A Deeper Look into the Science of Alternative Cancer Treatments

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In the September 2013 publication of the ACAM Voice newsletter, we wrote about the Seven Key Principles of Cancer Therapy and how they are intricately connected together in the article entitled "Alternative Cancer Treatments and the Rubik's Cube". The importance of alternative treatments as applied to chronic diseases, including cancer, cannot be over-stressed. This paper shares some of our insight into the scientific basis of these treatment paradigms, illustrated by one of our mainstay treatments, Sono-Photo Dynamic Therapy.

It should be noted that some of this material was recently shared at the Workshop on Integrative Oncology at the ACAM "Discovery of the Desert" Fall Conference in November 2013.

Misconceptions About Complementary and Alternative Medicine (CAM)

Most people, and an astonishingly large number of medical professionals, have a nebulous concept of what alternative medicine is all about. Part of that comes from the various existing approaches to alternative medicine. In some developed countries, Germany being a great example, complementary and alternative medicine (CAM) is very well accepted. In Germany, over 75% of conventional medicine physicians prescribe CAM, while more than 2/3rds of patients report using different forms on non-conventional therapies. With over 13,000 CAM practitioners and several organizations, CAM in Germany represents a well-organized health sector that recognizes the value such medicine to patients suffering from different types of chronic disease.

This is not true for other countries. In countries where CAM is not well organized, such as the United States, the concept is often considered too good to be true, incompatible with conventional medicine, ineffective, unscientific and worse.

Especially when it relates to cancer, many patients get attracted to CAM, concerned with the possible side effects and lack of efficacy of conventional methods. But simultaneously, they voice concerns about CAM as an effective approach, a thought that is abetted by a conventional world of medicine that heavily promotes a one-sided approach to cancer therapy through media and authoritative medical professionals. Doing what is best for our patients should really be the guiding principle of *all* medicine, and we hope that someday the integration of conventional and complementary approaches to cancer will usher a new world of hope for cancer patients looking for the ultimate solution to their malady.

Cancer: Multiple Mechanisms of Action and Evasion

Cancer holds a special place in the list of diseases that ail people. For sci-fi movie buffs, cancer is a lot like the aliens in the "Alien" franchise of movies – these parasitic creatures always find ways to evade and survive, ultimately resulting in the destruction of their host. Cancer is a constantly moving target, and is difficult to classify as a single disease.

Cancer affects the whole body – even in its initial stages as a localized tumor, it has repercussions throughout the body. In fact, we prefer view this concept in reverse: we consider cancer as a systemic change in the whole body environment (also called the *cancer terrain*), which causes cancer to find its roots in the first place.

It is therefore fitting that a whole body disease needs to be treated taking the whole body into consideration. Stabilizing the disturbed hemostasis is not secondary to cancer treatment – it is primary. That is why we focus on not just treating the symptom, but also the inducing factors that cause the symptom in the first place.

Consider the various mechanisms that are a hallmark of cancer:

1. **Self-sufficiency in growth signals** that result in sustained growth and multiplication of cancer cells.
2. **Insensitivity to anti-growth signals**, the biochemical messengers that attempt to maintain balance in cell populations.
3. **Evasion of programmed cell death**, a process that in the normal body ensures the death of old cells and replacements with viable healthy cells. This preserves cancer cells well past their appointed expiry date.
4. **Tissue invasion and metastasis,** a hallmark of cancer cells that results in their ability to adversely impact both nearby tissue and organs as well as distant ones.
5. **Limitless replicative potential** separates cancer cells from healthy cells. Cancer cells can multiply endlessly, making them extremely dangerous to the rest of the body fighting for space, nutrition and structural integrity.
6. **Sustained angiogenesis** that ensures nutrition for cancer cells through their independent network of constantly forming blood vessels.
7. **Capacity to escape immune control** wherein the body's guardians are rendered helpless against the invading enemy either through suppression or evasion.

Each of these mechanisms involves multiple biochemical pathways. Pharmaceutical companies create drugs that are tested in their ability to block specific mechanistic pathways. For example, mitotic inhibitors block cell replication, kinase inhibitors block different signal pathways used by cancer cells to control function and growth, hormone therapy blocks specific hormones or their ability to interact with cancer cells that get triggered by them and so on.

The three main issues here are: first, cancer always finds a way around the blocked pathway; second, the chemotherapy bears its own burden of toxicity with numerous side effects; third, the presence of cancer stem cells is ignored: these are dormant seed cells that have all the genetic information and cellular viability to recreate entire tumors, resistant to the chemotherapy insult.

A whole body approach instead looks at the various factors that affect the viability of cancer, while addressing the underlying causes in their entirety. The ability to tackle the various dimensions of cancer that closely interplay with each other is what makes alternative cancer therapies unique in their ability to affect the disease.

The Seven Key Principles of Cancer Therapy

In our recently published paper, entitled "The Seven Key Principles of Cancer Therapy: Alternative Approaches to Disease Resolution"[1] we discuss seven key principles that have formed the bedrock of our approach to the treatment of cancer using non-toxic methods over the past 25 years. These are:

1. Non-Toxic Cytolytic and Cytostatic Therapies
2. Enhance & Optimize the Immune System
3. Full Spectrum Nutrition
4. Detoxification (Heavy Metals & Toxins)
5. Eliminate Microbes & Pathogens
6. Oxygenation
7. Spiritual & Emotional Integrity

Our therapies are designed to be safe to normal cells and will not harm vital, healthy organs. Patients do not report experiencing the side effects that are common to chemotherapy and radiation, and enjoy better quality of lives during and after treatment.

When deciding on a therapy to implement at the Hope4Cancer Institute we look for a good balance between a strong science-based foundation and well-established track record in holistic medicine. While we have many treatments that we offer that fall within these principles, we will focus here on describing one of our key treatments*: Sono-Photo Dynamic Therapy.*

The Principles of Sono-Photo Dynamic Therapy

Sono-Photo Dynamic Therapy (SPDT) is really a combination of two individual therapies: Photodynamic Therapy (PDT) and Sonodynamic Therapy (SDT). Both these therapeutic methods have been extensively discussed in the scientific

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[1] Jimenez, A.; Chakravarty, S. (2012) The seven key principles of cancer therapy: alternative approaches to disease resolution. *Forum on Immunopathological Diseases and Therapeutics,* 3*:*281-308.

literature and have a strong scientific basis. However, the combination of these therapies into a non-toxic modality and integration with other natural treatment methods have allowed us to accomplish results with this therapy have not been witnessed elsewhere.

In essence, our implementation of SPDT accomplishes the desired results from chemotherapy or radiation, without adding toxicity into the body, even as we balance the hemostatic needs of the body using the other principles outlined above.

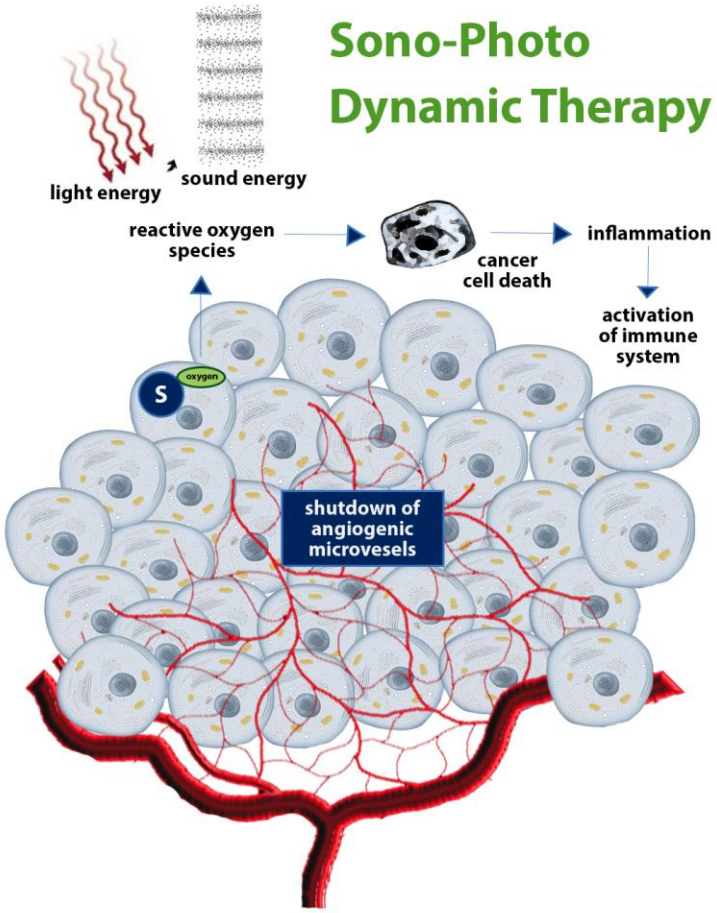

Figure 1. The mechanism of Sono-Photo Dynamic Therapy (SPDT).

Figure 1 illustrates the mechanism of Sono-Photo Dynamic Therapy (SPDT). SPDT has the following requirements:

1. A Sensitizer. A sensitizer is a molecule that gets preferentially absorbed into cancer cells. When subjected to specific wavelengths of light and sound, the electrons in the sensitizer molecule get stimulated to an "excited" energy level causing the desired biological effect described below.

2. A Sound and Light Source. The range of wavelengths of sound and light used are specific to the sensitizer – in other words, they need to be in the range where they can cause the activation of the sensitizer. While light, by nature, is not penetrative, sound can utilize the water in the body as a carrier to transmit its frequencies deep into the body. As a result, the combination of light and sound allows us to address tumors at various depths in the body. We have also worked to enhance our light technology. Our portable, pulsed LED light source is both easy to use as well as many times more penetrative than a regular light source of the same wavelength.

3. Molecular Oxygen. Using methods such as ozone therapy, oxygen supplements, hyperbaric chambers and direct administration of oxygen, we strive to improve the cellular concentrations of oxygen, a necessary component for the generation of reactive oxygen species explained below.

How SPDT Works: The excited sensitizer stimulates the formation of reactive oxygen species (ROS) from molecular oxygen present in the cell. The impact of ROS on cancer cells is very well documented in the literature.[2] The ROS lead the cancer cell to its death by severely increasing the levels of oxidative stress, causing genetic and cell membrane damage. The death of the cancer cells activates the immune system that responds to the call to clean up the debris and attacking the remaining malignant cells that are finally recognized as invaders. SPDT also blocks the formation of new blood vessels (angiogenesis), the crucial conduit for cancer cell nutrition. All these pathways are described and documented extensively in the scientific literature.

Our goal here is not to thoroughly review the science of SPDT, but to provide some examples of what is already known about these therapies:

The progress of PDT applications has been reviewed extensively.[3,4] According to the Roswell Park Cancer Institute, PDT using the drug Photofrin® (porfimer sodium) has been approved for various applications worldwide (in Canada, bladder and esophageal cancer; in The Netherlands, lung and esophageal cancer; in Japan, early lung cancer; in France, early and late stage lung cancer; in Germany, early lung cancer). Photofrin®-PDT has been approved by the U.S. Food & Drug Administration for the palliative treatment of advanced esophageal cancer, Barrett's esophagus with high grade dysplasia, advanced lung cancer (obstruction tumors

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[2] Schumacker, P.T. (2006) Reactive oxygen species in cancer cells: Live by the sword, die by the sword. *Cancer Cell* 10: 175-176.
[3] Huang, Z. (2005) A review of progress in clinical photodynamic therapy. *Technol. Cancer Res. Treat.* 4:283-293.
[4] Dolmans, D.E.J.G.J.; Fukumura, D.; Jain, R. (2003) Photodynamic therapy for cancer. *Nature Reviews Cancer* 3: 380-387.

located in the airway), and the treatment of early stage lung cancer (located in the airway) with curative intent.

Researchers have established that photodynamic therapy (PDT) generates a long-term, anti-tumor immune response elicited by phototoxic damage with an intermediate inflammatory stimulus.[5,6] The scientific basis for the anti-angiogenic effect of PDT is detailed by researchers who have shown that microvascular collapse is readily observed following PDT, and can lead to persistent post-PDT tumor hypoxia.[7]

While not as extensively investigated as PDT, Sonodynamic Therapy (SDT) also has sufficient precedent as a powerful anti-cancer therapy in the scientific literature. In a recent review, the authors describe the various potential mechanisms of SDT that could range from chain peroxidation of membrane lipids, the physical destabilization of the cell membrane, ultrasound induced free radicals and more.[8] Kuroki and co-authors have reviewed a number of sonosensitizers that can be used for sonodynamic therapy in a recent mini-review.[9] Hundreds of other scientific studies have detailed the efficacy of SDT, which will be reviewed elsewhere in future publications.

Clinical Demonstration: The Effect of Sono-Photo Dynamic Therapy on Tumor Vascularity

For the many years during which we have implemented SPDT as one of our key treatment protocols, we have accumulating clinical experience that points towards the efficacy of the protocol as a powerful treatment modality for cancer patients.

In unpublished work, we have recently evaluated the effect of SPDT on tumor vascularity. Using High Resolution Color Doppler Ultrasound technology, we routinely monitor not just the tumor size for our patients, but also the degree of

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[5] Okunaka, T.; Kato, H.; Konaka, C.; Kawate, N.; Yamamoto, H.; Ikeda, N.; Hayata, Y.; Bonaminio, A.; Tolentino, M.; Eckhauser, M.L. (1991) Photodynamic therapy for multiple primary bronchogenic carcinoma. *Cancer* 68:253-258.

[6] Oleinick, N.L.; Agarwal, M.L.; Berger, N.A.; Cheng, M.-F.; Chatterjee, S.; He. J.; Kenney, M.E.; Larkin, H.E.; Mukhter, H.; Rihter. B.D.; Zaidi, S.I.A. Signal transduction and metabolic changes during tumor cell apoptosis following phthalocyanine-sensitized photodynamic therapy. SPIE Proceedings, Vol. 1881, 1993.

[7] Henderson, B.W.; Fingar V.H. (1989) Oxygen limitation of direct tumor cell kill during photodynamic treatment of a murine tumor model. *Photochemistry and Photobiology* 49: 299-304.

[8] Rosenthal, I.; Sostaric, J.Z. (2004) Sonodynamic therapy – a review of the synergistic effects drugs and ultrasound. *Ultrasonics Sonochemistry* 11:349-363.

[9] Kuroki, M.; Hachimene, K.; Abe, H.; Shibaguchi, H.; Kuroki, M.; Maekawaw, S.-I.; Yanagisawa, J.; Kinugasa, T.; Tanaka, T.; Yamashita, Y. (2007). Sonodynamic therapy of cancer using novel sonosensitizers. *Anticancer Research* 27:3673-3677.

blood flow in the tumor that correlates to the viability of the tumor. The use of this method is increasing rapidly in cancer patients (alongside the use of contrast-enhanced MRI) for the non-invasive but accurate prognosis, therapy monitoring or prediction of therapy success. This study was conducted entirely at Hope4Cancer Institute's Baja California clinic location.

A total of 50 randomly selected patients treated at Hope4Cancer between January 2012 and June 2013 were studied. Two treatment modalities, SPDT and the BX Protocol, were evaluated as independent treatments, or in a combined protocol. The cancer and gender distribution for the study is shown in Figure 2.

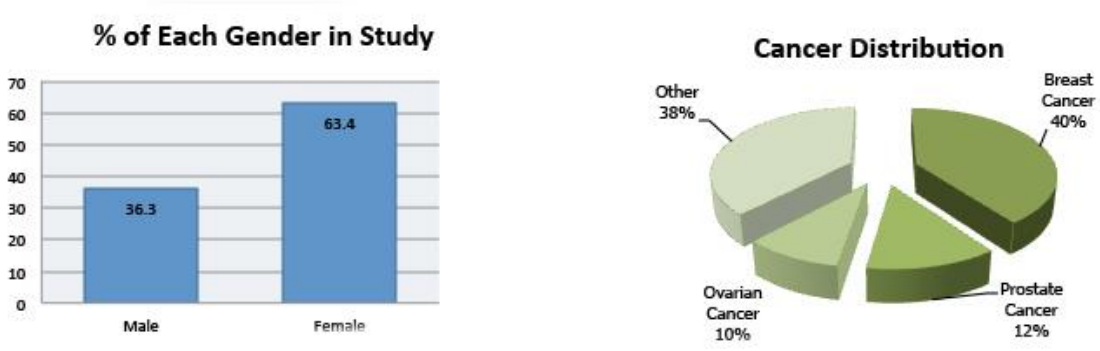
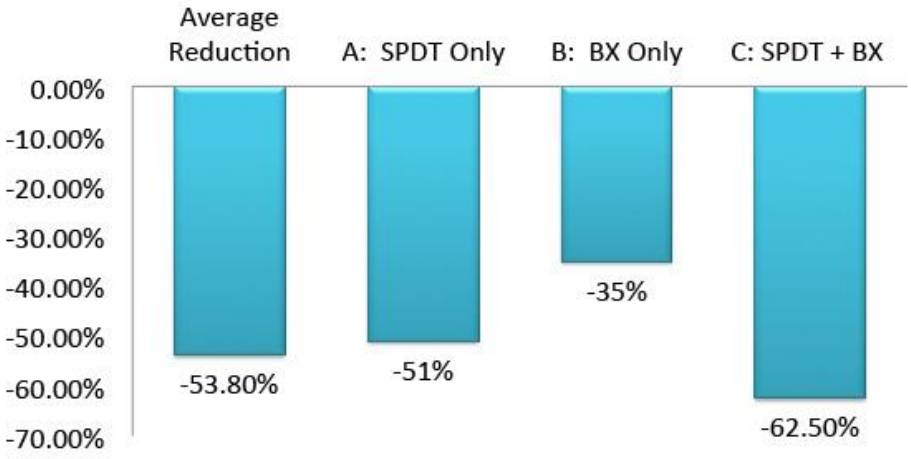


Figure 2. Gender and Cancer Distribution in Vascularity Study.

The patients were monitored once before and a second time at the end of their stay at the clinic (average of 2-3 weeks). The following chart (Figure 3) shows the drastic reduction in vascularity demonstrating, in particular, the powerful effect of SPDT (Figure 3) where the average reduction of vascularity was over 53.8%.



Conclusion

The integration of science-based treatments into traditional natural medicine enables us to provide powerful evidence-based treatment protocols to cancer patients without inducing negative toxicity-induced side effects. As alternative cancer treatments continue to improve, we can envision a world where cancer is treated effectively using combination protocols that take into account the diversity of stimuli that affect the growth and recurrence of cancer.

Dr. Antonio Jimenez, M.D. *is the Founder and Medical Director of the Hope4Cancer® Institute (established 2001) located in Baja California, Mexico. As a physician with 25 years of experience treating cancer and other chronic diseases with alternative, non-toxic methods, Dr. Jimenez is known internationally for his "Seven Key Principles for Cancer Therapy" and the clinical introduction of pioneering treatment methods such as Sono-Photo Dynamic Therapy and the BX Antitoxin Protocol. Dr. Jimenez has been an active member of ACAM in good standing since 2009.*