A Nontoxic Multi-Targeted Cancer Treatment as a Single Tablet

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Background

It is quite common for cancer patients adopting alternative and integrative therapies to take a multitude of supplements, nutraceuticals and off-label drugs. This can be overwhelming psychologically and physically taxing to the digestive tract. In addition, this approach can be expensive and may offer only a marginal treatment response. In general, this represents a shotgun approach where everything imaginable is prescribed without a coherent strategy or specified target. Additionally, most supplements that are incorporated within cancer treatment protocols are not bioavailable.

Is it possible to simplify cancer treatment to a single tablet? Is the “less is more” approach applicable to cancer treatment? Can this treatment approach offer a highly cost effective alternative?

NORI has developed a single nutraceutical tablet that contains every ingredient necessary to selectively target and kill cancer cells. The tablet was developed through many years of extensive translational and clinical research directed towards leveraging common nutritional supplements for therapeutic purposes.

A synergistic cocktail approach allows for far lower dosages of the individual components. There is no single natural agent that is fully effective in treating cancer without potential toxicity or adverse side effects. Combining agents that are individually powerful into a cocktail can amplify the effectiveness up to an order of magnitude provided that there is synergy between the agents.

For any agent to be reliably effective, it must be either water or fat soluble. Water solubility is preferable because of rapid absorption and distribution. A key aspect of all of the tablet active ingredients is very high bioavailability due to 100% water solubility. All active ingredients are readily absorbed and distributed through the blood stream. Very low dosages are therefore required to achieve rapid and stable pharmacologic blood concentration.

Imagine having just one bottle of tablets to take as opposed to multiple different bottles of tablets. No confusion, no errors and a very simple routine allows for a near normal life. Also, there will be far less stress in getting the protocol right.

Optimal results from the single tablet are obtained by incorporating a low sulfur amino acid plant-based alkaline diet and a high intake of polyunsaturated fatty acids. A plant-based diet is the best dietary recommendation for every cancer patient and for general

health. Diet, lifestyle and emotional state are at the foundation of a natural approach to cancer treatment. Conventional oncology is an extremely narrow approach that fails to successfully treat cancer without both physical and financial toxicity.

The NORI Nutraceutical Cocktail as a Single Tablet

Treating cancer necessitates killing cancer cells through applying cytotoxic agents or activating the immune system or a combination of both. Chemotherapy involves the administration of highly toxic pharmaceutical agents that cause severe side effects and organ damage. Chemotherapy significantly increases the risk for second cancers. Commonly observed, especially in treating stage 4 cancers is that the cancer returns with a vengeance after treatment with chemotherapy. Targeted drugs, radiotherapy, surgery and immunotherapy carry their own risks and limits in increasing survival.

What about seeking answers in nature as opposed to unnatural synthetic drugs? Let's place the patent issues aside and develop cancer treatments based on nontoxic natural agents that exist in nature.

Extensive scientific studies have identified natural compounds that selectively kill cancer cells leaving normal cells unharmed. Some of these natural compounds are common nutritional factors while others are derived form medicinal herbs. A large body of scientific research has been directed towards understanding how nutritional factors are involved in cancer prevention. Measurements of nutrient levels in cancer patients has identified potential risk factors for cancer as specific nutritional deficiencies.

Selenium, vitamin B6 and vitamin K standout as nutrients associated with cancer risk and have been studied for their therapeutic potential in cancer treatment. These three nutrients are at the tip of the iceberg as natural agents that selectively kill cancer cells and when combined together, a powerful synergistic cocktail is created. This may be challenging to accept that such a simple approach could treat advanced stage 4 cancers without any toxic side effects. The scientific evidence is clear and compelling in demonstrating the power of natural agents for treating cancer without toxicity. Also, consider the cost as these natural agents are very inexpensive and do not require FDA approval to be incorporated within integrative or naturopathic care.

The primary constitutes of the tablet are sodium selenite, vitamin B6 (P5P) and a vitamin K precursor. These are highly bioavailable compounds administered at dosages above levels for supplementation but well below levels that would create toxic effects. Each constitute individually exhibits potent and selective anticancer activity through oxidative mechanisms.

The cocktail is designed to maximize the creation of reactive oxygen species (ROS) inside the cancer cell. When the ROS level exceeds a threshold, the cancer cell is triggered to enter apoptosis (natural programmed cell death) or will literally explode by a form of cell death called ferroptosis.

The NORI protocol evolved over a decade and began with the utilization of sodium selenite. Various combinations, all of which included sodium selenite were evaluated. Recently, vitamin B6 (P5P) was added to the protocol and a significant improvement in response was observed. More recently, vitamin K3 was incorporated and an even greater response has been noted. Also, the goal is to relax the dietary methionine and cysteine restriction requirement. The diet will always be 100% plant-based but with a higher target level for methionine and cysteine. The diet will be continuous rather than cycled between restriction and non-restriction days.

For ease of administration of the protocol, a single tablet was developed. More than simply mixing the active ingredients together, the tablet must be designed to slowly release the active ingredients to prevent gastro- intestinal disturbances and to even out the blood concentration over time.

Could one simply purchase the tablet ingredients and self administer the cocktail? No, the only ingredient available as a tablet is vitamin B6 (P5P). Sodium selenite is only available at very small dosages. Vitamin K1 and K2 are ineffective at supplemental dosages and vitamin K3 was banned by the FDA as a nutritional supplement for human use. Vitamin K3 is available for supplementation in pet foods and animal feeds.

A major advantage of a cocktail is that multiple pathways are involved and this reduces the chance of treatment resistance. Hitting a single pathway can provide an opportunity for cancer cells to develop resistance. There is little opportunity for cancer cells to escape a multi-pronged attack from different angles.

Tablet Formulation

The all-in-one tablet is formulated as slow and sustained release by utilizing a self assembling gel matrix. Keeping the diameter to 8 mm and thickness to less than 6 mm allows for easy swallowing. An acid resistant enteric coating is applied to further limit dissolution in the stomach.

<u>Tablet Active Ingredients</u>

Sodium Selenite - 2 mg

Vitamin B6 (P5P) - 10 mg

Vitamin K Precursor (2-methyl-1,4-naphthoquinone sodium sulfonate) - 5 mg

Also included in the tablet are iron, zinc, copper and manganese which support ferroptosis, oxidative stress and the degradation of cysteine.

Synergy

As already stated, each individual constituent of the cocktail exerts potent anticancer activity which involves elevation of oxidative stress (ROS). Each constituent does this by affecting different pathways although there is some degree of overlap.

Sodium selenite interacts with the thioredoxin antioxidant defense system.

Vitamin K inhibits PKM2 which is involved in regulating glycolysis.

Vitamin B6 (P5P) along with iron degrades cysteine which limits glutathione synthesis.

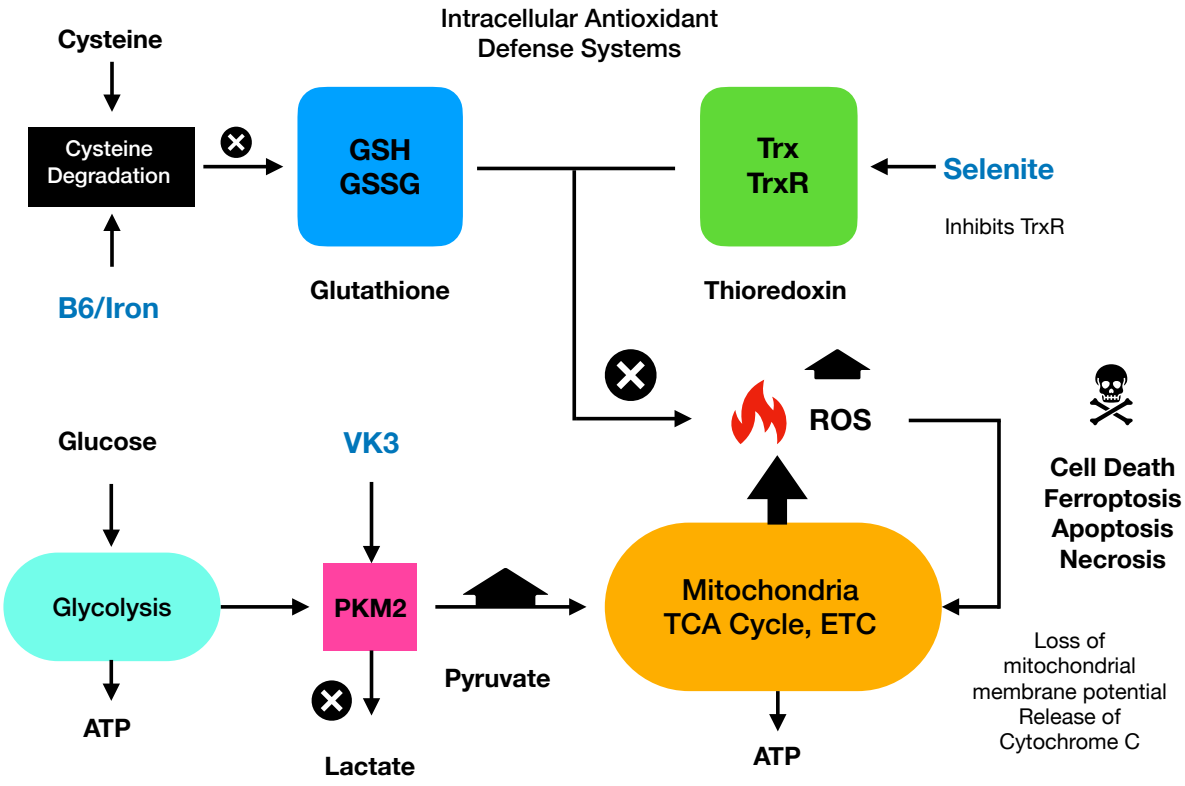

Diagram showing intracellular primary mechanisms for the anticancer activity sodium selenite, vitamin K3, B6 (Pyridoxal 5-Phoshpate) and Iron.

Overall, the cocktail causes the generation of an unsustainable level of ROS within the mitochondria and cytosol. This triggers apoptosis and if conditions are right, ferroptosis. Ferroptosis requires that a sufficient amount of polyunsaturated fatty acids (PUFAs) have been incorporated into the cell membrane.

Selectivity

How does the cocktail target only cancer cells while causing no harm to normal cells? There are several reasons for selectivity.

1. Cancer cells are more sensitive to an elevation in ROS than normal cells because cancer cells have a significantly higher basal ROS level.

2. The uptake of sodium selenite into tumor tissue is far greater than into normal tissue.

3. Uptake of B6 (P5P) is higher in cancer cells than normal cells.

4. The individual dosages of sodium selenite, B6 (P5P) and vitamin K3 are well below the toxic threshold for each agent. The synergy created by the cocktail allows for further dosage reduction and greater margin between therapeutic effect and toxicity.

5. The cocktail is composed of natural agents as opposed to synthetic pharmaceuticals that are expected to cause adverse side effects and organ damage.

6. The cocktail is administered for only 3-5 consecutive days per week allowing a washout period which prevents long term buildup of the active ingredients.

7. The plasma and systemic half-life of the cocktail ingredients is relatively short.

Immunogenic Activity

It is potentially possible that the tablet causes an immune response due to several mechanisms. Vitamin B6 (P5P) has been shown to lower the expression of PD-L1 and MR1 on the cancer cell outer membrane. This enables CD8+ T cells to see and attack cancer cells.

Sodium selenite may facilitate natural killer cell attack by lowering the expression of immune masking signals and activating natural killer cells.

Conclusion

Treating cancer need not be overly complex or necessitate targeting a multitude of pathways. A simple cocktail of natural agents, carefully selected to target only a few key pathways is sufficient for selectively killing cancer cells. Utilizing a cocktail of orally bioavailable compounds combined together as a single tablet represents an ideal, simple and cost-effective approach to cancer therapy. Applying the cocktail as individual nutraceuticals has already demonstrating remarkable clinical responses.

Small scale clinical studies will confirm the utility of single tablet approach and revolutionize both conventional and alternative cancer therapy. It is time to rethink, reconsider and revamp the entire field of oncology. The current approach is not effective, is excessively toxic and is obscenely expensive. Profit driven medicine is a hideous monster that must be fully restrained.

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