A Guide to a "Proper" Diet with "Appropriate" Supplements

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– Neil B. Feldman –

"The image of cancer depends on your perspective. It depends on whether you are a cancer patient, a friend or family member of a patient, an oncologist, a pathologist, a statistician, or a person who does basic research on the disease … The vast majority of cancer cells share a singular problem involving abnormal energy metabolism … the therapeutic efficacy of molecularly "targeted" therapies could be enhanced if combined with therapies that target energy metabolism."

*- Dr. Thomas N. Seyfried from "**Cancer as a Metabolic Disease**"*

"Cancer doesn't grow too much, it dies too little."

*– Dr. Robert Nagourney, **Rational Therapeutics***

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I. PREFACE

What follows is a detailed explanation of the science and rationale behind what I have dubbed a “proper” diet plus “appropriate” supplements for stage IV renal cancer patients (like myself). It is very much a “work-in-progress” and thus subject to change. Much of it is based on information found in these resources:

1. "**Anti-Cancer** – **A New Way of Life**" by Dr. David Servan-Schreiber – The author of this book was a young brain cancer research expert who accidentally discovered that he had contracted brain cancer himself. He also knew that the therapies available would not be sufficient to “cure” him. This inspired him to set out on a journey to figure out how to prolong his life. What he ultimately discovered and put into practice is what this book is about. He ultimately prolonged his life for another 20 years. (http://www.anticancerbook.com/)

2. "**Life Over Cancer**" by Dr. Keith I. Block – This book goes into great detail about both traditional and “integrative” cancer treatments and especially about the value of proper diet and certain nutritional supplements. The author is founder of the Block Integrative Cancer Center based in Skokie, IL. This was one of the very first facilities to offer concurrent "traditional" (chemotherapy or radiation) and "integrative" (nutritional, mind/body, physical) therapies to their patients. My wife and I consulted there as well. (http://www.lifeovercancer.com/)

3. “**Minding My Mitochondria**” by Terry L. Wahls, M.D. This is an account of how Dr. Wahls overcame secondary progressive Multiple Sclerosis (MS). Her MS confined her to a wheelchair for four years. But 18 months after starting her intensive and focused nutrition therapy she now commutes to work five miles each day on her bicycle. The book contains a clear and concise explanation of the biochemistry that drives our brains. She shows how the food we eat is linked to body health. I bought her book after watching this inspiring TEDTalk presentation that she gave here:

http://www.youtube.com/watch?v=KLjgBLwH3Wc

4. “**Fat Chance – Beating the Odds Against Sugar, Processed Food, Obesity, and Disease**” by Dr. Robert H. Lustig. I found this book after viewing the author’s very popular 90-minute YouTube lecture called “**Sugar: The Bitter Truth**”. There has been a very disquieting increase in type II diabetes, obesity, and metabolic syndrome (not to mention cardiovascular disease and cancer). It started in the late 1970’s when the US government decreed that we needed to reduce the (mostly saturated) fat in our diets. The food industry responded by removing the fat while pumping in more sugar in its place (in order to make the “low-fat” food more palatable and saleable). They also removed all the natural fiber in order to allow food to last longer on the shelf or to be able to be frozen. All of which has since resulted in a catastrophic excess of sugar (and, in particular, fructose) in the typical “western” diet.

5. "**Pure, White and Deadly – How Sugar Is Killing Us and What We Can Do To Stop It**" by John Yudkin. This is the classic precursor expose about the hidden dangers of sugar that was referenced by Dr. Lustig in his lecture and book (see above).

6. "**The Great Cholesterol Myth – Why Lowering Your Cholesterol Won't Prevent Heart Disease – And The Statin-Free Plan That Will**" by Dr. Stephen Sinatra and Dr. Jonny Bowden. This book begins with a simple and straightforward explanation of various metabolic body and cell mechanisms. The authors go on to make a compelling argument as to why lowering cholesterol (and fat intake) will **not** prevent heart disease and also why taking statins should be avoided (except for those patients who have severe heart disease). They go on to explore what they feel are the real culprits behind cardiovascular disease – excess sugar(s) and inflammation. Even though their analysis is primarily focused on avoiding cardiovascular illnesses much of what they have to say also applies directly to cancer sufferers.

7. "**The Sinatra Solution: Metabolic Cardiology**" by Dr. Stephen Sinatra. This book goes into great depth about how to maintain optimum cell metabolism and how to support healthy mitochondria function. Cancer is a metabolic disease. As such it is imperative to understand cell metabolism and, in particular, the functioning of the mitochondria within the cell.

8. "**Cancer as a Metabolic Disease – On the Origin, Management, and Prevention of Cancer**" by Dr. Thomas N. Seyfried. The unique book reevaluates the origins of cancer based on the very latest research. The author is a biochemical geneticist who has been investigating the lipid biochemistry of cancer for over 30 years. In this book he establishes why approaching cancer as a metabolic disease leads to better understanding and management of all aspects of the disease, including inflammation, vascularization, cell death, drug resistance, and genomic instability.

9. "**Cells, Gels and the Engines of Life**" by Dr. Gerald H. Pollack. This book challenges the mainstream paradigm of how cells function. It explores the "gel-like" nature of the cell and builds on this aspect to explain the underlying mechanisms of communication, transport, division, and other essential cell functions.

10. "**The China Study**" by T. Colin Campbell, Ph. D and Thomas M. Campbell II - This book describes the results of a monumental research effort that showed that in locations in China where meat and dairy products were not consumed (for whatever reason) the cancer rates were dramatically reduced or almost nonexistent. In the same vein there is also a popular video documentary currently available called: "**Forks Over Knives**" (http://www.forksoverknives.com/) that profiles several of the doctors who were associated with the China Study. It also traces the dramatic health gains that some cardiovascular patients achieved after changing to a pure vegan diet that eliminated all vegetable-oil based fats. (http://www.thechinastudy.com/)

11. "**Prevent and Reverse Heart Disease**" by Dr. Caldwell B. Esselstyn, Jr. The author, also featured in the video documentary "**Forks Over Knives**", is a former surgeon,

researcher, and clinician at the Cleveland Clinic. He argues (based on his own 20-year study) that a plant-based, completely vegetable-oil free vegan diet can prevent or stop the progression of cardiovascular disease and reverse arteriolosclerosis.

To sum up, I have also researched countless articles and papers. However I have not footnoted all of these various sources in this guide.

I should also note that I am a firm believer in **SBM** (**science-based medicine**) and **EBM** (**evidence-based medicine**). All these books and research articles suggest the essential need for any cancer sufferer to: 1) change to a "proper" diet; 2) add additional "appropriate" supplements to that diet as necessary; and 3) follow their oncologist's recommended drug or radiation therapy.

II. COMBATING MISLEADING OR NON-EXISTENT NUTRITIONAL ADVICE

There are still a few "old school" medical doctors and oncologists who, when queried, will tell their patients, "There is nothing that you did to cause this cancer, and there is nothing you can do to cure it. Only surgery or medication will be of any use."

But is that statement, "***only*** surgery or medication will be of any use", actually true?

I believe not. I feel that there is much more that one can do – if one so chooses.

Other oncologists may plead ignorance on the subject of proper nutrition and diet. They may claim that they were not "sufficiently trained" in the field of nutrition or that the taking of additional supplements may interfere with targeted or chemo therapies. These responses can create a confusing state of affairs for patients. They are then left mostly on their own if they wish to become more proactive about their diet and proper nutrition. That just does not seem right to me.

This document has been written to offer some guidance to those who may wish to adopt a "proper" diet and to take "appropriate" supplements to help fight or prevent cancer. It also outlines what I personally have been doing that has minimized or prevented any serious side effects while taking the targeted anti-angiogenesis TKI drug **Sutent®** (**sunitinib**) and the bone agent **Xgeva®** (**denosumab**).

III. SOME IMPORTANT CAVEATS

Before discussing the rationale behind the diet and supplements there are several important caveats to consider:

1. It is only by ***first*** following a proper diet that many of these supplements are able to "work" to maximum effect. So I believe that these dietary changes are essential. The supplements are really just additions to the diet. I do not know how (or even if) these supplements – alone – will work for someone still consuming a typical "western" diet.

Nor can I predict how well “cherry-picking” different supplements might work independently of all the others. To take one example, there is now evidence that turmeric and resveratrol work best together synergistically. In the same vein, there is recent evidence that Vitamin C allows Maitake D-fraction (a mushroom extract that can strengthen the immune system) to work much more effectively against some versions of cancers as well.

2. The diet and supplements are designed to work in two ways to allow the body's various systems to be able to work at peak efficiency. It does this first by eliminating those substances that are known to compromise or severely tax these systems. And second by increasing the presence of those substances that can strengthen them. The basic idea is to make the body's **five interior biochemical terrains**[1] hostile to cancer – just as they once were before any cancer took hold.
3. No diet or supplements ***on their own*** can kill or eliminate existing tumors or metastases. As such, the oncologist who believes that "only surgery or medication will be of any use" is partially correct. Without the help of a molecular targeted drug, or chemotherapy, or radiation, no diet with (or without) supplements, ***by itself***, will be sufficient to fight cancer once it has taken hold.
4. Re-read caveat number 1 again.

IV. WHAT IS THE POINT OF ALL THIS?

So what am I trying to accomplish with this diet and its supplements? How should its success or failure be judged? Why even bother with any of this stuff? Here is why:

1. To better focus molecular targeted drugs or chemotherapy on cancer cells while minimizing their effects on normal cells.
2. To better tolerate targeted molecular drugs or chemotherapy and/or radiation treatments and to help minimize or prevent their unpleasant side effects.
3. To help prevent or minimize any future metastases.
4. To repair, build up, and maintain one’s internal immune system by altering the body's internal “biochemical terrains”. One or more of these damaged terrains has allowed cancer to take hold in the first place.
5. To strengthen the immune system – especially if it is being compromised or weakened as a by-product of taking molecular targeted drugs, chemotherapy, or radiation.
6. To employ additional natural anti-angiogenic substances that may target additional receptors in addition to those currently approved by the FDA or only available in clinical trials.
7. To help ensure that once going “**NED**” (**N**o visible **E**vidence of **D**isease) there is no return of cancer in the future.

[1] Credit for the concept of five internal “biochemical terrains” goes to Dr. Keith I. Block.

V. A "PROPER" DIET FOR THOSE FIGHTING ANY KIND OF CANCER

The major changes to the regular "western" diet are these (in relative order of importance):

1. ***Limit excess sugar(s) and starches***
   Add sufficient fiber to mitigate sharp insulin "spikes" due to a rapid rise in blood glucose levels

The first major area of concern in my diet is the issue of sugars (i.e. **lactose, sucrose**, **fructose**, and **glucose**) consumed as food or drink additives and, to a lesser extent, as converted from carbohydrates (starches). It can be reasonably argued that sugar is probably the single worst additional ingredient in the standard western diet.

[**Note**: The following explanation is mostly based on a popular YouTube lecture given by Dr. Robert H. Lustig called, "**Sugar – The Bitter Truth**" and found here:

http://www.youtube.com/watch?NR=1&feature=endscreen&v=dBnniua6-oM

In this video Dr. Lustig claims that common sugar, in both of its forms – **sucrose** (table sugar) and **high fructose corn syrup** (**HFCS**) – should be considered "toxic". By this he does not mean that sugar is "acutely" toxic (like arsenic, for example) but "chronically" toxic because its lethality develops over a long period of time. Regardless, he considers sugar as a "poison" and the primary cause of metabolic syndrome and a conglomerate of highly prevalent chronic diseases including Obesity, Type 2 Diabetes, Dyslipidemia, Cardiovascular Disease, and Hypertension[2].

Some critics consider his case to still be lacking in evidence. But I don't agree with them and neither does Gary Taubes. He wrote extensively about this topic in the New York Times Magazine of April 13, 2011 in an article called, "**Is Sugar Toxic?**" to be found here:

http://www.nytimes.com/2011/04/17/magazine/mag-17Sugar-t.html?pagewanted=all&_r=0

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[2] Not to mention **Insulin Resistance** (also called **IR** or **Syndrome X**) that may play a vital role in the promotion of tumor growth and proliferation. Insulin is secreted in response to foods eaten – particularly carbohydrates – to keep blood sugar in control after a meal. When cells become resistant to insulin, the body (the pancreas to be precise) responds to the rising blood sugar by pumping out more and more insulin. Eventually the pancreas can no longer keep up with this demand or it gives in to what is called "pancreatic exhaustion." At this point the blood sugar will rise out of control, and you've got diabetes.

One disease that increases in incidence with obesity, diabetes, and metabolic syndrome is cancer. Insulin resistance may be a fundamental underlying defect in many cancers, just as it is in Type II Diabetes and Cardiovascular Disease. The connection between obesity, diabetes, and cancer was first reported in 2004 in large population studies by researchers from the WHO's International Agency for Research on Cancer. It showed that you are more likely to get cancer if you're obese or diabetic than if you're not, and that you're more likely to get cancer if you have metabolic syndrome than if you don't.

Lustig began his lecture by noting that the popular **Atkins** diet (consisting of all fat and no carbohydrates) – and the "traditional" **Japanese** diet (consisting of all carbohydrates but no fat) – ***both*** seems to "work" to reduce weight. This contradiction can best be resolved by noting that neither one of them contains excess sugar and, in particular, the sugar **fructose**.

Lustig goes on to counter the incorrect (but nonetheless popular) notion that obesity is only a matter of diet and exercise. He claims that the common perception that if you don't burn the calories that you eat you will still store them (i.e. get fat) is patently false. He points out that nowadays there are 6-month old babies all over the world that are obese as proof of how wrong this pernicious idea is.

The real problem, Lustig claims, begins when a person's internal "negative feedback system" has gone out of whack. For these people, **leptin**, a hormone that comes from fat cells and informs the brain to stop eating, is no longer working. Lustig believes that the initial culprit behind this failure is sugar, and in particular, fructose. And this is one substance that we are consuming more of today than ever before.

Fructose can make the brain **leptin-resistant**, which means that the brain doesn't "see" all the stored fat in the body but rather thinks that it is starving. This causes a powerful leptin-induced biochemical drive to keep eating – even when there is absolutely no need to do so.

Added to that there is a high level of sodium (salt) in many sweetened beverages (to further induce thirst). Sugar is then deliberately added to cover the salty taste. The insidious outcome is that consuming these drinks does not relieve thirst. Lustig dubs this trick the "**Coca-Cola Conspiracy**."

In addition there is also another important hormone to consider, called **ghrelin**, which is the "hunger" hormone. The more ghrelin there is, the hungrier we feel.

Studies show that fructose does not reduce blood levels of ghrelin nearly as much as glucose does. These studies suggest that fructose does not make you feel full after a meal in the same way as glucose, even with the exact same number of calories consumed. So this too can lead to an increase in overall calorie intake.

Added to this, there was an unfortunate confluence of factors that began in the early 1970's. It resulted in a misguided effort to eliminate the occurrence of heart disease by reducing the dietary consumption of fats from 40% to 30%. But as a result of this effort something totally unexpected occurred. Although the fat was removed (or reduced), the incidence of obesity, metabolic syndrome, non-alcoholic fatty liver disease, cardiovascular disease, and strokes has actually increased! Lustig categorically states that the major culprit for all this is sugar – and again, in particular, fructose. More sugar was added to mask the awful "cardboard" flavor whenever the fat was removed.

Table sugar (**sucrose**) and **high fructose corn syrup** (**HFCS**) both contain two molecules: **glucose** and **fructose**.

According to Lustig, to understand the damaging effects of fructose consumption one must first understand how it is metabolized. So he devotes a good portion of his lecture to comparing the metabolism of fructose to that of glucose and also to that of **ethanol** (**alcohol**)[3]. It is in this detailed analysis that Lustig shows that "a calorie is not a calorie."

Glucose is a sugar that is absolutely vital to life. It is an integral part of each cells metabolism. Our bodies produce it and we have a constant reservoir of it in the bloodstream. Every cell in the body can use glucose for energy. If we don't get enough glucose from our diet, our bodies will produce what we need out of proteins and fats and, in the worst case, even muscle.

Fructose, however, is very different. This molecule is not a big part of cell metabolism and humans do not produce much of it. In fact, very few cells in the body can make use of it at all – except for the liver cells. So when consuming sucrose most of the fructose will be metabolized by the liver. There it is turned into fat, which is then secreted into the blood.

Gary Taube's article explains some of the metabolic implications:

> The phrase Lustig uses when he describes this concept is "isocaloric but not isometabolic." This means we can eat 100 calories of glucose (from a potato or bread or other starch) or 100 calories of sugar (half glucose and half fructose), and they will be metabolized differently and have a different effect on the body. The calories are the same, but the metabolic consequences are quite different.
>
> So the fructose component of sugar or HFCS is metabolized primarily by the liver, while the glucose from sugar and starches is metabolized by every cell in the body. Consuming sugar [which is 50% fructose and 50% glucose] means more work for the liver than if you consumed the same number of calories from starch [100% glucose]. And if you take that sugar in liquid form – soda or fruit juices – the fructose and glucose will hit the liver more quickly than if you consume them, say, in an apple (or several apples, to get what researchers would call the equivalent dose of sugar). The speed with which the liver has to do its work will also affect how it metabolizes the fructose and glucose.
>
> In animals, or at least in laboratory rats and mice, it's clear that if the fructose hits the liver in sufficient quantity and with sufficient speed, the liver will convert much of it to fat. This apparently induces a condition known as insulin

[3] Glucose and fructose have the same molecular formula ($C_6H_{12}O_6$) and therefore are carbohydrates. Note, however, that ethanol (C_2H_6O) is **not** because all carbohydrates follow this formula: $(CH_2O)_n$.

resistance, which is now considered the fundamental problem in obesity, and the underlying defect in heart disease and in the type of diabetes, type 2, that is common to obese and overweight individuals. It might also be the underlying defect in many cancers.

If what happens in laboratory rodents also happens in humans, and if we are eating enough sugar to make it happen, then we are in trouble…

Now most researchers will agree that the link between Western diet or lifestyle and cancer manifests itself through this association with obesity, diabetes, and metabolic syndrome – i.e., insulin resistance. This was the conclusion, for instance, of a 2007 report published by the World Cancer Research Fund and the American Institute for Cancer Research – "Food, Nutrition, Physical Activity and the Prevention of Cancer."

So how does it work? Cancer researchers now consider that the problem with insulin resistance is that it leads us to secrete more insulin, and insulin (as well as a related hormone known as insulin-like growth factor) actually promotes tumor growth.

As it was explained to me by Craig Thompson, who has done much of this research and is now president of Memorial Sloan-Kettering Cancer Center in New York, the cells of many human cancers come to depend on insulin to provide the fuel (blood sugar) and materials they need to grow and multiply. Insulin and insulin-like growth factor (and related growth factors) also provide the signal, in effect, to do it. The more insulin, the better they do. Some cancers develop mutations that serve the purpose of increasing the influence of insulin on the cell; others take advantage of the elevated insulin levels that are common to metabolic syndrome, obesity, and type 2 diabetes. Some do both. Thompson believes that many pre-cancerous cells would never acquire the mutations that turn them into malignant tumors if they weren't being driven by insulin to take up more and more blood sugar and metabolize it.

What these researchers call elevated insulin (or insulin-like growth factor) signaling appears to be a necessary step in many human cancers, particularly cancers like breast and colon cancer. Lewis Cantley, director of the Cancer Center at Beth Israel Deaconess Medical Center at Harvard Medical School, says that up to 80 percent of all human cancers are driven by either mutations or environmental factors that work to enhance or mimic the effect of insulin on the incipient tumor cells. Cantley is now the leader of one of five scientific "dream teams," financed by a national coalition called Stand Up to Cancer, to study, in the case of Cantley's team, precisely this link between a specific insulin-signaling gene (known technically as PI3K) and tumor development in breast and other cancers common to women.

> Most of the researchers studying this insulin/cancer link seem concerned primarily with finding a drug that might work to suppress insulin signaling in incipient cancer cells and so, they hope, inhibit or prevent their growth entirely. Many of the experts writing about the insulin/cancer link from a public health perspective – as in the 2007 report from the World Cancer Research Fund and the American Institute for Cancer Research – work from the assumption that chronically elevated insulin levels and insulin resistance are both caused by being fat or by getting fatter. They recommend, as the 2007 report did, that we should all work to be lean and more physically active, and that in turn will help us prevent cancer.
>
> But some researchers will make the case, as Cantley and Thompson do, that if something other than just being fatter is causing insulin resistance to begin with, that's quite likely the dietary cause of many cancers. If it's sugar that causes insulin resistance, they say, then the conclusion is hard to avoid that sugar causes cancer — some cancers, at least — radical as this may seem and despite the fact that this suggestion has rarely if ever been voiced before publicly. For just this reason, neither of these men will eat sugar or high-fructose corn syrup if they can avoid it.
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> "I have eliminated refined sugar from my diet and eat as little as I possibly can," Thompson told me, "because I believe ultimately it's something I can do to decrease my risk of cancer." Cantley put it this way: "Sugar scares me."

There is yet another reason to be scared. Sugar, due to its powerful effects on the reward system in the brain, leads to classic signs of addiction comparable to drugs of abuse. This activates powerful reward-seeking behavior that can drive to overeating.

Only briefly mentioned in Lustig's lecture, but nonetheless quite vital, is the importance of maintaining adequate fiber in the diet. According to Dr. Lustig we currently consume only about 12 grams of fiber a day – as compared to 100 to 300 grams of fiber a day fifty thousand years ago.

Adequate fiber is important for three reasons. First, it slows the rate of absorption of carbohydrates in the intestine. A slower rate of absorption gives intestinal bacteria a chance to get to it first and break it down. Second, fiber increases the speed of transportation of intestinal contents to the **ileum**, the final section of the small intestine. This in turn raises the level of the satiety hormone that tells the brain that the meal is over. So the feeling of satiety occurs sooner. Finally, fiber inhibits the absorption of free fatty acids until reaching the colon where they are divided into tiny fragments called "short-chain fatty acids." These molecules suppress insulin instead of stimulating its release and that prevents issues with insulin resistance in the body.

It is for these reasons that the consumption of whole fruit (but ***not*** fruit juice), even though it may contain fructose, is not a big problem. The fiber packaged within the fruit

mitigates the metabolic issues created by consuming fructose alone and without adequate fiber.

To sum up this section, the brain runs on glucose. It cannot run on anything else[4]. The mere presence of glucose in the serum does not create an insulin release from the pancreas. What does create an insulin release is a ***rapid rise*** of glucose in the serum. If fiber slows that rate of rise, the insulin response will be fully within the norms of mammalian physiology and will thus not trigger insulin resistance or metabolic syndrome.

2. Limit consumption of milk and any other dairy products

There are numerous reasons for this, both evidence-based and science-based. Some of the initial research can be found in the book, "**The China Study**," and in the documentary, "**Forks Over Knives**." But there are numerous other studies and research articles.

One issue of some concern is that dairy products contain a type of animal protein, called **casein**, which has been linked in studies to promoting cancer. [To be completely accurate there are actually four different casein proteins found in milk.]

Thomas Campbell led a study on two groups of aflatoxin-exposed laboratory rats that were fed different concentrations of milk casein (20% vs. 5%) in their diet. All of the rats that were fed the higher casein concentration diet developed liver tumors. But when that higher percentage casein diet was reduced back to 5%, the tumors all went into remission. The logical conclusion was that casein protein in milk was a cancer promoter. That was not to say that milk was a carcinogen. It did not cause cancer per se, but it did appear to be a favored nutrient by cancer cells and it did promote their growth. These same studies were then repeated with other plant protein sources (including soy) and they did not seem to produce cancer as the animal protein casein had.

However, it later turned out these particular studies were, so to speak, "a bit flawed":

> "In a later 1989 study, Campbell discovered that wheat protein exhibited similar carcinogenic properties (as did casein) when **lysine**, its limiting amino acid, was restored. This suggests that any complementary combination of amino acids will spur cancer growth under certain experimental conditions, and that carcinogenic qualities are not unique to casein or to animal protein at large. The sole reason plant protein appeared protective in those rat studies was due to a deficiency in one or more amino acids, a scenario that rarely occurs in real-world situations when a variety of foods – whether plant or animal in origin – are consumed. Campbell himself notes that eating a variety

[4] Except when the body is put into a state of **ketosis**. Brain cells can be "trained" to run off of ketones.

> of plant foods provides a full spectrum of amino acids - indicating that even a plant-only diet can yield the complete protein Campbell claims to be carcinogenic ... He does not acknowledge the abundance of similar studies showing that **whey** – another milk protein – consistently boasts anti-cancer properties, including when studied under the same experimental conditions that demonstrate the carcinogenic qualities of casein. This is significant, as even a single example of animal protein inhibiting rather than spurring cancer invalidates Campbell's hypothesis that the effects of casein can be extrapolated to all animal protein." – a quote from Denise Minger on her Raw Food SOS website

Nonetheless I still think it is essential to avoid all dairy products – but not because of this rather questionable study of casein vs. plant protein in laboratory rats.

My greater concern stems from the fact that milk (from cows, goats, or whatever) is primarily designed to promote the growth of their offspring. As such it contains growth-inducing hormones such as **IGF-1** (**Insulin-like Growth Factor-1**) and similar agents. These are the very same substances and compounds that can promote the formation and sustenance of tumors in humans.

Note: This is still the case ***without*** contemplating the ***addition*** of more hormones and antibiotics that grain-fed farm animals are given to stimulate their growth faster and to excess. What this means is that finding an "organic" pasture grass-fed source of milk, cheese, or butter is ***not*** going to solve this problem.

[**Aside**: The prolific use of antibiotics is another major problem. It is extremely disconcerting to note that in 2011 more antibiotics were sold for use in meat and poultry production than ever before. They now represent four-fifths of all the antibiotics used in the US - according to a new report by the Pew Charitable Trusts.]

The scientific evidence is extensive but at times misleading. "**The China Study**" recounted a massive research project (also flawed) that seemed to reveal a very startling fact. In those areas of China (generally rural) where there was no consumption of ***meat and dairy products*** the incidence of cancer(s) was extremely low or almost non-existent. In contrast, in the early 1990's (when China started to open up to western tourism and products) these same areas began showing incidents of cancer that were more in line with the rest of the western world. What might have changed? Well, for one thing, the populace began to eat a "westernized" diet that now included more meat, dairy products, processed foods, and added sugar.

Note: Milk is made up of about 80% of the protein **casein**. The other 20% is made up of the protein **whey**. Whey protein is an interesting exception to my "no dairy" rule. It is highly recommended for weight gain by the folks at the Block Center for Integrative Cancer Treatment. Here is what they have to say about it:

> "Whey helps raise **glutathione**[5] levels and inhibit cancer. Thus, high-quality, micro-filtered whey protein is a good protein supplement for people needing more protein … It is a rich source of the essential amino acids needed by the body. In its purest form, as whey protein isolate, it contains little to no fat, lactose, or cholesterol. Whey has been found to provide immune support while raising **glutathione** levels. Cancer patients undergoing radiation or chemotherapy often have difficulty in meeting their daily nutritional requirements due to nausea and lack of appetite. This may lead to weight loss, muscle loss, and protein deficiency. Whey protein is an excellent protein choice for cancer patients as it is very easy to digest and very gentle to the system. Cancer patients also may have reduced glutathione levels (like many athletes) and a weakened immune system. Numerous studies have shown that whey protein, rich in the amino acid **cysteine**, provides an extra boost to the immune system by raising glutathione levels. This may help reduce the risk of infection and is believed to possibly improve the responsiveness of the immune system."

At this point it becomes useful to keep in mind that there seems to be a basic commonality between many different chronic ailments such as cancer, cardiovascular disease, type II diabetes, obesity, the metabolic syndrome, lupus, arthritis, and multiple sclerosis. They all (in different ways) involve chronic inflammation. That is why it is so beneficial to investigate the role of proper nutrition in reducing inflammation in relation to any of these illnesses.

The video documentary "**Forks Over Knives**" explores a striking example of the role of nutrition in reducing one such chronic illness. It documents the sharp reduction in cardiovascular disease in the population of Norway during its occupation during World War II. After the Nazis invaded Norway they absconded with all the farm animals (cattle, pigs, and chickens, etc.) and sent them back to feed the citizens of Germany. So, virtually overnight the Norwegians were forced to become mostly vegan – by force. There were no more meat or dairy products available (but do note that there was still plenty of fish and seafood). If you look at the incidence of heart disease in Norway during the years of Nazi occupation it quickly drops way, way down. It does not come back up to the levels seen in other western countries (or in Norway before its invasion) until the end of Nazi occupation.

To conclude this section, high consumption of dairy products doubles men's risk of getting prostate cancer. Is this due to casein protein? Iron? Insulin-like Growth Factor-1? Some other substance? Some combination of all of them together? A clear answer is not yet known.

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[5] **Glutathione** is very important in the generation of **GABA** (**gamma amino butyric acid**). It is manufactured inside the cell from its precursor amino acids: **glycine**, **glutamate**, and **cysteine**. Cysteine contains **sulfur**, another important cell nutrient. GABA is one of the most important inhibitory neurotransmitters. Some believe it is an important factor in mood disorders, including obsessive-compulsive disorder, depression, and anxiety.

3. Limit consumption of red meat, pork, poultry, and eggs – but increase consumption of fish and seafood

What, exactly, is the deal here? Why give up the beef, pork, and poultry but not fish or seafood? Why encourage eating even more fish (as in 3 or 4 times a week)? To understand the vital importance of eating fish while severely limiting other meat, a little understanding of basic biology is now called for. Along with that it becomes necessary to revisit a now decades-old controversy dealing with dietary fats.

Fat is the collective shorthand name given to any large collection of smaller units called "fatty acids". There are three families of fatty acids of interest: **saturated** fatty acids, **mono-unsaturated** fatty acids, and **poly-unsaturated** fatty acids (also called **PUFA**'s). What makes one fatty acid "saturated" and another "unsaturated" has to do with its molecular architecture and composition. In particular it has to do with the number of chemical double bonds that exist in its molecular chains. Saturated fats do not contain any double-bonded carbon atoms. Mono-unsaturated fats have one double bond while poly-unsaturated fats have more than one.

Saturated fats are primarily found in animal foods (meat, dairy products, eggs, etc.) and, less often, in certain plant foods such as coconut, coconut oil, and palm oil. They tend to be solid at room temperature and soften when warm. They are very stable. When exposed to high heat they aren't damaged as all the unsaturated fats can be. This is because saturated fats lack any carbon-to-carbon double bonds that could become oxidized.

The most abundant saturated fatty acid is palmitic acid (also called palmitate). It contains 16 carbon atoms, all of which are fully saturated. High levels of palmitic acid activate an inflammation pathway that, when activated in those cells of the pancreas that secrete insulin (the beta cells), results in beta cell death. Beta cell death significantly contributes to reduced insulin production and secretion and that can lead to insulin resistance.

Foods to avoid due to high levels of palmitic acid are palm oil, shortening, butter (unsalted is the worst), and lard.

Mono-unsaturated fats can be found in olive oil (which primarily contains the omega-9 called oleic acid), avocado, seeds, macadamia and other nuts. They are usually liquid at room temperature. Heating can damage them and turn them into the equivalent of trans-fats.

Poly-unsaturated fats can be split further into two subcategories of interest: the omega-6's and omega-3's. An omega-3 fatty acid has its first carbon double bond located at the third carbon atom in the chain; an omega-6 fatty acid has its first carbon double bond

located at the sixth carbon atom. They too tend to be liquid at room temperature and can be easily damaged when heated.

There are two (and only two) “essential” fatty acids that each of us has to consume from the outside world. These particular substances cannot be manufactured inside our bodies - they must be consumed from the external environment. They are essential for life, which is why they are called “**Essential Fatty Acids**” or **EFA**'s. Both of these EFA’s are poly-unsaturated.

One of them is known as **Linoleic Acid** or "**LA**"; the other is known as **Alpha-Linolenic Acid** or "**ALA**". Linoleic Acid is found corn, safflower, sunflower, and all vegetable oils. Alpha-Linolenic Acid is found in green leafy vegetables, walnuts, chia seeds, flaxseed, and perilla seeds.

By consuming Linoleic Acid (LA) our bodies can actually derive all of the other omega-6 fatty acids it needs. Similarly, from consuming Alpha-Linolenic Acid (ALA) our bodies can derive all of its other omega-3 fatty acids. However, saying that the body “can” derive them does not mean that this is the best way for the body “to” actually derive them.

In this regard there are two other omega-3 fatty acids that are of particular interest because of their anti-inflammatory properties: **Docosahexaenoic Acid** (**DHA**) and **Eicosapentaenoic Acid** (**EPA**). Both of these are primarily to be found in fish (and, to a much lesser extent, pasture grass-fed meat.)

The fact that the body can make its own EPA and DHA does not mean it does a very good job of it. It converts ALA into EPA and DHA using certain enzymes and a complicated series of operations that are influenced by many different factors, including the amount of (inflammatory) omega-6’s in the diet. In the end, only a very small amount of ALA actually gets successfully converted into EPA and DHA in this fashion.

Omega-6 and omega-3 fatty acids also compete for the same enzymes. When the omega-6 intake is very high it wins that competition by default. A high intake of omega-6 fatty acids will lower the conversion of ALA into EPA and DHA, further reducing the body’s ability to produce two of the most anti-inflammatory substances available to it. This is not good.

There are numerous sources of omega-6 fatty acids to be found – primarily in vegetable oils and some plant foods (and, of course, in animals as well). But the best source of omega-3 fatty acids is from fish and seafood (and to a much lesser extent from ground flax seeds or oil, chia seeds or oil, walnuts, and pasture grass-fed beef).

It turns out that it is the ***ratio*** of the omega-6 to omega-3 fatty acids that is of ***utmost*** importance. It should probably be somewhere between 1:1 and 4:1. But if one eats the "typical" western diet it is likely to be at 15:1 or 20:1 – or even higher! The bottom line is that most westerners are consuming far too many omega-6 fatty acids in relation to their

omega-3's. A ratio of around 3:1 seems to be the best balance for keeping inflammation in check and everything else running smoothly.

Linoleic Acid (an omega-6) has been shown to increase the oxidation of LDL cholesterol, thus increasing the severity of coronary atherosclerosis. Other omega-6 fatty acids also inhibit the body's ability to fully incorporate the EPA that you might get into the cell membranes from eating fish or taking fish oil supplements. Omega-6's can also stimulate the production of tumor-promoting growth factors, and activate a cancer-promoting gene called **ras-p21**, which can lead to uncontrolled cell replication and tumor growth.

Finally, if one is not paying attention to the "quality" of the omega-6 and omega-3 fatty acids, one may be feeding on "damaged" ones such as those found in processed foods, hydrogenated oils, and trans-fats[6], etc. Actually, damaged fatty acids can be found in ***all*** packaged grocery items that are designed to have a long shelf life (i.e. do not turn rancid quickly). But in particular they can be found in most margarines, nondairy "creamers", ramen noodles, soup cups, and virtually all packaged baked goods (e.g. Twinkies, chips, and crackers), doughnuts, many breakfast cereals, "energy" bars, cookies, and most fast food including such favorites as French Fries and Kentucky Fried Chicken. You can easily see the problem. They are quite pervasive, especially so in "fast foods."

It is a fair bet that those oncologists who do not advocate paying close attention to diet would nonetheless not allow their patients to eat all (or even any) of the Twinkies they might fancy. This wisdom just needs to be extended to cover ***all*** of the other menu items that rely on adding trans-fats (or other damaged fatty acids) to keep them from spoiling on the shelf.

Any item that does not turn rancid quickly (that is, is processed) is highly suspect.

For example do you know who is responsible for the invention of margarine – and why? It was Napoleon Bonaparte. He offered a generous prize to any man who could discover a way to preserve his army's food so that it wouldn't spoil. One fellow, Nicolas Appert, won the prize in the early 1800's with his method of sealing food in glass jars and soaking the closed jars in boiling water. This was the genesis of the modern-day canning process.

But Bonaparte also wanted a substitute for butter that would not turn rancid on his long war campaigns.

[6] There is one exception to the "all trans-fats are bad" rule. It does not apply to "**Conjugated Linolenic Acid**", or **CLA**. CLA is a trans-fat that is not man-made. It is made naturally in the bodies of ruminants (cows). Factory-farmed meat does ***not*** have any, but pasture grass-fed meat and products that come from pasture-raised animals do. CLA seems to have both anti-cancer and anti-obesity properties.

Eventually that substance was synthesized. Margarine is a product that does not easily oxidize because it is made of damaged oils (trans-fats) that no longer convey oxygen "properly" – and this was done completely by design!

Trans-fats are shaped like saturated fats and therefore the body gets fooled and mistakes them for saturated fats. There is a very good reason to suspect why substances containing trans-fats could also be prime cancer-causing agents due to the fact that they do not convey oxygen properly. The explanation will follow a bit later.

To sum up (as per the Block Center for Integrative Cancer Treatment):

> "People need an adequate amount of protein each day to maintain muscle mass and proteins in the blood. The reason for not going overboard with protein is to avoid the post-meal surplus of amino acids that can stimulate tumor growth. Limiting the amount of amino acids in the diet has been show to slow tumor growth in animal studies – even with more aggressive types of tumors.
>
> Fish is advised over other animal foods. Cold-water and deep ocean varieties of fish are preferred because these fish are excellent source of the omega-3 fatty acids which help the body reduce inflammation, protect against heart disease, help inhibit cancer growth, and benefit the immunes system … It is recommended that fish be consumed three to four times per week.
>
> Meat and poultry are strongly discouraged because of the type and amount of fat[7] they contain, their hormones and growth factors, and their impact on insulin levels. However, if it consumed the best choices are organically raised leaner animal foods such as skinless free-range poultry, pasture grass-fed beef, or lean wild game such as buffalo or venison."

4. Limit consumption of "processed" or otherwise "refined" foods

[**Note:** Before proceeding I wish to acknowledge my thanks to the researchers at the Block Center for Integrative Cancer Treatment for much of the explanation and concepts that follow.]

As mentioned earlier there are two important forms fatty of acids: Linoleic Acid (parent to the omega-6's) and Alpha-Linolenic Acid (parent to the omega-3's). There are many other forms, such as the omega-9's that can be found in olive oil – but LA and ALA are the only essential ones.

[7] But, as previously noted, I do not share the belief that saturated fats, such as primarily found in meat, are the main problem. The "diet-heart hypothesis" (which demonizes saturated fats and cholesterol) has not been scientifically substantiated. More info here: http://advances.nutrition.org/content/4/3/294.full

Linoleic Acid and Alpha-Linolenic Acid are transformed into **prostaglandins** and **leukotrienes** by way of some other fatty acids. Linoleic Acid is transformed into **Arachidonic Acid** (**AA**) and from there into a series of prostaglandins and leukotrienes. [**Note**: Don't worry, you won't be graded on any of this stuff. But if you ever are, it will definitely go on your permanent record.]

The important point to note here is that the bulk of the Arachidonic Acid end products serve to promote inflammation. However, there is also one by-product in the transformation process, called **D-GLA**, which creates a powerful anti-inflammatory prostaglandin called **PGE1** in a small quantity. Regardless, chronic inflammation can (and does) predispose humans to cancer.

Linoleic Acid is found in corn, safflower, sunflower, and all vegetable oils. Meat, dairy, poultry, and eggs will also directly contribute Arachidonic Acid. The omega-6 transformation pathway produces prostaglandins such as **PGE2** and leukotrienes such as **LTB4** that promote tumor growth, clotting, inflammation, and angiogenesis. However, it is the ***excess*** of the omega-6 derived prostaglandins that are at the root of the problem. If there is an excess of omega-6 fatty acid in the diet the body cannot make sufficient omega-3 end products that are needed to keep clotting, inflammation, and angiogenesis at "normal" levels.

Alpha-linolenic acid is transformed into Eicosapentaenoic Acid (EPA) and then into Docosahexaenoic Acid (DHA) and then into prostaglandins that are anti-inflammatory. Those who take fish or krill oil pills will recognize that these two components – EPA and DHA – are the two major ingredients in these supplements. Canola, Flax, Walnut, Pumpkin seed and Hemp oils are all sources of omega-3 fatty acids that will undergo transformation processes. Cold-water fish contribute EPA. EPA is processed into Docosahexaenoic Acid (DHA) and then into the anti-inflammatory prostaglandin **PGE3**. PGE3 inhibits tumor growth, clotting, inflammation, and angiogenesis.

One of the important supplements in my list is a special blend of fish oils that feature a high level of EPA.

Fish oil can help reduce **C-reactive protein** (CRP), a measure of chronic inflammation anywhere in the body. Here is a recent study of the importance of getting C-reactive protein checked if you are a cancer sufferer:

http://www.translational-medicine.com/content/7/1/102

What follows shows the efficacy of following a diet emphasizing fish, seafood, and fish oil (plus a few other supplements) to help reduce the CRP level.

For healthy people, the optimal CRP level is to be below **1.0mg/L**.

I first had my CRP checked on September 13, 2012. This was just one month after I discovered that I had bone metastases (lytic lesions) on my sacrum and left femur. It

was also just two weeks after I had first started taking the anti-angiogenic drug, Sutent (Sunitinib), at 50mg/day.

On that day my C-reactive protein was measured to be **44.35mg/L** (yikes!!). So, based on discussions with the Block Center for Integrative Cancer Treatment, I decided to add several supplements designed to reduce inflammation in my body. The primary supplement I added was their particular mix of fish oils called "ArcticBlox". Each ArcticBlox capsule contains 900mg of EPA and 200mg of DHA.

One month later, on October 3rd, my CRP level had dropped to **17.5mg/L**. That was very encouraging.

One month after that, on November 7th, my CRP level was further reduced to **2.3mg/L**. That was sweet. I was getting close to 1.0mg/L.

However, things do not always proceed so linearly and straightforwardly when it comes to dealing with metastatic renal cancer…

One month later, on December 12th, my CRP level showed a slight rise. It was now measured to be **3.3mg/L**. But was this significant? It was too early to speculate.

Two weeks later, on Christmas Day, I started to develop a diffuse throbbing pain in my left femur (thigh). It quickly got progressively worse. More disturbingly – this was identical to the kind of pain I had experienced back in July when mets were first discovered in that same location.

At that point in time I was just about at the end of a 2-week “break” from (i.e. not taking) Sutent. (At that time my regime had been to take Sutent at 50mg/day for 4-weeks straight followed by a 2-week break off of it.) Since I was on a break, I surmised that Sutent was no longer working and so bone lesions in that area were becoming active again.

I was correct. I later discovered that what I was experiencing was a somewhat common phenomenon. It even had a name – it is called Sutent “**flare.**” Flare is a very disquieting rapid tumor growth that may occur in patients when they stop taking a TKI (Tyrosine Kinase Inhibitor) such as Sutent. For some patients it can occur during their Sutent break period of 1 or 2 weeks (depending on what protocol they are on).

Sure enough, within two days of my starting back up on my next cycle of Sutent, all the pain quickly disappeared. Three days after that, on January 2nd, my C-reactive protein was routinely checked again. Not surprisingly, it had shot back up to be **41.1mg/L**.

However, two weeks later, on January 14th, (which was now smack in the middle of my being back on Sutent) my CRP dropped back down. It was now **4.3mg/L**.

Based on this new experience of Sutent flare my oncologist agreed to shorten my 2-week break off of Sutent to only 1-week off. Keep in mind that I could only do this because I had no significant side effects. (The reason for taking any break at all from Sutent is to help deal with its toxicity and potential severe side effects).

I then completed my first 1-week break off Sutent and started up on my next cycle (5th). There had been no repeat of any Sutent flare during that shorter 1-week break.

On February 6th my CRP level was measured to be down to **0.3mg/L**. What a tremendous relief. That number was well within the optimum range.

On March 8th my CRP level was measured to be **0.7mg/L**. That is still well within the optimum range. Note that this particular test was done on the very last day of another 1-week break off of Sutent – and yet it still had not risen significantly.

I believe this demonstrates a very powerful way that the approach I am taking can prove to be quite valuable.

Now back to the diet…

5. Limit consumption of foods that contain Carrageenan

[My thanks to Ray Peat's weblog for the quotes and explanations that follow.]

> "In the 1940s, carrageenan, a polysaccharide made from a type of seaweed, was recognized as a dangerous allergen. Since then it has become a standard laboratory material to use to produce inflammatory tumors (granulomas), immunodeficiency, arthritis, and other inflammations. It has also become an increasingly common material in the food industry. Articles are often written to praise its usefulness and to claim that it doesn't produce cancer in healthy animals. Its presence in food, like that of the polyester imitation fat, microcrystalline cellulose, and many other polymers used to stabilize emulsions or to increase smoothness, is often justified by the doctrine that these molecules are too large to be absorbed.
>
> The doctrine that polymers--gums, starches, peptides, polyester fat substitutes--and other particulate substances can be safely added to food because they are "too large to be absorbed" is very important to the food industry and its apologists.
>
> There are two points that are deliberately ignored by the food-safety regulators: 1) these materials can interact dangerously with intestinal bacteria, and 2) they can be absorbed, in the process called "persorption."

The permeability of the intestine that allows bacteria to enter the blood stream is very serious if the phagocytic cells are weakened. Carrageenan poisoning is one known cause of the disappearance of macrophages.

Carrageenan contributes to the ***disappearance*** of the liver enzymes (the Cytochrome P-450 system[8]) that detoxify drugs, hormones, and a variety of other chemicals.

When the bowel is inflamed, toxins are absorbed. The natural bacterial endotoxin produces many of the same inflammatory effects as the food additive, carrageenan.

Carrageenan produces inflammation and immunodeficiency, synergizing with estrogen, endotoxin and unsaturated fatty acids. Carrageenan has been found to cause colitis and anaphylaxis in humans, but it is often present in baby "formulas" and a wide range of milk products, with the result that many people have come to believe that it was the milk-product that was responsible for their allergic symptoms. Because the regulators claim that it is a safe natural substance, it is very likely that it sometimes appears in foods that don't list it on the label, for example when it is part of another ingredient.

Carrageenan enters even the intact, un-inflamed gut, and damages both chemical defenses and immunological defenses. When it has produced inflammatory bowel damage, the amount absorbed will be greater, as will the absorption of bacterial endotoxin. Carrageenan and endotoxin synergize in many ways, including their effects on nitric oxide, prostaglandins, toxic free radicals, and the defensive enzyme systems. The continuing efficient production of energy is a basic aspect of metabolic defense, and this is interrupted by carrageenan and endotoxin. The energy failure becomes part of a vicious circle, in which permeability of the intestine is increased by the very factors that it should exclude."

Some products that can contain carrageenan: Apple cider; beer; hot dogs; prepared sauces; ice cream; baby formulas; chocolate milk; soy milk; sherbet; jam, jellies; cheese spreads; dressings; crackers; pastries; custard; evaporated milk; pressurized whipped cream; reduced fat meat products; processed meats; pates; diet sodas; toothpaste.

VI. VIEWING CANCER AS A METABOLIC DISEASE

In May 2012, the following article, titled: "**Low Oxygen Levels Could Drive Cancer Growth, Research Suggests**", was published online in Science Daily:

[8] Please refer to Chapter VIII, "**TKI Interactions with Supplements and Certain Foods**" for more information on this.

http://www.sciencedaily.com/releases/2012/05/120503194219.htm

There were many provocative concepts touched on within the article, the most important one summed up in this quote:

> "Previous studies have linked low oxygen levels in cells as a contributing factor in cancer development, but not as the driving force for cancer growth. High incidence rates of cancer around the world cannot be explained by chance genetic mutations alone, Xu said."

Well those "previous" studies date back over 80 years to research started in 1924 by **Dr. Otto Warburg**, an eminent German researcher and cancer specialist. His discoveries subsequently led to his being awarded a Nobel Prize in 1931.

Dr. Warburg found that if you took any “healthy” cell and slowly deprived it of its normal level of oxygen, at a certain point – around 35% of normal – the cell would do one of two things. It would either die or it would turn cancerous. That is, in its struggle to stay alive it would "flip" from its normal mode of getting its energy by the respiration (slow burning) of oxygen – via a process called **oxidative phosphorylation** – to primarily getting its source of energy from the fermentation of glucose – via a process called **aerobic glycolysis**. He also discovered that once a cell had "flipped” its metabolism in this manner it could never be flipped back. There was no possibility of it returning back to its "normal" oxygen-based respiration and so there was no possibility of a cancerous cell ever becoming healthy again. [Another important point to keep for later reference: not only does aerobic glycolysis rely heavily on glucose for fuel but strictly glycolytic tumor cells cannot use fatty acids for their metabolism.]

These observations are the basis of "**the Warburg Effect.**" It is the key to how a **PET** scan works to reveal a tumor in the body. In a PET scan a radioactive medicine is first tagged to a natural chemical – usually glucose, water, or ammonia. This tagged natural chemical is known as a **radiotracer**. This radiotracer is then inserted into the body.

Inside the body the radiotracer then goes to those areas that normally utilize that natural chemical. For example, **FDG** (**F-18 Fluorodeoxyglucose** – a radioactive drug) is first tagged to glucose to make it into a radiotracer. The glucose then goes to those parts of the body that use glucose primarily for energy. The FDG can reveal a tumor by revealing those areas that are soaking up abnormally high levels of glucose. Tumors soak up high levels of glucose because aerobic glycolysis is a very inefficient source of energy as compared to oxidative phosphorylation (the “normal” respiration of oxygen)[9].

There are some tumors that may not seem to exhibit the Warburg Effect. For example, 80% of prostate cancers are not especially aggressive, nor are they avid for FDG

[9] A glucose molecule is capable of providing **36** molecules of ATP via the process of oxidative phosphorylation but can only yield **2** molecules of ATP via the process of aerobic glycolysis.

(glucose). This is also true for most renal cell carcinomas. They do not soak up large amounts of glucose even though they cannot run "normally" on oxidative phosphorylation. Instead these tumors get their primary energy from the fermentation of the amino acids glutamine and serine to lactate, which has been termed *glutaminolysis* and *serinolysis* respectively. Regardless of the choice of fuel, impaired cellular energy metabolism and, in particular, ***impaired mitochondrial function*** is a major distinction that ***every*** tumor shares, regardless of what kind of cancer it might be.

Dr. Warburg also made the bold claim that this very mechanism – that is, damaged respiration (most often due to lack of oxygen or hypoxia) – was the ***primary*** cause of ***all*** cancers. In his view a healthy cell would ***first*** flip from oxidative phosphorylation (the normal respiration of oxygen) to aerobic glycolysis (the fermentation of glucose) due to hypoxia or lack of oxygen. And it was this ***initial*** change that would ***subsequently*** cause damage to the cell's DNA or other genomic instability.

Naturally his concept was (and still is) rather controversial. The current paradigm as to the primary cause of most cancers remains opposite to what Dr. Warburg had suggested.

The currently accepted **genomic** paradigm assumes that a cancerous cell has its genetic material damaged ***first*** and only ***after that*** does its primary metabolism flip from the energy-abundant respiration of oxygen to the energy-inefficient fermentation of glucose or amino acids. Regardless, Dr. Warburg's original concepts are now beginning to find their way back into mainstream thinking, as evidenced by papers such as this one.

It is not my intent to delve very deeply into the pros and cons of Dr. Warburg's theory here. But it is quite important to understand that there exists today a very credible "contrary" viewpoint regarding the primary cause of cancer. This view sees cancer as a metabolic disease. The evidence shows that impaired cellular energy metabolism and/or impaired mitochondrial function is the defining characteristic of nearly all cancers regardless of cellular or tissue origin.

However, does this consideration of the Warburg Effect specifically apply to renal cell carcinoma (RCC)? Indeed it does:

> "Simonnet and colleagues have shown that respiratory impairment was significantly greater in patients with clear cell or high grade renal tumors than in patients with low grade or benign renal tumors[10]. Moreover, the respiratory impairment in these renal tumors was correlated with significant decreases in the content of ETC (Electron Transport Chain) complexes II, III, and IV as well as with abnormal assembly of the complex V (the F_1F_0 ATPase).

[10] **"Low mitochondrial respiratory chain content correlates with tumor aggressiveness in renal cell carcinoma"** by H. Simonnet et al**;** Carcinogenesis, 2002 May; 23(5):759-68

These investigators linked their metabolic findings to defects in the von Hippel-Lindau (VHL) tumor suppressor gene and the hepatic-growth factor MET proto-oncogene. However, alterations in these genes alone were unable to account for differences in tumor aggression. Defects were found in these genes in some benign renal tumors, whereas no defects were found in these genes in some of the most aggressive and malignant renal tumors.[11] It was surprising to me that these investigators tried to force their data to fit a gene defect model of renal tumor origin, but did not link their observations to Warburg's theory. Clearly, their data more strongly support an origin of cancer following respiratory dysfunction than an origin following gene dysfunction.

Unwin and coworkers from the United Kingdom used a proteomic approach, based on two-dimensional gel electrophoresis and mass spectrometry, to compare the protein profiles of renal carcinoma tissue with tissue from patient-matched normal kidney cortex. The most striking findings from their study were the decreased expression of several mitochondrial enzymes implicated in OxPhos (oxidative phosphorylation) and the increased expression of enzymes for glycolysis. The increased expression of the glycolytic enzymes was also associated with a parallel decrease in three of the enzymes catalyzing the reverse reactions of gluconeogenesis. In addition to supporting a downregulation of mitochondrial enzymes involved in other pathways including fatty acid and amino acid metabolism and the urea cycle, indicating a wider role for mitochondrial dysfunction in tumorigenesis."[12] [Dr. Thomas N. Seyfried, "**Cancer as a Metabolic Disease**"; John Wiley & Sons, 2012; p81]

More elucidation on this (and a detailed examination of several different versions of RCC) comes from this video presentation by Dr. W. Marston Linehan of the National Institutes of Health Clinical Center:

https://videocast.nih.gov/summary.asp?live=11952&bhcp=1

It is clear that approaching cancer as a metabolic disease is well worth the effort. The amount of oxygen and other vital nutrients available to each cell is critically important in cancer tumorigenesis and metastases. Obviously diet and proper nutrition has a pivotal role in these processes.

In the Science Daily article cited earlier it was further noted that:

[11] **"Low mitochondrial respiratory chain content correlates with tumor aggressiveness in renal cell carcinoma"** by H. Simonnet et al**;** Carcinogenesis, 2002 May; 23(5):759-68

[12] "**Proteomic changes in renal cancer and co-ordinate demonstration of both the glycolytic and mitochondrial aspects of the Warburg effect"** by RD Unwin et al; Protemics. 2003 Aug;3(8):1620-32

> "Cancer drugs try to get to the root -- at the molecular level -- of a particular mutation, but the cancer often bypasses it," Xu said. "So we think that possibly genetic mutations may not be the main driver of cancer."

Here may be another important reason to pay close attention to the delivery of sufficient oxygen and other nutrients to the cell. Could it be that impaired respiration (due to hypoxia or impaired mitochondrial function) is the "main driver of cancer" and not genetic mutations? If that were so it is logical to assume that this very same mechanism might be an important factor in promoting cancer metastases as well.

And indeed, research on how tumors stimulate the growth of blood vessels (angiogenesis) seems to suggest that it very well may be.

Recall that Dr. Warburg showed that lack of sufficient oxygen, or hypoxia, could turn normal cells cancerous. I do not believe that this is the only mechanism (as he did) but it likely is a primary mechanism. Regardless, while that fact might account for the new formation of a few cancerous cells it would not explain how those cells eventually organize themselves into something as large as a tumor. Because as those cancerous cells clump together they cannot grow any larger in size than about 1 to 2 mm, at least not without the formation of new blood vessels. These new blood vessels are essential to supply the growing tumor with sufficient oxygen and other key nutrients.

It was Dr. Judah Folkman (father of all anti-angiogenesis therapies) who first glimpsed the process by which tumors can “recruit” these necessary private blood supplies. In his earliest experiments (performed in 1961) he planted a tumor in the middle of a rabbit’s cornea – which normally has no blood vessels. He then demonstrated how new blood vessels would come ***shooting into*** and ***headed for*** that tumor. This simple experiment sparked his search to find and isolate those substances that stimulated that new blood vessel growth.

Eventually one of the most predominant of these substances, **VEGF** (**Vascular Endothelia Growth Factor**), was discovered. Significantly, it was also found that VEGF proliferates in an hypoxic environment. In 1992, while studying **glioblastoma** multiforms (the most common and most aggressive malignant primary brain tumor in humans), Eli Keshet and Karl Plate observed that VEGF expression was highest in the most **ischemic**[13] sections of the tumor and postulated that hypoxia was a key environmental trigger of tumor angiogenesis.

Interfering with angiogenesis by targeting VEGF and other receptors is the basis of how all the **TKI** (**Tyrosine Kinase Inhibitors**) such as Sutent, Inlyta®, Votrient®, Nexavar®, and Avastin® work to stop tumor growth.

[13] **Ischemic** = A decrease in the blood supply to a bodily organ, tissue, or part caused by constriction or obstruction of the blood vessels.

Realizing the importance of getting sufficient oxygen and other vital nutrients into the cells is the primary reason that I personally am so "wound up" on the issue of proper diet and nutrition. It is the reason for my advice to consume only undamaged fatty acids while maintaining the correct ratio of omega-6 to omega-3 poly-unsaturated fatty acids in the body. This same premise also underlies my thoughts on maintaining consistent and normal blood glucose levels.

The idea behind cutting out additional sugars (in most drinks and foods) and cutting down on the consumption of refined carbohydrates (like white bread, white rice, white flour, etc.) is ***not*** because there is any chance of "starving" cancer of its prime energy source (glucose). Carbohydrate restriction will not starve most tumors because they are usually excellent at pirating glucose at blood glucose concentrations that are ***way below*** the normal range.

All cells get their energy from glucose in some fashion. The blood glucose level is strictly regulated within a narrow range by several internal mechanisms. So the more practical idea is to reduce the heavy strain put on those mechanisms by the excessive consumption of sugars and high glycemic carbohydrates. There is simply far too much sugar present in many of the foods and drinks being consuming daily.

As mentioned earlier, high blood glucose levels can increase the risk of disease (such as type 2 diabetes, obesity, metabolic syndrome) and cancer progression while fueling inflammation. This serves to weaken the immune system. Keeping the blood glucose level properly in check also reduces those hormones (**Insulin** and **Insulin-like Growth Factor-1**) that can promote tumor growth and affect weight management and overall health.

1. Some Further Implications to Consider:

- One should avoid consuming **Gatorade®** or any other similar beverages for the purposes of hydration. Gatorade not only contains lots of sugar (20 grams of “sugars” with no fiber) – but the kind of sugar it typically contains is High Fructose Corn Syrup (HFCS). The original Gatorade formula, developed at the University of Florida, tasted awful. When Pepsi® bought the rights to market and manufacture it they changed the formula to include high levels of sugar to mask that awful taste. Meanwhile the only beverage that can safely relieve hydration remains pure water.
- For the same reason, **Gatorade, Gatorade 2,** or any similar beverages should not be consumed to help restore electrolytes. Instead, consider using **Pedialyte®** (or similar products). This medication does contain the sugar glucose (in the form **dextrose**) but the manufacturer claims that the amount included is only enough to facilitate getting its other nutrients absorbed into the gut. Regardless, there is no fructose in it and that is the really bad stuff. (Remember to always check the label for the actual ingredients on any product.)
- Similarly, avoid consuming beverages such as **Boost®** (28 grams of “sugars” with no fiber) or **Ensure®** (18 grams of “sugars” with no fiber) for purposes of adding weight. Instead consider only using the glucose-free versions of these products (which were

specifically formulated for diabetic patients). Yet another excellent source for "good" calories is pure **whey** protein. Yes, this is a dairy product. But pure whey protein does not have any casein protein which is the primary cancer-promoting agent found in milk (casein makes up to 87% of milk). Pure whey should normally not have any **lactose** in it either.

- Some other common beverages that contain HFCS: chocolate milk; low fat milk; Similac®, Isomil®[14], and Gatorade AM™ for Kids. The bottom line: one should always beware – because sugar is everywhere (and not necessarily always noted as an ingredient on the label).

What about those diet drinks that replace the sugar with the artificial sweetener **aspartame** (also found in **NutraSweet®** and **Equal®**)? Well that opens a whole other can of worms. In some people, **monosodium glutamate** (**MSG**) and aspartame can cause an increase in **glutamate**, which in turn leads to excitotoxicity; damaging and eventually killing brain cells. Excess glutamate can also cause neurological symptoms like headache, fatigue, and unexplained, vague neurological symptoms.

Here is a wonderful website that graphically illustrates the amount of sugar(s) contained in many foods that we eat:

http://www.sugarstacks.com/

This ends the review of my "proper" diet. Before moving on I thought I should list some additional (and rather unexpected) positive results that I have gotten from following these guidelines.

2. Some unexpected (but nice) consequences of this diet

- A slow but steady loss of excess weight without having to pay any attention to the amount of food consumed. In my case I slowly lost about 20 pounds (within three months) and am now steady at my optimum BMI.
- Increased energy and overall feeling of excellent health and wellness with no fatigue. Ironically, I literally have not felt better in decades.
- Ability to reduce the duration of my "break" off of Sutent from two weeks to just one.
- A slow reversal of atherosclerosis (calcification or hardening) that was due to plaque buildup in the walls of my arteries. For a 60-year old male (me) this was also rather dramatically evidenced by:
- Reversal of early stage erectile dysfunction (ED). This particular phenomenon is also humorously noted in the documentary "**Forks Over Knives.**"

VII. THE "APPROPRIATE" SUPPLEMENTS FOR FIGHTING CANCER

[14] Dr. Robert Lustig calls this stuff "a baby milkshake".

Before proceeding on to describing the supplements that I take, a few more caveats are in order.

No one should take any of these supplements without first:

- Completely understanding the rationale for each one.
- Making sure that any supplement taken does not interfere with whatever molecular targeted or chemotherapy drugs they might currently be taking or about to take.
- Making sure that any supplement taken does not interfere with any other medications they may be taking, especially any blood thinning agents (see caveat that follows).
- Being completely upfront and consulting with their doctor(s) about what they are doing and why.

VERY IMPORTANT CAVEAT: Many of these supplements are natural anticoagulants. For anyone taking **Coumadin®** (**Warfarin®**, etc.), please do not use any of those supplements without first consulting with a medical doctor.

VIII. TKI INTERACTIONS WITH SUPPLEMENTS AND CERTAIN FOODS

[**Note:** In the following I wish to again acknowledge my thanks to the researchers at the Block Center for Integrative Cancer Treatment for much of the explanation and information they provided.]

There is a very serious issue in regards to ingesting any supplements (and certain foods). That issue is whether or not the substance being consumed might interfere with Sutent getting properly absorbed into the body.

The mechanisms for that to occur revolves around how most pharmaceutical agents and TKI's (Tyrosine Kinase Inhibitors), including Sutent, are metabolized in the gut. Sutent is a substrate (that is, a chemical that is acted on by an enzyme) for the enzyme known as **Cytochrome P450 3A4** (**CYP3A4**). However, other drugs or foods can also be substrates for CYP3A4. If so, they may "compete" with Sutent for the amount of CYP3A4 enzyme that is readily available. If these other substances use up a lot of the CYP3A4 enzyme then Sutent may not get metabolized properly. Instead Sutent may remain in the blood stream at an abnormally high level. This could possibly lead to some very severe side effects.

In addition, any supplements (or other medications or foods) that ***increase*** (or "***induces***") the activity of this enzyme (such as **St. John's Wort**) will ***decrease*** the concentration of Sutent getting into the bloodstream. The increased activity of CYP3A4 will cause Sutent to be metabolized too quickly, resulting in less of it being available to fight angiogenesis (blood vessel creation). In contrast, anything that ***decreases*** (or "***inhibits***") the activity of this enzyme (such as **grapefruit**, **grapefruit juice**, **Seville**

oranges, or **green tea**) will ***increase*** the concentration of Sutent staying in the bloodstream. That result could become dangerous.

That is why in describing all the supplements that follow, I always post a "**SUTENT ALERT**" for those supplements (or foods) that might interact with Sutent – and in what ways they may do it.

My general rule is that I do not take any drug or food ***inducers*** that increase the activity of the CYP3A4 enzyme (i.e. will decrease the amount of Sutent getting into my system). On the other hand I still do take some supplements that "might" be ***inhibitors*** and could serve to increase the Sutent level. But this is only because, so far at least, I have not had any significant side effects to deal with. However, if drinking green tea I make sure it is consumed at least four hours before or after taking Sutent. And I still totally avoid grapefruit or grapefruit products[15] while on Sutent. These items remain too unpredictable in their overall effect.

Some other CYP3A4 inhibitors and inducers to consider can be found here:

http://www.gistsupport.org/treatments-for-gist/sutent/sunitinib-sutent-basics-for-gist.php#6

There are also a few other potential interactions to consider. Variation in the **CYP3A5** enzyme may also affect Sutent levels. However, none of the supplements I use happen to impact this enzyme. The gene **ABCB1**, which stimulates the protein **p-glycoprotein**, can also impact Sutent concentrations. P-glycoprotein helps cancer cells ship medications out through the cell membrane. Note that **Curcumin** and **Quercetin** are two supplements that may inhibit p-glycoprotein, which, in turn, could increase the concentration of Sutent in tumor cells.

OK, on to the rationale behind my list of "appropriate" supplements…

VIX. USE OF L-GLUTAMINE FOR GASTROINTESTINAL DISTRESS

Note: This supplement should be used ***only*** as needed.

This first supplement is a very special case – insofar as it is ***only*** to be taken to reduce certain unwelcome gastrointestinal side effects – **if** or **when** they might appear – but not otherwise or regularly. This is a supplement that I was advised to take when I lost all sense of taste about three weeks into my first cycle on Sutent (at 50mg/day). This supplement also helps to alleviate any metallic food taste as well as mouth sores, nausea, and diarrhea, etc.

The supplement is L-Glutamine. Glutamine is the most common amino acid found in our bloodstream. It assists in the process of turning excess hydrogen and nitrogen into

[15] Also Seville oranges or products made from them.

ammonia in the kidneys. The body must do this for all the proteins that are consumed from either animal or plant sources.

> "It is well-known for its digestive and gastrointestinal support. It plays a key role in the metabolism, structure, and functioning of the GI tract, including the liver and the pancreas. It helps the intestines maintain permeability during periods of physiological stress such as starvation, physical trauma, and surgery." – Block Center for Integrative Cancer Treatment.
>
> But beware of using it for a very long and sustained period. This is because ***after*** glucose, glutamine is the ***next*** nutrient that some tumors "may" primarily feed on. Be that as it may, the body can readily obtain its glutamine by the degradation of skeletal muscle. So attempting to eliminate it is not going to be a limiting factor to tumor growth. Taking it short term is not a problem.
>
> It turns out that glutamine is present mostly (in nature) in animal proteins and in not plant proteins (except in small amounts in wheat and spinach). When eating meat it acts as a natural "buffering agent" during digestion. It assists in the process of turning excess hydrogen and nitrogen into ammonia in the kidneys. The body must do this for ***all*** proteins consumed (be they from animal or plant). So anyone that is following a strict vegetarian or vegan diet is quite likely to be deficient in this amino acid.
>
> **Dosage**: 20-30 grams daily in liquid (2-3 scoops mixed in a very small amount of water twice a day). One scoop = 4.1 grams.

X. SUPPLEMENTS FOR 5 CANCER-RELATED BIOCHEMICAL TERRAINS

In September 2012 my wife and I traveled out to Skokie, IL to consult with the staff at the **Block Center for Integrative Cancer Treatment**. To say the least this is not your typical cancer facility. The very first thing that confronts the visitor upon entry is a fully equipped modern kitchen and small dining area. It is used to demonstrate how to cook various vegan/vegetarian dishes that visitors can later partake in for lunch.

While we were out there we met with two different oncologists, a nutritionist, a dietician, a psychologist, and Dr. Block himself. Most significantly, they also took about 14 separate vials of my blood and then sent them off for extensive testing. A few weeks later I got the results of those tests. The report was 12 pages long. It analyzed five different cancer-related "biochemical terrains" in my body including:

- Level of **Oxidation**
  -In order to maintain the maximum control of antioxidant levels. This is to eliminate free radicals in the body that can damage DNA.
- Level of **Inflammation**

- Which, if uncontrolled, damages cells and organs, fuels pain, discomfort, disease progression, and weakening of the immune system. I touched briefly on the results of one these tests earlier – the C-reactive protein level.

- Level of **Immune System**
  - To both monitor and boost my immune system in order to combat bacteria, viruses, and mutated cells while also helping my body to recover more quickly from illness, injury, and/or cancer treatments.

- Level of (Ease of) **Blood Circulation**
  - As it is known that thicker blood increases the risk of blood clots and also encourages the development of blood vessels that feed tumors and metastases. Healthy flowing circulation also allows nutrients to circulate freely and better nourish the body.

- Level of **Glycemia**
  - As high blood glucose level will increase disease risk and progression, fuel inflammation and weaken the immune system. Keeping Glycemia in check reduces those hormones that promote tumor growth and affect weight management and health.

The results of these extensive blood tests were used to define what supplements I needed to take (and at what dosage) and which might be superfluous.

Thus the supplements that I take relate directly to my own specific needs – and they are based on quantitative results from specific blood tests. These same blood tests are repeated every four months for comparison. I point all this out to underscore the fact that what works for me might turn out to be very different for others.

So here is a breakdown of the supplements that I take. It is based on the results of specific blood test "panels" related to those five key bioterrains:

A. Terrain 1 – The Oxidation Panel

1. Blood test for Vitamin **A**, Serum (retinol) level:
   Optimal value range: **18-77ug/dL**.
   My value (on 9/13/12) = 64ug/dL, considered good.
   My value (on 1/14/13) = 90ug/dL, now considered high.
   [--The reason for this high level remains unclear. A follow up check of my liver enzymes showed proper liver function. This level remains a mystery because **Retinol** comes from eating meat – something I had given up months ago.]

   "Retinol is essential for normal cell growth and development and boosts immune function. Excess Retinol can contribute to liver, eye, skin, and bone damage. There is a need to be aware of Retinol that comes from foods of animal origin. Some fruits and vegetables contain certain carotenoids like Beta-Carotene that provide non-toxic Vitamin A activity." – Block Center for Integrative Cancer Treatment

2. Blood test for Vitamin **B6** level:
   Optimal value range: **12.0-46.7ug/L**.
   My value (on 9/13/12) = 51.1ug/L, considered high.
   My value (on 1/14/13) = 12.4ug/L, now considered good.
   [--Based on the 9/13/12 test results I had stopped taking a multi-vitamin supplement. Doing this brought the value down to a good level.]

   "**Vitamin B6** is a coenzyme involved in the metabolism of protein, carbohydrates, and fat. It is required for normal red blood cell formation. In fact, Vitamin B6 can be regarded as an essential part of the formation of virtually all new cells in the body ... repeated studies show that Vitamin B6 is required to minimize the risk of unwanted inflammation in the body." – Block Center for Integrative Cancer Treatment

   "The role of Vitamin B6 (**pyridoxine**) involves many aspects of neurological activity. It is very important in making many neurotransmitters, including **serotonin** and **GABA**. GABA (**gamma amino butyric acid**) is one of the most important inhibitory neurotransmitters. It allows the body to have coordinated, fluid movements, and it helps control impulsive behavior. As an inhibitory neurotransmitter, GABA helps with calming and quieting both physical and mental pain and distress. A long list of prescription medications have been linked to depletion of the body's pyridoxine. These medications include birth control pills and oral estrogens, diuretics, anti-seizure drugs (often prescribed for pain control), asthma medications and antibiotics. Good food sources for Vitamin B6 include garlic, tuna, cauliflower, mustard greens, bananas, celery, cabbage, crimini mushrooms, asparagus, broccoli, kale, collard greens, Brussels sprouts, cod, and chard." – Dr. Terry L. Wahls

3. Blood test for **Vitamin B12** level:
   Optimal value: **211-946pg/mL**.
   My value (on 9/13/12) = 603pg/mL, considered good.
   My value (on 1/14/13) = 273pg/mL, still considered good.

   "An important coenzyme in the synthesis of DNA, RNA, and **myelin**. Required for normal red blood cell development. If deficient it could promote an environment for unwanted replication, development, and progression of cancer." – Block Center for Integrative Cancer Treatment

   "The body requires vitamin B12 (**cobalamin**) in order to make **hemoglobin** (the oxygen-carrying portion of our red blood cells). It is also necessary, along with **thiamin** (vitamin B1), for brain cells to effectively make myelin. We cannot make B12, but must consume it in our diet. Good food sources include liver, venison, shrimp, scallops, salmon, and beef. Vegetarians can get some B12 from sea plants (like kelp), algae (like spirulina), yeasts (like brewer's yeast), and fermented plant foods (like tempeh, miso, or tofu)… Some drugs that are commonly prescribed also diminish the body's supply of vitamin B12, including anticonvulsants, antihypertensive medication, cholesterol-lowering drugs, and potassium replacements." – Dr. Terry L. Wahls

4. Blood test for **Vitamin C** level:
   Optimal value: Greater than1.2 mg/dL.

My value (on 9/13/12) = 1.6mg/dL, considered good.
My value (on 1/14/13) = 0.9mg/dL, considered sub-optimal.
[--After the 9/13/12 blood tests I decided to cut my dosage to 1000mg/day. So, based on this later test I have decided to go back up to 2000mg/day.]

"Vitamin C is a highly effective antioxidant that protects proteins, lipids, carbohydrates, and DNA from damage by free radicals that can be generated through exposure to toxins and pollutants… Vitamin C appears to provide some protection from free radical damage to the eyes, lungs, blood, and the immune system… Vitamin C in general is essential for the synthesis of collagen and glycosaminoglycan's which are the building materials of all connective tissues. These tissues include the skin, blood vessels, tendons, cartilage and bone. Vitamin C also participates in the synthesis of carnitine, serotonin, and certain neurotransmitters, including norepiniephrine." – Block Center for Integrative Cancer Treatment

To boost this I take: **Vitamin C**.
Dosage = One capsule, twice a day.
One capsule = 1000mg.
Note: Vitamin C can increase the amount of iron absorbed from foods.

SUTENT ALERT: It is possible that there may be a mild increase in CYP3A4 enzyme in males based on some human studies. The Sutent drug information sheet suggests avoiding strong inducers of CYP3A4, which this is not. However, it ***may*** be worth avoiding while taking Sutent. It was for this reason that I had initially cut my dosage in half.

5. Blood test for Vitamin **D**, **25-hydroxy** level:
   Optimal value: 50-80ng/mL.
   My value (on 9/13/12) = 53.7ng/mL, considered good.
   My value (on 1/14/13) = 58.6ng/mL, still considered good.

   "Vitamin D is actually a hormone that targets over 2000 genes in the body. Deficiency has been found to be a major factor in the pathology of at least 17 varieties of cancer as well as heart disease, stroke, hypertension, autoimmune diseases, diabetes, depression, chronic pain, and osteoporosis." – Block Center for Integrative Cancer Treatment.

   "The hazard of excessive vitamin D levels is too much calcium in the blood stream, which can cause kidney stones, confusion, and seizures." – Dr. Terry L. Wahls

   Note: When the tumor suppressor p53 protein is a non-mutated vitamin D can assist in destroying the tumor. There might, however, be a reason for concern when p53 is mutated. Dr. Moshe Oren[16]: "When healthy, p53 prevents cancer. But mutations are like sticks jamming the machinery that keeps cancer at bay, and vitamin D may wedge those 'sticks' into the works a little tighter." Dr. Varda Rotter: "When deciding whether to prescribe vitamin D, it might be important to know not just whether the p53 is mutated, but the nature of those mutations."

[16] Weizmann Institute of Science

To boost this I take: Vitamin D3+Vitamin K2-Liposomal.
Dosage: 2000 units (2 sprays) twice a day.
Each spray contains 1000IU Vitamin D3 (as Cholecalciferol) plus 100mcg Vitamin K-2.
Note: Vitamin K2 helps protect against atherosclerosis (blood vessel calcification). High dose Vitamin K2 may even work to reverse plaque formation. Egg yolks and fermented vegetables (Natto) are other excellent sources of Vitamin K2.

SUTENT ALERT: There is a very unreliable suggestion that higher Vitamin D levels (above 40ng/mL) may lower concentrations of drugs metabolized by the enzyme CYP3A4. The effect is very mild, about 10%, but it ***may*** be worth considering letting the Vitamin D level drop to between 30 and 40 rather than up above 50.

Due to my taking Xgeva (denosumab) I also take: Calcium Citrate + Magnesium.
Dosage: One capsule once a day.
One capsule = 500mg Calcium Citrate; 200mg Magnesium Aspartate.
This supplement is absolutely essential for building up calcium in the bloodstream while taking Xgeva (denosumab).
Note: Calcium Citrate, Calcium Ascorbate, and Calcium Hydroxyapatite can all be digested easily but Calcium Carbonate cannot.

"Magnesium blocks excessive stimulation from glutamate…[it] has been shown to be helpful in reducing the severity of tension headaches and migraines and has been shown to be neuroprotective in animal models of brain injury. Because people eat so few green leafs, and because stress tends to cause magnesium wasting, many Americans are relatively depleted in their magnesium stores. Good sources include pumpkin seeds, sesame seeds, sunflower seeds, spinach, Swiss chard, black beans, and pinto beans…The primary side effect from excessive magnesium is diarrhea." – Dr. Terry L. Wahls

6. Blood test for Vitamin **E - Alpha-tocopherol** level:
   Optimal value: Greater than 9.4mg/L.
   My value (on 9/13/12) = 23.8mg/L, considered too high.
   My value (on 1/14/13) = 15.9mg/L, now considered good.
   [--Based on the 9/13/12 result I had stopped taking a multi-vitamin supplement. This brought the value down into the good range.]
   "Vitamin E as Alpha-Tocopherol acts like a "lightning rod" in cells, allowing free radicals to strike cells without causing damage. Alpha-Tocopherol also helps to stabilize cell membranes, fight inflammation, and boost immunity." – Block Center for Integrative Cancer Treatment

7. Blood test for **Coenzyme Q_{10}** level:
   Normal range: **0.37-2.20ug/mL**.
   Optimal value: Greater than 1.3ug/mL.

My value (on 9/13/12) = 3.88ug/mL, considered good but high.
My value (on 1/14/13) = 6.52ug/mL, still considered good but high.
[--This latest value can be reduced so I have cut the dosage in half – to only 200mg/day].

Coenzyme Q_{10} is a vitamin-like substance made in every cell. It has numerous important functions including creating energy from nutrients (food) in the body. In particular it helps cells utilize oxygen. CoQ_{10} deficiency can affect the heart as profoundly as a calcium deficiency can affect the bones. CoQ_{10} also has the ability to reduce blood pressure. And it is a very potent intracellular anti-oxidant.

Note: Recall the earlier discussion about Dr. Otto Warburg's theory that the primary cause of cancer may be due to hypoxia – or lack of sufficient oxygen getting into any normal cell.

Renal cell cancer is a metabolic disease. As such it is intimately affected by cell metabolism. In turn cell metabolism (energy production) is controlled by the mitochondria within the cell.

"CoQ_{10} is incorporated in the mitochondria of the cells. It facilitates the transformation of fats and sugars into energy. CoQ_{10} benefits high-energy demand organs, such as the brain, heart, kidneys, and muscles. The body uses it for cellular growth and to protect cells from damage. It also helps the immune system better able to resist certain infections and types of cancer. When taking chemotherapy, CoQ_{10} has been shown to help protect the heart from damaging side effects." – Block Center for Integrative Cancer Treatment

"It [Coenzyme Q_{10}] has been used successfully to reduce the severity of migraines, neuropathies, and dementia. Excellent food sources include wheat germ and dark green, leafy vegetables like kale and spinach, and organ meats such as liver, tongue, and heart." – Dr. Terry L. Wahls

Important Note for anyone taking Xgeva or Zometa®: The biggest danger from taking these drugs long term is the remote possibility of developing **ONJ – Osteonecrosis of the Jaw**:

"Osteonecrosis of the jaw, commonly called ONJ, occurs when the jaw bone is exposed and begins to starve from a lack of blood. As the name indicates (osteo meaning bone and necrosis meaning death), the bone begins to weaken and die, which usually, but not always, causes pain. ONJ is associated with cancer treatments (including radiation), infection, steroid use, or potent antiresorptive therapies that help prevent the loss of bone mass. Examples of potent antiresorptive therapies include bisphosphonates such as zoledronic acid (**Zometa®**); alendronate (Fosamax®); risedronate (Actonel® and Atelvia®); ibandronate (Boniva®); and denosumab (**Xgeva®** and Prolia®). While ONJ is associated with these conditions, it also can occur without any identifiable risk factors." – American College of Rheumatology website

Coenzyme Q_{10} – ***may*** also be helpful in preventing ONJ. Apparently when CoQ_{10} was first discovered (in 1957) it was also found to be deficient in those patients suffering from periodontal (gum) disease. Here is a pertinent study:

http://www.ncbi.nlm.nih.gov/pmc/articles/PMC2991687/

Maintaining sufficient CoQ_{10} levels may help prevent gum disease and thus remove a major precursor to ONJ.

Important Note for anyone taking statins to reduce cholesterol: Taking a CoQ_{10} supplement is absolutely essential for anyone on statins. This is because taking statins ***will*** significantly reduce the amount of CoQ_{10} in the body.

To maintain an optimal CoQ_{10} level I take: **Ubiquinol**.
Dosage: 1 capsule once a day.
One capsule = 200mg Ubiquinol (CoQH – this is the active form of CoQ_{10} - Ubiquinone).

8. Blood test for **Folate** (folic acid) level:
   Optimal value: **Greater than 12.0ng/mL**.
   My value (on 9/13/12) = 19.9ng/mL, considered good.
   My value (on 1/14/13) = 13.2ng/mL, still considered good.

"An important coenzyme in DNA synthesis, gene expression, and regulation. Also required for normal red blood cell development. Do not want to be deficient as it is involved in DNA synthesis and could promote an environment for unwanted replication, development, and progression of cancer." – Block Center for Integrative Cancer Treatment

"Folate is essential for normal brain function. It helps prevent hyper-homocysteinemia, which is associated with increased risk of cardiovascular disease, Parkinson's, Alzheimer's, and other dementia. Green leafy vegetables and asparagus are rich sources of folate and provide the basis for its name… It is estimated that 20% of Americans have relatively less-effective enzymes for absorbing and using folate, due to a problem with their methylation enzymes." – Dr. Terry L. Wahls

9. Blood test for **Zinc** level:
   Optimal value: **95-134ug/dL**.
   My value (on 9/13/12) = 102ug/dL, considered good.
   My value (on 1/14/13) = 101ug/dL, still considered good.

"Functions as an intracellular signal molecule for immune cells, and helps control inflammation markers. A lack of sufficient zinc in the body has been linked to increased production of pro-inflammatory cytokines and oxidative stress. Normal zinc concentrations have been correlated with a decreased risk of pneumonia, and decreased chance of infection." – Block Center for Integrative Cancer Treatment

"Low levels of zinc are associated with abnormal taste, depressed immunity, and increased risk of depression. Good sources include seaweed, liver, pumpkin seeds, nutritional yeast, and greens." – Dr. Terry L. Wahls

B. Terrain 2 – The Inflammation Panel

1. Blood test for **C-Reactive Protein** – Highly Sensitive level:
   Normal value = **1.0-3.0mg/L**.
   Optimal value = **Less than 1.0mg/L**.
   My value (on 9/13/12) = 44.0mg/L, considered far too high.
   My value (on 1/14/13) = 4.53mg/L, still considered high.
   My latest value (on 2/6/13) = 0.3mg/L, considered optimal.
   [--The first test was done on 9/14/12. This number was so disturbingly high that I decided to repeat this particular blood test every month since. As noted earlier, my reading in November 2012 showed that it had dropped down to 2.3mg/L. At the time I had attributed this drop largely to my diet and to certain supplements such as fish oil. However, in light of my further experience in dealing with Sutent "flare" around Christmas Day 2012, taking a combination of Sutent plus Xgeva was clearly another key reason.]
   "C-Reactive Protein is a sensitive marker of systematic inflammation. Researchers call it the "unifying theory" behind the major killers of our times. High levels of inflammation have been linked to increased risk of cardiovascular disease, diabetes, Alzheimer's, Parkinson's, and cancer." – Block Center for Integrative Cancer Treatment

2. Blood test for **Interleukin-6** (**IL-6**) level:
   Optimal value: **Less than 5.0pg/mL**.
   My value (on 9/13/12) = 3.5pg/mL, considered good.
   My value (on 1/14/13) = 2.5pg/mL, still considered good.
   "IL-6 is an inflammatory and prognostic factor. It is secreted by T-cells and Macrophages in the immune system to stimulate immune response to inflammation and has been shown to raise Fibrinogen levels leading to internal clot formation. In the muscle and fatty tissue IL-6 stimulates energy mobilization that leads to increased body temperature. However, if IL-6 levels become too high, it can induce negative Nitrogen balance which leads to muscle wasting and Cachexia." – Block Center for Integrative Cancer Treatment

3. Blood test for **Matrix Metalloproteinase-9** (**MMP-9**) level:
   Optimal value: **Less than 984ng/mL**.
   My value (on 9/13/12) = 720ng/mL, considered good.
   My value (on 1/14/14) = 390ng/mL, still considered good.
   "Matrix Metalloproteinase-9 is a marker that is related to normal tissue and development, such as embryonic development, ovulation, wound healing, etc. Inflammation markers often regulate its expression. MMP-9 is an enzyme that cancer cells use to degrade surrounding connective tissue and spread in the body. Elevated levels have been found to promote tumor growth and

progression, and angiogenesis (the formation of blood vessels to tumors)." – Block Center for Integrative Cancer Treatment

I am currently taking four supplements that help to lower Inflammation:

a. Ayur-Boswellia Serrata (also called Indian Frankincense)
Dosage: Four capsules twice a day – not taken with food.
One capsule = 200mg.

"Boswellia has been shown to aid in inflammatory conditions such as Inflammatory Bowel Syndrome and Asthma. Boswellic Acids inhibit **5-Lipoxygenase** (**5-LOX**) and leukotriene synthesis, and inhibit leukocyte elastase, which are the likely mechanisms for its anti-inflammatory properties." – Block Center for Integrative Cancer Treatment

SUTENT ALERT: This supplement tends to inhibit CYP3A4 based on lab studies, which could increase the Sutent concentration.

There actually is a better supplement than **Boswellia** out there. It is called **Scutellaria** (**Standardized Scut**):
Dosage: Three capsules twice daily with or without food.
One capsule = 420mg.

“The flavonoid compounds of scutelleria (baicalin, baicalein, and wogonin) contain significant anti-inflammatory and antioxidant effects…scutelleria contains some of the most exciting anti-aging and healthy inflammation response molecules known to science. Interestingly, baicalin is one of the only known naturally occurring compounds with 12-LOX modulatory activity. This makes scutelleria a key therapy for promotion of normal cell growth in multiple tissue types within the prostate, brain, pancreas, bladder, breast, liver, colon, and gastric system…moreover, scutelleria provides immune support, promotes relaxation without a sedating effect, modulates histamine release, and offers protection to healthy cells during oxidative treatments.” – Block Center for Integrative Cancer Treatment

b. Resveratrol - Advanced Resveratrol Formula
Dosage: 2 tablets, twice a day.
One tablet = 150mg Red Grape (Vitis Vinifera) Seed; 150mg Red Grape (Vitis Viifera) Skin; 100mg Red Wine (Viti Vinifera) Dried Extract; 100mg Japanese Knotweed (Polygorum Cuspidatum) Root; 500mg Citrus Bioflavanoid Complex; 25mg Quercetin.
[**Note**: The recommended daily dose is for 30 to 200mg of ***trans***-resveratrol, the active component of resveratrol.]

Resveratrol helps protect the arteries by improving their elasticity, thus inhibiting blood clots. It also lowers blood pressure and is a strong anti-oxidant. Resveratrol is a polyphenol. Polyphenols are said to mimic caloric restriction. That is, they can restrict carbohydrate utilization.

"Resveratrol is a polyphenolic compound. Its primary functions include anti-mutagenic, anti-inflammatory, and anti-oxidant activities. Due to its potent anti-oxidative effect, its ability to regulate cell proliferation, and ability to help

decrease blood supply to tumor cells, Resveratrol is strongly associated with inhibiting tumor growth while promoting beneficial effects in preventing cardiovascular disease." – Block Center for Integrative Cancer Treatment

“This compound is a polyphenol (a plant-based compound with antioxidant properties) potent intracellular antioxidant and is found in grapes, red wine, purple grape juice, peanuts, and some berries. It has been associated with decreased aging and neuroprotection in multiple studies.” – Dr. Terry L. Wahls

SUTENT ALERT: This supplement tends to inhibit the enzyme CYP3A4, which could increase the Sutent concentration.

c. ArcticBlox - Maximum Strength EPA

Dosage: 2 Softgels twice a day.

2 Softgels = 1200 mg Omega-3 Fatty acids: EPA = 900mg; DHA = 200mg; other = 100mg.

"ArcticBlox is the Block Center's highly concentrated Omega-3 fish oil... Although EPA and DHA are made within the body from another Omega-3 fatty acid, Alpha-Linolenic Acid (ALA) commonly found in Flax, the conversion of ALA to EPA and DHA is very inefficient. Taking Omega-3 fish oil in softgel or liquid form facilitates intake at higher levels than those achieved by fish consumption alone... EPA and DHA inhibit a number of steps in the carcinogenic process... they can also aid in cardiovascular function and have anti-inflammatory benefits." – Block Center for Integrative Cancer Treatment

d. Phytosome Turmeric - Liposomal Curcumin

Dosage: 2 capsules twice a day.

One capsule = 500mg Meriva Turmeric Phytosome (Curcuma Longa Rhizome/Glycine Max Soybeans).

Curcumin has multiple benefits leading with it being highly anti-inflammatory. In animal studies it was shown to protect the lining of the artery walls from damage caused by **homocysteine**.

Curcumin (chemical name = diferuloylmethane) is the yellow compound found in the spice turmeric. Curcumin has been shown to suppress tumor promotion and proliferation, inflammatory signaling, and angiogenesis (the development of new blood vessels). The anti-inflammatory activity of curcumin is, in part, due to its ability to inhibit enzymes that are necessary for the synthesis of lipid mediators of inflammation. In particular, curcumin inhibits cyclooxygenase-2 (COX-2: this is the same enzyme that is inhibited by the NSAID drug Celebrex®) and lipoxygenase. In studies on the effects of curcumin using human cells in culture it has been shown that the compound blocks the release of inducible nitric oxide synthase (iNOS) and COX-2 from airway epithelial cells, prevents COX-2 expression in mammary epithelial cells, inhibits cytokine secretion from macrophages, and blocks the release of cytokines and ROS from arterial cells.

More here: http://www.ncbi.nlm.nih.gov/pubmed/17569207

Here is a study showing that COX-2 inhibitors may make VEGF inhibitors (specifically Sutent) work longer: "COX-2 inhibition enhances the activity of Sunitinib (Su) in human renal cell carcinoma xenografts": http://www.ncbi.nlm.nih.gov/pmc/articles/PMC3566808/

"Conclusion: COX-2 inhibition can extend the effectiveness of VEGFR inhibition. This effect is dependent on the timing of therapy. Clinical trials combining Su and COX-2 inhibitors should be considered as a means delaying time to progression on sunitinib in patients with metastatic cRCC."

"Curcumin can protect against free radical damage because of its strong antioxidant properties ... it can potentially reduce inflammation by lowering Histamine levels and possibly increasing production of natural Cortisone by the Adrenal glands. Finally, Curcumin has the possibility to reduce platelets from clumping together, which in turn can improve circulation therefore supporting cardiovascular health." – Block Center for Integrative Cancer Treatment

"Turmeric is used in the treatment of brain cells, called astrocytes… [it] has been found to increase expression of the enzymes that are important to the manufacturing of GABA (glutathione S-transferase), leading to the protection of neurons exposed to oxidant stress." – Dr. Terry L. Wahls

Note: There is also evidence of a strong synergistic relationship between Curcumin and Resveratrol when taken together.

SUTENT ALERT: There is no effect in human studies to date but animal studies show it tends to inhibit the CYP3A4 enzyme, which would increase the Sutent concentration. It also tends to inhibit p-glycoprotein, which would tend to increase the Sutent concentration in tumor cells.

C. Terrain 3 – The Circulation Panel

e. Blood test for Fibrinogen Antigen **level:**
Optimal value: **Less than 350mg/dL**.
My value (on 9/13/12) = 500mg/dL, considered high.
My value (on 1/14/13) = 474mg/dL, still considered high.

"Fibrinogen can cause increased platelet aggregation, hyper-coagulation, and excessive blood thickening. This increases the risk for heart attack and stroke. Fibrinogen is the precursor for Fibrin, which cancer cells may use to coat themselves in order to hide from the immune system. Fibrin also relays a signal to cancer cells to initiate angiogenesis and sets the stage for tumor growth and metastasis." – Block Center for Integrative Cancer Treatment

4. Blood test for **Prothrombin Fragment 1+2 MoAb** level:
Optimal value: **87-325pmol/L**.
My value (on 9/13/12) = 848pmol/L, considered high.

My value (on 1/14/13) = 524pmol/L, considered high.

"Prothrombin 1+2 increases the activation of platelet aggregation, which can lead to internal blood clot formation." – Block Center for Integrative Cancer Treatment

In addition to **Scutelleria** (mentioned earlier) I am currently taking one other supplement to help ease blood flow and circulation:

f. Nattokinase II

Dosage: Three caplets twice a day.
One capsule = 50mg.

"This is an enzyme isolated from **Natto**, a traditional Japanese fermented soy food. Natto is comprised of boiled soybeans fermented with Bacillus Natto but has not been seen to have Estrogenic activity. It supports heart health and promotes healthy circulation. It regulates blood pressure. It is also a fibrinolytic enzyme that decreases platelet aggregation. It works by inactivating Plasminogen Activator Inhibitor. It also is believed to help with Atherosclerosis." – Block Center for Integrative Cancer Treatment

Note: Fermented soy (Natto) is also an excellent source of **Vitamin K2**. Vitamin K2 helps protect against atherosclerosis (blood vessel calcification). High doses of Vitamin K2 may even work to reverse plaque formation.

D. Terrain 4 – The Glycemia Panel

1. Blood test for **Insulin** level:
   Optimal value: **2.6-24.9ulu/mL** (while fasting).
   My value (on 9/13/12) = 30.1ulu/mL, considered high.
   My value (on 1/14/13) = 6.1ulu/mL, now considered good.
   [--The 9/13/12 test was done without my having fasted, so that day's test was deemed to be inconclusive.]
   My blood **Glucose** level was also measured one month later:
   Optimal value = **70-105mG/dL** (while fasting).
   My value (on 10/3/12) = 105mG/dL, considered normal (but just barely).
   My value (on 2/8/13) = 108mG/dL, now considered slightly high.
   [--This will need to be watched.]

2. Blood test for **C-Peptide** level:
   Optimal value: **1.1-4.4ng/mL** (while fasting).
   My value (on 9/13/12) = 7.4ng/mL, considered high.
   My value (on 1/14/13) = 2.9ng/mL, now considered good.
   [--The 9/13/12 test was done without my having fasted, so that day's test was deemed to be inconclusive.]

   "Insulin and C-Peptide levels may be used to monitor Insulin produced by the body and check for Insulin resistance. Both may be ordered to evaluate how much Insulin in the blood is due to endogenous production (what your body is making) and how much is from exogenous (produced outside of the body)

sources. Insulin tests will reflect the total, while C-Peptide will reflect only the endogenous Insulin." – Block Center for Integrative Cancer Treatment

3. Blood test for **Leptin** level:
   Optimal value ranges by **Body Mass Index** (**BMI**).
   My BMI at that time was = **23.7**, considered ideal.
   For that BMI, optimal Leptin value: **0.2 - 8.6ng/mL**.
   My value (on 9/13/12) = Less than 0.5ng/mL, considered low.
   My value (on 1/14/13) = 3.3ng/mL, now considered good.
   "Leptin released by fat cells regulates body weight in part by suppressing appetite. When Leptin levels in the blood go up, the brain signals us to stop eating. However, in people who are overweight, Leptin levels increase substantially and those people become resistant to Leptin's signal – making them increasing vulnerable to Leptin-induced blood clotting." – Block Center for Integrative Cancer Treatment

4. Blood test for **Insulin-Like Growth Factor 1 (IGF-1**) level:
   An age range determines optimal value.
   I just turned 60. For my age range (51-60 years old), the optimal IGF-1 value is between **51 to 194ng/mL**.
   My value (on 9/13/12) = 121ng/mL, considered good.
   My value (on 1/14/13) = 156ng/mL, still considered good.
   "Insulin-Like Growth Factor 1 is a growth hormone that has been found to play roles in promoting cell growth and replication as well as inhibiting cellular death at higher levels. Low levels of IGF-1 can contribute to fatigue, decreased sense of well-being, and diminished ability for cellular growth and repair." – Block Center for Integrative Cancer Treatment

I am not taking any supplements to directly address my Glycemia Terrain. Instead I am attempting to control it by diet and exercise alone. I try to walk for at least 60 minutes every day. Another important way is just by maintaining an appropriate weight for my height. I am 5' 8". In July, just before I started on my new dietary regime, my weight was at 162 lbs. Today it is steady at 142 lbs. My minimum is not to go below 140 lbs.

I also try to keep a constant blood sugar level by consuming small frequent meals (or snacks) every 3 to 4 hours and by avoiding all refined carbohydrates.

In addition I take two capsules of additional soluble fiber (.52g of **Psyllium Husk** per capsule) every morning to insure a minimum amount of fiber is always in my digestive system. Psyllium acts to delay gastric emptying and reduces the acceleration of colon transit. It modifies the body's response to rapidly fermentable, poorly absorbed dietary carbohydrates such as lactose and fructose.

The importance of adequate fiber in one's diet cannot be over-emphasized. Soluble fiber lowers LDL ("bad" cholesterol) levels. Some sources of soluble fiber are: Oat, bran, oatmeal, beans, peas, rice, bran, barley, citrus fruits, strawberries, and apple pulp. Some sources of insoluble fiber are: whole-wheat bread, most whole grains, cabbage, beets, carrots, turnips, cauliflower, and apple skin.

E. Terrain 5 – The Immune Panel

1. Blood test for **Natural Killer – NK-Cells (Absolute NK)** level:
   Optimal value: **136-406/uL**.
   My value (on 9/13/12) = 42/uL, considered very low.
   My value (on 1/14/13) = 131/uL, much better, slightly sub-optimal.
   "Natural Killer (NK) cells are a type of cytotoxic lymphocytes that help to fight infection and disease. These white blood cells can recognize microbes and tumor cells as "foreign" and attack and destroy them. NK cells also have a special ability to clear the bloodstream of metastatic cancer cells." – Block Center for Integrative Cancer Treatment

2. Blood test for **Activated T-Cells** (**Absolute CD3**) level:
   Optimal value: **801-2402/uL**.
   My value (on 9/13/12) = 1274/uL, considered good.
   My value (on 1/14/13) = 864/uL, still considered good.
   "T-cells coordinate the immune response and kill virus-infected and tumor cells. [In a healthy person] T-cells recognize virus infected cells, tumor cells, and other foreign cells and destroy them. T-cells instruct NK cells to attack cancer cells."
   – Block Center for Integrative Cancer Treatment

   Note that caveat "in a healthy person" cited above. For once a tumor has taken hold it "shields" itself from being recognized by the immune system. The goal of immunotherapies such as HD IL-2 or anti-PD-1 is to restore the immune system's ability to recognize (and kill) tumor cells. At that point the T-cells and NK cells can resume their normal function and rid the body of them.

3. Blood test for **Raji Cells** level:
   Optimal value: Less than 15.1ugEg/mL.
   My value (on 9/13/12) = 12.8ugEg/mL, considered good.
   My value (on 1/14/13) = 15.2ugEg/mL, considered slightly high.
   [It is not clear if this is meaningful or not.]
   "A Raji cell is a measure of the immune complexes in the body. Immune complexes are a measure of the antigens in the body. An antigen is a response created by the immune system to address any infection or foreign substance. Normally, immune complexes are rapidly removed from the bloodstream by Macrophages in the spleen and Kupffer cells in the liver. In some circumstances, however, immune complexes continue to circulate due to excessive formation and/or impaired removal. Eventually they become trapped in the tissues of the kidneys, lung, skin, joints, or blood vessels. There they set off reactions that lead to inflammation and tissue damage."– Block Center for Integrative Cancer Treatment

I currently take two supplements specifically designed to boost my immune system. However, there are several other supplements that, while primarily geared to protecting

either the kidney or liver (or both), also boost the immune system. They are described here as well:

a. Melatonin P.R. (Prolonged Release)
Dosage: 6 pills orally at night before bed. One pill = 3mg.
Slowly work up to the goal of 18mg/dose (6 pills).
Melatonin works during the nighttime hours and also regulates the sleep cycle. It is **mTOR2** blocker (so is **Metformin**).[17]

"Melatonin is a natural hormone nutrient that is synthesized from the amino acid Tryptophan by the Pineal gland in the back of the brain. It also occurs in small amounts in a variety of foods ... Melatonin supports normal immune function by helping maintain the activity of circulating Natural Killer (NK) cells. It also has been found to function as an antagonist for stress-induced immuno-suppression ... Melatonin is considered to be a potent antioxidant that enters all body cells and is believed to help prevent free radical damage. In the brain, Melatonin is perhaps the most important physiological antioxidant. Due to its lipid and water soluble properties, it can freely cross the blood - brain barrier." – Block Center for Integrative Cancer Treatment

SUTENT ALERT: This tends to inhibit the **CYP1A1** enzyme, which ***may*** increase the Sutent concentration to a minor extent. Melatonin also has an anticoagulant effect.

b. Myco Essentials
A proprietary blend of **Mushroom Extract**s from the Block Center for Integrative Cancer Treatment.
Dosage: 2 tablets twice a day.
3 tablets = Proprietary Blend 2250mg: LEM (Shiitake Mycelia extract) – 20:1; Red Reishi fruiting body extract – 15:1; Maitake fruiting body extract – 10:1[18]; Coriolus Versicolor – 7.5:1; Agaricus Blazeii – 4:1; Cordyceps Mycelia – 4:1.
"Research suggests the compounds may stimulate Macrophage and Natural Killer (NK) cells, support the inhibition of cancerous cell growth and discourage the mutation of healthy cells." – Block Center for Integrative Cancer Treatment

The supplements that I take that primarily protect the kidney or liver:

c. Astragalus.
Dosage: One capsule twice a day.
One capsule = 500mg Astragalus Extract.
This is primarily for kidney health. It has been found to be highly effective against renal cancer. It is extracted from a Chinese root.

[17] Afinitor (Everolimus) is an **mTORC1** blocker.
[18] Unpublished studies (by Dr. Sensuke Konno – NY Medical College) state that Maitake D-fraction may work synergistically with vitamin C to induce apoptosis in certain tumors.

SUTENT ALERT: This one tends to increase the activity of the CYP3A4 enzyme. This could lead to a decrease in Sutent concentration. This warning is based on lab studies only and not in humans – so it is not that reliable. Regardless I only take Astragalus during my Sutent break.

d. Milk Thistle (Silybum Marianum)

Dosage: Two capsules twice a day.
One capsule = 250mg.

This is primarily to help protect the liver. This is an herb native to the Mediterranean that has been used for centuries to support liver function.

"Milk thistle is a powerful antioxidant and supports the brain, liver, and kidneys in animal studies by preventing the depletion of glutathione. Silymarin is the active compound of milk thistle. Because it has been shown to help prevent depletion of glutathione, it is considered helpful to the detoxification process in the liver. It is also thought to protect the liver from toxins, such as carbon tetrachloride and alcohol." – Dr. Terry L. Wahls

SUTENT ALERT: There are a lot of contradictory lab data on this one and no effect was found in human studies. In any case it inhibits the CYP3A4 enzyme. That ***may*** increase the Sutent concentration.

e. N-Acetyl Cysteine (NAC) II

Dosage: One capsule, twice a day.
One capsule = 500mg.

N-acetylcysteine (NAC) has been approved by the FDA for use in several types of treatments. It is taken primarily to help protect the kidney and it is a powerful anti-oxidant.

"Biologically active precursor for the amino acid cysteine which, in turn, is a precursor for glutathione, a tripeptide with antioxidant properties ... Body cells and tissues are threatened continuously by damage caused by toxic free radicals and reactive oxygen species (e.g. peroxides) which are produced during normal oxygen metabolism, by other chemical reactions, and by toxic agents in the environment. Free radicals, once formed, are capable of disrupting metabolic activity and cell structure. When this occurs, additional free radicals are produced, which, in turn, can result in more extensive damage to cells and tissues. The uncontrolled production of free radicals is thought to be a major contributing factor to many degenerative diseases." – Block Center for Integrative Cancer Treatment

"N-acetylcysteine is considered to be the most cost-effective strategy to increase intracellular production of glutathione.

Because it is an effective helper in the detoxification process, NAC has been approved by the FDA for treatment of acetaminophen overdose and to help protect the kidneys from the toxic effects of IV contrast used in some CT scans and X-ray studies. Because of glutathione's tremendous importance in keeping the mitochondria healthy in the lungs, kidneys, and brain, NAC is

commonly used in the treatment of lung diseases like cystic fibrosis, bronchitis, and asthma.

NAC is also the key component in the generation of GABA. GABA (gamma amino butyric acid) is one of the most important inhibitory neurotransmitters. It allows the body to have coordinated, fluid movements, and it helps control impulsive behavior. As an inhibitory neurotransmitter, GABA helps with calming and quieting both physical and mental pain and distress.

Several neurologists and psychiatrists have asked patients to use one to two grams of NAC each day to support GABA generation in the brain. For some individuals, however, diarrhea occurs at doses more than 500mg per day. But the recommended daily allowance for a 150-pound adult is two grams a day (2000mg/day).

NAC is also found naturally in a variety of foods, including: poultry, egg yolks, yogurt, red peppers, garlic, onions, broccoli, Brussels sprouts and other cruciferous vegetables. It is also found in oats, wheat germ, asparagus, and avocado." – Dr. Terry L. Wahls

f. Ultra-Lipoic Forte (alpha lipoic acid).
Dosage: 2 capsules, twice a day.
One capsule = Alpha-Lipoic Acid 1,000mg.
This is taken primarily to help protect the kidney.

"Alpha Lipoic Acid is a non-vitamin coenzyme that carries out important metabolic and antioxidant functions in the body... [it] participates in the energy metabolism of proteins, carbohydrates, and fats, with a particular role in blood glucose disposal. It also scavenges a number of free radicals and helps the body regenerate Glutathione... Alpha-Lipoic Acid is unique among biological antioxidants because it is soluble in both water and lipids. This allows it to neutralize free radicals just about everywhere in the body, inside and outside the cells... Preliminary data suggests that these anti-oxidant effects might provide protection in cerebral ischemia, excito-toxic amino acid brain injury, mitochondrial dysfunction, muscle Ischemia associated with peripheral arterial disease, diabetes, diabetic neuropathy, and other causes of damage to the brain or neural tissue. Alpha-Lipoic Acid seems to improve neuropathic sensory symptoms such as burning, pain, numbness, and prickling of the feet and legs." – Block Center for Integrative Cancer Treatment

"Several studies suggest that treatment with alpha-lipoic acid may help reduce pain, burning, itching, tingling, and numbness in people who have nerve damage (called peripheral neuropathy) caused by diabetes. [It] has been used in Europe for years for this purpose. Good food sources include spinach, broccoli, beef, yeast (particularly brewer's yeast), and certain organ meats (such as kidney and heart)." – Dr. Terry L. Wahls

SUTENT ALERT: This has been found to inhibit the CYP3A4 enzyme and thus ***may*** increase the Sutent concentration. It also inhibits **NADPH** – Cytochrome P450 Reductase. This enzyme supplies the electrons (energy) for CYP450 reactions. If there are not enough electrons the CYP enzymes

are not be able to act and thus will be inhibited. When they are inhibited they ***may*** make the Sutent concentration increase.

This completes my list of supplements – except for one rather unique and important one. It qualifies under a category all by itself:

F. Natural Anti-angiogenic Foods and Supplements

Sutent is one of an ever-increasing family of **Tyrosine-Kinase Inhibitors** (**TKI**'s) – drugs that inhibit the tyrosine kinase enzymes responsible for the activation of signal transduction cascades. This basically interferes with the ability of tumors to build blood vessels (a process called angiogenesis) that supply it with necessary nutrients. Sutent is an inhibitor of the receptors for FGF, PDGF, and VEGF.

Here is a link to a very informative **TEDTalk** by Dr. William Li about the power of anti-angiogenic foods and substances in fighting cancer. It is titled, "**Can We Eat to Starve Cancer**?"

http://www.ted.com/talks/william_li.html

This last supplement in my list is also the very first one that I ever started on. This may be significant because it seemed to have had a noticeable effect ***prior to*** my starting on Sutent and the other supplements in my list:

a. TBL-12 - Sea Cucumber/Sea Urchin.
Dosage: 2 "jello shots", twice a day.
One shot = 20ml with 80% Sea Cucumber; 5% Sargassum Seaweed (whole plant); 5% Sea Sponge; 5% Shark Fin; 5% Sea Urchin.

This combination of "live" ingredients comes directly from traditional Chinese medicine (TCM). This concoction acts as a natural anti-angiogenesis agent – but one that may target more receptors than a "man-made" drug such as Sutent.

It recently received FDA approval as an "orphan drug" for the treatment of Multiple Myeloma.

It also recently completed its first Phase II Clinical Trial:

http://abstracts.hematologylibrary.org/cgi/content/abstract/116/21/5042?maxtoshow=&hits=10&RESULTFORMAT=&fulltext=sea+cucumber&searchid=1&FIRSTINDEX=0&volume=116&issue=21&resourcetype=HWCIT

And it seems that more trials are either underway or planned.

Here are some earlier studies about it:

http://abstracts.hematologylibrary.org/cgi/content/abstract/118/21/5109?maxtoshow=

&hits=10&RESULTFORMAT=&fulltext=tbl-12&searchid=1&FIRSTINDEX=0&sortspec=relevance&resourcetype=HWCIT

http://www.ncbi.nlm.nih.gov/pubmed/15645493

These links (from Australia) may also shed some light on it:

http://www.unicorn-pacific.com/tbl_1.html

http://www.unicorn-pacific.com/specs_1.html

http://www.unicorn-pacific.com/documents/index.html

SUTENT ALERT: There is no published data available on how TBL-12 is metabolized.

G. My TBL-12/Sea Cucumber Experience

On July 31, 2012 my oncologist confirmed that I was no longer NED. Mets were discovered on my sacrum (base of my spine) and my left femur (hip/thigh). On that same day, after almost 60 years of eating a typical western diet, I resolved to give up most meat (excepting fish and seafood) and dairy products. The next day I received my first shot of Xgeva (denosumab), however, I did ***not*** start taking any Sutent quite yet.

Around this time I began to develop a dull, throbbing pain in my left thigh. It progressively got worse and worse. I was soon walking with a limp and I could no longer go up the stairs normally – I could only manage one feeble step at a time. The pain was progressively getting worse and it would completely fatigue me. I would spend most of my day flat on my back. I could only control this pain by taking the maximum dosage of Ibuprofen (400mg) every 6 hours. This, of course, was absolutely the worst thing to do for the kidney – but I found that acetaminophen (which is metabolized by the liver) had no effect on this pain at all. I really thought I was a goner – since I had gone downhill so quickly.

On August 10th (some 10 days later) I began taking daily doses of TBL-12/Sea Cucumber. I still had not started on Sutent or any other supplements yet.

On August 18th I started taking some of the other supplements in my list.

On August 24th I started on my first dose of Sutent (50mg). Interestingly, the next day, August 25th, my pain started to subside. By August 28th I was completely pain free and have been ever since (except for that Sutent flare episode around Christmas).

So what, exactly, led to the end of all my pain so quickly? Looking back I conclude that it was the overall combination of diet, Xgeva, and taking TBL-12/Sea Cucumber. But it does seem unlikely that it was due to my taking Sutent (after only 2 or 3 day's time).

LATEST UPDATE: On February 15, 2013 I stopped taking TBL-12/Sea Cucumber. The reason was that I felt it was just too expensive to justify. Now that I have stopped taking it I can also report there is absolutely no difference in my overall health. So taking TBL-12 probably is not the reason behind why I have not experienced any fatigue.

On that note I am finished explaining the rationale and science behind what I am doing. I have tried to compress a vast array of research - and at times conflicting data - into just a few pages. Naturally there is much more I could write on all these subjects. I seem to learn something new almost everyday. This remains very much a work in progress. As such I welcome any questions, concerns, or comments.

XI. SOME FINAL THOUGHTS

Eric Jacobs, a senior epidemiologist and vitamin specialist with the American Cancer Society, once wrote: "There is no vitamin or mineral supplement proven to reduce the risk of cancer." But I hope that I have shown here that those who might still think this way need to stop and seriously evaluate the role of a “proper” diet, nutrition, and “appropriate” supplements in helping to prevent and combat this complex illness.

A few of the major conclusions from the book, “**Cancer as a Metabolic Disease**”:

1. Lifestyle changes can help manage and prevent cancer.
2. Most cancer, regardless of cell or tissue origin, is a singular disease of respiratory insufficiency coupled with compensatory fermentation.
3. Enhanced fermentation is largely responsible for tumor cell drug resistance.
4. Some factors that can cause respiratory insufficiency and cancer include age, viral infections, hypoxia, inflammation, rare inherited mutations, radiation, and carcinogens.
5. Genomic instability makes cancer cells vulnerable to metabolic stress.
6. Cancer cells do not have a growth advantage over normal cells.
7. Cancer cells depend largely on glucose and glutamine metabolism for survival, growth, and proliferation.
8. Restricted access to glucose and glutamine may compromise cancer cell growth and survival.
9. Protection of mitochondria from oxidative damage can prevent or reduce the risk of cancer.
10. Mitochondrial enhancement therapies administered together with drugs that target glucose and glutamine metabolism will go far as a non-toxic, cost-effective solution to the cancer problem.

Any questions, thoughts, or suggestions please feel free to contact me at:

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XII. APPENDIX A - SUPPLEMENTS SORTED IN ALPHABETICAL ORDER:

1. Advanced Resveratrol Formula

Dosage: 2 tablets, twice a day. One tablet = 150mg Red Grape (Vitis Vinifera) Seed; 150mg Red Grape (Vitis Viifera) Skin; 100mg Red Wine (Viti Vinifera) Dried Extract; 100mg Japanese Knotweed (Polygorum Cuspidatum) Root; 500mg Citrus Bioflavanoid Complex; 25mg Quercetin.

Rationale: To help protect kidney. In vitro and animal studies with Resveratrol and Grapeseed extract (another ingredient) shows it is effective in killing tumors as a natural anti-angiogenesis agent.

SUTENT ALERT: This tends to inhibit CYP3A4, which would increase the Sutent concentration.

2. ArcticBlox - Maximum Strength EPA

Dosage: 2 Softgels twice a day. 2 Softgels = 1200 mg Omega-3 Fatty acids: EPA = 900mg; DHA = 200mg; Other = 100mg.

Rationale: To reduce inflammation and high C-reactive protein number. May also protect against hypertension since it tends to lower blood pressure. Maintain proper Omega-3 ratio.

3. Ayur-Boswellia Serrata (also known as Indian Frankincense)

Dosage: Four capsules twice a day, on empty stomach. One capsule = 200mg.

Rationale: To prevent inflammation. It is a powerful natural anti-inflammatory agent.

SUTENT ALERT: This tends to inhibit CYP3A4 based on lab studies, which would increase the Sutent concentration.

However, there is a better alternative to **Boswellia:**

Scutellaria (**Standardized Scut**):

Dosage: Three capsules twice daily with or without food. One capsule = 420mg.

4. Calcium Citrate Plus Magnesium

Dosage: One capsule once every other day. One capsule = 500mg Calcium Citrate/200mg Magnesium Aspartate.

Rationale: Essential for building up calcium in the blood/bones when taking XGEVA.

Note: Do NOT take Calcium Carbonate. Only Calcium Citrate, Ascorbate, or Hydroxyapatite can be metabolized in the gut.

5. Fiber Capsules

Dosage: Two capsules once a day in morning. One capsule = .52g Psyllium Husk.

Rationale: To insure a minimum amount of soluble fiber is always in my digestive system.

6. L-Glutamine

Dosage: 20-30 grams daily in liquid (2-3 scoops mixed in water twice a day). One scoop = 4.1 grams.

Rationale: Well known for its digestive and gastrointestinal support. Reduces the side effects of harsh chemo treatments. Combats loss of taste, mouth soreness, and any gastrointestinal distress while taking Sutent.

ALERT: Only take L-Glutamine IF gastrointestinal side effects cannot be managed.

7. Melatonin P.R. (Prolonged Release)

Dosage: 7-3mg/pills orally at night - slowly work up to a **goal of 21mg/dose** (7 pills).

Rationale: A few different studies in vivo show cancer benefit at a dose more along the lines of 20mg or 30mg orally. It works during the nighttime hours.

SUTENT ALERT: This tends to inhibit the CYP1A1 enzyme, which might increase the Sutent concentration to a minor extent. This also has an anticoagulant effect.

8. Milk Thistle

Dosage: Two capsules twice a day.

Rationale: This is for liver health. This is an herb native to the Mediterranean that has been used for centuries to support liver function.

SUTENT ALERT: There are a lot of contradictory lab data on this and no effect was found in human studies. In any case it inhibits the CYP 3A4 enzyme and would tend to increase Sutent levels.

9. Myco Essentials - proprietary blend of Mushroom Extracts

Dosage: Two capsules twice a day.

Rationale: To help boost the Immune system. This is a potent blend of 6 medicinal Mushroom extracts that work synergistically to activate and support the immune system. Can also provide critical support during chemo and radiation therapy while guarding against treatment induced side effects. These multiple mushroom extracts also tend to have mild blood-thinning effects.

10. N-Acetyl Cysteine (NAC) II

Dosage: One capsule twice a day. One capsule = 500mg.

Rationale: To help protect the kidney. Powerful anti-oxidant. Biologically active precursor for the amino acid cysteine which, in turn, is a precursor for Glutathione, a tripeptide with antioxidant properties.

11. Nattokinase II

Dosage: Three caplets twice a day. One capsule = 50mg.

Rationale: Protects against blood clots. This is an enzyme isolated from Natto, a traditional Japanese fermented Soy product. It supports heart health and promotes healthy circulation. It regulates Blood Pressure. It is also a fibrinolytic enzyme that decreases platelet aggregation. It is favored over Bromelain.

12. Phytosome Turmeric - Liposomal Curcumin

Dosage: 2 capsules twice a day. One capsule = 500mg Meriva Turmeric Phytosome (Curcuma Longa Rhizome/Glycine Max Soybeans).

Rationale: To reduce inflammation. Also decreases chemo side effects and potentiates it. Turmeric is recognized as the single most potent anti-inflammatory and anti-cancer spice commonly available.

SUTENT ALERT: No effect in human studies but animal studies show it tends to inhibit CYP450 3A4 on humans, which would increase the Sutent concentration and also tends to inhibit P-Glycoprotein.

13. Ubiquinol

Dosage: 1 capsule once a day. One capsule = 200mg Ubiquinol.

Rationale: Helps to protect the heart. There are nearly 40 anecdotes historically of coenzyme Q10 - CoQ10 (Ubiquinone) remitting or improving cancer. Ubiquinol (CoQH) is the active form of CoQ10. Everyone is deficient in this.

14. Vitamin C – Solaray Two-Stage, Timed Release (Solaray slr4451)

Dosage: 1 capsule twice a day. One capsule = 1000mg.

Rationale: Intravenous Vitamin C has studies that show some benefit. Liposomal C cannot reach those blood levels though. However, anecdotally, this stuff is vitamin C on steroids.

SUTENT ALERT: It is possible that there may be a mild increase in CYP 3A4 in males based on human studies. The Sutent drug information sheet suggests avoiding strong inducers of CYP 3A4, which this is not. However, may be worth avoiding for now or only while during a Sutent break.

15. Vitamin D3 + Vitamin K2 - Liposomal

Dosage: 2000 units (2 sprays) twice a day. Hold liquid under tongue for 30 seconds. One spray = 1000IU Vitamin D3; 100mcg Vitamin K-2.

Rationale: Essential when taking Xgeva to maintain source of Calcium in bloodstream. Many studies correlate higher vitamin D with less cancer incidence and better prognosis. A study showed that cancer patients are like 15% less likely to die in the "bright" 6 months of the year rather than the other 6 months. This suggests that sunlight improves outcomes. A map of cancer incidence in the US shows that it goes down the closer you get to the equator, also indicating that sunlight helps.

SUTENT ALERT: There is a very unreliable suggestion that higher Vitamin D levels (above 40) may lower concentrations of drugs metabolized by CYP 3A4. The effect is very mild, about 10%, but perhaps it would be worth letting Vitamin D levels drop to between 30 and 40 rather than staying up above 50.

16. Ultra-Lipoic Forte

Dosage: 2 capsules twice a day. One capsule = Alpha-Lipoic Acid 1,000mg.

Rationale: Helps protect kidney. This is a non-vitamin coenzyme that carries out important metabolic and antioxidant functions in the body. Plays an important role in blood glucose disposal. It also scavenges a number of free radicals and helps the body regenerate Glutathione. However, it has been found to inhibit CYP3A4 enzyme and thus it may interfere with action of Sutent.

SUTENT ALERT: This inhibits NADPH – Cytochrome P450 Reductase. This enzyme supplies the electrons (energy) for CYP 450 reactions. If there are not enough electrons the CYP enzymes will not be able to act and thus will be inhibited. When they are inhibited they will tend to make the Sutent concentration increase.

XIII. APPENDIX B - ABRIDGED DIETARY GUIDELINES:

The foods to avoid:

1. No sugar(s) or sugar substitutes such as aspartame. Small amounts of stevia or agave are acceptable.
2. No sodas, fruit juices, or sweetened beverages with added sugar or HFCS.
3. Limit meat to only once a week. Beef; lamb; pork; chicken only from pasture grass-fed sources. But do have (preferably cold-water or small) fish and seafood at least 3 or 4 times a week.
4. Limit eggs to only once a week. Eggs from cage-free chickens feed with organic, hormone and antibiotic free feed.
5. Limit dairy or dairy products such as: Milk; Cheese; Yogurt; Butter; Sour Cream; Cottage Cheese; sauces with butter. (i.e. avoid all sources of casein).
6. Limit products made from other farm animals (goat or buffalo cheese/yogurt/etc.)
7. No trans-fats: hydrogenated oils such as found in Margarine, Wesson, Crisco, Non-Dairy Creamers, Cake Mixes, Ramen Noodles, Soup Cups, Twinkies, many "energy" bars, etc. Essentially no packaged baked goods.
8. No processed foods or meats (i.e. bologna, salami, sausage, bacon, etc.)
9. No foods made with chemical preservatives.
10. No foods with their fiber reduced or totally removed.
11. Avoid vegetable oils such as Canola, Corn, Sunflower, Safflower, Soybean, and other low burn-point oils. Cook in coconut oil or butter.
12. No fried foods.
13. Do not excessively heat or cook in olive oil. Use cold pressed, unrefined (extra virgin) olive oil on salads, etc.
14. Limit alcohol (no more than the equivalent of 2 glasses of wine – only with food).
15. No refined or processed carbohydrates such as found in packaged goods: crackers, cereals, potato (or other) chips, etc.
16. Limit white potatoes (but red or sweet potatoes are OK).
17. No white (flour) breads, pastas, etc. But real whole grain products such as Ezekiel 4:9 breads are fine.
18. No white or "Minute" rice.
19. No Tofu that is made with casein protein (i.e. from milk).
20. Limit citrus fruits (but lemons and limes are OK).
21. Limit pickled foods.
22. Limit cured, salted, or smoked foods.
23. Green tea should be consumed 4 hours before or after **taking Sutent**.
24. No grapefruit or grapefruit juice **while taking Sutent**.
25. No Seville oranges or products made from them **while taking Sutent**.

The foods to have lots of:

1. Pure clean water.
2. Organically grown veggies: Spinach, Celery, Carrots, Beets, Squash, Swiss Chard, Brussel Sprouts, Kale, etc.
3. Raw nuts: Walnuts, Almonds, Pecans. Nothing roasted. Keep nuts refrigerated and in the dark after opening their containers. Go easy on cashews.
4. Berries and cherries (eat all fruits on empty stomach if possible)
5. Avocado.

6. Fresh mushrooms, especially Shiitake, Maitake, and Reishi. [But note that their anti-cancer fighting compounds may not be fully metabolized].
7. Fish – the smaller the better (i.e. sardines, anchovies, mackerel) – but not farm raised; Cold water fish preferred.
8. Dried beans (canned beans not recommended due to additional of salt, preservatives, and BPA lining)
9. Pomegranate Juice.
10. Quinoa.
11. Humus.
12. Boil, bake, or steam foods; eating raw is the best.
13. Cocoa flavanols – as in dark chocolate at least 60% cocoa (2 squares max. per day)
14. Turmeric spice.
15. Garlic.
16. Green tea (2-3 cups) must be consumed 4 hours before or after **taking Sutent**.

The foods to go easy on:

1. Soy or soy containing products.
2. Bread made from Buckwheat, Almond flour, Barley flour, Millet, Sour Dough, Sorghum, etc.

Non-food items:

1. Daily exercise. At least 60 minutes brisk walking per day
2. Daily sunbathing to stimulate the natural production of Vitamin D internally. 10 or 15 minutes during middle of the day with some exposed skin. Skin should turn just barely pink.

XIV. APPENDIX C - SUPPLEMENTS THAT I NO LONGER USE:

1. Astaxanthin

Dosage: One capsule, twice a day. One capsule = 4mg Astaxanthin.

This powerful antioxidant's (it is Vitamin E) effect on Sutent metabolism is unknown.

2. Apigenin

This is made from Grapefruit, which has been found to inhibit CYP 3A4 enzyme, and thus it may interfere with action of Sutent by elevating its level in the blood plasma.

3. Artemix

This supplement can raise liver enzymes. It is made from Wormwood and will turn urine a dark color. It is not proven to be safe to consume.

4. Astragalus

Dosage: One capsule twice a day. One capsule = 500mg Astragalus Extract.

SUTENT ALERT: This tends to increase CYP3A4 which will decrease the Sutent concentration. This is based on lab studies only and not human studies. I take this one only during a Sutent break.

5. Colostrum-LD

Known to help boost the production of NK (Natural Killer) cells, but is made from milk proteins.

6. Iodoral.

High Potency Iodine/Potassium Iodide may interfere with normal Thyroid function.

7. Lumbrokinase

This is a family of fibrolynitic enzymes derived from worms. It is used to destroy fibrin in the blood and prevent excess clotting. In vitro, fibrolynitic enzymes potentiate treatment. There are other fibrolynitic enzymes such as Bromelain or Nattokinase. Some feel that Lumbrokinase is the strongest acting.

8. Magnesium oil

Most people are deficient in Magnesium but it is not recommended for anyone suffering from Kidney Disease. Should be used sparingly, if at all. It may also interfere with the efficacy of Xgeva.

9. Organic Life Vitamins

Block Integrative Cancer Center suggested my stopping this due to high Vitamin E and B6 levels.

10. Quercetin-C - Liposomal

Laboratory rats developed advanced Kidney cancer tumors when given Quercetin.

SUTENT ALERT: In animal studies only it inhibits the CYP3A4 enzyme and would tend to increase drug levels. It also inhibits P-Glycoprotein, which would tend to increase Sutent levels in tumor cells.

11. TBL-12 - Sea Cucumber/Sargassum/Sea Sponge/Shark Fin/Sea Urchin

This extract acts as a natural anti-angiogenesis agent with broader targets than in Sutent. It has just received approval from the FDA as an "orphan drug" for treating Multiple Myeloma.

Reason for stopping: It is extremely expensive **and it** remains unknown as to how it is metabolized.