temperature will then rise back up to the normal range. Remember to have your thermometer beside your bed so that you move as little as possible before and during taking your temperature. The readings should be taken over 4 or 5 days to see what the average is.

Men can do the test any day when not rushed and after an adequate night's rest. Women's temperatures however, can fluctuate at different times of their menstrual cycle. Day 2 until Day 6 are ideal (Day 1 is when the menstrual bleeding starts). However, measurement at different times of the cycle can be important for comparison and also indications of hormone fluctuations.

Before puberty and after menopause, women can take their temperature on any day.

It is not recommended that the temperature be taken orally. Oral temperature can be affected by sinus problems, teeth and gum problems, general inflammation in the body, etc.

## ***Low Carbohydrate Food List***

- All fish, fowl, eggs, cheese, and meat. Only whole food - no manufactured meats.
- Most herbs and spices as long as no added sugar.
- All nuts - especially walnuts, pecans, brazil, and almond. Only a small handful per serve. Nuts are high in calories.

Alfalfa Sprouts	Cucumber	Radishes
Artichoke	Eggplant	Rhubarb
Asparagus	Fennel	Sauerkraut
Artichoke hearts	Green String Beans	Snap Peas in a pod
Avocados	Kale	Snow Peas
Bamboo shoots	Kohlrabi	Spinach
Bok Choy	Leeks	Squash
Broccoli	Mushrooms	Swiss chard
Broccoli raw	Olive - Green	Tomato
Brussels sprouts	Olives - Black	Turnips
Cabbage	Onion	Water Chestnuts
Cauliflower	Parsley	Zucchini
Chives	Pumpkin	

## ***Study***

### ***AMPK: a key regulator of energy balance in the single cell and the whole organism.***

The AMP-activated protein kinase (AMPK) system is a key player in regulating energy balance at both the cellular and whole-body levels, placing it at centre stage in studies of obesity, diabetes and the metabolic syndrome. It is switched on in response to metabolic stresses such as muscle contraction or hypoxia, and modulated by hormones and cytokines affecting whole-body energy balance such as leptin, adiponectin, resistin, ghrelin and cannabinoids. Once activated, it switches on catabolic pathways that generate adenosine triphosphate (ATP), while switching off ATP-consuming anabolic processes. AMPK exists as heterotrimeric complexes comprising a catalytic alpha-subunit and regulatory beta- and gamma-subunits. Binding of AMP to the gamma-subunit, which is antagonized by high ATP, causes activation of the kinase by promoting phosphorylation at threonine (Thr-172) on the alpha-subunit by the upstream kinase LKB1, allowing the system to act as a sensor of cellular energy status. In certain cells, AMPK is activated in response to elevation of cytosolic Ca<sup>2+</sup> via phosphorylation of Thr-172 by calmodulin-dependent kinase kinase-beta (CaMKKbeta). Activation of AMPK, either in response to exercise or to pharmacological agents, has considerable potential to reverse the metabolic abnormalities associated with type 2 diabetes and the metabolic syndrome. Two existing classes of antidiabetic drugs, that is, biguanides (for example, metformin) and the thiazolidinediones (for example, rosiglitazone), both act (at least in part) by activation of AMPK. Novel drugs activating AMPK may also have potential for the treatment of obesity.

#### Reference:

International Journal Obesity (Lond). 2008 Sep;32 Suppl 4:S7-12. Doi: 10.1038/ijo.2008.116.

*Are you interested in switching  
your metabolism back on?*

Contact Vander Kraats & Associates today for more  
information, or to book an appointment.



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