LIGHT MEDICINE

A New Paradigm — The Science of Light, Spirit, and Longevity

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Chapter 22
Alternative Cancer Treatments

In Part 1 of this book, I talked about my longstanding dream to help patients with cancer. That idealistic vision seemed lost to me for years. However, once I finally let go of my past and entered the grand adventure of a new practice based upon Light Medicine, I have been able to support my cancer patients with different modalities, some of which I outline in this chapter. Looking back at Ramtha's teaching from May 2018, he stated: "So many entities say, 'Well, my dreams never came true.' Truly? Perhaps the dreams are faded petals of another time rather than a future time that, without knowledge, one cannot perceive. A limited entity cannot perceive higher flows of consciousness. It is only when they are trained properly, which the forty-some years of the work was about. In preparing entities to understand more broadly their place as divine beings—and in that to be able to tap into the superconsciousness, even if it is in Fieldwork®, even if it is in C&E®, even if it is in any discipline that has been created to augment the knowledge into a performed experience—the experience gives rational truth. To that person it is only important—to that person, to that being—as they accept that ability that opens them up. And now these dreams, long ago, have a place in the future. How many of you understand that? Not all dreams have a place in this time but in future times that can be augmented, as it were—a new word that I learned—into now."

Just as Ramtha said, it took me new levels of knowledge and experience to realize my dream that so dearly wanted to help patients with cancer. I now know from my personal journey and the experience of my patients that the healing of cancer requires

a profound transformation on the spiritual, emotional, and physical levels of our being.

Most of us have known or lost someone dear to us who has suffered the painful decline from cancer. We have also known those who have conquered this terrible disease. What did they realize?

There are many theories about the causation of cancer. Mainstream medicine discusses genetic predisposition. However, we know that genes do not really determine how we express our destiny but that epigenetics, the influence of the environment, plays a much larger role. Into epigenetics we need to factor in the idea of mind as a principal causative factor. Understanding that we are beings of light, recurrent negative emotions—such as hate, anger, resentment, depression, self-loathing—cause a hostile environment in the body, a disharmony that breaks down the energetic functioning of the body. As we discussed earlier, photon emission in cancer patients was detected months prior to the diagnosis of physical cancer. The loss of biophotonic light with this subsequent molecular change was associated with cancer development.[1]

Traumatic and stressful situations can be precursors of incidences in which people manifest severe illness including cancer. Depression is known to be a risk factor for the development of breast cancer.[2] Carcinogens interfere with the photorepair effect in the body and lead to a scrambling of light.

The alteration of energy metabolism, and thus changes in the electrical properties of tumor cells, provides a target for a nontoxic, therapeutic approach, which focuses in restoration of high ATP production and antioxidant utilization for the purpose of electron donation and thereby restoration of biophotonic light of these cells.

We can induce cancer cell death with combination therapies that target different metabolic cancer pathways, for example, glycolysis inhibitors, inhibition of cholesterol pathways, angiogenesis inhibitors, hormonal modulation, mitosis inhibitors, pH modulators, antipathogenic medications,

immunotherapy, and more. Many of those compounds are electron donors and have high light value and as such are able to modulate gene pathways that inhibit cancer growth.

A Light Medicine model combination therapy includes nutritional supplementation and optimization, anti- and pro-oxidants, repurpose drugs, mindfulness techniques, and light therapy.

Many cancers have been shown to be related to infections by viruses and bacteria. The utilization of repurpose drugs—that target latent viral, bacterial, and fungal infections—is part of anticancer cocktails. Other repurpose drugs target the metabolism of cancer cells at multiple access points and thereby inhibit tumor growth and initiate cancer cell death. These drugs have been utilized for other indications and were then found to have anticancer properties. Commonly used drugs are aspirin, metformin, cimetidine, loratadine, melatonin, doxycycline, nonsteroidal anti-inflammatories and many more. It is of great interest that some of these repurpose drugs directly affect the pH in cancer cells. The more acidic the cell, the lower the transmembrane potential. By alkalinizing the environment of the cancer cells through hyperoxygenation, electron donation, and inhibiting the proton pump exchange, we are actively treating the electrical properties of the cell and restoring the transmembrane potential which will activate the appropriate genetic pathways that are related to autophagy and cancer cell death.

Dr. Otto Warburg, Nobel laureate in medicine, postulated that the respiratory process of malignant cells was impaired and that the transformation of a normal cell to malignant was due to defects in the aerobic respiratory pathways, which are directly responsible for the production of ATP energy units in the cell.[3,4]

Dr. Albert Szent-Györgyi, also a Nobel laureate in medicine, viewed cancer as originating from insufficient availability of oxygen. Oxygen has an inhibitory action on malignant cell proliferation by interfering with anaerobic respiration, which is fermentation and lactic acid production that

subsequently leads to extreme acidification of the surrounding environment to the cancer.

Cancer cells have a very efficient mechanism in which they pump out the acidic hydrogen protons into the environment while themselves maintaining a stable pH. Environmental tumor acidity is responsible for metastatic spread and cell invasion by degrading basement membrane and increasing expression of matrix metalloproteinases, as well as affecting immune cell function and drug resistance.[5]

The failure to maintain high ATP production and high cell energy levels may be a consequence of inactivation of key enzymes, especially those related to the Krebs cycle. Mitochondria, the powerhouse of the cell, may develop suboptimal function with reduced transmembrane potential. Mitochondrial dysfunction has been associated with the development of all chronic diseases and the development of cancer. The correction of mitochondrial function has been recognized as a nontoxic target for cancer therapy. ATP production can be increased by any form of energy—including light, sound, DC electrical current, and electron donation from molecules.

An increased glucose utilization rate has been observed in malignant cells. This allows repurpose drugs—like the blood sugar lowering agent metformin or the blood sugar lowering natural compound berberine—to decrease energy that is aiding the process of survival of the cancer cells. Optimum blood sugar control is important in integrative cancer treatment.

From a bioelectric perspective, it has been shown that a characteristic feature of cancer cells is having cell membrane potentials that are lower than the cell membrane potential of healthy adult cells.[6]

Bioelectric control of tumor growth and metastasis have been researched for decades. Bioelectric signaling has emerged as an important control of cell growth and its role in driving cell migration and metastases in a variety of cancer types. The role of ion channels, pumps, exchanger activity, and ion flux—along

with the importance of the membrane potential and the relationship between ion flux and membrane potential—is all correlated in explaining the electrical properties of the cell.[7]

Ion transport is implicated in these cell functions in many ways, from the classic mechanisms relating membrane potential to calcium homeostasis, to the control of pH, cell volume, growth factor release, and interaction with the extracellular matrix. In peptides and proteins, electrons and photons modulate the vibration of the chemical bonds. They thereby change the chemical molecular structure, which then in turn affects their functioning as enzymes and proteins in the cell.

Everything is controlled by electricity. Electron flux is synonymous with biophotonic emission because every time an electron changes state, a photon is being emitted. In the medical literature it is easy to lose context, as the information is so enormous and there are so many fields of research, but they are speaking about the same mechanism in many different ways.[8]

Simply stated, the lowering of ATP production equals the lowering of cellular electricity. This is the signal for the development of the genetic mutations that cause cancer. Therefore, the reversal of this energy deficit can be utilized in the treatment of cancer.

Metastases have been controlled by external electric fields, while tumor regression has been achieved by applying electrical fields. A study evaluating the effects of low-level direct current therapy on preclinical breast cancer showed a direct correlation between charge passed and absolute volume regression when the intratumor electrode was made either a positive or a negative charge. Tumor destruction for a given charge was significantly greater following anodic (positive) rather than cathodic (negative) charge treatment. During the course of these experiments, a highly reproducible toxic effect was discovered. A positive charge greater than 10.6 coulombs, or a negative charge greater than 21.6 coulombs, resulted in 100% cell mortality at 24-72 hours, while lower charges had no influence on cancer cell death.[9]

In an animal model with induced liver metastases, direct current was applied with one anode (positive charge) in the tumor center and four cathodes (negative charge) peripherally. After five weeks, the MRI showed a 1.6-fold tumor enlargement in the treatment group versus a 2.9-fold enlargement in the untreated control group, indicating a slower growth rate in tumors treated with direct current. The histopathologic analysis of the treated livers yielded a 21% complete response rate and a 78% partial response rate.[10]

Electrical currents have been shown to function as an antioxidant. Apart from utilizing them in cancer treatment, they also have profound effects in accelerating wound healing. Wound healing is significantly diminished in age, and studies have shown that applying an ultralow current device overcomes the restrictions of aging and produces healing.

We know about the aging and eventually cancer-producing effects of free radicals and the mechanism of antioxidants in neutralizing them. The steady flow of electrons in a relatively low concentration appears to act exactly as one would expect from any antioxidant.[11]

In understanding that decrease of electrical flow and decrease of photon density in the body via accelerated biophoton loss correlates with disease, we also need to understand that the immune system keeps the balance of harmony by suppressing the effects of latent pathogens in our body. When overall voltage in the cells is decreased, functioning is decreased in all cells and aging occurs, which also affects the immune system. This allows fungi, bacteria, and viruses that have previously been kept in check to multiply in the body. We have already discussed the correlation between chronic infections of pathogens and the incidence of disease and cancer progression.

It is known that environmental toxins bioaccumulate. This includes heavy metals like lead, cadmium, and arsenic, which in turn cause disruption in the ability of the body to function properly as represented in endocrine disruption, epigenetic changes, increased atherosclerosis leading to decreased blood

flow, and decreased synthesis of nutrients like nitric oxide. From a Light Medicine perspective, our body is acting like an antenna. Heavy metals interfere with the harmony of the bioelectrical field, thereby increasing sensitivity to pathogens and harmful electromagnetic frequencies.

Nutritional deficiencies, such as a lack of vitamins, are involved in increasing the risk of cancer. This occurs, for example, by exacerbating immune deficiency due to lack of vitamins C and D, which are both needed for numerous immune system functions. Harmful electromagnetic frequencies from cell phones, or radiation from CT scans and MRIs, have been implicated in elevated cancer risk. It is not that there is one cause but that there are cumulative causes. For a patient to heal from this disease, all levels—the physical, emotional, mental, and spiritual—need to be addressed.

Suppressed Cancer Cures

In his book, *The Enzyme Treatment of Cancer,* published in 1911, John Beard, a biologist from the University of Edinburgh, introduced the enzyme treatment of cancer. Dr. Beard noted that the trophoblast of the placenta is invasive and acts like cancer until week sixteen of the pregnancy. He postulated that the development of the pancreas and its subsequent production of the pancreatic enzymes trypsin and chymotrypsin inhibited the ongoing invasion of the placenta into the mother's body. He then utilized these digestive enzymes in an injectable form to successfully treat cancer.

Dr. Beard's approach was furthered by Dr. William Donald Kelley, a dentist, who treated cancer with a nutritional approach and pancreatic enzymes. He was also successful. Dr. Nicholas Gonzalez studied the results of Dr. Kelley and found remarkable evidence of cancer remissions, which inspired Dr. Gonzalez to continue the work on pancreatic enzymes for the treatment of cancer. Unfortunately, Dr. Gonzalez met an untimely death, but his work lives on in his books featuring

successful case reports of cancer remissions even in advanced stages.[12,13]

Dr. Max Gerson was a German physician who developed the Gerson nutritional approach to healing, which includes the juicing and consumption of large amounts of raw vegetables, as well as the body's detoxification through coffee enemas. He also achieved many cancer remissions.[14]

Dr. William Koch discovered a molecule in 1919, which he named glyoxylide. It cured cancer within days without harming normal cells. When this substance was injected subcutaneously, within twenty-four hours a focal reaction took place accompanied by fever. This reaction lasted anywhere from six to forty-eight hours during which the cancer completely disappeared. Stomach, liver, and rectal cancers responded the fastest. Dr. Koch was never given the research facilities and the cooperation of the medical profession that he asked for to investigate his molecule, so his solution was never pursued. In 2015, scientists were able to resynthesize the chemical structure O=C=C=O. The molecule was synthesized in the process of experimenting with glyoxal. Koch's molecule is now called ethylenedione.

In 1937, Dr. Albert Szent-Gyorgyi had also worked on methylglyoxal, which is chemically a keto aldehyde that showed significant anticancer effects.[15] A methylglyoxal-based anticancer formulation was developed, and a three-phase study of treating a total number of 86 cancer patients was carried out. Most of the cancer patients benefited greatly and a significant number became free of the disease. Contrary to the effect of existing anticancer drugs, this methylglyoxal-based formulation is devoid of any toxic effect and is reasonably effective against a wide variety of cancers.[16]

The addition of creatine showed to enhance the anticancer effect of methylglyoxal. This was researched at the Department of Biophysics in Kolkata, India. Methylglyoxal is not approved in the United States as an anticancer compound.[17]

Dr. Szent-Györgyi discussed that methylglyoxal stops the growth of cancer cells without poisoning normal cells. He also found two substances: one called retine, which inhibited cancer growth; and the other, protamine, which enhanced cancer growth. Retine is produced by the body and prevents the growth of existing cancer cells. However, the body can lose the ability to produce this substance.[18]

Dr. Stanislaw Burzynski, in the 1970s, developed antineoplastons for the treatment of cancer. He also had, like Dr. Szent-Györgyi, the idea that our body produces natural anticancer compounds. He found that patients who do not have cancer do have certain molecules in the body, that he named antineoplastons, that appear to have a protective effect. Antineoplaston AS2-1 inhibits the incorporation of L-glutamine into tumor cell proteins, leading to the cell cycle arrest in the G1 phase and inhibition of cell division. This agent may also inhibit the RAS oncogene expression (a family of retrovirus-associated DNA sequences that have been shown to cause human cancers) and activate tumor suppressor gene p53. This resulted in cell differentiation and cancer cell death.

Dr. Burzynski has been persecuted for forty years for his research. He isolated those molecules, gave them to cancer patients, and achieved remissions and cures in remarkably difficult-to-treat cancers, including childhood brain tumors. He published several hundred scientific journal articles regarding his findings.[19]

Dr. Harry M. Hoxsey was a former coal miner who in the 1920s was operating cancer clinics and curing tens of thousands of patients with an herbal formula that he had inherited from his father. By 1962, he had seventeen clinics, with one in every major city throughout the United States and was treating twelve thousand cases of cancer. By 1964, the controversy between the American Medical Association, Dr. Fishbein, and Dr. Hoxsey culminated in a landmark lawsuit resulting in Harry Hoxey's win by proving the herbal formulas were successful in treating many cancers. Immediately thereafter, the FDA padlocked all 17

clinics in operation, on account of using unapproved medicines. The clinic moved to Tijuana, Mexico, exemplifying another prominent case of the suppression of natural cancer treatments by the FDA and AMA.

In 1953, the Fitzgerald Report was commissioned by a United States Senate committee. It concluded that the organized medicine apparatus had "conspired" to suppress the Hoxsey therapy and many other promising cancer treatments, which included Mucorhicin, Coley's immunotherapy, and the Krebiozen formula. The proponents of these methods were respected doctors and scientists who had developed nutritional or immunological approaches. Panels of opposing surgeons and radiation therapists had dismissed the therapies as quackery. Consequently, these promising treatments were banned without a serious investigation.[20]

The Hoxsey formula contains natural substances with high antioxidant value, including red clover, licorice, burdock, prickly ash, and others.

The Canadian nurse, Rene Caisse, utilized essiac tea, that treated and cured cancer in the 1920s. She was shut down by the authorities. Her tea contained antioxidant herbs like burdock root, slippery elm bark, sheep sorrel leaves, and Indian rhubarb root.[21] Both the Hoxsey formula and essiac tea contain herbal compounds with great antioxidant and electron donor capacity, indicating high light value.

There are many more such cases of natural cancer treatments which were effective, and because of that, all were labeled as quackery. The suppression of the FDA, AMA, and Rockefeller puppet masters, who have perpetrated great suffering upon humanity by withholding natural cures, goes way beyond what is discussed here. This kind of suppression continues to this day in all areas of medicine, as has been so overtly visible with the suppression of the effective treatment hydroxychloroquine for COVID-19.

Combination Therapies

Many common, natural compounds have been shown to have anticancer properties. For example, berberine is a natural compound that has been shown to inhibit the proliferation and reproduction of certain microorganisms and viruses that can cause cancer, like helicobacter pylori and hepatitis B virus. Berberine was found to regulate certain oncogenes as well as cancer-related gene expression. Berberine is an enzyme inhibitor and it can also regulate reactive oxygen species, which are part of the causation of aging. Mitochondrial transmembrane potential is positively affected. Berberine exhibits suppression of tumor growth metastases.[22] Berberine has also been shown to reduce blood sugar levels in diabetics. Taking 500 mg two to three times daily for up to three months might control blood sugar as effectively as metformin or rosiglitazone.[23] As cancers have been shown to have high glucose utilization, lowering blood sugar is an important mechanism to treat cancer.

Curcumin, derived from turmeric, is well known for its anti-inflammatory and antioxidant activity. The two isomers of curcumin react by hydrogen atom transfer mechanism and by electron transfer.[24] Curcumin is a medicinal agent that exhibits anticancer properties and has a huge, therapeutic value. We propose in our Light Medicine model that the fact that curcumin is such a strong donor of hydrogen atoms as well as electrons, this is what regulates anticancer gene expression and molecular reactions.

Curcumin has been found to possess anticancer activities via its effect on a variety of biological pathways involved in mutagenesis, oncogene expression, cell cycle regulation, apoptosis, tumorigenesis, and metastasis. Curcumin has shown antiproliferative effect in multiple cancers and is an inhibitor of the transcription factor NF-κB (nuclear factor kappa-light-chain-enhancer of activated B cells) and downstream gene products, including c-Myc (family of regulator genes and proto-oncogenes that code for transcription factors), Bcl-2 (B-cell

lymphoma 2), COX-2 (cyclooxygenase-2), NOS (nitric oxide synthases), Cyclin D1, TNF-α (tumor necrosis factor alpha), interleukins, and MMP-9 (Matrix metallopeptidase 9). In addition, curcumin affects a variety of growth factor receptors and cell adhesion molecules involved in tumor growth, angiogenesis, and metastasis.[25] As such, our theory proposes that we can evaluate numerous natural biological substances and predict their anticancer property based on their electrical properties, electron donor status, and antioxidant ability.

Vitamins in Cancer Therapy

Vitamin C in humans must be ingested for survival, as we have a genetic defect that does not allow us to synthesize it out of glucose. Vitamin C is an electron donor. This property accounts for all its known functions and thereby is a potent water-soluble antioxidant in humans. Human diseases, such as atherosclerosis and cancer, might occur in part from oxidant damage to tissues; therefore vitamin C has a role in prevention and treatment of cancer.[26]

Linus Pauling, Ph.D., and Ewan Cameron, M.D., published many papers and books regarding the effectiveness of vitamin C treatment in cancer.[27] Vitamin C has long been attacked by the medical establishment, despite significant scientific evidence of its usefulness in cancer therapy. Two mechanisms of anticancer activity with ascorbate have gained prominence: hydrogen peroxide induced oxidative stress and DNA demethylation. Only ascorbic acid at pharmacologic concentrations from intravenous dosing—and that would not occur from oral dosing—acted as a prodrug for hydrogen peroxide (H_2O_2) formation. Pharmacologic ascorbic acid was selectively toxic to cancer cells while having no toxicity in healthy cells. In animal models, ascorbate has anticancer activity similar to conventional chemotherapy and has also been shown to synergize with it. Findings in mice suggest oral ascorbate delays cancer development.[28]

A 2015 study published in the journal *Science* showed that in KRAS (an oncogene) and BRAF gene mutation driven cancer cells, which is prevalent in more than half of human colorectal cancers, high-dose vitamin C treatment induces cell death. The colorectal cancer cells metabolize vitamin C in a different way than other cells. Because a certain receptor is upregulated in the cancer cells, they take up the oxidized form of vitamin C (dehydroascorbate). This leads to oxidative stress, inactivation of a glycolytic enzyme required by the cells for growth, and finally cancer cell death.[29]

Antioxidants have antitumor activity. This is in line with our theory of the loss of light and the loss of cellular electricity as indicated by changes in transmembrane potential and changes in ionic flux across the cell membrane. When this is repaired and ATP production in the cell is increased and free radical production via antioxidant properties decreased, we can prevent development of cancer and reverse cellular existing damage.

Other vitamins, like vitamin E, cause antitumor and antimetastatic effects in several animal models of cancer. For example, it suppresses the transcription factor NFkB (nuclear factor kappa beta) in prostate cell lines. NFκB regulates pro-apoptotic and pro-metastatic proteins, which induce cell death and metastatic spread; thus suppression of this gene results in antitumor effects.[30]

Higher intake of dietary folate and vitamin B has been associated with lower incidence of colorectal cancer in women. Recent work suggests that hypoxia-inducible factor 1α (HIF), which plays a key role in tumorigenesis by facilitating adaptation to hypoxia (low cellular oxygen levels), is diminished by microtubule inhibitors. Some antioxidants may exert their antitumor effects through reducing HIF rather than by reducing genetic instability.[31]

The Use of Repurpose Drugs

Repurpose drugs in cancer treatment is the use of medications that have been approved for other indications and have also been shown to have anticancer properties. Many antifungal, antibacterial, and antimalarial agents have proven to be helpful in the fight against cancer. When combined with high-dose nutrients and herbal supplements with high antioxidant value, they can contribute in the natural fight against this disease. A few examples will be given.

Chloroquine and Hydroxychloroquine

Chloroquine (CQ) and hydroxychloroquine (HCQ) are antimalarial drugs. Hydroxychloroquine is a drug that inhibits autophagy and affects lysosomes in cancer cells. Autophagy is a process with which normal cells devour those components that are dysfunctional. Cancer cells protect themselves during chemotherapeutic treatment by eating themselves to stay alive. Once cancer has formed, autophagy may protect the cancer cells by providing extra nutrients to them or by keeping anticancer drugs or other substances from destroying them.

Studies show that hydroxychloroquine elevates the lysosomal pH of cancer cells. Lysosomes play a critical role in cellular processes, for example, the ability to secrete proteins, in energy metabolism, and cell signaling. The autophagy-lysosome pathway is associated with the hallmarks of cancer, such as escaping cell death pathways, evading immune surveillance, and deregulating metabolism. Lysosomes represent a weakness of cancer cells and, when targeted, have great therapeutic potential in cancer because they trigger apoptotic and lysosomal cell death pathways and inhibit cell protective autophagy. Lysosomes are involved in cancer drug resistance by capturing cancer drugs in their acidic environment, resulting in a reduction of the drug's effects.

In lung cancer, hydroxychloroquine exerts anticancer effects by reversing the drug sequestration in lysosomes and enhancing the CD8+ T-cell immune response. These findings suggest that HCQ could act as a promising chemosensitizer and immune regulator.[32] Autophagy appears to inhibit malignant transformation, reflecting its capability to limit the accumulation of cancer inducing entities like dysfunctional mitochondria, which overproduce genotoxic reactive oxygen species. Autophagy supports the progression and metastatic dissemination of established tumors by increasing the ability of malignant cells to cope with adverse microenvironmental conditions like nutrient deprivation and hypoxia. These are two common features of rapidly growing, solid tumors.[33]

As an autophagy inhibitor, hydroxychloroquine has been combined with multiple chemotherapeutic agents that have been and are currently being evaluated in various clinical trials. This includes studies in lymphoma,[34] brain metastases,[35] as well as other advanced solid tumors.[36] Hydroxychloroquine has also been evaluated in prostate cancer and shown to increase chemosensitivity as well as inhibiting proliferation.[37] There are ongoing trials evaluating the use of the antifungal medication itraconazole in combination with hydroxychloroquine for prostate cancer. Both have anticancer properties. Antifungal medications have been utilized as effective repurpose cancer drugs.[38] Hydroxychloroquine's anticancer effectiveness makes it a great chemosensitizer.[39]

Triple negative breast cancer is known to be associated with a high percentage of cancer stem cells, which in turn results in a poor prognosis, despite systemic chemotherapy. This has been associated not just with poor prognosis but also recurrent metastatic disease. In a study with this breast cancer type and hydroxychloroquine, the drug was able to reduce cancer stem cells.[40] It has been shown in studies that chemotherapy increases the amount of cancer stem cells and thereby increases the risk of metastatic relapse.[41] Treating and eliminating cancer stem cells is an important component of any effective cancer

treatment, as we want to not only treat the cancer now but prevent later recurrence. Hydroxychloroquine additionally overcomes tamoxifen resistance in breast cancer.[42] Tamoxifen is a drug that blocks the effects of estrogen in the breast tissue and has been used as an adjuvant treatment after surgery and other chemotherapeutic treatments for breast cancer.

In summary, we extrapolate from this research that the addition of hydroxychloroquine to natural compounds with anticancer effects or repurpose drugs may increase their anticancer activity as well.

Fenbendazole, Artemisinin, and Salinomycin

Fenbendazole and its sister drug mebendazole are antiparasitic agents. They interfere with microtubulin and exert cytotoxicity to human cancer cells at micromolar concentrations. It joins the effective antimicrobial group of repurpose drugs in the fight against cancer. Fenbendazole caused mitochondrial translocation of p53, a tumor suppressor gene frequently mutated in cancers. It effectively inhibited glucose uptake, which is the primary energy source for cancer cells. Fenbendazole interferes with expression of GLUT (Glucose transporters) as well as hexokinase, which is a key glycolytic enzyme needed for energy utilization that most cancer cells thrive on.[43]

Fenbendazole has effects on multiple cellular pathways leading to effective elimination of cancer cells, and its activities are enhanced by using supplementary vitamins.[44]

Another antimalarial drug with significant anticancer properties is sweet wormwood or artemisinin. It has been shown to block prostate cancer growth.[45] Artemisinin disrupts the responsiveness of prostate cancer cells to androgens.[46] We know that estrogen is also a driving force in the growth of prostate cancer.[47] Artemisinin has been found to be a natural estrogen and progesterone receptor blocker and can be utilized in cancers that

have these hormone receptors, like breast cancer and prostate cancer.[48]

There are other repurpose drugs with significant anticancer effects, like salinomycin, which has been studied in a novel combination therapy for triple negative breast cancer.[49] Salinomycin is an antibiotic that has both antimicrobial and antifungal properties. Salinomycin can be effective in killing cancer stem cells.

Daniel Stanciu, Ph.D., is founder of the blog, Cancer Treatments – From Research to Application, a scientific research resource of cancer treatments from all over the world. Dr. Stanciu describes salinomycin as one of the most effective compounds for a wide variety of cancers. He has had contact with patients who have successfully used it worldwide.[50]

Daniel Stanciu has been my friend and colleague in cancer research. He has been an invaluable resource in the development of the most effective combination therapies for my cancer patients. His work and collaboration with worldwide, renowned cancer researchers has led to a wealth of accessible information. His site is giving resources to cancer patients about the numerous, possible treatment options that are available.

Salinomycin, says Dr. Stanciu, acts via multiple pathways in inhibiting tumor growth. It can overcome multidrug resistance and targets cancer stem cells. However, the compound does have side effects and potential toxicity, due to possible tumor lysis syndrome from rapid cancer cell death and needs to be carefully administered. Salinomycin is not authorized in the United States, but in other parts of the world it has shown promising effects in cancer treatments.

Salinomycin is another excellent example of a compound with antimicrobial and antifungal properties acting as an effective agent in cancer therapy. This again raises the question regarding the etiology of cancer and its association with chronic infections. Salinomycin has been studied in a wide variety of cancers where effects have been substantial.[51]

Salinomycin induces cancer cell death and effectively eliminates cancer stem cells to induce partial clinical regression of heavily pretreated and therapy resistant cancers. The rare ability of salinomycin to kill both stem cells and therapy resistant cancer cells defines it as an effective anticancer drug.[52,53]

Due to its multiple abilities of action, salinomycin has been described in the scientific literature as a new paradigm in cancer therapy.[54]

Amygdalin

Amygdalin, also called laetrile, is found in many plants but most notably in the seeds or kernels of apricots, bitter almonds, apples, peaches, and plums. Amygdalin is classified as a cyanogenic glycoside because each amygdalin molecule includes a nitrile group, which can be released as the toxic cyanide anion by the action of a beta-glucosidase. Laetrile is another anticancer compound that has been attacked with false, corrupt science.

The history of laetrile was outlined by G. Edward Griffin in the book *World Without Cancer*. The original senior researcher at Sloan Kettering, Dr. Kanematsu Sugiura—who was silenced—clearly showed that laetrile was more effective in the control of cancer than any substance he had ever tested. The drug was discredited due to a false claim that it would cause cyanide poisoning. The FDA then made it illegal for United States physicians to use laetrile. These lies by the FDA have since been debunked, and the research needs to be reevaluated by competent physicians who do not have biased intentions.

Recent reviews show that amygdalin causes cancer cell death, called apoptosis, by upregulating expression of pro-apoptotic proteins and downregulating expression of anti-apoptotic proteins. It also promotes arrest of cell cycle in G0/G1 phase and decreases the number of cells entering S and G2/M phases, thereby preventing the cancer cells from multiplying.[55]

In an Iranian study from 2019, amygdalin has been shown to have anticancer effects due to various gene expressions that induced cancer cell death.[56]

Amygdalin has anticancer function by decomposing carcinogenic substances in the body, killing cancer cells, blocking nutrient source of tumor cells, inhibiting cancer cell growth, and could also reduce the incidence of prostate, lung, colon, and rectal cancers. It has been manufactured and used to treat cancer in America, Germany, Italy, Japan, the Philippines, and twenty other countries. It can also ameliorate the symptoms of patients in advanced stage of cancer and prolong their survival period.[57]

Peptides Used to Support Cancer Patients

We have discussed in a previous chapter the vast applications of peptides as novel agents for healing. Some peptides can be used to support cancer patients.

Thymosin alpha one (TA1) is a thymus peptide that modulates the immune system by augmenting T-cell function and has been used in cancer patients to combat tumors and prevent opportunistic infections. It inhibits cell proliferation and induces apoptosis in human leukemia, hepatocellular carcinoma, non-small cell lung cancer, melanoma, and other human cancers.[58] A double-blind, randomized trial involving 42 patients with localized, unresectable non-small cell lung cancer—who were given TA1 treatment for up to one year following radiation therapy—showed statistically significant improvement in relapse-free and overall survival correlated to T-cell levels previously depleted by radiation.[59]

GHK is a peptide that has been found to effectively downregulate expression of metastatic genes. GHK suppressed RNA production in 70% of 54 human genes overexpressed in patients with an aggressive metastatic form of colon cancer.[60]

GHK is capable of regulating various biochemical pathways on a gene level and resetting the gene activity of 30%

of the human genome back to health. In human neuroblastoma and breast cancer cells incubated in culture with GHK, the programmed cell death system (apoptosis) was reactivated and cell growth inhibited.[61]

Epitalon is a tripeptide that lengthens telomeres via increased telomerase activity and prolongs life span in multiple animal models and humans. It has been shown to restore melatonin secretion in the pineal gland and to have strong antioxidant properties via increase in antioxidant enzyme activity of superoxide dismutase, glutathione peroxidase, and glutathione S-transferase.[62]

Epitalon reduces the incidence of chromosomal aberrations, consistent with increases in telomere length.[63] It increases the proliferation of lymphocytes in the thymus and interferon gamma production by T-cells.[64] Epitalon has an inhibitory effect on Her2/neu gene expression in breast cancer and provided protection from development of leukemia in mice.[65,66] In M-1 sarcoma studied in rats, epitalon had cytostatic action on tumor cells, increased apoptosis, and hemorrhagic necrosis of tumor.[67] The effects on proliferation of colon tumors were evaluated and resulted in significant inhibition of mitotic activity of tumor cells, and a high level of apoptosis was seen.[68]

Met-enkephalin is an opioid growth factor that has been shown to selectively enhance the lymphoproliferative response to the T-cell mitogen concanavalin A.[69] Twenty subjects with advanced pancreatic cancer who had failed chemotherapy were treated weekly with Met5-enkephalin. Clinical benefit was experienced by 53% of the subjects surviving more than eight weeks, and 62% showed either a decrease or stabilization in tumor size by computed tomography.[70]

IRGD is a peptide that binds to integrins that are expressed on tumor endothelial cells. IRGD increased vascular and tissue permeability in a tumor-specific and neuropilin-1-dependent manner, allowing coadministered drugs to penetrate extra-vascular tumor tissue. Systemic injection with iRGD improved the therapeutic index of drugs of various compositions,

including doxorubicin, with nearly complete growth inhibition. The monoclonal antibody trastuzumab, when given with iRGD, increased the concentration of the antibody in tumor cells by 40-fold.

The iRGD-mediated enhancement in drug penetration persisted even after more than three weeks of antibody treatment. IRGD has been shown to enhance drug delivery for ten different drugs, thereby enhancing efficacy of anticancer drugs while reducing side effects.[71]

PNC-27, an anticancer peptide, which contains an HDM-2-binding domain corresponding to residues 12-26 of p53 and a transmembrane-penetrating domain, has been found to kill cancer cells—but not normal cells—by inducing membranolysis.[72,73] It has been approved for treatment outside of the U.S. However, concerns in application include risk of tumor lysis syndrome and reports of gastrointestinal bleeding.

Delta-sleep-inducing peptide (DSIP) has been shown to have reduction of chemotherapy-induced impairment of bioelectrical brain activity, called "chemobrain." Ten children, aged three to sixteen years, were given a ten-day course of DSIP and their bioelectric activity was recorded. Nine out of the ten children showed improvement in brain activity with DSIP.[74] DSIP was found in mice to decrease spontaneous tumor incidence by 2.6-fold.[75]

Hyperbaric Oxygen in Cancer Treatment

Hyperbaric oxygen can be an important adjunct in cancer therapy. Low cellular oxygen levels are a significant component in cancer progression and a critical hallmark of solid tumors. Low oxygen levels involve enhanced cancer cell survival, angiogenesis, which is the growing of new blood vessels to provide nourishment to the cancer, glycolytic metabolism, and the development of metastasis. Hyperbaric oxygen (HBO) treatment has been used to improve disorders involving hypoxia

and ischemia by enhancing the amount of dissolved oxygen in the plasma and thereby increasing oxygen delivery to the tissue.

Oxygen levels in the body are directly correlated to pH. Increasing pH from 4.0 pH to 5.0 pH increases oxygen to the cells by tenfold. Each whole number increases by tenfold again, so a 4.0 pH to a 6.0 pH increases oxygen by 100 times, and raising pH from 4.0 pH to 7.0 pH increases oxygen levels by 1,000 times.

Unless the body's pH level is slightly alkaline, the body cannot optimally heal itself. You cannot effectively improve cellular regeneration until pH levels are above 7. PH is directly correlated to the electrical conductivity of the biological system. The more acidic the body, the lower the electrical power in the cell.

Acid decreases the body's ability to repair damaged cells and to get rid of toxic and cancer-causing heavy metals. It makes the body more susceptible to fatigue, illness, and accelerated aging. Electromedicine and Light Medicine take into account a balanced pH. When body pH drops, enzymes are deactivated, digestion is interrupted, and vital nutrients are not effectively assimilated. While disease cannot survive in an alkaline state, in a low oxygen/low pH (acidic) state, viruses, bacteria, yeast, mold, fungus, candida, and cancer cells all thrive. As we discussed above, the reactivation and thriving of these pathogens could be the actual cause for cancer developing in the first place.

Cancers have a metabolism called glycolysis that doesn't use oxygen. Many integrative cancer clinics are combining their treatments with a hyperbaric oxygen chamber. Hyperbaric oxygen is very important and, unfortunately, a much-undervalued safe treatment for all chronic diseases and adjunct to cancer treatment.

The Effects of Light in Photodynamic Cancer Therapy

Blue light-emitting diodes are known to inhibit cancer proliferation and induce cancer cell death by increasing

intracellular reactive oxygen species (ROS) and activating a family of protease enzymes playing essential roles in programmed cell death called caspase.

The Blu Room, which will be discussed in the following chapter, could be an important mechanism to be further evaluated when utilized as an adjunct therapy in cancer treatment. Blu Room technology contains both medical UV light lamps, producing ultraviolet light in the 310 nm range, as well as blue LED lights used as an ambient light source which generally emits light at 400-450 nm. Both light sources have shown through research to directly affect cancer cell death alone as well as in combination with natural photosensitizers like curcumin, C60, fisetin, and others.

In a study published in 2019, the naturally occurring, photosensitizer molecule curcumin was used in photodynamic therapy mediated by a blue light-emitting diode. Researchers show that a curcumin encapsulated nanoplatform activated with a blue light-emitting diode induces cell death in cancer and represents a new class of cancer therapy.[76]

Blue LED light irradiation, with wavelengths of 400-480 nm, transmits high levels of energy and induces apoptosis by stimulating a mitochondrial pathway and reduces the early growth rate of melanoma cells in mice. The induction of apoptotic cell death and formation of autophagosome in human B lymphoma cells, after irradiation with blue LED, has also been detected.[77] Blue light-emitting diodes irradiation causes cell death in colorectal cancer by inducing ROS (reactive oxygen species) production and DNA damage while having no harmful effect on healthy cells.[78]

Two cell lines of melanoma and bovine endothelial cells were irradiated with blue light. Exposure to blue light (wavelength 450 nm, 10 J/cm^2 from a Waldman lamp) induced a rapid and large reduction in viability followed by the death of virtually all the irradiated cancer cells within 24 hours. These results led to exposure of a patient with hemorrhagic cutaneous melanoma metastasis to blue light. Irradiation led to an

immediate arrest of hemorrhage, an inhibition of tumor growth, and extensive tumor necrosis 24 hours after irradiation.[79]

Blue light was evaluated in another study to determine the pro-apoptotic effects in promyelocytic leukemia cells. Blue light reduced the viability and enhanced the mortality of cells in a time-dependent manner. Exposure to blue light for 24 hours caused depolarization of the mitochondrial membrane potential and the overproduction of reactive oxygen species in these leukemia cells. In a mouse model, 9-day exposure to blue light markedly suppressed the growth of tumors.[80]

These results indicate a preventative and adjunctive treatment role for blue light therapy against cancer.

To explore the possibility of using blue light for extracorporeal circulation therapy in patients with leukemia, the effects of blue light on cell growth in vitro and in the extracorporeally circulated blood of rats with leukemia were evaluated. When leukemia cells—circulated extracorporeally using a peristaltic pump—were exposed to blue light for 5 hours, the growth of the cells was found to be markedly suppressed. Then the blood of rats with erythroblastic leukemia was circulated extracorporeally and exposed to blue light for three hours. Lymphocytes were separated from the peripheral blood immediately after the end of blue-light exposure and incubated for seven days. The growth of leukemic cells was found to be significantly suppressed following exposure to blue light, whereas the growth of normal lymphocytes was unaffected. These findings suggest that cancer cells may be more sensitive to blue light than normal cells.[81]

The occurrence of lung metastases was effectively inhibited when melanoma cells from tumors in mice were exposed to blue light.[82]

A study evaluating the cytotoxic effects of blue light on melanoma cells, when combined with vitamins like riboflavin, showed that the vitamins had a significant contribution in the ability of the blue light to kill cancer cells. Cell necrosis was observed only in media containing riboflavin. The effects of

other components of visible light on riboflavin were also studied. Riboflavin-containing media were exposed to light from each of the three primary colors—red, green, and blue—and the effects on the melanoma cells were evaluated. Cell necrosis was induced only in media exposed to blue light. The effects of riboflavin increased in a concentration-dependent manner in the range from 0.3 to 1.0 mg/l in blue-light exposed media. These findings suggest that cell necrosis is probably induced by active oxygen species, such as hydrogen peroxide formed by the reaction of riboflavin with blue light.[83]

This combination approach is important in evaluating the effectiveness of blue light in the treatment of cancer. When it is combined with certain vitamins, as well as other photosensitizers like curcumin, the effectiveness against cancer is significantly enhanced.[84]

There are many other natural compounds that have been shown to have anticancer activity, which correlates with their ability of electron donation and antioxidant properties. ECGC (epigallocatechin gallate) extract from green tea has effects in prevention and treatment of breast and prostate cancer. It has anticancer properties in multiple other cancer categories like leukemia and has been successfully used as a photosensitizer.[85,86]

The information in this chapter is by no means exhaustive but gives an overview and understanding of how to combine natural molecules and repurpose drugs with light therapy, hyperbaric oxygen therapy, and peptides to support and treat cancer patients who do not want to undergo chemotherapeutic or radiation treatment for their illness or want to augment their current treatment with more natural, supportive means. It also outlines strategies for preventions by optimizing vitamin intake, strengthening the immune system, and using certain natural, antioxidant compounds for cancer prevention.

Another interesting molecule in photodynamic cancer therapy worth mentioning, given its blue color, is methylene blue (MB). Methylene blue has been shown to have renewable auto-oxidizing properties, which acts as an electron cycler that

allows MB to redirect electrons to the mitochondrial electron transport chain. This enhances adenosine triphosphate (ATP) energy production and promotes cell survival. This means MB directly gives electricity to the mitochondria, the powerhouse of the cell, and helps regenerate the cells. MB reduces reactive oxygen species production from the mitochondrial electron transport chain.

The antioxidant and electron donor property of MB is unique and can be utilized for photodynamic cancer treatment, neuro-regeneration, antiaging, and pain relief. It has anti-malarial, antiviral and antidepressant properties. Studies have established that MB enhances cytochrome c oxidase (complex IV) activity to produce more ATP (energy) in cells under normal oxygen conditions. MB replaces oxygen as the oxidant to sustain ATP generation under low oxygen conditions while simultaneously reducing oxidative stress. MB is one of the most effective compounds to delay senescence.[87]

MB photodynamic therapy (PDT) has been shown to induce massive cell death in breast cancer models, while having no effect on healthy cells. It therefore has been recommended as an adjunctive treatment to conventional treatments.[88] PDT has been effective in melanoma, basal cell carcinoma, prostate cancer, and Kaposi Sarcoma.[89]

There have been great advances in the field of integrative cancer treatments. Many more promising advances, like the antisense oligodeoxynucleotide mRNA therapy and CRISPR gene editing, open up this field for novel, less toxic therapies than what conventional chemotherapy and radiation treatment currently offers.

At AM Medical and other clinics around the county, we can offer repurpose drugs in combination with high-dose vitamin C infusions and other compounds with high light value. Integrating natural compounds that have been shown to have anticancer activity with the anticancer properties of blue and UV light is an interesting and promising new field of study.