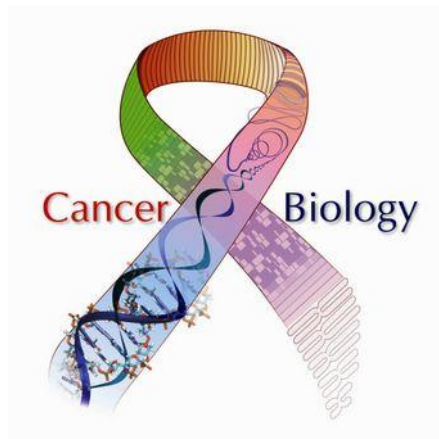


“Cancer and Sugar- A Lethal Combination”



This article will briefly explain the role of sugar or otherwise known as “glucose” in cancer progression. It also includes natural treatments and methods on how cancer cells can be eradicated gradually.

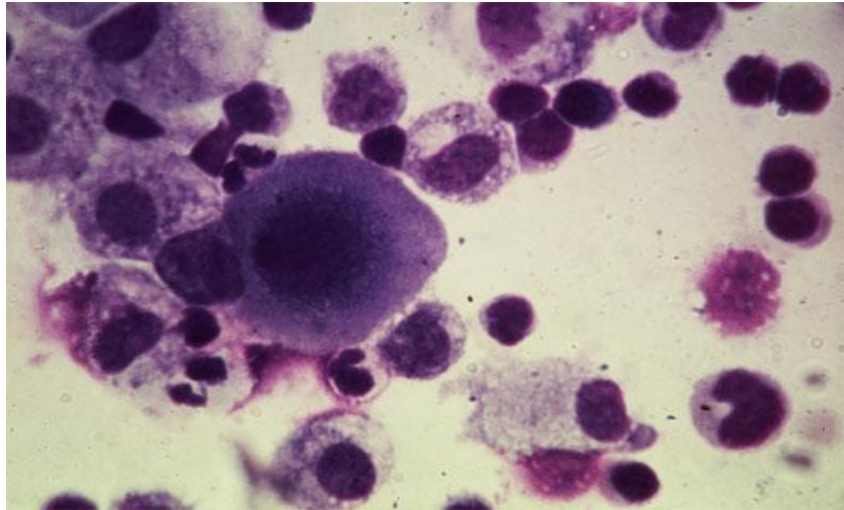
Most cancer patients cannot stand the lethal effects (e.g. infection & bleeding) of cancer treatments such as those chemotherapeutic drugs, hormonal therapy, as well as, radiation therapy. But these should not be an obstacle for them or for them to even lose hope as we introduce to you a diet therapy that is absolutely a preferred choice of most experts. (http://www.chemotherapy.com/side_effects/side_effects.jsp)

As a natural dietary therapy (ketogenic diet), a lot of cancer patients have witnessed its astounding effect in destroying cancer cells. These have brought countless sufferers hope to their never ending dilemma. Due to its natural ingredients it has also been proven to develop good health, prevents tumour formation, and even reduces inflammatory processes. (<http://www.nutritionandmetabolism.com/content/4/1/5>)

The following are few questions that you may come across as we go along these topics.

- * What role does glucose play in tumour growth?
- * What is Warburg’s effect?
- * What benefits can be derived from Ketogenic Diet (Low Glucose Diet)?
- * Has this study been proven effective to some cancer patients?
- * Can Ketogenic Diet prevent weight loss in cancer patients?
- * Can Nature itself prevent and cure cancer?

The Nature of Cancer



Having heard that your loved one has cancer is tremendous news for you, but what really is Cancer?

Cancer that is otherwise known as carcinoma, malignancy, neoplasms, or tumour is primarily a disease of the aging. It is defined in science as an uncontrolled growth of cell that can invade adjacent tissues and can metastasis to other body organs. The risk of developing cancer has increased significantly with advancing stage. However, millions of people nowadays are being affected; even children and young adults already have acquired this deadly fatal disease. (<http://en.wikipedia.org/wiki/Cancer>)

Scientists have learned that cancer is caused as a result of mutation in the genes that control normal cell growth and death. Normally, cells grow and divide to produce more cells as they are needed to keep the body healthy. However, sometimes this progression does not occur. What happen is the old cells don't die when they should be and these cells form a mass known as tumour. (<http://www.cancer.gov/cancertopics/factsheet/Sites-Types/metastatic>)

The survival rate for many types of cancer has improved in recent years due to insidious studies on its cure; however, cancer is still the second leading cause of death in the US .

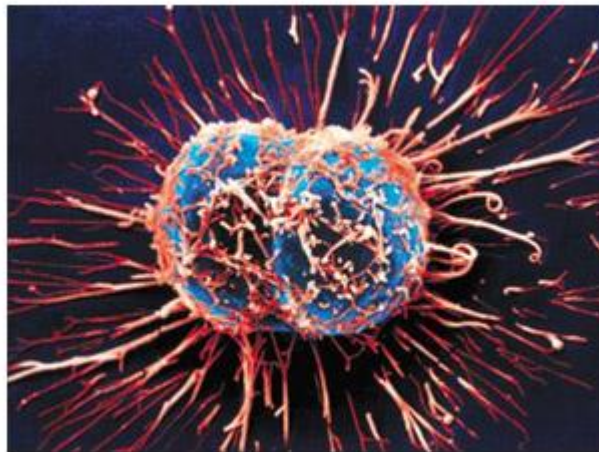
Today, it is known that mutations in oncogenes (cancer cells) and tumour suppressor genes are the fundamental cause of cancer. (<http://www.springerlink.com/content/x541252986x74528/>)

Major life-style and environmental risk factor for cancer includes tobacco, alcohol, diet, reproductive and sexual behaviour, occupation, pollution, industrial products and medicines. (<http://yourtotalhealth.ivillage.com/risk-factors-cancer.html>)

Nevertheless these risk factors can be reduce enormously by adopting a healthy lifestyle through eating nutritious foods that are rich in antioxidants and avoiding those that contain cancerous/harmful chemicals. Also, screening exams can detect some early stage conditions of cancer. (<http://www.ncbi.nlm.nih.gov/pmc/articles/PMC2515569/>)

As a rule, cancer is treated with chemotherapy, radiation therapy, surgery and biological therapy (e.g. hormones). Few numbers only have used diet therapy as a means of treatment; but why is this? Mainly because medical doctors prefer to use traditional method rather than treat the disease naturally (e.g. ketogenic diet) in which both have common purpose, to entirely interrupt cancer cells proliferation.

How Cancer Cells Survive



(Cancerous cells splitting apart)

Our body contains millions of cells. Each cell plays an important role in the continuation of a person's life. They are programmed so that when the cell matures or no longer required, it dies automatically. This death is called apoptosis. (<http://en.wikipedia.org/wiki/Apoptosis>)

On the other hand, cancers cells are generated if otherwise occur. This is mainly due to internal or external stress that causes an error in its genetic code (DNA & RNA), initiating the cell to a precancerous state.

A lot of changes occur in the transformation of a normal body cell to a metastatic growth cancer cells. These cancerous cells have the ability to grow and divide in the absence of proper and inhibitory signals. These then proliferate erratically and uncontrollably that the body cannot be in command of it anymore. Even, scientists describe cancer cells as being 'immortal'. (<http://www.cancerquest.org/index.cfm?page=55>)

The cycle goes continuously, cancer cells multiply in a massive numbers where glucose and glutamine serve as their primary fuel and to make sure they will survive they are smart enough to recognize that the only way to make it happen is to derive their energy through anaerobic metabolism with lactic acid as a waste product. Cori Cycle then takes place, this happens when the large amount of lactic acid produced is transported to the liver where it is processed into glucose ensuring the cancer cells have a constant supply of energy. (<http://www.nutritionandmetabolism.com/content/2/1/30>)

Cancers Are Sugar Junkies

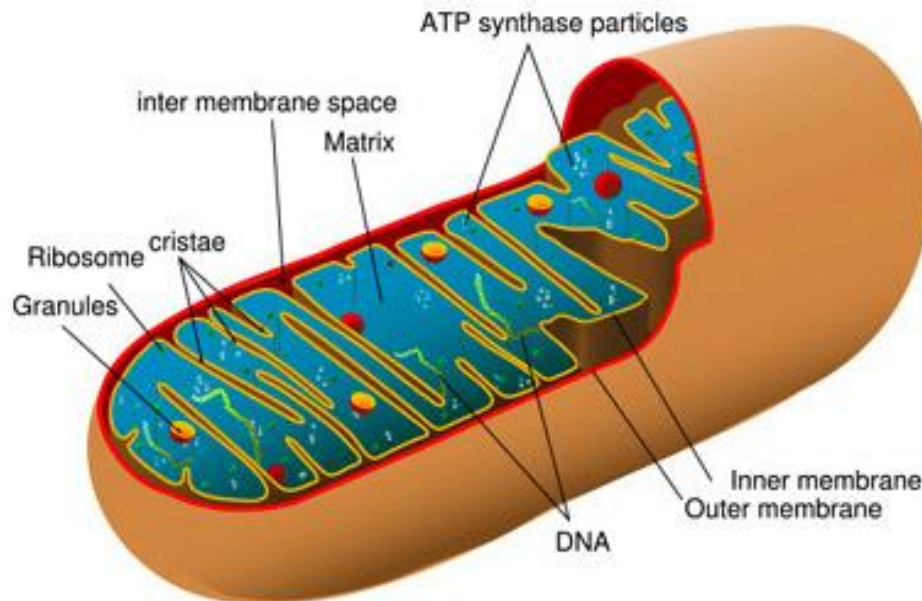


Cancer cells' heavily rely on glucose which is its major source of energy and vitality but could it also be one of its Achilles' heels?

All cells uses glucose for survival, but cancer cells consumes as much as 5 folds more than usual, healthy cells. In fact, cancer cells seem to have great difficulty surviving without glucose. A study that was carried out found evidence that some cancer cells are such absurd sugar junkies that they'll self-destruct when rundown of glucose. (<http://www.second-opinions.co.uk/cancer-5.html>)

This mechanism can be further explained by Warburg Effect, a discovery by Dr. Otto Heinrich Warburg in 1924 that have won him the 1931 Nobel Prize in medicine for discovering that cancer cells have a different energy metabolism compared to normal cells. The bottom line of this is that cancer cells don't like oxygen (aerobic metabolism) rather they prefer an environment without oxygen (anaerobic metabolism) to make sure they will continuously survive. (<http://www.personalliberty.com/alternative-medicine/glucose-sugar-feeds-cancer/>)

The Mystery of the Mitochondrial Warburg Effect



Prior to discussing the details of Warburg Effect, it is helpful to discuss some introductory information about what Mitochondria are and their role in our cells.

Mitochondria (Mitochondrion) or otherwise known as “powerhouses of the cells” are double membrane-bound organelles found in all cells of our body. Its primary function is to provide the energy a cell needs to multiply, move, contract and produce secretory products. These two membranes are called the inner and outer membrane.

(<http://en.wikipedia.org/wiki/Mitochondrion>)

However, it is in the inner membrane, mainly in the Cristae where oxygen and sugar (glucose) are combined to produce ATP (Adenosine Triphosphate), the primary source of energy of the cell.

Mitochondria also play an important role in cell signalling, cellular differentiation, cell death (apoptosis), and cell cycle. (<http://en.wikipedia.org/wiki/Mitochondrion>)

Now that you are already aware of what Mitochondria is, let's now talk about Warburg Hypothesis...

According to Dr. Otto Warburg, a German biochemist, cancer occurs when this mitochondrion is damaged or otherwise known as Mitochondrial Dysfunction which would

result to altered metabolism. Several factors have been considered that have cause this to take place, these includes low oxygen environment or due to a mutated gene.
(http://en.wikipedia.org/wiki/Warburg_hypothesis)

If this mitochondria cannot function normally, then things can come about one is apoptosis (a mechanism of self-destruction that involves mitochondria) cannot occur which would otherwise kill an abnormal cells; giving cancer cells an opportunity to multiply enormously, invading normal healthy cells.

Another is cancer cells will now have to rely on anaerobic metabolism (glycolysis), the process of creating their own food in the absence of oxygen, where lactic acid being a by-product. This mechanism occurs to ensure that cancer cells will continue to proliferate and survive.

However, it was demonstrated that in a normal mitochondria, evidence of Warburg effect also occurs. Thus, another angle has been viewed to explain such phenomenon.

Miracle Treatment: Ketogenic Diet (Low Glucose Diet)

Many readers may not be familiar of what ketogenic diet is and how it can help cure cancer. However, to make you more appreciate its therapeutic benefits, here are some facts regarding this diet therapy.

- * Develop in the 1920's and is now widely used to control epilepsy, obesity and cancer.
- * It's mainly composed of high fat, moderate protein and low carbohydrate (with ketogenic diet ratio of 4:1). For this therapy to be effective, it is however strictly implemented.
- * The name ketogenic means that it produce ketones in the body (keto=ketone, genic=producing).
- * Sluggishness is usually a side effect after it is started. However if it is used for a long time it can result to high blood cholesterol, dehydration, bone fracture and kidney stones.
- * To maintain normal calorie intake of a person under this therapy, they are usually given enough protein and high fat diet for tissue repair and body growth.

(<http://www.targetwoman.com/articles/ketogenic-diet.html>;
http://www.ehow.com/way_5704252_glioblastoma-nutrition-diet.html)

Every time we eat foods that contain carbohydrates, it is then converted to sugar (glucose) which serves as our primary source of energy. Its function is to feed our body most especially our major organs; this includes our brain, heart, and kidneys for them to function properly.

On the other hand, if there are little carbohydrates available; it will give signal to our liver to convert stored fats into ketones and fatty acids. These ketones are formed when the body

uses fats as a source of energy which enter the brain and replace glucose as a source of energy.

How then is ketogenic diet related to cancer?

Simple, we know that glucose is the primary food of cancer cells. Now, when ketogenic diet therapy is started with only little of sugar that is being used, then these cells couldn't proliferate any longer, thus stopping tumour growth and cancer metastasis.

Testimonials of Ketogenic Diet's Effectiveness

* An article entitled "The Calorically Restricted Ketogenic Diet, An Alternative Therapy for Malignant Brain Cancer" evaluated the effectiveness of KetoCal. KetoCal (Ketogenic Diet) is a new nutritionally balanced high fat/low carbohydrate diet for children with epilepsy, for growth and vascularity of malignant cancers of the brain. Results indicate that it has an anti-tumour and anti-angiogenic effects. It decreases the total caloric content, which reduces circulating glucose required for rapid tumour growth. (<http://www.ncbi.nlm.nih.gov/pmc/articles/PMC1819381/?tool=pubmed>)

* The first human experiments with ketogenic diet were conducted in two children with brain cancer by Linda Nebeling. Both children responded positively to the high-fat diet. Their tumours did not progress. The possible explanation for this is that brain tumour cells were unable to function when given ketones as a source of fuel — they must have glucose or otherwise they will die. (<http://drbass.com/cancer.html>)

* A study by trial in Wurzburg was again conducted to patients suffering from cancer. The results of this treatment were positive. Patients were able to live normally. Their physical condition was improved and tumour growth slowed down. The result of the study was not designed as to the effectiveness but to identify the side effects and determine the safety of the diet plans and approach. (<http://stanford.wellsphere.com/weight-loss-article/german-wurzburg-cancer-trial-showing-real-promise-with-ketogenic-diet/310335>)

Still, none of the researchers currently studying ketogenic diets, including Rieger, expects it to deliver anything close to a universal treatment for cancer. And none of them wants to create overstate hopes for a miracle cure but the recent findings are difficult to ignore that this diet has a positive result on cancer patients. (<http://www.time.com/time/health/article/0,8599,1662484,00.html>)

A Comparison: Insulin and Ketogenic Diet in CACHEXIA



Before we compare insulin and ketogenic diet in weight loss. Let us first discuss what insulin is for better understanding.

Insulin is a hormone secreted in the pancreas that has profound effects on metabolism that elevates blood sugar.

How Insulin Works

- switches off glucose production by the liver
- stimulates the storage of glucose as glycogen
- it opens the door for glucose to enter the cells
- stimulates the development of fat from excess carbohydrates
- stimulates the production of protein compounds in the body

(<http://en.wikipedia.org/wiki/Insulin>)

Does Insulin Plays a Major Role in Weight Gain and Keep Us From Losing Weight?

Yes! Insulin does have a great contribution in weight gain and keep us from losing weight. It is responsible for the storage of all the foods we eat: carbohydrates, proteins and fats. One of the side effects of insulin is weight gain. Since the main function of insulin is to improve the ability of our body to use and store sugars. When our blood glucose level is high, our kidneys try to remedy the situation by excreting glucose in our urine. The insulin provided from the outside reverses these processes as blood glucose levels return to normal which can contribute to weight gain.

Although the initial reaction of our body to ketogenic diets is weight loss it can be corrected with appropriate ketogenic diet plans for every individual to supply the right energy in order to regain weight. Comparative studies have been made between the effects of daily insulin injection and a ketogenic diet on weight loss and tumour weight in an experimental model of cancer cachexia. The results suggest that a ketogenic diet is more effective than insulin administration in reversing the cachectic process and has the advantage of an incidental reduction in tumour weight. (<http://www.mayoclinic.com/health/insulin-and-weight-gain/DA00139>)

Cancer Fights Chemicals from Nature



For centuries, science has been focused on understanding the mechanism of diseases and its cure. However, as they look closer on it, they were able to discover the powerful and protective nature of whole foods as an alternative treatment for cancer drugs.

Eating a balanced diet that contains all the nutrients and vitamins needed by our body is one of the healthiest diets one must consider; this includes fiber-rich grains, fresh fruits and vegetables. But take note that not all of those are safe to eat. Many of them have already been processed with harmful chemical and ingredients that are toxic to humans. On the other hand, organic foods are safer.

The human body continuously produces molecules called oxidants which damage our cell's DNA, hence, making us vulnerable to cancer, though, this can be repair with the help of phytochemicals (an antioxidant) that are found in several foods. Seems interesting? Here's how it works.

1. Avemar

A non-toxic germ extract that has an anticancer property. It functions by interfering with glucose metabolism thereby preventing cancer cells to proliferate.

2. Broccoli

A cruciferous vegetable that contains Sulforaphane, a substance that boosts the body's natural cancer fighting properties. Its main function is to neutralize harmful agents before it can make cell damage.

3. Carrots

Falcarinol protects carrots while growing; however, its anti-cancer property is still on research.

4. Chili Peppers

Chili Peppers contain Capsaicin; a chemical known to kills cancer cells.

5. Garlic

Garlic contains Allium, a chemical known to boosts immune system. It also helps normal cells to divide rapidly than usual.

6. Nuts

Selenium found in nuts inhibits cancer growth and protects DNA against free radicals. It also contains Omega 3 fatty acids, known to reduce inflammation and may lower risk of cancer.

7. Red grapes

Anthocyanins, found in dark colored foods, can inhibit an enzyme known as human DNA topoisomerase II that triggers the growth of cancer cells in human body.

8. Soy

A chemical substance that is found in soy is known as Genistein. It inhibits the growth of new blood vessels necessary for tumour survival. Without these blood vessels, the tumour shrinks. It also exhibits an antioxidant, antiangiogenic, and immunosuppressive activities.

9. Tea

Green Tea is regarded as an aid to good health. It contains lots of antioxidants. Example of which is the EGCG (epigallocatechin gallate) and Catechin . Both slows tumour growth and prevent cancer cells from dividing.

10. Tomatoes

A lot of health benefits can be derived from tomatoes. A phytochemical (antioxidant) known as Lycopene fights carcinogens and allow them to be excreted out of the body.

To summarize, the chemicals found in foods such as Sulforaphane, Falcarinol, Capsaicin, Allium, Selenium, Omega 3, Anthocyanins, Genistein, ECGC, Catechin and Lycopene have been found to fight cancer cells and repair damage DNA. This research provides an explanation as to how these diets could cut the risk of developing cancer. Results also suggest a clear connection between cancer prevention and dietary intake.

So keep in mind, you can live a long, healthy, happy life by choosing the right kind of diet!

Conclusion

Cancer is a killer disease that is wide spreading globally. Every year it increases to an alarming rate. When one knows that he has a cancer it's like the end of the world, a suicide especially for those who can't afford the treatment. First hearing the diagnosis the natural reaction is shock and most often denial. We can't deny that it cost a lot of money for medications and for chemotherapy. We can make a difference if we take action today. Prevention is better than cure. We can take action now by:

- * Reduction of tobacco consumption, as we all know it remains the most avoidable cancer risk.
- * A healthy lifestyle and diet can help. Frequent consumption of fruit and vegetables and physical activity can make a difference.
- * Early detection through screening, particularly for cervical and breast cancers, allow for prevention and successful cure.
- * Positive outlook in life.
- * Limit alcohol consumption.

It is more curable when detected early. Although some cancers develop completely without symptoms, the disease can cause destruction and much damage if one ignores it. Not knowing that these symptoms might already represent cancer. Therefore, proper knowledge about the disease is very important to be able to detect, prevent and fight against this killer disease.