

N-Thiolated Beta-Lactams for Cancer Prevention and Treatment

Researchers at the University of South Florida have developed a novel method to treat cancer using N-thiolated beta-lactam compounds.

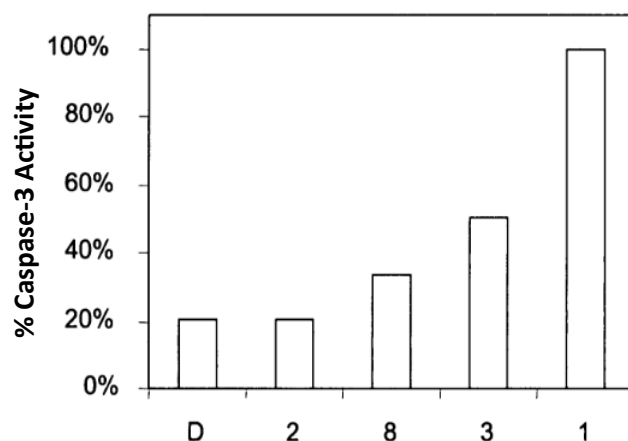
Currently, many anti-cancer therapies such as chemotherapy work by inducing apoptosis in the diseased cells. Unfortunately, these therapies tend to terminate healthy cells as well. This can cause several negative side effects such as fatigue, infection, hair loss, appetite changes, nausea, anemia and fertility problems. While synthetic small compounds exhibit great potential as anti-cancer drugs and are often used in cancer treatment, they need to be reconfigured to target cancer cells exclusively. N-thiolated beta-lactam compounds can be easily synthesized and structurally manipulated to target specific cells. Therefore, a cancer therapeutic which utilizes these small compounds to induce apoptosis exclusively in cancerous cells is an ideal cancer treatment option.

USF researchers have demonstrated that N-thiolated beta-lactams have a significant inhibitory effect on the proliferation of multiple solid tumor cell lines. For more than 60 years, N-thiolated beta-lactam antibiotics have played an essential role in treating bacterial infections. However, they have not been used as a cancer therapeutic until now. These N-thiolated beta-lactam compounds have the ability to induce DNA damage in cancer cell lines without affecting normal cells. This DNA damage then inhibits the replication and activation of caspase-3, a major contributor in the apoptosis signaling pathway. To date, these compounds have been used to treat multiple solid tumor cell lines including cancers of the prostate, breast, head and neck.

ADVANTAGES:

- Apoptosis induced in cancer cells
- Normal cells are preserved
- Validated *in vivo*
- Treats multiple cancer types

Novel N-Thiolated Beta-Lactam Compounds Induce Cancer Cell Apoptosis



Apoptosis Inducing Potencies of Different N-Thiolated Beta-Lactam Analogs Compared to D (DMSO) as a Control

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Patent #s: [7,026,472](#) / [7,635,693](#)