Abstract
Every bio molecule can be fingerprinted by a set of unique THz frequencies. There is a substantial plurality of such frequencies that comprise a fingerprint for any bio molecule. Therefore, cancer cells have different THz fingerprints than healthy cells. The idea is to destroy cancer cells by directing the focused energy Terahertz beam at cancer cell’s THz resonance frequencies (that do not coincide with the THz resonance frequencies of the healthy cells) by using Proprietary Tunable THz Magnon Laser. We offer new revolutionary treatment of cancer with the Magtera Proprietary, tunable THz Magnon Laser which has the size of a fingernail.

First step: Detect the THz modes for cancer cells. Second step: Find a THz window of penetration in body fluids that corresponds to one of these modes by using the highly tunable THz Magnon Laser that bridges the THz Gap. Third step: finding the THz frequencies of the cancer cells that do not coincide with the THz resonance frequencies of the healthy cells. Fourth step: applying the min THz energy at THz frequencies of the cancer cells that do not coincide with the THz resonance frequencies of the healthy cells capable of destruction the cancer cells.

No side effects. Indeed, as health cells have different THz frequencies than cancer cells, only cancer cells will be affected.

Keywords: Cancer, Treatment, Terahertz Laser

Biography
Dr. Tankhilevich is the co-founder and CEO of Magtera. Previously, Dr. Tankhilevich was a Research Scientist at the Academy of Science in St. Petersburg and is credited with being the first to realize magnon systems can be used as a source of terahertz radiation.

Background
Deaths in the United States among persons with cancer
Cancer was the second leading cause of death, after heart disease, in the United States in 2020. In 2020, there were 602,350 cancer deaths; 284,619 were among females and 317,731 among males.

What were the leading causes of cancer death in 2020?
Lung cancer was the leading cause of cancer death, accounting for 23% of all cancer deaths. Other common causes of cancer death were cancers of the colon and rectum (9%), pancreas (8%), female breast (7%), prostate (5%), and liver and intrahepatic bile duct (5%). Other cancers individually accounted for less than 5% of cancer deaths.

In 2020: (a) 136,084 people died of lung cancer (63,135 females and 72,949 males); (b) 51,869 people died of colorectal cancer (23,826 females and 28,043 males); (c) 46,774 people died of pancreatic cancer (22,495 females and 24,279 males); (d) 42,275 females died of breast cancer; (e) 32,707 males died of prostate cancer; (f) 28,227 people died of liver and intrahepatic bile duct cancer (9,591 females and 18,636 males).

Types of Cancer Treatment
• Chemotherapy
• Hormone Therapy
• Hyperthermia
• Immunotherapy to Treat Cancer
• Photodynamic therapy
• Radiation therapy
• Surgery

Chemotherapy
Treatment
Chemotherapy is a type of cancer treatment that uses drugs to kill cancer cells. However, chemotherapy can cause severe side effects. Indeed, chemotherapy also kills or slows the growth of healthy cells that grow and divide quickly.

Side effects
Chemotherapy can cause severe side effects. Indeed, chemotherapy also kills or slows the growth of healthy cells that grow and divide quickly.
Hormone Therapy
Treatment
Hormone therapy is a treatment that slows or stops the growth of breast and prostate cancers that use hormones to grow.

Side effects
Hormone therapy can cause side effects because hormone therapy blocks the body’s ability to produce hormones or interferes with how hormones behave.

Hyperthermia
Treatment
Hyperthermia is a type of treatment in which body tissue is heated to as high as 113 °F to help damage and kill cancer cells.

Side effects
Hyperthermia can also cause side effects. Indeed, diarrhea, nausea, and vomiting are common after whole-body hyperthermia. It can also cause more serious side effects that are not common, including heart and blood vessel problems.

Immunotherapy to Treat Cancer
Treatment
Immunotherapy is a type of cancer treatment that helps the body’s immune system fight cancer. The immune system helps the body to fight infections and other diseases. It is made up of white blood cells and organs and tissues of the lymph system. Thus, immunotherapy is a type of biological therapy. Biological therapy is a type of treatment that uses substances made from living organisms to treat cancer.

Side effects
However, immunotherapy can also cause side effects. Indeed, many corresponding side effects are caused when the immune system that is revved-up to act against the cancer also acts against healthy cells and tissues in the body.

Photodynamic therapy (PDT)
Treatment
Photodynamic therapy (PDT) uses a drug that is activated by light, called a photosensitizer or photosensitizing agent, to kill cancer cells. The light can come from a laser or other source, such as LEDs.

Side effects
Photodynamic therapy also causes side effects by still causing burns, swelling, pain, and scarring in the treatment area. But the main limitation of PDT is that it is used as a local treatment, which means it treats only a specific part of the body.

Radiation therapy
Treatment
Radiation therapy (also called radiotherapy) is a cancer treatment that uses high doses of radiation to kill cancer cell and shrink tumors.

Side effects
Radiation therapy can cause severe side effects because radiation not only kills or slows the growth of cancer cells, but it can also affect and damage nearby healthy cells.

Surgery
Treatment
Surgery is used to treat cancer locally; it is a procedure in which a surgeon removes cancer from your body.

Side effects
Side effects include damaging the healthy tissues, nerves, removing the healthy tissue nearby to cancer cells tissue., or failure to remove all cancerous cell tissues.

Side Effects of existing types of Cancer Treatment
Thus, all current methods of Cancer treatments can cause side effects.

Magtera Novel Approach-Terahertz-based radiation of Cancer without side effects.
Every bio molecule can be ‘fingerprinted’ by a set of unique THz frequencies. There is a substantial plurality of such frequencies that comprise a fingerprint for any bio molecule as shown in FIG. 1. [1].

![Figure 1: Illustrates various modes of molecular dynamics in THz region. THz Gap highlighted. All cancer cells resonance frequencies are in THz region.](image-url)
Therefore, cancer cells have **different THz fingerprints** than healthy cells.

The idea is to destroy cancer cells by directing the focused energy Terahertz beam at cancer cell’s THz resonance frequencies (that do not coincide with the THz resonance frequencies of the healthy cells) by using Proprietary Tunable THz Magnon Laser [2] as shown in FIG.2.

**Fourth step:** applying the min THz energy (at THz frequencies of the cancer cells that do not coincide with the THz resonance frequencies of the healthy cells) capable of destruction the cancer cells $E_{\text{THz\_Destruction\_Min}} > E_{\text{THz}[2]}$.

**Side effects**
No side effects. Indeed, as healthy cells have different THz frequencies than cancer cells, only cancer cells will be affected.

**Conclusion**
This is a theoretical paper. Magtera is actively seeking partners and investors to bring this new approach to life.

**References**

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