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**The Metabolic Approach to Healing Cancer**

I have been working on a new cancer therapy based on sparking up the oxidative metabolism in cancer cells – this is described in pages 179-185 of my book 3rd edition (pages 142-146 of the new PDF) if you are interested in the background story. Despite the many differences between the various types of cancer, they have certain fundamental similarities:

* Cells are growing too fast, out of control.
* These cells have genetic mutations – usually dozens of distinct mutations that promote growth and suppress normal metabolism and function.
* They do not stop growing when they bump into each other, they continue to grow and crowd each other.(loss of contact inhibition).
* The blood vessels in the tumours are laid in fast and not remodeled, making them very leaky.

As a result, at or before the time tumours are diagnosed, they are highly pressurized. Blood vessels get squashed, and pockets of low oxygen develop (hypoxia). If the oxygen drops to zero all human cells die, but cancer cells adapt to very low oxygen levels. The little combustion chambers in human cells that burn fuel with oxygen to make energy, start to malfunction. These mitochondria then lose control over a critical control system that makes cells check for genetic damage and mutations before they are allowed to double. If a cell is found to be highly damaged, by aging, or any reason, the bad cell is supposed to recycle itself, and not double into two bad cells (apoptosis or programmed cell death). Cell recycling causes a stem cell to awake from dormancy and replace the recycled cell. Every cell in our bodies have been replaced many times by this safety system. Loss of apoptosis means the cancer cells cannot shut off, and can become more and more mutated over time. No longer based on a stem cell replacement model (asymmetrical mitosis), each cancer cell is now able to double, and double again (embryo-like symmetrical mitosis). Masses of relatively unspecialized (undifferentiated) cells accumulate, become more and more focused on growth alone.

As the mitochondria lose oxygen they also switch from oxygen burning to fermentation reactions that do not need oxygen. This anaerobic glycolysis starts to generate masses of building materials needed to make cells. As the supply of carbon skeletons, fats, proteins and precursors of DNA and RNA ramps up, so does the growth rate of the cancer. With abundant cell materials, the cancer cells achieve an exponential growth rate. Lucking into this new paradigm, they lock the mitochondria into fermentation, closing critical membrane pores with a unique chemical called hexokinase II.

In addition, the fermentation reactions generate a lot of acid as a waste product. Human cells, even cancer cells, do not tolerate acid well. They send out distress signals and immune cells start to rescue them and move them to safe havens. Immune cells try to help our cells when sick or injured. Invasion and metastasis, the most malignant properties of cancer, are based on immune cells trying to help them escape a sick and toxic environment of low oxygen and high acid. They end up escorting and helping them to colonize elsewhere. The rate of growth and spread of any cancer has a direct, linear relationship with the loss of and damage to its mitochondria.

The DCA study in Alberta 10 years ago showed we could spark up oxygen metabolism in cancer cells, and re-open the pores that let the chemicals (caspases) out which cause mutated cells to recycle. We can shut off these mutant zombie cells, cut off the supplies for new cell growth, and stop the spread of the cancer in the body, all by a non-toxic *healing* of the cancer cell metabolism.

My research showed R-alpha lipoic acid, vitamin B1 (thiamine) was a much safer and more effective way to achieve what DCA does, I have also found other mitochondrial supports to augment this effect. I have had some success with it. Docs are seeing results with previous versions of this formula in some tough cancers. Recently I got a group of doctors and PhDs to review and refine the formula, and got Health Canada approval for **Mito-SAP**, a professional product made by NFH – Nutritional Fundamentals for Health. The dose is **2 capsules 3 times daily at meals**. A pared down version would be AOR brand **R-alpha lipoic acid** 300 mg and vitamin B1 – **thiamine** 100 mg or more, twice daily at meals. AOR Benfotiamine is an excellent water soluble form of thiamine which I dose at 2 of 80 mg capsules twice daily at meals. .

An elusive target in cancer metabolism is **Hexokinase II.** Normal cells make hexokinase I, but cancers make this other version, which locks them into burning fuel without oxygen. . So hexokinase II is something of a “magic bullet” target – you can wreck cancer cells by inhibiting it, but no harm will come to normal cells. Frankly, it’s a bit of Holy Grail in cancer research. In my previous book I listed *Garcinia* hydroxycitrate as a remedy found to inhibit Hex-II – but unfortunately it didn’t do much in humans. I continued to search and recently found research papers saying the herb **Solomon’s seal (*Polygonatum spp*)** inhibited Hex-II – and it is a joy to see that it really works. Research supports *P. odoratum*, *P. multiflorum*, and *P. cyrtonema* species.

**I** **prescribe 60% solomon’s seal tincture with 20% each yew and periwinkle,** **take ½ tsp twice daily in juice or water** – eg shake well, put 1 kitchen measuring tsp in liquid, drink half in the am and half in the pm. While nausea is theoretically possible, it has been very well tolerated and almost every cancer patient so far has responded immediately and strongly. Some cases take a month or two to improve. The yew and periwinkle are restricted herbs. Yew (*Taxus brevifolia*) is the source of the taxane family chemo drugs such as Docetaxol and Paclitaxel. It can cause nausea. Periwinkle flower (*Catharanthus rosea or Vinca rosea*) is added as an anti-inflammatory. It can lower blood sugar. It is not suitable for brain cancers. I am seeing consistent results in many different cancers. I do not expect everyone will tolerate it, nor do I expect it will it cure all cancers – but at this point it looks like a significant breakthrough. It is the best thing I have found in many years of practice, scholarship and research.

We can add a prescription for **Metformin** or berberine, and IV alpha lipoic acid and dichloroacetate, or **nebulize D-ALA and DCA** at home, if the situation is dire and requires aggressive care.